AGENDA

Donald P. Wagner
Chairman

Melissa Fox
Vice Chairwoman

Jeffrey Lalloway
Director

Lynn Schott
Director

Christina Shea
Director

ORANGE COUNTY GREAT PARK BOARD SPECIAL MEETING

September 25, 2018
3:30 PM
Conference and Training Center
One Civic Center Plaza
Irvine, CA 92606

Speaker's Card/Request to Speak: If you would like to address the Board on a scheduled agenda item – including a Consent Calendar item, a Regular Business item, a Public Hearing item, or Public Comments – please complete the Request to Speak Form. The card is at the table at the entrance to the City Council Chamber. Please identify on the card your name and the item on which you would like to speak and return to the Clerk of the Board. The Request to Speak Form assists the Chair in ensuring that all persons wishing to address the Board are recognized. It also ensures the accurate identification of meeting participants in the Board minutes. Your name will be called at the time the matter is heard by the Board. Board policy is to limit public testimony to up to three minutes per speaker depending on relevant circumstances (unless the time limit is extended by the Chair), which includes the presentation of electronic or audio visual information. Speakers may not yield their time to other persons.

Please take notice that the order of scheduled agenda items below and/or the time they are actually heard, considered and decided may be modified by the Chair or the Board during the course of the meeting, so please stay alert.

CALL TO ORDER

ROLL CALL

PLEDGE OF ALLEGIANCE

INTERIM DIRECTOR, OCGP, REPORT

Scan this QR code for an electronic copy of the Great Park Board staff reports

BOARDMEMBER REPORTS

1. CONSENT CALENDAR

All matters listed under Consent Calendar are considered by the Director, Orange County Great Park, and the City Manager to be routine and enacted by one roll call vote. There will be no discussion of these items unless members of the Orange County Great Park Board request specific items to be removed from the Consent Calendar for separate discussion. Any member of the public may address the Board on items on the Consent Calendar. See information for Speaker's Card/Request to Speak on first page.

1.1 MINUTES

ACTION:
Approve the minutes of a special joint meeting of the Orange County Great Park Board with the Irvine City Council held on August 28, 2018.

2. BOARD BUSINESS

2.1 PROPOSAL SELECTIONS AND BUDGET ADJUSTMENT FOR COMMUNITY CHOICE ENERGY FEASIBILITY STUDY AND STRATEGIC ENERGY PLAN

ACTION:

1) Recommend that the City Council approve a budget adjustment for the reallocation of existing funds and authorize staff to award a professional services contract in the amount of $77,470 to EES Consulting, Inc. for a Community Choice Energy Feasibility Study.
2) Recommend that the City Council approve a budget adjustment for the reallocation of existing funds and authorize staff to award a professional services contract in the amount of $105,500 to Integral Group, Inc. to develop the City of Irvine Strategic Energy Plan.
3) Recommend that the City Council direct staff to establish a quarterly task force, comprised of one representative from each City Commission, to review the progress of the Community Choice Energy Feasibility Study and the Strategic Energy Plan.

PUBLIC COMMENTS (Limited to 3 minutes per speaker)

Any member of the public may address the Board on items within the Orange County Great Park Board's subject matter jurisdiction but which are not listed on this agenda during Public Comments; however, no action may be taken on matters that are not part of the posted agenda. See information for Speaker's Card/Request to Speak on the first page.

ADJOURNMENT

NOTICE TO THE PUBLIC

LIVE BROADCASTING AND REBROADCASTING

Regular Orange County Great Park Board meetings are broadcast live every 4th Tuesday of the month at 2 p.m. and are replayed on Tuesdays at 2 p.m. (in weeks in which there is not a live Great Park Board meeting), Wednesdays at 8 a.m., Thursdays at 7 p.m., and Saturdays at 7 p.m. (in weeks in which there is not a live Orange County Great Park meeting) until the next Orange County Great Park Board meeting. All broadcasts can be viewed on Cox Communications Local Access Channel 30 and U-Verse Channel 99. Orange County Great Park Board meetings are also available via live webcast and at any time for replaying through the City's ICTV webpage at *cityofirvine.org/ictv*. For more information, please contact the Clerk of the Board/City Clerk's Office at (949) 724-6205.

STAFF REPORTS

As a general rule, staff reports or other written documentation have been prepared or organized with respect to each item of business listed on the agenda. Copies of these materials are on file with the Clerk of the Board and are available for public inspection and copying once the agenda is publicly posted (at least 72 hours prior to a regular Orange County Great Park Board meeting). Staff reports can also be downloaded from the City's website at *cityofirvine.org* and *ocgp.org* beginning the Friday prior to the scheduled regular Orange County Great Park Board meeting on the 4th Tuesday of each month.

In addition, meetings can be viewed live at the time posted on the agenda and related staff reports can be opened and viewed simultaneously along with the streaming of the meeting. To view the meeting, go to *cityofirvine.org/ictv*.

If you have any questions regarding any item of business on the agenda for this meeting, or any of the staff reports or other documentation relating to any agenda item, please contact Clerk of the Board/City Clerk staff at (949)724-6205.

SUPPLEMENTAL MATERIAL RECEIVED AFTER THE POSTING OF THE AGENDA

Any supplemental writings or documents distributed to a majority of the Orange County Great Park Board regarding any item on this agenda after the posting of the agenda will be available for public review in the Clerk of the Board/City Clerk's Office, One Civic Center Plaza, Irvine, California, during normal business hours. In addition, such writings or documents will be made available for public review at the respective public meeting.

If you have any questions regarding any item of business on the agenda for this meeting, or any of the staff reports or other documentation relating to any agenda item, please contact Clerk of the Board/City Clerk staff at (949)724-6205.

SUBMITTAL OF INFORMATION BY MEMBERS OF THE PUBLIC FOR DISSEMINATION OR PRESENTATION AT PUBLIC MEETINGS

Media Types and Guidelines

1. Written Materials/Handouts:

   Any member of the public who desires to submit documentation in hard copy form may do so prior to the meeting or at the time he/she addresses the Orange County Great Park Board. Please provide 15 copies of the information to be submitted and file with the Clerk of the Board at the time of arrival to the meeting. This information will be disseminated to the Orange County Great Park Board at the time testimony is given.

2. Large Displays/Maps/Renderings:

   Any member of the public who desires to display freestanding large displays or renderings in conjunction with their public testimony is asked to notify the Clerk of the Board/City Clerk's Office at (949)724-6205 no later than 10 a.m. on the day of the scheduled meeting so that an easel can be made available, if necessary.

3. Electronic Documents/Audio-Visuals:

   Any member of the public who desires to display information electronically in conjunction with their public testimony is asked to submit the information to the Public Information Office (PIO) no later than 10 a.m. on the day of the scheduled meeting. To facilitate your request contact the PIO Office at (949)724-6253 or the City Clerk's Office at (949)724-6205.

   Information must be provided on CD, DVD, or VHS; or, emailed by 10 a.m. on the day of the scheduled meeting to pio@ci.irvine.ca.us. Members of the public will be asked to provide their name, identify the meeting and the agenda item to be addressed, and a daytime phone number.

   The PIO office will notify the person submitting the information as soon as possible prior to the meeting if the information cannot be accessed or if the version provided is incompatible with the City's system. Every effort will be made by City staff to facilitate the presentation.

CITY SERVICES TO FACILITATE ACCESS TO PUBLIC MEETINGS

It is the intention of the City of Irvine to comply with the Americans With Disabilities Act (ADA) in all respects. If, as an attendee or a participant at this meeting, you will need special assistance beyond what is normally provided, the City of Irvine will attempt to accommodate you in every reasonable manner. Please contact the Clerk of the Board/City Clerk's Office at (949)724-6205.

Assisted listening devices are available at the meeting for individuals with hearing impairments. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting. (28 CFR 35. 102-35. 104 ADA Title II)

CHALLENGING BOARD DECISIONS

If a person wishes to challenge the validity or reasonableness of any Board action or decision in court, they may be limited to raising only those issues they or someone else raised at the meeting described in this notice, or in written correspondence delivered to the Orange County Great Park Corporation, at or prior to the meeting. In addition, judicial challenge may be limited or barred where the interested party has not sought and exhausted all available administrative remedies.

COMMUNICATION AND ELECTRONIC DEVICES

To minimize distractions, please be sure all personal communication and electronic devices are turned off or on silent mode.

MEETING SCHEDULE

Regular meetings of the Orange County Great Park Board are held on the fourth Tuesdays of each month at 2 p.m. Agendas are available at the following locations:

- Clerk of the Board/City Clerk's Office
- Police Department
- Front Entrance of City Hall
- University Park Center (Culver/Michelson)
- Walnut Village Center (Culver/Walnut)
- Northwood Town Center (Irvine Blvd./Yale)
- City's web page at *cityofirvine.org*
- Orange County Great Park's web page at *ocgp.org*

I hereby certify that the agenda for the Special Orange County Great Park Board meeting was posted in accordance with law in the posting book located in the Public Safety Lobby of City Hall, One Civic Center Plaza, Irvine, California on September 13, 2018 by 7:45pm as well as on the City's web page.

Molly McLaughlin, CMC
Secretary/Clerk of the Board

1.1

REQUEST FOR BOARD ACTION

MEETING DATE: SEPTEMBER 25, 2018

TITLE: MINUTES

Secretary / Clerk of the Board

RECOMMENDED ACTION:

Approve the minutes of a special joint meeting of the Orange County Great Park Board with the Irvine City Council held on August 28, 2018.

MINUTES

SPECIAL JOINT MEETING OF THE ORANGE COUNTY GREAT PARK BOARD WITH THE IRVINE CITY COUNCIL

August 28, 2018
Conference and Training Center
One Civic Center Plaza
Irvine, CA 92606

CALL TO ORDER

The special joint meeting of the Orange County Great Park Board with the Irvine City Council was called to order at 5:21 p.m. on August 28, 2018 in the Conference and Training Center, Irvine Civic Center, One Civic Center Plaza, Irvine, California; Mayor/Chairman Wagner presiding.

ROLL CALL

Present:	5	Councilmember/Vice Chairwoman:	Melissa Fox
		Councilmember/Director:	Jeffrey Lalloway
		Councilmember/Director:	Lynn Schott
		Mayor Pro Tempore/Director:	Christina Shea
		Mayor/Chairman:	Donald P. Wagner

5. CONSENT CALENDAR - GREAT PARK BOARD

ACTION: Moved by Mayor Pro Tempore/Director Shea, seconded by Councilmember/Vice Chairwoman Fox, and unanimously carried to approve Great Park Board Consent Calendar Item No. 5.1.

5.1 MINUTES

ACTION:
Approved the minutes of a special joint meeting of the Orange County Great Park Board with the Irvine City Council held on July 24, 2018.

6. CITY COUNCIL / BOARD BUSINESS

6.1 CONSIDERATION OF MAYOR/CHAIRMAN WAGNER'S REQUEST FOR DISCUSSION OF UNITED STATES OLYMPIC WATER POLO AT THE ORANGE COUNTY GREAT PARK

This item was agendized at the request of Mayor/Chairman Wagner, who requested City Council/Board support to direct the City Manager to negotiate and execute an Exclusive Negotiating Agreement with USA Water Polo to discuss the location, terms, and conditions under which the City and USA Water Polo could deliver a facility.

The following individuals spoke in support of United States Olympic Water Polo at the Orange County Great Park:

Chris Ramsey, USA Water Polo
Bryan Starr, Greater Irvine Chamber
Julie Ertel
Steve Carrera, USA Water Polo
Maddie Musselman, USA Water Polo
Daniel Klatt, USA Water Polo
Oleg Shatskikh, USA Water Polo
Ernie Kwan, USA Water Polo
Tony Wang

City Council/Board discussion included: reiterating prior Board and City Council discussion and support for water polo facility at the Orange County Great Park; inquired about the timeframe of the agreement; questioned the needs by the Olympics for additional temporary seating and how such seating could be incorporated into the venue; and reviewed the facility elements, including a scoreboard and cover.

John Russo, City Manager, noted that the proposed agreement include a 90-day provision with a 60-day extension if necessary at staff's discretion.

ACTION: Moved by Mayor/Chairman Wagner, seconded by Councilmember/Director Schott, and unanimously carried to:

Direct the City Manager to negotiate and execute an Exclusive Negotiating Agreement with USA Water Polo to discuss the location, terms, and conditions under which the City and USA Water Polo could deliver a facility. **(Contract No. 10358)**

PUBLIC COMMENT – ORANGE COUNTY GREAT PARK BOARD

Virginia Bickford, Los Alamitos resident, spoke in a support of botanical gardens and a Native American heritage and cultural museum in the Cultural Terrace at the Orange County Great Park.

ADJOURNMENT – JOINT MEETING WITH THE ORANGE COUNTY GREAT PARK BOARD

Moved by Mayor Pro Tempore/Director Shea, seconded by Councilmember/Vice Chairwoman Fox, and unanimously carried by those members present (Councilmember/Director Schott absent from the dais) to adjourn the special joint meeting with the Orange County Great Park Board at 6:05 p.m.

_____
CHAIRMAN

_____ September 25, 2018
SECRETARY/CLERK OF THE BOARD

2.1

REQUEST FOR BOARD ACTION

MEETING DATE: SEPTEMBER 25, 2018

TITLE: PROPOSAL SELECTIONS AND BUDGET ADJUSTMENT FOR COMMUNITY CHOICE ENERGY FEASIBILITY STUDY AND STRATEGIC ENERGY PLAN

Acting Director of Public Works

for City Manager

RECOMMENDED ACTION

1. Recommend that the City Council approve a budget adjustment for the reallocation of existing funds and authorize staff to award a professional services contract in the amount of $77,470 to EES Consulting, Inc. for a Community Choice Energy Feasibility Study.

2. Recommend that the City Council approve a budget adjustment for the reallocation of existing funds and authorize staff to award a professional services contract in the amount of $105,500 to Integral Group, Inc. to develop the City of Irvine Strategic Energy Plan.

3. Recommend that the City Council direct staff to establish a quarterly task force, comprised of one representative from each City Commission, to review the progress of the Community Choice Energy Feasibility Study and the Strategic Energy Plan.

EXECUTIVE SUMMARY

On September 12, 2017, the City Council approved the Green Ribbon Environmental Committee's work plan (Attachment 1) which included direction to initiate a Community Choice Energy (CCE) Feasibility Study and develop a Strategic Energy Plan (Energy Plan). Following this City Council direction, staff issued two Requests for Proposal (RFPs) to identify qualified consultants to work on these energy related initiatives.

The RFP process for both initiatives has concluded and staff identified experienced candidates for each of these projects. Staff recommends awarding a contract to EES Consulting, Inc. (EES Consulting) for the CCE study in the amount of $77,470, and a contract to Integral Group, Inc. (Integral Group) for $105,500 to develop the Energy Plan.

Funding for these initiatives was not allocated in the current budget. Staff plans to fund these projects through anticipated budget savings from the Fiscal Year 2018-19 Public Works operations budget and is requesting approval of a budget adjustment for the reallocation of existing funds.

COMMISSION/BOARD/COMMITTEE RECOMMENDATION

On August 15, 2017, the Green Ribbon Environmental Committee (Committee) recommended the City Council approve the Committee's work plan, which included a CCE Feasibility Study and an update to the 2008 Energy Plan. On August 27, 2018, the Committee recommended that City Council approve the use of existing funds and the proposals for both the CCE Feasibility Study and the Strategic Energy Plan.

On September 4, 2018 the Finance Commission recommended that the City Council move forward with a budget adjustment for the reallocation of existing funds and authorize staff to award professional service contracts. In addition, the Commission amended the action to include a recommendation that the City Council establish a task force, comprised of one representative from each City Commission (Community Services, Finance, Planning, and Transportation), to meet on a quarterly basis to review the progress of the CCE Feasibility Study and the Strategic Energy Plan.

ANALYSIS

To prepare for future energy demands in Irvine, the City is interested in defining an energy vision for the community and identifying strategies, such as Community Choice Energy, that promote economic vitality and energy efficiency. As communities face excessive-heat, high-winds, fires and other disaster events that can impact energy supply and reliability, planning for energy resilience becomes very important. The proposed development of a Strategic Energy Plan will consider CCE program feasibility as part of a comprehensive strategy to meet future energy needs in Irvine.

CCE programs and strategic energy planning complement one another by exploring local control over energy procurement and identifying areas where distributed energy resources, such as renewable energy, energy storage, or microgrid projects, can be implemented. Having greater local control over energy resources through a CCE program may lead to resources being put back into the community as any cost savings realized can be passed directly to local consumers of energy. For instance, CCE programs can file for Energy Efficiency Program funding from the California Public Utility Commission to implement their own energy programs that provide rebates and incentives tailored directly to the community's needs.

Community Choice Energy

Community Choice Energy is also known as Community Choice Aggregation (CCA), and is a program that enables local governments to control their energy procurement portfolio because the CCE entity can purchase power, set rates, and collect revenue. Jurisdictions that formed CCE programs early on have been able to offer lower electricity rates to their business and residential customers, while increasing the amount of renewable energy in the portfolio. A Feasibility Study and technical assessment of CCE program implementation is needed to better understand the potential for lowering electricity rates, and examine the issues surrounding development and risks of operating a CCE program in Irvine.

As background, CCE programs are not considered municipal utilities and will operate in partnership with the utility. Southern California Edison will continue to provide transmission and distribution services, power line maintenance, and customer billing services. There are 20 operational CCE programs in California, from Marin Clean Energy (launched in 2010) to Solana Beach (launched in June 2018). These CCE programs serve over four million consumers, representing over 154 cities and 16 counties in California, and generally offer a higher level of renewable energy at rates lower than the utility. Orange County cities, such as Huntington Beach, Laguna Woods, Lake Forest, San Clemente, and Tustin are considering conducting a CCE Feasibility Study, and Laguna Beach and Newport Beach have completed their feasibility studies. Staff will monitor the potential to partner with these communities and other agencies on the Feasibility Study and any possible program implementation.

As with any largescale program, there are risks involved and variables that warrant consideration before launching a CCE program. A CCE Feasibility Study would assess potential vulnerabilities, including increased utility fees for entities initiating CCE programs (e.g. exit fees), risks associated with energy procurement, potential changes to the energy industry, and industry attempts to alter legislative requirements for CCE programs. The Feasibility Study will also assess any economic impacts to the City, financial liability of the CCE program, and potential staffing needs.

Strategic Energy Plan

The objectives of the Energy Plan are to evaluate the City's current and future energy needs, identify economically feasible strategies to reduce costs in municipal operations, and provide cost effective measures the community can voluntarily implement to reduce energy consumption. An updated Energy Plan will explore strategies to meet the City's energy needs, and will also provide valuable data, such as an energy use baseline and emissions inventory, that will be used for the City's Comprehensive General Plan Update project that is currently underway.

The General Plan guides the evolution of the community and includes elements related to physical planning issues such as land use, transportation and housing. The General Plan also includes an Energy Element that covers goals for the City to maximize energy efficiency through land use and transportation planning, energy conservation and reduction of energy use in buildings, and municipal energy conservation. To implement the objectives and policies identified in the Energy Element, the City developed its first Energy Plan in 2008 which established best practices for the City to consider. Implementation of these best practices continues to result in cost savings for the City. For example, measures to improve energy performance of existing facilities such as retrofitting interior and exterior lighting, and reducing energy demand through replacement of illuminated street name signs, have resulted in an estimated utility cost savings of approximately $127,000 since 2012, in addition to the incentive rebates from the utility totaling over $293,000 to date.

Ten years after adoption of this 2008 Energy Plan, overall concerns relating to reducing vehicle emissions, reducing building energy use, and increasing use of renewable energy are still relevant, but tangible strategies with identified costs and efficiency gains are needed to assist the City in identifying and prioritizing future projects in Irvine. As utility rates increase annually, the ability to realize cost savings from energy efficiency improvements becomes even more important.

Request for Proposal Process for CCE Feasibility Study

On January 30, 2018 RFP 18-1357 (Attachment 2) was issued to identify a consultant to conduct the CCE Feasibility Study to understand the benefits and risks of forming a CCE program in Irvine. The RFP closed on March 6, 2018 and six firms met the minimum qualifications of the RFP, with one firm withdrawing its proposal. Staff evaluated the remaining proposals utilizing criteria set forth in the RFP and determined the firms were qualified to conduct the Feasibility Study.

EES Consulting was ranked as the highest rated firm because of its detailed, concise, and comprehensive approach to the project. The firm's team has extensive experience developing CCE feasibility studies for public agencies. The positive input provided during the reference checks with several public agencies included quality deliverables, meeting project milestones, and demonstrating expertise in the field of CCE.

Based on the quality of the proposal and strong understanding of the project's scope of work demonstrated by EES Consulting, staff recommends this firm to the Board for approval. The proposal submitted by EES Consulting is presented in Attachment 3. EES Consulting identified the City portion of the CCE Feasibility Study to cost $72,434 and the Great Park portion to cost $5,036. The summary ratings and fee proposals of the firms that were evaluated are highlighted in the following table.

Community Choice Energy Feasibility Study Evaluation Summary Table				
	Summary Rating (Out of 10)	**Fee for City Portion**	**Fee for Great Park Portion**	**Total Pricing**
EES Consulting, Inc.	8.45	$72,434	$5,036	$77,470
Good Energy, L.P.	8.30	$83,000	$2,000	$85,000
CA Choice Energy Authority	7.25	$53,245	$2,805	$56,050
Willdan Financial Services	7.17	$133,860	$4,140	$138,000
MRW & Associates, LLC	7.07	$99,000	$20,000	$119,000

Request for Proposal Process for Strategic Energy Plan

On February 28, 2018, the City issued RFP 18-1379 (Attachment 4) to select a qualified consultant to develop the Energy Plan. The RFP closed on March 21, 2018 and eight firms met the minimum qualifications of the RFP. City staff utilized criteria set forth in the

RFP to evaluate the proposals, and all firms were deemed qualified to develop the Energy Plan.

Integral Group's proposal received the highest rating because its proposal was well structured, thorough, and contained a clearly laid out methodology for the project. Integral Group's project team encompasses experts from all areas of the energy field, including engineers and scientists. The positive feedback provided by other public agencies during reference checks included meeting project deadlines, excellent customer service, and exceptional performance.

Based on the quality of the proposal and the firm's comprehensive experience developing energy plans for public agencies, staff recommends the Integral Group to the Board for approval. The proposal submitted by the Integral Group is presented in Attachment 5. Integral Group identified $98,000 as the cost for the City portion of the Energy Plan, and $7,500 for the Great Park portion of the Energy Plan. The summary ratings and fees for the proposals are provided in the following table.

Strategic Energy Plan Evaluation Summary Table

	Summary Rating (Out of 10)	Fee For City Portion	Fee for Great Park Portion	Total Pricing
Integral Group	9.45	$98,000	$7,500	$105,500
AECOM	8.65	$193,358	$55,600	$248,958
Newcomb Anderson McCormick	8.50	$171,000	$28,500	$199,500
Burohappold Engineering	8.33	$272,000	$7,000	$279,000
Optony, Inc.	8.00	$153,520	$43,700	$197,220
Navigant Consulting, Inc.	7.02	$355,000	$120,000	$475,000
EcoMotion	6.27	$62,115	$7,285	$69,400
P2S, Inc.	5.40	$242,000	$11,000	$253,000

Next Steps

In accordance with the City's Financial Policies and Procedures, staff recommends that the Board recommend that the City Council approve the budget adjustments for reallocation of existing funds and authorize staff to award and execute contracts for both projects. The draft contracts are presented in Attachment 6 and Attachment 7.

The CCE Feasibility Study is projected to be completed during the first quarter of 2019 and the Energy Plan is estimated to be completed in approximately 12 – 18 months. Upon completion of the respective projects, the results will be presented to the City Council for consideration.

If it is the City Council's direction to proceed with the implementation of a CCE program, then staff will work with the firm to develop the implementation plan for the program as outlined in Task 2 of the RFP (Attachment 2). The funding to complete Task 2 would be requested in the City's annual budget process.

If the City Council approves the proposed Energy Plan, then funding to implement the measures identified in the Energy Plan would be incorporated as part of the City's annual budget process.

ALTERNATIVES CONSIDERED

The Board could recommend that the City Council not proceed with the contract award or budget appropriation to conduct the CCE Feasibility Study and forego the development of the Strategic Energy Plan. This alternative is not recommended because it is inconsistent with the previous direction from the Board. In addition, the initiation of a CCE Feasibility Study and an update to the Energy Plan has been recommended by the Finance Commission, Green Ribbon Environmental Committee, and has received support from the community.

The Board could recommend that the City Council reject all proposals from both RFPs and award a sole source contract to an alternate firm. This alternative is not recommended because each of the respective highest ranked firms has extensive experience conducting CCE feasibility studies for public agencies and developing energy plans for local governments. The firms have also proposed fair and reasonable pricing proposals to complete the projects.

FINANCIAL IMPACT

The General Fund unallocated balance for FY 2017-18 was previously identified as an optional funding source for the CCE Feasibility Study and Energy Plan. To conduct the CCE Feasibility Study, a total of $77,470 will be funded from anticipated Public Works budget savings within the approved FY 2018-19 operations budget; $5,036 of this total will come from the Public Works Orange County Great Park operations budget. The Energy Plan will also be funded from anticipated budget savings within the Public Works approved FY 2018-19 operations budget. The total cost of the plan is $105,500; $7,500 of this total will come from the Public Works Orange County Great Park operations budget.

REPORT PREPARED BY Sona Coffee, Environmental Programs Administrator
Angie Burgh, Senior Management Analyst

ATTACHMENTS

1. September 12, 2017 City Council Staff Report
2. Request for Proposal for CCE Feasibility Study
3. Proposal from EES Consulting, Inc.
4. Request for Proposal for Strategic Energy Plan
5. Proposal from the Integral Group, Inc.
6. Agreement for Contract Services with EES Consulting, Inc.
7. Agreement for Contract Services with Integral Group, Inc.
8. Staff Presentation

REQUEST FOR CITY COUNCIL ACTION

MEETING DATE: SEPTEMBER 12, 2017

TITLE: GREEN RIBBON ENVIRONMENTAL COMMITTEE WORK PLAN AND COMMUNITY CHOICE ENERGY STUDY

Sharon Landers
Assistant City Manager

Sean Joyce
City Manager

RECOMMENDED ACTION

1. Approve the Green Ribbon Environmental Committee Work Plan.
2. Direct staff to initiate a study to analyze the feasibility of implementing a Community Choice Energy program in Irvine.

EXECUTIVE SUMMARY

The Green Ribbon Environmental Committee (Committee) has prepared a Work Plan for the City Council's approval that outlines the policy focus of the Committee for the next two years, as required in its Bylaws. The Work Plan is provided as an attachment to this staff report for the City Council to consider and approve (Attachment 1).

If the Work Plan is approved by the City Council, the Committee will provide its input on policy strategies for the areas listed in the Work Plan. Several of the items included in the Work Plan relate to work the City is undertaking or has plans to undertake, such as development of a Sustainability Plan for the Orange County Great Park (Great Park) and an update to the City's Energy Plan. Inclusion of these items in the Committee's Work Plan will enable the Committee to provide its perspective on those items to the City Council.

In addition to the approval of the Committee's Work Plan, the Committee recommends that the City Council direct staff to proceed with a Community Choice Energy (CCE) feasibility and implementation study to better understand the risks and benefits of this program. This is consistent with the City's General Plan Energy Element and Energy Plan, both of which call for exploring opportunities to expand residential and commercial use of renewable energy. If authorized to proceed with this study, staff will issue a Request for Proposals for an assessment to address the financial viability of a CCE program and the risks involved with implementing this program. Once the RFP process has been completed, staff will return to the City Council with a consultant recommendation and a request for funds to be appropriated as described in the Financial Impact section.

ATTACHMENT 1

COMMISSION/BOARD/COMMITTEE RECOMMENDATION

At its meeting on August 15, 2017, the Green Ribbon Environmental Committee approved its Work Plan for City Council consideration, and recommended that the City Council direct staff to initiate a study that would benchmark energy use in the City and analyze the feasibility of implementing CCE in Irvine.

ANALYSIS

In creating the Committee, City Council Resolution No. 12-04 states: "The mission of the Green Ribbon Environmental Committee is to advise the City Council on sustainability policies related to energy, recycling and waste management, mobility, open space and water issues." Resolution No. 12-04 also specifies that the Committee's values shall reflect the interests and needs of the community.

The Resolution further requires that the Committee develop a Work Plan every two years for review and approval by the City Council. The Committee's proposed Work Plan is summarized below and provided for the City Council's consideration as Attachment 1.

The Committee's Work Plan incorporates elements that the Committee views as priorities for the City. If approved by the City Council, the Work Plan will guide the focus of the Committee over the next two years. Implementation of individual elements of the Work Plan will be brought to the City Council for direction as appropriate. Two Work Plan elements – the Energy Plan Update and the Sustainability Plan at the Great Park – cover initiatives to which funds have been allocated. Staff anticipates retaining consultant experts for both of these endeavors. Staff will return to City Council with the results of the consultant's work products for its consideration.

The Community Choice Energy study, which is recommended by the Committee for approval by the City Council whether or not approved as an element in the Work Plan, will require a budget allocation as discussed in the Financial Impact section of this staff report. More information on CCE is provided below and in Attachment 2.

Overview of Committee Work Plan

Each element of the Work Plan falls under one or more areas under the Committee's purview, as identified in Resolution No. 12-04:

1. Energy Plan Update – Sustainability policies related to energy
2. Sustainability at the Great Park – Sustainability policies related to energy; recycling and waste management; open space; and water issues
3. Active Transportation and Mobility – Sustainability policies related to mobility
4. Water Conservation and Management – Sustainability policies related to water issues
5. Urban Forestry and Green Cover – Sustainability policies related to open space

6. Grants and Pilot Programs – all areas
7. Economic Development and Business-Friendly Initiatives – all areas

If this Work Plan is approved by the City Council, the Committee will consider policies that support each of these areas as described in Attachment 1. The Committee assigned the following three Subcommittees to focus on priority policies should the overall Work Plan be approved: Energy Development and Community Choice Energy, Active Transportation and Connectivity, and Green Infrastructure. The Subcommittees are temporary in nature and will operate in the two-year timeframe of the Work Plan.

Community Choice Energy (CCE)

Related to the work the City will be doing to update the Energy Plan, the Committee recommends that the City Council initiate a study to review the feasibility of implementing a Community Choice Energy (CCE) program in Irvine. Several community members also expressed interest during recent Committee meetings in having the City consider the CCE initiative to increase access to renewable energy for residential and commercial electricity customers in Irvine.

CCE, also known as Community Choice Aggregation (CCA), is an initiative that provides an alternative to electricity provided by the utility by allowing local governments to purchase electricity and sell it to residents and businesses at competitive rates. CCE programs are structured to provide local control over energy procurement to the municipality, but are not considered municipal utilities. The investor owned utility (IOU) will continue to provide transmission and distribution services, power line maintenance, and customer billing services. CCE programs operate in partnership with the utility.

CCE programs have successfully offered reduced electricity rates compared to the IOUs, while increasing the amount of renewable energy levels to their customers. They have also been able to generate revenue that can be invested in other energy-related initiatives for the community, such as energy efficiency programs, incentives to promote the use of renewable energy and support for electric vehicle infrastructure. Objectives of CCE programs in other cities have included offering the public choice about where their energy comes from, increased development of renewable energy, economic benefits from workforce development and local job creation, and environmental benefits associated with the transition to renewable energy such as reduced air pollution.

Variables that warrant review when considering a CCE program include the potential for increased utility fees for entities initiating CCE, risks associated with energy procurement and potential changes to the energy industry, and industry attempts to alter legislative requirements for CCE programs.

The City Council's approval is requested to gather the initial data from Southern California Edison (SCE) and release a Request for Proposal (RFP) to conduct an assessment for the City of Irvine to better understand issues surrounding power procurement and risk management. If approved, staff will return to the City Council after

the RFP process for approval of the consultant and appropriation of funds for the study. Staff will subsequently return to the City Council with findings at specified decision points during the study's progression and once the full study has been completed, to discuss implementation options available to the City.

ALTERNATIVES CONSIDERED

The City Council can decide not to approve the Committee Work Plan or provide direction on alternate items for the Committee to consider in its Work Plan. If there are any additional items recommended, staff will work with the Committee on incorporating any alternate items into the Work Plan at its next meeting scheduled for November 21, 2017.

Should City Council not wish to issue an RFP to initiate the study of the CCE program at this time, staff can continue to monitor programs in the region and provide further information to the City Council on lessons learned.

FINANCIAL IMPACT

Staff expects to hire consultant teams to assist with several tasks related to the Work Plan areas recommended by the Committee, as well as ongoing projects: Energy Plan Update, the Sustainability Plan for the Great Park and the CCE study, if approved by the City Council. Approximately $80,000 has already been allocated in the budget for the Energy Plan Update and Sustainability Plan for the Great Park, respectively. Consideration is being given to expanding the scope of work for these projects to ensure the City receives a comprehensive energy study, including a facilities energy audit, and a plan for the Great Park that outlines sustainable development for new sites. A budget adjustment may be required to complete the full scope of work. Staff will have more information once bids are received.

If directed to initiate the CCE study, staff will begin the CCE review process by requesting the City's electricity data from SCE (approximately $2,700 in data request fees). This data will also be used for the update to the Energy Plan. Staff will issue an RFP to retain an expert to review the City's data and assess the feasibility of a CCE program in Irvine. While we are currently estimating between $150,000 and $200,000 for the cost of this work, once we have received bids through the RFP process, the amount will be better defined and staff will return with a consultant recommendation and a request for funding from unallocated General Funds.

REPORT PREPARED BY Sona Coffee, Environmental Programs Administrator

ATTACHMENT

1. Green Ribbon Environmental Committee Work Plan
2. Overview of Community Choice Energy

Green Ribbon Environmental Committee Work Plan

As stated in City Council Resolution No. 12-04: "The mission of the Green Ribbon Environmental Committee is to advise the City Council on sustainability policies related to energy, recycling and waste management, mobility, open space and water issues." The Green Ribbon Environmental Committee (Committee) Bylaws state that a Work Plan shall be developed every two years and presented to the City Council for approval. This Work Plan identifies priority areas for the City of Irvine and is intended to guide the focus of the Committee for the next two years.

The Work Plan identifies policy areas related to the sustainability initiatives below, and identifies Subcommittees to assist with areas of priority. The Subcommittees will operate in the two-year timeframe of the Work Plan and are temporary in nature. The Work Plan is subject to annual review by the Committee. Any additional recommendations will be brought to the City Council for consideration.

Work Plan Items:

1. Energy Plan Update
2. Sustainability at the Great Park
3. Active Transportation and Mobility
4. Water Conservation and Management
5. Urban Forestry and Green Cover
6. Grants and Pilot Programs
7. Economic Development and Business-Friendly Initiatives

Subcommittees:

1. Energy Development and Community Choice Energy
2. Active Transportation and Connectivity
3. Green Infrastructure

The intended scope of work for the Work Plan items is summarized below.

<u>Green Ribbon Environmental Committee Work Plan</u>

1. *Energy Plan Update:*

An Energy Plan for the City was prepared in 2008. Much has changed since then regarding technology, including energy production. An update to the Energy Plan will review renewable energy opportunities for the City, proposed goals and actionable measures for the City to meet these goals. Staff will update the City's Energy Plan and work with the Committee to incorporate input on policy areas. The Energy Plan itself will be subject to the City Council's approval. Policy areas for the Committee to review include:

- Exploration of Community Choice Energy initiative,
- Goals for use of renewable energy, and
- Support for roll-out of EV infrastructure.

2. *Sustainability at the Great Park*:

A measure passed by Irvine voters in 2010 specified a desire for the Orange County Great Park (Great Park) to incorporate sustainability principles in the following categories: biodiversity, connection to nature, land diversity, air quality, water, well-being, energy, materials, transit-oriented, urban forestry, green building, and monitoring. The Committee will review sustainable initiatives implemented at the Great Park and recommend to the City Council sustainability principles to strategically guide future initiatives.

3. *Active Transportation and Mobility:*

The Committee identified Active Transportation as an important policy to improve the quality of life and attractiveness of the City, which contributes to creating places of character. The Committee will explore policies that support the City's participation in alternative transportation modes in an effort to reduce emissions and traffic congestion in Irvine including, but not limited to:

- Alternate fuels
- Reduced emission or zero emission vehicles
- Mass transit services
- Carpooling
- Bicycling
- Walking

4. *Water Conservation and Management*:

Water issues are important to the community, and the Committee identified that this issue will continue to gain importance because of drought conditions and climate change. The Committee is also interested in issues pertaining to use of recycled water in the City and increasing access Citywide as feasible.

5. *Urban Forestry and Green Cover:*

The Committee will review the City's Urban Forestry practices to understand the City's inspection, maintenance and tree replacement policies and identify any policy recommendations to further clarify or enhance the City's goals. The Committee will focus on policy issues surrounding shade and community-wide tree care.

6. *Grants and Pilot Programs:*

When looking at grant opportunities across all environmental areas – energy, waste management, mobility, open space, water – the Committee aims to seek out grants that serve policy objectives of the City. Staff will work with the Committee to identify policy objectives that will help set priorities for grant applications and any pilot programs to be proposed to the City Council for its consideration. The Committee may also bring to the City's attention grants and pilot programs that would provide funding to implement energy efficiency and renewable energy technologies, and support efforts to reduce waste generation among other sustainability initiatives.

Below are two policy objectives with examples of funding opportunities that would meet the specified objective.

Seek grants or initiate pilot programs using technology that has the potential to reduce non-renewable peak energy use or that promotes the use of clean fuel:

- Energy Storage Pilot Program: Review funding opportunities for energy storage technology at City facilities and throughout the community.
- EV Charging Infrastructure & EV Pilot Programs: Identify funding opportunities to install EV charging stations at the Civic Center and other public locations citywide, explore the use of electric vehicle car-sharing to promote mobility, and research funding for fleet electrification.
- Renewable Energy: Search for funding opportunities to increase use of renewable energy at City facilities and community wide.

Seek grants or initiate pilot programs to educate youth, residents, and/or businesses on recycling requirements and benefits:

- Food Waste Recycling: City applied for grant funds to provide informational resources to businesses to assist in compliance with mandatory recycling laws and educate businesses about food waste prevention programs.
- Recycling at Local Schools: Engage the School District and explore grant funding to provide recycling containers at local schools to support youth recycling education.

7. *Economic Development and Business Friendly Initiatives:*

Staff will work with the Committee to develop draft policies that are business-friendly and promote sustainable economic development opportunities for the City. Below is an example of such a policy and the types of initiatives that would fall within it.

Work with the business community to identify environmentally friendly initiatives that reduce the cost of or reliance on energy, or provide other benefits for businesses in Irvine:

- Community Choice Energy (CCE): Research economic development opportunities of CCE to better understand the benefits and incentives to the business community.

<u>Cross-Cutting Initiatives:</u>

The Committee identified several areas that will be considered under each issue area, including exploration of grants and pilot programs, community outreach and education and youth action. These opportunities will be incorporated throughout each of the Work Plan items.

Overview of Community Choice Energy

Community Choice Energy (CCE), also known as Community Choice Aggregation (CCA), is a program that provides local governments with control over the procurement and generation of energy resources for their communities. CCE is an alternative to traditional investor owned utility (IOU) power procurement.

The CCE entity will purchase power, set rates, and collect revenue. The utility will maintain the electricity grid, deliver energy and bill customers. CCEs offer automatic enrollment to businesses and residences in its jurisdiction, with the ability for the customer to opt out and continue to purchase electricity from the utility. Customers will have the option of choosing increased percentages of renewable energy. CCE programs in California generally procure and resell a power mix between 50 percent and 100 percent renewable energy to their customers. Southern California Edison's (SCE) energy mix includes 28 percent renewable energy resources.

Local governments that have created CCE programs have articulated the following goals and potential benefits:

- Potential to reduce electricity rates for commercial and residential customers,
- Local control over energy portfolio,
- Increased procurement of renewable energy (State's renewable portfolio standard (RPS) requires renewable energy resources to comprise 33 percent of total procurement by 2020),
- Environmental and public health benefits associated with increased use of renewable energy, which reduces air pollution,
- Development of new renewable power resources (solar, energy efficiency, combined heat & power, and management of electric vehicle charging),
- Economic benefits from workforce development in local green jobs and associated economic activity,
- Test labs for innovation and integration of clean technology (e.g. battery storage, EV infrastructure),
- Increased public conversation on options, programs, fees and community ownership of renewable resources, and
- Method to address future environmental regulations and State's greenhouse gas reduction targets.

Local governments have the option to join existing CCE programs, partner with other government entities to form a CCE through a Joint Powers Authority, or initiate an individual/single jurisdiction CCE program. A feasibility study and technical analysis will explore the potential benefits and risks associated with participating in CCE, including determining whether this program could generate revenue for the city that can be invested in other energy-related initiatives.

Jurisdictions that formed CCE programs early on have seen the benefits of flexible renewable energy contracts and have been able to offer lower electricity rates with an increase in the amount of renewable energy, but potential CCE programs need to factor in changing variables such as the increased utility fees associated with the Power Charge Indifference Adjustment (PCIA) fee or the Portfolio Allocation Method (PAM) fee. PCIA is an exit fee charged by the utilities to entities that leave the bundled service of the utility for another provider of electricity generation service. As part of the technical analysis, cities can factor in higher PCIA fees and energy costs before launching their CCE program. Newly formed CCEs in San Francisco, San Mateo and Santa Clara Counties included these factors as part of their technical analyses and concluded that their programs could move forward.

CCEs in California

CCE has been operating in California since 2002 following passage of Assembly Bill 117. There are eight operational CCE programs in California, including: Marin Clean Energy (2010), Sonoma Clean Power (2014), Lancaster Choice Energy (2015), CleanPower San Francisco (2016), Peninsula Clean Energy in San Mateo County (2016), Apple Valley Choice Energy (2017), Silicon Valley Clean Energy (2017), and Redwood Coast Energy Authority (2017).

These CCE programs represent nearly 80 cities and counties in California, and generally offer a higher level of renewable energy at rates lower than the utility. A majority of existing CCEs are located in Northern California, but two Southern California programs are operational with several other programs in various stages of review.

Lancaster Choice Energy began serving customers in May 2015. Following the successful program launch, the City of Lancaster and the City of San Jacinto partnered to create the California Choice Energy Authority (CCEA). CCEA is a Joint Powers Authority (JPA) designed to allow other cities in SCE territory participate in CCE programs. The City of Pico Rivera recently joined CCEA. Other Southern California cities that have expressed interest in CCEs by adopting a resolution to participate in a CCE feasibility study include: Hermosa Beach, Manhattan Beach, Santa Monica, Redondo Beach, Torrance, Carson, Beverly Hills, Palos Verdes Estates, Lomita, West Hollywood, Malibu, Rolling Hills Estates, and Culver City. The City of Huntington Beach recently voted to enter a non-disclosure agreement with SCE to obtain customer energy use data to determine the economic viability of a CCE program for the city, a first step to a more complete feasibility analysis.

There are several programs preparing to launch in California including Alameda County, Los Angeles County, Yolo County, and San Jose. San José Clean Energy (SJCE) will be the largest single jurisdiction in California to operate a CCE and is expected to launch in April 2018. The newly formed Los Angeles County Community Choice Energy (LACCE) program is set to launch in January 2018 and is open to other cities joining its JPA Board of Directors.

Community Choice Energy in California

Sonoma Clean Power

- Santa Rosa
- Sonoma County
- Mendocino County
- Town of Windsor
- Sebastopol
- Petaluma
- Cloverdale
- Cotati
- Town of Sonoma
- Rohnert Park
- Fort Bragg

Silicon Valley Clean Energy

- Cupertino
- Los Gatos
- Mountain View
- Santa Clara County
- Los Altos Hills
- Los Altos
- Campbell
- Gilroy
- Morgan Hill
- Sunnyvale
- Monte Sereno
- Saratoga

Redwood Coast Energy Authority

Peninsula Clean Energy

- San Mateo County
- City of San Mateo
- Atherton
- Belmont
- Brisbane
- Burlingame
- Colma
- Daly City
- Foster City
- East Palo Alto
- Hillsborough
- Menlo Park
- Half Moon Bay
- Millbrae
- Pacifica
- Portola Valley
- Redwood City
- San Bruno
- San Carlos
- Woodside
- South San Francisco

California Choice Energy Authority

- Lancaster
- Pico Rivera
- San Jacinto

MCE Clean Energy

- Mill Valley
- Walnut Creek
- County of Marin
- Richmond
- Benicia
- San Rafael
- El Cerrito
- Town of Ross
- Larkspur
- Sausalito
- Town of San Anselmo
- County of Napa
- San Pablo
- Town of Tiburon
- Novato
- Belvedere
- Town of Corte Madera
- Town of Fairfax
- Contra Costa County

Clean Power San Francisco

- City/County

Apple Valley Choice Energy

- Apple Valley

Launching in 2018

- San Jose Community Energy
- Los Angeles County Community Choice Energy
- East Bay Community Energy
- Monterey Bay Community Power
- Valley Clean Energy Alliance

January 30, 2018

REQUEST FOR PROPOSALS for

COMMUNITY CHOICE ENERGY
FEASIBILITY STUDY AND TECHNICAL ASSESSMENT

Thank you for considering the attached Request for Proposals (RFP). If you are interested in submitting a Proposal, please follow these instructions for submissions:

Only RFP documents downloaded from the City's website (www.cityofirvine.org/purchasing) shall be considered official, as the City must track RFP holders in the event an addendum is issued. Failure to register and download the RFP document and any addendum from the website will result in disqualification of the proposal.

Due Date and Time: **No Later than March 6, 2018 at 4:00:00 p.m.**

NO LATE PROPOSALS WILL BE ACCEPTED.

RFP Number: **18-1357**

This RFP number must be referenced in the proposal document, which must be submitted electronically via the City's website.

Proposal Submittal: Proposals must be submitted electronically via the City's BidsOnline system as set forth in this RFP document. (Proposals submitted by any other method such as hard copy or email will be disqualified.) Please refer to the Submittal Instructions section of this RFP for details.

A MANDATORY PRE-PROPOSAL conference will be held on February 8, 2018 at 10:00 a.m. at the Irvine City Hall, 1 Civic Center Plaza, Irvine, CA 92606. Failure to attend this meeting shall result in your firm being disqualified from proposing.

Any requests for clarification or other questions concerning this RFP must be submitted in writing and sent via email to Angie Burgh with a copy to Brian D. Brown (as shown below) no later than February 20, 2018 at 4:00:00 p.m.

Angie Burgh
Senior Management Analyst
aburgh@cityofirvine.org

Brian D. Brown
Senior Buyer
bbrown@cityofirvine.org

The City of Irvine reserves the right to reject any or all Proposals, to waive any informality in any Proposal, and to select the Proposal that best meets the City's needs.

RFP Number: 18-1357

REQUEST FOR PROPOSALS
FOR
Community Choice Energy Feasibility Study and Technical Assessment

Dear Proposers:

The City of Irvine (hereinafter referred to as the "City") is requesting proposals from qualified and experienced consultants to establish a contract for developing a feasibility study and technical assessment of Community Choice Energy, with work to commence on or about April 2, 2018 with the first task to be completed by June 1, 2018. Findings following the first task will be presented to the City before moving on to the second task. Performance of the second task is contingent upon City direction. If direction is received to move on to the second task, the schedule will be negotiated with the awarded Contractor.

Proposals must be submitted electronically no later than the date and time stated on this RFP cover sheet. Proposals shall be reviewed and rated as set forth in the Selection Process section of this RFP. The City will then determine which proposal(s) best meets the City's requirements.

LATE PROPOSALS WILL NOT BE ACCEPTED

The City reserves the right to reject any or all proposals, to waive any informality in any proposal and to select the proposal that best meets the City's needs.

MINIMUM QUALIFICATIONS REQUIRED FOR PROPOSAL SUBMITTAL

Firms who fail to meet the minimum qualifications set forth below should not submit a proposal; any such proposal shall be deemed non-responsive and not be considered.

1) Minimum three (3) most recent years of experience performing similar services as those detailed in the Scope of Services section of this RFP.

OVERVIEW AND SCOPE OF WORK

The City of Irvine is interested in Community Choice Energy (CCE), also known as Community Choice Aggregation (CCA), as a potential mechanism to increase the use of renewable energy in the region with the potential for reducing electricity rates for residents and businesses in the City. The City's Green Ribbon Environmental Committee has included support for the study and development of a CCE program in its Work Plan, which was approved by the City Council. The City Council has directed Staff to initiate a study to assess the feasibility of CCE implementation in Irvine. The objective of this RFP is to obtain information about developing a local CCE through a

public/private partnership or a regional Joint Powers Authority (JPA), based on the demand and availability of willing participants.

The selected Contractor shall provide comprehensive services to support the City with the assessment and development of a CCE program.

In the event a team arrangement is proposed, the team must be represented by a single primary Contractor who will be responsible for entering into an Agreement with the City, serve as the primary contact and responsible party, and have the authority to act on behalf of each member of the proposal team.

Contractor shall include other components that will be important in the program ultimately being successful, including any additional innovative or value-added services proposed beyond the basic requirements of CCE operations outlined above. Each respondent should also include a project schedule for completing the tasks.

Additional details for scope of work for the Community Choice Energy Feasbility Study and Technical Assessment are set forth in Attachment I. Proposers must include responses to each task identified in the Task 1 – Program Development and Technical Study and Task 2 – Implementation Plan sections. Performance of Task 2 is contingent upon City direction. If City so directs, Contractor will draft and submit an Implementation Plan to the CPUC.

Proposers may expand, modify, or restructure the tasks to best communicate their service model. The awarded Contractor shall be available for presentations to the City Council, Green Ribbon Environmental Committee and other community outreach as negotiated.

TERMS AND CONDITIONS

The City's standard Agreement for Contract Services is included as Attachment II. Upon award of the contract, it is expected that the successful proposer will accept the Agreement terms and conditions "as is" without modification. (Please refer to Part III Special Provisions of Attachment II for special requirements relating to these services.)

At the discretion of the City, any or all parts of the respondent's proposal shall be made a binding part of the selected firm's contract. The City reserves the right to reject in whole or in part any of the proposals.

Time frame for submittal of insurance documents: At the time the contract is awarded, the firm must be able to provide all required insurance documentation to the City's insurance certificate tracking company as set forth in Attachment II. If these requirements are not met, the City reserves the right to select the next best qualified firm.

ORGANIZATION OF PROPOSAL

If your proposal does not include all of the items below, it may be deemed non-responsive. The proposal will be evaluated by the City and shall include, at a minimum, the following information:

- **BUSINESS INFORMATION**

  State the full legal name of your firm, including the state of incorporation if applicable. Include your address, phone number, fax number and email address. State the number of years your firm has been doing business. List the names of principals or officers authorized to bind your firm, including position titles.

- **EXPERIENCE / QUALIFICATIONS INFORMATION**

  Provide information concerning your firm's experience and qualifications directly related to the services set forth herein. Define the experience of the proposed Project Manager, and other key personnel (and sub-consultants if applicable) who would be assigned to perform the services. (The designated Project Manager shall be the primary contact with the City during the contract period.) Provide resumes for the Project Manager, other key personnel, and sub-consultants if applicable.

- **PROJECT APPROACH / METHODOLOGY**

  Provide a detailed description of your proposed methodology/project approach based on your understanding of the Scope of Services (Attachment 1).

- **REFERENCES**

  Provide a minimum of three (3) references for similar work that your firm has provided within the last three (3) years. Include a detailed description of the services, the agency or firm names, contact names and phone numbers, and dates of services performed.

- **PRICING PROPOSAL**

  Provide a fee schedule/pricing information for the project. The City shall not provide reimbursement for business or travel-related expenses; therefore, such costs must be absorbed in the hourly rates. Provide hourly rates for each category of employee or subconsultant required to perform the services for each task as set forth in ATTACHMENT I, Scope of Services.

  Pricing shall remain firm for the entire Agreement term. Thereafter, any proposed pricing adjustment for follow-on renewal periods shall be submitted to the City Representative in writing at least ninety (90) days prior to the new Agreement term. City reserves the right to negotiate any pricing adjustment not to exceed the Bureau of Labor Statistics Consumer Price Index (CPI) data as follows: Los Angeles-Riverside-Orange County, CA; All Items; Not Seasonally Adjusted; annualized change comparing the most recent month's reported data to the

same month of the prior year. (This information may be found on the U.S. Department of Labor's website at www.bls.gov.)

- **SIGNATURE**

  The proposal shall be signed by an official authorized to bind the firm, including his or her printed name and title, and shall contain a statement to the effect that the proposal is valid for ninety (90) days.

SELECTION PROCESS

The contract award will be made after selection of one (1) respondent's proposal from among all respondents with implementation of services to follow. However, this RFP does not indicate a commitment by the City to award a contract to any successful respondent. An award of contract is estimated to occur within approximately sixty (60) days after receipt of proposals. The City intends to evaluate the proposed services based upon the data presented in response to the RFP. The following general selection criteria will be used to evaluate the proposals:

Phase 1:

- Experience and qualifications of firm and designated project management staff, other key personnel, and sub-consultants, if applicable (45%)
- Methodology/Project Approach provided (35%)
- Proposal Pricing (20%)

Phase 2 for highest-rated firm(s)

- The City reserves the right to conduct interviews with the highest-rated firm or firms. In the event the City does perform an interview process, the additive weighting shall be 30%.

Phase 3 for highest-rated firm(s)

- The City will perform reference checks for similar work completed within the last three years for the highest-rated firm(s), with an additive weighting of 20%.

The City reserves the right to negotiate final pricing with the highest-rated firm(s).

The City reserves the right to reject any or all proposals, to waive any informality in any proposal, and to select the proposal that best meets the City's needs.

SUBMITTAL INSTRUCTIONS

To download the RFP document or check for addenda, please visit the City's website at: ***cityofirvine.org/purchasing***

Click on the "Supplier Registration and Bid Opportunities" link, and then click on the "BidsOnline" link. Next, click on "Bid Opportunities" to locate and view the RFP

document. (If you haven't already done so, you will be required to register as a City of Irvine vendor before downloading the RFP document.)

Proposals must be submitted as follows:

Proposals must be submitted electronically by visiting the City's website at *www.cityofirvine.org/purchasing*. Click on the "Supplier Registration and Bid Opportunities" link. Next, click the BidsOnline link and then click "Log In." Enter your User Name and Password. Click "Bid Opportunities" and then select the RFP. Click on "Place eBid" and follow the instructions.

The deadline for proposal submissions is:

March 6, 2018 at 4:00:00 p.m. However, submittals may be submitted at any time prior to the deadline. (Submitted proposals may be withdrawn and resubmitted at any time prior to the deadline, and cannot be viewed by City staff until the close date and time.)

Late proposals will not be accepted.

- **Proposals must be submitted via the City's BidsOnline system as a single zip folder.**
- **No other form of submission will be accepted.**
- **Large files may take time to upload so plan the timing of your submittal accordingly.**
- **Failure to completely upload your documents by the deadline shall result in disqualification.**

Proposal Submittal

- Name your file "companyname" but do NOT exceed 20 characters or your file will not upload. Do not use symbols (i.e. "%" or "&" as your file may not load correctly. If your name is too long, then abbreviate. Failure to upload document shall result in disqualification.
- If the proposal contains more than one file, you should create a zip folder, containing the various PDF proposal documents.
- Name the zip folder "companyname."

To create a zip folder:

- Right click on your desktop
- Select "New," and then "Compressed Zip Folder"
- Name the folder "companyname."
- Drag your various proposal PDF documents into the Folder

Mac users

- Create a folder for your files and name it "companyname"
- Drag your various proposal PDF documents into the folder

- Right-click the folder and select “create archive”

Technical Support

In the event you encounter technical difficulties during the uploading process, please contact the Planet Bids, BidsOnline system team as shown below (M-F from 8 am to 5 pm):

support@planetbids.com or call (818) 992-1771 ext. 0

GENERAL INFORMATION

The City will make payments monthly on approved invoices, with payment terms of net 30 days upon receipt of invoice. Payment for additional work, if any, will be negotiated as required. Final payment will be made after approval and acceptance of the work.

Any costs incurred in the preparation of a proposal, presentation to the City, travel in conjunction with such presentations, or samples of items shall be the responsibility of the respondent. The City assumes no responsibility and no liability for costs incurred by respondents prior to issuance of a contract or purchase order.

The proposer shall furnish the City with such additional information as the City may reasonably require.

Any questions or requests for clarification must be submitted in writing and sent via email as set forth on the cover sheet of this RFP.

All data, documents and other products used or developed during performance of the services will remain the property of the City upon completion of the services.

Sincerely,

Brian D. Brown
Senior Buyer

Attachments:

I. Scope of Services
II. Agreement for Contract Services

ATTACHMENT I

SCOPE OF SERVICES

Contractor shall perform the services as set forth below.

Project Specifications
Contractor shall provide a Feasibility Study and Technical Assessment (Study) that evaluates the viability of launching and operating a Community Choice Energy (CCE) program in the City of Irvine. Contractor shall provide alternatives to improve the cost-effectiveness, stability, and beneficial impacts of the CCE program as part of the Study. Results from the Study will be presented to the City for consideration and direction prior to moving on to the next tasks associated with the Implementation Plan. Pending direction from the City, Contractor will prepare and submit an Implementation Plan to the California Public Utility Commission (CPUC).

As part of the Study, Contractor will review options for the City to operate an independent CCE program, partner with other interested cities/counties/public agencies as applicable, or join an existing CCE program through a Joint Powers Authority (JPA), and consider the benefits and risks for each option.

Contractor will identify costs for services associated with two key areas: development of the Feasibility Study and the drafting and submission of the Implementation Plan. As part of the Study, Contractor will estimate costs of future phases of the operation of a CCE program (e.g. Program Launch and Program Operation). Contractor shall also include details on the feasibility of scenarios in which the City would incur no upfront costs during the Program Launch phase of the CCE program.

Should the City choose not to move forward with development of the CCE program, Contractor will be paid for services rendered and the Agreement for Contract Services will be terminated. Upon completion of the Feasibility Study, the City reserves the right to solicit a third party peer review of the findings before moving on to subsequent phases of the program.

Feasibility Study and Technical Assessment:
This Study will incorporate load data from Southern California Edison (SCE) and other sources as appropriate to assess the overall electricity and capacity requirements to serve residential, municipal and commercial electricity customers in the community, as well as examine other CCE Programs. The load data for Irvine has already been received from SCE.

The Study will identify pertinent technical parameters of a CCE Program for the City of Irvine, including the number of prospective customers, the tariff designations under which such customers will take electric service, anticipated customer energy

requirements (hourly) throughout the CCE's defined implementation period, expected peak demands (for purposes of quantifying the CCE's anticipated resource adequacy requirements across each applicable capacity designation: system, local and flexible), and renewable energy requirements to achieve compliance with California's Renewables Portfolio Standard (RPS) Program, as well as other pertinent information that may be required to develop supplier bid specifications and promote successful CCE implementation.

The Study will examine the CCE's ability to achieve rate competitiveness with the incumbent utility (Southern California Edison) in consideration of then-current market prices including scenarios that incorporate any potential exit fees to be charged to the CCE. The Study will also examine the projected financial impacts of varying levels of renewable energy integration and of increasing the procurement of renewable energy built with strong labor standards and prevailing wages, as well as the impacts of procuring renewable energy from projects of varying sizes – from residential solar to utility-scale solar photovoltaic. The Study will examine the potential for emissions reductions through the use of varying levels of renewable/clean energy, including an assessment of the emissions reduction potential from in-state renewable energy projects compared to the use of unbundled renewable energy certificates.

The Study shall generate and validate tools needed to prepare a CCE business plan to quantify resource needs, prioritize resource preferences and other relevant energy procurement policies to guide the electricity procurement process of the CCE.

The Study shall identify strategies, tactics, and planning tools for developing a CCE consistent with the following goals:

- Achieve rate parity or better with SCE, and a lower rate escalation than SCE over time
- Provide and maintain an energy supply portfolio with overall carbon content lower than SCE's energy supply profile carbon content.
- Meet or exceed the California RPS Program.
- Differentiated energy options (e.g. same as SCE, 33%, or 50% qualified renewable) for default service, and a 100% renewable content option in which customers may "opt-up" and voluntarily participate.
- Provide an energy purchase portfolio that excludes specific purchases of coal and minimizes purchases of system power.
- An energy portfolio that prioritizes the use and development of local renewable resources and minimizes the use of unbundled renewable energy credits.
- Provide a project development and ownership strategy that increases the development of renewable energy projects statewide and locally to achieve reductions in emissions from electrical energy generation, and expands opportunities for local ownership and investment in energy assets.
- Provide an energy portfolio that includes the maximum amount of local renewable energy possible.
- Develop a financially sustainable and flexible business model that supports investment in, and the local development of, distributed energy resources and

local energy efficiency and conservation programs including but not limited to: solar photovoltaic, solar hot water, combined heat and power, small wind, demand response and dispatch, energy efficiency, electric vehicle managed charging, advanced energy storage and nanogrids/microgrids.
- Identify potential regional economic benefits including job creation, increased local energy investment, and reduced energy imports.
- An energy portfolio that incorporates energy efficiency and demand response programs and has aggressive reduced consumption goals.

Deliverables: The following tasks are included as the minimum services required by the awarded Contractor.

<u>Task 1. Program Development and Technical Study</u>

Contractor will include the following seven tasks in the development of this comprehensive Feasibility Study and Technical Assessment (Study).

- Task 1.1: Load Analysis
- Task 1.2: SCE Rate Analysis
- Task 1.3: Preferred Supply Portfolio Selection & Sensitivity Analysis
- Task 1.4: Cost-of-Service Analysis
- Task 1.5: Risk Analysis
- Task 1.6: Report of Technical Study Results
- Task 1.7: Developing Support Information for City Council and Community Engagement

Task 1.1: Load Analysis

1. Define regionally and/or geographically appropriate aggregated load categories that may include combinations of residential, commercial, industrial, municipal, institutional, agricultural, and transportation end-use electric consumer groups within the City of Irvine.
    a. Receive and review SCE data.
    b. Format and import data into analytical framework.
    c. Prepare summary level data.
2. Analyze impacts to energy use and energy requirements to quantify resource needs. Identify regional growth projections.
    a. Determine if a review of California Independent System Operator (CAISO) sales data is appropriate, and if so, which data shall be reviewed.
    b. Estimate potential load reduction from energy efficiency or distributed generation.
    c. Estimate potential opt-out rates (model at least 20%).
    d. Estimate energy use and reflect change in data set.
3. Render a composite CCE electric load and load shape forecast based on the electric energy and demand load profiles for regionally and/or geographically appropriate aggregated load categories. Recommendations shall include

determining whether or not load categories shall be developed to model a phase-in of the Program.

   a. Identify projected future energy consumption for CCE customers, being sure to account for any areas with an influx of seasonal residents to avoid any costly spot-market power purchases.
   b. Discuss projections with designated stakeholders. Finalize forecast to be used in feasibility assessment.

4. Determine additional energy requirements based on factors such as load profiles, geography, distribution line losses, RPS requirements, and resource adequacy obligations. Energy requirements considered shall include: peak demand requirements, resource adequacy/capacity reserve obligations, energy needed to compensate for distribution line losses, RPS supply requirements, and any other Contractor-identified energy requirements.
   a. Prepare summary in format suitable to support power solicitation.
   b. Discuss projected requirements with staff and stakeholders.
5. Specifically address the impact of any new, high energy demand industries.

Task 1.2: SCE Rate Analysis

1. Develop rate projection forecasts. Include the following:
   a. Review current and historic SCE rate trends and structures to develop rate projections over 5-, 10-, 15-, 20-year forecasts based on RPS scenarios.
   b. Identify other factors that may affect rate comparison, including combinations of the following: high gas, low gas, high hydro, low hydro, and rate restructuring.
   c. Identify SCE costs embedded in rate forecasts for direct comparisons to CCE costs, including development of several scenarios to forecast any potential exit fees charged to the CCE.
   d. Discuss assumptions with designated staff and stakeholders and agree on pertinent items affecting SCE rate projections.
2. Prepare utility rate forecast under continued SCE service scenario.
   a. Compile electric generation service cost/payment estimates for prospective CCE customers in consideration of applicable SCE rate schedules based on SCE rate forecasts and other independent rate forecasts.
3. Specifically examine and analyze the past five and ten-year historic SCE tariffs and energy costs to determine if a CCE could withstand a future recession.

Task 1.3: Preferred Supply Portfolio Selection & Sensitivity Analysis

1. Define electric supply scenarios based on variations in the overall renewable energy content, renewable resource composition (e.g., in-state, in-county, out-of-state, renewable energy credits, technology preferences), and non-renewable portfolio attributes (e.g., system purchases, natural gas, hydro-electric). Scenarios may be further defined based on input from Contractor in coordination with City staff. At a minimum, analyze the following electric supply scenarios:
   a. Option 1: Consistent with SCE's current RPS.

b. Option 2: Minimum 33% RPS compliance to meet or exceed the State's 2020 RPS minimum of 33% at the time of service commencement. This 33% level can be assumed to be flat during the course of the CCE Program or at least be equal to SCE (if the RPS increases after 2020).
c. Option 3: Minimum 50% California Qualified Renewable Portfolio with less GHG intensity than SCE.
d. Option 4: Start with 50% renewable and build up to 80% of the CCE's total load being met by California eligible renewables by the end of Year 5 of the Program.

Note: All scenarios shall consider that consumers would be able to sign up for a 100% renewable option, which would be offered on a premium, voluntary basis, with a substantial portion of that coming from in-State and local renewable resources in the County and general region (Contractor shall assume participation rates similar to Lancaster, MCE Clean Energy, and Sonoma Clean Power's 100% voluntary programs).

2. Identify CCE cost of power working with designated electric supply scenarios.
    a. Correspond with potential electric service providers to determine indicative energy, capacity and renewable energy pricing as well as CAISO and administrative costs of CCE operation.
    b. Evaluate potential electric service providers in the region. Present a variety of renewable energy providers that could be resources for a CCE in Orange County. The Study shall evaluate these potential power sources, the cost of using these power sources, and their capacity to serve a CCE for Irvine.
    c. Determine CAISO and administrative costs of CCE operation.
    d. Discuss assumptions and planned operational/organizational elements of a CCE program with designated City staff to develop accurate cost projections.
    e. Document cost-based assumptions/inputs for future reference.
    f. Quantify cost of service under each scenario and related rate impacts and estimate the projected costs for each supply portfolio scenario.
    g. Discuss analytical results with designated City staff and stakeholders.
3. Estimate projected environmental impacts (i.e., the projected GHG emissions profile for each supply portfolio scenario) using publicly available data sources.
4. Prepare a sensitivity analysis for each supply scenario showing the projected impact to program costs for variations in the following input cost variables:
    a. Market prices for conventional (non-renewable) energy.
    b. Market prices for renewable energy based on preferred technologies.
    c. SCE generation rates and customer surcharges (considering the effect of the 33% RPS).
    d. Customer opt-out rates.
5. Discuss findings and strategies with designated staff and stakeholders, and modify parameters, as appropriate, based on discussions.
6. Develop presentation materials and present results of cost comparison and prospective modifications to CCE Program design structure with City staff, stakeholders and City Council.

Task 1.4: Cost-of-Service Analysis

1. Provide insight on how best to achieve the CCE Program's goals and capture those activities in the modeling. Consider current CCE program designs and implementation pathways, and recommend improvements that minimize risks to the City of Irvine and accelerate the timeline.
2. Assemble known and predictable cost-of-service variables and incorporate these variables into base-case analyses. Create pro forma developments considering each preferred supply portfolio selection. Predictable cost-of-service variables include:
    a. Energy costs
    b. Start-up costs
    c. Cost of capital
    d. Operating and maintenance costs including:
        i. Administrative and general expenses.
        ii. Staffing.
        iii. External technical/legal/marketing/public relations support.
        iv. Billing, metering, and collections.
        v. Customer service (e.g., call center) and data management.
        vi. Scheduling and coordination.
    e. Uncollected accounts.
    f. Program reserves.
    g. CCE bonding for re-entry fees.
    h. SCE surcharges and cost-recovery mechanisms (exit fees).
    i. Characterize and evaluate feed-in tariff and net energy metering programs that encourage development of renewable energy generation projects in the region by offering customers a sustained reliable payback on their investment in renewable energy and a sustainable local generation system.
3. Perform 5-, 10-, 15-, and 20-year term consistent with term of financing Investor Owned Utility (IOU) versus CCE cost comparisons.
4. Determine potential economic benefits, challenges and strategies for reducing costs and/or administrative/organizational overhead and enhancing customer benefits.
5. Evaluate alternative structural approaches to CCE implementation, as necessary. This analysis shall estimate the costs to prepare any further technical assessment needed and include evaluation of the most efficient structure for a CCE including the following scenarios:
    a. CCE operated by one or more individual jurisdictions
    b. CCE operated independent regions (e.g. LA County, Orange County, etc.)
    c. CCE operated collectively
    d. CCE operated by a third party administrator
6. Present results of cost estimates and prospective modifications to CCE Program design with City staff, stakeholders and City Council (as requested).

Task 1.5: Risk Analysis

1. Contractor shall analyze the potential risks to a CCE Program in Irvine, as well as outline risk mitigation measures. Such risks could include, but not be limited to:

a. Financial risk to the City in the event that the CCE fails.
b. The financial risk to a CCE that procures too much or too little electricity and what the reasons might be for missing demand forecasts (e.g. higher than expected opt-out rate).
c. Address instances where a CCE has failed or has had to wind down its program.
d. Regulatory and legislative risk, due to rules changes at the CPUC or changes in state law that affect the ability of CCEs to be competitive.
e. Ability to procure the necessary amounts of renewable energy in order to meet RPS standards, particularly if the RPS rises to 50% by 2030 and the demand for renewable energy spikes. Contractor shall examine concerns expressed by some in the region that there may not be enough renewable energy supply with a number of new CCEs potentially coming into the market.
f. Financial risks of establishing competitive electrical generation rates, including analysis of rate setting, local control and transfer of revenues generated.
g. Financial risks to the City and CCA if a significant number of customers opt out and return to SCE or Direct Access Service.

Task 1.6: Report of Technical Study Results

1. Prepare a draft Study report that details the results of the technical study, including recommendations for CCE organization and implementation and an assessment of the overall cost-benefit potential to support a threshold decision to move forward with CCE. Costs shall include upfront program development and implementation costs as well as net rate-payer costs over the forecast period. The estimated cost of the CPUC-required Implementation Plan for a CCE in the City of Irvine shall be included in this study report. Quantifiable benefits shall include net GHG reductions, expanded use of renewable energy resources, local economic development, and reduced exposure to volatile fossil fuel costs.

   Provide the following reports:
   a. Pro forma report, including cash flow analysis, detailing costs and projected benefits under three electric supply scenario assumptions.
   b. Pro forma reports detailing costs and projected benefits under sensitivity case assumptions, and of phasing in customer load over time.

2. First Draft: Prepare the report in draft form and submit to City staff for review and approval in accordance with the deliverables timeline. City staff will return one (1) copy of the draft report with comments or approval in writing within fourteen (14) business days.
3. Subsequent Draft(s): If City staff requests revisions, revisions shall be made and the draft report resubmitted to City staff for approval within seven (7) business days.
4. Final: Following City staff's approval and prior to City Council acceptance of the final report, Contractor shall submit the final approved report to City staff.

5. Develop presentation materials and deliver presentation regarding feasibility report and related recommendations to City staff, stakeholders and City Council.

Task 1.7: Developing Support Information for City Council and Community Engagement

1. Review economic impact of a CCA program to the City including local jobs generated, other direct and indirect impacts such as development of local renewable energy projects and other energy innovations located within Irvine.
2. Contractor shall develop a summary of other Orange County municipalities interested in developing CCE programs. Contractor shall identify opportunities for the City to work with other communities to coordinate development and operation of CCE programs cooperatively in order to reduce administrative costs and achieve common goals while maintaining local control of their programs.
    a. The County of Orange and other Orange County Cities may begin exploring CCE; assess the possibility for the City of Irvine to combine efforts with these other organizations versus operating a stand-alone CCE.
3. Contractor may be asked to assist the City with engaging local officials, policymakers, community members, groups and organizations (City Councilmembers, City staff, Green Ribbon Environmental Committee, etc.) on the basics of Community Choice Energy, highlighting the experience of CCE programs to date and detailing the benefits and challenges of running an effective CCE.
4. Contractor will assist the City with refining a timeline for CCE formation and implementation. The timetable shall include a schedule of all steps needed to launch. As part of this task, Contractor may also be asked to provide detail on operational structures and procedures.
5. Contractor will assist the City with refining and defining the CCE program priorities and goals to support evaluating the environmental benefits and cost implications of the range of scenarios explored during the technical analysis. The estimated cost of developing and submitting the Implementation Plan should also be included.

Before proceeding to tasks associated with the Implementation Plan, Contractor will assist City staff in presenting findings from the Technical Study to the City Council.

<u>Task 2. Implementation Plan</u>

Performance of Task 2 is contingent upon City direction. Assuming there are no critical barriers to a successful CCE identified in the Technical Study, Contractor will address all of the tasks required to submit the Implementation Plan to the CPUC. These tasks are outlined below.

- Task 2.1: Implementation Plan/Perform All Regulatory Functions
- Task 2.2: CCE Organizational Infrastructure
- Task 2.3: Customer Engagement

- Task 2.4: Rate Setting & Distributed Generation Policies

Task 2.1: Implementation Plan/Perform All Regulatory Functions

1. Contractor will undertake all functions necessary to comply with CPUC regulations related to launching a CCE program. For example, the CPUC, which ultimately has to approve the program, requires that the CCE submit an Implementation Plan that covers all aspects of the set-up and operation. The plan will include the following:
    a. Process and consequences of aggregation.
    b. Organizational structure of the program, its operations and funding.
    c. Rate setting and other costs to participants.
    d. Disclosure and due process in setting rates and allocating costs among participants.
    e. Methods for entering and terminating agreements with other entities.
    f. Participant rights and responsibilities.
    g. Termination of the program.
    h. Description of third parties that will be supplying electricity under the program, including information about financial, technical and operational capabilities

The Implementation Plan must also include a statement of intent indicating that the program must provide universal access, reliability and equitable treatment of all classes of customers, and to meet any other requirements established by state law or by the CPUC. Contractor will be responsible for drafting the Plan and ensuring its certification by the CPUC.

Task 2.2: CCE Organizational Infrastructure

Contractor will assist the City with creating the necessary organizational documents, procedures, and systems to successfully operate the CCE, including:

1. Business and operations plan
2. Operational policies and procedures
3. Committee structures and processes
4. Independent review and oversight of contractor and City staff activities and recommendations.

Task 2.3: Customer Engagement

Contractor will assist the City with developing, implementing and managing a plan for engaging the customers prior to launch. Contractor will be required to work with the City to ensure the community outreach plan is being implemented.

Task 2.4: Rate Setting & Distributed Generation Policies

Contractor will need to conduct an analysis to assist the CCE in establishing a rate regime that meets the annual budgetary revenue requirement developed by the

program. This will include recovery of all expenses and any reserves or coverage requirements set forth in bond covenants or other debt-service requirements. The City anticipates a rate structure similar to, but lower than, SCE's rate schedule at the outset. Included in the rate structure shall be consideration of policies that further encourage renewable energy development including, but not limited to:

1. A feed-in-tariff program to incentivize renewable energy projects within the CCE service territory.
2. A net energy metering tariff that encourages solar installation on the customer side of the meter.
3. A 100% renewable, opt-in choice. Customers would be offered a 100% renewable energy option at a premium price, based on the costs of a 100% renewable supply.

ATTACHMENT II

AGREEMENT FOR CONTRACT SERVICES

THIS AGREEMENT FOR CONTRACT SERVICES (the "Agreement") is made and entered into as of 2018, by and between the CITY OF IRVINE, a municipal corporation ("City"), and , a California corporation ("Contractor"). (The term Contractor includes professionals performing in a consulting capacity.)

PART I

FUNDAMENTAL TERMS

A. Location of Project: The City of Irvine location(s) as set forth in PART IV, Scope of Services, included herein.

B. Description of Services/Goods to be Provided: Community Choice Energy Feasbility Study and Technical Assessment in accordance with PART IV, Scope of Services, included herein (reference RFP _____).

C. Term: Unless terminated earlier as set forth in this Agreement, the services shall commence on April 2, 2018 ("Commencement Date") and shall continue through June 1, 2018. The City reserves the right to extend this Agreement for up to four (4) additional one (1) year periods. Such extension shall only be valid if effectuated in writing by the City.

D. Party Representatives:

D.1. The City designates the following person/officer to act on City's behalf:_____, email:

D.2. The Contractor designates the following person to act on Contractor's behalf:_____, email: _____

E. Notices: Contractor shall deliver all notices and other writings required to be delivered under this Agreement to City at the address set forth in Part II ("General Provisions"). The City shall deliver all notices and other writings required to be delivered to Contractor at the address set forth following Contractor's signature below.

F. Attachments: This Agreement incorporates by reference the following Attachments to this Agreement:

F.1. Part I: Fundamental Terms
F.2. Part II: General Provisions
F.3. Part III: Special Provisions
F.4. Part IV: Scope of Services
F.5. Part V: Budget

G. Integration: This Agreement represents the entire understanding of City and Contractor as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with regard to those matters covered by this Agreement. This Agreement supersedes and cancels any and all previous negotiations, arrangements, agreements, and understandings, if any, between the parties, and none shall be used to interpret this Agreement.

IN WITNESS WHEREOF, the parties have executed and entered into this Agreement as of the date first set forth above.

CITY OF IRVINE	**CONTRACTOR'S NAME**
By: _____	By: _____
Its: Public Works Director	Its: _____
By: _____	By: _____
Its: City Manager	Its: _____

Attest:

By:

_____
Molly McLaughlin
City Clerk

APPROVED AS TO FORM:
RUTAN & TUCKER, LLP

_____
Jeffrey Melching

<u>Contractor Information</u>
Address for Notices and Payments:

Attn:
Telephone:
Email:

PART II
GENERAL PROVISIONS

SECTION ONE: SERVICES OF CONTRACTOR

1.1 Scope of Services. In compliance with all terms and conditions of this Agreement, Contractor shall provide the goods and/or services shown on Part IV hereto ("Scope of Services"), which may be referred to herein as the "services" or the "work." If this Agreement is for the provision of goods, supplies, equipment or personal property, the terms "services" and "work" shall include the provision (and, if designated in the Scope of Services, the installation) of such goods, supplies, equipment or personal property.

1.2 Changes and Additions to Scope of Services. City shall have the right at any time during the performance of the services, without invalidating this Agreement, to order extra work beyond that specified in the Scope of Services or make changes by altering, adding to, or deducting from said work. No such work shall be undertaken unless a written order is first given by City to Contractor, incorporating therein any adjustment in (i) the Budget, and/or (ii) the time to perform this Agreement, which adjustments are subject to the written approval of the Contractor. City approval and/or payment for work claimed by Contractor as changed or additional shall not act to prevent City at any time to claim such work is covered by the Scope of Work and should be performed by Contractor without additional consideration due. It is expressly understood by Contractor that the provisions of this Section 1.2 shall not apply to services specifically set forth in the Scope of Services or reasonably contemplated therein. Contractor hereby acknowledges that it accepts the risk that the services to be provided pursuant to the Scope of Services may be more costly or time consuming than Contractor anticipates and that Contractor shall not be entitled to additional compensation therefor.

1.3 Standard of Performance. Contractor agrees that all services shall be performed in a competent, professional, and satisfactory manner in accordance with the standards prevalent in the industry, and that all goods, materials, equipment or personal property included within the services herein shall be of good quality, fit for the purpose intended.

1.4 Performance to Satisfaction of City. Notwithstanding any other provision herein, Contractor agrees to perform all work to the satisfaction of City within the time specified. If City reasonably determines that the work is not satisfactory, City shall have the right to take appropriate action, including but not limited to: (i) meeting with Contractor to review the quality of the work and resolve matters of concern; (ii) requiring Contractor to repeat unsatisfactory work at no additional charge until it is satisfactory; (iii) suspending the delivery of work to Contractor for an indefinite time; (iv) withholding payment; and (v) terminating this Agreement as hereinafter set forth.

1.5 Instructions from City. In the performance of this Agreement, Contractor shall report to and receive instructions from the City's Representative designated in Paragraph D.1 of Part I ("Fundamental Terms") of this Agreement. Tasks or services other

than those specifically described in the Scope of Services shall not be performed without the prior written approval of the City's Representative.

1.6 Familiarity with Work. By executing this Agreement, Contractor warrants that Contractor (i) has thoroughly investigated and considered the scope of services to be performed, (ii) has carefully considered how the services should be performed, and (iii) fully understands the facilities, difficulties, and restrictions attending performance of the services under the Agreement. If the services involve work upon any site, Contractor warrants that Contractor has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services hereunder. Should the Contractor discover any conditions, including any latent or unknown conditions, which will materially affect the performance of the services hereunder, Contractor shall immediately inform the City of such fact in writing and shall not proceed except at Contractor's risk until written instructions are received from the City's Representative.

1.7 Identity of Persons Performing Work.

(A) Contractor represents that it employs or will employ at its own expense all personnel required for the satisfactory performance of any and all tasks and services required hereunder. Any personnel performing the services under this Agreement on behalf of Contractor shall at all times be under Contractor's exclusive direction and control. Contractor shall pay all wages, salaries, and other amounts due such personnel in connection with their performance of services under this Agreement and as required by law.

(B) Contractor represents that the tasks and services required hereunder will be performed by Contractor or under its direct supervision, and that all personnel engaged in such work shall be fully qualified and shall be authorized and permitted under applicable State and local law to perform such tasks and services. Contractor will exclusively determine the means, methods and details of performing the services subject to the requirements of this Agreement.

(C) This Agreement contemplates the personal services of Contractor and Contractor's employees, and it is recognized by the parties hereto that a substantial inducement to City for entering into this Agreement was, and is, the professional reputation and competence of Contractor. Neither this Agreement nor any interest therein may be assigned by Contractor, except upon written consent of City.

1.8 Prohibition Against Subcontracting or Assignment. Contractor shall not contract with any other entity to perform in whole or in part the services required hereunder without the express written approval of City. In addition, neither the Agreement nor any interest herein may be transferred, assigned, conveyed, hypothecated, or encumbered voluntarily or by operation of law, whether for the benefit of creditors or otherwise, without the prior written approval of City. In the event of any unapproved transfer, including any bankruptcy proceeding, City may void the Agreement at City's option in its sole and absolute discretion. No approved transfer shall release any surety of Contractor of any liability hereunder without the express written consent of City.

SECTION TWO: INSURANCE AND INDEMNIFICATION

2.1 Insurance. Without limiting Contractor's indemnification obligations, Contractor shall procure and maintain, at its sole cost and for the duration of this Agreement, insurance coverage as provided below, against all claims for injuries against persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees, and/or subcontractors. In the event that Contractor subcontracts any portion of the work in compliance with Section 1.8 of this Agreement, the contract between the Contractor and such subcontractor shall require the subcontractor to maintain the same policies of insurance that the contractor is required to maintain pursuant to this Section 2.1.

2.1.1 Insurance Coverage Required. The policies and amounts of insurance required hereunder shall be as follows:

A. Comprehensive General Liability Insurance which affords coverage at least as broad as Insurance Services Office "occurrence" form CG 00 01 including completed operations and contractual liability, with limits of liability of not less than $1,000,000 per occurrence and $2,000,000 annual aggregate for liability arising out of Contractor's performance of this Agreement. The limits shall be provided by either a single primary policy or combination of policies. If limits are provided with excess and/or umbrella coverage the limits combined with the primary will equal the minimum limits set forth above. If written with an aggregate, the aggregate shall be double the each occurrence limit. Such insurance shall be endorsed to:

(1) Name the City of Irvine and its employees, representatives, officers and agents (collectively hereinafter "City and City Personnel") as additional insured for claims arising out of Contractor's performance of this Agreement.

(2) Provide that the insurance is primary and non-contributing with any other valid and collectible insurance or self-insurance available to City.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement.

B. Automobile Liability Insurance with a limit of liability of not less than $1,000,000 each occurrence and $1,000,000 annual aggregate. The limits shall be provided by either a single primary policy or combination of policies. If limits are provided with excess and/or umbrella coverage the limits combined with the primary will equal the minimum limits set above. Such insurance shall include coverage for all "owned," "hired" and "non-owned" vehicles, or coverage for "any auto." Such insurance shall be endorsed to:

(1) Name the City of Irvine and its employees, representatives, officers and agents as additional insured for claims arising out of Contractor's performance of this Agreement.

(2) Provide that the insurance is primary and non-contributing with any other valid and collectible insurance or self-insurance available to City.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement.

C. Workers' Compensation Insurance in accordance with the Labor Code of California and covering all employees of the Contractor providing any service in the performance of this agreement. Such insurance shall be endorsed to:

(1) Waive the insurer's right of Subrogation against the City and City Personnel.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement unless your insurance carrier is the State of California Insurance Fund (SCIF) and the endorsement numbers 2570 and 2065 are referenced on the certificate of insurance.

Contractor's completion of the form attached hereto as Exhibit 1 shall be a condition precedent to Contractor's rights under this Agreement. Should Contractor certify, pursuant to Exhibit 1, that, in the performance of the work under this Agreement, it shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, Contractor shall nonetheless maintain responsibility for requiring that any subcontractors performing work under this Agreement have and maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the work performed under this Agreement.

D. Professional Liability Insurance with minimum limits of $1,000,000 each claim. Covered professional services shall include all work performed under this Agreement and delete any exclusion that may potentially affect the work to be performed.

E. Evidence of Insurance: Contractor shall provide to City a Certificate(s) of Insurance evidencing such coverage together with copies of the required policy endorsements no later than five (5) business days prior to commencement of service and at least fifteen (15) business days prior to the expiration of any policy. Coverage shall not be suspended, voided, cancelled, reduced in coverage or in limits, non-renewed, or materially changed for any reason, without thirty (30) days prior written notice thereof given by the insurer to City by U.S. mail, or by personal delivery, except for nonpayment of premiums, in which case ten (10) days prior notice shall be provided.

The City project title or description MUST be included in the "Description of Operations" box on the certificate.

The City's insurance certificate tracking services provider, Exigis, LLC, will send Contractor an email message providing instructions for submitting insurance certificates and endorsements.

Certificate Holder:

City of Irvine, California
c/o: Exigis LLC
PO Box 4668 ECM #35050
New York, NY 10168-4668

F. Endorsements: A statement on an insurance certificate will not be accepted in lieu of the actual endorsement. Insurance policies shall not be in compliance if they include any limiting provision or endorsement that has not been submitted to the City for approval.

Additional Insured Endorsements shall not:

1. Be limited to "Ongoing Operations"
2. Exclude "Contractual Liability"
3. Restrict coverage to the "Sole" liability of Contractor
4. Contain any other exclusion contrary to the Agreement.

G. Any Deductible in Excess of $50,000 and/or Self-Insured Retentions must be approved in writing by the City.

H. Acceptability of Insurers. Each policy shall be from a company with current A.M. Best's rating of A- VII or higher and authorized to do business in the State of California, or otherwise allowed to place insurance through surplus lines brokers under applicable provisions of the California Insurance Code or any federal law. Any other rating must be approved in writing by the City.

I. Insurance of Subcontractors. Contractor shall be responsible for causing Subcontractors to maintain the same types and limits of coverage in compliance with this Agreement, including naming the City as an additional insured to the Subcontractor's policies.

2.2 Indemnification. Contractor shall indemnify, defend, and hold City and City Personnel harmless from and against any and all actions, suits, claims, demands, judgments, attorney's fees, costs, damages to persons or property, losses, penalties, obligations, expenses or liabilities (herein "claims" or "liabilities") that may be asserted or claimed by any person or entity arising out of the willful or negligent acts, errors or omissions of Contractor, its employees, agents, representatives or subcontractors which directly or indirectly relate to the work being performed or services being provided under this Agreement, whether or not there is concurrent active or passive negligence on the part

of City and/or City Personnel, but excluding such claims or liabilities arising from the sole active negligence or willful misconduct of City or City Personnel in connection therewith:

2.2.1 Contractor shall defend any action or actions filed in connection with any such claims or liabilities, and shall pay all costs and expenses, including attorney's fees incurred in connection therewith.

2.2.2 Contractor shall promptly pay any judgment rendered against City or any City Personnel for any such claims or liabilities.

2.2.3 In the event City and/or any City Personnel is made a party to any action or proceeding filed or prosecuted for any such damages or other claims arising out of or in connection with the work being performed or services being provided under this Agreement, Contractor shall pay to City any and all costs and expenses incurred by City or City Personnel in such action or proceeding, together with reasonable attorney's fees and expert witness fees.

SECTION THREE: LEGAL RELATIONS AND RESPONSIBILITIES

3.1 Compliance with Laws. Contractor shall keep itself fully informed of all existing and future state and federal laws and all county and city ordinances and regulations which in any manner affect those employed by it or in any way affect the performance of services pursuant to this Agreement. Contractor shall at all times observe and comply with all such laws, ordinances, and regulations and shall be responsible for the compliance of all work and services performed by or on behalf of Contractor. When applicable, Contractor shall not pay less than the prevailing wage, which rate is determined by the Director of Industrial Relations of the State of California.

3.2 Licenses, Permits, Fees and Assessments. Contractor shall obtain at its sole cost and expense all licenses, permits, and approvals that may be required by law for the performance of the services required by this Agreement. Contractor shall have the sole obligation to pay any fees, assessments, and taxes, plus applicable penalties and interest, which may be imposed by law and arise from or are necessary for Contractor's performance of the services required by this Agreement, and shall indemnify, defend, and hold harmless City against any such fees, assessments, taxes, penalties, or interest levied, assessed, or imposed against City thereunder.

3.3 Covenant against Discrimination. Contractor covenants for itself, its heirs, executors, assigns, and all persons claiming under or through it, that there shall be no discrimination against any person on account of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status of any person, in the performance of this Agreement. Contractor further covenants and agrees to comply with the terms of the Americans with Disabilities Act of 1990 (42 U.S.C. §12101 et seq.) as the same may be amended from time to time.

3.4 Independent Contractor. Contractor shall perform all services required herein as an independent contractor of City and shall remain at all times as to City a wholly independent contractor. City shall not in any way or for any purpose become or be deemed to be a partner of Contractor in its business or otherwise, or a joint venturer, or a member of any joint enterprise with Contractor. Contractor shall not at any time or in any manner represent that it or any of its agents or employees are agents or employees of City. Neither Contractor nor any of Contractor's employees shall, at any time, or in any way, be entitled to any sick leave, vacation, retirement, or other fringe benefits from the City; and neither Contractor nor any of its employees shall be paid by City time and one-half for working in excess of forty (40) hours in any one week. City is under no obligation to withhold State and Federal tax deductions from Contractor's compensation. Neither Contractor nor any of Contractor's employees shall be included in the competitive service, have any property right to any position, or any of the rights an employee may have in the event of termination of this Agreement.

3.5 Covenant against Contingent Fees. Contractor warrants that it has not employed or retained any company or person other than a bona fide employee working for Contractor, to solicit or secure this Agreement and that it has not paid or agreed to pay any company or person any fee, commission, percentage, brokerage fee, gift, or any other consideration contingent upon, or resulting from, the award or making of this Agreement. For breach or violation of this warranty, City shall have the right to annul this Agreement without liability or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

3.6 Use of Patented Materials. Contractor shall assume all costs arising from the use of patented or copyrighted materials, including but not limited to equipment, devices, processes, and software programs, used or incorporated in the services or work performed by Contractor under this Agreement. Contractor shall indemnify, defend, and save the City harmless from any and all suits, actions or proceedings of every nature for or on account of the use of any patented or copyrighted materials consistent with Section 2.2 herein.

3.7 Proprietary Information. All proprietary information developed specifically for City by Contractor in connection with, or resulting from, this Agreement, including but not limited to inventions, discoveries, improvements, copyrights, patents, maps, reports, textual material, or software programs, but not including Contractor's underlying materials, software, or know-how, shall be the sole and exclusive property of City, and are confidential and shall not be made available to any person or entity without the prior written approval of City. Contractor agrees that the compensation to be paid pursuant to this Agreement includes adequate and sufficient compensation for any proprietary information developed in connection with or resulting from the performance of Contractor's services under this Agreement. Contractor further understands and agrees that full disclosure of all proprietary information developed in connection with, or resulting from, the performance of services by Contractor under this Agreement shall be made to City, and that Contractor shall do all things necessary and proper to perfect and maintain ownership of such proprietary information by City.

3.8 Retention of Funds. Contractor hereby authorizes City to deduct from any amount payable to Contractor (whether arising out of this Agreement or otherwise) any amounts the payment of which may be in dispute hereunder or which are necessary to compensate City for any losses, costs, liabilities, or damages suffered by City, and all amounts for which City may be liable to third parties, by reason of Contractor's negligent acts, errors, or omissions, or willful misconduct, in performing or failing to perform Contractor's obligations under this Agreement. City in its sole and absolute discretion, may withhold from any payment due Contractor, without liability for interest, an amount sufficient to cover such claim or any resulting lien. The failure of City to exercise such right to deduct or withhold shall not act as a waiver of Contractor's obligation to pay City any sums Contractor owes City.

3.9 Termination by City. City reserves the right to terminate this Agreement at any time, with or without cause, upon written notice to Contractor. Upon receipt of any notice of termination from City, Contractor shall immediately cease all services hereunder except such as may be specifically approved in writing by City. Contractor shall be entitled to compensation for all services rendered prior to receipt of City's notice of termination and for any services authorized in writing by City thereafter. If termination is due to the failure of Contractor to fulfill its obligations under this Agreement, City may take over the work and prosecute the same to completion by contract or otherwise, and Contractor shall be liable to the extent that the total cost for completion of the services required hereunder, including costs incurred by City in retaining a replacement contractor and similar expenses, exceeds the Budget.

3.10 Right to Stop Work; Termination by Contractor. Contractor shall have the right to stop work and terminate only if City fails to timely make a payment required under the terms of the Budget. Contractor shall provide City thirty (30) day prior written notice of such claimed payment owed and City shall have an opportunity to remedy any such claimed breach during such time with no legal consequence to City. Contractor shall immediately cease all services hereunder following the thirty (30) day notice, except such services as may be specifically approved in writing by City. Contractor shall be entitled to compensation for all services rendered prior to termination and for any services authorized in writing by City thereafter. If Contractor terminates this Agreement because of an error, omission, or a fault of Contractor, or Contractor's willful misconduct, the terms of Section 3.9 relating to City's right to take over and finish the work and Contractor's liability shall apply.

3.11 Waiver. No delay or omission in the exercise of any right or remedy by a nondefaulting party with respect to any default shall impair such right or remedy or be construed as a waiver. A party's consent to or approval of any act by the other party requiring the party's consent or approval shall not be deemed to waive or render unnecessary consent to or approval of any subsequent act. A waiver by either party of any default must be in writing.

3.12 Legal Actions. Legal actions concerning any dispute, claim, or matter arising out of or in relation to this Agreement shall be instituted and maintained in the Superior Courts of the State of California in the County of Orange, or in any other

appropriate court with jurisdiction in such County, and Contractor agrees to submit to the personal jurisdiction of such court.

3.13 Rights and Remedies are Cumulative. Except as may be expressly set forth in this Agreement, the rights and remedies of the parties are cumulative and the exercise by either party of one or more of such rights or remedies or other rights or remedies as may be permitted by law or in equity shall not preclude the exercise by such party, at the same or different times, of any other rights or remedies to which such party may be entitled.

3.14 Attorneys' Fees. In any action between the parties hereto seeking enforcement of any of the terms or provisions of this Agreement or in connection with the performance of the work hereunder, the party prevailing in the final judgment in such action or proceeding, in addition to any other relief which may be granted, shall be entitled to have and recover from the other party its reasonable costs and expenses, including, but not limited to, reasonable attorney's fees, expert witness fees, and courts costs. If either party to this Agreement is required to initiate or defend litigation with a third party because of the violation of any term or provision of this Agreement by the other party, then the party so litigating shall be entitled to its reasonable attorney's fees and costs from the other party to this Agreement.

3.15 Force Majeure. The time period specified in this Agreement for performance of services shall be extended because of any delays due to unforeseeable causes beyond the control and without the fault or negligence of City or Contractor, including, but not restricted to, acts of nature or of the public enemy, unusually severe weather, fires, earthquakes, floods, epidemics, quarantine restrictions, riots, strikes, freight embargoes, wars, litigation, and/or acts of any governmental agency, including City, if the delaying party shall within ten (10) days of the commencement of such delay notify the other party in writing of the causes of the delay. If Contractor is the delaying party, City shall ascertain the facts and the extent of delay, and extend the time for performing the services for the period of the enforced delay when and if in the judgment of City such delay is justified. City's determination shall be final and conclusive upon the parties to this Agreement. In no event shall Contractor be entitled to recover damages against City for any delay in the performance of this Agreement, however caused. Contractor's sole remedy shall be extension of this Agreement pursuant to this Section 3.15.

3.16 Non-liability of City Officers and Employees. No officer, official, employee, agent, representative, or volunteer of City shall be personally liable to Contractor, or any successor in interest, in the event of any default or breach by City, or for any amount which may become due to Contractor or its successor, or for breach of any obligation of the terms of this Agreement.

3.17 Conflicts of Interest.

A. No officer, official, employee, agent, representative or volunteer of City shall have any financial interest, direct or indirect, in this Agreement, or participate in any decision relating to this Agreement that affects his or her financial interest or the financial interest of any corporation, partnership, association or other entity in which he

or she is interested, in violation of any federal, state or city statute, ordinance or regulation. Contractor shall not employ any such person while this Agreement is in effect.

B. Contractor represents, warrants and covenants that he, she or it presently has no interest, direct or indirect, which would interfere with or impair in any manner or degree the performance of Contractor's obligations and responsibilities under this Agreement. Contractor further agrees that while this Agreement is in effect, Contractor shall not acquire or otherwise obtain any interest, direct or indirect, that would interfere with or impair in any manner or degree the performance of Contractor's obligations and responsibilities under this Agreement.

C. Contractor acknowledges that pursuant to the provisions of the Political Reform Act (Government Code section 87100 *et seq.*), City may determine Contractor to be a "Consultant" as that term is defined by the Act. In the event City makes such a determination, Contractor agrees to complete and file a "Statement of Economic Interest" with the City Clerk to disclose such financial interests as required by City. In such event, Contractor further agrees to require any other person doing work under this Agreement to complete and file a "Statement of Economic Interest" to disclose such other person's financial interests as required by City.

3.18 <u>Contractor Ethics.</u> Contractor represents and warrants that it has not provided or promised to provide any gift or other consideration, directly or indirectly, to any officer, employee, or agent of City to obtain City's approval of this Agreement. Contractor shall not, at any time, have any financial interest in this Agreement or the project that is the subject of this Agreement other than the compensation to be paid to Contractor as set forth in this Agreement. In the event the work and/or services to be performed hereunder relate to a project and/or application under consideration by or on file with the City, (i) Contractor shall not possess or maintain any business relationship with the applicant or any other person or entity which Contractor knows to have a personal stake in said project and/or application, (ii) other than performing its work and/or services to City in accordance with this Agreement Contractor shall not advocate either for or against said project and/or application, and (iii) Contractor shall immediately notify City in the event Contractor determines that Contractor has or acquires any such business relationship with the applicant or other person or entity which has a personal stake in said project and/or application. The provisions in this Section shall be applicable to all of Contractor's officers, directors, employees, and agents, and shall survive the termination of this Agreement.

3.19 <u>Compliance with California Unemployment Insurance Code Section 1088.8</u>. If Contractor is a Sole Proprietor, then prior to signing the Agreement, Contractor shall provide to the City a completed and signed Form W-9, Request for Taxpayer Identification Number and Certification. Contractor understands that pursuant to California Unemployment Insurance Code Section 1088.8, the City will report the information from Form W-9 to the State of California Employment Development Department, and that the information may be used for the purposes of establishing,

modifying, or enforcing child support obligations, including collections, or reported to the Franchise Tax Board for tax enforcement purposes.

3.20 CalPERS Annuitants. If Contractor is a California Public Employees' Retirement System ("CalPERS") annuitant, Contractor must provide the City with written notification of such fact a minimum of 14 calendar days prior to commencement of services under this Agreement. Failure to provide such notification may result in termination of the Agreement, and any penalties or other costs relating thereto shall be borne by Contractor. If this Agreement remains in place, Contractor shall execute any amendment(s) to this Agreement requested by the City in order to comply with all laws and regulations applicable to CalPERS annuitants.

SECTION FOUR: MISCELLANEOUS PROVISIONS

4.1 Records and Reports. The City Manager of the City of Irvine or his/her designee reserves the right to perform such audits, performance reviews, and other evaluations (collectively 'audit') that relate to or concern this Agreement at any time. Contractor agrees to participate and cooperate in up to five (5) hours of meetings and interviews (at no additional cost to City), if the same are requested by the City in connection with such an audit. Further, provided that the City pays Contractor's commercially reasonable hourly rate for services, Contractor agrees to participate and cooperate in such additional meetings and interviews (in excess of five (5) hours), if the same are requested by the City in connection with such an audit. Upon request by City, Contractor shall prepare and submit to City any reports concerning Contractor's performance of the services rendered under this Agreement. City shall have access, with 72 hours advance written notice delivered to Contractor, to the books and records of Contractor related to Contractor's performance of this Agreement in the event any audit is required. All drawings, documents, and other materials prepared by Contractor in the performance of this Agreement (i) shall be the property of City and shall be delivered at no cost to City upon request of City or upon the termination of this Agreement, and (ii) shall not be made available to any individual or entity without prior written approval of City. The obligations of this Section 4.1 shall survive the expiration (or earlier termination) of this Agreement for a period of three (3) years. During said three (3) year period, Contractor shall keep and maintain all records and reports related to this Agreement, and City shall have access to such records in the event any audit is required.

4.2 Notices. Unless otherwise provided herein, all notices required to be delivered under this Agreement or under applicable law shall be personally delivered, or delivered by United States mail, prepaid, certified, return receipt requested, or by reputable document delivery service that provides a receipt showing date and time of delivery. Notices personally delivered or delivered by a document delivery service shall be effective upon receipt. Notices delivered by mail shall be effective at 5:00 p.m. on the second calendar day following dispatch. Notices to the City shall be delivered to the following address, to the attention of the City Representative set forth in Paragraph D.1 of the Fundamental Terms of this Agreement:

To City: City of Irvine
One Civic Center Plaza (92606) (Hand Deliveries)
P. O. Box 19575
Irvine, CA 92623-9575

Notices to Contractor shall be delivered to the address set forth below Contractor's signature on Part I of this Agreement, to the attention of Contractor's Representative set forth in Paragraph D.2 of the Fundamental Terms of this Agreement. Changes in the address to be used for receipt of notices shall be effected in accordance with this Section 4.2.

4.3 Construction and Amendment. The terms of this Agreement shall be construed in accordance with the meaning of the language used and shall not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction which might otherwise apply. The headings of sections and paragraphs of this Agreement are for convenience or reference only, and shall not be construed to limit or extend the meaning of the terms, covenants and conditions of this Agreement. This Agreement may only be amended by the mutual consent of the parties by an instrument in writing.

4.4 Severability. Each provision of this Agreement shall be severable from the whole. If any provision of this Agreement shall be found contrary to law, the remainder of this Agreement shall continue in full force.

4.5 Authority. The person(s) executing this Agreement on behalf of the parties hereto warrant that (i) such party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said party, (iii) by so executing this Agreement, such party is formally bound to the provisions of this Agreement, and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which said party is bound.

4.6 Special Provisions. Any additional or supplementary provisions or modifications or alterations of these General Provisions shall be set forth in Part III of this Agreement ("Special Provisions").

4.7 Precedence. In the event of any discrepancy between Part I ("Fundamental Terms"), Part II ("General Provisions"), Part III ("Special Provisions"), Part IV ("Scope of Services"), and/or Part V ("Budget") of this Agreement, the order of precedence shall be as follows.
Part III
Part II
Part IV
Part V
Part I

PART III
SPECIAL PROVISIONS

1) **Business License Requirement.** Contractors who provide services for the City of Irvine within the city limits of Irvine shall obtain, within five (5) days of executing this Agreement and prior to commencing any work herein, a City of Irvine business license and shall maintain a current business license throughout the term of this Agreement.

PART IV

SCOPE OF SERVICES

Services shall be performed as set forth below and in accordance with ATTACHMENT I (to be inserted after contract award).

PART V

BUDGET

Pricing shall be as set forth below and in accordance with ATTACHMENT II (to be inserted after contract award).

Included in the total compensation are all ordinary and overhead expenses incurred by Contractor and its agents and employees, including meetings with City representatives, and incidental costs incurred in performing under this Agreement. The total compensation for the Scope of Services set forth herein **shall not exceed $_____**, including all amounts payable to Contractor for its overhead, payroll, profit, and all costs of whatever nature, including without limitation all costs for subcontracts, materials, equipment, supplies, and costs arising from or due to termination of this Agreement.

No work shall be performed in connection with this Agreement until the receipt of a signed City of Irvine Purchase Order; and no work shall be performed with a value in excess of the Purchase Order amount as the City has not authorized nor is it obligated to pay Contractor any such excess amount.

In the event Contractor anticipates the potential need to perform services beyond those set forth herein where additional funding may be needed, Contractor shall notify City in writing allowing sufficient time for City to consider further action.

Payment for services will be made monthly on invoices deemed satisfactory to the City, with payment terms of net 30 days upon receipt of invoice. Contractor shall submit invoices within fifteen (15) days from the end of each month in which services have been provided. Contractor shall provide invoices with sufficient detail to ensure compliance with pricing as set forth in this Agreement. The information required may include: date(s) of work, hours of work, hourly rate(s), and material costs.

The Purchase Order number must be included on all invoices, along with the City Representative's name. Failure to include this information on the invoice shall result in the return of the unpaid invoice.

Contractors should submit invoices electronically to:

invoicesubmittal@cityofirvine.org

Payment by City under this Agreement shall not be deemed as a waiver of the City's right to claim at a later point that such payment was not due under the terms of this Agreement.

Pricing shall remain firm for the entire Agreement term. Thereafter, any proposed pricing adjustment for follow-on renewal periods shall be submitted to the City Representative in writing at least ninety (90) days prior to the new Agreement term. The City reserves the right to negotiate any proposed pricing adjustment not to exceed the

Bureau of Labor Statistics Consumer Price Index (CPI) data as follows: Los Angeles-Riverside-Orange County, CA; All Items; Not Seasonally Adjusted; annualized change comparing the most recent month's reported data to the same month of the prior year. (This information may be found on the U.S. Department of Labor's website at www.bls.gov.)

Exhibit 1

WORKERS' COMPENSATION INSURANCE CERTIFICATION

Contract Services Description:_____

WORKERS' COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

(CHECK ONE APPLICABLE BOX BELOW)

☐ **I have and will maintain workers' compensation insurance**, as required by Section 3700 of the Labor Code, for the performance of the work to be performed under this Agreement and shall submit insurance certificates evidencing such coverage as set forth herein.

☐ I certify that, in the performance of the work under this Agreement, **I shall not employ any person** in any manner so as to become subject to the workers' compensation laws of California, and I hereby agree to indemnify, defend, and hold harmless the City of Irvine and all of its officials, employees, and agents from and against any and all claims, liabilities, and losses relating to personal injury or death, economic losses, and property damage arising out of my failure to provide such worker's compensation insurance. I further agree that, **if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions and immediately furnish insurance certificates** evidencing such coverage as set forth herein.

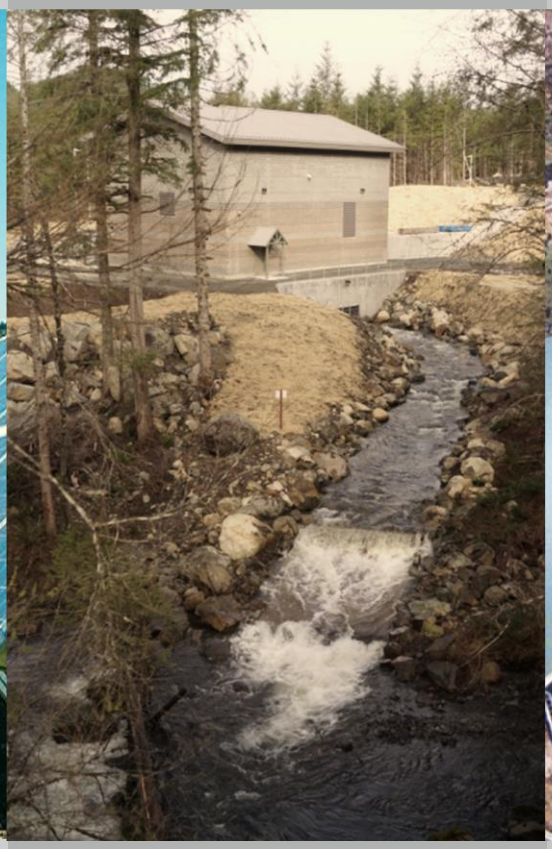
WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

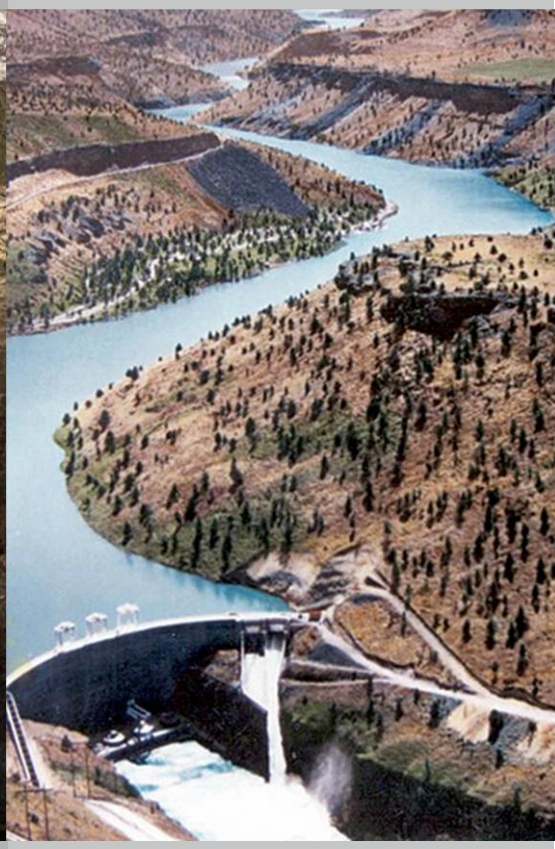
Dated:	
Contracting Firm:	
Signature:	
Title:	
Address:	

City of Irvine

Community Choice Energy
Feasibility Study and Technical Assessment
(RFP 18-1357)

March 2018





VANIR

EES Consulting, Inc.

A registered professional engineering and management consulting firm with offices in Kirkland, WA, Portland OR and La Quinta, CA

570 Kirkland Way, Suite 100
Kirkland, Washington 98033

Telephone: (425) 889-2700

www.eesconsulting.com

ATTACHMENT 3

March 5, 2018

Ms. Angie Burgh
Senior Management Analyst
City of Irvine
One Civic Center Plaza
Irvine, California 92606

SUBJECT: Request for Proposal – Community Choice Energy Feasibility Study and Technical Assessment – RFP 18-1357

Dear Ms. Burgh:

EES Consulting, Inc. (EES) and Vanir Construction Management (Project Team) are pleased to submit this proposal to prepare a Community Choice Energy (CCE) Feasibility Study and Technical Assessment to the City of Irvine (City).

The Project Team has previously prepared CCE Feasibility Analyses and CCE Business Plans for the County of Los Angeles, Alameda and Butte Counties, the San Bernardino Associated Governments, the Coachella Valley Association of Governments, Western Riverside Council of Governments, and the City of San José, and is currently preparing CCE feasibility studies for the Cities of Carlsbad, Del Mar, Oceanside, and Encinitas. Additionally, the Project Team is currently serving as the implementation technical consultant for Los Angeles Community Choice Energy, Western Community Energy, and San Jose Clean Energy. Finally, the Project Team is an ongoing participant in numerous CCE-related regulatory proceedings at the California Public Utility Commission (CPUC), including the current Power Charge Indifference Adjustment (PCIA) review proceeding (R.17-06-026) and the Resource Adequacy proceedings.

The Project Team personnel have expertise in all areas of electric utility operations, which has developed over our 40 years of working as a full-service professional engineering, financial and regulatory consulting firm for the electric industry. Our Project Team of professional staff members have backgrounds in engineering, economics, finance, financial analysis, power plant development, wholesale power and gas markets, power supply procurement, wholesale rate

setting, public administration, operations research, telecommunications and utility corporate management. Prior to consulting, many of the Project Team staff have worked for a utility or regulatory agency. This understanding of the day-to-day workings of a typical utility is invaluable in attempting to work with clients and manage projects in an efficient and cost-effective manner. In addition, the senior staff on our Project Team have professional licenses and/or one or more graduate degrees to supplement their practical experience.

Our Project Team's broad base of clients includes utilities and industrial companies located throughout North America, with a focus on municipalities, cooperatives, CCAs and public power utilities. Our Project Team has a track record of success in areas where the results of the evaluation or analysis may have far reaching effects on the viability of an organization and the local community. Because of the size of our firm and our highly qualified staff, we can deliver results in less time and with less expense to our clients. We are responsive and focused on cost-effective solutions for our clients' needs, and always recommend the most direct and efficient means of carrying out a project.

EES has partnered with Vanir Construction Management Inc. Vanir provides sustainability services to public agencies including Distributed Energy Resource planning and implementation. Vanir's Community Choice Aggregation Specialist, Howard Choy, will bring his extensive CCA experience and knowledge of the local Southern California energy landscape as an advisor to EES on this project. Howard will provide quality assurance on the project as well provide local distributed resource pricing information.

We look forward to working with the City on this interesting project and hope to hear back from you soon. This proposal will remain valid for ninety (90) days.

In the meantime, feel free to call me with any questions.

Very truly yours,

Gary Saleba
President/CEO
EES Consulting, Inc.
570 Kirkland Way #100
Kirkland, WA 98033
O-425.889.2700
C-425.260.6678

Contents

Business Information 1

Experience/Qualifications Information 2

Project Approach/Methodology 10

References 21

Pricing Proposal 24

Business Information

EES is a corporation with offices in Kirkland, WA, Portland, OR and La Quinta, CA. Our contact person, corporate address and phone number are noted below:

Company/Website:	EES Consulting, Inc., http://www.eesconsulting.com/
President:	Gary S. Saleba
Company Address:	570 Kirkland Way, #100, Kirkland, WA 98033
Phone:	425-889-2700
Fax:	425-889-2725
Email:	saleba@eesconsulting.com
Legal Status:	C corporation registered State of Washington
Years in Business:	1978 – Current
Officers to Bind Firm:	Gary S. Saleba, President/CEO

Experience/Qualifications Information

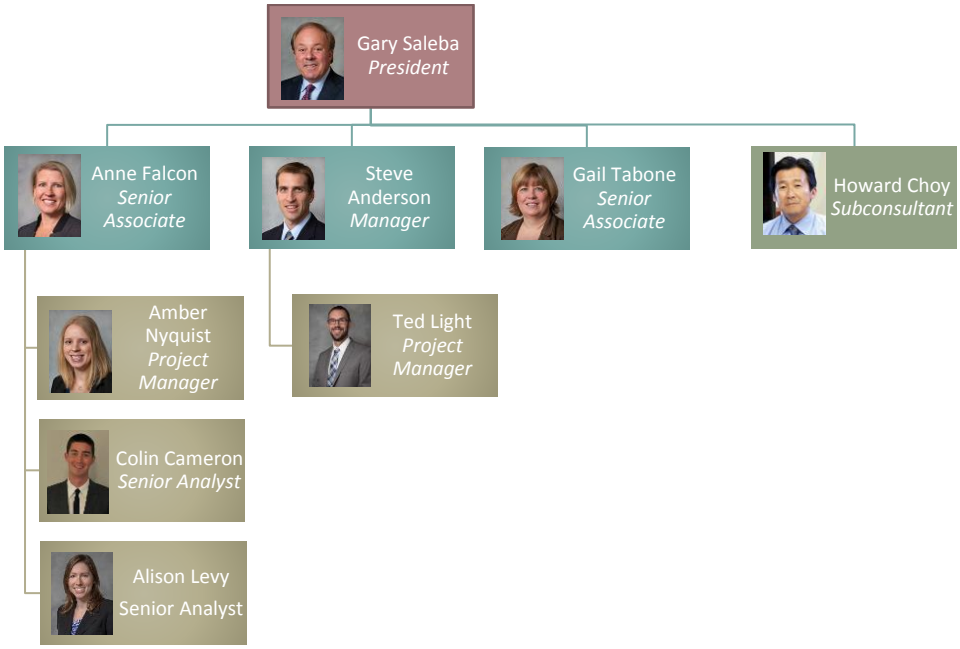
EES Consulting, Inc. (EES) is a registered professional engineering and management consulting firm that has been serving the utility industry since 1978 with offices in Kirkland, Washington; Portland, Oregon; and La Quinta, California. We have over 500 regular utility clients across North America with our primary focus within the Western Electricity Coordinating Council reliability area. EES's professional staff have backgrounds in the areas of engineering, economics, power procurement, rate setting, finance, public administration, operations research and general management. Our Project Team offers a range of utility management services including resource planning, financial analysis, cost of service analysis, rate studies, load forecasting, market analysis, and regulatory compliance and analysis. A full description of EES's lines of business, personnel, and clientele can be found on our website at: www.eesconsulting.com.

CCE Experience: EES has previously prepared CCE Feasibility Analyses and CCE Business Plans for the County of Los Angeles, the San Bernardino Associated Governments, the Coachella Valley Association of Governments, Western Riverside Council of Governments, and the City of San José, and is currently preparing CCE feasibility studies for Butte County and the cities of Carlsbad, Del Mar, Oceanside, and Encinitas. EES has also provided CCE Feasibility Peer Review services for Alameda County, the City of Solana Beach, the City of San Diego, and King City. In addition, EES Consulting is currently serving as the implementation technical consultant for Los Angeles Community Choice Energy, Western Community Energy, and San Jose Clean Energy. EES is an ongoing participant in numerous CCE-related regulatory proceedings at the California Public Utility Commission (CPUC), including the Resource Adequacy hearings and the current Power Charge Indifference Adjustment (PCIA) review proceeding (R.17-06-026).

Vanir is an award-winning program, project, and construction management corporation operating strategically throughout the United States. Vanir streamlines the connection between buildings, people and sustainability, particularly in clean energy and energy efficiency. Vanir has contracted with Howard Choy, recently retired from the Los Angeles County Office of Sustainability. While developing and administering a variety of community, clean energy programs, Howard also led the efforts for the County to assess and move forward with a Countywide CCE which could include the eligible 82 cities within the County. He also led the development of the initial Feasibility Study/Business Plan and the initial plan to implement CCA within the County. Today Howard and continue to work on behalf of local governments and public agencies on assessment and development of local/regional clean energy programs.

The following organizational chart outlines EES's management consulting team:

Figure 1
Organization Chart



Project Team Staffing

As noted in the previous section, EES has worked with ten CCE clients throughout California fulfilling tasks including feasibility analysis, peer review, and CCE implementation technical consulting. The team proposed for this project is the same team to have completed all of EES's previous CCE work, and; therefore, brings substantial experience and subject-specific knowledge on CCE issues. Narrative resumes for staff members are included in Appendix A.

Name	Position	Project Role
Gary Saleba	President and CEO	Project Lead, Primary Contact
Anne Falcon	Senior Associate	Project Management, Financial Analysis
Gail Tabone	Senior Associate	Quality Assurance
Howard Choy	Community Energy Specialist	Community Energy and Distributed Energy Resources
Steve Andersen	Manager	Power Supply
Amber Nyquist	Project Manager	Load Analysis
Ted Light	Project Manager	Energy Efficiency and Distributed Energy
Colin Cameron	Senior Analyst	Load & Regulatory Analysis
Alison Levy	Senior Analyst	Financial Analysis

Gary Saleba, President/CEO
Role: Quality Assurance and Control, Project Leader

Gary Saleba has over 35 years of experience in providing consultant services to electric power utilities. Gary started EES in 1978 and has worked for our electric power utility clients ever since.

Gary's areas of specialty include overall quality control for EES's projects as well as development of corporate management, financial and strategic planning models primarily for electric, natural gas and water utilities. He has extensive experience in the areas of utility rate design, revenue requirement analysis, cost of service, financial planning, management audits, professional development educational seminars, marketing, consumer research, forecasting, integrated resource planning, cost-benefit analyses, overall strategic planning, power procurement, and mergers and acquisitions.

Having worked as a utility employee, Gary combines an extensive background as both a utility industry expert and a management consultant. He is able to draw upon this professional and educational experience to manage projects including comprehensive utility cost of service studies, strategic planning, and management critiques for clients throughout North America. His experience extends to alternative fuel cost comparisons, econometric forecasting models, resource planning and reliability studies. Gary has participated in numerous generic utility proceedings, testified before over 200 regulatory bodies and courts of law and coordinated over 500 utility planning studies.

Gary has served on numerous energy and natural resource-related trade associations, including as Chairman of the American Water Works Association Financial Management Committee and Management Division. He has also served on the board of directors for the Northwest Public Power Association and on the Board of Directors for ENERconnect, Inc., a bulk power aggregation and procurement entity serving the municipal utilities in the Province of Ontario. Gary is located in our Kirkland, Washington office.

> Education: M.B.A., Finance, Butler University, Indianapolis, IN; B.A., Economics and Mathematics, Franklin College, Franklin, IN
>
> Affiliations: American Water Works Association, American Public Power Association, Northwest Public Power Association, Canadian Energy Association, California Municipal Utilities Association

Anne Falcon, Senior Associate
Role: Project Manager

Anne Falcon has over 20 years of experience providing integrated resource planning, financial analysis, cost of service and rate design services to electric utility clients. She has provided financial analysis assistance to our electric power utility clients since then. Anne provides project management and technical support for all types of utility studies. She has managed projects concerning cost of service and rate design analyses, financial planning including estimation of power and non-power supply costs, and regulatory proceedings for electric, natural gas, water, and wastewater utilities. Her expertise includes restructuring, strategic planning, forecasting, unbundled cost-of-service studies, optimization research, and specialized statistical studies.

Through her research and analysis of the current state of the industry, Anne has assisted many California and Northwest electric power utility clients in preparing for the changes that are taking place. Her work has included developing wholesale power price forecasts, unbundled rates,

average embedded and marginal cost-of-service studies, analysis of stranded costs, development of direct access programs, research on Independent System Operators (ISOs) and power markets, development of customer choice programs and conservation, market-based and green rate designs.

At EES, Anne has been involved in all aspects of the integrated resource planning process from the initial identification of demand and supply-side resources to the final ranking of resource portfolios. She has developed numerous decision models for United States and Canadian utilities and performed resource evaluations by applying social costing principles and risk analysis.

Anne applies her extensive economic and technical knowledge in the development of resource-related computer models for use by electric, gas, water, wastewater, and solid waste utilities. Her work also includes the development of a multitude of econometric forecasts for electric, gas, and water utilities. She has developed disaggregate energy and demand forecasts using a variety of forecasting and econometric tools. Anne is located in our Kirkland, Washington office.

Education: M.S., Operations Research, Stanford University; B.A., Economics, University of San Francisco, Summa Cum Laude

Affiliations: Operations Research Society of America

Gail Tabone, Senior Associate
Role: Assistant Project Leader, Quality Control
Years of Employment with EES: 25 years
M.S., Agricultural and Applied Economics, University of Minnesota / B.S., Economics, University of Minnesota

Gail has over 25 years of experience in short- and long-term utility planning related to both operations and financial analysis. Gail has managed projects concerning power supply planning, load aggregation, cost of service and rate analyses, and regulatory proceedings. Her experience includes power supply management for a large public utility. This project included load forecasting, optimization of resource and contract options, procurement and negotiations for power supply, power supply cost estimation, negotiating transmission contracts, auditing of scheduling and dispatching services, rate design and devising customer choice programs.

Gail participated in the deregulation process very early on when she assisted an Alberta municipal utility through the deregulation that occurred in that Province resulting in the establishment of a power pool and a grid operating company. She was involved in strategic planning and regulatory intervention for the utility and performed an unbundled cost of service study incorporating the new power supply and transmission costs.

Ms. Tabone participated in various aspects of changing utility regulation, from early deregulation in Alberta, pooling of transmission costs in Texas, and formation of CCAs in California. She has been involved in strategic planning and regulatory intervention for existing utilities facing changes in the industry structure and reviewing the feasibility of forming new utilities under CCA regulation in California. Gail is skilled at determining clients' needs in the changing utility environment. She develops unique approaches to the analysis of issues facing each client. While

her primary focus is economic, she also has a thorough knowledge of the technical issues related to power supply diversification.

Steven Andersen, Manager, Project Evaluations
Role: Power Supply Cost Estimation

Steve has over 20 years of experience in developing wholesale power supply pricing and financial analysis for electric utilities. Steve's broad knowledge of the engineering field enables him to handle technical issues and provide economic and technical analyses for utility and industrial clients of EES. He has evaluated power supply proposals for many utilities in the northwest. He has calculated the potential savings in total power supply costs offered by competing suppliers. With his background in power engineering, he is able to assess the technical barriers to potential savings in today's changing electric industry.

Steve has been responsible for managing the interplay of multiple power supply contracts for a major electric utility. He has monitored the hourly loads and power schedules of the utility and recommended changes to economically optimize the utility's various resources. He has also negotiated and implemented short and long-term power supply and transmission contracts on behalf of the utility.

Steve has prepared integrated resources plans for both large and small utilities and has performed resource feasibility studies for both utility and industrial clients. He has performed cost of service analyses for many utilities. This analysis includes developing rates for residential, commercial and large industrial customer classes. He has also audited the power supply costs of large industrial corporations and suggested options for reducing their overall costs.

Steve has experience monitoring gas and electric markets and recommending purchases based on potential savings in total power supply costs. He is familiar with the functionality of hourly, daily, monthly, and long-term energy markets. Steve is located in our Portland, Oregon office.

Education: B.S., Electrical Engineering, University of Washington

Amber Nyquist, Senior Project Manager
Role: Load Forecasting

Amber has over 10 years of experience providing analytical expertise for EES in support of economic and financial studies. She offers experience and knowledge to a wide range of topics related to regulated utilities. Her background includes cost of service analysis, electric rate design, wholesale rate setting, and other power supply costs or related information. She assists in Integrated Resource Planning as well as independent resource evaluation. Specific areas of expertise include demand-side and conservation resources, geothermal, wind, renewable energy credits, gas-fired, and other resources.

In addition to resource planning, Amber uses her background in econometrics and data analysis to develop load forecasts, normalize electric loads according to weather, and to develop market price forecasts. She also conducts conservation program evaluations and provides utilities with

statistically significant results, which assist in utility program planning, data collection, and presentation.

Finally, Amber and her staff have performed over 50 conservation potential assessment studies for electric utilities on the west coast. Amber is located in our Kirkland, Washington office.

Education: M.A., Economics, Simon Fraser University; B.A., Economics, Western Washington University

Ted Light, Project Manager
Role: Analytical Support

Ted is a Project Manager with a specialty in energy efficiency and demand-side management. He brings nearly nine years of experience to EES, having worked previously for the Energy Trust of Oregon, the non-profit energy efficiency and renewable energy program administrator for Oregon's investor-owned utilities. He has expertise and knowledge on a broad array of energy efficiency program management and planning topics including: conservation/DSM potential assessments, conservation program planning, program data analysis, and cost-benefit analyses. Mr. Light is a Certified Energy Manager with the Association of Energy Engineers and holds a B.A. in Aerospace Engineering from Purdue University.

Education: B.S., Aeronautical & Aerospace Engineering, Purdue University

Certifications: Certified Energy Manager

Colin Cameron, Senior Analyst
Role: Analytical Support and Communications

Colin provides analytical expertise for EES on economic and regulatory issues. He brings experience in least-cost and econometric model development, benefit-cost analysis, and regulatory research.

Prior to joining EES, Colin worked on energy system modeling teams at the U.S. Environmental Protection Agency and the International Institute for Applied Systems Analysis in Vienna, Austria. In these roles, Mr. Cameron led analysis of energy subsidies, emission taxation, and rapid implementation of new power generation technologies. He has published research on water-energy nexus issues in the United States and on fuel affordability in South Asia. Colin is located in our Kirkland, Washington office.

Education: M.S., Environmental Science and Engineering, University of North Carolina, Chapel Hill; B.A., Neuroscience and Behavior, Columbia University

Alison Levy, Senior Analyst
Role: Financial Proforma and Analysis

Alison Levy provides analytical and research expertise for EES in support of financial studies. Ms. Levy offers experience in a wide range of topics, including data analytics, strategy development, power plant facilities operation, emissions technology, and oil and gas processing. Prior to joining EES, Ms. Levy's experience included viability assessments of renewable energy storage and supply chain carbon emissions reduction, as well as many years performing engineering and economic analyses within the oil and gas industry.

> Education: M.B.A., University of Michigan, High Distinction; B.S., Chemical and Biomolecular Engineering, Cornell University

Vanir Staffing

Randy Britt, Principal
Role: Energy Program Support

Randy has over 35 years of experience developing and managing projects and programs in the sustainability areas of energy conservation, water use maximization, energy efficient building design and renewable energy. At Vanir, he is responsible for leading sustainability strategies and initiatives and overseeing energy efficiency and renewable energy sustainability projects across the United States. Notably, Randy provided feasibility studies for 20 MW at various Los Angeles Unified School District (LAUSD) locations.

> Education: Bachelor of Science, Illinois State University.
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> Certifications: Leadership in Energy and Environmental Design (LEED) Accredited Professional; Green Business Certification.
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> Affiliations: Construction Management Association of America's Sustainability Committee Chair; U.S. Green Building Council-Los Angeles (USGBC-LA) Chapter Board Member Emeritus; USGBC-LA Greenbuild Host Committee Co-Chair; Los Angeles Business Council Energy Committee member; Association of Energy Engineers member; Sustainable Remediation Forum member.

Howard Choy, Community Choice Technical Support
Role: Energy Program Support

Howard brings more than 30 years of diversified experience in the energy industry. He spent the past 17 years managing Los Angeles County's Office of Sustainability which oversees energy and environmental programs for both municipal operations and the Los Angeles County regional community budgeted at about $250 million per year. Notably, Mr. Choy acquired nearly $100 million for the County and the region in federal and state funding for these programs; including $25 million annually for the Southern California Regional Energy Network (SoCalREN). Mr. Choy initiated the County's Property Assessed Clean Energy (PACE) financing programs and led the

development of L.A. County's CCA initial assessments, Feasibility Study and plan for implementation. Mr. Choy also oversaw the County's energy-related legislative and regulatory efforts and is recognized as an industry leader in clean energy programs in the State legislature, California Public Utilities Commission, California Energy Commission, and within local government energy venues.

Education: Bachelor of Science, Mechanical Engineering, University of California at Berkeley.

Certifications: Registered Professional Engineer (Mechanical); Certified Energy Manager.

Affiliations: (all past) Local Government Sustainable Energy Coalition Board Chair; CA Energy Efficiency Coordinating Committee member; Los Angeles Regional Collaborative for Climate Action and Sustainability (LARC) Executive Committee member.

Jenny Whitson, Program Manager
Role: Energy Program Support

Jenny is a sustainability leader with over 15 years of industry experience focused on the built environment. She brings extensive knowledge of the integrated design process, program management, sustainable systems, renewable energy, materials, resiliency, benchmarking, and paybacks. Jenny successfully managed the sustainability program for the largest airport to be newly constructed within the last 40 years targeting challenging on-site renewable energy goals. She combines her design expertise and hands-on project management skills to drive programs to success. Her public agency projects include the New International Airport of Mexico City managing the design through construction phases for LEEDv4 Platinum certification; Honolulu Authority for Rapid Transportation, Airport Guideway and Stations developing their Sustainability Action Plan; Sound Transit, Link Operations and Maintenance Facility, Bellevue, WA developing preliminary energy modeling and life cycle cost analysis; Royal Commission Headquarters, Yanbu, Saudi Arabia managing constructability review and gap analysis for a 300,000 square foot LEEDV4 Platinum building goal.

Education: Master of Science, Sustainable Design, Philadelphia University; BAAS, Emphasis in Design, San Diego State University

Certifications: Certified Interior Designer, #7002; National Council for Interior Design Qualification, #30350; LEED Accredited Professional;

Affiliations: L.A. Resilience Initiative, Steering Committee Member; USGBC-LA Member

Project Approach/Methodology

EES President and CEO, Gary Saleba, will serve as Project Manager and Point of Contact for staff on this project. Gary has lead the EES team in the development of several CCE Feasibility Analyses for other municipal entities across California to date. Gail Tabone, Anne Falcon, and Steve Andersen all have over 25 years of relevant utility experience. Leveraging this experience, the Project Team can guarantee its ability to deliver results on schedule and on budget. EES will work closely with staff from the City to account for the City's priorities and concerns in the analysis. These priorities include offering competitive rates, creating local economic benefits, and reducing environmental impacts from electricity generation.

Our Project Team will then develop a load forecast, power supply scenarios, a comparative rates analysis, an economic impacts assessment, and a pro-forma analysis for the potential CCE. EES will also conduct an extensive sensitivity analysis exploring a range of possible outcomes for key variables in the analysis. This will be combined with an analysis of possible regulatory changes and risks to the CCE. Finally, the Project Team will explore possible models for the CCE's governance and management as well as funding.

Our Project Team will prepare the study such that the assumptions are consistent with following CCE goals:

- Rate parity or better with SCE, with lower rates over the study period.
- Energy portfolio content that has lower overall carbon content compared with the SCE portfolio.
- Meet or exceed California RPS.
- Differentiated energy options for default service with voluntary 100% renewable option.
- Provide energy purchase portfolio the excludes purchases of coal fired resource output.
- Energy portfolio that prioritizes the development of local renewable resources.
- Project development and ownership strategy that increases the development of renewable energy projects statewide.
- Maximize local renewable energy content, conservation, and distributed energy resources within the CCE portfolio.
- Develop a financially sustainable and flexible business model that supports investment in local development of distributed energy resources, energy efficiency, and conservation.
- Identify local economic and regional benefits of the CCE program.

Throughout the study process, the Project Team will check-in regularly with staff from the City to provide updates, solicit feedback, and ensure client expectations are fulfilled. The Project Team will document all methods and assumptions used in the analysis and provide the City with its analytical modeling tools to ensure that the City is comfortable with the model inputs and results. A draft study will be provided to the client for review at least three weeks before the agreed on final study submission date. The Project Team will then be available to present the study to staff,

City councils, or community groups as needed by the City. Each of the key components of the scope of work are detailed below.

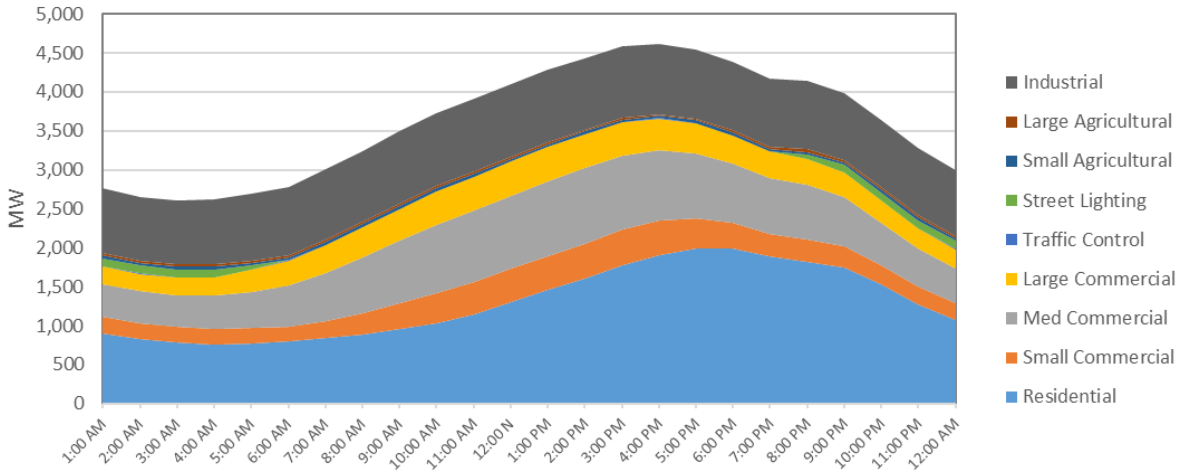
Task 1 – Program Development and Technical Study

Task 1.1 – Load Analysis

The Project Team will clean and verify the load data the City has already received from SCE and review whether or not additional data is needed. Load data will be aggregated by rate schedule for monthly energy use, peak demand, and number of accounts. Customers currently receiving Direct Access (DA) service will be excluded from the analysis, as these customers do not typically do not participate in CCEs. The Project Team will draw on the customer participation rates at other CCEs across California as well as local demographic factors to estimate a base-case opt-out rate for the City. The Project Team will model opt-out rates of at least 20% as the City requests. the Project Team will use energy use growth rate forecasts by the California Energy Commission to model a base-case scenario of load growth into the future.

The Project Team has already developed the model to process raw SCE customer data and translate it into the necessary load curves such as in Figure 2 below. The SCE load shapes will be reviewed to ensure any seasonal variations in customer types are accounted for (seasonal customers). The Project Team will use this model to estimate monthly peak demand for each rate class to determine the CCE's resource adequacy requirements (RAR). SCE standard transmission and distribution losses will then be applied to evaluate wholesale energy purchase needs. Load reduction from energy efficiency or distributed energy resources, such as from small-scale solar or from energy storage, will be modeled separately to allow for analysis of several scenarios based on economic and technical potential.

Figure 2
Sample Load Profile – Typical Summer Weekday Load Profile



Based on the load-forecast output, the Project Team will work with the City to develop a possible phase-in scenario for the CCE. CCE phases typically use rate schedule, account ownership, or

geographic regions to differentiate customers into groups for a staggered CCE roll-out that can then be implemented more smoothly than if all accounts were launched simultaneously.

EES will summarize the resulting forecast in a format suitable to support power solicitation. Load scenarios will be developed that address the impact of new, high energy demand industries. Load data will be summarized according to energy and peak demand requirements, losses, geography, renewable energy requirements, and resource adequacy. Energy requirements will be utilized to identify resource needs including an evaluation of CAISO prices.

Task 1.2 – SCE Rate Analysis

Electricity rates for CCE customers include three components: the CCE's cost of generation, SCE's cost for transmission and distribution (T&D), and regulated charges such as the Power Charge Indifference Adjustment (PCIA) an exit fee. Based on the outputs of the load forecast and CCE power supply scenario analysis, EES will develop a rate projection for each of these components for the potential CCE, as well as the competing SCE rates in 5 year increments out to 20 years.

The Project Team will project SCE's power supply rate based on SCE's latest power supply filings, procurement strategy, projected generation costs, and RPS requirements. SCE's T&D rates will be forecast based on distribution system investment trends, recent rate filings, and the revenue requirements stated in SCE's most recent California Public Utilities Commission (CPUC) filing.

Additional sources of variability, such as high and low gas and hydro pricing, rate restructuring, hydro scenarios, and larger economic trends will be explored as part of a sensitivity analysis. All rate forecast assumptions will be discussed with City staff and stake holders to reach an agreement on the inputs to SCE rate projections

As part of the feasibility test, the Project Team will prepare utility rate forecasts for continued SCE service. Additionally, the Project Team will review historic SCE tariffs and energy costs to evaluate the sustainability of the CCE to withstand future recessions. The stability of the CCE will be evaluated per the risk assessment discussed later in this scope.

The Project Team will also evaluate the range of possible regulated surcharge costs, such as for the PCIA. The PCIA is a charge enforced by the CPUC to ensure that stranded generation costs are not disproportionately passed on to SCE's remaining bundled customers as CCEs are formed. The Project Team monitors all CCE-relevant CPUC proceedings very closely to ensure our regulated charge forecast accounts for the most up-to-date regulations. The sensitivity analysis will also explore a range of possible PCIA rates and scenarios.

Task 1.3 – Preferred Supply Portfolio Selection & Sensitivity Analysis

The Project Team will work with staff from the City to develop multiple power supply scenarios that match the needs and priorities of the four communities. Scenarios may vary in their share of renewable energy, greenhouse-gas free energy, locally generated energy, and use of specific generation technologies. All scenarios will consider that consumers would be able to opt-up to a

100% renewable option, which would be offered on a premium, voluntary basis, with a substantial portion of the electricity from in-State and local renewable resources. The participation rates for 100% renewable programs will be based on the participation rates for currently operating CCEs (Lancaster, MCE, Sonoma, etc.). The following scenarios will be modeled:

- **Option 1:** Match SCE's share of RPS-compliant and GHG-free generation.
- **Option 2:** Minimum 33% RPS per 2020 RPS.
- **Option 3**: Minimum 50% California Qualified Renewable Portfolio with less GHG intensity than SCE.
- **Option 4**: 50% renewable and build to 80% by the end of year 5 (California eligible renewables).

The project team will review potential electric service providers, the cost of using these power sources, and their capacity to serve the City. The cost of service will be quantified under each scenario, and related rate impacts and estimates of the projected costs for each supply portfolio scenario will be provided. To evaluate such local opportunities for the CCE, the project team will correspond with potential electric service providers to determine indicative pricing, as well as CAISO and administrative costs. This analysis will also estimate costs associated with scheduling and ancillary services. The portfolio analysis will also estimate the GHG emissions reductions of each power supply scenario to ensure the resource portfolios meet each jurisdiction's GHG reduction goals.

The energy procurement analysis will explore alternative supply options such as energy efficiency programs and local renewable projects (e.g., net energy metering, distributed generation, community solar, etc.). The Study shall address the CA energy marketplace with respect to the local development of a variety of distributed energy resources (DERs). Within CA a number of programs and opportunities exist and are being developed for deployment of DERs. The Study will assess these opportunities within the CA Public Utilities Commission (under existing IOU grid programs and solicitations, and under ongoing DER proceedings), the CA Energy Commission (through EPIC and other grant programs), the CA Independent System Operator (under existing grid management programs and development of additional DERs integration markets), the investor-owned utilities as grid operators, and for CCAs themselves as load serving entities.

CCAs have access to CPUC energy efficiency funding, and possibly other CPUC program funding. EES will analyze energy portfolios that incorporate energy efficiency and demand response programs in aggressive reduced consumption goals. As part of serving customer loads and developing resource plans, CCAs may procure the benefits of DERs, incentivize their development, or participate in existing and future market programs that similarly seek to deploy DERs. Additionally, as local governments, CCAs may access government program funding available under Cap & Trade and other State clean energy programs. The Study shall address these opportunities in detail.

The Project Team will examine CCE viability under a wide range of values for all key inputs in the analysis. This analysis will ensure that the recommended resource plan is appropriate under

unexpected market and regulatory conditions. The sensitivity analysis will include the following variables:

- Market prices for conventional and renewable energy (high and low price scenarios for gas, hydro, solar, etc.)
- Program phase-in at varying supply levels
- Changes in SCE generation rates, Power Charge Indifference Adjustment (PCIA), and other customer surcharges
- Customer participation rates
- Rate sensitivity to the inclusion of local renewable generation, energy efficiency, demand response, and demand reduction programs
- Identification of any anomalies, either challenges or opportunities, in the service area related to geographic, demographic, or economic circumstances

The Project Team will discuss the assumptions and planned operational/organization elements of the CCE with City staff to develop accurate cost projections. All assumptions will be cost-based and clearly documented for each power supply portfolio scenario. The results will be discussed with City staff and stakeholders. The Project Team will prepare presentation materials showing cost comparisons and projected environmental impacts such as GHG emissions and present to stakeholders and the City Council.

Task 1.4 – Cost of Service Analysis

Now that many CCEs have been launched or the Project Team will prepare a cost of service projection based on best practices and professional experience on how to best achieve CCE program goals at minimum risk to the City. The Project Team will estimate operating and administrative costs for running the CCE and develop a proforma analysis that can be continually updated as the City moves from feasibility to implementation. Costs (budget items) to be included in the proforma include:

- Load forecasts
- Power supply costs
- Start-up costs
- Capital costs
- Operating and maintenance such as administration and general; staff; external technical, marketing, public relations, and legal support; billing, metering, and collections; customer service and data management; and scheduling and coordination.
- Uncollected accounts
- Financial reserves and debt service coverage ratios
- CCE bonding for re-entry fees
- SCE surcharges and cost recovery (exit fees)

The Project Team will detail collection of reserves to provide emergency rate stabilization for the CCE in the future. These operating costs will be based on the operating costs of existing CCEs and scaled for the size of the program. Based on these expenses, the Project Team will estimate the

total CCE revenue requirement and resulting unit costs for 20-years of operation. The analysis will address the minimum viable number of customers for each CCE. The Project Team will also explore the benefits of different possible phasing strategies. To tie these components together, the pro-forma will develop a cost-benefit analysis of the potential program.

In addition, the Project Team will develop multiple financing plans for major capital expenditures and credit facilities, including additional debt and cash requirements. For each financing plan, the project team will determine the impact of projected revenues and expenses on the CCA's debt-related financial ratios. If the financial targets are not met, the plan will identify deficiencies in revenues and the resulting needed rate changes.

The Project Team will also identify strategies to minimize program costs. For example, behind the meter demand-side management costs may be reduced by offering a standardized menu of options from which all CCA participants may select. By standardizing options, the administrative and implementation costs can be reduced without diminishing the benefits of the programs. A second cost minimization strategy is to arrange power procurement, scheduling, dispatching, and balancing with an entity that already provides these services to other electric utilities.

The resulting CCE program rates will be compared with SCE rate forecasts to determine if the CCE program is financially feasible over 5-, 10-, 15-, and 20-year terms.

Task 1.5 – Risk Analysis

The Project Team will evaluate a range of risks and risk mitigation strategies associated with CCA formation and operation. The risk analysis will evaluate which parameters result in CCE retail rates that are no greater than SCE rates over the study period. The analysis will address challenges faced by existing CCAs, as well as those anticipated for new CCAs over the next 10 to 20 years. For each risk category identified in the RFP, the study will describe causes, effects, potential impact, likelihood of occurrence, and strategies to mitigate them. Based on the results of this analysis, risks can then be anticipated and addressed through changes in program policy, contract terms, insurance, financing, and modification of management practices. Specific risks to be analyzed include:

- Risk of over- or under-procurement of electric power
- Market availability of renewable power
- Regulatory and legislative changes impacting CCA financial viability
- Financing and debt risks
- Financing of renewable and distributed energy resource (DER) facilities
- Power Charge Indifference Adjustment (PCIA) and other regulated surcharges
- Labor cost risk
- Changes in federal energy policy
- Large opt-out rate
- CCE failure

The Project Team is a party on many key CCE-related proceedings at the California Public Utilities Commission and continuously monitors activity on key issues at the California Energy Commission and California Air Resources Board. In addition, the Project Team monitors federal energy policies, such as the Investment Tax Credit (ITC) for solar developers and the possible solar import tariff. Changes in energy regulation at the state and local level can have significant impacts on CCE viability. The Project Team will evaluate these regulatory risks and provide guidance on their likelihood and potential impacts.

Task 1.6 – Report of Technical Study Results

The Project Team will provide regular updates on the progress of the project. In the past, the Project Team has held weekly calls with the client to provide these updates, discuss key decisions, and solicit feedback. We can work around any update schedule requested by the City. As noted above, the Project Team will involve staff from the City to ensure the study design, power portfolio scenarios, and other key decisions are consistent with the vision of the Cities. Key decisions and discussions will be documented for reference by City staff. The Project Team will then provide a draft Technical Study in MS Word format as well as a draft pro-forma model in MS Excel for Staff review. We will also make our work available to a third-party reviewer as needed, which we've done for several previous CCE Feasibility studies.

After review is complete, the Project Team will provide a final version of the study and the pro-forma model. The Project Team will present the study findings to staff, City Councils, or community groups as needed. Finally, the Project Team will support the City in educating local stakeholders and presenting the draft Plan at up to six community events. The Project Team members have extensive experience developing web sites, providing collateral materials, and supporting public meetings and events to introduce energy programs. The Project Team stands ready to provide additional services beyond the scope of this proposal to support the development of the CCE. The scope and costs of these additional services will be negotiated separately and will not be performed until the City has issued the appropriate authorization.

The first draft will be provided to City staff no later than May 7, 2018. Subsequent drafts will be provided based on City staff comments. A final report will be delivered by June 1, 2018 once the City staff have approved of all changes. The Project Team will also prepare presentation materials for stakeholder and City Council meetings.

Task 1.7 – Developing Support Information for City Council and Community Engagement

Perhaps the greatest benefit of a CCA is to bring economic vitality to the communities it serves. The project team will use an economic input-output model to estimate the magnitude of CCA impacts on the economy. Specifically, the Project Team will use the National Renewable Energy Laboratory's (NREL) Jobs and Economic Development Impact (JEDI) model to evaluate the impact of local projects on jobs, and increased local spending. In addition, the project team will estimate the benefit to the local economy of trickle-down effects due to any bill savings to CCA customers. These bill savings will be evaluated using MIG's IMPLAN input-output model. Potential economic impacts will be reviewed and presented as appropriate.

Currently there is a high level of interest in CCE programs and many jurisdictions are in various stages of studying and implementation. The Project Team will provide a summary of other Orange County municipalities interested in CCE programs and identify opportunities for coordination. Cooperation with other municipalities can reduce administration costs meanwhile achieving common goals such as local control. The Project Team will assess the possibility of forming a joint powers agreement with other interested jurisdictions.

The Project Team is well versed in the presentation and education of community members, groups, and officials regarding CCE programs. Based on our experience in both feasibility and implementation plans, the Project Team can provide a comprehensive analysis of CCE program challenges and benefits over time. As the feasibility study progresses, the Project Team will assist the City in refining CCE program timelines, priorities, and goals. As cost estimates are refined and market conditions change, CCE program goals may need to be adjusted and timelines adjusted to allow for least cost and least risk planning. The Project Team will assist the City in navigating launch timelines, operational structures, and power supply planning as the planning environment evolves.

Prior to program implementation, the Project Team will present the results of the Technical Study to the City Council.

Task 2 – Implementation Plan

Provided that the City Council moves forward with the CCE program, the Project Team will provide the services detailed under Task 2, Implementation Plan.

Task 2.1 – Implementation Plan/Perform All Regulatory Functions

The Project Team will manage and complete all functions necessary to comply with CPUC regulations related to launching the CCE program. Most importantly, the Project Team will develop and submit an implementation plan that covers all aspects of the program set-up and operation such as process and consequences of aggregation, define organization structure and funding, develop rates and define costs to participants, detail disclosure and due process in rate setting and cost allocation to participants, describe methodology for entering and terminating agreements with other entities, define participant rights and responsibilities, termination of the program, and describe third parties electric suppliers including financial, technical, and operational capabilities.

The Implementation Plan will include a statement of intent, per CPUC regulations, stating that the program will provide universal access, reliability, equitable treatment to all classes of customers, and meet all other requirements established by the CPUC. The Project Team will both draft the Implementation plan and revise if necessary to achieve certification. Our Project Team has done several Implementation Plans and all have been certified by the CPUC.

Task 2.2 – CCE Organizational Infrastructure

EES will assist the City in developing necessary organization documents and structures to successfully operate the CCE including:

1. Business and operations plan
2. Operational policies and procedures
3. Committee structures and processes
4. Independent review and oversight of contractor and City staff activities and recommendations

The project team will evaluate three CCE governance structures: a CCE operated by a Joint Powers Authority (JPA) formed between the four likely CCE member governments, four separate, individual CCEs, or joining an existing CCE, such as in the City of Solana Beach, the City of San Diego, or another potential SCE area CCEs. EES will discuss the pros and cons of each structure as they pertain to management efficiency and effectiveness, financial impacts, and decision-making autonomy and discretion. Strategies to customize programs within each jurisdiction will also be discussed. EES will also discuss different management and staffing strategies for the CCE, ranging from a completely internally staffed program to a maximally outsourced program. The project team examined similar scenarios for governance and operation of CCEs in Los Angeles County, San Bernardino and Riverside Counties, and the City of San José.

EES' experience in establishing organizational infrastructure for both LACCE and EBCE will assist the City in developing infrastructure that reflects best practices and recent experience.

Task 2.3 – Customer Engagement

EES will support the City in educating local stakeholders and presenting the Plan at up to ten community events. EES members have extensive experience developing web sites, providing collateral materials, and supporting public meetings and events to introduce energy programs.

Task 2.4 – Rate Setting & Distributed Generation Policies

The proforma developed under Task 1 will be updated and used to assist the City in developing rates for each class. Generally, the initial rates for CCE programs reflect incumbent rates, but lower. Additional programs such as feed-in-tariff (FIT) and net energy metering rate will be developed as well. These rate schedules and policies will encourage the development of renewable energy projects in the County. The proforma will also be updated as necessary to develop rates for the CCE's 100% renewable energy choice.

Schedule

EES will complete a draft feasibility analysis by May 8. EES will then solicit feedback and comments from the staff managing the project, implement those changes, and turn around a final report. The expected schedule for Task 1 is detailed in the following chart.

	April				May				June			
Notice to Proceed	2-Apr											
Receive Process and Validate Data												
Task 1 Technical Study												
1.1 Load Study												
1.2 SCE Rate Analysis												
1.3 Portfolio Selection & Sensitivity												
1.4 Cost of Service Analysis												
1.5 Risk Analysis												
1.6 Report of Technical Study Results												
Draft Report						8-May						
Final Report									1-Jun			
Presentation City Council												
1.7 Information and Community Engagement												

A detailed schedule for Task 2 is provided below. The following indicative assumes that the City would elect to proceed with a CCA as a single jurisdiction. An additional schedule illustrating steps to form a JPA with other Orange County municipalities can be provided at the City's request. In addition, this schedule assumes that the City would target a January 1, 2020 to start of CCA service. This schedule is based on the recently approved CPUC Resolution E-4907, which prevents CCAs that have not yet submitted an Implementation Plan to the CPUC as of March 1, 2018 from launching service prior to January 1, 2020. The schedule could be truncated if these regulatory requirements are amended.

City of Irvine CCA Implementation Schedule

		2018							2019												2020		
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Decision to Proceed	City Votes to Proceed with CCA Implementation	■																					
Personnel	Post Job Opening for Executive Director		■																				
	Select Executive Director and Negotiate Contract			■																			
	Staff Recruitment				■	■	■	■															
Regulatory Compliane	Develop Implementation Plan					■	■																
	City approves Implementation Plan							■															
	File Implementation Plan with CPUC							■															
	CPUC certifies implementation plan							■	■	■													
	Complete Service Agreement with SCE									■													
	Submit Surety Bond and Register with CPUC										■												
	Submit Year-Ahead Resource Adequacy Load Forecast											■											
Consultant Solicitation	Develop RFPs: Financing, Data Mngr, Portfolio Mngr & SC							■															
	Issue RFPs: Financing, Data Mngr, Portfolio Mngr & SC								■	■													
	Negotiate Contracts										■	■											
	City approves contracts												■										
	Power Supply RFP													■	■	■							
	Set Rates																■						
	Prep Systems and Call Center																■	■					
Service Launch and Customer Outreach	Opt Out notice 1																		■				
	Opt Out Notice 2																			■			
	Phase 1 Launch of Service																				■		
	Opt Out notice 3																					■	
	Opt Out Notice 4																						■

References

EES has previously prepared CCE Feasibility Analyses and CCE Business Plans for the County of Los Angeles, the San Bernardino Associated Governments, the Coachella Valley Association of Governments, Western Riverside Council of Governments, and the City of San José, and is currently preparing a CCE feasibility study for Butte County. EES has also provided CCE Feasibility Peer Review services for Alameda County, the City of Solana Beach, and is currently peer reviewing CCE feasibility studies for the cities of San Diego and King City. In addition, EES Consulting is currently serving as the implementation technical consultant for Los Angeles Community Choice Energy, East Bay Community Energy, and San Jose Clean Energy. The Project Team is an ongoing participant in numerous CCE-related regulatory proceedings at the California Public Utility Commission (CPUC), including the current Power Charge Indifference Adjustment (PCIA) review proceeding (R.17-06-026).

Previous CCE Feasibility Study projects are explained in greater detail below and reference contacts for each project are provided:

1. Los Angeles County Customer Choice Aggregation Business Plan

Agency:	Los Angeles County, Office of Sustainability 1100 N. Eastern Avenue, Los Angeles, CA 90063
Project Start/End:	10/15 – 09/16
Contact:	Gary Gero, Chief Sustainability Officer ggero@ceo.lacounty.gov, (213)974-1160
Services Provided: ■ Developed CCA technical business plan; electric wholesale power market forecast, Investor Owned Utility rate forecast, CCA electric power retail rate forecast, emissions cap-and-trade program impact study; cost-effectiveness of co-generation plants. ■ Developed Southern California Edison (SCE) and CCA electric power retail rate forecasts. ■ Monitored and participated in electric power retail rate proceedings at CPUC on behalf of LA County.	
EES Staff on Project: *Gary Saleba–Project Lead *Gail Tabone–Quality Control *Amber Nyquist–Load Forecasting *Anne Falcon—Financial Analysis & Rates *Steve Andersen—Power Supply *Colin Cameron–Regulatory Analysis	

2. San Jose Clean Energy CCA Business Plan

Agency:	City of San José, Environmental Services Department 200 E. Santa Clara St., San José, CA 95113-1905
Project Start/End:	08/16 – 12/16
Contact:	Julie Benabente, Energy Officer Julie.Benabente@sanjoseca.gov, (408) 975-2537
Services Provided: ■ Developing CCA technical business plan; electric wholesale power market forecast, developed Investor Owned Utility rate forecast, provided in-depth analysis of electric load forecasts and wholesale power supply costing scenarios, including delivery that include different levels of renewable supply and demand-side management (DSM). Evaluated non-power related costs, examine the potential for energy efficiency and demand reduction as they relate to electric load and supply, and perform an extensive sensitivity analysis that considers variables such as gas and electricity prices, loads, program participation rates, discount rates, and financing scenarios. ■ Developing CCA electric power retail rate forecast.	
EES Staff on Project: *Gary Saleba – Project Lead *Anne Falcon –Financial Analysis & Rates *Colin Cameron – Load Forecasting & Regulatory Analysis *Gail Tabone—Quality Control *Steve Andersen—Power Supply	

3. Western Riverside Council of Governments (WRCOG), San Bernardino Council of Governments (SBCOG), and Coachella Valley Association of Governments (CVAG): Joint Community Choice Aggregation Business Plan

Agency:	Western Riverside Council of Governments (WRCOG) 4080 Lemon Street, Riverside, CA 92501 San Bernardino Council of Governments (SBCOG) 1170 W. 3rd Street, San Bernardino, CA 92410-1715 Coachella Valley Association of Governments (CVAG) 73-710 Fred Waring Drive, Palm Desert, CA 92260
Project Start/End:	07/16 – 07/17
Contact:	Barbara Spoonhour, Director of Energy Programs, WRCOG spoonhour@wrcog.cog.ca.us, (951) 955-8313 Katie Barrows, Director of Environmental Resources, CVAG kbarrows@cvag.org, (760) 346-1127 Duane Baker, Deputy Executive Director, SBCOG dbaker@sanbag.ca.gov, (909) 884-8276
Services Provided: ■ Demonstrated to stakeholders that a CCA is feasible and cost-effective, using an overall financial comparison to Southern California Edison (SCE). ■ Developing CCA technical business plan; electric wholesale power market forecast, developed Investor-Owned Utility rate forecast, provided in-depth analysis of electric load forecasts and wholesale power supply costing scenarios, including delivery that includes different levels of renewable supply and DSM. ■ Evaluated non-power related costs, examined the potential for energy efficiency and demand reduction and performed an extensive sensitivity analysis that considers variables such as gas and electricity prices, loads, program participation rates, discount rates, and financing scenarios. ■ Developed CCA electric power retail rate forecast.	
EES Staff on Project: *Gary Saleba – Project Lead *Gail Tabone – Quality Control *Colin Cameron – Load Forecasting & Regulatory Analysis *Anne Falcon—Financial Analysis & Rates *Steve Andersen—Power Supply	

4. Selected Other Municipal and County Clients

In addition to our CCE clients, EES also works with a wide range of municipal and county governments, as well as publicly-owned utilities. A complete list of our clients can be found in Appendix B. The following is a selection from that client list:

- Anaheim Public Utilities, CA
- City of Corona, CA
- City of Glendale, CA
- City of Moreno Valley, CA
- City of Needles, CA
- City of Redding, CA
- City of Roseville, CA
- City of San Bernardino, CA
- City of San Marcos, CA
- City of Palo Alto, California
- County of Butte, California
- Sacramento Municipal Utility District, CA
- Los Angeles Department of Water & Power, CA
- Silicon Valley Power, CA
- Imperial Irrigation District, CA
- City of Pasadena, CA
- City of Burbank, CA
- City of Irvine, CA
- City of Santa Ana, CA
- Del Norte County, CA
- City of Lodi, CA
- King City, California

Pricing Proposal

EES's standard hourly billing rates are as follows:

President	$250
Senior Associate	245
Manager	240
Senior Project Manager	235
Project Manager	230
Senior Analyst/Engineer	225
Analyst/Engineer	220
Senior Administrative Assistant	170

Vanir's standard hourly billing rates are as follows:

Chief Sustainability Officer	$200
CCA/DERs Consultant	150
Sustainability Manager	144
Sustainability Coordinator	97

Based on these rates, EES can perform the work needed for the Technical Study (Task 1) on a budget of $107,125. An itemized list of staff hours by task is provided on the following page. Task 2 (Implementation Plan) can be completed for a not to exceed budget of $108,730. The Task 2 budget assumes a maximum of 3 on-site public meetings. Additional on-site meeting labor costs will need to be charged separately.

Task 1	Hours	Rate	Total Cost
1.1 Load Study and Forecast			
Amber Nyquist, Senior Project Manager	10	$235.00	$2,350.00
Colin Cameron, Senior Analyst	20	$225.00	$4,500.00
Task 1.1 Subtotal			*$6,850.00*
1.2 SCE Rate Analysis			
Anne Falcon, Senior Associate	10	$245.00	$2,450.00
Amber Nyquist, Senior Project Manager	15	$235.00	$3,525.00
Alison Levy, Senior Analyst	30	$225.00	$6,750.00
Task 1.2 Subtotal			*$12,725.00*
1.3 Portfolio Selection & Sensitivity			
Gary Saleba, President/CEO	5	$250.00	$1,250.00
Steve Andersen, Manager	30	$240.00	$7,200.00
Task 1.3 Subtotal			*$8,450.00*
1.4 Cost of Service			
Gary Saleba, President/CEO	5	$250.00	$1,250.00
Anne Falcon, Senior Associate	20	$245.00	$4,900.00
Alison Levy, Senior Analyst	20	$225.00	$4,500.00
Task 1.5 Subtotal			*$10,650.00*
1.5 Risk Analysis			
Anne Falcon, Senior Associate	40	$245.00	$9,800.00
Steve Andersen, Manager	5	$240.00	$1,200.00
Colin Cameron, Senior Analyst	30	$225.00	$6,750.00
Alison Levy, Senior Analyst	15	$225.00	$3,375.00
Task 1.5 Subtotal			*$21,125.00*
1.6 Report of Technical Study Results			
Gary Saleba, President/CEO	50	$250.00	$12,500.00
Anne Falcon, Senior Associate	40	$245.00	$9,800.00
Steve Andersen, Manager	5	$240.00	$1,200.00
Colin Cameron, Senior Analyst	30	$225.00	$6,750.00
Alison Levy, Senior Analyst	5	$225.00	$1,125.00
Howard Choy, Subconsultant, Vanir	20	$150.00	$3,000.00
Subtotal Task 1.6			*$34,375.00*
1.7 Information & Community Engagement			
Gary Saleba, President/CEO	15	$250.00	$3,750.00
Anne Falcon, Senior Associate	10	$245.00	$2,450.00
Colin Cameron, Senior Analyst	30	$225.00	$6,750.00
Subtotal Task 1.7			*$12,950.00*
GRAND TOTAL	**390**		**$107,125.00**

Task 2 budget is provided in the table below.

Task 2	Hours	Rate	Total Cost
2.1 Implementation Plan			
Gary Saleba, President/CEO	35	$250.00	$8,750.00
Anne Falcon, Senior Associate	35	$245.00	$8,575.00
Steve Andersen, Manager	45	$240.00	$10,800.00
Amber Nyquist, Senior Project Manager	20	$235.00	$4,700.00
Colin Cameron, Senior Analyst	45	$225.00	$10,125.00
Alison Levy, Senior Analyst	35	$225.00	$7,875.00
Howard Choy, Subconsultant, Vanir	34	$150.00	$5,100.00
Task 2.1 Subtotal			*$55,925.00*
2.2 CCE Org Infrastructure			
Gary Saleba, President/CEO	20	$250.00	$5,000.00
Anne Falcon, Senior Associate	20	$245.00	$4,900.00
Steve Andersen, Manager	10	$240.00	$2,400.00
Colin Cameron, Senior Analyst	30	$225.00	$6,750.00
Alison Levy, Senior Analyst	30	$225.00	$6,750.00
Task 2.2 Subtotal			*$25,800.00*
2.3 Customer Engagement			
Gary Saleba, President/CEO	15	$250.00	$3,750.00
Anne Falcon, Senior Associate	15	$245.00	$3,675.00
Colin Cameron, Senior Analyst	40	$225.00	$9,000.00
Task 2.3 Subtotal			*$16,425.00*
2.4 Rate Setting			
Anne Falcon, Senior Associate	20	$245.00	$4,900.00
Steve Andersen, Manager	8	$240.00	$1,920.00
Amber Nyquist, Senior Project Manager	16	$235.00	$3,760.00
Task 2.4 Subtotal			*$10,580.00*
GRAND TOTAL	**473**		**$108,730.00**

Appendix A – Resumes

GARY S. SALEBA
President

Gary Saleba is a principal and president/CEO of EES Consulting, Inc. His areas of specialty include overall quality control for EES Consulting's projects as well as development of corporate management, financial and strategic planning models. Mr. Saleba has extensive experience in the areas of utility rates, financial planning, management audits, professional development educational seminars, marketing, consumer research, forecasting, integrated resource planning, cost-benefit analyses, overall strategic planning, and mergers and acquisitions.

Having worked as a utility employee, Mr. Saleba combines an extensive background as both a utility industry expert and a management consultant. He is able to draw upon this professional and educational experience to manage projects including comprehensive water, wastewater, gas and electric cost of service studies, strategic planning, and management critiques for clients throughout North America. His experience extends to alternative fuel cost comparisons, econometric forecasting models, resource planning and reliability studies. Mr. Saleba has participated in numerous generic utility proceedings, testified before over 200 regulatory bodies and courts of law and coordinated over 500 financial planning, rate study, resource acquisition, and strategic planning studies.

Mr. Saleba has also served on numerous energy and natural resource-related trade associations. He has served as Chairman of the American Water Works Association Financial Management Committee and Management Division. He has also served on the board of directors for the Northwest Public Power Association. He also served on the Board of Directors for ENERconnect, Inc., a bulk power aggregation and procurement entity serving the municipal utilities in Ontario.

Through EES Consulting and as a utility employee, Mr. Saleba has provided expert testimony in a number of subject areas including:

- Cost of service
- Wholesale and retail rate design
- Avoided cost of power
- General utility financing guidelines
- Load forecasting
- Retail wheeling
- Automatic adjustment clauses
- Wheeling rates
- Supply contracts/negotiations
- Interclass load characteristics
- Prudency issues
- Resource acquisitions
- Integrated resource planning
- Efficient utility operations
- Construction contract analysis
- Return on equity
- Mergers and acquisitions

EDUCATION

M.B.A., Finance, Butler University, Indianapolis, Indiana

B.A., Economics and Mathematics, Franklin College, Franklin, Indiana

PROFESSIONAL ASSOCIATIONS

American Water Works Association
American Public Power Association
Northwest Public Power Association
Canadian Energy Association
California Municipal Utilities Association

ANNE FALCON
Senior Associate

Anne Falcon's primary responsibility with EES Consulting includes providing project management and technical support for all types of economic studies. Ms. Falcon has managed projects concerning cost of service and rate analyses, financial planning and regulatory proceedings for electric, natural gas, water and wastewater utilities. Her area of expertise includes restructuring, strategic planning, forecasting, unbundled cost-of-service studies, optimization research and specialized statistical studies.

Through her research and analysis of the current state of the industry, she has assisted many California and Northwest clients in preparing for the changes that are taking place. Ms. Falcon's work with California and Northwest electric utilities has included developing unbundled rates, average embedded and marginal cost-of-service studies, analysis of stranded costs, CTC calculation, development of direct access programs, research on ISOs and power markets, development of customer choice programs and conservation, market-based and green rate designs. For her water and wastewater clients, Ms Falcon has assisted them in developing sound financial long-term plans and determined rates sufficient to fund expenses and required capital programs.

On the regulatory front, Ms. Falcon has prepared evidence in several proceedings before public regulatory bodies in the U.S. and Canada. She has been a board expert to the Ontario Energy Board and Newfoundland and Labrador Utility Board in cost of service proceedings.

At EES Consulting, Inc. Ms. Falcon has been involved in all aspects of the integrated resource planning process, from the initial identification of demand and supply-side resources to the final ranking of resource portfolios. She has developed numerous decision models for U.S. and Canadian utilities and she has performed resource evaluations by applying social costing principles and risk analysis.

Ms. Falcon applies her extensive economic and technical knowledge in the development of resource-related computer models for use by electric, gas, water, wastewater, and solid waste utilities. With a master's degree in Operations Research, she has superior technical skills and is well suited to conduct mathematical and statistical studies. Ms. Falcon has also provided training in the areas of forecasting and operations research.

Her work at EES Consulting has also included the development of a multitude of econometric forecasts for electric, gas and water utilities. She has developed disaggregate energy and demand forecasts using a variety of forecasting and econometric tools.

EDUCATION

M.S., Operations Research, Stanford University

B.A., Economics, University of San Francisco, Summa Cum Laude

ASSOCIATIONS

Operations Research Society of America

GAIL D. TABONE
Senior Associate

Ms. Tabone has managed projects concerning regulatory proceedings, mergers, new utility formation, power supply planning, load aggregation and cost of service and rate analyses.

On the regulatory front, Ms. Tabone has prepared evidence or appeared as an expert witness in several proceedings before public regulatory bodies in the U.S. and Canada. She has been active in preparing and intervening in electric and natural gas rate proceedings, wholesale transmission access and rates, as well as approval for mergers and/or new utility formation.

Ms. Tabone participated in various aspects of changing utility regulation, from early deregulation in Alberta, pooling of transmission costs in Texas, and formation of CCAs in California. She has been involved in strategic planning and regulatory intervention for existing utilities facing changes in the industry structure and reviewing the feasibility of forming new utilites under CCA regulation in Califonia.

Ms. Tabone's experience includes power supply management and has been actively involved in resource planning, evaluating resource proposals and negotiating contracts for numerous utilities. This work involves load forecasting, optimization of resource and contract options, procurement and negotiations for power supply, power supply cost estimation, negotiating transmission contracts, auditing of scheduling and dispatching services, rate design and devising customer choice programs.

Ms. Tabone is both skilled and experienced at determining the needs of the client in the changing utility environment. She is able to develop unique approaches to the analysis of issues facing the client. While her primary focus is economic, she is capable of addressing non-economic issues along with her economic analysis. She has a thorough knowledge of the technical issues related to planning and feasibility analysis.

EDUCATION

M.S., Agricultural and Applied Economics, University of Minnesota
B.S., Economics, University of Minnesota

PROFESSIONAL ASSOCIATIONS

American Water Works Association, Northwest Public Power Association, California Municipal Utilities Association

STEVEN J. ANDERSEN
Manager of Project Evaluations

Steve Andersen, whose broad knowledge of the engineering field enables him to handle most technical issues, provides economic and technical analyses for utility and industrial clients of EES Consulting, Inc.

Mr. Andersen is skilled in evaluating power supply proposals and has done so for many utilities in the region. He has calculated the potential savings in total power supply costs offered by competing suppliers. With his background in power engineering, he is able to assess the technical barriers to potential savings in today's changing electric industry.

Mr. Andersen has been responsible for managing the interplay of multiple power supply contracts for a major Northwest utility. He has monitored the hourly loads and power schedules of the utility and recommended changes to optimize economically the utility's various resources. He has also negotiated and implemented short and long-term power supply and transmission contracts on behalf of the utility.

Mr. Andersen has performed integrated resources plans for both large and small utilities. He has also performed resource feasibility studies for both utility and industrial clients.

Mr. Andersen has performed cost of service analyses for many utilities. This analysis includes developing rates for residential, commercial and large industrial customer classes. He has also audited the power supply costs of large industrial corporations and suggested options for reducing their overall costs.

Mr. Andersen, has experience scheduling output from hydroelectric and thermal projects based on inflow information, flood control restrictions, maintenance outages, economic displacement and native load requirements. He has experience monitoring gas and electric markets and recommending purchases based on potential savings in total power supply costs. He is familiar with the functionality of hourly, daily, monthly and long-term energy markets.

Mr. Andersen has experience working with BPA power and transmission contracts and rates. This experience runs the gamut from participating in rate case activities to auditing power and transmission invoices.

EDUCATION

B.S., Electrical Engineering, University of Washington

AMBER NYQUIST
Senior Project Manager

Amber Nyquist provides analytical expertise for EES in support of economic and financial studies. Ms. Nyquist offers experience and knowledge to a wide range of topics related to regulated utilities. Ms. Nyquist's background includes cost of service analysis, electric rate design, Bonneville Power Administration's tiered rate methodology and other power supply costs or related information. Ms. Nyquist assists in Integrated Resource Planning as well as independent resource evaluation. Specific resources include demand-side and conservation resources, geothermal, wind, renewable energy credits, gas-fired and other resources.

Besides resource planning, she uses her background in econometrics and data analysis to develop load forecasts, normalize electric loads according to weather, and to develop market price forecasts. Also using her statistics knowledge Ms. Nyquist conducts conservation program evaluations and provides utilities with statistically significant results. The results assist in utility program planning, data collection, and presentation.

Furthermore, Ms. Nyquist has specific experience with the federal standards for evaluating benefits and costs of water supply and related resources according to the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (March 10, 1983).

In addition to her background in economics, Ms. Nyquist is also trained in written communication skills. She has four years experience in teaching others to write as well as abundant experience in written and oral presentations.

EDUCATION

M.A., Economics, Simon Fraser University
B.A., Economics, Western Washington University

TED LIGHT
Project Manager

Ted Light is a Project Manager with a specialty in energy efficiency and demand-side management. He brings nearly nine years of experience to EES, having worked previously for the Energy Trust of Oregon, the non-profit energy efficiency and renewable energy program administrator for Oregon's investor-owned utilities. He has expertise and knowledge on a broad array of energy efficiency program management and planning topics including: conservation/DSM potential assessments, conservation program planning, program data analysis, and cost-benefit analyses.

While working for the Energy Trust, Mr. Light managed the development of a new conservation potential assessment model that included an innovative approach to forecasting savings from emerging energy efficient technologies. That model was used to develop energy savings forecasts in over half a dozen electric and natural gas utility IRP processes.

Mr. Light also developed new tools to calculate avoided costs and benefit-cost ratios for energy efficiency programs and measures, greatly improving Energy Trust's reporting capability. Those tools incorporated new load shapes developed by the Northwest Power and Conservation Council for the 7th Power Plan and enabled the calculation of utility specific peak demand reductions for both electric and natural gas measures.

In addition to his conservation planning work, Mr. Light also managed Energy Trust's small industrial, agricultural, and industrial lighting programs. He provided technical review for Strategic Energy Management program participants in the commercial sector and advised the residential program on a behavior program. With the development of new measures that offer both efficiency and demand response capabilities, Mr. Light helped Energy Trust consider the combined benefits of these technologies. He also served on the Northwest Energy Efficiency Alliance's Cost Effectiveness Advisory Committee.

Earlier in his career, Mr. Light taught high school math and science on the Rosebud Reservation in South Dakota through Teach For America.

EDUCATION

B.S., Aeronautical & Aerospace Engineering, Purdue University

CERTIFICATIONS

Certified Energy Manager (CEM), Association of Energy Engineers (#14608)

COLIN CAMERON
Senior Analyst

Mr. Cameron provides expertise on economic analysis and regulatory issues. He brings experience in benefit-cost analysis, regulatory research, and econometric analysis and is also experienced in optimization techniques for cost-minimization studies. Mr. Cameron assists with rate design, power supply cost, and financial planning. Mr. Cameron also works on community choice aggregation (CCA) feasibility analysis and on analysis of regulatory proceedings on distributed energy resources (DER) and renewable portfolio standards (RPS).

Prior to joining EES, Mr. Cameron worked on energy system modeling teams at the U.S. Environmental Protection Agency and the International Institute for Applied Systems Analysis in Vienna, Austria. In these roles, Mr. Cameron led analysis of energy subsidies, emission taxation, and rapid implementation of new power generation technologies. He has published research on water-energy nexus issues in the United States and on fuel affordability in South Asia.

EDUCATION

M.S., University of North Carolina, Chapel Hill
B.A., Columbia University

ALISON LEVY
Senior Analyst

Alison Levy provides analytical and research expertise for EES in support of financial studies. Ms. Levy offers experience in a wide range of topics, including data analytics, strategy development, power plant facilities operation, emissions technology, and oil and gas processing. Prior to joining EES, Ms. Levy's experience included viability assessments of renewable energy storage and supply chain carbon emissions reduction, as well as many years performing engineering and economic analyses within the oil and gas industry.

In addition to her career experience, Ms. Levy is a fellow with the Tauber Institute for Global Operations at the University of Michigan, where her studies were focused on finance and renewable energy markets and technology.

EDUCATION

M.B.A., University of Michigan Ross School of Business, High Distinction
B.S., Chemical and Biomolecular Engineering, Cornell University

Resume

EDUCATION

Bachelor of Science, Political Science, Illinois State University, Illinois

CERTIFICATIONS

Leadership in Energy and Environmental Design (LEED) Accredited Professional

Green Business Certification

AFFILIATIONS

US Green Building Council, Los Angeles Chapter, Board Member Emeritus

Los Angeles Business Council (LABC), Energy Committee, Member

Construction Management Association of America (CMAA), Sustainability Committee, Chair

Sustainable Remediation Forum (SURF), Member

Association of Energy Engineers (AEE), Member

FIRM

Vanir

RANDY BRITT, LEED AP

Chief Sustainability Officer

Summary of Qualifications

Mr. Randy Britt is the Chief Sustainability Officer for Vanir, leading sustainability strategies and initiatives and overseeing energy efficiency and renewable energy sustainability projects across the United States. He is a Leadership in Energy and Environmental Design (LEED) Accredited Professional with over 35 years of extensive experience developing and managing projects and programs in the sustainability areas of energy conservation, water use maximization, energy-efficient building design, and renewable energy.

Specific Qualifications

- California energy markets (33 years)
- CAISO market operations and regulations applicable to Community Energy Programs (4 years)
- Power procurement and portfolio management services (20 years)
- Development and evaluation of risk management policies and regulations (10 years)
- Electricity load forecasting and data analysis (33 years)
- Community Energy formation process in CA (2 years)
- Knowledge of CA laws and regulations governing Community Energy Programs (2 years)
- Experience in evaluating bids for power including: financial and economic analysis and modeling, and analysis of energy demand (20 years)
- Knowledge of utility rate-setting, rate design and cost of service analysis (33 years)
- Knowledge of community energy programs (ZNE, all electric fuel switching, EV programs, Feed-in tariffs, community solar and other technologies) (10 years)
- Experience analyzing construction labor markets related to labor and clean energy goals (10 years)

Project Experience

California Air Resource Board, Southern California Consolidation, Riverside, CA. Sustainability Project Principal, $377 million. The project will consolidate the Air Resources Board's (ARB) existing southern California space at the Haagan-Smit Lab, leased offices in El Monte, and space leased from the Metropolitan Transit Authority facilities in Los Angeles, into a new Emissions Testing and Research Center of approximately 383,000 gross square feet to support approximately 400 staff. Mr. Britt is performing technical sustainability reviews on ARB's project documentation throughout all phases of design and construction. All LEED Platinum strategies, net zero energy reports, technical specifications, design drawings are reviewed and cross checked to ensure the sustainability strategies are implemented and aligned with ARB's project goals and requirements.

Highlights

- ✓ 35+ years industry experience
- ✓ USGBC, Board Member Emeritus
- ✓ Co-chair of Construction Management Association of America's Sustainability Committee

Eastern Municipal Water District (EMWD), Solar Renewable Energy Power Facility and Microturbine Generating Facility Evaluation, Perris, CA. Technical Support Manager. Mr. Britt provided technical support on two solar photovoltaic renewable energy programs (5.5 MW total) and one microturbine project. He managed the development of feasibility studies, evaluated the cost-benefit of multiple scenarios for incorporating renewable energy, and evaluated requests for proposals for designing and installing solar photovoltaic renewable energy projects. In addition, Mr. Britt led a team that reviewed technical proposals, proposer terms and conditions and provided recommendations to the district. Mr. Britt also provided the district with technical assistance in negotiating pricing, terms, and conditions with the selected contractor.

City of Los Angeles Bureau of Sanitation, Lopez Canyon Landfill Solar Renewable Energy Feasibility Study, Lake View Terrace, CA. Technical Support Manager. Mr. Britt led a team that developed a preliminary engineering report for a 4MW solar photovoltaic renewable energy project at the Lopez Canyon Landfill. Scope included the preparation of evaluations and recommendations for siting, solar technologies, incentive programs, and interconnection options. He provided City staff with technical guidance to perform cost-benefit analyses of multiple financial scenarios.

RANDY BRITT, LEED AP

Chief Sustainability Officer

Los Angeles Unified School District, New Construction and Modernization Programs, Los Angeles, CA. Director of Sustainability Initiatives. Mr. Britt developed and directed the sustainability initiatives program for the Los Angeles Unified School District. The district has more than 14,000 buildings, on 670 campuses across 700 square miles, and serves nearly 700,000 students and 70,000 faculty and staff. In addition, Mr. Britt developed their sustainability strategy for the future, bringing groups together to work toward cultural change in transportation, procurement, education, food services, maintenance and operations, and new construction. Mr. Britt created partnerships with the US Green Building Council and Energy Star; and green jobs workforce development. He created the District's inaugural sustainability plan and developed renewable energy projects for 99 Los Angeles Unified School District sites. In addition, Mr. Britt successfully applied for, and received, the largest allocation of Clean Renewable Energy Bonds in the U.S. in 2009 to assist in funding LAUSD's solar programs.

California Department of Transportation, Caltrans District 7 High Desert Corridor, Los Angeles and San Bernardino Counties, CA. Sustainability Manager. Mr. Britt managed and directed a team responsible for the preparation of a comprehensive Master Sustainability Plan. The goal of this plan was to evaluate the viability of all available design options that would make construction and operation of the proposed High Desert Corridor, between Lancaster and Victorville, as sustainable as possible. Options included innovative applications of high-efficiency lighting, renewable energy, construction waste management, alternative fueling stations, and high-efficiency water fixtures.

New International Airport of Mexico City, Distrito Federal, Mexico. Sustainability Program Advisor. Mr. Britt provided project administration support to teams in both the United States and Mexico to prepare for and monitor LEED certification and sustainability programs and renewable energy feasibility studies for all new terminals and service buildings to be built for the New Mexico City Airport.

Resume

EDUCATION

Bachelor of Science, Mechanical Engineering, University of California at Berkeley

PROFESSIONAL LICENSES

Professional Engineer Mechanical #M22779

CERTIFICATIONS

Certified Energy Manager (CEM)

PROFESSIONAL AFFILIATIONS (RETIRED)

Local Government Sustainable Energy Coalition (LGSEC), Chair

Southern California Regional Energy Network (SoCalREN), Administrator

Los Angeles Regional Collaborative for Climate Action and Sustainability (LARC), Executive Committee

Highlights

- ✓ 30+ years of industry experience
- ✓ Community Choice Aggregation expert
- ✓ Certified Energy Manager

HOWARD CHOY, PE, CEM

Community Energy Programs Support

Summary of Qualifications

Howard Choy brings more than 30 years of diversified experience in the energy industry. Mr. Choy has spent the past 17 years managing the Los Angeles County's Office of Sustainability, which manages energy and environmental programs for both municipal operations and the Los Angeles County region. Notably, Mr. Choy acquired nearly $100 million for the County and the region in federal and state funding for these programs; including $25 million annually for the SoCalREN. Mr. Choy also oversaw the County's energy-related legislative and regulatory efforts and is recognized as an industry leader in the State legislature, California Public Utilities Commission, California Energy Commission, and within local government energy venues.

Mr. Choy initiated local and regional organizations whose mission is to support local governments in navigating California's clean energy and sustainability industry. He served as Chair of the Local Government Sustainable Energy Coalition (LGSEC), Administrator of the Southern California Regional Energy Network (SoCalREN), and Executive Committee Member of the Los Angeles Regional Collaborative for Climate Action and Sustainability (LARC).

Specific Qualifications

- California energy markets (15 years)
- CAISO market operations and regulations applicable to Community Energy Programs (3 years)
- Development and evaluation of risk management policies and regulations (10 years)
- Community Energy formation process in CA (7 years)
- Knowledge of CA laws and regulations governing Community Energy Programs (4 years)
- Experience in evaluating bids for power including: financial and economic analysis and modeling, and analysis of energy demand (1 year)
- Knowledge of utility rate-setting, rate design and cost of service analysis (4 years)
- Knowledge of community energy programs (ZNE, all electric fuel switching, EV programs, Feed-in tariffs, community solar and other technologies) (30 years)
- Experience analyzing construction labor markets related to labor and clean energy goals (5 years)
- Knowledge of CA compliance reporting (15 years)

Project Experience

Los Angeles Internal Services Department, County Office of Sustainability (COS), Los Angeles, CA. Retired General Manager, $250 million (Annually). The County Office of Sustainability coordinates energy efficiency, conservation, and sustainability programs to maximize the efficient use of natural resources within County operations and throughout the Southern California Region. COS consists of: Energy Management Division, Environmental Initiatives Division, and Administrative Section.

Mr. Choy served as the inaugural General Manager, and as such, led the department on a variety of initiatives and activities including; climate change, energy efficiency, utility management, land use planning, renewable energy sources, and alternative fuels and transportation. He led the development of L.A. County's Community Choice Aggregation Study and Business Plan, leading to the subsequent approval of the program by the Board of Supervisors. In addition, Mr. Choy developed a County-wide energy management system for tracking and analyzing bills, meter data, and energy consumption patterns; and authored the County Municipal Climate Action Plan - implementing strategies for reducing greenhouse gasses.

Los Angeles Department of Water and Power, Los Angeles, CA. Former Energy Division Manager. Held a variety of positions within the nation's largest municipal electric and water utility including: power plant commissioning engineer, power plant project manager, industrial sector customer service manager, electric industry deregulation strategy analyst, and utility resource planning support. Howard's wide range of duties within an electric utility provide valuable insight into new electric industry changes and trends.

EES Consulting, Los Angeles, CA. Consultant. Worked on retail customer deregulation support in California, Oregon and Washington and provided technical support on utility system mergers and acquisitions - including the proposed sale of PacifiCorp service territory assets in northern California to a group of municipal governments in the territory.

Resume

EDUCATION

MS, Sustainable Design, Philadelphia University

BAAS, Emphasis in Design, San Diego State University, San Diego

PROFESSIONAL LICENSES

Certified Interior Designer, #7002

National Council for Interior Design Qualification, #30350

CERTIFICATIONS

Leadership in Energy and Environmental Design Accredited Professional, #10150293

AFFILIATIONS

LA Resilience Initiative, Steering Committee, Member

USGBC Los Angeles Chapter, Board Member

FIRM

Vanir

Highlights

- ✓ 15+ years of experience in the built environment
- ✓ Registered Interior Designer
- ✓ LEED AP

JENNY WHITSON, CID, LEED AP+

Sustainability Project Manager

Summary of Qualifications

Jenny Whitson is a sustainability leader with over 15 years of industry experience focused on the built environment. She brings extensive knowledge of the integrated design process, program management, sustainable systems, renewable energy, materials, resiliency, benchmarking, and paybacks. Jenny successfully managed the sustainability program for the largest airport to be newly constructed within the last 40 years targeting challenging on-site renewable energy goals. She combines her design expertise and hands-on project management skills to drive programs to success.

Specific Qualifications

- California energy markets (10 years)
- CAISO market operations and regulations applicable to Community Energy Programs (1 year)
- Power procurement and portfolio management services (6 years)
- Development and evaluation of risk management policies and regulations (4 years)
- Electricity load forecasting and data analysis (6 years)
- Community Energy formation process in CA (1 years)
- Knowledge of CA laws and regulations governing Community Energy Programs (1 years)
- Experience in evaluating bids for power including: financial and economic analysis and modeling, and analysis of energy demand (3 years)

Project Experience

Eastern Municipal Water District (EMWD), Solar Renewable Energy Power Facility and Microturbine Generating Facility Evaluation, Perris, CA. Provided technical support. Responsible for providing initial monitoring of the 5.5 MW system following start up, updating the performance tracker with actual versus predicted usage, and managing the incentives received each month. Provided guidance performance, guarantee, and warranty contracts ensuring the owner's best interest is incorporated.

Grupo Aeroportuario de la Ciudad de México, Mexico City Airport, Mexico City, Mexico. Sustainability Program Manager for new $11 billion, 8 million square foot, design-bid-build construction airport project. Responsible for design phase sustainability and LEEDv4 Platinum program activities from pre-design through construction documentation phase, including 20-30 MW of on-site solar. Project is targeting the first LEEDv4 Platinum Certification for an airport.

California Air Resource Board (ARB), Southern California Consolidation, Riverside, CA. Sustainability Project Manager for the $377 million, 383,000 square foot consolidation project. The project will consolidate ARB's existing southern California space at the Haagan-Smith Lab, leased offices in El Monte, and space leased from the Metropolitan Transit Authority facilities in Los Angeles into a new Emissions Testing and Research Center that will support approximately 400 staff. Performed technical sustainability reviews on ARB's

project documentation throughout all phases of design and construction. Currently reviewing all LEED Platinum strategies, net zero energy reports, technical specifications, and design drawings to ensure sustainability strategies are implemented and aligned with ARB's project goals and requirements.

Saudi Aramco Energy Industrial City, Al-Ahsa District, Saudi Arabia. Senior Sustainability Specialist for the $10 billion, 8,600 to 59,200 square foot, design-build new construction administration building, mosque, maintenance building, fire station, health clinic, visitor/ security gate building. Responsible for developing LEEDv4 for Neighborhood Development and New Construction requirements for Phase 1. The project is expected to create 69,000 direct jobs by 2035 and be developed in three 5-year phases to be completed by 2030.

Appendix B – Client List

EES CONSULTING, INC.
PARTIAL CLIENT LIST

Alameda County, California
- Community Choice Aggregation Peer Review
- Power supply planning

Alaska Power & Telephone, Alaska
- Cost of service and rate design
- Expert testimony/report

Alaska Village Electric Cooperative, Alaska
- Due diligence and valuation of utility property acquisition
- Fuel transportation feasibility
- Power supply planning

University of Alberta, Canada
- Electricity and natural gas rates, generation supply options and procurement
- Expert testimony
- Cogeneration feasibility
- Water and wastewater rate analysis
- Asset sale/acquisition analysis

Association of Major Power Companies, Ontario
- Retail rate analysis
- Wheeling rate analysis
- Expert testimony

American Public Power Association (APPA)
- Instruct APPA cost of service, rate design, load forecasting and financial management seminars
- Authored APPA technical manual on cost of service

American Water Works Association (AWWA)
- Instruct AWWA cost of service, rate design, forecasting and financial management seminars
- Develop AWWA technical manuals
- Chair of Management Division, Total Water Management and Financial Management Committees

City of Anaheim, California
- Electric rate study assistance
- Advice on strategic partnering
- Stranded cost analysis
- Cogeneration analysis
- Property tax analysis

Municipality of Anchorage, Light & Power, Alaska
- Engineer of Record
- Unbundled cost of service
- Competitiveness analysis
- Strategic advice and assistance
- Deregulation consulting
- Regulatory/legal support
- Organizational audits
- Schedule/dispatch department support
- Integrated resource plans
- Generation planning study
- Property acquisition assistance
- Joint generation feasibility study
- Merger and acquisition analysis
- Load forecast
- Production costing analysis

Anyox Hydroelectric Corp, Canada
- Design of 4 new hydroelectric projects
- Canadian water licensing and permits
- Power sales contract assistance
- Financing support and modeling

Avista, Washington
- Water quality program support
- Spokane River FERC relicensing analyses and negotiations /litigation
- Strategic planning

Basin City Water/Sewer District, Washington
- Valuation study

Benton County Public Utility District, Washington
- Integrated resource plan
- Conservation potential assessment

Beartooth Electric Cooperative, Montana
- Cost of service study
- Generation option study
- Valuation study
- Strategic planning
- Merger and acquisition analysis
- Load forecast

Benton County REA, Washington
- Strategic planning retreat
- Evaluation of alternative power supply options and contract negotiations
- Wheeling rate analysis
- Asset acquisition study
- Cost allocation and retail rate design
- Permitting/feasibility for gas generation

Big Bend Electric Cooperative, Washington
- Electric cost of service rate study

Big Flat Electric Cooperative, Montana
- Wheeling rate development
- Natural gas pipeline feasibility study

Blachly-Lane Electric Cooperative, Oregon
- Cost of service study/rate design
- Capital credits allocation study

City of Bonners Ferry, Idaho
- Water cost of service study
- Electric cost of service study
- Large customer rate setting analysis and expert testimony
- Hydro generation feasibility study

Burbank Water & Power, California
- Transformer Temperature Control Installation

Butte County, California
- Community choice aggregation
- Power supply planning

Central Electric Cooperative, Oregon
- Retail rate study

Central Lincoln PUD, Oregon
- Electric retail rate study
- Wheeling rate

Circle Telephone, Alaska
- Appraisal/merger and acquisition support

City of Birmingham, Alabama
- Comprehensive water cost allocation and rate design study
- Litigation support/expert testimony

City of Boulder City, Nevada
- Electric, water, wastewater cost of service study

City of Burien, Washington
- Electric conversion financial analysis

County of Butte, California
- Preparing Community Choice Aggregation (CCA) business plan

British Columbia Utilities Commission, Canada
- Evaluation of natural gas rate application

Building Owners Management Association
- Expert testimony in Puget Sound Energy rate case on interclass cost allocations

California Municipal Utilities Association
- Evaluation of joining California ISO for California municipal electric utilities
- Educational services

City of Calgary, Alberta
- Water and sewer cost of service and rate analyses

CH2M Hill, Washington
- Fish passage facility design
- Mechanical engineering/design
- Electrical engineering
- Control system design

Chelan County Public Utility District, Washington

- Conservation potential assessment
- Engineering assistance/substation design
- Implementation of time differentiated, average embedded and marginal cost of service software programs
- Load research program assistance
- Econometric demand forecasting models
- New large load analysis
- Conservation and transformer load management analysis
- Water/sewer service regulation critique and rate studies
- Diesel generation feasibility study
- DSM potential study
- Juvenile fish bypass engineering
- Fiber system benefit/cost analysis
- Load forecasting

City of Cheney, Washington

- Electric cost of service/rate design study
- Strategic options study for electric utility

Clackamas River Water District, Oregon

- Utility coordination with Damascus, Mt. Scott and Oak Lodge water districts
- Strategic planning
- Merger study

Clallam County Public Utility District, Washington

- Conservation potential assessment
- Water cost of service study
- Retail cost of service and rate design studies
- Review and calculation of wheeling tariffs
- Resource evaluation
- Representation in regional power planning issues
- Integrated resource plan
- Evaluation of bulk power alternatives/BPA support
- Load forecast

Clark Public Utilities, Washington

- Conservation potential assessment
- Hydro feasibility study
- Electric integrated resource planning study
- Engineer's letters for bond financings
- DSM evaluation/CPA evaluation
- Owner's agent for construction of 248 MW gas turbine project
- Retail wheeling analysis
- Natural gas procurement
- Customer choice program
- Assistance in construction of gas engine project
- Renewable resource evaluation
- Risk management evaluation
- Load forecasting

Clearwater Power Company, Idaho

- Line extension policy analysis
- Retail rate study

Coachella Valley Association of Governments, California

- Consumer Choice Aggregation (CCA) formation study
- Evaluation of electric utility options/new utility
- Property valuation for condemnation evaluation
- Expert testimony
- Power supply planning

Columbia River PUD, Oregon

- Retail rate study

Columbia REA, Washington

- Electric retail rate study
- New large customer load analysis

City of Corona, California

- Strategic advice
- Valuation assessments
- Condemnation evaluation/expert testimony

Consumers Power, Inc., Oregon
- Electric rate assistance

Costco Companies, Inc., Washington
- Power supply evaluation
- Electric deregulation strategy

Cowlitz County PUD, Washington
- Expert testimony on Wells #2 hydro failure
- Power supply evaluation
- Conservation potential assessment

Denver Water Board, Colorado
- Water rate study assistance
- Strategic planning
- Litigation support
- Expert testimony

District of Lake Country, B.C., Canada
- Turbine and generator procurement for hydroelectric project

Douglas County PUD, Washington
- Wells Dam FERC relicensing support and negotiations
- Tribal negotiation
- Negotiation of 10(e) payments
- Water quality/temperature modeling/dissolved gas investigations

Douglas Electric Cooperative, Oregon
- Electric retail rate study

Energy Facility Site Evaluation Council (EFSEC)
- Assess financial prudency of purchasing combustion turbine project

Electricity Distributors Association, Ontario
- Retail cost of service/rate design studies
- Evaluation of load management options
- Evaluation of provincial resource acquisition study
- Expert testimony
- DSM evaluation
- Merger and acquisition analysis/support
- Power pooling acquisition study and business plan

Electricity Distributors Association (cont'd)
- Integrated resource planning study assistance
- Strategic planning
- Customer choice analysis
- Evaluation of ISO for Ontario
- Educational services
- Energy trading operations
- Unbundled cost of service model

City of Ellensburg, Washington
- Power supply/Tier 2 options
- Rate studies, financial analysis, management review, load management
- Integrated resource plan
- Gas utility acquisition analysis
- Evaluation of bulk power alternatives
- Power contract negotiations
- Litigation support/expert testimony
- Resource evaluation
- Load forecast

El Dorado Irrigation District, California
- Water and wastewater financial planning and rate studies
- Customer service manual
- Contract negotiations

Elmhurst Mutual Power and Light, Washington
- General engineering/substation design
- Distribution protection study
- Rate study

Emerald Public Utility District, Oregon
- Expert testimony for condemnation proceedings
- Power resource evaluations
- Cost of service and rate design studies
- Contract negotiations
- Asset acquisition analysis
- Conservation program review
- Strategic planning

ENERconnect, Inc., Ontario

- Established wholesale power trading protocol for Ontario
- Consulted on various technical and financial requirements
- Elected to Board of Directors from 1999 – 2001

Energy Northwest, Washington

- Packwood hydro relicensing support
- Evaluation of Columbia Generation Station
- Fisheries and water quality studies
- Instream flow determination
- Habitat enhancement and restoration
- Threatened and endangered species
- Fisheries investigations, including netting, hydroacoustics, population assessments, and entrainment and impingement
- REC analysis/forecast
- Strategic planning
- Production costing analysis
- Power resource feasibility study

Enmax, Canada

- Wheeling rate regulatory support/expert testimony

Fall River Rural Electric Cooperative, Idaho

- Propane purchase evaluation
- Merger analysis, and operations and management review
- Asset acquisition evaluation
- Retail rate study
- Power resource evaluation model
- Gas distribution system feasibility study

City of Fargo, North Dakota

- Wastewater cost of service study
- Water cost of service study
- Long-term financial plan

Ferry County Public Utility District, Washington

- Contract negotiations
- Electric rate study

Flathead Electric Cooperative, Montana

- Merger and acquisition evaluation
- Regulatory compliance
- Unbundled cost of service
- Strategic advice
- Lead consultant for 40,000 electric meter acquisition from neighboring investor-owned utility
- Due diligence on coal plant
- Load forecast

Franklin County PUD, Washington

- Conservation potential assessment

FortisBC, Canada

- Power supply capital planning
- Rate design application for electric and gas utilities
- Main extension analysis
- Power contract negotiations
- Regulatory expert testimony
- Electric industry restructuring analysis
- Electric cost of service and rate design study
- Line extension policy
- Resource acquisition study
- Wholesale power sales contract negotiation
- Integrated resource planning study
- Power supply dispatch optimization study
- Competitiveness study
- Retail wheeling application
- Owner's regulatory expert for construction of major 230 kV transmission line
- Conservation potential analysis
- Load forecast

Garrison Diversion Conservancy District, North Dakota

- Analyze the financial/rate impacts of the proposed Red River Valley water supply/200 mile-8' water supply project
- Critique of project benefit/cost calculations
- General financial analysis support
- Load forecast

Glacier Electric Cooperative, Montana
- Standby rate analysis
- Power supply acquisition study
- Cost of service study

City of Glendale, California
- Electric cost of service study

Golden Valley Electric Cooperative, Alaska
- Strategic planning
- Power supply planning advice

Grant County PUD, Washington
- Conservation potential assessment

Grant County Industrial Customers, Washington
- Retail rate review
- Power contract negotiations

Grays Harbor County Public Utility District, Washington
- Conservation potential assessment
- Cost of service and retail rate study
- Bulk power sales forecast and contract negotiations
- Integrated resource plan
- Regional power issues
- Power resource evaluation
- Cogeneration feasibility
- Transmission analysis

Green Island Energy, Ltd.
- Biomass power project development assistance

Hampton Affiliates, Washington
- Provided assistance in energy related matters
- Assistance in construction of wood-fired boiler and back pressure turbine projects
- Negotiation of power purchase and wheeling agreement

HDR Engineering, Washington
- Hydro feasibility and power marketing services
- Transmission line feasibility

Hermiston Energy Services, Oregon
- Cost of service study

City of Heyburn, Idaho
- Expert testimony and litigation support
- Utility asset sale evaluation

Hidroelectrica Secacao, Guatemala
- Hydropower turbines and generators procurement
- Dam design
- Construction management
- Plant automation and controls

City of Idaho Falls, Idaho
- Update COSA model

Imperial Irrigation District, California
- Geothermal update analysis
- Salton Sea revenue analysis

Inland Choice Power, California
- Community choice aggregation business plan for CVAG, SANBAG and WRCOG
- Power supply options evaluation

Industrial Customers of Idaho Power, Idaho
- Expert testimony and analysis of Idaho Power rate increase applications
- Customer choice negotiations

Inland Power & Light Company, Washington
- Conservation potential assessment
- Cost of service and rate design
- EPAct 2005 time of use analysis
- Integrated resource plan
- Wheeling rate analysis

International Forest Products, Washington
- Wood-fired power plant feasibility studies
- Steam cycle heat balances

Iron Mountain Quarry, Washington
- Advice on new electric generation project

City of Irvine, California
- Greenfield municipalization feasibility study

Jefferson County PUD, Washington
- Cost of service and rate design studies
- Strategic planning
- Capital plan critique

Kentucky-American Water Company, Kentucky
- Conservation evaluation and program development
- Water demand forecast
- Integrated resource planning study
- Strategic planning
- Expert testimony/regulatory assistance
- Meter cost analysis

King City, California
- Peer review of CCA feasibility study

Kittitas County PUD #1, Washington
- General engineering
- 20-year system plan
- Irrigation and new large single load rate analysis

Klamath Water Users Association, Oregon
- Retail rate analysis
- Strategic electric options
- Power supply planning analysis

Klickitat County Public Utility District, Washington
- Rate study
- Financial planning
- Integrated resource planning study
- Water system technical assistance/review
- Evaluation of hydro project
- IPP wheeling rate negotiations
- Pump storage project evaluation

Kootenai Electric Cooperative, Idaho
- Electric rate study
- Business acquisition analysis
- Asset acquisition support
- Merger/acquisition assistance
- Cogeneration feasibility study
- Integrated resource plan
- Large customer negotiations/litigation support

City of Lake Forest Park, Washington
- Water and sewer rate study
- Strategic planning

Lakeview Light and Power, Washington
- Cost of service and rate design
- Pole attachment rates and contracts
- Windmill power evaluation
- Engineer's letter for bond financing
- Load forecast

Lassen Municipal Utility District, California
- Electric cost of service and rate design

Lewis County Public Utility District, Washington
- Conservation potential assessment
- Cost of service and rate design
- Fixed asset ledger development
- Power resource acquisition analysis
- Integrated resource plan
- Major hydro generation evaluation and assessment
- Regional power issues and contract negotiations
- Asset acquisition analysis

City of Lethbridge, Alberta
- Wholesale power negotiations/expert testimony
- Analysis of electric industry restructuring
- Cost of service/rate design studies
- Strategic advice on deregulation and existing retail business
- Strategic partnership advice
- Power supply option study
- Load forecast

Lincoln Electric Cooperative, Montana
- Cost of service and rate design study

Lodi, City of, California
- Rate study

Los Angeles County, California
- Consumer Choice Aggregation (CCA) formation
- Strategic advice on power supply and wheeling options for owned generation
- Rate analysis and negotiations
- Litigation support
- Franchise agreement assistance
- Cogeneration feasibility study
- Analysis of wheeling options
- ISO negotiations
- Transmission access evaluations
- Expert testimony at FERC on ISO transmission issues

Los Angeles Department of Water & Power, California
- Prepared testimony on behalf of LADWP in PGE rate case

Lower Valley Energy, Wyoming
- Evaluation of merger options
- Natural gas pipeline and gas turbine generation financial and technical feasibility
- Integrated resource plan
- Contract negotiation
- Evaluation of LNG distribution systems
- DSM program development
- Expert testimony and regulatory support
- Fuel cell feasibility
- Load forecast

Mason County Public Utility District No. 1, Washington
- Electric rate study
- Power supply resource evaluation
- Contract negotiations
- Hydro feasibility studies

Mason County Public Utility District No. 3, Washington
- Conservation potential assessment
- New load rate analysis
- Design and implementation of continuing property records fixed asset accounting system
- Cost of service and other miscellaneous financial related analyses
- Electric demand forecast
- Resource acquisition study
- Hydro evaluation
- Bond financing
- Least cost planning study
- Contract negotiations
- DSM program development
- Cogeneration review
- Fiber optics business plan
- Engineering/contracting assistance and oversight for reciprocating engine construction

McMinnville Water & Light, Oregon
- Integrated resource plan
- Cost of service/rate study
- Conservation potential assessment

Medicine Hat, City of, Canada
- Strategic planning
- Energy consulting
- Resource evaluation/AGC study
- Production costing modeling
- Electric power project assistance
- Utility revenue requirement policies and cost of service

Microsoft, Inc., Washington
- Power supply option analysis and contract negotiations
- Strategic planning

Midstate Electric Cooperative, Oregon
- Electric rate study

City of Millersburg, Oregon
- Formation of municipal electric utility

City of Milton, Washington
- Cost of service study
- Long-term strategic plan
- Substation design

Ministry of Fisheries and Oceans, Canada
- Expert testimony

Mission Valley Power, Montana
- Electric rate study

Missoula Electric Cooperative, Montana
- Electric rate study
- Net metering analysis

Montana Associated Cooperatives, Montana— (20 cooperatives within the state)
- Lead consultant in evaluation of acquiring major IOU service territory
- Strategic advice

City of Moreno Valley, California
- Cost of service study
- Prepared RFP for bulk power supply

M-S-R Public Power Agency, California
- BPA White Book analysis
- Litigation support

City of Needles, California
- Wastewater cost of service study
- Water and electric cost of service studies
- Financial planning

Nor-Cal Electric Authority, California
- Assisted in reviewing bid for purchase of investor-owned utility's facilities
- Negotiated MOU and final Purchase and Sales Agreement
- Performed engineering, environmental and financial due diligence for asset sale
- Assisted in preparation of regulatory approval materials
- Develop operating plan
- Power supply options evaluation
- Load forecast

Northern California Generation Coalition, California
- Regulatory assistance on natural gas issues

Northern Lights, Inc., Idaho
- Electric rate study
- Pole attachment rate study
- Large customer negotiations

Northern Wasco Public Utility District, Oregon
- Transmission and distribution design assistance
- Strategic planning
- Power supply resource evaluation
- Rate study
- Conservation potential study

Northwest Public Power Association (NWPPA), Washington
- Instruct technical seminars on integrated resource planning, rates, cost allocation, financial management and load forecasting
- Member of Board of Directors
- Strategic planning

Northwest Territories Power Corporation, Canada
- Regulatory filing, expert testimony
- Integrated resource planning study
- Strategic planning
- Power supply resource evaluation
- Rate study/load forecast

Northwestern Energy, Montana
- Prepared and evaluated RFP for default supply for retail load
- Expert testimony/regulatory assistance

Okanogan County Public Utility District, Washington
- Integrated resource planning study
- Cost of service study

Okanogan REA, Washington
- Strategic planning

Ontario Energy Board, Canada
- Regulatory cost allocation
- Distributed generation and standby rate study
- Expert testimony

Ontario Hydro, Canada
- Retail and wholesale rate evaluation
- Strategic planning
- Conservation evaluation
- Rate design mediation
- Integrated resource planning assistance
- Competitiveness study

Ontario Power Authority, Canada
- Energy conservation study

Orcas Power & Light Cooperative, Washington
- Cost of service analysis
- Resource evaluation/integrated resource plan
- Broadband study

Oregon Restaurant Association, Oregon
- Strategic advice
- Load aggregation

Pacific County Public Utility District, Washington
- Integrated resource study
- Rate studies
- Litigation support on pole attachment rates
- Power supply resource evaluation
- Fiber optics business plan

City of Palo Alto, California
- Power supply study
- Joint action review
- Gas, electric, water and sewer cost of service studies
- Demand forecast/resource evaluation
- Least cost planning assistance
- Customer choice program

Parkland Power & Light, Washington
- Rate study
- Strategic and least cost generation planning studies
- Power supply resource evaluation

City of Pasadena, California
- Water and electric cost of service and rate design studies
- DSM program evaluation

Pend Oreille County Public Utility District, Washington
- Hydro plant options feasibilities
- Integrated resource plan
- Bond issue for new transmission line
- Expert testimony/litigation support
- FERC relicensing
- FERC Part 12 inspections
- Penstock repair
- Dam design
- Fishery behavior studies
- Total dissolved gas reduction project
- Turbine upgrade
- Renewable energy credit analysis

Peninsula Light Company, Washington
- Electric rate study
- Asset evaluation study
- Power supply resource acquisition study
- Line extension analysis
- Conservation evaluation
- Integrated resource planning study
- Resource acquisition assistance
- Water quality advice
- Financial planning analysis
- Renewable resource evaluation
- Conservation potential analysis
- Load forecast

Pierce County Cooperative Association*, Washington*

- Negotiation of power contracts, resource evaluation and integrated resource plans
- Transmission system analysis
- Resource acquisition/Rate study
- Strategic planning advice

*(*Alder Mutual Light Company, Town of Eatonville, Elmhurst Mutual Power and Light Company, City of Fircrest, Lakeview Light and Power Company, City of Milton, Ohop Mutual Light Company, Parkland Light and Water Company, Town of Steilacoom)*

PNGC Power, Oregon

- Conservation potential study
- Contract evaluation risk study
- Cost of service advice

Polk-Burnett Cooperative, Wisconsin

- Rate study
- DSM study
- Strategic planning

City of Portland Water Bureau, Oregon

- Internal audit and valuation study
- Wholesale contract review

Portland General Electric, Oregon

- Hydro relicensing support

City of Port Angeles, Washington

- Resource acquisition studies
- Power supply strategic planning
- Merger study
- Conservation potential study
- Demand response strategic assistance
- Rate study
- Load forecast

Potomac Electric Power Company, Washington, D.C.

- Assistance in preparation of energy plan

PPL Montana, Montana

- Power supply evaluation and acquisition RFP
- Litigation support/expert testimony for hydro land lease dispute

Princeton Power and Light, B.C.

- Rate study
- Regulatory filings
- Expert testimony

Puyallup Tribe of Indians, Washington

- Hydro project evaluation/cost benefit study
- Strategic advice
- Expert report on hydro feasibility

Raft River Rural Electric Coop, Idaho

- Asset acquisition analysis

City of Red Deer, Canada

- Wholesale power rate negotiations
- Cost of service and rate design studies
- Expert testimony
- Strategic advice on deregulation and existing retail business

City of Redding, California

- Organization audit/strategic planning
- Competitiveness study/stranded cost review
- Citizens' Committee support
- Evaluation of power dispatch protocol

City of Reno, Nevada

- Auditing and renegotiating electric and gas franchise agreements
- Owner's agent for service territory acquisition of 75,000 customers for $450 million

City of Richland, Washington

- Power resource plan
- Valuation study
- Strategic planning services and consulting
- Analyzed storm drainage rates
- Evaluation of BPA slice product
- Management and operations review
- Integrated resource plan
- Conservation potential assessment
- Electric rate study
- Load forecast

Riveria Water Department, Washington
- Cost of service and rate design

City of Roseville, Oregon
- Electric cost of service model evaluation

Sacramento Municipal Utility District, California
- Load research and cost of service software
- Sample selection assistance
- Rate study
- Litigation support and expert testimony
- FERC licensing compliance audit

City of St. Paul, Alaska
- System valuation

Salem Electric, Oregon
- Retail rate study

Salmon River Electric Coop, Idaho
- Industrial rate development

City of San Bernardino, California
- Developed Community Choice Aggregation (CCA) technical business plan
- Design and construction management of cogeneration project
- Air quality permitting support

City of San Jose, California
- Developed Community Choice Aggregation (CCA) technical business plan
- Developed CCA electric power retail rate forecast

City of San Marcos, California
- Evaluation and due diligence for new municipal generation project
- New municipal electric utility formation options study

City of Santa Ana, California
- Developed RFP for strategic energy planning study

City of Santa Clara, California
- Cost of service study

Seattle City Light, Washington
- Hydro option evaluation study
- Transmission/distribution design

Seattle Times, Washington
- Evaluation of electric power supply options
- Contract negotiations for retail electric service

Seattle Water Department, Washington
- Rate, financial management and forecasting studies
- Conservation evaluation
- Strategic planning studies
- Contract negotiations
- Least cost planning
- Load forecast

SEH America, Washington
- Strategic consulting
- Electric supply option evaluation
- Natural gas supply transportation support

Shady Cove, Oregon
- Financing plan and prospectus development for water system purchase

City of Shoreline, Washington
- Negotiation assistance
- Strategic planning seminar
- Energy aggregation analysis
- Water service analysis
- Evaluation of strategic utility options
- Assumption negotiations of wastewater system
- Franchise fee negotiations
- Due diligence & valuation of utility system

Silicon Valley Power, California
- Cost of service study

Simpson Timber Company, California
- Engineering/financial consulting for a new woodwaste boiler/condensing turbine project

Skamania County PUD, Washington
- New large load
- Wheeling rate
- Electric retail rate study
- Pole attachment study

Snohomish County Public Utility District, Washington
- Calligan & Hancock hydro project design/construction management
- Average and marginal cost of service models
- Load research program
- Elasticity study/load forecast
- Power supply resource acquisition evaluation
- Cost of service model
- Landfill gas generation study
- DSM study
- Conservation potential assessment
- Energy efficiency behavior program evaluation
- Energy efficiency department support
- Regional office evaluation
- Engineering audit for FERC relicensing support

Solano Beach, City of, California
- Community choice aggregation peer reviews
- Power supply planning

South San Joaquin Irrigation District, California
- Start-up assistance
- Power supply evaluation

Southeast Idaho Cooperatives
- Asset acquisition analysis

Springfield Utility Board, Oregon
- Cost of service programs and comprehensive rate study
- Contract negotiations
- Power supply resource evaluation and acquisition assistance
- Cogeneration feasibility study

Surprise Valley Electric, California
- QF assistance/wheeling rates
- Expert testimony

City of Tacoma, Washington
- Conservation potential assessment
- Comprehensive electric and water cost of service and rate design analyses
- Power supply option resource study
- Review of line extension policy
- Elasticity and load forecasting studies
- Review of internal departmental staffing requirements
- Conservation effectiveness evaluation
- Policy seminars
- Integrated resource planning
- Contract negotiations
- FERC hydro relicensing assistance
- Major water use contract negotiations

Terasen Gas, Canada
- Integrated resource planning study
- Optimal dispatch model
- Retail cost of service/rate design filing
- Expert testimony
- Main extension development

Texas Municipal Power Agency, Texas
- Expert testimony
- FERC wheeling rate application
- State wheeling rate application
- Antitrust litigation support

Tillamook People's Utility District, Oregon
- Rate assistance

City of Toppenish, Washington
- Strategic advice
- Electric utility options study
- Valuation assessments

Truckee-Meadows Water Authority, Nevada

- Lead strategic and financial consultant in acquisition of 70,000 meter water system previously owned by Sierra Pacific in the Sparks/Reno area valued at $400 million
- 108" pipeline replacement project
- Hydro generator repair and rewind project
- Flume repair and upgrade design

Turlock Irrigation District, California

- Cost of service review
- Seminars on utility planning and operations
- Load growth study
- Time of use rates
- Marginal cost study for electric system
- Litigation support for contract disputes
- Customer service support
- Relicensing compliance audit

Umatilla Electric Cooperative, Oregon

- Cost of service study

US Ecology, Inc., Washington

- Expert testimony on cost of service and rate design issues
- Regulatory filing for Hanford nuclear waste disposal site

Vigilante Electric Cooperative, Montana

- Wheeling rate analysis
- Merger/acquisition study

Wasco Electric Cooperative, Inc. Oregon

- Electric rate study

Washington PUD Association, Washington

- Feasibility analysis for power options
- Sourcebook publication

Western Oregon Electric Cooperative, Oregon

- Cost of service study

City of West Linn, Oregon

- Water and wastewater rate studies
- Strategic planning
- Cogeneration feasibility study

Western Montana G&T, Montana

- Integrated resource planning study
- Power contract negotiations

Western Public Agencies Group, Washington*

- Representation and expert testimony in 1982, 1983, 1985, 1987, 1991, 1993, 1995 and 1999, 2001, 2003, 2007 and 2009, 2012 and 2014 BPA wholesale power and transmission rate cases
- Renegotiation of ASC methodology
- Ongoing BPA-related activities
- Integrated resource planning and strategic resource acquisition studies and advice
- Bulk power evaluation
- Power pooling study

*(*Alder Mutual Light, Benton REA Clallam County PUD, Clark Public Utilities, City of Ellensburg, Elmhurst Mutual Power & Light, Grays Harbor County PUD, Kittitas County PUD, Lewis County PUD, Mason County PUD #1, Mason County PUD #3, City of Milton, Ohop Mutual Light Company, Pacific County PUD, Parkland Light & Water Company, City of Port Angeles, Skamania County PUD, Town of Eatonville*

Western River Council of Governments (WRCOG), California

- Developed Community Council Aggregation (CCA) technical business plan

Weyerhaeuser, Inc., Washington

- Energy pricing and sourcing advice

Whatcom County PUD, Washington

- Strategic electric advice and options study

Village of Winnetka, Illinois

- Power supply resource evaluation and feasibility
- Cost of service/rate design study

City of Yakima, Washington

- Wastewater connection charge review
- Litigation support
- Expert testimony

Yellowstone Valley Electric Cooperative, Montana

- Electric cost of service and rate design study
- Wheeling rate
- Coal and gas plant acquisition due diligence

Yucaipa Valley Water District, California

- Water and wastewater financial planning and rate studies
- Hydro plant evaluation

EES Consulting

July 3, 2018

Ms. Angie Burgh
Senior Management Analyst
City of Irvine
One Civic Center Plaza
Irvine, California 92606

SUBJECT: Addendum: CCE Feasibility and Technical Assessment Proposal

Dear Ms. Burgh:

EES Consulting, Inc. (EES) received the City's request for a detailed cost break-out by task, hours, and staff member. The tables attached to this letter provide this cost break-out for Tasks 1 and 2. For the cost allocation to Great Park, we estimate that 6.5% of the budget should be allocated to the park based on an estimate of kWh consumption for the Great Park as a share of total City consumption. This allocation may be updated at a later date when kWh information is made available.

Thank you for your consideration and please do not hesitate to contact us with any questions.

Very truly yours,

Gary Saleba
President/CEO

570 Kirkland Way, Suite 100
Kirkland, Washington 98033

Telephone: 425 889-2700 Facsimile: 425 889-2725

A registered professional engineering corporation with
offices in Kirkland, WA; Portland, OR; and La Quinta, CA.

Task	Hours	Rate	Total Cost	Great Park Share (6.5%)	City Share (93.5%)
1.1 Load Study and Forecast					
Amber Nyquist, Senior Project Manager	20	$235.00	$4,700.00	$305.50	$4,394.50
Kyle Morrill, Senior Analyst	24	$225.00	$5,400.00	$351.00	$5,049.00
Task 1.1 Subtotal			*$10,100.00*	$656.50	$9,443.50
1.2 SCE Rate Analysis					
Anne Falcon, Senior Associate	8	$245.00	$1,960.00	$127.40	$1,832.60
Amber Nyquist, Senior Project Manager	12	$235.00	$2,820.00	$183.30	$2,636.70
Task 1.2 Subtotal			*$4,780.00*	*$310.70*	*$4,469.30*
1.3 Portfolio Selection & Sensitivity					
Gary Saleba, President/CEO	8	$250.00	$2,000.00	$130.00	$1,870.00
Steve Andersen, Manager	54	$240.00	$12,960.00	$842.40	$12,117.60
Task 1.3 Subtotal			*$14,960.00*	*$972.40*	*$13,987.60*
1.4 Cost of Service					
Gary Saleba, President/CEO	5	$250.00	$1,250.00	$81.25	$1,168.75
Anne Falcon, Senior Associate	40	$245.00	$9,800.00	$637.00	$9,163.00
Kyle Morrill, Senior Analyst	40	$225.00	$9,000.00	$585.00	$8,415.00
Task 1.5 Subtotal			*$20,050.00*	*$1,303.25*	*$18,746.75*
1.5 Risk Analysis					
Anne Falcon, Senior Associate	10	$245.00	$2,450.00	$159.25	$2,290.75
Steve Andersen, Manager	5	$240.00	$1,200.00	$78.00	$1,122.00
Kyle Morrill, Senior Analyst	10	$225.00	$2,250.00	$146.25	$2,103.75
Zac Yañez, Senior Analyst	20	$225.00	$4,500.00	$292.50	$4,207.50
Task 1.5 Subtotal			*$10,400.00*	*$676.00*	*$9,724.00*
1.6 Report of Technical Study Results					
Gary Saleba, President/CEO	4	$250.00	$1,000.00	$65.00	$935.00
Anne Falcon, Senior Associate	8	$245.00	$1,960.00	$127.40	$1,832.60
Steve Andersen, Manager	4	$240.00	$960.00	$62.40	$897.60
Kyle Morrill, Senior Analyst	8	$225.00	$1,800.00	$117.00	$1,683.00
Howard Choy, Subconsultant, Vanir	20	$150.00	$3,000.00	$195.00	$2,805.00
Subtotal Task 1.6			*$8,720.00*	*$566.80*	*$8,153.20*
1.7 Information & Community Engagement					
Gary Saleba, President/CEO	8	$250.00	$2,000.00	$130.00	$1,870.00
Anne Falcon, Senior Associate	8	$245.00	$1,960.00	$127.40	$1,832.60
Kyle Morrill, Senior Analyst	20	$225.00	$4,500.00	$292.50	$4,207.50
Subtotal Task 1.7			*$8,460.00*	*$549.90*	*$7,910.10*
GRAND TOTAL	**336**		**$77,470.00**	**$5,035.55**	**$72,434.45**

Task	Hours	Rate	Total Cost	Great Park Share (6.5%)	City Share (93.5%)
2.1 Implementation Plan					
Gary Saleba, President/CEO	8	$250.00	$2,000.00	$130.00	$1,870.00
Anne Falcon, Senior Associate	8	$245.00	$1,960.00	$127.40	$1,832.60
Steve Andersen, Manager	16	$240.00	$3,840.00	$249.60	$3,590.40
Amber Nyquist, Senior Project Manager	20	$235.00	$4,700.00	$305.50	$4,394.50
Kyle Morrill, Senior Analyst	36	$225.00	$8,100.00	$526.50	$7,573.50
Howard Choy, Subconsultant, Vanir	30	$150.00	$4,500.00	$292.50	$4,207.50
Task 2.1 Subtotal			*$25,100.00*	*$1,631.50*	*$23,468.50*
2.2 CCE Org Infrastructure					
Gary Saleba, President/CEO	10	$250.00	$2,500.00	$162.50	$2,337.50
Anne Falcon, Senior Associate	12	$245.00	$2,940.00	$191.10	$2,748.90
Steve Andersen, Manager	8	$240.00	$1,920.00	$124.80	$1,795.20
Kyle Morrill, Senior Analyst	10	$225.00	$2,250.00	$146.25	$2,103.75
Task 2.2 Subtotal			*$9,610.00*	*$624.65*	*$8,985.35*
2.3 Customer Engagement					
Gary Saleba, President/CEO	2	$250.00	$500.00	$32.50	$467.50
Anne Falcon, Senior Associate	2	$245.00	$490.00	*$31.85*	*$458.15*
Kyle Morrill, Senior Analyst	18	$225.00	$4,050.00	*$263.25*	*$3,786.75*
Task 2.3 Subtotal			*$5,040.00*	*$327.60*	*$4,712.40*
2.4 Rate Setting					
Anne Falcon, Senior Associate	20	$245.00	$4,900.00	$318.50	$4,581.50
Steve Andersen, Manager	8	$240.00	$1,920.00	$124.80	$1,795.20
Amber Nyquist, Senior Project Manager	16	$235.00	$3,760.00	$244.40	$3,515.60
Task 2.4 Subtotal			*$10,580.00*	*$687.70*	*$9,892.30*
GRAND TOTAL	**224**		**$50,330.00**	**$3,271.45**	**$47,058.55**

February 28, 2018

REQUEST FOR PROPOSALS for

City of Irvine Strategic Energy Plan

Thank you for considering the attached Request for Proposals (RFP). If you are interested in submitting a Proposal, please follow these instructions for submissions:

Only RFP documents downloaded from the City's website (www.cityofirvine.org/purchasing) shall be considered official, as the City must track RFP holders in the event an addendum is issued. Failure to register and download the RFP document and any addendum from the website will result in disqualification of the proposal.

Due Date and Time: **No Later than March 21, 2018 at 4:00:00 pm**

NO LATE PROPOSALS WILL BE ACCEPTED.

RFP Number: **18-1379**

This RFP number must be referenced in the proposal document, which must be submitted electronically via the City's website.

Proposal Submittal: Proposals must be submitted electronically via the City's BidsOnline system as set forth in this RFP document. (Proposals submitted by any other method such as hard copy or email will be disqualified.) Please refer to the Submittal Instructions section of this RFP for details.

Any requests for clarification or other questions concerning this RFP must be submitted in writing and sent via email to Angie Burgh with a copy to Brian D. Brown (as shown below) no later than March 12, 2018 at 4:00:00 p.m.

Angie Burgh
Senior Management Analyst
aburgh@cityofirvine.org

Brian D. Brown
Senior Buyer
bbrown@cityofirvine.org

The City of Irvine reserves the right to reject any or all Proposals, to waive any informality in any Proposal, and to select the Proposal that best meets the City's needs.

RFP Number: 18-1379

REQUEST FOR PROPOSALS
FOR
CITY OF IRVINE STRATEGIC ENERGY PLAN

Dear Proposers:

The City of Irvine (hereinafter referred to as the "City") is requesting proposals to establish a contract for the City of Irvine Strategic Energy Plan, with work to commence on or about May 1, 2018 and be completed on November 30, 2019.

Proposals must be submitted electronically no later than the date and time stated on this RFP cover sheet. Proposals shall be reviewed and rated as set forth in the Selection Process section of this RFP. The City will then determine which proposal(s) best meets the City's requirements.

LATE PROPOSALS WILL NOT BE ACCEPTED

The City reserves the right to reject any or all proposals, to waive any informality in any proposal and to select the proposal that best meets the City's needs.

MINIMUM QUALIFICATIONS REQUIRED FOR PROPOSAL SUBMITTAL

Firms who fail to meet the minimum qualifications set forth below should not submit a proposal; any such proposal shall be deemed non-responsive and not be considered.

1) Minimum five (5) most recent years of experience performing similar services as those detailed in the Scope of Services section of this RFP.

OVERVIEW AND SCOPE OF WORK

Proposers shall submit a proposal for the development of a Strategic Energy Plan (Plan) with a defined energy vision for the City of Irvine's municipal operations and the community. The Plan should determine the current state of energy consumption at City facilities and communitywide, identify technologies for the City to explore and/or implement to reduce its municipal operation's energy usage, review State mandates that may affect municipal and communitywide energy consumption, and engage stakeholders to identify voluntary strategies that encourage reduction of energy consumption in residential and business sectors. Additional details for the scope of work are set forth in Attachment I.

Proposers shall provide a project timeline and costs for each of the tasks as described in the Deliverables section of the scope of work in Attachment 1. To proceed with the scope of work, City approval will be required.

TERMS AND CONDITIONS

The City's standard Agreement for Contract Services is included as Attachment II. Upon award of the contract, it is expected that the successful proposer will accept the Agreement terms and conditions "as is" without modification. (Please refer to Part III Special Provisions of Attachment II for special requirements relating to these services.)

At the discretion of the City, any or all parts of the respondent's proposal shall be made a binding part of the selected firm's contract. The City reserves the right to reject in whole or in part any of the proposals.

Time frame for submittal of insurance documents: At the time the contract is awarded, the firm must be able to provide all required insurance documentation to the City's insurance certificate tracking company as set forth in Attachment II. If these requirements are not met, the City reserves the right to select the next best qualified firm.

ORGANIZATION OF PROPOSAL

If your proposal does not include all of the items below, it may be deemed non-responsive. The proposal will be evaluated by the City and shall include, at a minimum, the following information:

- **BUSINESS INFORMATION**

  State the full legal name of your firm, including the state of incorporation if applicable. Include your address, phone number, fax number and email address. State the number of years your firm has been doing business. List the names of principals or officers authorized to bind your firm, including position titles.

- **EXPERIENCE / QUALIFICATIONS INFORMATION**

  Provide information concerning your firm's experience and qualifications directly related to the services set forth herein. Define the experience of the proposed Project Manager, and other key personnel (and sub-consultants if applicable) who would be assigned to perform the services. (The designated Project Manager shall be the primary contact with the City during the contract period.) Provide resumes for the Project Manager, other key personnel, and sub-consultants if applicable.

- **PROJECT APPROACH / METHODOLOGY**

  Provide a detailed description of your proposed methodology/project approach based on your understanding of the Scope of Services (Attachment 1).

- **REFERENCES**

  Provide a minimum of three (3) references for similar work that your firm has provided within the last three (3) years. Include a detailed description of the services, the agency or firm names, contact names and phone numbers, and dates of services performed.

- **PRICING PROPOSAL**

  Provide a fee schedule/pricing information for the project. The City shall not provide reimbursement for business or travel-related expenses; therefore, such costs must be absorbed in the hourly or lump sum fee structure. Provide hourly rates for each category of employee or subconsultant required to perform the services as set forth in ATTACHMENT I, Scope of Services.

  Pricing shall remain firm for the entire one (1) year Agreement term. Thereafter, any proposed pricing adjustment for follow-on renewal periods shall be submitted to the City Representative in writing at least ninety (90) days prior to the new Agreement term. City reserves the right to negotiate any pricing adjustment not to exceed the Bureau of Labor Statistics Consumer Price Index (CPI) data as follows: Los Angeles-Riverside-Orange County, CA; All Items; Not Seasonally Adjusted; annualized change comparing the most recent month's reported data to the same month of the prior year. (This information may be found on the U.S. Department of Labor's website at www.bls.gov.)

- **SIGNATURE**

  The proposal shall be signed by an official authorized to bind the firm, including his or her printed name and title, and shall contain a statement to the effect that the proposal is valid for ninety (90) days.

SELECTION PROCESS

The contract award will be made after selection of one (1) respondent's proposal from among all respondents with implementation of services to follow. However, this RFP does not indicate a commitment by the City to award a contract to any successful respondent. An award of contract is estimated to occur within approximately sixty (60) days after receipt of proposals. The City intends to evaluate the proposed services based upon the data presented in response to the RFP. The following general selection criteria will be used to evaluate the proposals:

Phase 1:

1. Experience and qualifications of firm and designated project management staff, other key personnel, and sub-consultants, if applicable (30%)
2. Methodology/Project Approach provided (30%)
3. Proposal Pricing (20%)

4. Responsiveness to the Request for Proposals (20%)

Phase 2 for highest-rated firm(s):

- The City reserves the right to conduct interviews with the highest-rated firm or firms. In the event the City does perform an interview process, the additive weighting shall be 30%.

Phase 3 for highest-rated firm(s)

- The City will perform reference checks for similar work completed within the last three years for the highest-rated firm(s), with an additive weighting of 20%.

The City reserves the right to negotiate final pricing with the highest-rated firm(s).

The City reserves the right to reject any or all proposals, to waive any informality in any proposal, and to select the proposal that best meets the City's needs.

SUBMITTAL INSTRUCTIONS

To download the RFP document or check for addenda, please visit the City's website at: ***cityofirvine.org/purchasing***

Click on the "Supplier Registration and Bid Opportunities" link, and then click on the "BidsOnline" link. Next, click on "Bid Opportunities" to locate and view the RFP document. (If you haven't already done so, you will be required to register as a City of Irvine vendor before downloading the RFP document.)

Proposals must be submitted as follows:

Proposals must be submitted electronically by visiting the City's website at *www.cityofirvine.org/purchasing*. Click on the "Supplier Registration and Bid Opportunities" link. Next, click the BidsOnline link and then click "Log In." Enter your User Name and Password. Click "Bid Opportunities" and then select the RFP. Click on "Place eBid" and follow the instructions.

The deadline for proposal submissions is:

March 21 2018 at 4:00:00 p.m. However, submittals may be submitted at any time prior to the deadline. (Submitted proposals may be withdrawn and resubmitted at any time prior to the deadline, and cannot be viewed by City staff until the close date and time.)

Late proposals will not be accepted.

- **Proposals must be submitted via the City's BidsOnline system as a single zip folder.**

- **No other form of submission will be accepted.**
- **Large files may take time to upload so plan the timing of your submittal accordingly.**
- **Failure to completely upload your documents by the deadline shall result in disqualification.**

Proposal Submittal

- Name your file "companyname" but do NOT exceed 20 characters or your file will not upload. Do not use symbols (i.e. "%" or "&" as your file may not load correctly. If your name is too long, then abbreviate. Failure to upload document shall result in disqualification.
- If the proposal contains more than one file, you should create a zip folder, containing the various PDF proposal documents.
- Name the zip folder "companyname."

To create a zip folder:

- Right click on your desktop
- Select "New," and then "Compressed Zip Folder"
- Name the folder "companyname."
- Drag your various proposal PDF documents into the Folder

Mac users

- Create a folder for your files and name it "companyname"
- Drag your various proposal PDF documents into the folder
- Right-click the folder and select "create archive"

Technical Support

In the event you encounter technical difficulties during the uploading process, please contact the Planet Bids, BidsOnline system team as shown below (M-F from 8 am to 5 pm):

support@planetbids.com or call (818) 992-1771 ext. 0

GENERAL INFORMATION

The City will make payments monthly on approved invoices, with payment terms of net 30 days upon receipt of invoice. Payment for additional work, if any, will be negotiated as required. Final payment will be made after approval and acceptance of the work.

Any costs incurred in the preparation of a proposal, presentation to the City, travel in conjunction with such presentations, or samples of items shall be the responsibility of the respondent. The City assumes no responsibility and no liability for costs incurred by respondents prior to issuance of a contract or purchase order.

The proposer shall furnish the City with such additional information as the City may reasonably require.

Any questions or requests for clarification must be submitted in writing and sent via email as set forth on the cover sheet of this RFP.

All data, documents and other products used or developed during performance of the services will remain the property of the City upon completion of the services.

Sincerely,

Brian D. Brown
Senior Buyer

Attachments
1. Scope of Services
2. Agreement for Contract Services

ATTACHMENT I

SCOPE OF SERVICES

Contractor shall perform the services as set forth below.

Overview
Contractor shall assist with the development of a Strategic Energy Plan (Plan) with a defined energy vision for the City of Irvine's municipal operations and the community. The Plan should articulate goals that prepare for future energy demands, strategies and actions to meet these goals, and identify funding resources to support completion of these strategies.

The purpose for the development of a Strategic Energy Plan for the City of Irvine is to determine the current state of energy consumption communitywide and in municipal operations, evaluate best available technologies for the City to explore and/or implement that reduce energy usage at municipal facilities with a reasonable return on investment, identify funding to implement energy strategies, and engage stakeholders to identify voluntary strategies that encourage reduction of energy consumption in residential and business sectors and promote economic vitality. The Contractor shall include an assessment of energy storage, stationary fuel cells, microgrid technology, and renewable energy for municipal facilities, as well as consider the feasibility of battery electric vehicle charging infrastructure and hydrogen fuel cell vehicle fueling stations citywide.

In 2008 the City of Irvine adopted a 20-year Energy Plan (Exhibit I) to serve as a roadmap to encourage energy conservation communitywide and incorporate best practices to reduce energy consumption in its municipal operations. Since the adoption of the 2008 Energy Plan, the City has implemented energy efficiency projects, such as exterior and interior lighting upgrades, replacement of boilers and pool covers, and installation of variable frequency drives, resulting in savings of approximately 1 million kilowatts and over 45,000 therms annually. Ten years after the adoption of the City's first energy plan, it is timely to reassess the status of the City of Irvine's energy needs by developing a Strategic Energy Plan.

In addition to the 2008 Energy Plan, the City's General Plan (Exhibit II) contains an Energy Element to promote energy efficiency through land use and transportation planning and incorporate energy conservation in the City's municipal operations. The General Plan is in the process of being updated and will include a general emissions inventory and an assessment of climate adaptation strategies in the Safety Element. The Contractor will collaborate with the team working on the General Plan Update to incorporate information into this Plan as needed. The Contractor will also coordinate with the consultant team working on the feasibility assessment of a Community Choice Energy (CCE) program for the City of Irvine. The Contractor should consider in its recommendations whether CCE is an option the City can use to meet any future mandated reductions in emissions.

Project Deadline

Estimated time to complete the Scope of Work is 18 months.

Deliverables

Contractor shall develop a Strategic Energy Plan that includes the following sections:

- Task 1: Assess Current and Future Energy Profile
- Task 2: Develop Energy Vision, Goals and Strategies
- Task 3: Identify Funding Sources
- Task 4: Stakeholder Input and Educational Opportunities

Task 1: Assess Current and Future Energy Profile

1) Briefly summarize benchmark data from the 2008 Energy Plan.
2) Review current baseline energy usage and project future energy use and supply data for the City of Irvine.
3) Review greenhouse gas inventory, analyze current energy consumption and emissions communitywide and in municipal operations. For municipal operations, include a City fleet inventory and identify sites that have high utility usage (e.g. peak demand.)
4) Identify potential to significantly reduce energy usage through energy efficiency measures, renewable energy, stationary fuel cells, energy storage, and incorporation of battery electric vehicle charging and hydrogen fuel cell electric vehicle fueling in municipal operations and citywide.
5) Create an inventory of existing energy-related activities, projects, programs, and policies, including any regional or state mandates that may impact future energy use. Recommend strategies and measures for the City to meet any related State mandated requirements.

Task 2: Develop Energy Vision, Goals and Strategies

1) Based on the energy profile assessment, collaborate to create an effective energy vision statement representing what Irvine's energy composition should look like in the future.
2) Present tangible long-term goals and nearer-term strategies that are measurable and provide cost-effective actions to meet future needs and work towards the Energy Vision.
3) Identify an implementation strategy to include a list of actions, cost estimates, and implementation timetable for energy efficiency, renewable energy, stationary fuel cells, energy storage, and battery electric vehicle charging and hydrogen fuel cell electric vehicle fueling projects. List and describe strategies to encourage Irvine residents and businesses to seek opportunities to voluntarily reduce energy consumption.
4) Establish the role of microgrids citywide (e.g., shopping centers, commercial centers, educational institutions, city facilities) for efficiency, resiliency, and community safety. Provide a roadmap and overall strategy for the evolution of microgrid technology citywide.

5) Prioritize and rank potential actions to meet goals and strategies, considering a reasonable return on investment.
6) Review the policies in the General Plan Energy Element and Community Choice Energy feasibility study to incorporate strategies as needed.
7) Review energy audit information to identify potential energy efficiency and renewable energy measures, such as energy storage, building electrification, stationary fuel cells, and solar.
8) Provide information on resources available to implement clearly defined strategies.
9) Develop an annual data gathering and tracking and reporting template to monitor and present progress in meeting new or updated goals.

Task 3: Identify Funding Sources

1) Identify funding and financing options to implement energy efficiency projects, including grants and utility rebates/incentive programs for communitywide initiatives.
2) Incorporate risk profile and time horizon for financing options, and structure any recommended projects to minimize risk and align savings with repayment schedules.
3) Seek potential for public-private partnerships that promote energy efficiency and economic vitality in the community and in municipal operations.

Task 4: Stakeholder Input and Educational Opportunities (Community Engagement)

1) Engage stakeholders throughout the development of the Strategic Energy Plan and incorporate input from organizations representing businesses, educational institutions and other interested members of the community (e.g. Irvine Chamber of Commerce, Irvine Company, the Advanced Power and Energy Program at the University of California Irvine, and the Green Ribbon Environmental Committee.) This shall include preparation, presentation, and debrief of community meetings.
2) Identify outreach and educational opportunities for City and stakeholders to host that highlight economically feasible technologies the community might consider to voluntarily reduce energy use, such as installation of renewable energy systems, battery electric vehicle charging, and fuel cell electric vehicle fueling.

Public Meetings

1) Attend and respond to questions at meetings of the City Council and Green Ribbon Environmental Committee on the final draft of the Strategic Energy Plan.

Exhibits:

1. City of Irvine 2008 Energy Plan
2. City of Irvine General Plan – Energy Element

ATTACHMENT II

AGREEMENT FOR CONTRACT SERVICES

THIS AGREEMENT FOR CONTRACT SERVICES (the "Agreement") is made and entered into as of 2018, by and between the CITY OF IRVINE, a municipal corporation ("City"), and , a California corporation ("Contractor"). (The term Contractor includes professionals performing in a consulting capacity.)

PART I

FUNDAMENTAL TERMS

A. Location of Project: The City of Irvine location(s) as set forth in PART IV, Scope of Services, included herein.

B. Description of Services/Goods to be Provided: Strategic Energy Plan in accordance with PART IV, Scope of Services, included herein (reference RFP 18-379).

C. Term: Unless terminated earlier as set forth in this Agreement, the services shall commence on May 1, 2018 ("Commencement Date") and shall continue through November 30, 2019.

D. Party Representatives:

D.1. The City designates the following person/officer to act on City's behalf:_____, email: _____

D.2. The Contractor designates the following person to act on Contractor's behalf:_____, email: _____

E. Notices: Contractor shall deliver all notices and other writings required to be delivered under this Agreement to City at the address set forth in Part II ("General Provisions"). The City shall deliver all notices and other writings required to be delivered to Contractor at the address set forth following Contractor's signature below.

F. Attachments: This Agreement incorporates by reference the following Attachments to this Agreement:

F.1. Part I: Fundamental Terms
F.2. Part II: General Provisions
F.3. Part III: Special Provisions
F.4. Part IV: Scope of Services
F.5. Part V: Budget

G. Integration: This Agreement represents the entire understanding of City and Contractor as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with regard to those matters covered by this Agreement.

This Agreement supersedes and cancels any and all previous negotiations, arrangements, agreements, and understandings, if any, between the parties, and none shall be used to interpret this Agreement.

IN WITNESS WHEREOF, the parties have executed and entered into this Agreement as of the date first set forth above.

CITY OF IRVINE	**CONTRACTOR'S NAME**
By: _____	By: _____
Its: Director of Public Works	Its: _____
By: _____	By: _____
Its: City Manager	Its: _____

Attest:

By:

_____
Molly McLaughlin
City Clerk

APPROVED AS TO FORM:
RUTAN & TUCKER, LLP

_____
Jeffrey Melching

<u>Contractor Information</u>
Address for Notices and Payments:

Attn:
Telephone:
Email:

PART II

GENERAL PROVISIONS

SECTION ONE: SERVICES OF CONTRACTOR

1.1 Scope of Services. In compliance with all terms and conditions of this Agreement, Contractor shall provide the goods and/or services shown on Part IV hereto ("Scope of Services"), which may be referred to herein as the "services" or the "work." If this Agreement is for the provision of goods, supplies, equipment or personal property, the terms "services" and "work" shall include the provision (and, if designated in the Scope of Services, the installation) of such goods, supplies, equipment or personal property.

1.2 Changes and Additions to Scope of Services. City shall have the right at any time during the performance of the services, without invalidating this Agreement, to order extra work beyond that specified in the Scope of Services or make changes by altering, adding to, or deducting from said work. No such work shall be undertaken unless a written order is first given by City to Contractor, incorporating therein any adjustment in (i) the Budget, and/or (ii) the time to perform this Agreement, which adjustments are subject to the written approval of the Contractor. City approval and/or payment for work claimed by Contractor as changed or additional shall not act to prevent City at any time to claim such work is covered by the Scope of Work and should be performed by Contractor without additional consideration due. It is expressly understood by Contractor that the provisions of this Section 1.2 shall not apply to services specifically set forth in the Scope of Services or reasonably contemplated therein. Contractor hereby acknowledges that it accepts the risk that the services to be provided pursuant to the Scope of Services may be more costly or time consuming than Contractor anticipates and that Contractor shall not be entitled to additional compensation therefor.

1.3 Standard of Performance. Contractor agrees that all services shall be performed in a competent, professional, and satisfactory manner in accordance with the standards prevalent in the industry, and that all goods, materials, equipment or personal property included within the services herein shall be of good quality, fit for the purpose intended.

1.4 Performance to Satisfaction of City. Notwithstanding any other provision herein, Contractor agrees to perform all work to the satisfaction of City within the time specified. If City reasonably determines that the work is not satisfactory, City shall have the right to take appropriate action, including but not limited to: (i) meeting with Contractor to review the quality of the work and resolve matters of concern; (ii) requiring Contractor to repeat unsatisfactory work at no additional charge until it is satisfactory; (iii) suspending the delivery of work to Contractor for an indefinite time; (iv) withholding payment; and (v) terminating this Agreement as hereinafter set forth.

1.5 Instructions from City. In the performance of this Agreement, Contractor shall report to and receive instructions from the City's Representative designated in Paragraph D.1 of Part I ("Fundamental Terms") of this Agreement. Tasks or services other than those specifically described in the Scope of Services shall not be performed without the prior written approval of the City's Representative.

1.6 Familiarity with Work. By executing this Agreement, Contractor warrants that Contractor (i) has thoroughly investigated and considered the scope of services to be performed, (ii) has carefully considered how the services should be performed, and (iii) fully understands the facilities, difficulties, and restrictions attending performance of the services under the Agreement. If the services involve work upon any site, Contractor warrants that Contractor has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services hereunder. Should the Contractor discover any conditions, including any latent or unknown conditions, which will materially affect the performance of the services hereunder, Contractor shall immediately inform the City of such fact in writing and shall not proceed except at Contractor's risk until written instructions are received from the City's Representative.

1.7 Identity of Persons Performing Work.

(A) Contractor represents that it employs or will employ at its own expense all personnel required for the satisfactory performance of any and all tasks and services required hereunder. Any personnel performing the services under this Agreement on behalf of Contractor shall at all times be under Contractor’s exclusive direction and control. Contractor shall pay all wages, salaries, and other amounts due such personnel in connection with their performance of services under this Agreement and as required by law.

(B) Contractor represents that the tasks and services required hereunder will be performed by Contractor or under its direct supervision, and that all personnel engaged in such work shall be fully qualified and shall be authorized and permitted under applicable State and local law to perform such tasks and services. Contractor will exclusively determine the means, methods and details of performing the services subject to the requirements of this Agreement.

(C) This Agreement contemplates the personal services of Contractor and Contractor's employees, and it is recognized by the parties hereto that a substantial inducement to City for entering into this Agreement was, and is, the professional reputation and competence of Contractor. Neither this Agreement nor any interest therein may be assigned by Contractor, except upon written consent of City.

1.8 Prohibition Against Subcontracting or Assignment. Contractor shall not contract with any other entity to perform in whole or in part the services required hereunder without the express written approval of City. In addition, neither the Agreement nor any interest herein may be transferred, assigned, conveyed, hypothecated, or encumbered voluntarily or by operation of law, whether for the benefit of creditors or otherwise, without the prior written approval of City. In the event of any

unapproved transfer, including any bankruptcy proceeding, City may void the Agreement at City's option in its sole and absolute discretion. No approved transfer shall release any surety of Contractor of any liability hereunder without the express written consent of City.

SECTION TWO: INSURANCE AND INDEMNIFICATION

2.1 Insurance. Without limiting Contractor's indemnification obligations, Contractor shall procure and maintain, at its sole cost and for the duration of this Agreement, insurance coverage as provided below, against all claims for injuries against persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees, and/or subcontractors. In the event that Contractor subcontracts any portion of the work in compliance with Section 1.8 of this Agreement, the contract between the Contractor and such subcontractor shall require the subcontractor to maintain the same policies of insurance that the contractor is required to maintain pursuant to this Section 2.1.

2.1.1 Insurance Coverage Required. The policies and amounts of insurance required hereunder shall be as follows:

A. Comprehensive General Liability Insurance which affords coverage at least as broad as Insurance Services Office "occurrence" form CG 00 01 including completed operations and contractual liability, with limits of liability of not less than $1,000,000 per occurrence and $2,000,000 annual aggregate for liability arising out of Contractor's performance of this Agreement. The limits shall be provided by either a single primary policy or combination of policies. If limits are provided with excess and/or umbrella coverage the limits combined with the primary will equal the minimum limits set forth above. If written with an aggregate, the aggregate shall be double the each occurrence limit. Such insurance shall be endorsed to:

(1) Name the City of Irvine and its employees, representatives, officers and agents (collectively hereinafter "City and City Personnel") as additional insured for claims arising out of Contractor's performance of this Agreement.

(2) Provide that the insurance is primary and non-contributing with any other valid and collectible insurance or self-insurance available to City.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement.

B. Automobile Liability Insurance with a limit of liability of not less than $1,000,000 each occurrence and $1,000,000 annual aggregate. The limits shall be provided by either a single primary policy or combination of policies. If limits

are provided with excess and/or umbrella coverage the limits combined with the primary will equal the minimum limits set above. Such insurance shall include coverage for all "owned," "hired" and "non-owned" vehicles, or coverage for "any auto." Such insurance shall be endorsed to:

(1) Name the City of Irvine and its employees, representatives, officers and agents as additional insured for claims arising out of Contractor's performance of this Agreement.

(2) Provide that the insurance is primary and non-contributing with any other valid and collectible insurance or self-insurance available to City.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement.

C. Workers' Compensation Insurance in accordance with the Labor Code of California and covering all employees of the Contractor providing any service in the performance of this agreement. Such insurance shall be endorsed to:

(1) Waive the insurer's right of Subrogation against the City and City Personnel.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement unless your insurance carrier is the State of California Insurance Fund (SCIF) and the endorsement numbers 2570 and 2065 are referenced on the certificate of insurance.

Contractor's completion of the form attached hereto as Exhibit I shall be a condition precedent to Contractor's rights under this Agreement. Should Contractor certify, pursuant to Exhibit I, that, in the performance of the work under this Agreement, it shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, Contractor shall nonetheless maintain responsibility for requiring that any subcontractors performing work under this Agreement have and maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the work performed under this Agreement.

D. Professional Liability Insurance with minimum limits of $1,000,000 each claim. Covered professional services shall include all work performed under this Agreement and delete any exclusion that may potentially affect the work to be performed.

E. Evidence of Insurance: Contractor shall provide to City a Certificate(s) of Insurance evidencing such coverage together with copies of the required policy endorsements no later than five (5) business days prior to commencement of service and at least fifteen (15) business days prior to the expiration of any policy. Coverage shall not be suspended, voided, cancelled, reduced in coverage

or in limits, non-renewed, or materially changed for any reason, without thirty (30) days prior written notice thereof given by the insurer to City by U.S. mail, or by personal delivery, except for nonpayment of premiums, in which case ten (10) days prior notice shall be provided.

The City project title or description MUST be included in the "Description of Operations" box on the certificate.

The City's insurance certificate tracking services provider, Exigis, LLC, will send Contractor an email message providing instructions for submitting insurance certificates and endorsements.

Certificate Holder:

City of Irvine, California
c/o: Exigis LLC
PO Box 4668 ECM #35050
New York, NY 10168-4668

F. Endorsements: A statement on an insurance certificate will not be accepted in lieu of the actual endorsement. Insurance policies shall not be in compliance if they include any limiting provision or endorsement that has not been submitted to the City for approval.

Additional Insured Endorsements shall not:

1. Be limited to "Ongoing Operations"
2. Exclude "Contractual Liability"
3. Restrict coverage to the "Sole" liability of Contractor
4. Contain any other exclusion contrary to the Agreement.

G. Any Deductible in Excess of $50,000 and/or Self-Insured Retentions must be approved in writing by the City.

H. Acceptability of Insurers. Each policy shall be from a company with current A.M. Best's rating of A- VII or higher and authorized to do business in the State of California, or otherwise allowed to place insurance through surplus lines brokers under applicable provisions of the California Insurance Code or any federal law. Any other rating must be approved in writing by the City.

I. Insurance of Subcontractors. Contractor shall be responsible for causing Subcontractors to maintain the same types and limits of coverage in compliance with this Agreement, including naming the City as an additional insured to the Subcontractor's policies.

2.2 Indemnification. Contractor shall indemnify, defend, and hold City and City Personnel harmless from and against any and all actions, suits, claims, demands, judgments, attorney's fees, costs, damages to persons or property, losses, penalties,

obligations, expenses or liabilities (herein "claims" or "liabilities") that may be asserted or claimed by any person or entity arising out of the willful or negligent acts, errors or omissions of Contractor, its employees, agents, representatives or subcontractors which directly or indirectly relate to the work being performed or services being provided under this Agreement, whether or not there is concurrent active or passive negligence on the part of City and/or City Personnel, but excluding such claims or liabilities arising from the sole active negligence or willful misconduct of City or City Personnel in connection therewith:

2.2.1 Contractor shall defend any action or actions filed in connection with any such claims or liabilities, and shall pay all costs and expenses, including attorney's fees incurred in connection therewith.

2.2.2 Contractor shall promptly pay any judgment rendered against City or any City Personnel for any such claims or liabilities.

2.2.3 In the event City and/or any City Personnel is made a party to any action or proceeding filed or prosecuted for any such damages or other claims arising out of or in connection with the work being performed or services being provided under this Agreement, Contractor shall pay to City any and all costs and expenses incurred by City or City Personnel in such action or proceeding, together with reasonable attorney's fees and expert witness fees.

SECTION THREE: LEGAL RELATIONS AND RESPONSIBILITIES

3.1 Compliance with Laws. Contractor shall keep itself fully informed of all existing and future state and federal laws and all county and city ordinances and regulations which in any manner affect those employed by it or in any way affect the performance of services pursuant to this Agreement. Contractor shall at all times observe and comply with all such laws, ordinances, and regulations and shall be responsible for the compliance of all work and services performed by or on behalf of Contractor. When applicable, Contractor shall not pay less than the prevailing wage, which rate is determined by the Director of Industrial Relations of the State of California.

3.2 Licenses, Permits, Fees and Assessments. Contractor shall obtain at its sole cost and expense all licenses, permits, and approvals that may be required by law for the performance of the services required by this Agreement. Contractor shall have the sole obligation to pay any fees, assessments, and taxes, plus applicable penalties and interest, which may be imposed by law and arise from or are necessary for Contractor's performance of the services required by this Agreement, and shall indemnify, defend, and hold harmless City against any such fees, assessments, taxes, penalties, or interest levied, assessed, or imposed against City thereunder.

3.3 Covenant against Discrimination. Contractor covenants for itself, its heirs, executors, assigns, and all persons claiming under or through it, that there shall be no discrimination against any person on account of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic

information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status of any person, in the performance of this Agreement. Contractor further covenants and agrees to comply with the terms of the Americans with Disabilities Act of 1990 (42 U.S.C. §12101 et seq.) as the same may be amended from time to time.

3.4 Independent Contractor. Contractor shall perform all services required herein as an independent contractor of City and shall remain at all times as to City a wholly independent contractor. City shall not in any way or for any purpose become or be deemed to be a partner of Contractor in its business or otherwise, or a joint venturer, or a member of any joint enterprise with Contractor. Contractor shall not at any time or in any manner represent that it or any of its agents or employees are agents or employees of City. Neither Contractor nor any of Contractor's employees shall, at any time, or in any way, be entitled to any sick leave, vacation, retirement, or other fringe benefits from the City; and neither Contractor nor any of its employees shall be paid by City time and one-half for working in excess of forty (40) hours in any one week. City is under no obligation to withhold State and Federal tax deductions from Contractor's compensation. Neither Contractor nor any of Contractor's employees shall be included in the competitive service, have any property right to any position, or any of the rights an employee may have in the event of termination of this Agreement.

3.5 Covenant against Contingent Fees. Contractor warrants that it has not employed or retained any company or person other than a bona fide employee working for Contractor, to solicit or secure this Agreement and that it has not paid or agreed to pay any company or person any fee, commission, percentage, brokerage fee, gift, or any other consideration contingent upon, or resulting from, the award or making of this Agreement. For breach or violation of this warranty, City shall have the right to annul this Agreement without liability or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

3.6 Use of Patented Materials. Contractor shall assume all costs arising from the use of patented or copyrighted materials, including but not limited to equipment, devices, processes, and software programs, used or incorporated in the services or work performed by Contractor under this Agreement. Contractor shall indemnify, defend, and save the City harmless from any and all suits, actions or proceedings of every nature for or on account of the use of any patented or copyrighted materials consistent with Section 2.2 herein.

3.7 Proprietary Information. All proprietary information developed specifically for City by Contractor in connection with, or resulting from, this Agreement, including but not limited to inventions, discoveries, improvements, copyrights, patents, maps, reports, textual material, or software programs, but not including Contractor's underlying materials, software, or know-how, shall be the sole and exclusive property of City, and are confidential and shall not be made available to any person or entity without the prior written approval of City. Contractor agrees that the compensation to be paid pursuant to this Agreement includes adequate and sufficient compensation for any proprietary information developed in connection with or resulting from the performance

of Contractor's services under this Agreement. Contractor further understands and agrees that full disclosure of all proprietary information developed in connection with, or resulting from, the performance of services by Contractor under this Agreement shall be made to City, and that Contractor shall do all things necessary and proper to perfect and maintain ownership of such proprietary information by City.

3.8 Retention of Funds. Contractor hereby authorizes City to deduct from any amount payable to Contractor (whether arising out of this Agreement or otherwise) any amounts the payment of which may be in dispute hereunder or which are necessary to compensate City for any losses, costs, liabilities, or damages suffered by City, and all amounts for which City may be liable to third parties, by reason of Contractor's negligent acts, errors, or omissions, or willful misconduct, in performing or failing to perform Contractor's obligations under this Agreement. City in its sole and absolute discretion, may withhold from any payment due Contractor, without liability for interest, an amount sufficient to cover such claim or any resulting lien. The failure of City to exercise such right to deduct or withhold shall not act as a waiver of Contractor's obligation to pay City any sums Contractor owes City.

3.9 Termination by City. City reserves the right to terminate this Agreement at any time, with or without cause, upon written notice to Contractor. Upon receipt of any notice of termination from City, Contractor shall immediately cease all services hereunder except such as may be specifically approved in writing by City. Contractor shall be entitled to compensation for all services rendered prior to receipt of City's notice of termination and for any services authorized in writing by City thereafter. If termination is due to the failure of Contractor to fulfill its obligations under this Agreement, City may take over the work and prosecute the same to completion by contract or otherwise, and Contractor shall be liable to the extent that the total cost for completion of the services required hereunder, including costs incurred by City in retaining a replacement contractor and similar expenses, exceeds the Budget.

3.10 Right to Stop Work; Termination by Contractor. Contractor shall have the right to stop work and terminate only if City fails to timely make a payment required under the terms of the Budget. Contractor shall provide City thirty (30) day prior written notice of such claimed payment owed and City shall have an opportunity to remedy any such claimed breach during such time with no legal consequence to City. Contractor shall immediately cease all services hereunder following the thirty (30) day notice, except such services as may be specifically approved in writing by City. Contractor shall be entitled to compensation for all services rendered prior to termination and for any services authorized in writing by City thereafter. If Contractor terminates this Agreement because of an error, omission, or a fault of Contractor, or Contractor's willful misconduct, the terms of Section 3.9 relating to City's right to take over and finish the work and Contractor's liability shall apply.

3.11 Waiver. No delay or omission in the exercise of any right or remedy by a nondefaulting party with respect to any default shall impair such right or remedy or be construed as a waiver. A party's consent to or approval of any act by the other party requiring the party's consent or approval shall not be deemed to waive or render

unnecessary consent to or approval of any subsequent act. A waiver by either party of any default must be in writing.

3.12 Legal Actions. Legal actions concerning any dispute, claim, or matter arising out of or in relation to this Agreement shall be instituted and maintained in the Superior Courts of the State of California in the County of Orange, or in any other appropriate court with jurisdiction in such County, and Contractor agrees to submit to the personal jurisdiction of such court.

3.13 Rights and Remedies are Cumulative. Except as may be expressly set forth in this Agreement, the rights and remedies of the parties are cumulative and the exercise by either party of one or more of such rights or remedies or other rights or remedies as may be permitted by law or in equity shall not preclude the exercise by such party, at the same or different times, of any other rights or remedies to which such party may be entitled.

3.14 Attorneys' Fees. In any action between the parties hereto seeking enforcement of any of the terms or provisions of this Agreement or in connection with the performance of the work hereunder, the party prevailing in the final judgment in such action or proceeding, in addition to any other relief which may be granted, shall be entitled to have and recover from the other party its reasonable costs and expenses, including, but not limited to, reasonable attorney's fees, expert witness fees, and courts costs. If either party to this Agreement is required to initiate or defend litigation with a third party because of the violation of any term or provision of this Agreement by the other party, then the party so litigating shall be entitled to its reasonable attorney's fees and costs from the other party to this Agreement.

3.15 Force Majeure. The time period specified in this Agreement for performance of services shall be extended because of any delays due to unforeseeable causes beyond the control and without the fault or negligence of City or Contractor, including, but not restricted to, acts of nature or of the public enemy, unusually severe weather, fires, earthquakes, floods, epidemics, quarantine restrictions, riots, strikes, freight embargoes, wars, litigation, and/or acts of any governmental agency, including City, if the delaying party shall within ten (10) days of the commencement of such delay notify the other party in writing of the causes of the delay. If Contractor is the delaying party, City shall ascertain the facts and the extent of delay, and extend the time for performing the services for the period of the enforced delay when and if in the judgment of City such delay is justified. City's determination shall be final and conclusive upon the parties to this Agreement. In no event shall Contractor be entitled to recover damages against City for any delay in the performance of this Agreement, however caused. Contractor's sole remedy shall be extension of this Agreement pursuant to this Section 3.15.

3.16 Non-liability of City Officers and Employees. No officer, official, employee, agent, representative, or volunteer of City shall be personally liable to Contractor, or any successor in interest, in the event of any default or breach by City, or for any amount which may become due to Contractor or its successor, or for breach of any obligation of the terms of this Agreement.

3.17 Conflicts of Interest.

A. No officer, official, employee, agent, representative or volunteer of City shall have any financial interest, direct or indirect, in this Agreement, or participate in any decision relating to this Agreement that affects his or her financial interest or the financial interest of any corporation, partnership, association or other entity in which he or she is interested, in violation of any federal, state or city statute, ordinance or regulation. Contractor shall not employ any such person while this Agreement is in effect.

B. Contractor represents, warrants and covenants that he, she or it presently has no interest, direct or indirect, which would interfere with or impair in any manner or degree the performance of Contractor's obligations and responsibilities under this Agreement. Contractor further agrees that while this Agreement is in effect, Contractor shall not acquire or otherwise obtain any interest, direct or indirect, that would interfere with or impair in any manner or degree the performance of Contractor's obligations and responsibilities under this Agreement.

C. Contractor acknowledges that pursuant to the provisions of the Political Reform Act (Government Code section 87100 *et seq.*), City may determine Contractor to be a "Consultant" as that term is defined by the Act. In the event City makes such a determination, Contractor agrees to complete and file a "Statement of Economic Interest" with the City Clerk to disclose such financial interests as required by City. In such event, Contractor further agrees to require any other person doing work under this Agreement to complete and file a "Statement of Economic Interest" to disclose such other person's financial interests as required by City.

3.18 Contractor Ethics. Contractor represents and warrants that it has not provided or promised to provide any gift or other consideration, directly or indirectly, to any officer, employee, or agent of City to obtain City's approval of this Agreement. Contractor shall not, at any time, have any financial interest in this Agreement or the project that is the subject of this Agreement other than the compensation to be paid to Contractor as set forth in this Agreement. In the event the work and/or services to be performed hereunder relate to a project and/or application under consideration by or on file with the City, (i) Contractor shall not possess or maintain any business relationship with the applicant or any other person or entity which Contractor knows to have a personal stake in said project and/or application, (ii) other than performing its work and/or services to City in accordance with this Agreement Contractor shall not advocate either for or against said project and/or application, and (iii) Contractor shall immediately notify City in the event Contractor determines that Contractor has or acquires any such business relationship with the applicant or other person or entity which has a personal stake in said project and/or application. The provisions in this Section shall be applicable to all of Contractor's officers, directors, employees, and agents, and shall survive the termination of this Agreement.

3.19 Compliance with California Unemployment Insurance Code Section 1088.8. If Contractor is a Sole Proprietor, then prior to signing the Agreement, Contractor shall provide to the City a completed and signed Form W-9, Request for

Taxpayer Identification Number and Certification. Contractor understands that pursuant to California Unemployment Insurance Code Section 1088.8, the City will report the information from Form W-9 to the State of California Employment Development Department, and that the information may be used for the purposes of establishing, modifying, or enforcing child support obligations, including collections, or reported to the Franchise Tax Board for tax enforcement purposes.

3.20 CalPERS Annuitants. If Contractor is a California Public Employees' Retirement System ("CalPERS") annuitant, Contractor must provide the City with written notification of such fact a minimum of 14 calendar days prior to commencement of services under this Agreement. Failure to provide such notification may result in termination of the Agreement, and any penalties or other costs relating thereto shall be borne by Contractor. If this Agreement remains in place, Contractor shall execute any amendment(s) to this Agreement requested by the City in order to comply with all laws and regulations applicable to CalPERS annuitants.

SECTION FOUR: MISCELLANEOUS PROVISIONS

4.1 Records and Reports. The City Manager of the City of Irvine or his/her designee reserves the right to perform such audits, performance reviews, and other evaluations (collectively 'audit') that relate to or concern this Agreement at any time. Contractor agrees to participate and cooperate in up to five (5) hours of meetings and interviews (at no additional cost to City), if the same are requested by the City in connection with such an audit. Further, provided that the City pays Contractor's commercially reasonable hourly rate for services, Contractor agrees to participate and cooperate in such additional meetings and interviews (in excess of five (5) hours), if the same are requested by the City in connection with such an audit. Upon request by City, Contractor shall prepare and submit to City any reports concerning Contractor's performance of the services rendered under this Agreement. City shall have access, with 72 hours advance written notice delivered to Contractor, to the books and records of Contractor related to Contractor's performance of this Agreement in the event any audit is required. All drawings, documents, and other materials prepared by Contractor in the performance of this Agreement (i) shall be the property of City and shall be delivered at no cost to City upon request of City or upon the termination of this Agreement, and (ii) shall not be made available to any individual or entity without prior written approval of City. The obligations of this Section 4.1 shall survive the expiration (or earlier termination) of this Agreement for a period of three (3) years. During said three (3) year period, Contractor shall keep and maintain all records and reports related to this Agreement, and City shall have access to such records in the event any audit is required.

4.2 Notices. Unless otherwise provided herein, all notices required to be delivered under this Agreement or under applicable law shall be personally delivered, or delivered by United States mail, prepaid, certified, return receipt requested, or by reputable document delivery service that provides a receipt showing date and time of delivery. Notices personally delivered or delivered by a document delivery service shall be effective upon receipt. Notices delivered by mail shall be effective at 5:00 p.m. on the

second calendar day following dispatch. Notices to the City shall be delivered to the following address, to the attention of the City Representative set forth in Paragraph D.1 of the Fundamental Terms of this Agreement:

To City: City of Irvine
One Civic Center Plaza (92606) (Hand Deliveries)
P. O. Box 19575
Irvine, CA 92623-9575

Notices to Contractor shall be delivered to the address set forth below Contractor's signature on Part I of this Agreement, to the attention of Contractor's Representative set forth in Paragraph D.2 of the Fundamental Terms of this Agreement. Changes in the address to be used for receipt of notices shall be effected in accordance with this Section 4.2.

4.3 Construction and Amendment. The terms of this Agreement shall be construed in accordance with the meaning of the language used and shall not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction which might otherwise apply. The headings of sections and paragraphs of this Agreement are for convenience or reference only, and shall not be construed to limit or extend the meaning of the terms, covenants and conditions of this Agreement. This Agreement may only be amended by the mutual consent of the parties by an instrument in writing.

4.4 Severability. Each provision of this Agreement shall be severable from the whole. If any provision of this Agreement shall be found contrary to law, the remainder of this Agreement shall continue in full force.

4.5 Authority. The person(s) executing this Agreement on behalf of the parties hereto warrant that (i) such party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said party, (iii) by so executing this Agreement, such party is formally bound to the provisions of this Agreement, and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which said party is bound.

4.6 Special Provisions. Any additional or supplementary provisions or modifications or alterations of these General Provisions shall be set forth in Part III of this Agreement ("Special Provisions").

4.7 Precedence. In the event of any discrepancy between Part I ("Fundamental Terms"), Part II ("General Provisions"), Part III ("Special Provisions"), Part IV ("Scope of Services"), and/or Part V ("Budget") of this Agreement, the order of precedence shall be as follows.
Part III
Part II
Part IV
Part V
Part I

PART III

SPECIAL PROVISIONS

1) **Business License Requirement.** Contractors who provide services for the City of Irvine within the city limits of Irvine shall obtain, within five (5) days of executing this Agreement and prior to commencing any work herein, a City of Irvine business license and shall maintain a current business license throughout the term of this Agreement.

PART IV

SCOPE OF SERVICES

Services shall be performed as set forth below and in accordance with ATTACHMENT I (to be inserted after contract award).

PART V

BUDGET

Pricing shall be as set forth below and in accordance with ATTACHMENT II (to be inserted after contract award).

Included in the total compensation are all ordinary and overhead expenses incurred by Contractor and its agents and employees, including meetings with City representatives, and incidental costs incurred in performing under this Agreement. The total compensation for the Scope of Services set forth herein **shall not exceed $_____**, including all amounts payable to Contractor for its overhead, payroll, profit, and all costs of whatever nature, including without limitation all costs for subcontracts, materials, equipment, supplies, and costs arising from or due to termination of this Agreement.

No work shall be performed in connection with this Agreement until the receipt of a signed City of Irvine Purchase Order; and no work shall be performed with a value in excess of the Purchase Order amount as the City has not authorized nor is it obligated to pay Contractor any such excess amount.

In the event Contractor anticipates the potential need to perform services beyond those set forth herein where additional funding may be needed, Contractor shall notify City in writing allowing sufficient time for City to consider further action.

Payment for services will be made monthly on invoices deemed satisfactory to the City, with payment terms of net 30 days upon receipt of invoice. Contractor shall submit invoices within fifteen (15) days from the end of each month in which services have been provided. Contractor shall provide invoices with sufficient detail to ensure compliance with pricing as set forth in this Agreement. The information required may include: date(s) of work, hours of work, hourly rate(s), and material costs.

The Purchase Order number must be included on all invoices, along with the City Representative's name. Failure to include this information on the invoice shall result in the return of the unpaid invoice.

Contractors should submit invoices electronically to:

invoicesubmittal@cityofirvine.org

Payment by City under this Agreement shall not be deemed as a waiver of the City's right to claim at a later point that such payment was not due under the terms of this Agreement.

Pricing shall remain firm for the entire one (1) year Agreement term. Thereafter, any proposed pricing adjustment for follow-on renewal periods shall be submitted to the City Representative in writing at least ninety (90) days prior to the new Agreement term. The City reserves the right to negotiate any proposed pricing adjustment not to exceed the

Bureau of Labor Statistics Consumer Price Index (CPI) data as follows: Los Angeles-Riverside-Orange County, CA; All Items; Not Seasonally Adjusted; annualized change comparing the most recent month's reported data to the same month of the prior year. (This information may be found on the U.S. Department of Labor's website at www.bls.gov.)

Exhibit I

WORKERS' COMPENSATION INSURANCE CERTIFICATION

Contract Services Description:_____

WORKERS' COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

(CHECK ONE APPLICABLE BOX BELOW)

☐ **I have and will maintain workers' compensation insurance**, as required by Section 3700 of the Labor Code, for the performance of the work to be performed under this Agreement and shall submit insurance certificates evidencing such coverage as set forth herein.

☐ I certify that, in the performance of the work under this Agreement, **I shall not employ any person** in any manner so as to become subject to the workers' compensation laws of California, and I hereby agree to indemnify, defend, and hold harmless the City of Irvine and all of its officials, employees, and agents from and against any and all claims, liabilities, and losses relating to personal injury or death, economic losses, and property damage arising out of my failure to provide such worker's compensation insurance. I further agree that, **if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions and immediately furnish insurance certificates** evidencing such coverage as set forth herein.

WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

Dated:	
Contracting Firm:	
Signature:	
Title:	
Address:	

EXHIBIT I

City of Irvine Energy Plan

FINAL

Approved on July 8, 2008

Acknowledgements

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***

Written comments on the Interim Draft Report were also provided by Mwirigi Imungi of The Energy Coalition.

Project Consultants

HDR/Brown Vence & Associates (HDR/BVA) provides energy and solid waste consulting services to local government and other clients. The offices are located at 115 Sansome Street, Suite 800, San Francisco, CA 94104-3622.

HDR/BVA Project Staff

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Table of Contents

EXECUTIVE SUMMARY 8

SECTION 1 – INTRODUCTION.....11
1.1 – City of Irvine's Efforts
1.2 – The Process
1.3 – The General Approach

SECTION 2 – ENERGY USE IN MUNICIPAL FACILITIES. 19
2.1 – Municipal Energy Use
2.2 – Where Energy is Consumed
2.3 – Energy Efficiency
2.4 – Current Energy Programs and Policies

SECTION 3 – CITYWIDE ENERGY USE 32
3.1 – Overall Energy Use
3.2 – Energy Efficiency Initiatives Citywide
3.3 – Current Utility Energy Efficiency Investment

SECTION 4 – OTHER AGENCIES' GOALS 40
4.1 – Federal Government
4.2 – Local Utilities
4.3 – State of California
4.4 – US Conference of Mayors and US Green Building Council
4.5 – Local Agencies

SECTION 5 – IRVINE ENERGY PLAN GOALS 52
5.1 – Community Participation
5.2 – Energy Efficiency
5.3 – Transition to Renewable Energy
5.4 – Greenhouse Gas Emissions

SECTION 6 – NEXT STEPS.....56
6.1 – Step 1: Create an Energy Management Team
6.2 – Step 2: Calculate Greenhouse Gas Emissions Baseline
6.3 – Step 3: Track and Monitor Progress
6.4 – Step 4: Energy Program Financing
6.5 – Step 5: Initiate 100 Percent Irvine Campaign
6.6 – Step 6: Summary of Next Steps

SECTION 7- MUNICIPAL IMPLEMENTATION STRATEGIES.....66
7.1 – Existing Municipal Facilities
7.2 – New Municipal Facilities
7.3 – Transportation

SECTION 8 – CITYWIDE IMPLEMENTATION STRATEGIES 74
8.1 – Commercial/Industrial Sector
8.2 – Citywide Transportation
8.3 – Residential Sector

Appendix A – Energy Demand Data for Irvine 83

Appendix B – Emerging Energy Technologies.....85

Appendix C – Additional Resources.....97

List of Tables

Table 1: Municipal Energy Use by End Use 20
Table 2: Annual Energy Use Top Energy-Using Municipal Facilities. 22
Table 3: Municipal Vehicle Types..... 23
Table 4: Annual Municipal Fuel Purchases 23
Table 5: Energy Use per Square Foot..... 25
Table 6: Additional Potential Opportunities 29
Table 7: Electric Account Summary 33
Table 8: Southern California Edison Power Content 35
Table 9: Summary of SCE 2006 Program Spending and Savings 38
Table 10: Next Steps in Implementing the Energy Plan 65
Table 11: Municipal Implementation Strategies..... 71
Table 12: Citywide Implementation Strategies 81

List of Figures

Figure 1: Municipal Energy Use by Major End Use 19
Figure 2: Breakdown of Citywide Energy Use 32
Figure 3: Monthly Citywide Electricity Usage 34
Figure 4: Irvine Citywide Gas Usage..... 36
Figure 5: Gasoline Gallons and Population 37
Figure 6: Vehicle Miles Traveled in Irvine..... 37
Figure 7: The Gas Company Energy Efficiency Results in 2006..... 39

Executive Summary

The City of Irvine has a long tradition of environmental stewardship and planning for the future. It has taken many bold steps in its 36-year history to preserve the quality of life through setting aside open space, protecting the environment, and developing or participating in programs to conserve energy. It has also consistently planned for the future through installing reclaimed water systems to conserve potable water and enforcing development standards for fire protection such as fire resistant landscaping and building features that help prevent the spread of fire. Sustainability, smart growth, green building, conservation, and recycling have all become increasingly important issues for local governments. Irvine stands at the forefront of many of the environmental programs and policies being developed to address these issues, including the creation of this Energy Plan for the City.

The Energy Plan began with the Planning Commission's request to City Council to implement the policies of the Energy Element of the General Plan. In September 2005, City Council directed two Planning Commissioners to work with staff to develop energy standards and policies to guide the City in achieving its long-term objectives to be a leader in energy efficiency, the use of renewable energy, and reducing carbon emissions. The Energy Plan serves as the first step in tackling these objectives by presenting the current energy situation, defining goals, listing the next steps to be taken, and presenting strategies and policies to meet the goals.

The Energy Plan consists of eight sections. The first section presents an introduction to the Energy Plan's development as well as provides an overview of global climate change, including the need for adaptability and carbon emission reductions, and the significant role that energy plays when discussing dealing with global climate change and its affects.

Sections 2 and 3 assess municipal and citywide energy use, respectively. When comparing the two, it becomes apparent that the municipal facilities and fleet represent very little of the overall energy consumed in Irvine. In fact, the City of Irvine municipal buildings consume less than 1/10 of one percent of the total energy consumed by buildings within City of Irvine boundaries. A breakdown of the total energy consumed within Irvine is approximately 40 percent electricity, 34 percent natural gas, and 26 percent gasoline. Of the electricity consumed, 72 percent is consumed by small-to-medium-sized businesses (i.e., small to medium manufacturing and processing firms, retail businesses, churches, service stations, schools, and restaurants), 16 percent is consumed by residential and 10 percent by large commercial and industrial.

Section 4 describes energy plans at the federal, state and local level, and describes which goals are being set by other California government agencies, the state of California, and the US Conference of Mayors. This helps set the

stage for the Energy Plan goals for the City of Irvine. The rapidly growing concerns about reducing climate changing emissions, the majority of which are associated with the generation and use of energy in buildings and in transportation, are a major influence on the development of both California's and the Conference of Mayors' energy goals.

The driving force for the State of California is Assembly Bill 32 (AB 32) which was signed by the Governor in 2006. AB 32, known as *The Global Warming Solutions Act*, sets a goal for carbon emissions to be reduced to 1990 levels by year 2020. The implementation actions for AB 32 have not yet occurred, but the state agencies that can affect AB 32 goals best--the California Energy Commission, the Attorney General's Office, and the California Air Resources Board--are currently conducting public meetings to help determine what those actions will be.

Section 5 sets out four goals for the City of Irvine. In keeping with Irvine's history of leadership, the intent of the goals is to match or exceed the State's energy and emissions reduction goals for California. The year 2020 timeframe for the goals was designed to align with that of the State of California.

- The first goal of the Plan is to involve 100 percent of Irvine residents and businesses in reducing energy consumption and thus, reduce carbon emissions. Ensuring widespread participation will require that all sectors of the community are well-informed about energy issues and enabled to take action to change their day-to-day energy use practices.

- The second goal is to increase the energy efficiency in buildings to reduce building energy use to 30 percent by the year 2015. Existing buildings present a major challenge and cannot be ignored since they already represent a very high percentage of the building stock in Irvine, and will continue to consume energy for years to come.

- The third goal is to transition new buildings Citywide to renewable energy. This can be done directly with solar panels, solar water heating and small wind turbines. It will also be occurring, indirectly, as Southern California Edison moves to produce more of its electricity using renewable resources per California Public Utility Commission mandates. Together, the goal for renewable energy use by new buildings is achievable.

- The fourth goal is to reduce greenhouse gas emissions Citywide to 1990 levels by 2020, in accordance with AB 32. Achievements in the previous three goals will contribute greatly to this goal. There will also likely be measures mandated statewide. Achieving this goal will demonstrate the City of Irvine's leadership by reducing emissions within its own boundaries to meet the state's goal.

Successful implementation of all these goals will require that they be fully

supported politically and by community and business leaders. The goals will need to become fully integrated into the day-to-day activities within city governments, businesses, and homes.

Section 6 discusses the steps the City should take once it adopts the Energy Plan goals. For example, the City should establish an Energy Management Team to provide guidance and direction on project implementation. The team should have City staff at its core and include, as appropriate to the strategy, members of the community, such as Irvine Unified School District, University of California, Irvine, Chamber of Commerce, The Irvine Company, etc.

Sections 7 and 8 list strategies that can be employed separately and in combination to achieve the goals listed above. Section 7 addresses strategies for municipal facilities and fleet; Section 8 addresses strategies Citywide. The highest priority for the City will be to implement the strategies for its own facilities, operations, and fleet prior to encouraging the community to do the same.

No single strategy will achieve the ambitious energy and emissions reduction goals set forth in this Plan; instead, a wide range of strategies will have to be employed in order to meet the Energy Plan goals within the proposed timeframes.

Included in the Energy Plan are three appendices. Appendix A provides more in-depth information on Irvine's energy use patterns, Appendix B provides an overview of current and anticipated developments in low carbon energy technologies, and Appendix C provides resources for additional information.

SECTION 1 – INTRODUCTION

In recent decades the earth's average temperature has been rising. Recognizing that this warming could have severe consequences for the natural environment, the economy, and public health within several decades, 141 countries codified the Kyoto Treaty in February 2005, the international agreement to address climate change. In a February 2007 report, the Intergovernmental Panel on Climate Change (IPCC) stated that the main cause of this warming has been determined, with greater than 90 percent accuracy, to be the emissions of greenhouse gases (GHGs) from human activities[1].

The same year 141 countries were codifying the Kyoto Treaty, the US Conference of Mayors created the US Mayors Climate Protection Agreement to demonstrate the leadership and commitment of mayors around the country. The Mayor of Irvine, Beth Krom, signed the Agreement in April 2005 and it was endorsed by mayors from around the country through a resolution in June 2005.

In September 2006, California's governor signed into law Assembly Bill 32 (AB 32), the "Global Warming Solutions Act of 2006." State officials are aware that the impacts of climate change in California are likely to be many and varied, and will affect all sectors of the economy. For example, higher average temperatures are likely to lead to more air-conditioning use, which will lead to an increased demand for energy, and as a result, new power plants will need to be constructed. Inevitably, this may mean higher energy costs in order to pay for those additional power plants.

Reduced snow pack [2] from higher temperatures will result in reduced hydro-electric generation and add to the state's need for additional electricity generation. This will also obviously have a major influence on the state's water management practices. In addition, a range of other non-energy impacts are anticipated, including impacts on agriculture, fisheries, and wildlife; increased likelihood of forest fires; damage to buildings and infrastructure, especially low-lying roads, bridges, levees, sewage treatment plants, etc; increases in insect-borne diseases; and impacts on those least able to adapt, including the elderly, infirm, and the very young.

The reaction to climate change should be twofold. First, to prepare and adapt to the myriad of impacts brought on by climate change, and second, to reduce the GHG emissions that are likely contributing to climate change. Because of its geographic location, the adaptation strategies for Irvine will include addressing water shortages, increased wildfires, and changes to flora and fauna. Together that will create imbalances in the natural environment that will make it difficult to

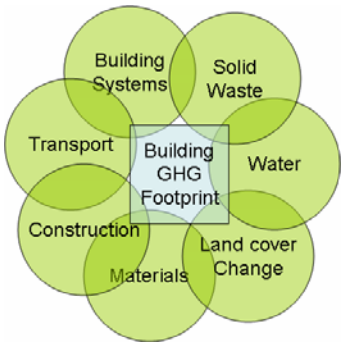
[1] The Intergovernmental Panel on Climate Change was created in 1988 by the United Nations Environmental Programme and the World Meteorological Society to study the causes of climate change.
[2] Some estimates of the possible decline in California snow pack run as high as 70 percent reduction over the next 100 years according to California EPA..

predict exactly how that will affect the health and safety of the community. Reducing GHG emissions by increasing energy efficiency and diversifying to renewable energy resources will also help the community to conserve monetary resources and adapt to an increasingly expensive carbon fuel based economy.

AB 32 formally commits the state to reduce its GHG emissions to 1990 levels by 2020 through an enforceable statewide emissions cap. A major influence on the development of State [3] and other energy goals is the direct correlation between climate-changing GHG emissions and the generation and use of energy, either in buildings or in transportation.

A community, such as the City of Irvine, is a nexus of multiple GHG emission sources including:

- Buildings (air-conditioning, heating, equipment)
- Transportation (direct and indirect emissions)
- Street and exterior lighting (electricity use)
- Water use (embodied energy)
- Landscaping (water and maintenance)
- Solid waste (embodied energy)
- Construction materials (embodied energy)
- Land use/land cover change (sequestration)



[3] Refer to, for example, the "California Climate Action Team Report to Governor Schwarzenegger and the California Legislature" issued by California Environmental Protection Agency, (EPA) March 2006.

1.1 – City of Irvine's Efforts

The objectives of creating this Energy Plan are to eliminate energy waste, improve the efficiency with which energy is used, encourage the use of renewable energy, such as the sun and wind, and increase awareness of energy issues in Irvine. Defined energy goals at a local level will provide City decision makers and the community with a clear direction for Irvine's energy management efforts. Goals also provide milestones against which the City's efforts can be evaluated.

The Energy Plan will serve as a road map for integrating comprehensive alternative strategies into the community in ways that make economic sense and help the City in adapting to the changing climate. The plan will take into account the relevant incentive programs and technological resources of the local utilities and other public agencies. The plan presents strategies and provides a starting point for pursuing funding opportunities from outside groups, such as utility companies, the State, and/or the Federal Government. The Energy Plan could also serve as the starting point for a cohesive energy program, which would include implementation elements such as inspection, education, measurement, monitoring, and verification.

Many aspects of the current energy systems in Irvine and elsewhere are not sustainable over the long term. They are dependent upon non-renewable resources drawn from the natural environment and once consumed, they are gone forever. In contrast, sustainable systems draw, from the environment, only those resources that are necessary and that can be used perpetually, or that can be recycled back into the environment in a form that nature can use to generate more resources. As resources such as water and crude oil become scarcer, communities will suffer, unless they consciously move to a more sustainable economy.

The City of Irvine has already taken proactive steps to address energy issues and adaptability through a number of programs and policies, including the Irvine Redevelopment Agency's Plan to develop a sustainable community in the Orange County Great Park Redevelopment Project Area, the creation of a "Green Team" to address collaboration in achieving sustainability in the Great Park and the Great Park Neighborhoods, regulations in the City's Zoning and Building Code that address wildfire protection, the City's adoption of a voluntary green building program in 2006, the City's aggressive recycling efforts culminating in the adoption of a Zero Waste Ordinance in 2007, and the distribution of 60,000 compact fluorescent light bulbs to the community to, both, reduce energy use and GHG emissions, and to educate people on these issues.

The City's earliest efforts at energy efficiency and sustainability can be traced back to the early 1990s, when it began its association with John Phillips and his non-profit organization called The Energy Coalition (formerly The California

Energy Coalition). Through The Energy Coalition's Aspen Accord, early partnerships were forged among the utilities, Southern California Edison and The Gas Company, and the City. These partnerships resulted in energy savings projects for the City, the creation of the PEAK energy efficiency education program in Irvine schools, and have evolved into the current Community Energy Partnership.

The seeds of change were being planted in the City's General Plan around the same time. During an update of the General Plan, the Land Use, Transportation, and Waste Management Elements were enhanced to include objectives that embraced sustainable concepts. Additionally, the City added an Energy Element to the General Plan and the Sustainability Landscaping Guideline Manual was published. This Energy Plan is a direct result of the City's Energy Element. It was a request by the City's Planning Commission to the City Council to implement the policies contained in the General Plan's Energy Element. This resulted in the City Council's decision in September 2005 to direct staff to prepare this Energy Plan.

1.2 – The Process

In late January 2007, a request for proposals was issued for a consultant to assist in preparing an energy plan for the City that will guide it in achieving its long-term objective of being a leader on energy efficiency, the use of renewables, and carbon emissions reductions. Specifically, the consultant was to be responsible for delivering a draft Energy Plan that characterizes current energy use, presents long-term goals for the City's consideration, and proposes strategies for achieving the goals. Once the Plan was adopted, the consultant was to assist in defining metrics and methodologies to monitor progress.

HDR/Brown Vence & Associates (HDR/BVA) was hired in early March 2007 to work on the Energy Plan. The first step was to gather the energy use data from the utility companies and compile it in an easy to read format. This Plan details current energy use for City-owned and leased facilities, vehicles, and equipment. It also details current energy use citywide for residential, commercial, institutional, and other governmental facilities.

A Technical Working Group was formed to provide ideas and feedback on the development of the Energy Plan. The Technical Working Group is composed of representatives of the Irvine Planning Commission, City staff, Irvine Chamber of Commerce, University of California, Irvine, the local utilities, and local experts in sustainability and energy issues. After reviewing goals set by other local agencies, the State of California, the US Conference of Mayors, and the International Council for Local Government Initiatives (ICLEI), this Plan lays out proposed goals for the City of Irvine.

Once the City Council has approved the Energy Plan, staff can move forward with developing proposed programs and budgets to bring back to the City Council for its approval.

1.3 – The General Approach

There is no single approach available to meet the goals outlined in The Energy Plan; instead, a wide range of strategies will have to be employed. The first step is to greatly improve the efficiency with which energy is being used both in buildings and for transportation. For buildings and other facilities, improved efficiency must then be followed by a transition from energy produced from fossil fuels, over to renewable energy resources such as solar and wind. The renewable energy will likely be a combination of on-site generated energy with off-site generated energy in order to fully support facility operations.

For transportation, reduced dependency on cars, more efficient vehicles, alternative fuel vehicles, and much greater use of transportation alternatives such as mass transit (e.g., rail, shuttle systems, and buses), car and van pools, bicycling, and walking, will be necessary.

Many of the strategies recommended reducing energy and greenhouse gas emissions have initial costs associated with them, but there will also be economic benefits. A 2006 study at University of California, Berkeley on economic growth and greenhouse gas mitigation found that reducing CO_2 emissions to 1990 levels by 2020 would result in $74 billion being added into the state's economy.[4] Similarly, a study for the United Kingdom Treasury on the global impacts of climate change, found that climate change was likely to reduce global gross domestic product (GDP) by about 5 to 20 percent each year over the coming decades. Mitigating the most serious impacts of climate change will cost only about 1 percent of global GDP each year.[5] Closer to home, a study for Santa Barbara County, using a scenario in which the county produced the equivalent of 100 percent of its energy needs from a mix of renewable resources and energy efficiency, found that the county would save $418 million annually or about $830 per resident each year by 2020 and $3,015 each year by 2030[6].

For business owners reducing energy use, reusing materials, whenever possible, and conserving resources will be cost-savings strategies. Replacing fossil fuels with renewable alternatives will have an initial cost, but will save money over the long term. As power becomes more decentralized in the form of solar panels, fuel cells, and wind energy, businesses will also be able to increase the reliability of their power supply. This will become an especially important economic adaptation as fossil fuels become scarcer, and supply becomes more intermittent causing disruptions in service.

1.3.1 *Reducing Building Energy Use*

To reduce energy use and emissions from both existing and new buildings and to

[4] David Roland-Holst, U.C. Berkeley. "Economic Growth and Greenhouse Gas Mitigation in California." August 2006

[5] Sir Nicholas Stern, former chief economist of the World Bank, Head of the U.K. Government Economics Service and Adviser to the Government on the economics of climate change and development, London, UK "Stern Review Report on the Economics of Climate Change", October 30, 2006

[6] Santa Barbara Community Environmental Council, "A New Energy Direction: A Blueprint for Santa Barbara County", October 2007

move homes, schools, and other public buildings toward passive survivability[7], there are several broad sets of actions that will need to be taken.

The first and most important step is to get the fundamentals correct. For example, passive heating and cooling, correct building orientation, color and choice of materials, the use of day lighting and building integrated shading, together with natural ventilation, will all help to reduce energy use and increase the passive survivability of buildings with minimal maintenance costs.

Once the fundamental strategies have been effectively employed, then it is time to focus on the addition of high performance building technologies. These include high performance lighting systems, energy efficient appliances, solar hot water systems (solar thermal), solar electricity generation (photovoltaic), mechanized shading devices, and sophisticated control systems. At the neighborhood level, this second category would also include neighborhood scale wind, solar, and the use of bio-mass and co-generation.

Existing buildings present a major challenge; they cannot be ignored since they already represent a very high percentage of the building stock that will still be consuming energy and contributing to climate changing emissions in 2030. The focus for existing buildings must be on avoiding the unnecessary use of energy, retrofitting as many passive measures as possible (e.g., insulation, shading, cool roof coatings), improving the efficiency with which energy is used, shifting to renewable energy, and changing consumer behavior.

1.3.2 *Use More Renewable Energy*

Replacing energy derived from fossil fuels with renewable energy will enable Irvine to substantially reduce its climate changing emissions. There are two ways of accomplishing this; first, through the use of renewable energy generated on-site, for example, solar power; second, by purchasing renewable energy generated elsewhere. New buildings should all be equipped with solar or other renewable energy systems, or be designed 'solar-ready' for easy retrofitting later. Where it is technically feasible, existing buildings should also be retrofitted with solar photovoltaic and/or solar thermal systems to reduce their use of fossil fuel generated power.

Many buildings cannot easily meet their entire electricity demands through the use of on-site renewable energy systems; requiring continued energy supplies generated elsewhere. In these cases, the alternative is to purchase renewable energy generated off-site, probably well outside the city, through use of Renewable Energy Credits (RECs) or 'Green Tags.' (Refer to section 6.4.6 for

[7] Environmental Building News, December 2005, April 2008 – In a future of more intense storms that could cause extended power outages, with an ever present risk of terrorism that could target energy distribution networks, and with higher energy costs and the prospect of fuel and water shortages, it makes sense to design homes and apartment buildings – along with certain other public buildings, such as schools and community centers – so that they will maintain livable conditions in the event of extended power outages. Passive survivability can be achieved with such features as a highly insulated building envelope, passive solar design, cooling load avoidance and natural ventilation.

another scenario for RECs)

1.3.3 *Reduce Vehicle Emissions*

Over 40 percent of greenhouse gas emissions in California are from transportation. The use of lower carbon fuels, such as ethanol and biodiesel, as well as electricity and compressed natural gas (CNG), can help reduce vehicle emissions. However, since Californians rely on petroleum-based fuels for 96 percent of their transportation fuel needs; these alternative fuels still represent a very small percentage of fuel use. The California Air Resources Board has proposed a number of greenhouse gas emission reduction programs; these include regulations to reduce climate changing emissions from passenger cars and light trucks, regulations requiring the displacement of a percentage of diesel fuel by biodiesel; increased use of ethanol, and "CA H2 Net," which is a State initiative to promote the use of hydrogen as a means of diversifying California's sources of transportation fuel.

In addition to the State's initiatives, a strategy this Plan recommends is Irvine considers implementing a wide range of programs, including requesting a major behavioral shift by residents and City employees. According to the Southern California Association of Governments, 77 percent of the area's commuters currently drive alone. Residents would be encouraged to reduce the number and distance of trips they take, carpool more, ride the bus, walk, or ride a bicycle or motorcycle to work. The advantages of doing so include avoiding the need to pay expensive gas prices for commuting, as well as the cost of repairs and maintenance on vehicles. In addition, there are the non-economic benefits which include reductions in greenhouse gas emissions; reduced smog, noise, childhood asthma, water pollution, suburban sprawl, parking lots; and other changes that result from driving less. For many people, these changes may not be easy to make; reducing vehicle use remains one of the most intractable problems for cities attempting to reduce local emissions.

SECTION 2 – ENERGY USE IN MUNICIPAL FACILITIES

In this Section, the current amount of energy being used in the City of Irvine municipal (City) facilities is discussed and analyzed. This will set the stage for a later discussion about what strategies can be employed by the City to reduce that use and associated greenhouse gases.

This data has been compiled using utility records for 2006. If the City chooses, it could use this data as a baseline against which all future energy projects and programs can be measured against and compared to. Using 1990 data would be more difficult to obtain, but would correctly reflect much of the City's efforts to reduce energy use throughout the 1990s, such as building retrofits and traffic signal conversion to LEDs. Therefore, this Plan recommends that the year 1990 be used as a baseline.

The section also presents information on energy efficiency initiatives and projects that have already been undertaken by the City and, where applicable, presents energy savings achieved from those programs.

2.1 – Municipal Energy Use

In 2006, the City of Irvine municipal government used approximately 150 billion BTUs of energy in its buildings, street lights, and vehicles at a cost of $4.2 million. Of the City's annual energy expenditures, 45 percent is attributed to facility energy use (electricity and natural gas), 29 percent is for street lighting and park lighting, 5 percent is for traffic signals, and 21 percent is for fleet vehicles (refer to Figure 1 and Table 1).

Figure 1: Municipal Energy Use by Major End Use

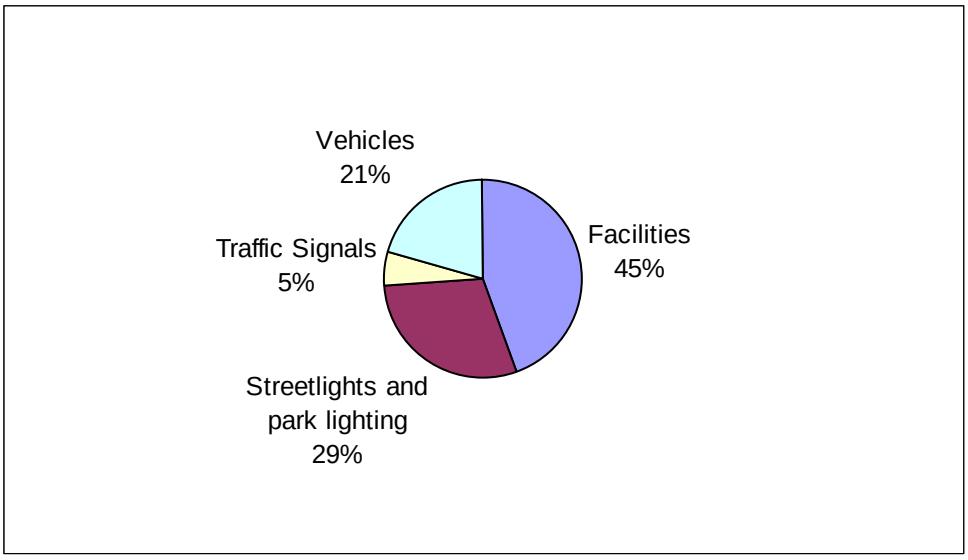


Table 1: Municipal Energy Use by End Use

Energy Type	Annual Units Consumed	Annual KBtu	Annual Cost	Percent of Cost
Electricity Use (kWh)				
Pumping (AG-TOU)	21,636	73,844	2,995	0.1%
Domestic Service	14,234	48,581	1,970	0.0%
Small facilities and irrigation (GS-1)	1,440,701	4,917,113	199,427	4.7%
Large facilities (GS-2, TOU-GS)	10,051,267	34,304,974	1,391,333	32.9%
Street and Park Lighting	8,910,571	30,411,779	1,233,434	29.2%
Traffic Control (TC-1)	1,644,578	5,612,945	227,649	5.4%
Subtotal Electricity	22,082,987	75,369,235	3,056,808	72.4%
Natural Gas (therms)	318,927	31,892,700	287,034	6.8%
Vehicles (gallons)	341,953	42,402,172	880,429	20.8%
Total		149,664,107	4,224,271	100.0%

2.1.1 *Electricity*

The City obtains its electricity from Southern California Edison (SCE). The Community Services Department pays all facility electricity bills and the Public Works Department pays for traffic signals, irrigation, and street lighting electricity bills.

The total use at the highest, or peak, time for all of the City's facilities and lights is approximately 3,000 kilowatts (kW) or 3 Megawatts (MW). Annually, all municipal facilities consume 22 million kilowatt hours (kWh) of electricity. In 2006, the highest electricity demand occurred in the months of March, May, and October probably due to higher than normal temperatures.

Municipal electricity use has increased 25 percent in the past ten years. Electricity use was 17.7 million kWh in 1997, compared to 22 million kWh in 2006. The City of Irvine's population has increased by 38 percent over approximately the same time period. Assuming there is a direct correlation between the increased energy needed to supply services and the increase in Irvine's population, a projection of municipal energy use can be made based on the projected population growth. If Irvine's population increases as planned , from the current population of about 198,000 up to about 270,000, then this 35 percent population increase may result in an increase in municipal electricity use of a further 25 percent. That would be an annual cost increase of perhaps $1 million at 2006 energy prices.

This forecast assumes that the growth rate in energy use by the City relative to population growth rate stays constant. The actual future increase in municipal energy use and costs will depend on a number of factors, for example, the standard of energy performance achieved by any new municipal facilities, and the extent to which the existing facilities can continue to adequately serve the expanding population.

2.1.2 *Natural Gas*

The City purchases natural gas from The Gas Company. Natural gas consumption is approximately 320,000 therms at an approximate cost of $290,000. The Public Works Department tracks and pays the natural gas bills. The largest users of natural gas among the City facilities are primarily the two aquatics centers, Woollett and Northwood High, where natural gas is used to heat swimming pools nearly year-round. The Fine Arts Center, where there are four natural gas kilns, also uses a considerable amount of natural gas, but not on the scale of the aquatics centers.

2.1.3 *Gasoline, Diesel and Compressed Natural Gas*

The City operates 424 vehicles which consume about 342,000 gallons of fuel (including 50,000 gasoline-equivalent gallons of compressed natural gas (CNG) annually at a cost of $880,000). Gasoline and diesel fuel is purchased through a cooperative agreement with a percentage based on rack, or wholesale, cost. CNG is purchased from Clean Energy.

2.2 – Where Energy is Consumed

2.2.1 *Buildings*

The City purchases electricity and gas for 444 facilities (based on the number of electric meters). The 22 larger facilities are buildings and parks. The 424 small facilities are irrigation meters, pumps, and traffic signals. All of the facilities are owned by the City. In the buildings, each department is charged for electricity and natural gas use based on per-square-foot of occupied space that covers the maintenance and operations cost of the building. The top ten of the City's 22 large electric and gas users account for 77 percent of the City's energy use. A list of these "top 10 electric and gas users" is provided in Table 2.

Table 2: Annual Energy Use of Top 10 Energy-Using Municipal Facilities

Building	Electricity Use (kWh)	Electricity Cost ($)	Gas Use (Therms)	Gas Cost ($)	Total Energy Cost ($)
City Hall, 1 Civic Center Plaza	4,042,939	421,166	7,984	8,521	429,687
William Woollett Jr, Aquatics Center, 4601 Walnut Ave.	1,290,720	163,593	167,443	148,938	312,531
Operations Support Facility 6427 Oak Cyn.	1,020,833	120,212	N/A	N/A	120,212
Lakeview Senior Center 20 Lake Front	722,794	89,126	N/A	N/A	89,126
Fine Arts Center 14321 Yale	265,920	39,217	16,319	16,055	55,272
4515 Portola Pkwy, Pool at Northwood High School	103,640	14,418	38,167	36,947	51,365
Heritage Park 14301 Yale	354,720	46,778	63	268	47,046
Animal Care Center, 6443 Oak Cyn	242,520	33,218	9,016	9,534	42,752
Irvine Transportation Center 15215 Barranca Pkwy	342,060	41,099	-		41,099
Turtle Rock Park/Community Center, 1 Sunnyhill Rec	252,840	36,612	N/A	N/A	36,612

The City plans to add two new community parks and one community center in the next five years. Assuming the community center and the parks are similar in energy use patterns to Turtle Rock Park Community Center, municipal energy costs for all three combined will grow by another $36,000 (2007 dollars) annually.

2.2.2 *Street, Park, and Traffic Lighting*

SCE owns and operates most of the streetlights in the City of Irvine, except for 500 lights on 150 bridges, which are owned and maintained by the City. The park lighting, which includes thousands of lights on trails in parks and green belts, is owned and operated by the City. The traffic signals are also owned and operated by the City. There is a Lighting, Landscape, and Park Maintenance Assessment that covers the entire city proper. Those assessments help to pay the electricity expenses for street lighting, park lighting, trail lighting, and the landscape maintenance of the City's parks.

2.2.3 *Fleet Vehicles*

The City owns and operates 424 vehicles and leases one electric car (refer to

Table 3). Vehicles are refueled at the Operations Support Facility and the Civic Center. Compressed natural gas is available only at the Operations Support Facility through a fueling station open to the public and leased and operated by Clean Energy. The annual mileage for the municipal fleet, including police vehicles, is about 2,941,000 miles.

Vehicle fuel use accounts for 21 percent of the City's annual energy bill. The City fleet consists of 43 compressed natural gas vehicles and 3 hybrid vehicles with the remainder being conventional automobiles, trucks, and heavy equipment. Annual fuel purchases by fuel type are listed in Table 4. The City does not track the annual mileage of individual vehicles. The average overall fuel efficiency (miles per gallon) of the City's fleet is low because it is skewed by a number of vehicles that have secondary uses, such as police and maintenance vehicles that are left idling to provide lighting, and/or power on-board equipment.

Table 3: Municipal Vehicle Types

Vehicle Type	Quantity
Heavy Duty Trucks	9
Light Duty Trucks	135
Buses	11
Vans	36
Large/Intermediate Cars (Primarily Patrol Cars)	80
Small/Compact Cars	16
Hybrid cars	3
Compressed natural gas (CNG) vehicles	43
Other (inc 7 battery-electric carts)	91
Total	424

Table 4: Annual Municipal Fuel Purchases

Fuel Type	Gallons	Cost/Gal	Total Cost
Gasoline	270,599	$2.65	$717,087
Diesel	20,920	$2.80	$58,576
Compressed Natural Gas (CNG)	50,434	$2.10	$105,911
Total	341,953		$881,575

2.3 – Energy Efficiency

Since all of the City's facilities were constructed after the introduction of the State's Title 24 Energy Code, the City's buildings have higher levels of insulation and better heating, ventilation and air-conditioning (HVAC) systems and controls relative to many older cities. In addition, the City has been implementing energy efficiency upgrades over the last 10 years. For example, a number of facilities that still have outdated T12 fluorescent lighting are currently being upgraded to more efficient systems. A more detailed description of these activities can be located in Section 2.3.2.

Street lighting and park lighting represent 29 percent of the City's total energy costs. All of the street lights are high pressure sodium lights, which is one of the more energy efficient types of lamp. Exterior lights are controlled with photocells or timers to eliminate daytime use. The City is also phasing in the use of lumen maintenance controller and group re-lamping of park lighting to improve energy efficiency (e.g., Musco "Light Structure Green").

Traffic signals account for only 5 percent of City's total energy use. To reduce the energy consumed by traffic lights, the City has already replaced incandescent red and green signals with Light Emitting Diode (LED) signals; the City will have completed the phase-in of yellow LED signals in the next two to three years. All new signal lights are required to be fully LED. The traffic signal control cabinets have also continued to evolve. While more complex control technology is being used now than in the past, the efficiency of the control systems has also improved dramatically in the last 20 years, so that the cabinets use about as much more energy as they did before.

2.3.1 *Building Efficiency*

City buildings account for 45 percent of total municipal energy use. Most of the City's buildings are relatively new. The 10 buildings with the highest energy use have all been constructed since 1978; 70 percent of the City's facilities have been built within the last 20 years.

One simple method for comparing building efficiencies is to calculate the energy use per square foot of comparable types of buildings, such as community centers and offices. Table 5 illustrates the energy use/square feet for the largest energy using facilities, excluding buildings with large process loads, such as the swimming pools and the transportation center, for which building size has no correlation to energy use.

Table 5: Energy Use per Square Foot

Building	Size (Square Feet)	Year Built	Electricity Use (kWh/ Year)	Gas Use (Therm/ Year)	Total Energy Cost ($/Year)	Total Energy Use (KBtu/ SF)	Total Cost/ SF	Comments
City Hall, 1 Civic Center Plaza	191,233	1989	4,042,939	7,984	429,687	73	2.25	Includes Police Station occupied 24 hours per day
Operations Support Facility 6427 Oak Cyn.	77,791	1984 -88	1,020,833	N/A	120,212	45	1.55	
Lakeview Sr Ctr 20 Lake Front	30,361	1993	722,794	N/A	89,126	81	2.94	Large commercial kitchen on-site
Fine Arts Center 14321 Yale	12,300	1979	265,920	16,319	55,272	74	4.49	4 gas kilns and 2 electric kilns
Heritage Park 14301 Yale	19,772	1978	354,720	63	47,046	61	2.38	
Animal Care Ctr 6443 Oak Cyn	20,670	1984	242,520	9,016	42,752	44	2.07	Hot water used for daily cleaning
Turtle Rock Park/ Community Center 1 Sunnyhill Rec	19,856	1979	252,840	N/A	36,612	43	1.84	

Unfortunately, there are no published databases of the typical energy cost per square foot of government building to compare to. This information is useful for comparing energy use among the City's own buildings. Knowing energy use per square foot is helpful in identifying buildings that may have room for improvement. For example, the Lakeview Senior Center's energy use on a square foot basis is higher than that of City Hall while the Senior Center's operating hours are lower than City Hall's. An energy audit of Lakeview Senior Center may be warranted to determine why its usage is higher. If the analysis is completed on a regular basis, change can be detected which may point to malfunctioning control systems, air leaks, or other repairable problems that are driving up energy costs. Billing errors can sometimes be detected as well.

2.3.2 *Past Energy Efficiency Projects*

Since technology is always evolving and the efficiency of buildings can degrade over time, maintaining peak energy efficiency is an ongoing process. A good municipal energy efficiency program contains the following elements:

- Track energy use
- Retrofit existing buildings with more efficient equipment and/or renewable energy
- Develop operations and maintenance practices that support energy efficiency
- Provide energy education programs for staff
- Improve efficiency in new construction
- Reduce fleet energy use

The City has implemented multiple energy efficiency projects in the last few years, some of the main achievements include:

- In 1994, the City, in partnership with SCE, The Gas Co, and The Energy Coalition, implemented an Energy Efficiency Demonstration Project at three facilities: Irvine City Hall, the Heritage Park, and Northwood Park Community Centers. That project included an upgrade from T12 to T8 lights and modifications to the HVAC systems.
- Upgraded lighting from T12 to T8 at Lakeview Senior Center, Bill Barber Park, and the Irvine Transportation Center.
- Installed occupancy sensors and programmable thermostats in most locations.
- In 2001, the City installed photocells and time clocks to control athletic field lighting energy use.
- Replaced air-conditioning units at the Operations Support Facility with new high efficiency units.
- Installed Musco "Light Structure Green" athletic field lighting at Harvard Park Fields 3, 4, and 5. This system combines lumen maintenance controls with group re-lamping to reduce energy use.
- Retrofitted all of its red and green incandescent traffic lights with LED traffic lights and has replaced 15 percent of the yellow traffic lights.

2.3.3 *On-going Energy Efficiency Projects*

Several of the ongoing energy efficiency activities include the following:

- Upgrading T12 to T8 lighting at a number of facilities in the next five years, including the Operations and Support Facility, the Fine Arts Center, the Rancho Senior Center, and the Turtle Rock Community Center.
- Installing wireless rain sensors at tennis courts to turn off lights in rainy conditions.
- Installing high SEER (Seasonal Energy Efficiency Rating) air-conditioning units as they need replacement.
- Replacing spot incandescent lamps with compact fluorescent lamps.
- Purchasing Energy Star rated appliances for community facilities.
- Continue conversion of incandescent exit signs to LED exit signs.
- Continue conversion of analog to digital timers to control exterior lighting.

At City Hall, the Information Technology (IT) department is consolidating data onto fewer machines through “data virtualization.” Vendors of virtualization and data file management software claim the potential for energy savings is 60 to 70 percent of data center energy use.

The building retrofit projects are initiated and managed by the Community Services Department and funded through the City’s General Fund Rehabilitation Program. The rehabilitation program’s budget is $3.7 million for fiscal year 2007-2008, a portion of which is being used for energy efficiency upgrades. The City typically evaluates projects on a simple payback basis and in the past has considered implementing projects with up to a 5-year payback.

2.3.4 *Planned Energy Efficiency Projects*

A number of the planned energy efficiency and renewable projects include:

- Utilizing light-colored roof coatings that reflect heat in rehabilitation projects,
- Conversion of exterior mercury vapor lights to metal halide lights,
- Investigate solar photovoltaic technology at the Operations Support Facility building No. 3,
- Installing solar photovoltaic system mounted on shade structures at the William Woollett Aquatics Center, and
- Installing a solar photovoltaic system atop the Transportation Center parking structure.

2.3.5 Additional Savings Opportunities

Based on interviews with City staff, a review of recent energy audits, and a walk-through in four facilities, HDR/Brown, Vence and Associates made observations regarding additional energy efficiency measures that may be applicable in the largest energy using buildings. The measures are presented in Table 6. A thorough energy audit is required to confirm the potential cost and savings of the measures.

Table 6: Additional Potential Opportunities

LOCATION	POTENTIAL OPPORTUNITIES
City Hall	Replace chiller inlet guide vanes with Variable Frequency Drive. Use outside air to cool data center at night. Upgrade to premium (next generation) T8 lamps and electronic ballasts in the areas with 24 hour occupancy (e.g. Police Station). Retro-commission all controls.
Aquatics Centers	Install Variable Frequency Drives on filtration pumps. Reduce rate of filtration pumping when pool is unoccupied. Install cogeneration system. Install solar water heating for the pools and/or domestic hot water, and showers depending on the load match to the panel areas.
Operations Support Facility	Replace mercury vapor and metal halide lighting fixtures with fluorescent fixtures with T8 lamps. Install skylights for Administrative Building hallways. Install translucent rolling doors to bring in more natural light into shops.
Park and Trail Lighting	Install motion-activated lighting. Solar powered fixtures in new areas to avoid need for electrical connections. Install photocell control of interior lighting for restrooms with skylights.

2.4 – Current City Energy Programs and Policies

2.4.1 *Operations and Maintenance*

Community Services Department operates and maintains all of the City buildings except the Civic Center, which is maintained under a 3-year contract with an outside maintenance firm. The City has a preventive maintenance program that utilizes a computerized system to identify service needs, which includes items such as replacing filters and checking programmable time clocks, which are important for maintaining building energy efficiency. The City also prepares facility condition assessment reports for every building indicating what equipment should be replaced and when, based on its age and repair history. The City's practice is to maintain temperatures in occupied spaces between 68 and 72 degrees during working hours.

2.4.2 *Purchasing*

The City has a green purchasing policy. However, none of the components of the policy appear to address the energy efficiency of equipment purchases.

2.4.3 *Fleet Vehicles*

The City is installing Global Positioning Satellite system (GPS) units in all new vehicles purchased and will install GPS units in all vehicles over the next three years. These units and software allow monitoring of vehicle use, miles driven, idle time, speed, and monitoring of smog control devices. This will allow for active management of vehicle use. The City has invested in three hybrid cars and 43 low-emissions CNG vehicles.

The current operating premise is that the City will purchase CNG vehicles for replacement of vehicles parked at the Operation Support Facility (the City's maintenance yard) because there is a CNG station on-site. Passenger vehicle replacement at Civic Center (non-Public Safety) will be with hybrids. Public Works and Administrative Services staff are working on annual vehicle replacement list to identify candidate vehicles and funding.

The current overall fleet efficiency is 8.6 miles per gallon. This overall fuel efficiency includes all vehicles such as maintenance vehicles and police cruisers. The fleet fuel efficiency will increase as vehicles are replaced with hybrids.

2.4.4 *Energy Education for Staff*

The City does not have an on-going program of energy education. The City has addressed the problem of staff leaving lights and HVAC units on after business hours by installing occupancy sensors and timers.

2.4.5 *New Construction*

The City passed a resolution in 2005 that requires that any new or major remodel of a municipal building over 5,000 square feet, will need to achieve a 'Leadership in Energy and Environmental Design' (LEED) certified rating. Most buildings that are LEED certified use less energy than the Title 24 code requires. [8] A recent addition to the University Park Community Center will be LEED certified. In smaller park facilities, such as small offices and restrooms, the Community Services department is making an effort to integrate energy efficiency into its operating practices. For example, the City is installing Mitsubishi Jet Towel dryers, which are expected to be 50 percent more efficient than traditional electric hand dryers in one new park. The City is also installing skylights in restrooms to reduce the need for electric lighting.

2.4.6 *Tracking Energy Use*

Electricity bills for facilities are processed by the Community Services Department and the natural gas, street lighting, traffic signal, and irrigation controller bills are processed by the Public Works Department. The City does not have an internal system for tracking and monitoring energy usage, but does receive summary reports

[8] A study by Greg Katz indicated that LEED rated buildings are on average 25 – 30% more efficient compared to a California Title 24 baseline. "The Cost and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force" 2003

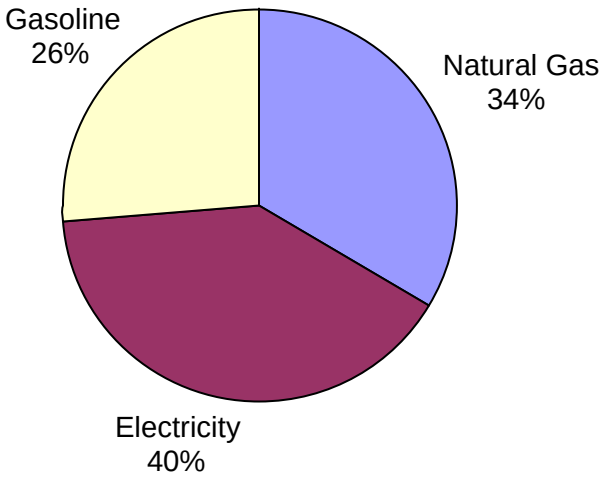
on all the electricity accounts periodically from SCE. Natural gas usage is not as well monitored. The Superintendent of Facilities has requested “Utility Manager” software as a tool to assist the City monitor its energy costs.

SECTION 3.0 – CITYWIDE ENERGY USE

3.1 – Overall Energy Use

Residential, commercial, municipal, and transportation activities within the city limits of the City of Irvine (Irvine) in 2006 collectively used approximately 18,500 billion BTUs (or 18.5 trillion BTUs) of energy.[9] 74 percent of the energy use is in buildings and 26 percent is used in vehicles. Figure 2 breaks down the energy use by type.

Figure 2: Breakdown of Citywide Energy Use



SCE electricity customers residing in Irvine, on aggregate, use approximately 294 MW of power at the highest peak, which typically occurs in September[10]. Irvine's electricity load has an overall load factor of 0.58. (A load factor is the ratio of total electricity consumption to peak use and identifies how great the difference is between the two. A factor of 1.0 would signify that a customer utilizes exactly the same amount of energy 24 hours a day, 7 days a week. Lower load factors signify that SCE needs to add large amounts of power for short periods of time, such as during a heat wave. This is both difficult and expensive, which occasionally strains the system causing rolling blackouts.) SCE supplies electricity to buildings in Irvine and The Gas Company provides natural gas. The unit cost of electricity and gas varies depending on the rate schedule assigned and the load profiles of the buildings. As with municipal energy accounts, larger facilities with higher usage are eligible for rate schedules that have lower average costs.

[9] The energy use for transportation is for 2006 while the rest of the energy use is for 2005. For simplicity's sake the two numbers have been combined as if they represented the same year.
[10] Source: *Electricity Use Report for City of Irvine*, Version 4.0, March 2, 2006.

3.1.1 *Electricity*

The state Energy Efficiency Standards for Residential and Nonresidential Buildings or "Title 24" was initiated in 1978 and predates most of Irvine's growth, (Irvine's population has more than quadrupled since then.) Therefore, most buildings in Irvine start from a relatively energy efficient baseline[11]. While there are certainly opportunities for improvement, Irvine's building stock is on average more efficient than that of older cities.

Although, about 83 percent of the approximately 69,000 electricity accounts with SCE in Irvine are residential, these comprise only 16 percent of total electricity usage. Medium and large commercial customers (GS-1 and GS-2 customers) make up about 15 percent of the accounts, but represent about 70 percent of total electric usage. This data is exhibited in Table 7.

Table 7: Electric Account Summary[12]

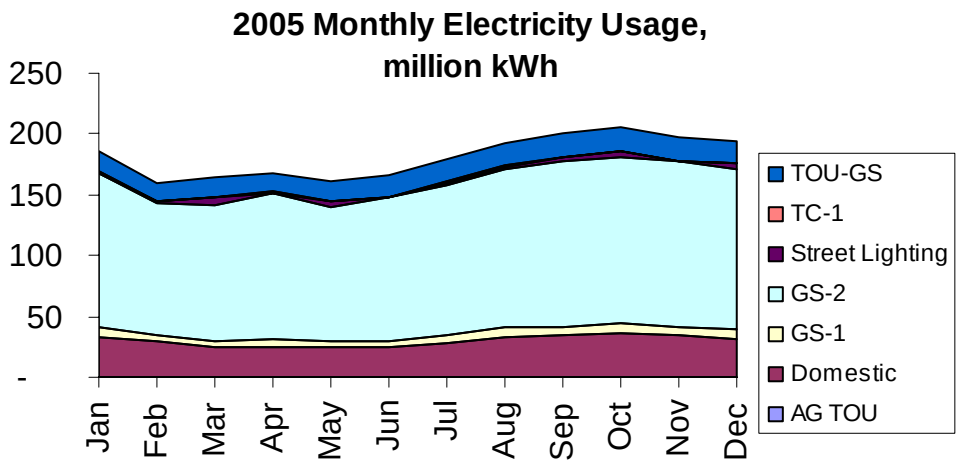
Rate	Annual kWh	% of Total kWh	Number of Service Accounts	% of Total Service Accounts
AG TOU (agriculture)	4,908,248	0.2%	40	0.1%
Domestic	353,126,189	16.2%	57,128	82.8%
GS-1 (small commercial)	80,558,220	3.7%	7,171	10.4%
GS-2 (medium commercial)	1,488,847,290	68.5%	3,169	4.6%
Street Lighting	32,132,910	1.5%	798	1.2%
TC-1 (traffic lights)	1,988,733	0.1%	360	0.5%
TOU-GS (large commercial time of use)	211,924,977	9.8%	324	0.5%
Total	**2,173,486,567**	**100%**	**68,990**	**100%**

Source: Electricity Use Report for City of Irvine

The monthly load profile for Irvine's electricity usage is exhibited in Figure 3. Overall usage for Irvine peaks in October and is lowest in February. Of the major rate groups, domestic or residential accounts show the most seasonal variability, with the peak month usage being 24 percent higher than the average value.

[11] Source: *City/County Population Estimates*, California Department of Finance - Demographic Research Unit
[12] For a more complete table of energy use for Irvine showing coincident and non-coincident electricity demand, see Appendix A.

Figure 3: Monthly Citywide Electricity Usage



Source: Electricity Use Report for City of Irvine

If the Citywide population increases, as anticipated, to 270,000 people (about a 35 percent increase over the current population) and is accompanied by an equivalent increase in commercial activity, it is reasonable to expect that Citywide energy use will also expand by at least 25 percent over the same period, even if the City allows future energy efficiency improvements.

As demonstrated in Table 8 and Figure 4, the power sold to Irvine customers by Southern California Edison is generated by various fuel resources, but primarily natural gas. The energy derived from large hydroelectric sources varies year-to-year with the amount of rainfall received in California and the Pacific Northwest. The portion of SCE's energy coming from coal is projected to decline in 2008 and can, generally, be expected to decline further, over time, as the utility complies with SB 1368. This Act prohibits new long-term contracts with generators that emit more CO_2 than a new combined cycle natural gas power plant. Similarly, the portion of renewables can be expected to rise over time as SCE complies with the state's renewable portfolio standard (RPS) requirements to derive 20 percent of the energy sold from eligible renewable sources by year 2020. (SCE has already achieved 16 to 17 percent renewable energy in its power mix). There has also been a shift in the state government to accelerate the target, requiring California utilities to sell 20 percent renewable energy by 2013 and 30 percent renewable energy by 2020.

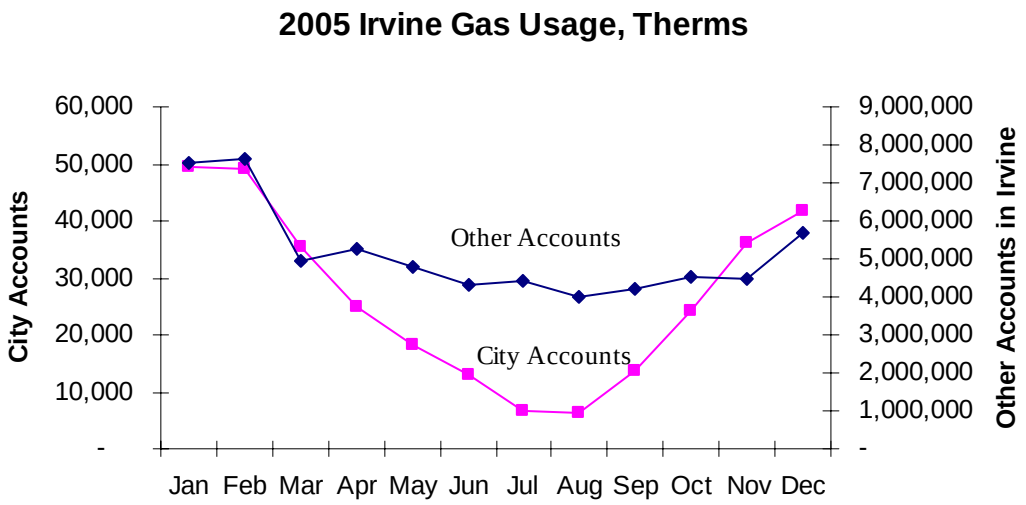
Table 8: Southern California Edison Power Content

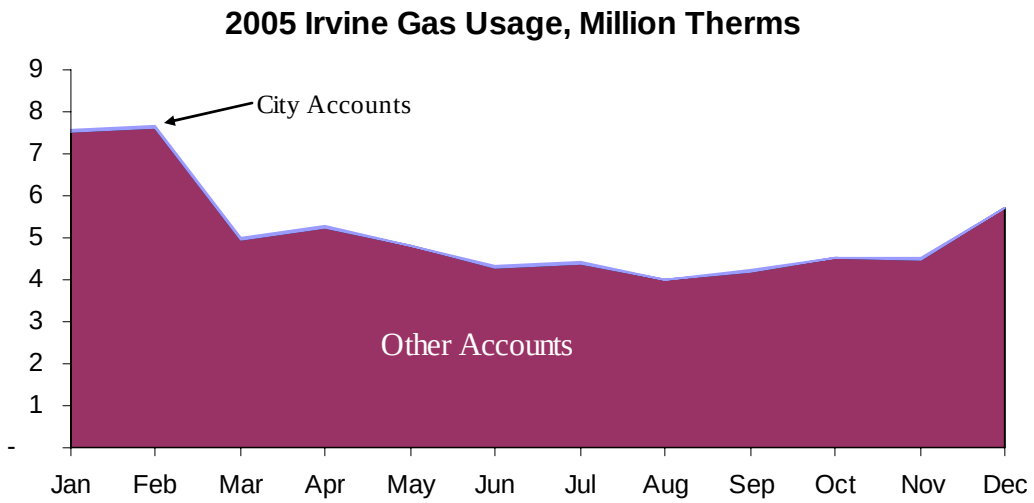
RESOURCE	2006 ACTUAL	2007 PROJECTED	2008 PROJECTED
Eligible Renewables	**16%**	**16%**	**16%**
Biomass & waste	2%	2%	2%
Geothermal	9%	9%	9%
Small hydro	1%	1%	1%
Solar	1%	1%	1%
Wind	3%	3%	3%
Coal	**11%**	**7%**	**8%**
Large Hydroelectric	**8%**	**6%**	**5%**
Natural Gas	**48%**	**51%**	**50%**
Nuclear	**17%**	**20%**	**21%**
Other	**<1%**	**<1%**	**<1%**
Total	**100%**	**100%**	**100%**

3.1.2 *Natural Gas*

About 63 million therms of natural gas are consumed, annually, in Irvine. The vast majority of Irvine's total natural gas usage is from private accounts, while municipal government accounts comprise approximately 0.5 percent of the total. However, as Figure 5 exhibits, the City's natural gas accounts exhibit greater seasonal variation than the remaining non-municipal accounts. This is because the City's use of gas is primarily for space heating, whereas other non-municipal accounts encompass industrial clients who use gas for process heating.

Figure 4: Irvine Citywide Gas Usage





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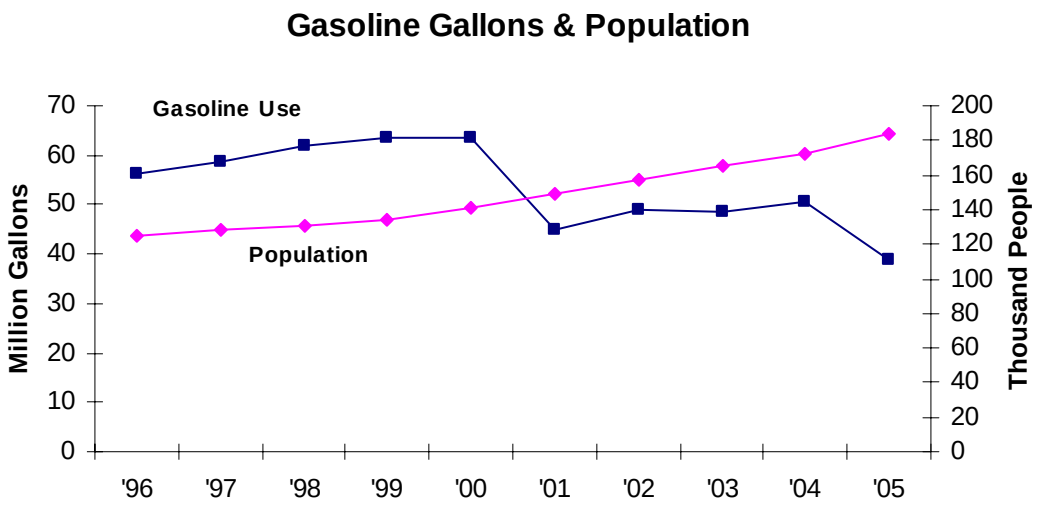
Source: Southern California Gas Company

3.1.3 *Vehicle Energy Use*

Irvine has experienced significant growth in vehicle travel as the City has grown. While it is impossible to tell exactly how much gasoline was used within City limits, a reasonable estimate can be made from the number of vehicle miles traveled annually. Figure 6 displays estimated fuel use by vehicles traveling in Irvine. Figure 8 displays the number of lane miles maintained by the City compared to vehicle miles traveled. [Note: The steep drop in vehicle miles traveled in 2001 corresponds to a drop in the number of miles of roadway maintained in the City of Irvine as reported by the California Department of Transportation's Highway Performance Monitoring System.]

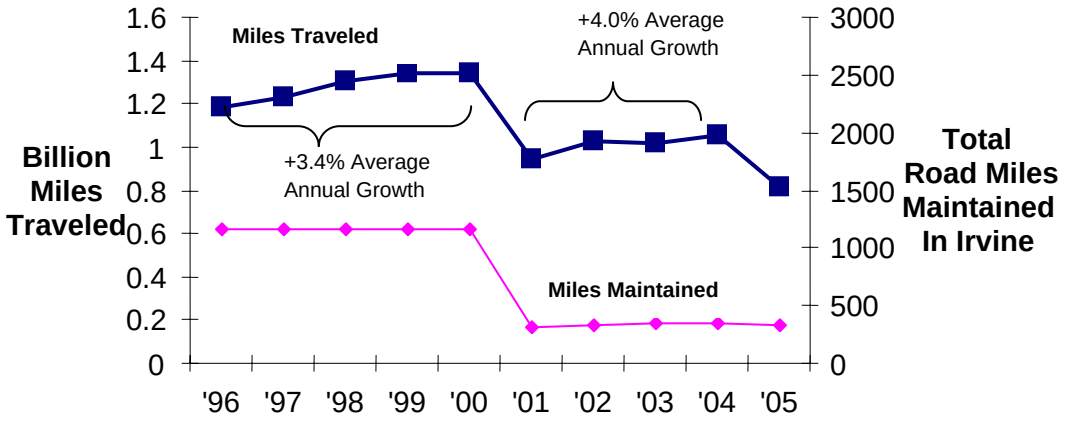
Actual miles traveled have been increasing at an average annual rate of approximately 4 percent since 2001. The increased growth rate in vehicle travel from an average of 3.4 percent in the late 1990's to 4 percent in early 2000 is probably due, in part, to the increase rate of population growth in Irvine from an average of about 2.2 percent in the 1990's to an average of 5.4 percent after year 2000. There was a steep drop in vehicle miles in 2005, but it is not clear what caused this. It is likely to be a data anomaly rather than being indicative of a downward trend. Without a concerted effort to shift auto trips to other modes, this high growth rate of gasoline use is likely to continue to track Irvine's population growth well into the future, limited only by congestion on major roadways and by any future improvements in vehicle fuel economy. Similarly, without a major shift to more efficient and/or smaller vehicles, CO_2 emissions from vehicles in Irvine are likely to continue to increase at about the same annual rate.

Figure 5: Gasoline Gallons and Population



Source: *Highway Performance Monitoring System,* California Department of Transportation; *City/County Population Estimates*, California Department of Finance - Demographic Research Unit

Figure 6: Vehicle Miles Traveled in Irvine



Source: California Department of Transportation *Highway Performance Monitoring System*

3.2 – Energy Efficiency Initiatives Citywide

Approximately, 2 percent of electricity use in Irvine is for street lighting, municipal government buildings, and other City accounts, while the vast majority of electricity is used by private customers. Approximately 16 percent of this usage is in residential accounts, while the remainder is attributable to commercial and industrial customers. Irvine has a history of numerous programs promoting energy efficiency in the community; these continue to improve the performance of the Irvine's building stock. For example:

- The City's Irvine Quality Plus, or "IQ+" program has helped to greatly reduce duct leakage in single family detached homes. Its approach and specification for maximum allowable leakage became the basis for the California energy codes section on "sealed ducts."
- The Irvine Company claims a 30 percent reduction in energy use in its commercial office buildings from, both, retrofits of existing buildings and incorporation of efficiency features in new buildings.[13]
- The City is a member of the Community Energy Partnership (CEP), a partnership program between the City of Irvine, its serving utilities (SCE and The Gas Company), and The Energy Coalition. Through this partnership program, The Energy Coalition advocates and supports community opportunities for improved energy management in Irvine. Between 2002 and 2007, residents and businesses located within Irvine have benefited from more than $700,000 worth of education, outreach, and energy efficiency installations.

3.3 – Current Utility Energy Efficiency Investment

The state's investor-owned electric and natural gas utilities are investing significant amounts of money collected through the "public goods" charge into building efficiency. Both Southern California Edison (SCE) and The Gas Company are spending a portion of their money in Irvine, during the current program. During 2006, SCE spent approximately $1,000,000 on incentive payments in Irvine[14]. This has resulted in estimated annual savings of approximately 16.6 million kWh and 3,000 kW in Irvine. This is equal to approximately 1 percent of Irvine's total electric use in 2005. Table 9 explains the estimated breakdown of these savings by sector.

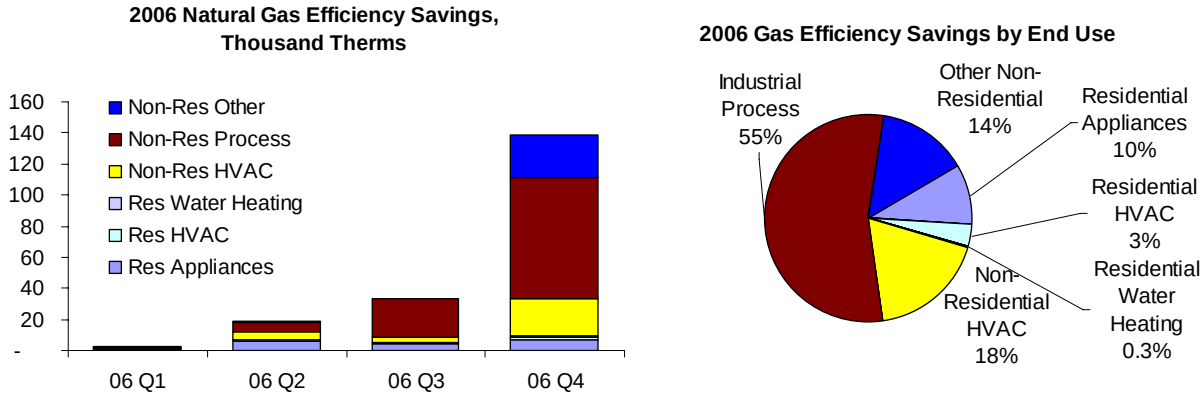
Table 9: Summary of SCE 2006 Program Spending and Savings

	Incentive Payments	Savings (kWh/yr)	Savings (kW)
Residential Programs	$592,626	9,262,452	1,235
Non-Residential Programs	$436,336	7,340,105	1,747
Total	$1,028,962	16,602,557	2,982
Total Electricity Consumption 2005		2,173,486,567	294,859
Percent Reduction		0.8%	1.0%

[13] http://www.goodplanning.org/stewardship/energyefficiency.asp
[14] Program Participation data provided by SCE.

The Gas Company's spending during 2006 on energy efficiency programs funded by Public Goods Charges is estimated at $19.7 million, approximately $350,000 of which has been spent in Irvine.[15] This has resulted in an annual savings of approximately 200,000 therms in Irvine. This represents 0.3 percent of overall gas consumption. Most of the savings from this system-wide program have come from non-residential applications; primarily industrial process savings (refer to Figure 3-7). The specific breakdown of natural gas savings in Irvine may be different to some extent.

Figure 7: The Gas Company Energy Efficiency Results in 2006



By the end of 2006, The Gas Company's savings under this program are approximately 19 percent of the total savings they expect to achieve by the end of 2008. If SCG achieves this goal, the three-year program will result in an annual natural gas savings of approximately one million therms in Irvine, a reduction of approximately 1.7 percent from 2005 levels.

[15] The incentives and savings accrued to Irvine customers was estimated by assuming that Irvine's share of The Gas Company's overall incentive payments is proportional to its share of gas usage, City-specific data was not provided by The Gas Company.

SECTION 4 – OTHER AGENCIES' GOALS

It is important to be aware that the City's local goals for energy will exist alongside energy goals and emissions reduction goals being developed and implemented by other federal, state, and local agencies, including the local utilities. Far from existing in isolation, the City's goals will be implemented as part of a web of inter-related activities, many of them outside the City's influence. So while the City's own goals are to provide clear long-term direction, the shorter term implementing programs must be flexible and adaptable to the changing economic, environmental, and political climate and to the influence of activities being managed by other agencies.

In reviewing the goals established by other agencies, the City should be concerned, first, with those of the federal, state and local utility companies because they will determine the context in which the City's own goals will have to operate; second, with those goals established by important non-governmental agencies, like the US Conference of Mayors and the US Green Building Council (USGBC), because they are the acknowledged leaders in their respective fields; and third, with those established by other cities and local agencies because they can provide inspiration and guidance on what is possible.

4.1 – Federal Government

The Energy Independence and Security Act of 2007 were signed by the President in December 2007. While it does not include a national renewable energy portfolio standard, it does promote higher fuel economy standards (often referred to as CAFE or Corporate Average Fuel Economy standards). Cars and light trucks will have to be 40 percent more efficient by 2020, raising the fleet average to 35 miles per gallon. Also, light bulbs must be three times as efficient by 2030, phasing out most incandescent by 2014. Federal buildings that are renovated or built in or after 2010 will have to cut their fossil-fuel energy consumption by 55 percent by 2010, and then by 100 percent by 2030. The bill did not extend tax benefits for solar installations and supports a seven-fold increase in ethanol production by 2022.

4.2 – Local Utilities

California's electric and gas utility goals are strongly influenced by the goals established by the State and especially by the California Public Utility Commission (CPUC). The State was the first to establish a renewable portfolio standard (Senate Bill 1078 – Sher, 2002), which required electricity providers to increase renewable energy resources by 1 percent per year until they have attained a portfolio of 20 percent renewable resources. Subsequently, the 'Accelerated Renewable Portfolio Standard' set a goal of achieving 33 percent renewable in the State's resource mix by 2020. The joint CPUC/Energy Commission September 2005 Energy Action Plan II adopts the 33 percent goal.

In October 2007, the CPUC:

> (1) "Direct[ed] the utilities to prepare a single, comprehensive statewide long-term energy efficiency plan;
>
> (2) Adopt three programmatic initiatives:
>
> > * All new residential construction in California will be zero net energy by 2020;
> >
> > * All new commercial construction in California will be zero net energy by 2030; and
> >
> > * Heating, Ventilation, and Air-conditioning (HVAC) industry will be reshaped to ensure optimal equipment performance;
>
> (3) Develop the "next generation" of California utility energy efficiency programs for 2009-2011;
>
> (4) Commit in the near term to adopting utility energy efficiency goals through 2020 and reaffirm . . . previously adopted 2009-2011 goals; and
>
> (5) Establish new, collaborative processes with key business, consumer groups, and governmental organizations in California, throughout the West, nationally and internationally."

The utilities are currently working with the California Public Utilities Commission to draft the California Strategic Energy Efficiency Plan for 2009 - 2020. Although still in draft form, there is currently a large role for local governments to play.[16] It will be important for the City to follow this process carefully, since it will ultimately be tied to the ratepayer funds used for energy efficiency programs throughout the state.

4.3 – State of California

California has been a leader in promoting energy efficiency, cleaner technologies, and renewable energy since the 1970s and is today one of the most energy efficient economies in the world. As a result, per capita electricity use has remained practically unchanged since the mid-70s, compared to a growth in national per capita electricity use of about 1.5 percent per year. Furthermore, whereas national annual per capita greenhouse gas emissions average 20 metric tons, Californians' per capita emissions average only 12 metric tons – still higher than some other national average emissions, but substantially lower than the US national per capita average emissions.

California was the first government to attempt to regulate greenhouse gas emissions from vehicles and the first to set a Renewable Portfolio Standard (RPS) requiring 20 percent of electricity to be sourced from renewable by 2010.[17] It has been claimed

[16] *Draft Strawman* dated January 7, 2008, "Achieving Aggressive Energy Efficiency Goals in Local Communities and Statewide – Steps Towards a Strategic and Coordinated Approach."

[17] Subsequently through the 'Accelerated Renewable Portfolio Standard' this was increased to 33% by 2020, and this change was adopted in the joint CPUC / CEC Sept 2005 Energy Action Plan.

that by meeting the goals of the RPS standard, the State would generate more than 200,000 person-years of employment and fuel growth with payroll benefits worth $8 billion. California also established the first state-sponsored climate change research program and opened the California Climate Action Registry to facilitate public and private sector reporting of greenhouse gas emissions. California is also home to three globally competitive wind power companies, three of the world's biggest geothermal power companies, two of the world's largest solar PV plants, and the world's premier research and development consortium for fuel cell vehicles.

Additionally, the State of California is committed by executive order (S-01-07) and legislation (AB 1007) to expand the use of alternative fuels as a mechanism for reducing transportation-related greenhouse gas emissions. The State of California intends to reduce the carbon intensity of transportation fuels by at least 10 percent by 2020.

4.3.1 *California's Joint Energy Plan*

In 2003, the State's energy agencies adopted a joint plan to guide energy decision-making in California. As part of its introduction to the adopted goals, the plan clarifies the general situation that the plan is intended to address. The following are excerpts from the Plan:

"As a context for this plan, Californians must understand the essential and complex nature of the state's energy resources…. Consumption is growing 2 percent annually. Over the last decade, between 29 and 42 percent of California's in-state generation used natural gas. Another 10 to 20 percent was provided by hydroelectric power that is subject to significant annual variations. Almost one third of California's entire in-state generation base is over 40 years old. California's transmission system is aging also. While in-state generation resources provide the majority of California's power, California is part of a larger system that includes all of western North America. Fifteen to thirty percent of statewide electricity demand is served from sources outside state borders."

"Peak electricity demands occur on hot summer days… Peak demand is growing at about 2.4 percent per year, roughly the equivalent of three new 500-megawatt power plants. Residential and commercial air-conditioning represent at least 30 percent of summer peak electricity loads."

"California's demand for natural gas also is increasing. Currently the state uses 2 trillion cubic feet of natural gas per year. Historically the primary use of this fuel was for space heating in homes and businesses. Electricity generation's dependence on relatively clean-burning natural gas now means that California's annual natural gas use by power plants is expected to increase. Overall, natural gas use is growing by 1.6 percent per year. Eighty-five percent of natural gas consumed in California is supplied by pipelines from sources outside the state."

The joint Energy Plan goes on to outline the major actions the State is proposing to implement, including the following actions (not a complete listing) which are of particular interest to local governments:

> *Optimize Energy Conservation and Resource Efficiency*
> "California should decrease its per capita electricity use through increased

energy conservation and efficiency measures. This would minimize the need for new generation, reduce emissions of toxic, criteria pollutants and greenhouse gases, avoid environmental concerns, improve energy reliability, and contribute to price stability. Optimizing conservation and resource efficiency will include the following specific actions:

1. Create customer incentives for aggressive energy demand reduction.
2. Increase local government conservation and energy efficiency programs.
3. Incorporate, as appropriate per Public Resources Code section 25402, distributed generation or renewable technologies into energy efficiency standards for new building construction.
4. Encourage companies that invest in energy conservation and resource efficiency to register with the state's Climate Change Registry.

Accelerate the State's Goal for Renewable Generation

"In 2002, the Governor signed the Renewable Portfolio Standard (RPS), SB 1078. This standard requires an annual increase in renewable generation equivalent to at least 1 percent of sales, with an aggregate goal of 20 percent by 2017. The state is aggressively implementing this policy, with the intention of accelerating the completion date to 2010, and will:

1. Add a net average of up to 600 MW of new renewable generation sources annually to the investor-owned utility resource portfolio.

Promote Customer and Utility Owned Distributed Generation

"Distributed generation is an important local resource that can enhance reliability and provide high quality power, without compromising environmental quality. The state is promoting and encouraging clean and renewable customer and utility owned distributed generation as a key component of its energy system. Clean distributed generation should enhance the state's environmental goals. This determined and aggressive commitment to efficient, clean, and renewable energy resources will provide vision and leadership to others seeking to enhance environmental quality and moderate energy sector impacts on climate change.

1. Promote clean, small generation resources located at load centers.
2. Collaborate with the Air Resources Board, Cal-EPA and representatives of local air quality districts to achieve better integration of energy and air quality policies and regulations affecting distributed generation.
3. The agencies will work together to further develop distributed generation policies, target research and development, track the market adoption of distributed generation technologies, identify cumulative energy system impacts, and examine issues associated with new technologies and their use."

4.3.2 *Other State of California Energy-related Goals*

Green Building Executive Order, S-20-04

In addition to the joint agency Energy Plan, the Governor's December 2004 Green Building Executive Order, S-20-04 (CA 2004) sets a goal of reducing energy use in public and private buildings by 20 percent by the year 2015, as compared with 2003 levels. The Executive Order and related action plan[18] clarifies specific actions state agencies are to undertake with state-owned and leased buildings. The order and plan also discuss various strategies and incentives to encourage private building owners and operators to achieve the 20 percent target.

California Solar Initiative

The California Solar Initiative has a goal of installing 1 million solar roofs (or an equivalent 3,000 MW by 2017) on homes and businesses; an increased use of solar thermal systems to offset the increasing demand for natural gas; the use of advanced metering in solar applications; and the creation of a funding source to provide rebates over a 10-year period.

New Solar Homes Partnership

The California Energy Commission through its "New Solar Homes Partnership" has a goal of placing solar systems on 50 percent of new homes by 2020.

AB 32: the Global Warming Solutions Act

On June 1st 2005, Governor Schwarzenegger signed Executive Order S-3-05 committing the state to the following targets for limiting the heat-trapping gases that contribute to global warming:

- By 2010, California emissions will be reduced to 2000 levels.
- By 2020, California emissions will be reduced to 1990 levels.
- By 2050, California emissions will be reduced to 80 percent below 1990 levels.

The 2050 target is consistent with what most scientists suggest will be needed to avoid dangerous levels of global warming.

On August 27, 2006, Governor Schwarzenegger signed Assembly Bill 32: the Global Warming Solutions Act making those targets law. AB 32 calls for the State's global warming emissions to be reduced to 2000 levels by 2010, (11 percent below business as usual); to 1990 levels by 2020 (25 percent below business as usual); and 80 percent below 1990 levels by 2050. This is to be accomplished through a statewide enforceable cap on emissions phased in starting in 2012.

AB 1493 - Vehicular emissions, greenhouse gases

Also as part of a broader effort to reduce greenhouse gases from all sources by 25 percent by 2020, the State has also proposed requiring a reduction in greenhouse gases from vehicles (AB 1493) by 30 percent by 2016. This action is currently awaiting a waiver from the US EPA.

[18] The State of California 'Green Building Action Plan' provides detailed directions on the implementation of the Green Building Executive Order.

The Solar Water Heating and Efficiency Act of 2007

In October 2007 Governor Schwarzenegger signed Assembly Bill 1470 to create the nation's largest solar hot water heating program. The bill "The Solar Water Heating and Efficiency Act of 2007" (AB 1470) creates a $250 million, ten year program to provide consumer rebates for solar hot water systems.

AB 151 (Laird 2005)

Assembly Bill 151 (Laird 2005) establishes that it is the State's policy to take every technologically feasible action necessary to reduce the growth of petroleum consumption and to increase transportation energy efficiency and the use of alternative fuels. State agencies are intended to take this policy into account when adopting new rules and regulations.

4.4 – U.S. Conference of Mayors and US Green Building Council [19]

The U.S. Conference of Mayors and many of its member Mayors, including the Mayor of Irvine, Beth Krom, have long been leaders in the sustainable cities movement. On February 16, 2005 when the Kyoto Protocol, the international agreement to address climate change, became law for the 141 countries that have ratified it to date, Seattle Mayor Greg Nickels launched the Mayors for Climate Change initiative. He developed the Mayors for Climate Protection Agreement to advance the goals of the Kyoto Protocol through leadership and action by American cities. In April 2005, Mayor Krom signed the Agreement. In June 2005, the Agreement was endorsed by a resolution of the US Conference of Mayors.

In 2006, the U.S. Conference of Mayors, the American Institute of Architects, the US Green Building Council, and a number of other influential agencies, adopted a set of goals called the "2030 Challenge" originally introduced by the Santa Fe non-profit "Architecture 2030."[20] The goals are intended to provide a template for the design and construction of all future new buildings, developments, and major renovations.

The main focus of both the 2030 Challenge and the Mayors' goals is directed at reducing climate changing emissions through a major shift from the use of fossil fuel for electricity in buildings, over to the use of on-site generated renewable energy. The Mayors' recommend that this transfer happen through a serious of stepped increases in the percentage of renewable energy generated on-site, with the eventual goal of all new municipal government buildings being built 'carbon neutral' by 2030. By 'carbon neutral', it's meant that by 2030 municipal buildings will use no fossil fuel generated/greenhouse gas emitting energy in their operations. The Mayors' Resolution focuses on local government facilities, but also recommends that all non-government buildings should also be working toward these goals. Clearly, since local government buildings only represent a few percent of the nation's built

[19] These goals have also been adopted by the American Institute of Architects, the US Green Building Council, International Council on Local Environmental Initiatives (ICLEI); the goals are also supported by the Rocky Mountain Institute (RMI); the World Business Council for Sustainable Development; the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE); the National Wildlife Federation, and the American Solar Energy Society, and are being actively promoted by the Mayors of Chicago, Albuquerque, Miami, and Seattle, and a number of other cities.

[20] The 2030 Challenge is described in "eco-structure" magazine for March 2007; also at www.architecture2030.org and at www.aia.org

environment, merely improving those buildings will not by itself have much impact on reducing overall emissions.

The 2030 Challenge goals are very ambitious, but it is argued that without such radical and immediate action, future generations will not enjoy the quality of life we have today. Further, it is claimed that without such action, and under an alternative "business-as-usual" scenario, US fossil fuel use is expected to increase by about 34 percent by 2035. This represents an increase of about 34 quadrillion Btu's, or "quads" and every quad is roughly equal to forty 1,000 megawatt power plants. If even a minority of these plants burn fossil fuels, their impact on national emissions will be very significant.

The US Conference of Mayors Resolution 50 (June 2006) describing the 2030 Challenge encourages all member cities to require that: [21]

- "New construction of City buildings shall be designed to, and achieve, a minimum delivered fossil-fuel energy consumption performance of one half of the US average for that building type, as defined by the US Department of Energy."
- "Renovation projects of City buildings shall be designed to and achieve a minimum delivered fossil-fuel energy consumption performance standard of one half the US average for that building type, as defined by the US Department of Energy."
- "All other new construction, renovation, repairs, and replacements of City buildings shall employ cost-effective, energy efficient green building practices to the maximum extent possible."
- In California, where all buildings already perform at a higher level than in most parts of the country, reducing fossil fuel use in new buildings by half is a serious challenge, though by no means impossible to achieve. It requires a strong commitment to the use of on-site solar photovoltaic for building electricity needs, and solar thermal systems for the production of hot water used in buildings, and / or the purchasing of renewable energy generated elsewhere.

The 2030 Challenge asks that off-site generated renewable energy be limited to a maximum of 20 percent of a building's energy needs. The goal here is to improve the energy performance of new buildings to the point that they can become largely self-supporting. Their operation would then no longer require large amounts of energy (even renewable energy) transmitted over great distances.

The US Conference of Mayors Resolution 50 goes on to ask that mayors work to increase the fossil fuel reduction standard for all new buildings until they become

[21] On June 12, 2007 (and subsequent amendment of June 27) the U.S. House Oversight & Government Reform Committee approved H.R. 2635 "Carbon –Neutral Government Act of 2007" which incorporates many features of the 2030 Challenge and the U.S. Mayors goals. Under the act all federal agencies are required to reduce greenhouse gas emissions incrementally until reaching zero emissions by 2050. By 2030 new and significantly renovated federal buildings will be carbon neutral.

Carbon neutral by 2030; the reduction to occur in the following increments:

- 60 percent in 2010
- 70 percent in 2015
- 80 percent in 2020
- 90 percent in 2025
- Carbon neutral in 2030

By carbon neutral, Resolution 50 means that by 2030 new municipal buildings will use no fossil fuel generated greenhouse gas emitting energy at all in their operations. The Resolution further resolves that "mayors from around the nation develop plans to fully implement the above mentioned targets for all new and renovated buildings."

The original 2030 Challenge, which was subsequently adopted by the US Conference of Mayors in the form described, has the goal of requiring all new construction to meet these performance standards, whether or not they are owned and operated by a municipal government. Obviously the percentage of energy use by most local government agencies is relatively small – generally less than five per cent of a city's total energy use, and so even radically improved performance in this sector will not by itself have a large impact on overall energy use, or on the long-term goal of reducing greenhouse gas emissions.[22]

4.5 – Local Agencies

4.5.1 *University of California, Irvine*

In July 2003, the UC Regents adopted a comprehensive green policy and goals for the University of California, but UC Irvine (UCI) had been focusing on sustainable practices for almost 10 years prior. UCI is using a combination of energy efficiency approaches to reduce consumption of non-renewable energy, including incorporating locally generated renewable power for existing and new facilities; making green power purchases, and investigating other energy projects that reduce fossil fuel use. UCI also incorporates energy retrofits into all major building renovations and performs energy-only retrofits when they can be justified by future energy savings.

[22] World-wide CO2 emissions from cars, factories, and power plants grew at an annual rate of 1.1% during the 1990s. But from 2000 to 2004, CO2 emissions rates almost tripled to 3% a year. According to the Global Carbon Project, emissions need to be reduced by 90% by 2050 if we are to avoid the strongest effects of global warming. As reported in the Christian Science Monitor, May 22, 2007.
Also, according to the US Energy Information Administration, based on current policies, world consumption of energy is expected to increase by 57% between 2004 and 2030. If oil prices remain at current or higher levels, coal is expected to be the fastest growing energy resource. As reported in The Economist, May 26, 2007.
According to a report in "Waste News" of May 28 2007; US carbon emissions from burning fossil fuels decreased by 1.3% in 2006. This occurred at the same time as the economy grew by 3.3%. Factors that contributed to the reduction included weather conditions that reduced the demand for heating and cooling services; higher energy prices for natural gas, gasoline and electricity also reduced demand, plus an increased use of lower-carbon and no-carbon fuels for electricity generation.

Actions underway or completed by September 2007 include sustainable projects in seventeen areas. Among the projects in energy efficiency and carbon reduction are:

- Construction of the Palo Verde II Student Apartments to USGBC LEED Gold standard. This was the first LEED Gold certificated project in Orange County.

- Installation of a 300 KW fuel cell that will generate both electricity and thermal energy for the central campus.

- UC Irvine has the highest on-campus housing percentage of all UC campuses and among all major public universities. In addition, if student housing within half-mile of campus is considered, 64 percent of the student body lives on campus, lives within walking distance, or has shuttle access to UCI. To encourage alternative modes of transportation, students living within half-mile of UCI cannot purchase commuter parking permits. The no-commuter-permit radius will be increased as new housing facilities are made available to students on, or adjacent to, campus.

- In 2007, UCI signed an agreement with Zip Car to provide shared cars throughout campus.

- In addition to carrying over one million passengers per year, the campus shuttle system is being retrofitted for 100 percent biofuel (B-100 biodiesel). Although many campuses use B-20 biodiesel (20 percent biodiesel / 80 percent regular diesel), UC Irvine is the first U.S. campus to convert its entire shuttle bus fleet to 100 percent carbon-neutral biodiesel.

- UCI is the largest employer in Irvine and its 2006 average vehicle rider ship of 1.87 is the highest among large employers in the entire Los Angeles basin.

- UCI's combined heat and power plant, with its 53,000 ton-hour thermal storage tank, is possibly the most efficient central plant on any North American campus. This plant can capture waste heat and utilize it (or store it for future use) six alternative ways, thus maximizing the efficiency of waste heat recovery and it reduces CO_2 emissions 24,000 tons annually and NO_X emissions 58 tons annually.

- UC Irvine's thermal energy storage system, the largest above ground in the western U.S., can shift up to 4.5 megawatts of electric load to off-peak (nighttime) hours.

- Energy conservation projects currently planned or underway will reduce CO_2 emissions 5,200 tons/year and NO_X emissions 4 tons/year, while reducing overall energy consumption per unit area by 5 percent. These projects will be completed within two years. Energy-retrofit projects planned in four years will increase energy-efficiency another 13 percent and reduce CO_2 and NO_X emissions an additional 12,400 tons and 7 tons per year, respectively. Buildings on the UCI campus constructed since 1992 have outperformed

California's Title 24 (energy code) by 20-30 percent for more than a decade before the Regents adopted the goal for the UC system

Beyond instituting green build standards, energy-efficiency retrofits and renewable energy such as photovoltaic, UCI will need emissions credits to become carbon neutral. All UC campuses face this requirement, so a system-wide solution has been proposed -- a large-scale "renewable energy farm" at a, as yet undetermined, UC field station site.

All measures in UCI's sustainability plan will enable UCI to approach carbon-neutrality as early as 2025 by reducing and offsetting carbon emissions *directly* not by buying carbon offsets from the marketplace.

4.5.2 *City of Los Angeles*

In May 2007, Los Angeles Mayor Antonio Villaraigosa published a plan[23] to reduce CO2 emissions in the city as a whole by 35 percent below 1990 levels by 2030, even as the city's population of 4 million is expected to keep growing. The Mayor's plan calls for securing 35 percent of the Department of Water and Power's energy from renewable sources by 2020. The utility's renewable energy sources currently stand at 8 percent of its power mix, up from 3 percent in 2005. The Department, which supplies electricity for 1.4 million homes and businesses, is responsible for about a third of the city's total emissions, because it relies heavily on burning coal at power plants in Utah and Arizona to produce electricity.[24] About half of the CO_2 produced in the city comes from vehicles. According to the Southern California Association of Governments, 77 percent of the area's commuters drive alone.

In April of 2008, Los Angeles became the largest city in the nation to impose green building rules that would potentially cut millions of tons of pollution over the next decade. The City Council passed an ordinance requiring builders of large commercial and residential developments to adopt such measures as planting drought-resistant landscaping and using recycled materials and energy-efficient heating, cooling and lighting. The law requires new commercial buildings and high-rise residential structures with more than 50,000 square feet of floor space to meet a nationally recognized "Leadership in Energy and Environmental Design" (LEED) standard, developed by the U.S. Green Building Council, a Washington-based nonprofit organization. It also would cover major renovations and low-rise developments of 50 units or more. The rules would amount to preventing about 85,000 metric tons of carbon dioxide emissions over the next five years, the equivalent of removing 15,000 cars from the roads.

4.5.3 *City of San Jose*

In early June 2007, the City of San Jose adopted a set of greenhouse gas reduction goals for its municipal operations only ranging from 25 percent below 1990 levels by

[23] As reported in the Los Angeles Times, May 15, 2007.

[24] On May 23, 2007 the California Energy Commission imposed new rules forbidding the LA Dept of Water & Power and all other municipal utilities in California from signing new contracts with coal-fired power plants. Identical regulations were imposed on private utilities in January. Overall 20% of California's electricity is currently generated using coal-fired plants in other states. As reported in the Los Angeles Times, May 24, 2007.

2012 to an 80 percent reduction by 2045. This follows from the City's prior adoption in March 2007 of the Climate Change Agreement proposed by the U.S. Conference of Mayors. San Jose already has a 'green' fleet of over 900 vehicles using bio diesel; a wastewater treatment plant that has reduced its energy use by 25 percent; and a new City Hall that uses 25 percent less energy per square foot than required by Code.

4.5.4 *Los Angeles Community College District*

The Los Angeles Community College District has adopted a target of obtaining 15-25 percent of its electricity from renewable sources, with 10 percent of this produced off-site. The District intends constructing 44 LEED certified buildings over the next decade, and hopes to hold energy demand at 45MW, while building floor area increases by 60 percent. The District has already received $1.3 million in utility rebates to assist with its energy projects and anticipates receiving a further $5.5 million in future.

4.5.5 City of San Diego

The City of San Diego is planning to reduce its greenhouse gas emissions by 15 percent below 1990 levels by 2010, in part by producing 50MW of local renewable energy by 2013. At the Point Loma Waste Water Treatment Plant, a cogeneration facility is powered by methane gas produced at the plant and generates 4.57 MW of electricity. Also at the Point Loma Plant, there is a hydroelectric facility producing another 1.35 MW of power as the treated wastewater drops 100 feet into the ocean and a 1.2 MW generator peaking unit that runs on 80 percent digester gas and 20 percent diesel was recently added. An additional 6.4 MW of electricity is generated using landfill gas from the Miramar Landfill as fuel. Modeled after the success of the Point Loma Plant, the North City Water Reclamation Plant was built to produce 3.8 MW of energy. The City has installed 13 photovoltaic systems on City-owned facilities capable of producing 1.24 MW. The City also intends reducing its fleet's fuel consumption by 15 percent annually. The anticipated cost savings from the City's utility bills total $15 million.

4.5.6 *Sonoma County*

In September, 2005 the Sonoma County Board of Supervisors voted to establish a county-wide greenhouse gas reduction target of reducing emissions by 25 percent below 1990 levels by 2015. Subsequently, all nine Sonoma cities passed resolutions establishing this emissions reduction target for their communities.

SECTION 5.0 – IRVINE ENERGY PLAN GOALS

The goals of this Energy Plan provide general direction for Irvine's energy and emissions reduction efforts over the long term. Two of the four goals also include interim goals which, when successfully implemented, will move Irvine toward the long term goals. These goals have been defined using the General Plan Energy Element as a guide and by taking into account the strategies of the State of California. There is an emphasis on information and participation as having an informed public clears the path for initiating future change. Energy efficiency is also emphasized because it is the most cost-effective and powerful tool we have to achieve greenhouse gas reductions over the short run. Once energy consumption is as efficient as possible, the next step is to switch to renewable energy to further reduce fossil fuel use. The fourth goal addresses greenhouse gas reductions and, to some degree, encompasses each of the other three goals.

5.1 – Community Participation

Goal: Involve 100% of Irvine residents and businesses in the Energy Plan

The City would strive to make sure that the entire community is informed about energy issues and to encourage, to the greatest degree possible, its participation in achieving the long term goals of the Irvine Energy Plan. The motto would be:

"100% Participation, 100% Irvine"

The key to success here is emphasizing the important contribution that each member of the community can make by being an informed consumer and how everyone making small individual changes will produce large citywide benefits. Education of the residents, businesses and those who visit the City must be a cornerstone of this effort. An informed public is one empowered to reduce energy consumption (and thus, greenhouse gas emissions) and one that will collectively protect the environment for generations in the future. An informed public will also be more willing to make changes once they understand the impact on their future and the future of their children and grandchildren. An informed public will make the difference in Irvine's ability to succeed.

5.2 – Energy Efficiency

Goal: Irvine will reduce its energy use in buildings citywide 30 percent by 2015 compared to 2003 levels.

The goal of achieving a 30 percent reduction in building energy use by 2015 exceeds the Governor's Green Building Executive Order (S-20-04) goal of reducing energy use in public and private buildings by 20 percent by 2015. Irvine has shown leadership in adopting the voluntary program, Irvine Build Green, and can reach beyond what the state has envisioned. The year 2003 was chosen as a base year to match the Green Building Executive Order. Becoming more efficient not only saves energy, but also saves residents and businesses money. Meaningful energy

efficiency can be effectively accomplished using existing technologies.

5.3 – Transition to Renewable Energy

Goal: Increase the percentage of renewable energy used in new buildings citywide:

- ***40 percent of the energy used by new buildings citywide will be derived from renewable sources by 2015***
- ***60 percent of the energy used by new buildings citywide will be derived from renewable sources by 2020***

While these goals for renewable energy use may seem ambitious, it is important to recognize that electricity supplied by Southern California Edison (SCE) is already 17 percent renewable energy, and that SCE expects to continue increasing this percentage to at least 20 percent.

5.4 – Greenhouse Gas Emissions

Goal: Reduce greenhouse gas (GHG) emissions:

- ***to 2000 levels by 2010 (This reduction is equivalent to about 11 percent below the anticipated 2010 emissions under a business-as-usual scenario.)***
- ***to 1990 levels by 2020 (25 percent below the anticipated business-as-usual scenario)***
- ***to 80 percent below 1990 levels by 2050***

These goals follow those established in the State's AB 32: *Global Warming Solutions Act*. An early step in implementing the emissions reduction goals will be to conduct an inventory to provide a baseline picture of Irvine's current emissions. Additionally, an emissions reduction plan will need to be created to be able to effectively track the total amount of emissions reduced from the established baseline.

Current best practices for achieving a reduction in greenhouse gas emissions includes: (1) conducting an initial assessment of neighborhoods or communities, to identify its potential sources of greenhouse gases emissions and it's likely exposure to the consequences of climate change (e.g., rising temperatures, changing precipitation patterns, wildfires), (2) developing a quantitative greenhouse gas emissions inventory, (3) using information from the inventory to identify and prioritize emission reduction strategies, (4) use information from the initial assessment to identify and prioritize opportunities to make the neighborhood or community more resilient to changing conditions.

Planners and developers who take these actions jointly will be able to reduce the risk of regulatory surprises, minimize future liabilities, and potentially create new business opportunities.

The City government will need to lead by example before it asks for the cooperation of the community in achieving the goals as set out. This effort will build upon the City government's history of commitment to energy efficiency, but must now include the use of renewable energy, reduction of carbon emissions, and will require a comprehensive approach to energy management for its own operations. This will involve, for example, retrofitting and monitoring all existing City facilities, ensuring that new City facilities are built to the highest energy performance and green building standards, altering purchasing practices, providing education and training to the municipal users of energy consuming equipment, changing operations and maintenance practices, and shifting facilities from fossil fuel generated electricity over to the widespread use of renewable energy resources.

SECTION 6 – NEXT STEPS

In this section is a set-by-step process for the City to follow as it leads the way for the community on the Energy Plan Goals. First, the City will need to assemble a management team that will guide the process and implementation. That same team can be augmented with community representatives as it transitions to dealing with citywide strategies. Next, the City will have to formally monitor and track its efforts in order to check its progress towards the goals. Most importantly, the City will need to investigate all avenues of financing in order to make the most cost effective decisions while pursuing the goals. Below is a more detailed description of these steps.

6.1 – Step 1: Create an Energy Management Team

Successful implementation of a comprehensive citywide Energy Plan requires participation and support from elected officials, Commissioners, staff in all the City's departments, as well as residents and representatives of the commercial and business sectors. New energy projects can affect many people and, sometimes, those that are negatively impacted feel they have cause to impede a proposed project or to bypass an energy saving system after it has been installed. Meeting these challenges requires a team of key participants, who can come to a unified vision of the kind of energy activities Irvine should undertake and how they will be implemented.

The energy team can help identify difficulties during the early project development stages to ensure that everyone who may be affected by the project also understands the benefits that will result from its success. Successful energy teams increase collaboration, help build consensus, and allow those who will be affected by decisions to also participate in making them. Key requirements for energy team success are:

- A clearly defined long-term direction
- Strong political support from the City's top decision makers
- Members who are energy champions in each department or city sector to be impacted, and at all levels of the department or sector. This must include decision makers, City management, and in the business leaders.

6.1.1 *The Core Team*

The core membership of the energy team is provided by the City and may involve personnel from many different departments. Core participants may vary depending on current project priorities, but is likely to include the following:

- Environmental Programs Administrator – coordinates the activities of the energy team.
- Finance Department – provides assistance on budgetary, accounting, and economic analysis of energy projects. Finance may also help track energy costs and inform the Environmental Programs Administrator of billing anomalies.
- Public Works Department – provides experience with the agency's infrastructure and with current maintenance practices. For some retrofit

projects, like the transportation center, Public Works staff may be the actual project implementers.

- Community Services – as the manager of many of the City Government's buildings, the department has a major role in determining when, where and what energy projects will be implemented for the City, and how they will be financed and operated.
- Community Development Department – to ensure that planning and building codes do not present barriers to energy efficiency, especially in the residential and commercial sectors. For example, building height limits and aesthetic concerns may sometimes present barriers to the installation of renewable energy systems. Also, as a major decision-maker in the redevelopment of the Great Park, the department needs to be involved in energy-related decisions affecting this and similar future projects.
- Utility Representatives – to ensure that the City is coordinating effectively with its utility providers and aware of all existing utility programs available to support the Energy Plan efforts.

Other team members may be added on a project specific basis to provide specialized skills such as legal, human resources, purchasing and contracts, transportation, etc.

For the City's own facilities this core group can form the City's in-house 'energy team,' that can guide energy projects in municipal facilities. This in-house team can help the City set its internal energy priorities, establish implementation projects, and advocate for energy project funding. This core group should be supplemented by representatives of the wider residential, commercial, and business communities as the City moves to implement programs that affect the City as a whole.

For projects directed at the private residential and commercial sectors, there are also local non-profit energy interest groups and business community leaders who, while perhaps not permanent energy team members, can also be essential supporters of local energy efficiency projects. Other possible community supporters include local environmental organizations, including those concerned with the relationships between energy use and human health. For example, childhood asthma is of growing concern, and has been strongly linked to local air quality, which is in turn directly impacted by local energy use. U.C. Irvine is obviously a strong local resource; and as the major developer in Irvine, a representative of The Irvine Company would ideally also be included on the Core Team.

6.2 – Step 2 - Calculate Irvine's Greenhouse Gas Emissions Baseline

The City should establish both its baseline greenhouse gas emissions and its current greenhouse gas emissions to use for generating a target reduction plan. The State of California has recognized climate change as a threat to people and the environment. The Global Warming Solutions Act (AB 32) sets ambitious, economy-wide targets for greenhouse gas reductions, including a return to 1990 levels by 2020. This goal reflects approximately a 25 percent reduction from "business-as-usual" trends. This baseline analysis evaluates opportunities for the City to demonstrate consistency with state goals by showing a substantial break from

business-as-usual patterns of development. This can be done by identifying development features within the City that contribute to tangible reductions in greenhouse gas ("carbon") emissions intensity. One measure of performance could include a 25 percent decrease in emissions compared to a "business-as-usual" baseline (i.e., 25 percent reduction in the net increase in emissions associated with building a similar project under conventional parameters). Achieving a 25 percent reduction in emissions would be an indicator of consistency with the state's goals for long-term emissions reductions.

6.3 – Step 3: Track and Monitor Progress

The ability to regularly and effectively monitor progress is critical to long-term energy program success. Without quality information on whether programs are or not meeting their goals, it may become very difficult to make informed decisions about project schedules and the future disposition of financial, staffing, and other resources.

In general, different types of energy programs will have their own appropriate metrics for program evaluation. For example:

- Programs focusing on energy efficiency measures should track the initial program target savings, the number and type of measures being installed, anticipated and actual savings per measure, and costs per measure. Long-term energy savings also need to be verified through persistence studies at a fixed-period after a measure's initial installation.
- Programs to install renewable energy systems can use similar metrics – number and type of installation, estimated annual energy production, costs for installation and operations and maintenance.
- Staff energy education programs should track the numbers of staff participating in the program, number of workshops held, and the types of education / information service offered. Post-participation surveys can be conducted to demonstrate how behavior has changed and to evaluate its persistence over time.

Information on City energy use needs to be available to the Energy Management Team, to individual building managers, and to City decision makers, though the different users will typically require different levels of detail. The Energy Management Team will have principal responsibility for gathering the City's energy information together, identifying the key information – especially that indicating long-term trends, and for reporting the findings to the relevant commissions and to Council. Facilities managers will be more interested in the energy performance of the specific facilities under their control and in tracking energy use trends to identify anomalies in facility energy use. All are dependent on information derived from an effective utility information management system. The local utilities can provide technical assistance for the development of these energy information resources.

6.3.1 *Energy Tracking in Municipal Facilities*

For the City's facilities the Energy Plan recommendations focus on improving the energy performance of existing facilities, on ensuring that any future building are

built to a high standard of performance, and on shifting the City's electricity use from fossil fuel generated electricity over to renewable resources. Therefore, the City needs to be capable of tracking energy use and costs in its existing and new facilities. As buildings equipped with renewable energy systems begin to appear on line, the City should also be capable of tracking the contribution these systems make toward their host building's energy use.

Electricity bills for City facilities are currently received and paid by the Community Services Department, and the City's natural gas, street lighting, irrigation controller, and traffic signal bills are paid by the Public Works Department. The City does not currently have an internal system for tracking and regularly monitoring its energy use, but does periodically receive summary reports on the electric accounts from SCE. Natural gas use, although tracked, seems to be somewhat less well monitored. The City should establish a procedure to inform facilities managers of ongoing building performance.

The City's Facilities Maintenance Superintendent has requested proprietary utility software ("Utility Manager"[25]) as a tool to help the City monitor its energy use and costs. An energy tracking and accounting system such as Utility Manager allows an energy user to record, analyze, and report energy use and energy costs. It keeps track of utility bills for facilities and provides information on trends in energy use. A good system will also assist with evaluating the effectiveness of an energy management program and help with identifying the most cost-effective energy conservation measures to implement. Certain systems will also allow you to track other utilities such as water, sewer and natural gas, as well as electricity.

Most energy accounting software easily adjusts for variations in weather, facility operating hours, and square footage, so the City can also track year-to-year changes in energy use that are truly due to improved energy efficiency. Another advantage is that utility companies and utility accounting software developers have coordinated their electronic data interchange systems to enable utility billing data to go directly into a City's energy accounting system. This greatly simplifies the process of entering information into the energy tracking and accounting system, and ensures that energy use data and cost information is always current.

Access to such information allows City decision makers to make fully informed decisions about the City's energy programs. A system can help provide information on which projects are meeting their goals; enable adjustments in project timelines and staffing; and inform the future disposition of program resources.

Energy accounting can help the City:

- Measure energy savings and track the performance of energy projects
- Understand where energy is being used and when
- Track energy use trends overall and in specific facilities
- Communicate energy use data to the staff that manage building operations
- Catch billing errors and unusual energy use activity
- Calculate the avoided costs associated with completed energy efficiency projects.

[25] For information on "Utility Manager" and its capabilities, go to: info@utilityaccounting.com

- Allow accounting staff to track energy cost trends over time and identify billing anomalies

6.3.2 *Benchmarking Municipal Facilities*

Benchmarking is a way of rating the energy efficiency of a building, using the federal government's Energy Star system. This provides a performance "score" which ranks the building on a percentile basis against other comparable buildings. Energy Star also provides the energy intensity, or annual energy use per square foot, which can be useful for comparing smaller groups of buildings.

The benchmarking process uses a year's worth of energy consumption, adjusted for the size of the building, its occupancy, operating hours, number of computers, the climate and other factors. A building's final score reflects both the physical efficiency of the building and its equipment, and its operational efficiency, and this information can help managers identify the performance of their buildings compared to other similar facilities.

The State's 'Green Building Action Plan' requires that all State-owned buildings undergo benchmarking for energy efficiency by 2007. [26]

6.3.3 *Tracking City Vehicle Energy Use*

The City currently tracks the quantities of gasoline and diesel fuel used each year together with the associated costs, but the City does not presently have a formal program to reduce the annual miles traveled by fleet vehicles, or to raise the average fuel efficiency per vehicle mile traveled. The City does track annual fleet vehicle miles traveled which could provide the necessary baseline information for initiating a program to increase the efficiency of the City's fleet.

As described in Section 2.4.3, the City is installing GPS (Network Car) units in all new vehicles purchased and will install GPS units in all vehicles over the next three years. These units and software allow monitoring of vehicle use, miles driven, idle time, speed, and monitoring of smog control devices. These units allow for active management of vehicle use.

The current overall fleet efficiency is 8.6 miles per gallon.[27] This overall fuel efficiency is likely to increase as vehicles are replaced with various hybrid and alternative fuel vehicles that are proven to be more fuel efficient and use less fossil fuel.

[26] For further information on benchmarking go to the Green California website at: www.green.ca.gov/EnergyEffProj
For information on the Energy Star program including its benchmarking support information go to: www.energystar.gov/index.
Information on estimated annual energy savings attributable to efficiency and renewable energy installations, including typical values for estimating the cost of efficiency measures, annual energy savings, and effective useful lifetimes can be found in the State-sponsored Database for Energy Efficient Resources (DEER) at www.energy.ca.gov/deer

[27] Vehicles left idling to be able to use on-board equipment (e.g. police lights, maintenance equipment) brings this average down.

6.3.4 *Tracking Private Residential and Commercial Energy Use*

Most local energy efficiency programs directed at the private residential and commercial sectors are currently funded by the California Public Utilities Commission (CPUC) and managed by the local utilities, or by third party program managers in cooperation with the utilities. For all these programs, the CPUC has set high standards for the required measurement and evaluation of program results. Since this is public information, the energy reduction impacts of implementing the various programs are available to the City.

Reductions in local energy use that result from individually financed, owner-managed private sector projects may be more difficult to track. At present these represent a relatively small percentage of completed installations, but hopefully this will increase. Private sector efficiency projects, and renewable energy systems installed through participation in programs such as the Irvine Build Green program, which require participant registration in the program; and projects that require building, plumbing, or electrical permitting by the City are all relatively easy to track.

Information on transportation usage is available from regional transit agencies and from the State Department of Transportation "Highway Performance Monitoring System."

6.4 – Step 4: Energy Program Financing

The two fundamental activities for most municipal energy programs are retrofitting existing municipal buildings to improve their energy performance and ensuring that any new municipal facilities are built to the highest energy performance standards. To be effective, both activities need long-term support and a serious commitment to continued funding. This allows staff to build its technical and management skills, and to develop the relationships with staff in other municipal agencies that are so critical to implementing successful energy projects. Unfortunately, local government energy programs are often seen as amenities rather than necessities, and so expenditures on energy programs fluctuate over time along with national and local political interest in energy issues. However, maintaining continuing funding is the key to long-term program success.

Municipalities have responded to the need for consistent long-term energy program funding in a variety of ways. Some programs depend largely on outside funding from state government or their local utilities. Other local government programs have had to rely on the annual budgeting process, and have had no choice but to make their arguments for funding regularly each year. This obviously makes these programs very vulnerable to current perceptions of the importance of energy efficiency at that particular moment in time, and it can make long-term energy program planning and implementation very difficult.

Some municipal governments, such as the City of Phoenix, have instead tried to protect their programs from annual fluctuations in financial support. Obviously these city councils still retain general financial control, but the energy programs are much less vulnerable to shifting short-term priorities. Other cities, such as Portland with its 1 percent add-on to departmental energy bills, and Boulder, CO with its climate action tax have developed different program funding mechanisms. In California the

CEC has for many years provided a loan program for local governments. The program is structured so that the loan repayments are less than the savings that result from installing the energy measures, so there is no additional net cost to the city. These alternative financing mechanisms are described briefly below.

6.4.1 *Revolving Funds*

For some cities the solution to the energy project financing problem has been to put in place an administrative device, sometimes called a "revolving fund," that provides continuing long-term financial support to the energy program. To some extent, this device operates outside the annual budget review process, and so energy program staff can be confident that funding will continue to be available. This allows the energy staff to make longer-term commitments to the energy program's many stakeholders.

A typical revolving fund works as follows:

- The energy program obtains initial seed funding from a city's general fund, or from the local utility, or as a grant or loan from a state or federal agency. Occasionally funding may be received from a non-profit foundation interested in environmental and energy related issues.
- This initial "stake" money forms a kind of "bank account" from which energy projects in the city's facilities may then be funded.
- The dollar value of the energy savings that result from the funded energy projects, are reinvested in the bank account to provide funding for subsequent energy projects.

When the revolving fund program is fully operational, and savings are accumulating in the fund, then a decision may be made to either leave all the funds in the energy account, or to split the accumulated savings with the general fund, or to share the savings with a recipient client department if they have also been contributing toward energy project costs.

The best known local government example of a fully operational revolving fund is that operated by the City of Phoenix. The City of Phoenix began its energy management program following the energy crises of the late 1970's. The program initially funded no-cost / low-cost energy retrofits, especially lighting projects. By 1983 the program had fully established its credibility and City Council felt confident enough of the program's via percent of documented energy avoided costs to be reinvested in further energy efficiency improvements. Any avoided costs [28]over a set amount would be attributed to the City's general fund. The funds are all spent on retrofit work in the general fund departments. Any activities related to new construction are funded separately, and in general the program is entirely self-supporting.

[28] Program staff in Phoenix have made it a habit to refer to the dollar benefits from completed energy projects as "cost avoidance" rather than as "savings," in order to avoid giving the impression that money saved by energy projects is sitting around waiting to be spent.

6.4.2 *The City of Portland's 1 Percent for Energy*

Portland has used a very different method of financing staff supported energy projects in the city's existing facilities. Portland imposed a 1 percent surcharge (with a ceiling of $15,000 per department) on departmental energy bills. The money went into a central fund to support a city energy specialist who acts as the representative on energy issues for the departments, interfacing with the utilities, staying in touch with current rebates and other assistance available, and providing technical support for departmental energy projects.

6.4.3 *The City of Boulder's Climate Action Tax*

In November 2006 the City of Boulder's voters approved Initiative 202 – the Climate Action Tax Plan that went into effect on April 1st, 2007. The revenues generated through the tax will be targeted at reducing greenhouse gas emissions generated by energy use in buildings, the operation of vehicles, and landfill gas emissions. The tax is a surcharge based on a per-kilowatt-hour usage with an annual cap. The tax is collected by the utility as part of the normal billing process; however, customers who subscribe to the utility's premium priced renewables portfolio will be exempt. In 2007 the tax is expected to generate more than $860,000, though in future this could go as high as $1.3 million. The specific programs established under the plan include weatherization services, energy audits, contractor training and public workshops, promoting renewable energy, recognition programs for high achievers, light bulb incentive programs, and neighborhood sweeps where conservation kits and information will be distributed to residences.

6.4.4 *CEC Local Government Loan Program*

The California Energy Commission (CEC) has for many years provided a loan program to support local government energy retrofit and some new construction projects. The program provides low interest loans (currently as low as 3.95 percent and fixed for the term of the loan) for feasibility studies and the installation of cost-effective energy projects in schools, hospitals and local government facilities.

The loans are repaid out of the energy cost savings, and the program will finance lighting, motors, drives and pumps, building insulation, heating and air-conditioning modifications, certain energy generation projects, including renewable energy projects and cogeneration, streetlights and traffic signal efficiency projects. Loans can cover up to 100 percent of project costs and there is a maximum loan amount of $3 million. [29]

6.4.5 *Acceptable Energy Project Payback Periods*

There are a number of alternative ways of evaluating the cost-effectiveness of a proposed energy project, including total life-cycle cost, net savings, savings to investment ratio, and internal rate of return. By far, the most common project evaluation method is simple payback. This method ignores the time value of money and assumes that future savings occur in even amounts each year over the lifetime of a proposed measure. The simple payback period is equal to the investment cost

[29] For more information see www.energy.ca.gov/efficiency/financing

divided by the annual savings. For example, a $1,000 investment that saves $500 each year has a two year simple payback.

In the recent past it has been the City of Irvine's general practice to look for payback periods as short as two years to five years. These are very short payback requirements and they severely limit the kinds of projects that can be supported. They also exclude many otherwise worthwhile projects with longer payback periods and inevitably increase the City's overall long term energy costs. The City should institute a payback policy for future energy projects in City facilities to have a longer payback period than 2-5 years.

Like most local governments, Irvine is primarily an owner / occupier of its facilities. The City's financial interests therefore, are best served by taking every cost-effective opportunity to implement energy projects that lower the City's energy costs. The federal government has chosen to implement all efficiency projects with a payback of ten years or less, but in principle any project that pays back its initial investment in less than the measure's anticipated lifetime can reasonably be considered worthwhile. Another way other government agencies have dealt with energy project payback periods is to implement comprehensive energy projects that include a range of different measures, where the shorter payback measures can subsidize the cost of longer payback items, to produce an acceptable overall payback period.

6.4.6 *Local Renewable Energy Credit Projects*

Many companies and individuals wishing to reduce their carbon footprint buy Renewable Energy Credits, or RECs. A REC is nothing more than an assurance that the money paid will be used to fund a renewable power facility that would not otherwise have been funded. The City of Irvine could set up a program to fund those projects in Irvine using the money that would have been paid for projects in other parts of the country or even the world. It would be an option for businesses and individuals in Irvine or in neighboring communities to be sure their money is used for the purpose intended and it will benefit them more directly.

6.5 – Step 5 - Initiate "100% Participation, 100% Irvine" Campaign

This must be an on-going campaign because the residents and business are constantly in flux. Energy efficiency, renewable energy, and reducing carbon should become core values for the community. It is only when everyone is doing their part that the goals set out in this Energy Plan can be achieved. "100% Participation, 100% Irvine" will need to become part of everything the City does. Whenever the City hosts an event, the elements that contribute toward achieving the goals of the Energy Plan should be highlighted for all who attend to see. Every City employee should be trained in the basic precepts of this Plan so that they can either answer questions about the goals or direct people to information about how they can help achieve the goals. A comprehensive and on-going program to accomplish this will need to be developed. It will need to include such entities as the Chamber of Commerce and the Homeowners' Associations in order to be successful.

6.6 – Summary of the Next Steps

Table 10 summarizes the steps as described, and includes the staffing and cost impacts to implement.

Table 10 – Next Steps in Implementing the Energy Plan

ACTION	PURPOSE	COST TO IMPLEMENT	STAFFING IMPACTS
Establish an Energy Management Team	Provides direction to the energy programs, helps build consensus, and allows those affected to participate in decision making	Low initial cost, but on-going	Environmental Programs Administrator is only permanent member, but requires time from all participants
Prepare citywide CO2 emissions inventory and reduction plan by 2009	Provides a baseline picture of current local climate-changing emissions	Approximately $150K	Data gathering and/or preparation of inventory by consultant, with project management by Community Development Environmental Programs staff
Establish energy tracking and monitoring program	Ability to track and communicate energy and cost trends, measure program savings, and identify billing anomalies	Relatively low cost to purchase software, but requires ongoing maintenance	Ongoing by both Community Development Environmental Programs and Finance staff; access should also be available to individual dept and building managers
Establish short term and long term energy program financing methods	Provides near-term financing of current Municipal retrofit opportunities, and on-going funding for long-term switch to renewable energy systems	Loans from CEC to finance retrofit opportunities which can be met from energy savings. Long term costs for renewable energy systems are high, with long paybacks; rebates are available	Ongoing by both Community Development Environmental Programs and Finance staff
Establish 100% Participation, 100% Irvine Public information campaign	Essential component of Irvine's public information campaign. Provides vehicle for all sectors to demonstrate commitment to the city's energy goals	Requires ongoing financial support from public and private sectors	Ongoing support from Community Development Environmental Programs staff, management, and elected officials; plus participation and support from influential private sector commercial and residential decision makers and local energy interest groups

SECTION 7 - MUNICIPAL IMPLEMENTATION STRATEGIES

The City will need to lead the way towards accomplishing the goals of this Energy Plan so this section lays out the strategies that would do just that. The first set of strategies listed is those that improve the energy performance of existing facilities and thereby reduce the demand for energy. The second set of strategies ensures that all new facilities are designed and constructed to be as energy efficient as possible. When a facility's need for energy has been reduced as far as possible, then meeting the remaining demand with renewable energy is much easier and more cost-efficient. The third set of strategies addresses the City's fleet vehicles and employee transportation.

Selected strategies, along with a budget, will make up an implementation plan that would be approved by City Council before staff could proceed. They are presented here to provide an overview of what kind of actions will need to be taken by the City to achieve the four long-term goals presented in the previous section.

7.1 – Existing Municipal Facilities

7.1.1 *Conservation & Improved Efficiency*

These "higher impact" strategies would do the most toward helping achieve the long-term goals:

a. Determine the status of previous audits of municipal facilities; identify cost-effective energy efficiency retrofit measures, and evaluate alternative project financing mechanisms. (A discussion of cost-effectiveness is included in Section 6.3.5 Acceptable Energy Project Payback [30])

b. Consolidate smaller energy retrofit projects, and identify potential funding sources.

c. Implement all cost-effective retrofit projects, and select certain projects for certification under the LEED Rating System for Existing Buildings (LEED EB) to provide a benchmark for future retrofit projects.

d. Re-commission all major energy using facilities to ensure that their energy using systems are operating at maximum efficiency. (Note that Southern California Edison and The Gas Company have programs to assist with some aspects of re-commissioning.)

e. Identify all non-building energy uses such as exterior lighting and irrigation systems, and evaluate performance. Identify and implement cost-effective ways to improve efficiency and/or reduce lighting during low usage time periods.

f. Certify all municipal facilities under LEED for Existing Buildings (LEED-EB).

[30] A complete evaluation of the cost of implementing a potential energy efficiency project should also include the "cost of delay." For example, if a proposed retrofit project will save $5,000 annually but for financial or other reasons its implementation is delayed for two years, then the cost of delay is $10,000. Quite often the cost of delay is greater than the savings that may result from delaying a project in order to downsize the work in hope of reducing the project's cost. The obvious conclusion is that cost-effective energy efficiency projects should, whenever possible, be implemented without unnecessary delay.

These "lower impact" strategies would still move the City toward achieving the long-term goals, albeit at a slower pace:

g. Evaluate replacing conventional systems with off-grid systems such as using solar powered lights for conventional park trail lighting.
h. Work with Southern California Edison to pursue the testing and introduction of new technologies, such as electronic ballasts for high pressure sodium street lights (and possibly LED street lighting) through the installation and monitoring of pilot projects.
i. Continue to work closely with Southern California Gas Company and Southern California Edison to ensure the City is taking full advantage of their many technical and financial energy efficiency resources.
j. Evaluate and, where appropriate, incorporate demand response technologies such as programmable communicating thermostats.
k. Adopt operations and maintenance practices, staff education, and purchasing policies that support energy efficiency goals.

7.1.2 *Administrative / Institutional Changes*

Higher impact strategies:

a. Conduct an internal review of City policies for the financing of energy retrofit projects, the current use of one-time carry-over funds, and develop a payback policy for the future financing of municipal energy projects. 31.

b. Evaluate energy project financing mechanisms (e.g. general fund expenditures, a revolving fund, or using California Energy Commission loans) and put a project financing system in place using one or more of those mechanisms.

c. Evaluate energy project delivery methods (in-house staff install v. contractor v. energy service company (ESCO) v. etc) and select preferred alternative to match City's current needs, and implement retrofit projects. 32

d. Evaluate various utility management systems; select and purchase a system together with staff training and technical support.

e. Participate in State and Federal energy programs such as EPA Green Lights and Energy Star Purchasing and other similar programs, which promote the use of energy-efficient technologies and provide services to help agencies identify, specify and purchase energy efficient office equipment, lighting equipment, appliances, etc.

f. Work with utilities and local energy interest groups to ensure information on energy and related issues is widely available, especially to 'hard-to-reach' communities.

[31] Section 6.3.5 of this Plan includes a discussion of payback criteria.
[32] Different project delivery methods have varying advantages and disadvantages. For example, certain project delivery systems can minimize the administrative burden on staff but are likely to be more expensive; in contrast certain types of project may be installed more cheaply using in-house labor, but they obviously are more demanding of staff, which may then not be available for routine maintenance work.

g. Work with utilities and adjacent local and regional governments to ensure that available local energy resources such as landfill gas opportunities in the County are fully exploited.

Lower impact strategies:

a. Evaluate existing available staff training and energy education programs;[33] identify incentives for improved energy efficiency performance by staff.
b. Develop a reward system for staff ideas leading to a reduction in energy use.
c. Expand energy efficient transportation alternatives for staff such as van pool programs.
d. Work with UCI and Toyota to make the ZEV-NET program available to City employees to encourage commuting by rail.
e. Consider joining the California Climate Action Registry and registering all future qualified energy efficiency projects.
f. Develop an energy emergency contingency plan to provide initial guidance to City departments on the appropriate operation of municipal facilities in the event of a future disruption to energy supplies.
g. Track the development of "White Tags" which are intended to provide a tradable market value for installed energy efficiency projects.

7.1.3 *Renewable Energy Systems*

Higher impact strategies:

a. Survey and map all existing City owned properties to determine their potential for the installation of renewable energy systems – primarily solar photovoltaic and thermal systems.
b. Determine the percentage of renewable installation potential available on-site at each municipal facility, and the amount of remaining energy demand that is to be met by purchasing renewable energy generated off-site.
c. Establish a multi-year plan to finance and install renewable systems at the selected facilities, completing all installations by 2015.
d. Identify and evaluate alternatives for the provision of off-site generated green energy.
e. Pursue the development of educational/informational renewable energy demonstration projects at the Great Park.

7.2 – New Municipal Facilities

The US Conference of Mayors long-term goal for new facilities is to eliminate fossil fuel use in new city owned facilities by 2030. Since Irvine anticipates reaching full build out by 2025, ideally new buildings constructed during the latter part of this time period will already meet that standard. Buildings constructed earlier can reach the goal through a stepped increase in the percentage of renewable energy used over time, as recommended in the Mayors' Resolution 50.

[33] For example, the US Dept of Energy has produced a CD-ROM staff training aid called "Power Check Low and No-cost Tips for Saving Energy." The Gas Company has also developed an employee training program that would be available to City employees.

7.2.1 Conservation & Improved Efficiency

Higher impact strategies:

a. Design and construct high performance facilities exceeding the requirements of the State energy code Title 24 by a minimum of 20% and adopting a LEED certification level of Gold as the standard for new municipal facilities[34]. Purchase energy efficient equipment and materials for those facilities thus lowering building energy operating requirements.
b. Ensure that all new municipal facilities are built to provide a very high level of energy performance, easily exceeding code requirements, through careful architect/engineer selection, expert energy design review of proposed projects, appropriate specification preparation, etc.
c. Develop selection criteria for the architects/engineers of new municipal construction projects that will ensure adequate previous green building and renewable energy system experience.
d. Ensure new municipal construction projects are taking maximum advantage of utility assistance programs such as 'Savings by Design' that provide design assistance, and owner and design team incentives.
e. Require extensive use of day lighting in the design of all new municipal facilities.

Lower impact strategies:

f. Since pumping water is a major user of electricity, measures to reduce water use also save energy. Therefore, all toilets in new municipal construction projects, and replacement toilets in major remodel projects in municipal facilities could be required to meet the water efficiency standards (January 2006) of the 'Uniform North American Requirements (UNAR) for Toilet Fixtures.' [35]
g. All urinals in new municipal construction projects and in major remodel projects in municipal facilities shall be high-efficiency fixtures using less than 0.25 gallons per flush (0.95lpf) or be waterless fixtures.

7.2.2 *Renewable Energy Strategies*

Higher Impact Strategies:

a. Provide all new facilities with on-site renewable energy systems, which over time meet a steadily increasing percentage of facility energy needs, until new buildings reach the US Mayors Conference goal of carbon neutrality in 2030.
b. Where necessary, purchase renewable energy generated elsewhere to bridge the

[34] The City currently has LEED Certified as the required standard for new construction projects. A survey of 33 LEED buildings reported by Greg Katz indicated that the surveyed projects had an average increased cost premium of 1.8%, or about $4 per square foot. Katz also describes the results of a survey of 60 LEED rated buildings that indicated that green buildings are 25-30% more energy efficient when compared to conventional buildings. The LEED Gold buildings surveyed experienced an average reduction in energy use of 37% compared to conventional buildings, and LEED Certified a reduction of 18%. The total 20 year net present value per square foot of a LEED Gold building was $67.31, and $48.87 for a LEED Certified building. "The Cost and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force. 2003, Greg Katz; Capital E, Principal Author.

[35] UNAR is a voluntary qualification system that can be adopted by water authorities who want to ensure both that toilet fixtures achieve water savings that persist over time and that customers are satisfied with toilet flush performance. UNAR incorporates both minimum performance standards and the Los Angeles Supplementary Purchase Specification to ensure performance is maintained.

gap between a building's energy needs and the energy provided through on-site renewable energy generation.

c. All new public swimming pools, gymnasia, and related community facilities should be required to have water heating provided (at least in part) by renewable energy sources, especially by solar hot water systems, and/or by cogeneration.

7.3 – Transportation

Higher impact strategies:

a. When replacing fleet vehicles, maintain the current practice of purchasing Compressed Natural Gas (CNG) vehicles for the replacement of vehicles parked at the Operations Support Facility (OSF) (i.e. the maintenance yard) since there is a CNG fueling station on site. Non-police passenger vehicle replacements for Civic Center should be high mile-per-gallon hybrid vehicles. Public Works and Administrative Services staff are currently working on an annual vehicle replacement program to identify candidate vehicles and funding sources. (Alternative fuel vehicles typically cost more than standard vehicles.)
b. Review the perceived need for vehicles with large capacity engines and downsize engines in replacement vehicles whenever possible.
c. Continue to emphasize the maintenance of existing vehicles through regular tune-ups, tire pressure maintenance and smog inspections; and encourage driver training to maximize fuel efficiency and reduce impacts on local air quality.
d. Investigate the use of telecommuting technologies to allow some City employees to work out of their homes at certain times to reduce the traffic congestion and environmental impacts of city employee commuting.
e. Provide preferential parking for van pools / car pools, and as rewards for energy efficiency ideas; also provide preferential parking for neighborhood shuttles, and for City employee's use of personal hybrid cars. Provide information to employees on how to use transportation alternatives.
f. Encourage the use of car pools, transit, walking, bicycles, and other forms of alternative transportation by City employees by offering preferred parking, cash and/or other incentives to those who use alternatives to driving alone to and from work.
g. Negotiate a contract to make the ZEV-NET vehicles at the Irvine Transportation Center available to employees. This will reduce the number of older "station" cars used, and encourage more employees to commute by train.

Lower impact strategies:

h. Track mileage driven per driver and department, and encourage strategies to minimize numbers of trips and to optimize routes.
i. Continue to look for effective alternatives for heavy duty vehicles such as street maintenance trucks.
j. Create a link on the intranet to Renewable Energy Credits (REC's) for employees to purchase to offset their commute emissions. The cost to offset the average commuter's emissions (3 tons/year) is $30 - $40. By making this available on the City's intranet, people who are environmentally proactive could take advantage of the opportunity. The City could also encourage this by paying a portion of the cost of the offsets.

k. Create a City carpool tool on the City's intranet that would allow employees to register for carpooling, connecting them to other employee's living close-by, with similar work schedules. A small number of commute surveys indicate that 10 percent of employees cite difficulties with finding others to share a ride as the primary reason for driving alone to work, and indicate that as many as 40 percent of employees surveyed cite car pooling as their preferred alternative to driving solo.

Table 11 - Municipal Implementation Strategies

MUNICIPAL IMPLEMENTATION STRATEGIES	PURPOSE	COST TO IMPLEMENT	STAFFING IMPACTS
Establish policy of purchasing energy efficient products	Ensures that the City purchases the most cost-efficient energy using equipment	Relatively low cost to establish, but requires ongoing maintenance	Ongoing by CD Environmental Programs, Purchasing and Finance staff, and by each dept.
Investigate use of telecommuting technologies and alternative staff work schedules	Allow certain employees to work from home at certain times to reduce traffic and vehicle emissions	Variable depending on numbers of employees involved and equipment provided	May reduce space required for staff offices and for staff parking
Prepare survey of existing buildings for future solar system installation	Provides picture of future solar generation potential in City facilities	$30 - $50k depending on scope	Preparation of survey by consultant, with project management by Environmental Programs Administrator

SECTION 8.0 CITYWIDE IMPLEMENTATION STRATEGIES

Citywide implementation strategies are divided among three sectors – Commercial/Industrial, Transportation and Residential. In working together in a collaborative fashion, both the City and the private sector can achieve significant reductions in energy usage through the following suggested implementation strategies. Controlling the increasing costs and reliability of energy can prepare businesses for the long-term and support their ability to compete in a changing world. Passive survivability strategies will also help to keep operating costs down and to allow for some business to continue in the face of adverse conditions such as a temporary loss of power.

8.1 – Commercial / Industrial Sector

The State of California has been investing in energy efficiency and enforcing stringent energy standards in the commercial sector for more than 25 years. About 9,000 megawatts of energy have been saved which is equivalent to the output of eighteen 500 MW power plants, and adding 3 percent to the state's rate of economic growth.

In total, the commercial sector electricity consumption accounts for about 35 percent of the state's demand, and 38 percent of total peak demand. Peak demand in the commercial sector is dominated by energy for air-conditioning (45 percent) and by lighting (33 percent). Office buildings are the single largest energy user in the state's commercial sector accounting for 28 percent of all commercial demand. [36]

Although more than 80 percent of Irvine's 69,000 electricity accounts with Southern California Edison are residential, these accounts comprise only 15 percent of total electricity use. Medium and large commercial/industrial customers (GS-1 and GS-2 accounts) make up only about 16 percent of the accounts, but represent 70 percent of total electricity usage citywide. This means that successfully reducing overall energy use in Irvine is highly dependent upon reducing energy usage in the commercial sector.

As with municipal facilities, the long term goal for new commercial/industrial construction should be to work toward meeting the US Conference of Mayors goal of eventually eliminating the use of fossil fuel generated electricity, and substituting renewable energy generated either on-site or off-site.

The first step in achieving this goal is to reduce the need for energy supplies through improved energy conservation and greater efficiency. This should result in cost savings for businesses that can be directed towards producing and/or procuring renewable energy. There are a number of strategies available to accomplish this.

[36] For more detail on energy use in commercial buildings and examples of successful commercial sector energy projects, see www.fypower.org/bpg/index

8.1.1 *Conservation & Improved Efficiency*

Higher impact strategies:

a. All new commercial / industrial construction should be encouraged to exceed the State's energy code Title 24 by at least 15 percent. (Under Irvine Build Green for commercial buildings, exceeding Title 24 energy efficiency requirements by 20 percent garners 25 of the minimum points needed for certification).
b. Develop incentives for high performance design and construction in the private sector, such as reduced fees and expedited processing.
c. Provide incentives for achieving higher standards of energy efficiency alone, such as fast-tracked permitting for proposed projects that exceed Title 24 by 15 percent or more.
d. Encourage businesses to power all decorative lighting, advertising, and other non-safety related exterior lighting by renewable energy.
e. In cooperation with locally-based non-profit agencies, provide technical and other assistance to local small businesses to replace existing inefficient lighting and refrigeration systems.
f. Work with local utilities, energy and business interest groups to develop a program for re-commissioning existing commercial buildings.
g. Work with the utilities, local energy interest groups and local business and civic organizations to provide training and educational programs about energy efficiency and conservation, demand response programs and renewable energy resources especially wind and solar, for local businesses. [37]

Lower impact strategies:

h. Recommend that all new commercial and retail construction projects to be designed and built 'solar ready' with an accommodation for the necessary electric service, wiring, water storage tank and pipe work to be provided at the time of initial construction, ready for the future installation of solar photovoltaic and/or solar hot water systems. [38]
i. Encourage less paved areas and more shading adjoining buildings to reduce the 'heat island effect.' Trees help moderate the temperature through evapotranspiration, and provide shade that reduces the amount of solar radiation absorbed by pavement and buildings. Properly located trees can reduce the cost of cooling buildings, reducing air-conditioning needs up to 30 percent[39], thereby reducing the amount of fossil fuels required to produce electricity.
j. Encourage the more widespread use of grey water for permitted non-potable purposes such as toilet flushing and irrigation on-site. Grey water is different than reclaimed water. It is the wastewater from all water-using fixtures except toilets and sinks with food grinders; it contains far less organic material than normal waste water and so can potentially be managed in different ways. In

[37] The PEAK program currently provides energy education in the IUSD. This effort could be expanded.
[38] The 'solar-ready' construction guidelines could be based on the 'Montana Guide to Building Energy Star Solar Homes' developed by the National Center for Appropriate Technology.
[39] Michigan State University Extension, Urban Forestry #07269501, "Benefits of Urban Trees."

some buildings, as much as 50 percent of water use can be recaptured and reused to flush toilets.[40]

k. Encourage the use of waterless urinals in new construction and major remodeled projects.

l. Consider adopting (and adapting as necessary for commercial areas) the Model Lighting Ordinance and Design Guidelines jointly developed by the International Dark Sky Association and the Illuminating Engineering Society of North America. The Model Ordinance requires outdoor lighting appropriate to communities, the environment, and the natural habitat.

8.1.2 Energy Information and Education

m. In cooperation with the Irvine Chamber of Commerce, provide a regular energy information and education column in the Chamber's newsletter, describing new opportunities for saving energy and money.

n. Work with the Irvine Chamber's Go Green Committee to develop a recognition program to showcase high performance local energy projects.

8.2 – Citywide Transportation

Currently, according to the Southern California Association of Governments (SCAG), 77 percent of the area's commuters drive alone. Reducing transportation energy use requires requesting a major behavioral shift on the part of residents, the many commuters who come to Irvine to work, and City employees, who would all be encouraged to carpool, bike, ride the bus, walk, or ride a motorcycle to work and on their every day errands. When taking advantage of alternatives to driving alone, employees and residents avoid the need to pay expensive gas prices for commuting, as well as the cost of repairs and maintenance on vehicles. In addition, there are the non-financial benefits: reductions in greenhouse gas emissions, reduced smog, noise, childhood asthma, water pollution, suburban sprawl, parking lots, and other changes that come from driving less.

The California Air Resources Board's proposed greenhouse gas emission reduction strategies include regulations to achieve the maximum feasible and cost-effective reduction of climate change emissions from passenger cars and light trucks (adopted 2004); measures to limit idling by diesel-fueled commercial vehicles (2004); new standards for light duty vehicles to be phased in by the 2017 model year; regulations requiring the displacement of a percentage of diesel fuel by biodiesel; increased use of ethanol; as well as the California Hydrogen Highway Network (CA H2 Net) – a State initiative to promote the use of hydrogen as a means of diversifying transportation fuel sources.

Beyond the above initiatives, reducing vehicle miles traveled is the strategy most likely to achieve an early reduction in vehicle originated emissions. However, reducing vehicle use remains one of the most intractable problems for cities attempting to reduce local emissions. The importance of land use planning and transportation planning via the General Plan's Land Use and Circulation

[40] Irvine's existing commercial Green Building program includes a voluntary requirement that buildings use reclaimed water for toilet flushing.

elements cannot be overemphasized. Land use patterns which facilitate non-auto travel and such things as a robust network of bike trails give people the option to use alternative modes of travel. It also offers them a healthier way of getting around and helps break the pattern of a sedentary lifestyle that most Americans lead.

Higher impact strategies:

a. Encourage Irvine employers to use telecommuting technologies and to examine the possible benefits of alternative work schedules to allow some employees to work out of their homes at certain times and to reduce the traffic congestion and environmental impacts of employee commuting.
b. Encourage businesses to provide preferential parking for van pools / car pools, and as rewards for energy efficiency ideas; also provide preferential parking for neighborhood shuttles, and for employee's personal hybrid cars.
c. Work with businesses to provide their employees up-to-date information on how to use transportation alternatives particularly the new I-shuttle recently launched in the Irvine Business Complex. Include tips on driving, and energy, health and pollution impacts of driving.
d. Implement policies in the City's Circulation Element that are likely to result in a decreased use of fossil fuel energy, especially those recommendations that encourage walking, transit and bicycling.
e. Encourage businesses to enter into a contract to make the ZEV-NET vehicles at the Irvine Transportation Center available to its employees, to reduce the number of older "station" cars used, and encourage more of its employees to commute by train.
f. Encourage the use of new car rental / car sharing options such as Flexcar.
g. Discourage the provision of ample free employee parking. Free parking is a strong incentive to drive alone, and represents a subsidy those who bike or walk, or use rideshare or public transit does not receive. [41]
h. Another alternative would be to give all employees who choose some other mode of transportation a cash subsidy equivalent to the cost of paid parking. Those employees may use the cash to pay for their commute and pocket the difference. Such a system offers employees who take public transit or bike to work similar subsidy-payments to those presently benefiting from free parking.

Lower impact strategies:

i. Evaluate construction of covered parking areas to provide preferential parking which also serve as solar PV generation sites. Provide employee free plug-in hybrid refueling stations at City facilities with solar PV electricity generation systems.
j. Encourage businesses to facilitate employee purchases of Renewable Energy

[41] Free, employer-provided parking is one of the most widespread transportation practices in the country. Wilson and Shoup point out that "Free gasoline for employees who drive to work would seem like a reckless offer, yet employer-paid parking is a much stronger incentive to drive to work alone." Wilson, R.W. and Shoup, D.C. *Employer-Paid Parking.* Transportation Quarterly, Vol. 46, #2, pp. 169-192.

Credits (REC's) to offset their commute emissions. The cost to offset the average commuter's emissions (3 tons/year) is between $30 and $40. Employees who are environmentally proactive could take advantage of the opportunity. To encourage participation, the business could offer to pay a portion of the cost of the offsets.

k. Work with OCTA to provide lunch time shuttle bus use in the other areas of the City. Employee commuter surveys often indicate that about 15 percent of drivers commute alone because they need their cars for personal business such as banking, dry-cleaning, or small shopping accomplished during the lunch hour at adjacent shopping centers. A personal auto is not needed if alternative transportation is available during the lunch hour.

8.2.1 Policies to Encourage Transportation Alternatives

a. In all new developments, prioritize the implementation of circulation system improvements, incentives and disincentive measures to reduce single-occupancy automobile travel, and promote bus transit, rail transit/fixed guide way systems, carpooling, bicycling and walking.
b. Encourage local businesses to use incentives and disincentive measures to reduce single-occupancy automobile travel by their employees, and to promote the use of bus transit, carpooling, bicycling, and walking to work.
c. Promote and expand alternatives to single-occupancy driving, advocate at county and regional levels for increased supply/increased frequency, reliable and convenient public transportation. Promote regional public transit, especially between major Orange County urban centers.
d. Work with regional transportation agencies to develop and promote a regional on-line car pool rider connector to help residents who wish to car pool to connect with other drivers using similar routes.
e. Encourage all new commercial/office centers to include food services, a gym with showers, bike lockers, etc. to reduce employees' need/desire to leave the area during lunch breaks. Bike lockers safely store bicycles during the day, together with helmets and other bike equipment and make bike commuting more appealing.
f. Discourage the provision of free parking in commercial, educational, and other centers. [42]

8.3 – Residential Sector

The general long-term goal for new construction in the residential sector is the same as for the City's own new facilities. That is, over time and through incremental steps, to eliminate fossil fuel generated energy use, and to substitute a mix of on-site and off-site generated renewable energy.

However, establishing effective polices and practices to improve the performance of existing residential buildings are more difficult. The difficulties range from

[42] When Palo Alto began charging students for parking at Gunn High School, the number of students driving alone was reduced from 250 to 85. The number of students carpooling rose from 85 to 225. Parking fees were also used to subsidize transit passes for students.

homeowners' investment preferences that discourage spending on energy efficiency, to difficulties with energy program design. For example, many homeowners perceive that energy costs are mostly fixed costs and that little can be done to reduce them. Many homeowners prefer to make investments in their homes that improve its comfort and appearance, and thereby enhance its resale value, rather than investing in 'behind the scenes' energy efficiency measures. This limits a homeowner's willingness to invest in improving energy efficiency in the home.

On the program design side, there are also difficulties. For example, many programs designed to encourage improved efficiency are 'information only' programs which, unless the homeowner is already close to making a decision, are unlikely to have a major impact on homeowners investment decisions. The most effective programs combine education and information and regulation, together with incentives. Fortunately, since most housing in Irvine is relatively new, it is already more efficient than in many older cities; nevertheless, there remains many opportunities in Irvine to improve residential building performance.

The general goal for existing residential buildings is to improve their energy performance over time, through a gradual upgrading of buildings and their energy using systems. There are basically two opportunities to do this – the first by encouraging homeowners to improve the performance of their home using education, information, and incentives, etc. And secondly, to require improved performance at time of sale, when there is typically financing available to also implement projects to improve energy efficiency. For maximum impact, Irvine could do both.

The requirement to upgrade the existing housing stock can be accomplished through a residential conservation ordinance (RECO) that requires the upgrading of a residence at the time of sale. [43] Typically a RECO will focus on the space heating system, hot water heating, lighting, attic insulation, weather-stripping, and replacing inefficient showerheads, toilets, etc.[44] In multifamily buildings, a RECO would also focus on improving energy use in public area lighting and in shared laundry facilities.

Another consideration for existing housing will be working with the many homeowners' associations (HOAs) throughout the Irvine. The HOA Boards regulate much of the architectural changes that occur in their associations through implementation of the covenants, Conditions and Restrictions.

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[43] The proposed residential energy conservation ordinance (RECO) could be based upon those currently in effect in Berkeley and San Francisco, but since Irvine's housing stock is so much newer it would probably exclude some measures considered necessary for the older housing in those cities. Who pays, buyer or seller, could be negotiated at the time of the sale.

[44] Pumping water is a major energy user in California; reducing the use of water therefore also saves energy. Many homes in Irvine are now more than 20 year old and thus are equipped with older less efficient fixtures and appliances. The Pacific Institute estimates that while great progress has been made in California, "Indoor residential use could be reduced by approximately another 40%... by replacing remaining inefficient toilets, washing machines, showerheads, and dishwashers, and by reducing the level of leaks, even without improvements in technology." Pacific Institute for Studies in Development, Environment, and Security, *"Waste Not, Want Not: The Potential for Urban Water Conservation in California."* November 2003

Anecdotally, solar installation companies have expressed some frustration with these HOA boards or architectural committees opposing installation on the southern exposure or the look of the panels. It would facilitate implementation of renewable energy such as solar thermal, photovoltaic, wind, etc. if the City were to work closely with the HOAs to develop guidelines for renewable installations that are consistent throughout the City.

Many of the necessary measures for reducing energy use in new residential; construction are already part of Irvine's existing voluntary green building program, Irvine Build Green. Irvine Build Green also includes a requirement to install conduit to, and provide a proposed layout for, a future solar photovoltaic system. At present, however, most residences are not built with solar systems included. A straightforward way of both improving energy efficiency and emphasizing on-site renewable energy would be to make the energy and renewable energy measures in the green building program mandatory instead of voluntary Citywide, and to require that a percentage of residences be built with renewable energy systems at the time of initial construction.

The US Conference of Mayor's goal of reducing the use of fossil fuel generated energy, and providing an increasing percentage of renewable energy can be interpreted either to mean that all residences shall have renewable energy systems supplying 60 percent of their required energy, or that 60 percent of the residences in a development shall receive 100 percent of their electricity needs (on a net-metered basis) from renewable energy. The first of these options is likely to be more acceptable to the marketplace at this time.

As described, under the Energy Plan, the percentage of permitted fossil fuel generated electricity will decrease over time, to be replaced by a mix of on-site and off-site generated renewable electricity. If Irvine chooses to follow the guidelines of the US Conference of Mayors by 2015, 70 percent of the electricity required by a new home will be supplied by on-site generated renewable energy; and 80 percent by 2020. Irvine is expected to be fully built out by 2025. Under the US Conference of Mayor scenario, newly constructed dwellings will be required to be carbon neutral by 2030.

8.3.1 *Energy Information and Education*

Higher impact strategies:

a. City to work with homeowners' associations throughout the City to develop uniform guidelines citywide for renewable energy installations.
b. City to work with the utilities and local energy interest groups to provide public information through community facilities, public libraries, permit counters, etc; especially on renewable energy, energy efficient appliances, and utility and state energy equipment rebates, etc.
c. Establish an outreach program through the City's newsletters, website, and other media to inform the public on measures taken by the City to reduce energy use in its facilities, and to promote increased awareness of energy conservation and renewable energy strategies throughout the community.

d. Work with the utilities, local energy interest groups, business groups and other interested agencies to provide public information on the energy and water efficiency benefits of fixtures and appliances such as faucet aerators, low-flow showerheads, high-efficiency dishwashers and water heaters, etc. all of which save both energy and water.

Lower impact strategies:

e. In cooperation with the utilities and local energy interest groups, establish a regular energy policy review workshop for senior City staff, Commissioners, elected officials, and the public, to update participants on current trends and developments in national and local energy policies and practices.

8.3.2 *Changes to City Policies and Practices*

a. Identify and remove current policies such as in the Zoning Code, which present barriers to the installation of renewable energy systems on existing residential and commercial buildings.
b. Consider development of a residential energy conservation ordinance (RECO) based on those currently operated in San Francisco and Berkeley. [45] Coordinate RECO with other local programs such as IRWD rebate program for the replacement of pre-1992 toilets.
c. Provide incentives for achieving higher standards of energy efficiency, such as fast-tracked permitting for proposed projects that exceed code requirements by 15 percent, and/or that meet Irvine Build Green guidelines for energy and renewable energy.
d. Establish a policy of evaluating all existing City energy related policies and practices at five year intervals, as part of the process of updating the City Energy Plan, and preparing detailed interim energy program designs for the upcoming five year period. The process to also include reporting on progress toward the goals to City Council.
e. All new homes to be energy rated using a State approved rating system.

8.3.3 Renewable Energy Strategies

a. Encourage the builders of all new single family homes to provide buyers with the option of including renewable energy systems at the time of initial construction.
b. Where residences are built without on-site renewable energy systems, they should be designed and built 'solar-ready' with a minimum of south-facing roof, and with accommodation for the necessary electric service, wiring, (and water storage tank and pipe work for solar thermal installations) ready for the future

[45] California's Public Resources Code Section 25402.1(h) 2 and Section 10-106 of the Building Energy Efficiency Standards establishes a process which allows local adoption of energy standards that are more stringent than the Statewide standards, though the standards must be approved by the Energy Commission.

installation of renewable systems. [46]

c. Enforce the applicable State and any local Solar Rights Acts to provide for passive and natural heating/cooling opportunities, including beneficial site orientation, and which authorizes local governments to require the dedication of solar easements. [47]
d. Strongly encourage all new private swimming pools, spas and hot tubs to be heated (at least in part) by renewable energy sources, especially solar hot water systems or by cogeneration. [48]
e. Advocate for a statewide system under which utility companies could own and operate renewable energy systems installed on privately owned residences.
f. Work with local residents and energy interest groups to establish cooperative installation of solar PV systems on residential properties. [49]
g. Investigate the ability of the City to set up bulk-rate purchases of solar systems similar to Solar Santa Monica.[50] If feasible, set up the procedure by which an Irvine homeowner can use municipal bonds to pay for renewable energy and energy efficiency system upgrades to their home.[51]

[46] In the new 144-home Carsten Crossings project in Rocklin near Sacramento developed by the Grupe Company, all the homes are being built with a 2.4 kilowatt (kW) roof-integrated solar system designed to meet 50% of a home's electricity demand. The "Environment California" website includes a list of current residential developments equipped with solar systems. For example, the list at May 2007 includes four solar equipped residential developments at Ladera Ranch in Orange County, with a total of 360 homes equipped mostly with 2.4 kW solar systems.

[47] California law protects the right to own and operate a solar system for a home or business. For example, Civil Code 714 prohibits any covenant, restriction, deed, contract, or security instrument from effectively prohibiting or restricting the installation or use of a solar system. For a detailed analysis of California's solar rights laws, visit the Energy Policy Initiatives Center at University of San Diego School of Law – http:www.sandiego.edu/epic

[48] On June 6 2007 the California General Assembly approved "The Solar Water Heating & Efficiency Act" (AB 1470) which provides $250 million over 10 years to provide consumer rebates for solar hot water heating systems. AB 1470 heads to the State Senate Energy & Commerce Committee in July.

[49] For example, the company 'SolarCity' operates a 'Collective Power' program to install solar pv systems in existing communities. www.solarcity.com

[50] Solar Santa Monica facilitates the installation of solar photovoltaic by having information, expert advice and standardized solar packages available to residents and businesses of Santa Monica.

[51] The City of Berkeley, CA has been proposing such an arrangement and legislation has been proposed to make the process easier.

Table 12 – Citywide Implementation Strategies

RESIDENTIAL / COMMERCIAL PRIORITY STRATEGIES	PURPOSE	COST TO IMPLEMENT	POLICY REQUIREMENTS
Encourage all new buildings to exceed State energy code (T24) by 10 percent	Improves energy efficiency performance of new buildings, and saves $$ long-term	Average cost premium of 0 - 2 percent of construction cost, or about $4 sq ft. Saves 15 – 20 percent on energy	Changes to local building / planning codes
All new buildings to be built 'solar-ready'	Simplifies future installation of solar energy systems on buildings	Very low cost for solar-ready photovoltaic systems; higher for thermal systems due to the need for space for future hot water storage tank	Changes to local building / planning codes
All residential builders to provide buyers with solar system option, plus information on solar costs / benefits	Provides home owners with choice of buying solar and including system cost in with initial mortgage	Average $15 - $25k depending on photovoltaic system size and rebates available	Changes to local building / planning codes
Work with utilities, local energy interest groups, business and civic leaders on energy and CO2 emissions issues	Increase awareness of energy and CO2 emissions issues among City Commissions, elected officials, business leaders and the general public	Some existing funding for energy education/ information already exists, together with skills and knowledge in existing utility and interest group programs	No policy change required. Provides additional role for Energy Management Team in providing general direction
Encourage local businesses to use incentive and disincentive measures to reduce single-occupancy vehicle commuting	To reduce single occupancy vehicle commuting by employees, and to promote use of transit, car-pooling, bicycling, walking, etc.	Variable depending on scope of program	No policy change required. Provides additional role for Energy Management Team in providing general direction

Appendix A – City of Irvine Electricity Demand

This table is an expanded version of Table 7 electrical Account Summary for Irvine. This includes the detailed data for electricity demand among those accounts where demand is measured.

Rate	Annual kWh	% of Total kWh	Non-coincident Peak Demand (kW)	Estimated Coincident Peak Demand (kW)	Number of Service Accounts	% of Total Service Accounts
AG TOU (agriculture)	4,908,248	0.2%	2,556	1,584	40	0.1%
Domestic	353,126,189	16.2%	-	-	57128	82.8%
GS-1 (small commercial)	80,558,220	3.7%	-	-	7171	10.4%
GS-2 (medium commercial)	1,488,847,290	68.5%	374,201	265,683	3169	4.6%
Street Lighting	32,132,910	1.5%	-	-	798	1.2%
TC-1 (traffic lights)	1,988,733	0.1%	-	-	360	0.5%
TOU-GS (large commercial time of use)	211,924,977	9.8%	52,060	27,592	324	0.5%
Total	**2,173,486,567**	**100%**	**428,817**	**294,859**	**68,990**	**100%**

Appendix B – Emerging Energy Technologies

There are a variety of reports and documents available that outline a number of policies and project recommendations to increase the use of renewable energy[52] technologies over the next 20 years. Many of these reports contain projections of renewable energy technology improvements and costs over the next 20 years, as well as necessary policy actions needed to further integrate renewables into the US energy supply. This section aims to outline renewable energy technology projections for the US over the next 20[53] years, as well as policy options and recommendations, with a particular emphasis on the State of California.

Many of the supporters of renewable energy technologies project that 25 percent of the energy produced in the United States by 2025 will come from renewable energy resources. This number varies depending on the source. For example, the Energy Information Agency (EIA) projected electricity generation share from renewables for 2030 is much lower at 9 percent, and suggests a slight increase to 11 percent in a "high renewables" scenario[54]. The "high renewables" scenario projects greater use of wind, biomass, and geothermal. A group of representatives from several national laboratories show a 20 percent share by 2020[55]. As an increasing number of states adopt Renewable Portfolio Standards[56], and adopt other targets such as greenhouse gas emission reductions, the percentage of renewable energy project installations may continue to grow at the higher percentage rate. A group of renewable energy advocates are currently trying to push through legislature a 'Federal Renewable Portfolio Standard' that would establish a goal of 15 percent electricity generation for all of the United States from renewable energy by 2020. Many individuals and organizations are optimistic that a federal target would create the public awareness and help create other incentives such as a long term Production Tax Credit (PTC) to encourage the increased development of the renewable energy market. The PTC is a tax credit of 1.9 cents per kWh of electricity for the production of electricity from qualifying resources (including wind, biomass, poultry waste, geothermal, municipal solid waste, irrigation power, refined coal, and hydropower). The tax credit is due to expire on December, 2008 which means facilities must be in service before January 1, 2009. There is currently a bill to extend the expiration date for an additional 5 years. The tax credit is a great incentive for renewable energy project development.

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[52] Renewable energy is any naturally occurring, theoretically inexhaustible source of energy, such as biomass, solar, wind, tidal, wave, geothermal and hydroelectric power that is not derived from fossil or nuclear fuel

[53] Due to inconsistencies in the projection year that varies from report to report, some examples will refer to 2020, 2025 or 2030.

[54] Projections from Annual Energy Outlook, 2007. Energy Information Administration, US Department of Energy, http://www.eia.doe.gov

[55] Martinot, E, "Renewable Energy Futures: Targets, Scenarios and Pathways. Pre-Publication Draft (April 2007), forthcoming in *Annual Review of Environment and Resources 2007,* Annual Reviews.

[56] The Renewables Portfolio Standard (RPS) is a policy that obligates each retail seller of electricity to include in its resource portfolio a certain amount of electricity from renewable energy resources, such as wind, solar, geothermal, hydro, and various forms of biomass and ocean energy.

Individual states, counties and cities are primarily responsible for actions that are driving forward the renewable energy agenda in the United States. Many cities are adopting future targets of 10–20 percent of electricity from renewables. Targets typically aim for some year in the 2010–2020 timeframe. For example, the City of Los Angeles established a 20 percent renewable energy goal by 2010. Depending on the city, some targets are for a share of total energy consumption, whereas other city targets address installed capacity. For example, cities will target 10 percent of homes to have solar hot water by 2010 or require on-site renewables for *all* new buildings over specific size thresholds. Urban planning that envisions a greater share of clean energy for the future is gaining hold in many cities, often with participation from a variety of stakeholders, including universities, municipal government and the local energy utility. The City of Irvine is wise to take this opportunity to develop realistic renewable energy and carbon reduction targets as part of this Energy Plan.

Many US cities are also establishing CO2 reduction targets which can be achieved in part by increasing renewable energy project development. New York City had set a target in 2002 for 20 percent reduction by 2010 from 1995 levels; this was supplemented by a "U.S. Mayor's Climate Protection Agreement" in 2005 initiated by the Mayor of Seattle, targeting 7 percent reduction from 1990 levels by 2012. As of April 2007, 471 mayors have signed on to the agreement, representing a large percentage of the population dedicated to reducing greenhouse gas emissions. Many renewable energy advocates are optimistic that the current emphasis on global warming will be a catalyst for many of these renewable energy goals.

The State of California has adopted both a Renewable Portfolio Standard (SB 1078) and a CO2 emission reduction target (AB 32). The RPS requires an annual increase in renewable generation equivalent to at least 1 percent of sales, with an aggregate goal of 20 percent by 2017. The state is aggressively implementing this policy, with the intention of accelerating the completion date to 2010. Accelerating achievement of the RPS goal to 20 percent by 2010 would mean adding 4,200 MW of renewables over 7 years, or 600 MW per year[57].

The City of Irvine has already demonstrated commitment to smart energy management through its collaboration with the Energy Coalition since the early 1990's, and other initiatives such as the compilation of the Green Building Resource Guide. Combined with the state mandates to increase renewable energy electricity generation, the City of Irvine is in a good position to develop and set reachable renewable energy targets as part of its long term planning process.

Policy Recommendations

There are many non-profit organizations dedicated to the development and promotion of policy options for increased renewable energy installations. Many of these groups agree upon several policy recommendations that could be enforced

[57] State of California Energy Action Plan, 2003.

at the federal, state of local level to meet specific goals such as the 20 percent by 2020 as noted in many RPS policies. These policy recommendations generally include:

- Increasing production of renewable energy
- Delivering renewable energy to markets
- Expanding renewable energy markets
- Improving energy efficiency and productivity
- Strengthening conservation of natural resources and the environment
- Reducing waste (solid, water, etc.)

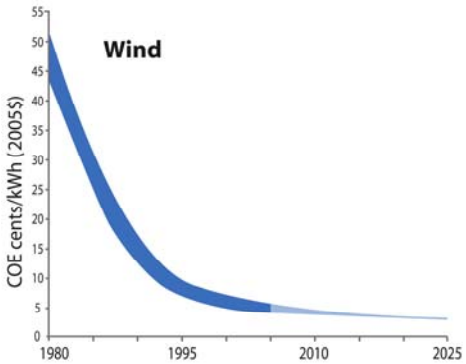
All of these recommendations are linked to long-term detailed strategies to meet RPS and greenhouse gas emissions reduction goals.

Renewable Energy Technology Future Outlook: Costs and Future Trends

The following section includes cost curves for several renewable energy technologies, as well as information about the future market[58]. The cost trends typically show a steep decline from 1980 to the present. Projections show this decline to continue, but at a slower absolute pace as the technologies mature.

Wind

The American Wind Energy Association (AWEA) recently established an aggressive goal for 25 percent of the US electricity generation to come from wind energy by 2025. Representatives from AWEA state that the current emphasis on global warming acts as a catalyst that will help met this goal. Wind technology cost projections show that lower costs will result from design and technology improvements across the spectrum from foundations and towers, to turbine blades, hubs, generators, and electronics.



The biggest challenge for the wind industry, as for other renewable energy technologies, is managing the existing transmission constraints. Many initiatives are under way to study how new large integrated transmission lines can help

[58] National Renewable Energy Laboratory Energy Analysis Office, www.nrel.gov

carry much of the wind potential from the Midwest out to the West coast to help meet the Western States RPS goals. At a local level, many states and cities are studying how to best upgrade their transmission capacity to carry intermittent resources like wind, and in general how to add additional capacity to the lines to meet new energy demands. The State of Montana has invited developers to visit the state and explore development of large-scale wind farms and building a large new transmission line to carry the energy to one of the western states, such as California[59]. Technical experts are currently exploring wind energy development in the Northern Baja region of Mexico and how this energy may be exported north across the California border. Again, transmission interconnection between the two countries would pose the greatest barrier.

In terms of technology improvements and where the wind energy industry will be in 20 years, it is projected that wind farms will increasingly be operated as conventional power plants, and advanced grid integration and upgrades will help overcome transmission barriers.

Biomass and Biofuels

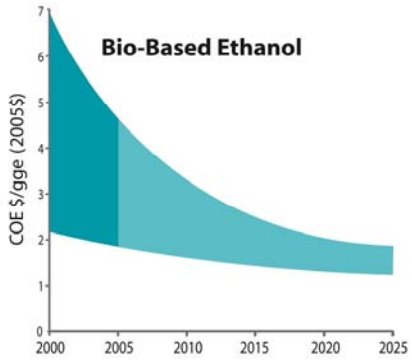
Biomass can provide energy to be used for heating and cooling, electricity and transport. Biomass fuels can easily be stored meeting both peak and baseline energy demands. In the form of biofuels (solid, liquid and gaseous) biomass can directly replace fossil fuels. Biomass and biofuels are CO2 neutral if produced in a sustainable manner. Bioenergy contributes to all-important elements of national and regional economic development.

There are varying opinions as to the percentage of contribution of biomass to the US energy supply over the next 20 years. One reason for different conclusions is that two crucial parameters—land availability and energy crop yields. Availability of land, as well as forest and agricultural residues, relate to the interaction of biomass energy with other land uses (e.g., food production, biodiversity, and soil and nature conservation), and synergies between different uses. The International Energy Agency projects that 3 percent of transport fuels will come from biofuels in the United States by 2030.

Significant progress has been achieved on biomass procurement and conversion technologies over the last decade resulting in the increase of competitive, reliable and efficient technologies. Nevertheless, new fuel chains addressing more complex resources and new applications are under development[60].

Bio-based ethanol represents a combination of corn starch in the near term and lignocellulosic ethanol in the long term. Lignocellulosic production technologies that co-produce feed products and electricity with ethanol are projected to become the lower cost technology in the latter years of the projected values.

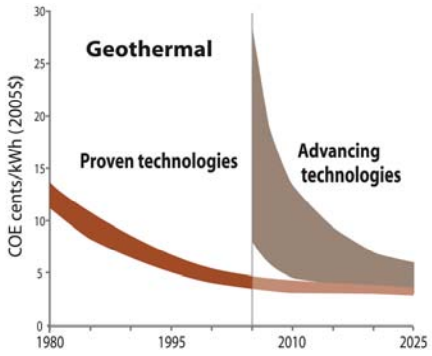
[59] Speech by the Honorable Brian Schweitzer, Governor of Montana, Windpower Conference June 2007, Los Angeles, CA.
[60] European Renewable Energy Council, http://www.erec.org



Geothermal

Geothermal power plants have the potential to contribute to an environmentally friendly and sustainable energy supply, using existing technologies to exploit steam, and hot water reservoirs. The technological developments of recent years have opened new ways to use heat in the interior of our planet.

Geothermal cost reductions will result from more efficient and productive resource exploration and characterization as well as from continued improvements in heat exchangers, fluid-handling technologies, turbines, and generators. Also, non-technical developments are critical, including administrative and policy clarity, suitable infrastructure in the form of machinery and skilled labor, as well as further educating the public.



Solar Thermal

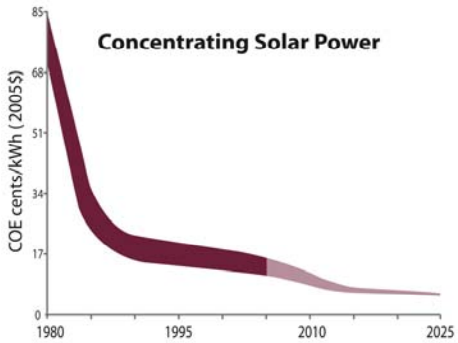
Solar thermal systems are based on a simple principle known for centuries: the sun heats up water contained in a dark vessel. Solar thermal technologies on the market are now efficient and highly reliable, providing solar energy solutions for a wide range of areas of use and potential users. Most of the systems sold today are intended to supply domestic hot water and an increasing number of systems provide

thermal energy for space heating[61].

As in all industrial sectors, manufacturing will be more exposed to global competition as the market develops. However for solar thermal, nearly half of the jobs are in retail, installation and maintenance. Technological innovations are expected to improve solar thermal technologies for domestic hot water, space heating, cooling and air-conditioning, solar desalinization and advanced heat storages.

Many countries have set high targets for solar heating and cooling, and in many cases the success lays in future building design and construction, and new building standards. In Europe a 100 percent active solar roof target by 2030 has been established. The Million Solar Roof Initiative in the United States is another example of a positive policy move that will help contribute to solar thermal goals.

Cost reductions will result from improved reflectors and lower-cost heliostat designs, improved solar thermal receivers, heat exchangers and fluid handling technologies, and turbines and generators, as well as from volume manufacturing.



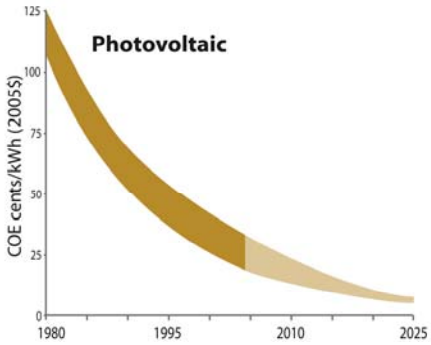
Photovoltaic

Photovoltaic (PV) solar electricity has a very high potential, since solar energy is a practically unlimited resource available everywhere. Therefore, it is ideally suited for distributed generation of electricity near the user, everywhere around the globe. Many scenarios show PV as holding a small portion of the renewable energy market share by 2030, at about 3 percent, although a Greenpeace reports shows a more optimistic view of 10 percent of the global share by 2030[62].

The production of PV cells is constantly improving as a result of both technology advances and changing industrial processes. Production costs need to be reduced considerably to penetrate the major electricity markets. Consequently the main effort of research and industrial technology development is directed towards reducing the production cost.

[61] European Renewable Energy Council, http://www.erec.org
[62] Martinot, E, "Renewable Energy Futures: Targets, Scenarios and Pathways. Pre-Publication Draft (April 2007), forthcoming in *Annual Review of Environment and Resources 2007,* Annual Reviews.

The PV cost projections below are based on increasing penetration of thin-film technology into the building sector. Thin film makes up about 10 percent of the solar market, whereas crystalline solar cells have a market share of over 90 percent and will probably remain the dominant technology for the next 10-15 years. Likely technology improvements include higher efficiencies, increased reliability (which can reduce module prices), improved manufacturing processes, and lower balance of system costs through technology improvements and volume sales.



Other Technologies and Future Trends:

Distributed Generation

Much of the literature that discusses future renewable energy trends present scenarios that assume the electricity system will remain highly centralized, and many do not address the issue of distributed power generation. However, most advanced scenarios for Europe and some global scenarios do envision community-level or "distributed" generation becoming a prominent part of power systems. A survey of European experts found a large consensus about the trend towards a more decentralized electricity supply, estimating a 30 percent share of decentralized power by 2020[63.] Many scenarios envision solar PV as a primary form of distributed generation from renewables, although European scenarios also include large shares of biomass (in combined-heat-and-power plants) and geothermal power. Thus the share of distributed generation from renewables depends on solar PV technology advances and cost reductions.

The share from solar PV also depends on fairer cost comparisons, and that solar PV is much closer to being competitive with conventional power if compared on the basis of delivered electricity or peak power costs. Under a decentralized paradigm, renewables have an advantage because they compete with the end-user cost of power rather than centralized generation costs, avoiding transmission and distribution costs.

[63] Martinot, E, "Renewable Energy Futures: Targets, Scenarios and Pathways. Pre-Publication Draft (April 2007), forthcoming in *Annual Review of Environment and Resources 2007,* Annual Reviews.

Hydrogen Combined with Renewables

Much of the literature refers to the 'ultimate hydrogen economy' as fueled entirely by renewables, with electricity and hydrogen as the dominant and largely interchangeable energy carriers. But transitionally at least, until 2030-2050, studies envision hydrogen from nuclear and fossil fuels (some with carbon sequestration)[64]. Some studies show hydrogen infrastructure emerging after 2030, with natural gas as "bridge" to hydrogen from renewables after 2050. Some scenarios limit renewables-produced hydrogen because of high projected electricity demand that requires the renewable electricity. Others show hydrogen from renewables emerging only after power grids are strengthened to accommodate intermittent and distributed renewables. Many Europe and global scenarios don't show significant hydrogen production until after 2030.

There are differing opinions as to how, when and to what degree hydrogen will penetrate the marketplace. The International Energy Agency (IEA) projects minimal contribution from hydrogen, while other organizations envision cost reductions in fuel cells and other technology breakthroughs making hydrogen 9 percent of transport energy by 2050. The Europeans are more optimistic projecting that 13 percent of world final energy from hydrogen by 2050, produced from nuclear (40 percent) and renewables (50 percent)[65]. The World Business Council for Sustainable Development projects widespread use of fuel-cell vehicles by 2050 and 25 percent of world transport energy from hydrogen (including 17 percent in China, 27 percent in the US/Canada, 32 percent in Europe, and 100 percent in Japan), with renewables-produced hydrogen in some countries[66].

There are also varying opinions as to whether hydrogen infrastructures would be centralized or decentralized, employing local renewable electricity and biomass for decentralized hydrogen production, or large-scale renewables like wind and solar thermal power for centralized production. Others envision hydrogen as a decentralizing technology that promotes community energy systems. Some claim that neither centralized nor decentralized hydrogen visions are practical or desirable, because of the view that hydrogen combined with renewables deceptively hide an agenda – hydrogen from nuclear and fossil fuels – or that such visions force renewables into current energy paradigms rather than create new paradigms better suited to renewables. It will be interesting to continue to observe the hydrogen agenda unfold.

Electric Vehicle Technologies

Beyond long-term visions of renewables-produced hydrogen for transport, most scenarios only discuss the contribution of biofuels to the transport sector. A topic that is often overlooked is the direct contribution of renewable electricity for transport. There has been growing interest in hybrid gasoline-electric vehicles,

[64] Ibid.
[65] European Renewable Energy Council, http://www.erec.org
[66] World Business Council for Sustainable Development website: http://www.wbcsd.org

including "plug-in hybrids" in which the battery can be recharged from an external source such as renewable electricity. Plug-in hybrids could allow shorter trips to be made entirely on renewables, with stored gasoline used for longer trips. There has also been a recent increased interest in electric-only vehicles, following the decline of earlier models in the 1990s[67]. A growing number of authors envision a future with transport technology closely tied to electric power and renewable electricity rather than liquid or gaseous fuels. This future also includes potential use of electric vehicle batteries as mediums for electricity storage, for example charging a car at night and then using the power during the day or selling it for peak-power prices. Wind power could be a good match for electric vehicle technologies as vehicles can be charged with cheap off-peak wind power, and because battery charging is ideally suited to intermittent wind power. The key barrier remains battery technology. Ongoing technology developments may accelerate beyond what some literature projects.

Advanced Storage Technologies

Energy storage is a key enabling technology for the integration of renewables. Many experts believe energy storage will be used widely by early 2020 to support renewables. However, very few energy scenarios address the storage issue specifically. A number of energy storage technologies have the potential to shape the use of renewable energy, including centralized storage to stabilize power grids containing large shares of intermittent renewables, local distributed storage, and storage on-board vehicles. Some scenarios envision advanced battery storage in homes to compliment local solar PV generation. Advanced research and development on the storage issues is critical to the long-term integration of renewables into the energy system.

Nuclear Power

There is much debate as to how nuclear will play a role in the future of our energy supply. Many global scenarios envision nuclear retaining roughly the same electricity share as today (15 percent), which means increasing at the same rate of world electricity demand[68]. The World Business Council for Sustainable Development shows a 12 percent share for nuclear by 2050.[69] Some scenarios show an even higher share for nuclear, 30 percent more. At the other extreme, some global scenarios envision the complete elimination of nuclear power by 2050 and consequently high levels of renewables. The policy debate surrounding nuclear will surely play an important part in the role of nuclear in the future.

[67] Martinot, E, "Renewable Energy Futures: Targets, Scenarios and Pathways. Pre-Publication Draft (April 2007), forthcoming in *Annual Review of Environment and Resources 2007,* Annual Reviews.
[68] Ibid.
[69] World Business Council for Sustainable Development website: http://www.wbcsd.org

High Performance Commercial Buildings and Renewable Energy

Making commercial buildings more energy and resource efficient represents an enormous opportunity to save money and reduce pollution in every community across the country. Greater cost competitiveness of photovoltaics, fuel cells, and combined heat and power could make on-site power generation an increasingly viable option for commercial buildings. Demand is already growing for energy-efficient buildings, particularly in areas with high power costs or reliability concerns. In states or cities with climate action plans, or mandated greenhouse gas emissions reductions, such as in California, future controls on carbon dioxide emissions will accelerate the demand for 'green' buildings.

According to the Department of Energy, annual expenditures in the commercial building sector currently exceed $100 billion.[70.] An efficiency improvement of 30 percent would result in a $30 billion per year in energy savings, which also translates into important environmental benefits such as reduced sulfur dioxide, nitrogen dioxide and carbon dioxide from fossil-fueled power generation. A 30 percent reduction in energy usage in commercial buildings could realistically be achieved through existing technologies. A more aggressive agenda of reducing energy in commercial buildings by 50-80 percent could be achieved with a long-term approach to research and development. Ultimately, the appropriate use of heating, cooling, and power systems, optimized building controls, solar and other forms of renewable energy, and energy-efficient building shells and equipment can produce commercial buildings that generate more electricity than is consumed. The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System has made important steps in this direction by establishment of a framework for meeting energy efficiency goals in buildings and communities[71].

The Energy-Water Nexus

It is impossible to discuss the future of renewable energy technologies without mentioning the dependency on water. Energy and water are inextricably linked: energy and power production requires water, and water production, processing, distribution and end-use requires energy. Many experts researching this issue raise concerns about water supplies being sufficient to meet energy demands in 20 years. The energy industry competes for water with agriculture, domestic use and other industries, and climate change and energy-industry operations could impact water supplies, quality and energy demand[72].

Future energy development will put new demands on water in that many new technologies will be more water intensive, such as the hydrogen economy that would require even more water. Likewise, future water supplies and treatment will be more energy intensive. Readily accessible fresh water supplies are limited, and new technologies to access and/or treat non-traditional water

[70] US Department of Energy website: http://www.doe.gov
[71] US Green Building Council website: http://www.usgbc.org
[72] Energy-Water Science and Technology Roadmap Summary: www.sandia.gov/energy-water

resources will require more energy per gallon of water. As advanced research and development continues to improve renewable energy technologies, a parallel investment in addressing the energy-water nexus is critical to meet the needs of each community.

Conclusions

There are many challenges facing communities, states, countries and the world as a whole when designing energy strategies for the next 20 years. Recent changes in the political environment as well as improved technologies and costs have increased the focus on clean energy technologies that are efficient reduce total energy consumption and that reduce greenhouse gas emissions. There is, as a whole, an optimistic view towards renewable energy playing a more important role in our energy supply over the next 20 years.

The average view from most of the literature shows that the share of electricity from renewables to be about 15 percent by 2040-2050, medium scenarios show a 30-40 percent share, and high scenarios show a 50-80 percent share, compared to 19 percent in 2005. For individual countries and states, there are many targets and scenarios for 15-25 percent share of primary energy and 20-35 percent share of electricity by 2020. Scenarios for 2050 show up to 50 percent share of primary energy and 50-80 percent share of electricity under policy-intensive or advanced scenarios.

Factors affecting scenario outcomes include aggressiveness of policy action, cost-competitiveness driven by technology development and fuel price changes, and aggregate energy demand. Other factors include carbon prices, speed of capital-stock replacement, and business strategies. Many scenarios show large reductions in aggregate energy demand from energy efficiency that allows renewables to supply nearly a majority share.

The future of renewables appears promising to many. Cost reduction and technology development – from incremental technological improvements to large-scale policy change – will be important, but ultimately the decisions of business managers, policy-makers, and households will determine those futures.

Appendix C – Resources and Further Information

Benchmarking information can be found on the Green California website
www.green.ca.gov/EnergyEffProj

California's "Flex Your Power" program
www.flexyourpower.ca.gov

California Energy Commission
www.energy.ca.gov

California Climate Registry
www.climateregistry.org

"Energy Conservation under the Sun: A Resource Book for Local Governments"
Local Government Commission
www.lgc.org

Energy Information Administration, U.S. Department of Energy
http://www.eia.doe.gov

Energy Policy Initiatives Center at University of San Diego School of Law
www.sandiego.edu/epic

Energy Star program information, including its benchmarking support information go to: www.energystar.gov/index.

Estimated annual energy savings attributable to efficiency and renewable energy installations, and useful lifetimes can be found in the State-sponsored Database for Energy Efficient Resources (DEER)
www.energy.ca.gov/deer

Energy-Water Science and Technology Roadmap Summary
www.sandia.gov/energy-water

European Renewable Energy Council
http://www.erec.org

Federal Energy Management Program
www.eren.doe.gov.femp

Life cycle cost assessment model information is available at
www.green.ca.gov/LCCA/FactSheet.htm

National Renewable Energy Laboratory Energy Analysis Office
www.nrel.gov

Santa Monica Green Building Design and Construction Guidelines
www.greenbuildings.santa-monica.org

U.S. Green Building Council
www.usgbc.org

U.S. Department of Energy
www.doe.gov

U.S. Department of Energy – Energy Efficiency and Renewable Energy Network
www.eren.doe.gov/buildings/highperformance

World Business Council for Sustainable Development
http://www.wbcsd.org

Energy

ELEMENT I
ENERGY

GOAL: Promote energy conservation and the use of renewable energy sources throughout the City in a cost effective way.

Description of Energy and Energy Sources

Energy is defined as anything that makes it possible to do work and cause movement against resistance. The use of energy depends upon the availability of sources and development of the technological skill to use them.

Energy sources can be categorized as nonrenewable or renewable. Nonrenewable energy sources cannot be restored, whereas, renewable sources can be harnessed indefinitely. Examples of nonrenewable sources are petroleum fuels and natural gas. Renewable energy sources include solar, wind, hydroelectric, and geothermal steam.

Nonrenewable energy sources are subject to price fluctuation and interruptions in supply. In addition, air pollution, water pollution and acid rain are some examples of the by-products produced from converting petroleum fuel to energy. These by-products are not associated with most renewable sources. Substituting renewable for nonrenewable sources and conserving energy will reduce the chance of a future energy crisis and will result in a cleaner environment. This conservation can be accomplished through reduced consumption, increased efficiency and changes in individual behavior.

This element provides a basis for long-range energy planning. In addition, it summarizes information on energy supply and demand. The associated state and local objectives, when implemented, will result in efficient energy consumption by the City and its residents, businesses, and industries.

Existing Conditions

Supply: The primary supplier of retail natural gas to Irvine is the Southern California Gas Company (SCG). The primary supplier of retail electricity to Irvine is the Southern California Edison Company (SCE). On March 31, 1998, the electricity generation market was deregulated creating the ability for other providers to supply electricity. However, as of June 1998, SCE remains the primary supplier for the City of Irvine. Electricity can be generated from a combination of oil, natural gas, hydroelectric, nuclear, or renewable sources (wind and solar). Future energy sources which may decrease the area's reliance on fossil fuels include solar, wind, and geothermal energy. Operational wind turbines in the Coachella Valley provide a small portion of the region's electricity needs.

Consumption: Irvine's energy is consumed by residential, commercial, industrial, agricultural and transportation uses. The commercial sector is the largest energy (electricity) consumer in Irvine. Natural gas is mostly consumed by the residential sector. Lighting and space heating are the principal end users of electricity and natural gas in the residential and commercial sectors. Transportation is the only major end user of liquid fuels.

Trends

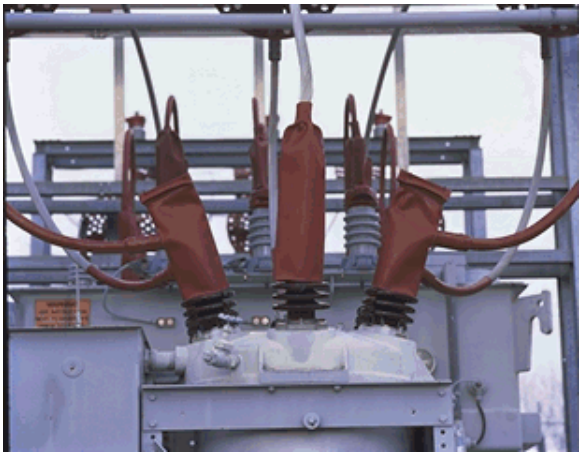
Supply: This Element assumes that the existing mix of energy supply will continue through the 1990s. Some renewable energy sources, such as solar water heating, will replace existing sources but will not significantly change the future mix of Irvine's supply.

The natural gas industry was deregulated in 1994. Now, large users are commonly supplied by companies other than The Gas Company while residents are still served by The Gas Company: Price fluctuations do occur but the volatility is tempered by the ability to stockpile natural gas. It can be stored underground in natural rock formations, above ground in tanks, or in transmission and distribution systems.

The electricity industry in California was restructured effective March 1998. All consumers can now purchase power directly. Most of the smaller users (residents and small businesses) received an automatic 10 percent reduction in rates effective January 1, 1998. As the electricity market evolves, pricing is expected to become more volatile as it reacts to fluctuating demand and other market factors. The fact that electricity cannot be stored and must be used immediately will contribute to its price volatility. This makes the market for electricity very different from that for natural gas.

Consumption: Irvine's future energy consumption has been evaluated based on two scenarios: a) the "base case" assumes that the existing energy consumption pattern continues without conservation and that the

energy consumption increases in proportion to the change in building stock and/or population growth; b) the "conservation case" assumes that energy conservation measures are implemented and nonrenewable sources are replaced by renewable ones. The principal actions being taken in the conservation case are the strong enforcement of the State of California Code of Regulations, Title 24, "Energy Building Regulations" and this element's objectives and policies. The state regulations are strictly enforced in the City of Irvine.



Identification of Issues

1. How can the City mitigate the impact of rising energy costs for natural gas and electricity for Irvine's residents, businesses, industries, and municipal operations?

2. How can the City reduce its vulnerability to price fluctuations and supply and increase the use of locally available resources?

3. How might the City influence regional policies such as transportation planning to serve local residents and businesses more effectively?

4. How can the City inform the public of existing and future potential energy programs and regulations?

5. In what ways might the City encourage public acceptance of energy retrofit programs?

6. How can the City maintain its services to protect the public health and safety during energy shortages?

7. What services can the City provide to implement energy programs and promote the use of renewable energy sources?

Response To Issues

The following objectives and policies respond to the identified issues:

OBJECTIVE I-1: ENERGY CONSERVATION

Maximize energy efficiency through land use and transportation planning.

The following policies support Objective I-1:

Policy (a): Consider the following or comparable design features, to the extent feasible, in developments at time of concept plan, subdivision, or development review:

- Encourage optimum solar access, natural ventilation and energy efficient landscaping.
- Encourage east/west alignment for local streets and building orientation which maximizes solar access, natural ventilation, and which minimizes conflicts with the solar access of adjacent structures or properties.
- Encourage energy-efficient landscaping (water conserving plants, indigenous vegetation, and use of on-site water run-off) consistent with the City's Sustainability and Landscaping Ordinance.

- Encourage, as part of required landscape plans, plant types and irrigation systems which minimize water usage and provide cooling opportunities during summer and minimize conflicts with solar access during winter.
- Encourage cluster residential development when feasible.
- Encourage south slope utilization in hillside development.
- Require cut-off or directional lighting fixtures to be used to direct light only to desired areas and to reduce glare.

Policy (b): Encourage and promote incorporation of energy conservation measures. The measures should be developed in conjunction with the applicant and may include:

- Active solar water and/or space heating.
- Passive design features for heating and cooling.
- Use of energy efficient devices.

Policy (c): Encourage development of shared energy facilities in major commercial projects where cost effective, such as:

- Heating/cooling system.
- Solar water heating.
- Photovoltaic (e.g., solar panel).

Policy (d): Develop guidelines establishing architectural and aesthetic controls for solar devices. Guidelines should provide reasonable controls while maintaining cost effectiveness of devices or systems.

Policy (e): Facilitate the participation of industries in the following conservation programs where cost effective:

- Cogeneration (process heat/steam/electricity).
- Reclaiming waste products (biomass, solid waste, waste water).
- Recycling (aluminum, paper, glass and steel).
- Carpooling.
- Mass Transportation.

Policy (f): Require developers of major commercial or industrial facilities who develop a transportation management plan to address such measures as:

- Flex time and/or shifting work schedules to avoid peak traffic.
- Employee carpools and vanpools.
- Preferential and free parking for carpoolers and vanpoolers.
- Ridesharing programs.
- Shuttle services from regional transportation (e.g., rail/bus) stations to final destination.
- Subsidies for transit passes.
- Locker room facilities for employees (e.g., for bicyclists).

Policy (g): Promote use of alternative modes of transportation by the following programs:

- Encourage use of regional public transportation (e.g., rail service) by:

  1. Supporting the development of regional transportation stations in Irvine.

  2. Making schedules available at City Hall and other public agencies.

  3. Requesting Orange Transportation Authority (OCTA) to establish and provide information on bus connection for regional transportation passengers.

- Encourage use of the bus system by working with OCTA to provide:

  1. Bus circulation between residential, commercial and industrial uses.

  2. More efficient transfers between bus routes.

  3. Posted schedules at bus stops.

  4. Widely distributed bus schedules.

  5. Shuttle services from regional transportation stations to final destination.

- Encourage use of public transit and ridesharing by promoting and participating in public information programs aimed at schools, sports clubs and other institutions and organizations.

Policy (h): Continue implementing the City program to synchronize traffic signals.

Policy (i): Monitor the federal, state, regional, other local governments, the utility companies, Irvine Ranch Water District (IRWD), and other private and public agencies energy programs and regulations and:

- Explore opportunities and limitations on use of renewable sources.
- Obtain information and technical assistance for energy programs.
- Implement federal and state energy programs.
- Support continuation of tax credits for alternative renewable sources and conservation measures.
- Allocate available federal funds and grants such as Community Development Block Grant (CDBG) for energy programs for low income and senior housing development.
- Inform developers and the general public of recent available energy programs, regulations, technical, and economic data (e.g., cost effectiveness).

OBJECTIVE I-2: RETROFIT PROGRAMS

Promote energy savings in buildings constructed prior to 1978.

The following policies support Objective I-2:

Policy (a): Encourage voluntary retrofit energy programs for residential, commercial and industrial buildings including energy conservation measures such as:

- Residential retrofit measures.
    1. Ceiling and wall insulation.
    2. Weather stripping, sealing and caulking.
    3. Low flow shower head.
    4. Water heater tank insulation.
    5. Duct insulation.
    6. Air conditioning recycling devices.
    7. Computer controlled thermostats.
- Commercial retrofit measures.
    1. Ceiling and wall insulation.
    2. Weather stripping, sealing and caulking.
    3. Shading controls (e.g., overhangs).

4. Lighting controls.

5. Thermostat controls (summer and winter).

6. Optimum heating, ventilation, and air conditioning (HVAC) scheduling.

- Industrial retrofit measures.

1. Operating and maintaining equipment at peak performance.

2. Maintaining furnaces.

3. Adjusting lighting.

4. Plugging leaks in heating and cooling process.

Policy (b): Support the voluntary retrofit energy programs through the following:

- Providing an energy efficiency rating system for identifying the needed type of retrofit measures.

- Provision of information to the chamber of commerce, real estate brokers, building contractors, homeowners, apartment owners and consumers on retrofit measures installation, cost-effectiveness, financing assistance, and other agencies energy programs.

Policy (c): Promote the voluntary residential retrofit energy program by encouraging homeowners associations to do the following:

- Purchase bulk solar systems and conservation materials.

- Sponsor buying clubs, cooperative or other suitable mechanism to purchase, install, and maintain retrofit measures.

Policy (d): Provide technical assistance for homeowners for the installation of active solar systems, such as information on optimal orientation and building code requirements.

Policy (e): Work closely with the utility companies and the chamber of commerce, schools and other public entities in support of energy reduction programs, and dissemination of information regarding these programs.

Policy (f): Consider increasing public information regarding energy programs by:

- Mailing energy consumption and conservation data to homeowners associations.
- Displaying energy information in local shopping area and community centers, City, and other public-libraries (e.g. UCI).
- Publishing energy information in local newspapers.
- Incorporating energy information in City schools, Irvine Valley College and UCI programs.

Policy (g): Provide homeowners associations and the general public with available information on:

- Renewable energy sources, conservation measures, technical and economic data (e.g. cost-effective analysis), and consumer protection issues and programs.

OBJECTIVE I-3: MUNICIPAL CONSERVATION

Maximize energy efficiency of the City's facilities and operations by use of recycled materials, renewable sources, and conservation measures.

The following policies support Objective I-3:

Policy (a): Management program to reduce energy consumption for municipal facilities and operations including:

- Public buildings and facilities.
- Street lighting.
- City vehicle fleet management.
- Appliance/equipment procurement.
- Employee energy awareness program.

Policy (b): Incorporate the commercial retrofit conservation measures in municipal facilities where feasible.

Policy (c): Use the following renewable sources for municipal facilities where cost effective:

- Solar water and pool heating.
- Photovoltaics (e.g., solar panels).
- Cogeneration.

Policy (d): Establish a fund for improving energy efficiency of municipal facilities, and reinvest up to 50 percent of energy savings for implementing the actions of this Energy Element.

Policy (e): Develop an energy plan coordinated with utilities, local and regional government agencies.

Policy (f): Consider establishing a City energy service/coordinator with adequate support to promote, implement and administer the Energy Element.

RELATED OBJECTIVE NUMBERS

Land Use Element - A-1, A-7
Circulation Element - B-3 through B-6
Housing Element - C-2
Noise Element - F-1
Public Facilities and Services Element – G-4
Integrated Waste Management Element - H-1
Growth Management Element - M-4, M-5

PROPOSAL FOR CONSULTING SERVICES

CITY OF IRVINE STRATEGIC ENERGY PLAN

RFP# 18-1379

INTEGRAL GROUP
MARCH 21, 2018

Prepared for: City of Irvine

ATTACHMENT 5

March 21, 2018

INTEGRAL REF: VA18-10191
EMAIL: aburgh@cityofirvine.org / bbrown@cityofirvine.org

Angie Burgh / Brian D. Brown
City of Irvine
1 Civic Center Plaza
Irvine, CA 92606

Re: Proposal for Consulting Services:
City of Irvine Strategic Energy Plan (RFP# 18-1379)

Dear Ms. Burgh and Mr. Brown,

Thank you for the opportunity to provide the attached proposal for the City of Irvine (the City). Integral Group (Integral) understands the City's goal is to not only develop a Strategic Energy Plan, but to also ensure it communicates a cohesive vision for the City's municipal operations and the community. Integral has assembled a team of highly qualified individuals including expertise from The Energy Coalition (TEC) and the University of California, Irvine's Advanced Power and Energy Program (UCI APEP). Together, the team has a solid history of developing and implementing energy plans that yield measurable financial, social and environmental results. Integral's Sustainability Planning team has worked with some of the most ambitious local governments across the US, Canada and the UK developing zero emissions and Strategic Energy Plans. Integral is also working for PG&E as the building technical lead for PG&E's "Code Readiness" initiative and is leading the technical development of code enhancements to Title 24 for 2019. TEC has served over 100 public agencies, all four California Investor Owned Utilities (IOUs), numerous industry professionals and organizations and statewide education institutions. Moreover, the team brings strong local knowledge and experience to this proposal, having worked with the City since 1995.

The attached proposal is Integral's customized solution for the City of Irvine based on extensive experience developing strategic energy and sustainability plans locally and nationally. The proposed approach recognizes the imperative to shift the energy landscape toward a resilient, clean and efficient future. The technology and solutions for a clean energy future exist, and the team's approach will be to work with the City of Irvine to develop a locally-tailored, cost-effective Strategic Energy Plan that is financially sustainable and environmentally progressive, delivering rapid transformation over the next 20 years.

This proposal outlines our firms' qualifications and expertise in strategic planning and delivering innovative technological, programmatic and policy solutions. It describes a collaborative process that will engage the City and key stakeholders including residents and the local business and academic communities in identifying opportunities, developing the Strategic Energy Plan and delivering an actionable roadmap to measurable results.

Integral believes it has the right team and qualifications to support the City in its efforts to conserve energy, be fiscally responsible and ultimately improve the quality of life for Irvine residents. We look forward to the opportunity to present more information about our proposal and answer any questions you may have.

Sincerely,

INTEGRAL GROUP INC.

Andrea Traber, AIA, LEED Fellow – Senior Principal, US West Sustainability & Resilient Design Leader

TABLE OF CONTENTS

Table of Contents 2

1. Executive Summary 3

2. Business Information 4

3. Experience / Qualifications Information 5
   - *3.1 Overview* *5*
   - *3.2 Background* *5*
   - *3.3 Summary of Qualifications* *6*

4. Revelant Project Experience 8

5. Key Personnel 12

6. Team Organization 17

7. Project Approach & Methodology 18

8. References 38

9. Pricing Proposal 42

APPENDIX A: Resumes xliii

APPENDIX B: CIty Of Irvine – Comparative Energy Analysis Report xliv

1. EXECUTIVE SUMMARY

The project team (Team) will be led by Integral Group working in collaboration with The Energy Coalition (TEC) and University of Irvine's Advanced Power & Energy Program (UCI APEP). The Team brings diverse but complementary sets of experience and expertise that will be aligned in order to deliver a robust and implementable Strategic Energy Plan for the City of Irvine. The Plan will ensure the City's ability to prosper and thrive into the future, as technological and regulatory contexts evolve.

The Team proposes a collaborative approach, working closely with the City's project team and/or a proposed internal steering committee to guide the development of the Plan and ensure progress toward a collectively agreed upon Energy Vision. Integral has proven processes for developing comprehensive, innovative and implementable plans, guided by internal and external stakeholder input to ensure recommendations are customized to the specific local context. Integral brings a set of processes and tools used to help frame the 'issue' and the proposed 'solution' by asking the right questions and involving the right parties. Integral's proven processes for clarifying the current state and desired future state for a given jurisdiction will be bolstered by TEC's and UCI's familiarity with the local context, existing local knowledge and data sets.

All team members are familiar with the key elements of the energy system (generation, distribution and consumption) and related policy, program and project design delivery, and thus are well positioned to undertake analysis and make recommendations with regard to implementation of strategies within the City of Irvine.

The Team has carefully reviewed the four key tasks identified by the City and has developed the following approach to each that provide the highest level product while minimizing cost and risk.

Task 1: Assess Current and Future Energy Profile

Integral Group will lead the assessment of the City's municipal and community-wide energy data as well as the current status of renewables within City boundaries to understand the current state of energy consumption and forecasts for future energy profiles. This analysis will be used to prioritize actions and investments to accomplish the goals that will be set in the Strategic Energy Plan. TEC and UCI APEP will support Integral by providing data and technology insights for the analysis.

Task 2: Develop Energy Visions, Goals and Strategies

Integral Group, TEC and UCI APEP will work with the City to articulate strategic priorities and develop a corresponding vision and set of goals for the Strategic Energy Plan. The Team will then propose a number of strategies to meet these goals and analyze the impact and cost of specific proposed measures, identify and prioritize ways to maximize impact, reduce risk, investigate more advanced energy projects and deliver focused recommendations.

Task 3: Identify Funding Sources

TEC will work with Integral Group to identify funding and financing options that are available and applicable to the City to implement energy projects. This will include investigating external sources, such as utility rebates and incentives, grant funding opportunities and on-bill financing. The Team will also evaluate the risk and timelines associated with these financing options and identify the options with the lowest risk and will maximize savings potential for recommended projects.

Task 4: Stakeholder Input and Educational Opportunities

TEC will work with Integral Group and UCI APEP to engage stakeholders (both internally and externally) throughout the Strategic Energy Plan development and incorporate input and feedback into the plan. The Team will also identify a number of outreach and educational events where the City can inform community stakeholders about the benefits of economically feasible technologies.

2. BUSINESS INFORMATION

The following Table 1 summarizes business information for Integral Group and its sub consultants (The Energy Coalition and University of California, Irvine).

Firm Name	Integral Group	The Energy Coalition	The Regents of the University of California
State of Incorporation	California	California	California
Address	15760 Ventura Blvd, Suite 1902, Encino, CA 91436	47 Discovery, Ste 250 Irvine, CA 92618	141 Innovation, Suite 250 Irvine, CA 92697-7600
Contact Information	**Rachel Moscovich** Phone: 778-869-6602 Fax: 510-663-2080 rmoscovich@integralgroup.com	**Craig Perkins** Phone: 949-701-4646 Fax: 949-701 - 4644 cperkins@energycoalition.org	**Jack Brouwer,** Phone: 949-338-5953, Fax: 949-824-7423 jbrouwer@uci.edu
Legal Entity	C-Corporation	Corporation Non-Profit 501(c)3	Corporation
Years in Business	17 years	45 years	152 years 23 years for APEP
Authorized Officers	Kevin Hydes CEO Gerry Faubert Vice President, US West	Craig Perkins President and CEO Allison Hart Executive Vice President	Paul Lekutai Principal Contract and Grant Offiicer

**Advanced Power & Energy Program (APEP)*

Table 1: Business Information for Integral Group, TEC and UCI APEP

3. EXPERIENCE / QUALIFICATIONS INFORMATION

3.1 OVERVIEW

Integral Group has assembled a team of qualified and experienced professionals to support the City of Irvine in the development of its Strategic Energy Plan. The project team (Team) will be led by Integral Group working in collaboration with The Energy Coalition (TEC) and University of Irvine's Advanced Power & Energy Program (UCI APEP). Collectively, the team has over 80 years of experience in the energy sector and provides the necessary expertise to deliver above and beyond expectations. Specifically, our Team offers the following expertise:

Firm Name	Summary of Firm Expertise
INTEGRAL GROUP	• Comprehensive energy and zero emissions planning • Development of energy plans, policies, ordinances, programs, net zero building codes • Microgrid feasibility and design • Net zero emissions building design • Energy and emissions modelling and projections • Stakeholder engagement and facilitation
the Energy Coalition	• Local presence and knowledge of City operations • Strategic and community-wide planning • Project identification and implementation • Benchmarking and energy use analysis • Integrated systems modelling • Project funding and financing • Stakeholder and community engagement
UCIRVINE	• Smart grid and smart microgrid technology • Electrochemical energy conversion and storage (e.g., batteries, fuel cells, electrolyzers) • Renewable power and energy system dynamics • Hydrogen production, delivery, and fueling infrastructure development • Fuel cell and battery electric vehicle deployment

3.2 BACKGROUND

Integral Group's Sustainability Planning team has worked with some of the leading jurisdictions in North America and the UK on *developing and delivering zero emissions and comprehensive energy plans*. These include the development of the District of Columbia's Comprehensive Energy Plan: Clean Energy DC, the development of a *Roadmap to Net Zero Emissions* for both Cambridge and Lexington, MA, developing an Energy Systems Transformation Playbook for the Cities of Boulder, CO, Seattle, WA, and Minneapolis, MN on behalf of the Carbon Neutral Cities Alliance, developing a *Zero Emissions Building Strategy* for Vancouver, BC, a new Green Standard for Toronto, ON, a Zero Emissions Building Framework for the Canadian Green Building Council, and recently leading the London Energy Transformation Initiative, for the City of London, UK. This planning and policy expertise is complemented by the firm's leading-edge MEP engineers, including renowned *experts in net zero design, renewable energy, microgrid and district energy systems*. Integral is central to the conversation about future code direction in California, working with PG&E on as the building technical lead for PG&E's "Code Readiness" initiative and is leading the technical development of code enhancements to Title 24 for 2019. The Integral team thus brings an unrivaled understanding of future energy performance requirements, as well as the design approaches to meet future requirements. Integral's planners and engineers work collaboratively to develop strategic, cost effective and implementable, technically excellent solutions at the municipal asset and community scales.

In addition, TEC has *extensive experience working with the City of Irvine* and is excited to build upon that knowledge in this project. In the City of Irvine's 2008 Energy Plan, The Energy Coalition was referenced as the catalyst for the City's energy efforts. *Since 1995*, TEC has worked, and currently works, with Irvine on climate and energy projects under California Public Utilities Commission funded programs[1]. The City and TEC have a long history, and TEC currently employees former City staff that played a key role in preparing the 2008 Energy Plan.

The Advanced Power and Energy Program of the University of California, Irvine has also worked with the City of Irvine on several related projects over the years. These projects have included the establishment of an *electric vehicle (EV) car-sharing program, ZEV_NET* and EV charging infrastructure at the Irvine Transportation Center; working with the Mayor's office to loan a prototype fuel cell electric vehicle to the City of Irvine and to provide training and access to the UCI *hydrogen fueling station* for testing and evaluation of this technology before it was available on the market; and working with many faculty and students from UCI, Chapman University, Irvine Valley College, and Saddleback College to successfully compete in the 2015 U.S. Department of Energy Solar Decathlon competition. The below list highlights *key information the team already has* that will allow us to hit the ground running.

- Access to data related to buildings, energy usage and benchmarking data
- Experience piloting GreenButton data acquisition
- Access to the municipal building energy audits
- Experience identifying and managing energy projects
- Access to aggregate data for community wide energy consumption
- Visual representation of 60,000+ GIS building footprints
- Involvement in the initial 2008 Energy Plan and General Plan Energy Element
- Intimate knowledge of the City operations, history and approval process

3.3 SUMMARY OF QUALIFICATIONS

Integral Group

Integral Group is a global network of Engineering, Architecture and Planning professionals all collaborating under a deep green consulting umbrella, aspiring to be the best in the world. We are a mission-driven corporation that seeks out clients interested in pushing the boundaries of resilience, regenerative design, and deep carbon emissions reductions, and are widely regarded as a *pioneer in high performance building design, integrated sustainability and energy system transformation*.

Our expertise in high performance building design and deep green mechanical and electrical engineering is unrivaled. Integral has designed more zero net buildings than any other firm in our sector. In addition to our building design and low carbon energy system expertise, Integral Group's Sustainability and Resilient Design Team specializes in the *development of strategic plans and policies for cities and campuses seeking to achieve regenerative sustainability and robust resilience*. We have experience in all aspects of sustainability planning, from transportation solutions to waste and materials recovery programs, urban ecology, water conservation and reuse, to energy and carbon reductions. We have worked with some of the most ambitious cities and organizations in North America and have won numerous awards for not only pushing the bounds of sustainability but also providing solutions that are actionable and implementable.

Our competitive advantage is that we *combine creative problem solving, thoughtful engagement, and comprehensive qualitative research* all with the technical rigor expected of a best-in-class engineering firm. The strategies we develop for our clients are born out of the experience of designing and building some of the most leading-edge cost effective buildings in the world and taking these solutions to scale. Integral Group has over 450 staff located in 15 offices across the United States, Canada, Australia and the UK.

The Energy Coalition

The Energy Coalition is a mission-driven organization with over *four decades of experience designing and implementing energy strategies* that transform use and empower communities to take action. TEC creates value for its clients by identifying solutions that create a positive social, economic and environmental impact. With a staff of over 50 people throughout California, we have highly-qualified professionals on hand to bring knowledge and expertise in the following areas: portfolio management, energy use analysis and *benchmarking, strategic planning*, project identification and implementation, *financial analysis, incentives and rebates*, procurement, regulatory policy, *engagement, education and outreach*. The firm has worked in a variety of areas including energy efficiency and conservation, retro-commissioning, water, wastewater, renewables, distributed energy resources and transportation.

In addition to the technical expertise required to develop a comprehensive energy plan, TEC has the social understanding to engage stakeholders and ensure buy-in. In addition, TEC has worked with a variety of sectors and has expertise in working with utilities, financing institutions, residents, business owners, public agencies, communities to name a few. TEC is known for helping its clients understand their portfolio, develop energy strategies and them implement them with *measurable performance metrics* to ensure success. In addition, the team has extensive knowledge and expertise of the funding and financing options available to the public sector and how to ensure they are secured.

TEC has been involved in strategic planning at many levels to further sustainability and energy goals for its clients. A key example is the CEC Advanced Energy Community Project where TEC is working to develop a *zero net electricity community master plan* in a disadvantaged community. Components include reduced energy use strategies, access to electric vehicles and enhanced mobility, potential for increased resiliency, improved standards of living and alleviation of local grid constraints.

University of Irvine, Advanced Power and Energy Program

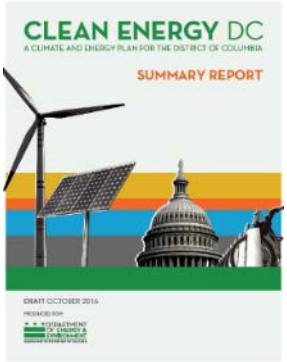
UCI APEP has extensive experience in executing research and demonstration programs in *power and energy, distributed generation, renewable energy, smart grid and microgrids*, and related fields. APEP worked with the UCI Business and Administrative Services group to *create and operate the UCI Microgrid*. Funding was obtained from the U.S. Department of Energy to develop a Generic Microgrid Controller, and from the California Energy Commission to advance microgrid technology. In 2002, APEP established the *first public hydrogen fueling station in southern California*, and still operates a public hydrogen fueling station in the same location (Campus and Jamboree). The Orange County Sanitation District *biogas trigeneration energy station* is another example of project leadership comprised of APEP, FuelCell Energy, and Air Products and Chemicals, Inc.

UCI APEP also has extensive experience in community-wide planning through its work with Altura Associates, the City of Huntington Beach, and the National Renewable Energy Laboratory to *design an Advanced Energy Community* for Oak View in the California Energy Commission's (CEC) EPIC Challenge competition. In addition, UCI APEP worked on the *Renewable-Based Energy Secure Community* (RESCO) under CEC support. We *investigated high levels of solar PV* use on PG&E distribution circuits in under a California Solar Initiative (CSI) program. We investigated the *integration of Concentrated PV* (CPV) on a UCI campus 12 kV circuit in "Improved PV Production Technologies and Innovative Business Model" under a California Solar Initiative (CSI) program. Moreover, the UCI APEP team has expertise in communication and planning of collaboration amongst community members, research agencies, and local governments in the planning and implementation of an advanced energy community and microgrid.

4. REVELANT PROJECT EXPERIENCE

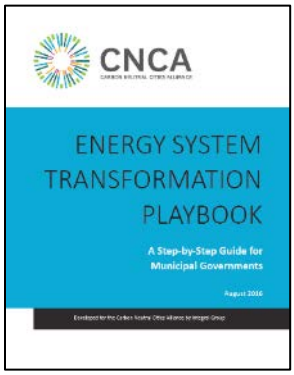
The following highlights specific project experience the team has with developing Strategic Energy Plans and strategies. Integral Group and the team can meet the minimum qualifications of five years of experience performing similar services of work.

Integral Group



Project 1: District of Columbia Comprehensive Energy Plan (2016)

Integral developed the District of Columbia's Comprehensive Energy Plan (CEP), Clean Energy DC, for the District's Department of Energy and Environment (DOEE). The District has ambitious energy use reduction, greenhouse gas emissions reduction, and renewable energy utilization targets that require significant improvements in energy efficiency, shifts to clean energy, and the infrastructure and organizational capacity required to enable them. The plan was developed through a collaborative process involving several DOEE departments and other local stakeholders. The CEP outlines a set of policies, plans, and programs that can help the District to achieve a 50% reductions in GHG emissions by 2032. To measure the impact of each proposed strategy, Integral developed an *energy and emissions model that addresses buildings, transportation, and energy supply* to forecast the District's energy use and emissions under different policy scenarios over time. Key strategies include net zero building codes and the design of a renewable portfolio standard that drives renewable energy generation.



Project 2: Energy Systems Transformation Playbook, Boulder, Seattle, Minneapolis and Carbon Neutral Cities Alliance (2016 - Present)

In collaboration with three Carbon Neutral Cities Alliance (CNCA) member cities (Boulder, Seattle and Minneapolis), Group developed and tested an Energy System Transformation Playbook. The playbook framework includes *guidance on policy, planning and land-use issues*, as well as key infrastructure investments that will be required to transition away from fossil fuel use in both buildings and transportation. The framework was tested on three specific neighborhoods in Seattle, WA, Boulder, CO, and Minneapolis, MN. The pilot tested the proposed strategies to ground truth the financial modeling done for the project. Final deliverables included three neighborhood-scale energy transformation strategies and a playbook for municipal governments to use to design and implement their own *city- or neighborhood-wide energy transformation strategies*.

Project 3: City of Cambridge Getting To Net Zero (2016)

In 2014, the City of Cambridge, MA retained Integral Group to advise City staff and a task force of key stakeholders and expert professionals to develop an action plan to meet their goal of becoming net zero community. Integral *provided project management, facilitation, research, and modeling and analysis services* plus policy recommendations to the task force and Cambridge City staff. The team compiled supportive data and research to aid in the development of a net zero strategy in a series of guides. Research included the development of three guides: (1) best practices in net zero energy and energy efficiency policy – municipal case studies, (2) Cambridge building energy guide – a snapshot of Cambridge's building stock including available data on energy use by building-type and sector, and (3) a low carbon energy supply

guide describing feasible renewable and low-carbon energy generation options for Cambridge. The project led to the creation of a high level action plan that lays out a set of strategies including regulation, education, and incentives to move Cambridge toward their net zero objective.

Project 4: PG&E Code Readiness, ZNE 2030 (2017 - Present)

Integral Group serves as the building technical lead on PG&E's Code Readiness program, focused on the acceleration of future Codes and Standards (C&S) for *California's Zero Net Energy goals* in 2020 and 2030. The program aims to produce high-quality information and data that demonstrates *cost-effectiveness, feasibility, and compliance efficacy* for strategically selected technologies, systems, or practices in C&S rulemakings. The goals of the project are to gather real market information on construction and building operations to demonstrate effective energy efficiency strategies. Integral Group provides *strategic energy consulting services* to identify technologies, holistic design strategies, and create a connection to designers, builders, and code local jurisdictions. The long term steps of this program include development of whole building energy targets by major building types, develop prescriptive measure packages for ZNE codes, identify gaps in infrastructure or major challenges, defining research questions need, and effectively identify ways to bundle efficiency measures together.

Project 5: PG&E Codes and Standards Enhancements, 2019 Title 24 (2016)

Integral Group was selected to lead the technical development of code enhancements to Title 24 for 2019. Integral Group was responsible for *developing commercial code change proposals*, targeted at building heat and cooling systems. The project leveraged Integral Groups knowledge of high performance buildings, how Title 24 codes are implemented and challenges and necessary improvements to enable the next generation of efficiency.

Project 6: Hawaii Ka Hei Energy Master Plan (2017- Present)

Integral Group is serving as the Owner's Adviser for the Hawaii Department of Education Ka Hei Energy & Sustainability Master Plan. The name comes from a snare used by the Hawaiian god Maui to capture the sun. It also means "to absorb as knowledge or skill." 258 schools strive to achieve *net zero energy cost*, including *energy efficiency upgrades*, helping the DOE achieve its goal of 90% renewable energy at all public schools in the state by 2040 and supporting the Hawaii Clean Energy Initiative. Three campuses that are 100kw will be designed to be *microgrids* that can run off grid.

The Energy Coalition

Project 7: Advanced Energy Community (2015 - 2018)

TEC is a key team member in a California Energy Commission project that is focused on developing an Advanced Energy Community (AEC) in a disadvantaged area within Los Angeles County to further sustainability and energy efficiency in the State. TEC is working to develop a *zero net electricity community master plan* that lays out a detailed plan to provide community participants with clean energy through solar PV and storage sites and lower energy costs through deep energy retrofits and financing options. Components of the AEC project include energy efficiency strategies, access to *electric vehicles and enhanced mobility*, potential for increased resiliency, improved standards of living and alleviation of local grid constraints. The scope of this project is similar to the activities specified in Tasks 1 and 2 and provides TEC with relevant experience *developing communitywide plans and strategies* and setting ambitious yet achievable goals.

Project 8: Southern California Regional Energy Network (2013 - Present)

TEC designed and is implementing the SoCalREN Public Agency Program. The program pioneered the regional "one-stop" approach to supporting local governments in achieving their goals to reduce energy use. In this project, TEC ***benchmarked customer energy use***[2] and summarized profiles to establish a baseline. TEC then facilitated energy assessments and provided recommendations based on feasibility, financial viability and agency interest. One of the key services includes objective, financial advisory support to ***analyze options for project funding and financing*** as well as apply for and secure these resources. In addition, TEC managed a variety of stakeholders to obtain input throughout the project and provide feedback on improvements. TEC also provided ***community engagement*** on energy efficiency and demand response through workshops, newsletters, website, case studies and other educational materials. The scope of this project is similar to the activities specified in Tasks 3 and 4.

Project 9: California Energy Commission, AB 802 Outreach and Facilitation (2017 - Present)

As part of the California Energy Commission's AB 802 Outreach and Facilitation, TEC is leading a team that will provide educational resources for building owners and stakeholders required to comply with California energy benchmarking mandates. A key part of TEC's role on this project is identifying buildings statewide that need to comply with benchmarking mandates. The work from this project can benefit the Strategic Energy Plan by providing a clear description of the AB 802 mandate and identify the buildings that will need to comply within the City of Irvine. Intimate knowledge of these regulations can also ***assist the City to comply with the law***, anticipate changes to the law, and help the City fully leverage information resulting from publicly disclosed energy usage. ***Building characteristics will enormously complement the energy data the City*** has obtained for Community Choice Energy (CCE) analysis, and TEC can help connect the dots.

Project 10: Clean Power Alliance of Southern California, Marketing & Outreach (2018 - Present)

The largest ***Community Choice Aggregation program*** in the U.S. recently launched and TEC is providing the marketing and outreach services for the Clean Power Alliance of Southern California or CPA (formerly Los Angeles Community Choice Energy). In this project, TEC will conduct a full marketing campaign including customer notification and engagement covering the tasks as listed below and broken out between three phases. Phase 1 will cover program launch, phase 2 will cover commercial customer marketing and outreach, and phase 3 will cover residential customer marketing and outreach. The overall campaign will seek to inform and educate customers about CPA. This experience can ***strategically guide the City of Irvine's vision and goals*** towards a renewable energy transition especially as CCE options are locally explored.

Project 11: Community Energy Partnership (1998 - 2017)

TEC led the development and subsequent implementation of the Community Energy Partnership (CEP) working with Southern California Edison (SCE) and the City of Irvine representing the first, pioneering Partnership city (then known as the Irvine Regional Energy Efficiency Initiative). The CEP grew into a pilot collaboration among eight Southern California cities, SCE, Southern California Gas Company (SCG), and TEC. Its mission was to build positive relationships among cities, energy consumers, and their serving utilities, and to ***educate communities about sustainable and efficient energy practices***. Through the CEP, cities and utilities collaborated to empower consumers to take responsibility for their energy use. The CEP was dedicated to providing energy efficiency knowledge and spreading awareness of services within the communities of its ***eight partner cities of Culver City, Brea, Corona, Irvine, Moreno Valley, San Bernardino, Santa Clarita and Santa Monica***. The CEP served as the first Partnership model which is now replicated statewide by all four Investor Owned Utilities.

University of Irvine, Advanced Power and Energy Program

Project 12: DOE Irvine Smart Grid Demonstration Project (2010-2015)

Research, development, and demonstration partner to Southern California Edison on an $80 million investigation of most *smart grid technology and concepts*. UCI APEP was involved in implementation of all technologies in the University Hills community, design and use of synchrophasor technology to identify small changes in substation loading in order to validate the performance of power aggregators, simulation of the smart grid, and analyses of the data.

Project 13: UCI Microgrid Project (2003-2018)

Over the last 15 years, UCI APEP has increasingly *developed and deployed advanced power and energy technologies in the UCI Microgrid*. These technologies include battery energy storage, thermal energy storage, solar PV installations of various types, smart EV charging, hydrogen fuel cell vehicle fueling, load shedding and management, and novel controls and algorithms for optimal application of combined cooling, heating and power (CCHP) in buildings in cooperation with Siemens and with funding from the U.S. DOE and CEC.

Project 14: DOE Development of Microgrid Controller (2013-2017)

UCI APEP developed a *generic microgrid controller* with funding from the U.S. Department of Energy to monitor and control all aspects of a microgrid including loads, power generation, electric and thermal energy storage systems, etc. The generic controller is being used by IEEE in their development of microgrid standards, and an instance of the controller is being demonstrated on the UCI Microgrid.

Project 15: Advance Energy Community (2016-2018)

UCI APEP is teamed with the City of Huntington Beach, a built environment technology developer, Altura Associates, Southern California Edison, National Renewable Energy Laboratory (NREL), and a community based organization, ComUNIDAD to address the EPIC Challenge by *using renewable distributed generation*, targeted building energy efficiency retrofits , *electrification, and microgrid upgrades* to improve air quality and electric grid operations in dense urban areas, while also substantially reducing greenhouse gas emissions in a disadvantaged community.

5. KEY PERSONNEL

Integral Group

SPECIALTIES

- Energy Efficiency and Renewables
- Community Planning
- Energy and Sustainability Programs

Andrea Traber, AIA, LEED Fellow – Senior Principal, US West Sustainability & Resilient Design Leader (Oakland, CA)
Andrea will be the principal in charge and oversee this project.

Internationally recognized as a green building and sustainability expert, Andrea contributes over 20 years of experience as Project Architect and Principal on numerous green building projects, climate action plans, and sustainability and energy programs, to the Integral team. Serving as a "translator," Andrea bridges the design and communication gaps naturally occurring between A/E/C disciplines, while identifying opportunities for increased resource efficiency and sustainability through informed, holistic building systems design.

SPECIALTIES

- Energy Modeling
- Zero Net Energy Design
- Radiant Cooling System Design
- Natural Ventilation

Neil Bulger, PE LEED AP BD+C - Principal (Oakland, CA)
Neil will serve as codes and energy modeling advisor for this project.

Neil leads the building performance modeling team for Integral Group's west coast offices. Neil provides thermal comfort and low energy system design strategies for buildings, leveraging world class simulation tools and years of experience in building science and HVAC. Providing design consulting support that goes back to the basics in using simulated models, Neil focuses on illustrative options, while always asking how a design move provides true value to the people experiencing a proposed environment. Relying on expertise in thermal comfort, daylighting, systems design, and energy, the team deploys models to validate designer driven ideas and test designer posed questions.

SPECIALTIES

- Energy Efficient Electrical System
- Sustainable Electrical Design
- Zero Net Energy Buildings
- Zero Net Carbon Emission Buildings

David Kaneda, PE, FAIA, LEED Fellow – Managing Principal (San Jose, CA)
David will serve as energy storage and mircogrids advisor for this project.

Over the past three decades, David has designed high performance and resource efficient electrical systems, resulting in cutting-edge, sustainable projects operating at and attaining certifications for zero carbon emissions, CHPS, Zero Net Energy, and LEED Platinum. David co-chairs GSA's Net Zero Energy Task Group and the AIA California Council COTE and serves as an advisor to a number of key organizations focused on sustainability issues including: the GSA Net Zero Energy Professionals, California Building Standards Commission - Green Building Code, CPUC Zero Net Energy Action Plan, and DOE/ CEC PIER High Performance Building Façade Research Program.

SPECIALTIES

- Green building & sustainability
- Resilience planning
- Renewable energy solutions
- Energy conservation and efficiency

Rachel Moscovich, MES, LEED AP, Senior Sustainability Planner (Los Angeles, CA)
Rachel will be responsible for strategic planning and stakeholder engagement for this project.

Rachel is an experienced strategist and project manager with ten years' experience in the sustainability field. Her work experience ranges from policy development to greenhouse gas accounting to program design and implementation. Rachel`s ability to collaborate and coalesce a range of ideas and competing priorities makes her an effective project manager. She has the proven ability to see projects through from conceptualization to implementation and refinement. With a background in urban planning, green building and sustainable business, Rachel brings a broad understanding of current sustainability issues and solutions in the public and private sectors.

SPECIALTIES

- HVAC Systems
- LEED Project Design
- Integrated Design

Andy Reilman, PE, LEED AP BD+C - Principal (Los Angeles, CA)
Andy will be responsible for energy systems and net zero design for this project.

Andy is a Principal and a mechanical engineer with over 17 years of experience in HVAC systems design and integrated sustainable project design. His expertise in sustainable architecture and green buildings includes building designs for passive, low energy systems such as natural and mixed-mode ventilation, displacement ventilation, radiant heating and cooling, and building integrated renewable energy systems.

SPECIALTIES

- Community Engagement
- Green Building Design and Material Specifications
- Sustainability Metric Data Collection, Analysis and Reporting

Janika McFeely, LEED AP BD+C, Architect - Associate (Oakland, CA)
Rachel will be responsible for strategic planning and stakeholder engagement for this project.

Janika joins Integral Group with over ten years of experience in the sustainable building industry. Janika focuses on holistic sustainable planning and design, working with clients on integrated planning efforts on projects including strategic action plans, campus-scale master plans, and working to merge large-scale policy with planning. With a specialty in higher education and campuses, Janika works with organizations to take a deeper look at long-term planning and the implications of development.

The Energy Coalition

Allison Hart, PhD. – Executive Vice President

Allison will be responsible for community planning and solutions for this project.

Allison provides management, oversight and strategic leadership for TEC's program implementation. Prior to joining The Energy Coalition, Allison was the City Manager for the City of Irvine, where she served for 17 years. During her tenure, Allison served as the President of the California City's Managers Association. Prior to her work with the City of Irvine, Allison was the Executive Director of Human Resources for the City of Santa Ana. She has extensive experience leading teams to design and implement public purpose programs and startup organizations. Allison has a B.A. in Political Science and an M.P.A from the University of Colorado and a Ph.D. in Public Administration from USC.

Laurel Rothschild – Director

Allison will be responsible for stakeholder engagement, funding and financing for this project.

Laurel oversees all energy, education and training programs at TEC, including Local Government Partnership Programs and the SoCalREN Public Agency Program. In her role, she has led stakeholder, community and public agency engagement and outreach activities for multiple programs. She has over 10 years of experience working with the City of Irvine and other local governments and communities to promote energy efficiency action, including benchmarking. She is a recognized expert in energy programs and has a keen understanding of best practices for rolling out energy programs to stakeholders across the state. Laurel is a Energy Star Portfolio Manager Trainer, a Certified Energy Auditor (CEA) and LEED AP O+M. She holds a B.S. in Business Economics from UCSB.

Ivana Dorin – Program Manager

Ivana will be responsible for community engagement, education and outreach for this project.

Ivana manages engagement, education, and outreach activities for TEC and its programs. She has over eight years of experience serving the energy needs of communities and supporting local governments with energy strategic planning and the rollout of benchmarking requirements to IOU Local Government Partnerships. Ivana has worked with several local governments across southern California assisting them with developing energy efficiency projects, energy action plans, and energy related messaging and outreach. She holds a B.A. in Environmental Policy from UCSD and an M.A. in Environmental Policy from Colorado State University.

Marc Costa – Policy and Regulatory Manager
Marc will be responsible for benchmarking and modelling for this project.

Marc has more than ten years of experience in the building industry focusing on areas ranging from advanced energy community planning, federal energy data standards and software development, as well as state and local government energy policy. Marc leads the Local Government Sustainable Energy Coalition (LGSEC) "To Code" committee, is an active member of the California Technical Forum, advisor to the CEC on AB 802 data regulations and machine learning GIS data efforts, a member of the Department of Energy's Task Force to create and implement data exchange standards, and was on the triennial DOE Solar Energy Technology Office investment proposal review team to award National Research Laboratories 2018-2020 funding. He holds a B.S. in Management Science from UCSD, a B.S. in Construction Engineering from CSULB, and is a LEED AP, CGBP, and BOC Level II.

Rebecca Hausheer – Program Manager
Rebecca will be responsible for funding and financial strategies for this project.

Rebecca has over 6 years of experience working with public agencies through local government partnership programs and the SoCalREN. She oversees project delivery for a regional portfolio of energy efficiency projects for the SoCalREN Public Agency Program. Rebecca has expertise on funding and financing sources for energy efficiency projects and also developed the SoCalREN's project feasibility financial analysis tool. Rebecca also has extensive experience navigating the world of utility incentives and programs to minimize out-of-pocket project costs. Lastly, she has experience evaluating energy storage and solar opportunities. She has a Master's degree in Environmental Science and Management with an emphasis on energy and climate from the Donald Bren School at UCSB and is LEED AP O&M.

Shawn Thompson – Project Engineer
Shawn will be responsible for analysis and planning for this project.

Shawn has 28 years of experience in both public and private sector engineering; 23 of those years she worked at the City of Irvine. At the City she worked on plans for district cooling systems and microgrids, coordinated with UCI APEP to install an electric vehicle car-sharing program at the Irvine Transportation Center and, in 1999, created sustainability strategies and a new Energy Element for the Irvine General Plan update. Shawn also developed a green building program, complete with marketing, outreach and worker training, for home developers in the City. As the City's first Energy Manager, she developed the City of Irvine's Energy Plan which was adopted by the City in 2008. Shawn has a B.S. in Civil Engineering from Cal Poly Pomona, a Professional Engineer's license in CA and is a LEED AP O+M.

University of Irvine, Advanced Power and Energy Program

Jack Brouwer, Ph.D. – Professor of Mechanical and Aerospace Engineering, Associate Director
Prof. Brouwer provides experience in the management and technical leadership of advanced technology demonstration and deployment projects, and monitors closely the details of both the administrative and technical dimensions of the research initiative while emphasizing the overall "large perspective" of energy integration, reliability, control and cost issues that are critical to the success of a project. Through his experience with forming and managing strategic alliances from research to policy, Professor Brouwer places emphasis on the effort needed to bridge between disparate stakeholders in the development and deployment of both the power and energy technologies and the associated public policy.

Robert Flores, Ph.D. – Associate Development Engineer
Dr. Robert Flores who is an integrated energy systems expert who has designed, optimized, and evaluated many types of renewable and sustainable energy systems including the UCI Microgrid, battery electric vehicle charging infrastructure, natural gas combined cycle plants, fuel cell systems, and solar power systems.

Li Zhao, P.E., Ph.D. – Associate Manager of Fuel Cell Technology
Dr. Li Zhao has technical expertise and skills to lead electrochemical systems modeling, experimental research on hydrogen production, distribution, and end-use, and on demonstration of these emerging technologies. He is currently supervising projects involving research on, and demonstration of, fuel cells, electrolyzers, other electrochemical technologies, hydrogen systems that generate, distribute, store or consume fossil and renewable fuels, including natural gas, digester gas, landfill gas, hydrogen, methanol, electricity, and biofuels.

6. TEAM ORGANIZATION

In addition to our qualifications and history, Integral recognizes that a Strategic Energy Plan requires a diverse team of experts in not only buildings and energy systems, electricity and natural gas, but also transportation fuels, and planning and stakeholder engagement. We have carefully reviewed the scope and understand the unique needs of the City. Integral will manage the overall development of the Strategic Energy Plan including project management as it relates to timeline, budget, administration, deliverables and vision and goals. TEC will leads Task 3 and 4 and UCI APEP will support Tasks 1, 2 and 4. The organizational chart below (Figure 1) summarizes each firm and the key personnel proposed for this project. Additional team member resumes are included in the *Appendix A* for your reference.

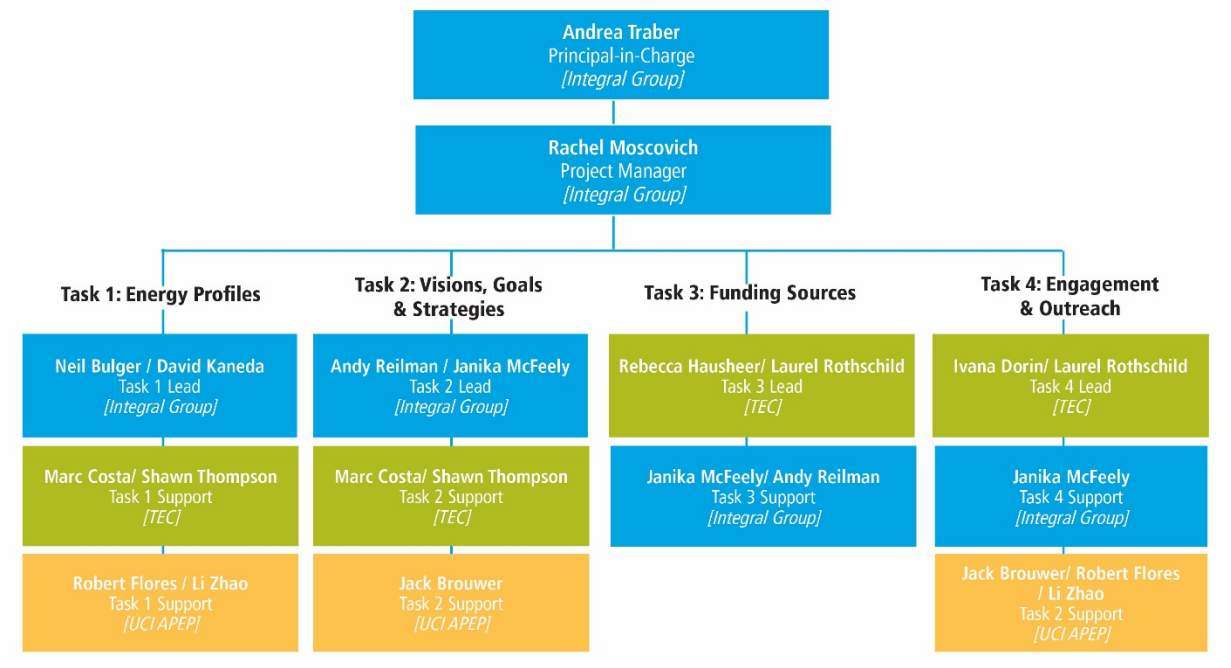


Figure 1: Organizational chart showing key personnel

7. PROJECT APPROACH & METHODOLOGY

Integral has established a proven method for working with cities and other organizations to develop comprehensive, effective and implementable plans. We are committed to the overarching project structure summarized as "discover, define, refine, implement."

DISCOVER	DEFINE	REFINE	IMPLEMENT
Discover project and team vision	Begin to define the current & desired future state: goals, targets & actions	Process of refinement through testing: modeling & engagement	Ensure team is well-positioned to hit the ground running and deliver impactful results

Figure 2: Project approach and methodology

This describes the arc of the project over the course of 18 months. In the "Discover" phase, the team will clarify the City's priorities and aspirations, specific project objectives; and past and current initiatives. The next phase will be to "Define" the desired future state by imagining what's possible by co-developing a set of goals, targets, and a comprehensive list of potential strategies, drawing from previous project experience, familiarity with leading-edge technology, and database of best practice approaches from other jurisdictions. The "Refine" stage is the opportunity to filter the list of potential strategies using factors such as engagement, modeling and analysis. This will produce a set of prioritized strategies specifically tailored to meet the City's objectives while optimizing return on investment. The final phase is "Implement" where the team proposes to deliver a detailed roadmap that will set up City staff for success in delivering and implementing each of the strategies articulated in the Plan. A detailed summary of the team's approach is provided below for each stage.

Stage 1 Discover

We will take care to ensure we have a strong understanding of the local context. While team members have a good deal of experience working within the City of Irvine, the first phase of work is focused on deepening our understanding of the current state. This is accomplished through a process of discovery, which can include, but is not limited to (a) a kick-off meeting where key staff members define the project and the current state in their own words; (b) a review of the City's 2008 and current emissions profile, past and current initiatives around energy efficiency, renewable energy and related actions; (c) identification of key stakeholders and their relative level of interest or impact; and (d) key informant interviews with staff and/or external stakeholders.

Stage 2 Define

The local context, including the City's emissions inventory, plans, policies, programs and key stakeholders will allow us to define both the current state and the desired future state. This phase involves developing the energy vision, goals and identifying the strategies that can be implemented in order to achieve the desired future state.

Stage 3 Refine

The process of refinement involves testing the above set of proposed strategies by: (1) modeling and analyzing associated impacts from a human resource (e.g. staff time), energy or greenhouse gas, and cost perspective; (2) testing the practicality and feasibility of proposed solutions in the 'real world' by way of engagement with internal and externals stakeholders; (3) identifying funding sources that will enable implementation of the proposed strategies.

Stage 4 Implement

Once the plan and the set of strategies are agreed upon, we will articulate the key steps to implementing each strategy. We take pride in our ability to not just deliver a plan, but to ensure that the individuals responsible for implementation are well-positioned to do so. Because members of our team have worked in municipal government we understand what

it takes to push a new policy or program forward. Our objective is that once the plan is complete, the responsible parties are able to hit the ground running and begin to see impacts in short order.

In addition, the team will plan out the four tasks specified by the City to ensure they are all completed within the 18 month timeframe. A draft project schedule is shown below. This general timeline will be discussed and finalized with input from the City to ensure the team is meeting any internal deadlines or goals the City may also have. The Team will then work with detailed dates and deadlines as agreed upon with the City.

		2018			2019			
Task	**Description**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
1	Access Current and Future Energy Profile							
2	Develop Energy Vision, Goals and Strategies							
3	Identify Funding Sources							
4	Stakeholder Input and Educational Opportunities							

Figure 3: Project schedule showing general timeline for key tasks

The City of Irvine has identified four key tasks to be included in the Strategic Energy Plan. The Team has carefully considered how best to approach each one of these to provide the highest level of product while also minimizing cost and risk for the City. Our detailed approach is provided below.

Task 1: Assess Current and Future Energy Profile	
Timeline: Q2 – Q4 2018	Costs: $23,000
Lead: Integral Group	Support: TEC, UCI APEP

The Team will begin this task by assessing the City's municipal and community-wide energy profile using 2008 information. We will then create forecasts for future energy profiles. Collecting and analyzing this information will allow two important outcomes. One outcome is to set energy goals that align with the the vision. The second outcome is to use the energy profiles to prioritize actions and investments that accomplish goals set forth in the Strategic Energy Plan. With a well-informed understanding of energy profiles, the Strategic Energy Plan can set an achievable trajectory to meet the City and its constituents' vision.

Our team's advantage is that we have obtained and analyzed the City's municipal building stock and energy usage from 2008 to present day. We have GIS maps of every building in the city. We have access to all commercial and residential business data through CoStar and the ESRI Business Analyst. This will allow our team to spend valuable time on transportation analysis, forecasting and developing strategies to accomplish the vision.

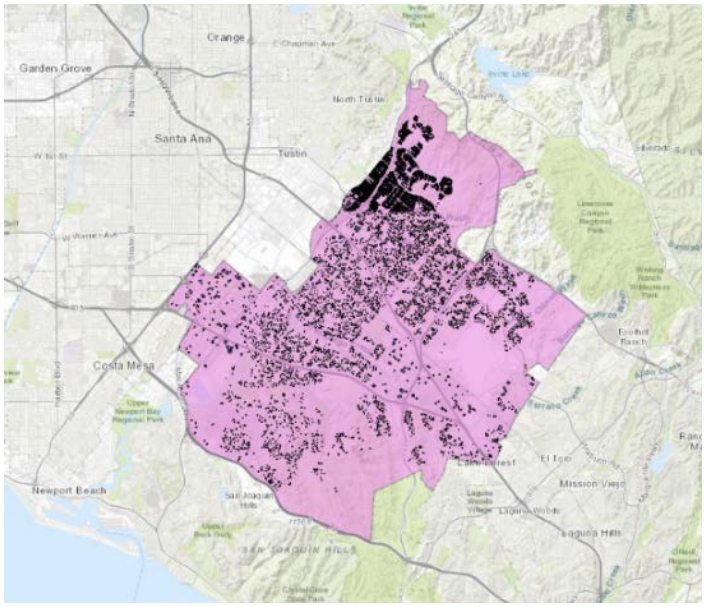


Figure 4: GIS Map of building footprints for City of Irvine

Through previous experience working with the City, the team has already collected over 60,000 building footprints. See Figure 4. The Team will leverage GIS visualization to spatially understand where, how and who is using energy. This powerful approach will allow the team to estimate energy consumption building-by-building for a highly accurate understanding of the current and future energy profiles. If our team accesses the Community Choice Energy program (CCE) data, the estimates can be turned into an enormous asset, for the City, in (1) forecasting energy procurement as a Load Serving Entity and (2) providing the foundation for investment-grade microgrid analysis and community solar plus storage. See Figures 5 and 6 to see preliminary mapping of buildings at the community and municipal asset level.

Figure 5: Solar rooftop potential for Irvine City Hall

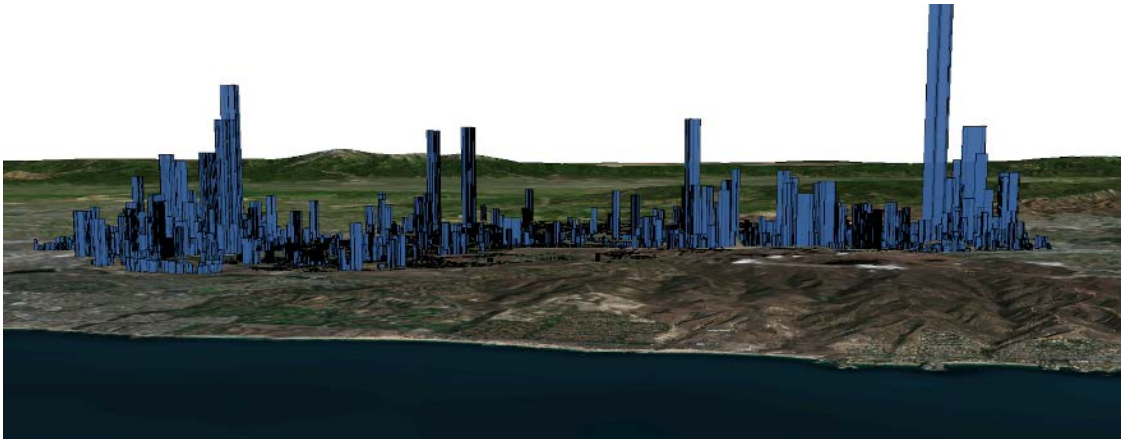


Figure 6: Municipal Asset Level - City of Irvine 3D Rendering by Rooftop Area

These figures help illustrate that the more the Team understands about how and where buildings are using energy, the better positioned the Team is to propose targeted strategies to improve efficiency or shift to a clean energy supply in areas of greatest opportunity. The Team also has an initial understanding of the solar potential for the City's buildings and can map this out visually for the City. See Figure 5 for example showing the solar potential for the Irvine City Hall rooftop.

The Team will then identify an initial list projects that can be used to significantly reduce energy usage and greenhouse gas emissions. Detailed information for each subtask is provided below.

Task 1.1 Briefly summarize benchmark data from the 2008 Energy Plan.
Deliverable: Brief summary of 2008 benchmark data.

To guide the Team's work throughout the duration of the project, the Team proposes to create a project steering committee, assembling key internal City staff representatives. The steering committee will review progress at key milestones, will advise on key decisions, and will review deliverables as needed.

Integral will review the 2008 Energy Plan to summarize benchmarked data and visualize key findings. Using the municipal portion of the City's energy usage, our team will provide baseline metrics on energy per square foot (energy use intensity), per capita, per vehicle miles traveled (VMT) and by economic factors such as gross city product for all municipal facilities. The Team will address this request by using the summary of benchmark data from the 2008 Energy Plan and to describe how this data will be used to influence the methodology for the analysis of current energy consumption data. The Team will also work with the City to get feedback (see Task 4) on how the team can build off the work that has been done and create a more effective plan. The goal is to leverage existing information and resources and ensure consistency across the original and updated plans.

In developing future targets and objectives for municipal operations and community-wide energy consumption it is crucial to establish a base year for comparison. This Strategic Energy Plan will build upon the work and analysis from the 2008 plan. In collaboration with the City and based on the data available, we will determine the optimal baseline year for this updated plan. Integral and TEC have experience performing using benchmark data for building level and community scale projects. Benchmarked data provides a snapshot of relative performance at a given time, and can be used as a baseline from which to build future projections.

Task 1.2 Review current baseline energy usage and project future energy use and supply data for the City of Irvine.

Deliverable: Summarized baseline data on energy generation, distribution and consumption.

Building off of the review of benchmarking data from the 2008 Energy Plan, the team will perform a detailed analysis of the City's current energy consumption and supply data. The team's approach is to review the entirety of the local energy system. The term energy system refers to the following three components: energy generation, energy distribution and energy use:

ENERGY GENERATION refers to the power plants and other energy generators that transform primary energy sources, such as coal, natural gas, wind, or sun, into usable energy.

ENERGY DISTRIBUTION refers to the network of pipes, power lines, and vehicles that deliver usable energy from where it is generated to where it is used. For electricity, this includes transmission and distribution.

ENERGY USE refers to both the total amount of energy consumed by our systems and technologies, as well as the demand for energy at a given moment in time. Energy use is shaped by the way we interact with and use these systems and technologies, including our expectations of consistent supply, convenience, and cost.

The Team will review the data provided by the City and incorporate other datasets the team has to create a comprehensive, portfolio view for analysis. TEC, through previous work in the City, has community-wide, building data as well as energy consumption data for public buildings. In addition to this existing data, both TEC and Integral have experience working with large datasets and understanding the importance of organizing data sets prior to analysis. The Team will coordinate with the City team and ensure that the proper set up is established prior to starting the data analysis.

Below is an example of the datasets the team will utilize:

- Municipal and communitywide data from the IOUs
- Monthly customer level data, if available, from the CCE analysis team
- ESRI and OCTA data on community vehicle inventory, vehicle miles traveled, gasoline and transportation fuel levels
- City of Irvine GIS department building footprints to further assess the building stock and locational baselines of energy

- ESRI Business Analyst data to inventory commercial business and apartment sectors for additional metrics on load growth, since these constituents and customers represent the highest load of the 2008 plan
- CoStar database
- Lawrence Berkeley Lab Tracking the Sun solar install database and Google Project Sunroof for total solar potential
- SCE DERiM Maps for grid interconnection potential

The Team will also develop a clear methodology for data analysis and identify what tools will be used. Integral Group will lead this building off of extensive experience performing energy data analysis and using in-house modelling and analysis tools. The Team will work to finalize the methodology and craft a narrative that explains the data analysis process for transparency into the eventual results.

Once the baseline is established the team will develop future energy use projections for a 20-year time horizon (or other target year as specified by the City or stakeholders). To determine future energy use and emissions projections, the team will take into account (a) the rate of development, renovation and building replacement within the City of Irvine; (b) information on age of HVAC equipment (if available); (c) community-scale fuel-switching and efficiencies (e.g. grid modernization, repair of gas leaks, as applicable); (d) evolving and future building codes; (e) future development on PPAs or CCAs. All of these data points will be entered into an energy and emissions modelling tool, which will be used to build out potential future energy scenarios for the City's municipal buildings and fleet, and for community-wide energy systems.

Task 1.3	Review greenhouse gas inventory, analyze current energy consumption and emissions communitywide and in municipal operations. For municipal operations, include a City fleet inventory and identify sites that have high utility usage (e.g. peak demand).
Deliverable: Emissions profile for both municipal operations and community wide emission.	

Community-wide emissions inventory

Depending on the granularity of the data included in the community wide emissions inventory, Integral will analyze energy use and emissions from buildings, classified by the following:

- Building type, e.g. large commercial, small commercial (retail), industrial, residential multi-unit, residential single family. Data sources are Assessor Data, GIS data, CoStar and ESRI Business Analyst, and City Permitting Data
- Fuel use by type, e.g. electricity, gas, renewable. Data sources include DOE Tracking The Sun database and City Permitting Data
- Emissions profile of each fuel source. Data source is from SCE and SoCalGas site and source energy GHG conversion rates.

This will allow the team at the outset of the project to begin to identify areas of opportunity for emissions reductions, to be realized by way of fuel switching and/or energy efficiency retrofits or behavior change.

Municipal buildings and fleet emissions inventory

For City-owned buildings and fleet vehicles the inventory and analysis will be more fine-grained, based on data provided by the City and data the team has from previous work. The recommended interventions will in turn be more specific and more targeted, due to the fact that (a) these buildings are City property, therefore retrofit investments and fuel switching decisions can be made internally by staff and decision makers, (b) more information about fuel sources, age of equipment, building performance will be accessible, and (c) the City should lead by example, demonstrating to private-sector owners what is possible, and a commitment to emissions reductions and transition to a cleaner energy system.

Risk mitigation strategy: Data access is often a time delay and risk to emissions inventories. The team proposes multiple pathways to data access. TEC already has municipal electricity and gas data. The team is prepared to sign an NDA to obtain the CCE electricity data. We are familiar with the data request procedures with SoCalGas for community wide data. Lastly we can derive hourly energy load profiles and forecasts in the building sector by leveraging Integral Group's energy modeling expertise by using the GIS data to create investment-grade energy forecasts that support CCE analysis and microgrid development.

Task 1.4	Identify potential to significantly reduce energy usage through energy efficiency measures, renewable energy, stationary fuel cells, energy storage, and incorporation of battery electric vehicle charging and hydrogen fuel cell electric vehicle fueling in municipal operations and citywide.
Deliverable: Summary of potentially viable energy use and emissions reduction strategies.	

To begin to frame what's possible in terms of energy and emissions goals and strategies for both municipally owned assets and community wide energy use, the team will engage the City's internal steering committee in an exploration of the City's sphere of influence relative to energy sources, energy systems, and energy consumption. See Figure 8 below. Public buildings, for example fall within the City's direct sphere of control, and the City has varying degrees of control over new construction (of privately owned buildings) and improvements or retrofits to existing buildings. This exploration will help determine the parameters of what tools and strategies will be included in the strategic plan.

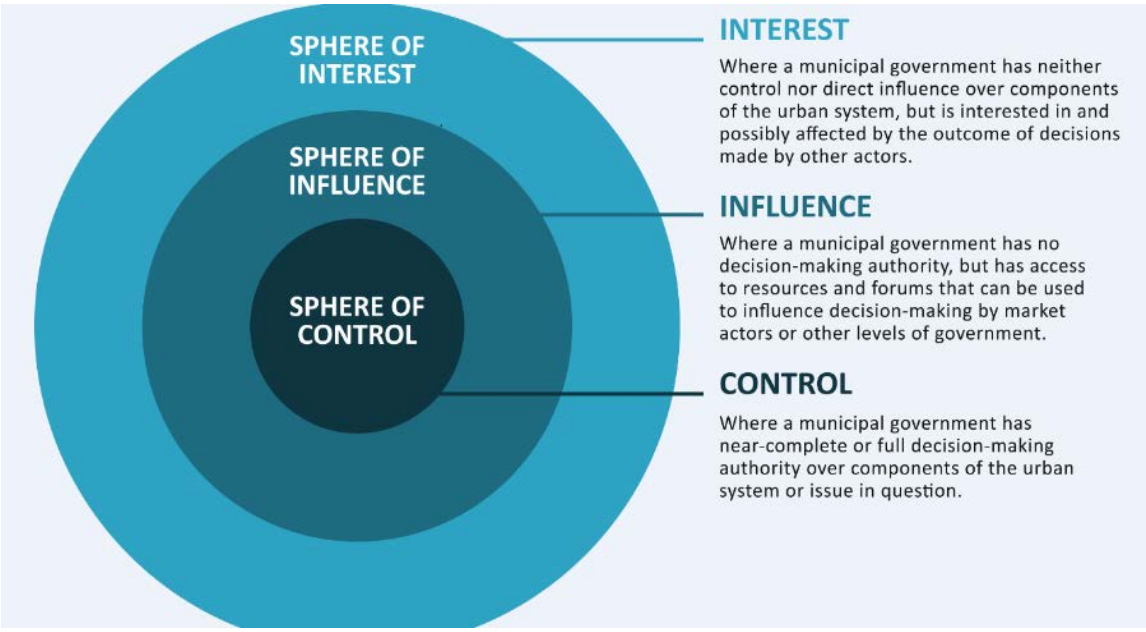


Figure 8: Framework for identifying the City's areas of interest, influence and control

The team will first present a comprehensive list of potential measures that could be implemented to address reductions from the municipally owned portfolio and the entire City. The team will derive this list from three sources:

1. Past and current measures already underway in the City;
2. Internal and external stakeholder input; and
3. Best practices from jurisdictions across North America.

This preliminary list of potential strategies will be tailored to what the team understands about the City of Irvine's energy use, building profile, municipally owned fleet, and related emissions.

At this stage the team will solicit feedback from internal and external stakeholders to gauge interest or readiness to explore new approaches to energy use and emissions reductions. This will help determine which measures should be examined and analyzed at a greater depth in Task 2.

Task 1.5	Create an inventory of existing energy-related activities, projects, programs, and policies, including any regional or state mandates that may impact future energy use. Recommend strategies and measures for the City to meet any related State mandated requirements.
Deliverable: Inventory, organized by scope and type, of existing energy initiatives in the City of Irvine.	

The Team will review all of the applicable energy related resources and mandates to create a comprehensive inventory for the City. The Team will also work with the City to understand what types of activities and initiatives should be included in the inventory. This information will be clearly presented in the overview of resources and mandates. The Team will then work together to propose a set of strategies and measures that help the City meet and exceed all applicable mandates.

This scan of existing energy-related activities will help the team to identify opportunities to leverage current initiatives locally, at the utility-scale and at other levels of government that will catalyze Irvine's ability to achieve its energy objectives. This will include collaborating with the respective teams working on the General Plan update and the feasibility assessment of a CCE program for the City.

Further, the team will identify other City priorities (outside of the realm of energy) that could be addressed by way of a Strategic Energy Plan. For example, through work for the District of Columbia, because social and racial equity were identified as key priorities for that jurisdiction, Integral convened a National Roundtable on Energy and Equity to identify ways to avoid introducing energy policies that could have adverse effects on disadvantaged communities, and moreover to identify policies that could have a positive impact from a social equity perspective.

Our team's advantage is that Integral Group has a long track record of energy planning, most recently with Washington D.C., as well as with international perspectives in the London, United Kingdom "London Energy Transformation Initiative." Furthermore TEC has already conducted energy audits and has strategies to reduce municipal energy consumption. This is rapid-start fodder for renewable energy strategy integration. Lastly, UC Irvine has pioneered strategies for fuel cells, transportation and stationary electric storage and microgrids. This combined experience will provide a pragmatic and sophisticated approach to the next twenty years of strategic energy communities in Irvine.

Task 2: Develop Energy Vision, Goals and Strategies	
Timeline: Q3 2018 – Q4 2019	Costs: $47,000
Lead: Integral Group	Support: TEC, UCI APEP

The Team will work with the City to understand what the key priorities are, and develop the vision, goals and strategies. Clear articulation of vision, goals and strategies will enable the team to analyze the impact and cost of specific measures, identify and prioritize ways to reduce risk and investigate more advanced energy projects, such as microgrids and deliver focused recommendations in the final plan.

Task 2.1 Based on the energy profile assessment, collaborate to create an effective energy vision statement representing what Irvine's energy composition should look like in the future.
Deliverable: Succinct, clear energy vision statement and rationale for Irvine's energy future.

Figure 9: Framework for feedback to and gathering input for vision, goals and strategies

The team will work with the City to develop a vision statement, supporting goals and strategies. As illustrated in Figure 9, the Team takes a top down and a bottom up approach to developing a vision and goals. This means taking into account external factors such as the impacts of climate change, regulatory frameworks, and best-in-class examples from other jurisdictions and organizations. The 'top-down' influences are weighted against a set of 'bottom-up' factors including stakeholder input, City priorities and budget, ROI, and project feasibility. The Team will work with the City and key community stakeholders, as specified in Task 4, to understand the desired community goals and objectives and will craft a vision statement that articulates a shared vision for the future, and will guide the development of the plan

Task 2.2 Present tangible long-term goals and nearer-term strategies that are measurable and provide cost-effective actions to meet future needs and work towards the Energy Vision.

Deliverable: A list of potential short- and long-term strategies supporting the Energy Vision, that will be tested (impacts measured) in future tasks.

Since 2008, the energy landscape has dramatically changed in California. Renewable portfolio standards are increasing, the movement towards customer choice and local, decentralized energy is blossoming faster than local governments had ever envisioned. Electrification of vehicles, new energy storage technologies and new issues on grid modernization leave uncertainty, yet create opportunity for those with a vision. This Team understands these industry dynamics and stands ready to help the City navigate through them successfully.

The Team will highlight the key findings from the energy data assessment and present a set of scenarios to the City. These scenarios will present the City with options and strategies for meeting goals supporting the vision of the Strategic Energy Plan. For example, the team can present scenarios that showcase pathways to meeting energy mandates (compliant), exceeding energy mandates (aggressive), and becoming a State leader in clean energy and greenhouse gas emissions reduction (exceptional). The Team will host discussions with key City members and finalize a clear vision and structure for the Strategic Energy Plan.

With a firm understanding of the energy profiles and future trajectories of energy use, the Team will lead the City through a discovery process to create realistic sequences of goals, actions and internal systems to ensure twenty years of successful implementation.

First, a stakeholder process must be in place to establish a carbon reduction target across all energy uses in the City. From there, the carbon intensity of each fuel source needs to be calculated, which will be completed in Task 1.3. At this point, a menu of strategies will be created for each fuel source, for municipal operations in buildings, infrastructure and fleet, and then for energy uses in the community buildings and fleet. The highly experienced team at Integral will walk the City and stakeholders through this process of evaluating the costs and benefits of each strategy, and the interactive effects of implementing packages of strategies. The following is a sample of questions that will be used to facilitate the process.

- Will a 100% renewable energy CCA negate the need for energy efficiency?
- Will a high percentage of electric vehicle adoption curb vehicle GHGs, but dramatically increase electricity GHG emissions if there is not enough renewable energy?
- Where does a microgrid have the most value?

These are all questions that Integral Group has managed for its clients, questions that UCI APEP has tackled in their campus renewable energy transformation, and policies that The Energy Coalition is tackling at the CPUC, CEC and with the newly formed Clean Power Alliance of Southern California (formerly known as Los Angeles Community Choice Energy or LACCE).

Task 2.3 Identify an implementation strategy to include a list of actions, cost estimates, and implementation timetable for energy efficiency, renewable energy, stationary fuel cells, energy storage, and battery electric vehicle charging and hydrogen fuel cell electric vehicle fueling projects. List and describe strategies to encourage Irvine residents and businesses to seek opportunities to voluntarily reduce energy consumption.

Deliverable: List of proposed strategies including implementation details, such as estimated costs and impacts, for municipal operations, City-driven initiatives, and voluntary initiatives led by businesses and individuals.

Based on the findings of Task 1 and the outputs of Tasks 2.1 and 2.2, the Team will develop list of actions, costs, and timetables for specific strategies. The Team will highlight findings from the energy analysis to identify more immediate strategies for high impact projects/measures. The Team will also develop a plan to encourage residents and businesses to implement strategies by highlight cost effectiveness and/or highly innovative technologies. These strategies will be tested via stakeholder engagement as described in Task 4, and viable strategies will be modeled to measure impacts and further prioritize in task 2.5.

TEC will leverage its expertise in community messaging to engage residents and business to join the energy transformation. Being an Irvine headquartered company, and having staffed outreach events, walked the streets for direct install programs, hosted booths at Irvine Global Village, we have the knowledge of engaging local constituents. Additionally TEC has the marketing contract for the Clean Power Alliance of Southern California and can leverage best practices in working on CCE outreach.

Task 2.4 Establish the role of microgrids citywide for efficiency, resiliency, and community safety. Provide a roadmap and overall strategy for the evolution of microgrid technology citywide.

Deliverable: Briefing detailing the potential for microgrid development throughout the city, including potential applications and locations, and projected impacts and outcomes.
Please note: A more detailed feasibility analysis for any proposed system(s) can be undertaken at an additional fee.

The Team will put together a briefing focused on the benefits of microgrids, the appropriate application of microgrid technology and a high-level feasibility assessment of the implementation of microgrids in specific applications throughout the City. This will include aligning the benefits of microgrids with specific City priorities and objectives, including but not limited to emissions reduction, efficiency, resiliency and safety. The briefing will include examples of application in other cities in a range of contexts, to demonstrate the variety of possible applications. The Team will also identify specific applications within the City of Irvine, and provide an assessment as to which applications would be be most effective, feasible and beneficial. Finally, the team will integrate the above into an overall strategy for the evolution of microgrid technology citywide. This can include some example sites and case studies from other microgrid developments to help showcase the feasibility and impact.

Task 2.5 Prioritize and rank potential actions to meet goals and strategies, considering a reasonable return on investment.

Deliverable: Short-list of prioritized strategies to meet Irvine's Energy Vision, along with rationale and projected quantitative impact of each.

Having worked with the City and stakeholders to determine objectives and priorities, Integral will prioritize and rank the comprehensive list of actions to a shorter list of strategies that will maximize return on investment (ROI) from environmental, economic and social perspectives. Integral will use the energy and emissions planning tool to model the potential impact of each of the strategies, in terms of reducing energy consumption, increasing renewable energy supply, and reducing emissions (see Figure 11). In addition to quantifying the energy and emissions benefits associated with each strategy over time, the Team will also identify any co-benefits associated with each action. This could include:

- Water conservation
- Energy resilience and community preparedness
- Reduced operations and maintenance costs (fleet and buildings)
- Reduced air pollution
- Local job creation and economic development
- Social equity benefits
- Energy cost savings

Potential strategies will also be filtered by practical considerations such as:

- City staff needs (e.g. FTE)
- Cost of implementation
- Time to implement
- Return on investment or other financial metrics
- Funding or partnership opportunities
- Feasibility of implementation
- Regulatory hurdles

By way of this quantitative and qualitative analysis, the team will propose a set of complementary strategies that together will set up the City of Irvine to achieve its vision and goals. This draft set of strategies will be reviewed by the City's steering committee and external stakeholders. The wedge diagram in Figure 11 (see below) illustrates the outputs of the energy and emissions modeling tool. Each of the colored wedges represents a specific emissions-reduction strategy, and impacts of each are projected over time, based on research and data on uptake and implementation. The energy and emissions model will take into account "background" improvements to the energy profile such as grid-scale fuel switching, as well as City-driven and voluntary initiatives.

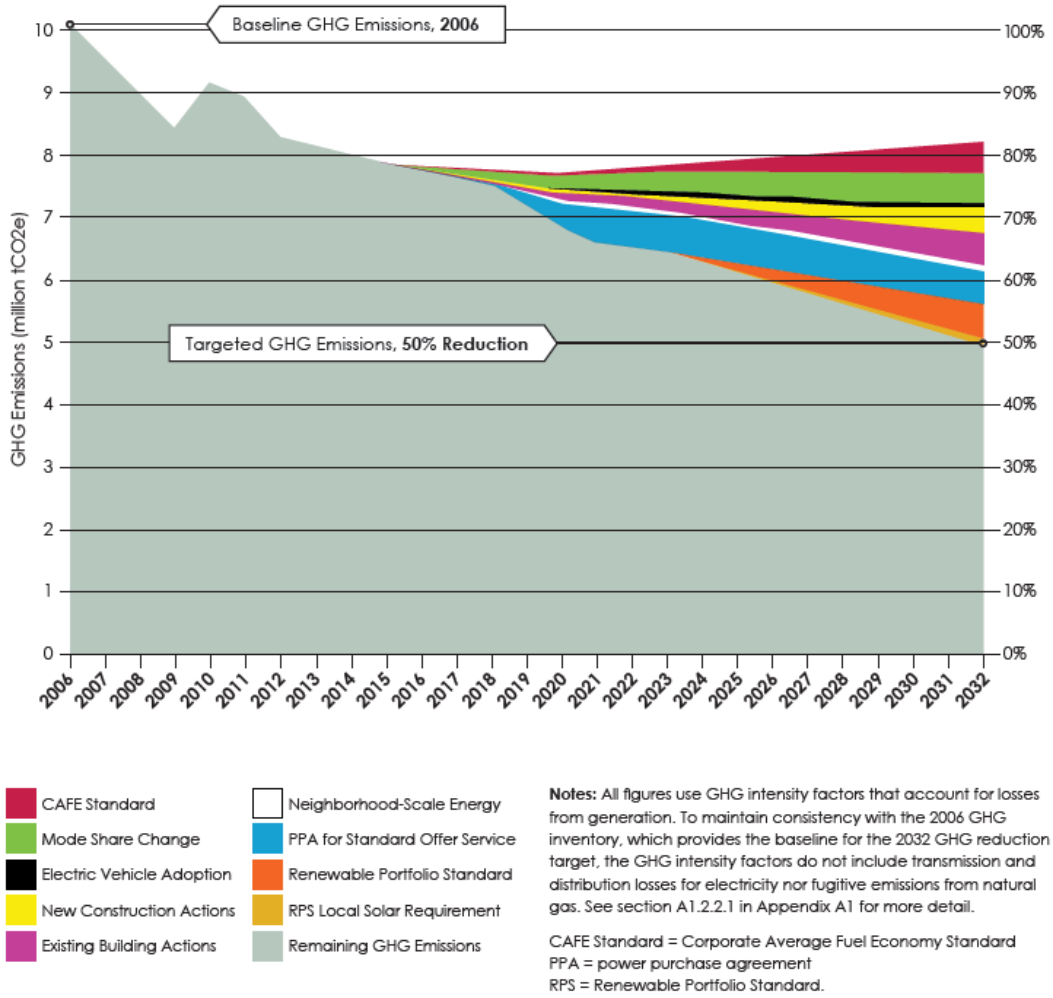


Figure 11. Example output of Integral's energy and emissions modeling tool.

Task 2.6 Review the policies in the General Plan Energy Element and Community Choice Energy feasibility study to incorporate strategies as needed.

Deliverable: Summary of how the proposed Strategic Energy Plan will interface with, incorporate, and/or complement the concurrent General Plan update and CCE feasibility study findings.

In order to create a comprehensive plan, the team will review the policies in the General Plan Energy Element and Community Choice Energy feasibility study to ensure alignment. This will build off findings of Task 1.5, where the time will have established a clear picture of the current state and parallel and supporting initiatives. Integral will lead this effort, with support from TEC, and work with the City and any consultants to incorporate the key goals from the feasibility study into strategies introduced in the Strategic Energy Plan. TEC has been very involved and engaged in policy discussions and the framing of Community Choice Aggregation (CCA) strategies. TEC has participated in planning and strategic visioning with Marin Clean Energy (MCE) and through our work with the County of Los Angeles we were on the ground floor helping develop the strategy for the LA County CCA. Moreover, TEC has delivered numerous presentations to local agencies on the strategy, opportunities and benefits of participation in CCAs. This experience and understanding of the CCA/CCE market will help the team communicate the results of the CCE feasibility study.

Task 2.7 Review energy audit information to identify potential energy efficiency and renewable energy measures, such as energy storage, building electrification, stationary fuel cells, and solar.

Deliverable: List of proposed targeted strategies based on energy audit outputs.

In addition to the assessment of energy consumption data, the team will also review energy audit information to identify more specific, targeted energy efficiency and renewable energy measures that have been suggested for specific building types. The Team will compile a list of commonly recommended measures from these energy audits and other potential measures identified from the energy consumption and building data assessment. Integral Group and TEC have experience identifying energy efficiency and renewable energy measures for clients, ranging from public agencies to commercial building owners. Both groups will draw from project records to identify commonly recommended measures for similar building types, as well as the estimated costs and savings.

Task 2.8 Provide information on resources available to implement clearly defined strategies.

Deliverable: Summary of available resources, delivery agents, and preliminary steps to implementation.

Integral Group will work with the Team to summarize the resources that are available to support the City with implementation of the Strategic Energy Plan. This will include funding and financing sources, design tools, data and analytical resources, risk management guidelines and best practices from projects. This will also include working closely with the City's project team and steering committee to articulate the process and parties (internal and external delivery agents) responsible for implementing each of the strategies. The team will identify preliminary steps (such as budget approvals, data needs or feasibility assessments) that may needed as preliminary steps to enable each of the strategies. The Team will include an overview of the available options in the Strategic Energy Plan and provide the City with the sources for the available resources.

Task 2.9 Develop an annual data gathering and tracking and reporting template to monitor and present progress in meeting new or updated goals.

Deliverable: Simple and user-friendly reporting and tracking template for City staff use to monitor progress as the Plan is implemented.

Finally, the team will finalize the list of strategies and develop a template to monitor energy data and measure progress towards goals. The Team will first review the City's current data gathering, tracking and reporting procedures and work with the City to identify what information should be prioritized. The Team will then develop a template that showcases key information for the City towards meeting goals and integrates with the format and structure of data that is being

tracked. Both Integral Group and TEC have experience working with and organizing large energy data sets, and will develop a template that can be easily managed by the City after the Strategic Energy Plan has been completed.

Figure 12 is an example of a simple schedule and tracking tool used to identify the various components of a plan and respective implementation and review timelines.

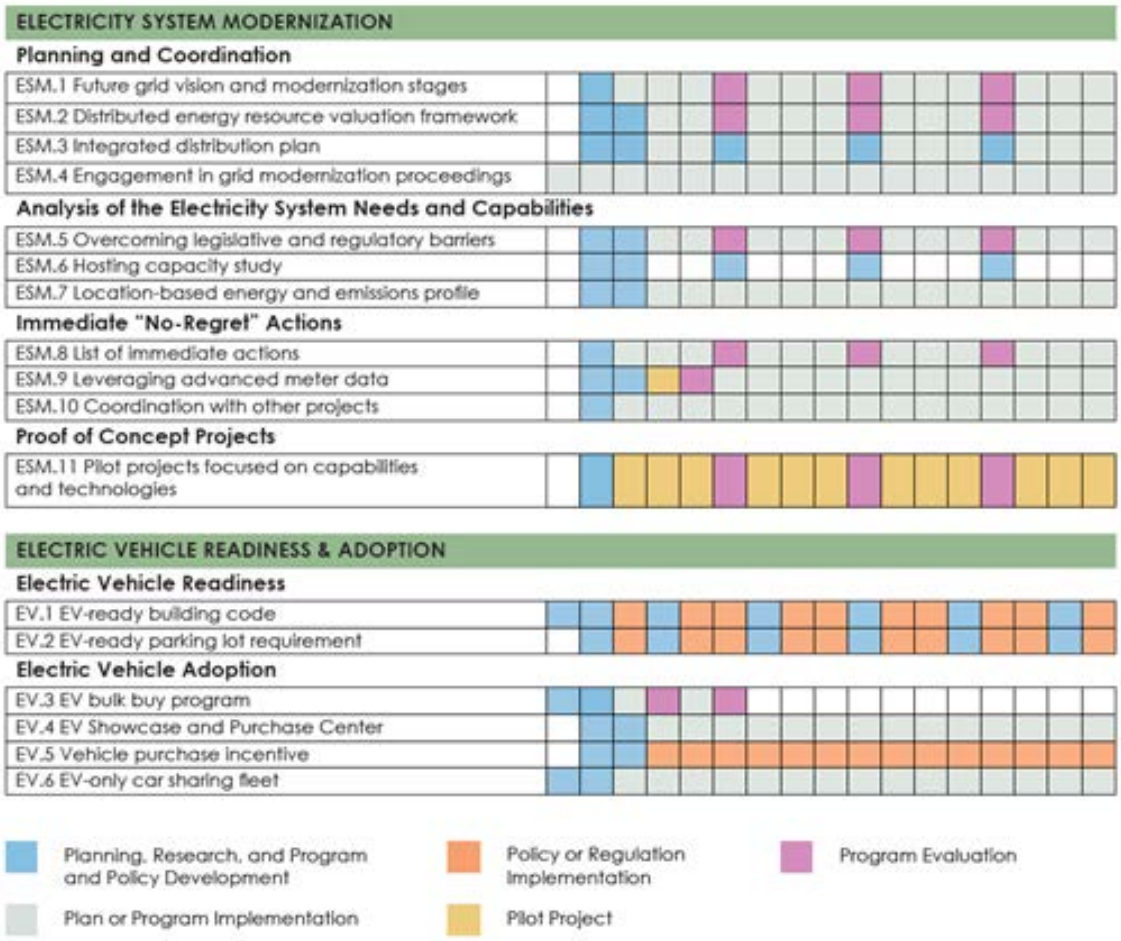


Figure 12. Sample Strategies and Timeline for Implementation

Task 3: Identify Funding Sources	
Timeline: Q1 – Q4 2019	Costs: $18,000
Lead: TEC	Support: Integral Group

TEC understands the importance of financial resources when prioritizing projects and ensuring successful implementation. Through its work under the SoCalREN Public Agency Program, TEC project managers provide financial advisory services to public agencies like the City of Irvine. In fact, the team has assisted in funding for 19 projects to date for the City. In addition, the team has assisted in identifying and securing over $250,000 in incentives and rebates. Analyzing risk profiles and understanding the details of financing options are a key expertise of TEC as is presenting the information in an executive format that allows the City to make informed decisions. The team also has extensive experience in developing strong partnerships, having worked with 75 firms that we have worked with on projects. Detailed information for each subtask is provided below.

Task 3.1 Identify funding and financing options to implement energy efficiency projects, including grants and utility rebates/incentive programs for community-wide initiatives.
Deliverable: 1. Summary of available funding sources for projects identified during Task 1 and 2 2. Table showing potential projects and which funding and financing resources are available and corresponding requirements and terms of each resource 3. Summary of financial resources available for the Irvine community

Our approach to identifying funding sources for energy efficiency projects starts with a summary of possible financial resources and their applicability to the City of Irvine. The idea will be to first leverage any existing resources that are available at no cost to the City i.e. SoCalREN, the Local Government Partnership, or California Energy Commission programs, then complement City staff with research and investigation. The team will develop a comprehensive list of available and applicable funding and financing options for the City to implement projects. This includes both internal and external resources. A sampling of the possible financial sources are below.

Internal - City Funding

The team will work with City staff to first understand internal funding sources such as existing contracts with vendors, maintenance funds, capital improvement budgets, general funds, enterprise funds, revolving loan funds or other budgets these projects can have access to. The team will then understand financial metrics and hurdle rates required to access those funds. In addition, the team will understand any deadlines for application and approval required. As mentioned above, TEC has a long history of working with the City of Irvine on the financial aspect of energy efficiency projects, so we should be able to move through this step quickly.

External - Utility Rebates and Incentives Funding

The team will review all applicable utility solution guides to match available incentives and rebates to projects identified. This work will be conducted in collaboration with SoCalREN since these resources are already offered to the City at no cost. The team will review the projects identified and summarize the customized and deemed financial incentives/rebates that will be applicable to the project creating a simple table summary table.

External - Utility and Utility Third Party Programs

The team will survey all relevant utility programs that may be applicable to the measures identified. Various programs exist to provide energy efficiency retrofits at no-cost or reduced costs to public agencies like Irvine. Further, specific programs and enhanced incentives are available for Irvine given that it is in the SONGS zone - zip codes identified in the target area for energy demand reduction. Some programs include SCE's Direct Install, Local Capacity Requirements initiative, and SCE's Midstream and Upstream lighting and HVAC programs.

External - Grant Funding

The Team will also identify unique opportunities for grant funding, including partnering with companies for demonstration projects. This can be a low cost option to test innovative technologies, and State or Federal grants for implementing new

technologies. TEC will review these funding resources quarterly to ensure it has the most up to date list of options available to the City. The team will work with SoCalREN to leverage any free resources available for this research.

External - On Bill Financing

On-bill financing (OBF) is a very cost effective and simplified method to securing financing for energy efficiency projects from utilities. The team will work with SoCalREN and the utilities to review projects identified and check eligibility for OBF. The team is also very knowledgeable on possible exceptions and will be sure to exhaust all possible avenues to maximize this 0% interest option.

External - Energy Lease Financing

TEC developed an innovative financing product called energy lease financing under the SoCalREN program. This financing option is available for a variety of energy projects including energy efficiency, renewable energy, etc. TEC will include this as an option for City and describe the requirements for eligibility, including general terms and conditions. TEC will discuss this option with Public Financial Management (PFM) a financing firm dedicated to the public sector.

External - CEC Financing

The California Energy Commission also has an option for financing energy efficiency and renewable energy generation projects. TEC will investigate the availability of these funds and determine if any of the City's projects would be good candidates. Traditionally, these funds are appropriated far in advance, so this could be a good long-term strategy for the City, especially where projects have a combined solution between energy efficiency and renewables.

External - CA IBank CLEEN Program

The California Infrastructure and Economic Development Bank has created a program to provide direct financing to the public sector to help meet the State's greenhouse gas reduction goals through energy efficiency, water conservation or even energy storage. TEC will determine if any of the City's projects would be good candidates and investigate the feasibility of leveraging this program.

Once all the financial resources have been identified, another analysis by sector will be conducted to understand the applicability across the full Irvine community. Information and resources will be identified for commercial, residential and other sectors as indicated by the City. TEC has experience performing similar work for these market segments during its management of the Energy Upgrade California Program and the Property Assessed Clean Energy financing program. TEC will research and speak with the administrators of the relevant funding and financing mechanisms to confirm availability and validate the fact that it is a good match for this community's energy projects.

Task 3.2 Incorporate risk profile and time horizon for financing options, and structure any recommended projects to minimize risk and align savings with repayment schedules.
Deliverable: 1. Summary of financing options, risk profiles and time horizons to inform the City's approval process 2. Table showing potential financing options for selected projects

After we have a summary of available financing and funding sources, the team will then work with the City to understand their desired level of risk and target for project cost effectiveness. Next, the team will evaluate the risk of the investment in relation to these options to inform the City's decision-making process. The evaluation will include the following factors:

1. Capital investment required for the project net of utility incentives and rebates
2. Availability of financing, sources and amounts
3. Financial metrics such as net present value, return on investment and simple payback
4. Project cost savings, terms of repayment, and how they align with equipment useful life
5. Risk profile of energy savings being realized across time

6. Repayment structures available that neutralize or yield net positive returns based on payments and energy bill savings
7. Cash flow analysis
8. The City's preferred financial analysis assumptions like discount rate
9. Eligibility requirements

These and other factors will be analyzed to understand the risk of each financing option. Then, financing options will be ranked and showcasing the ideal financing product and timeline for selected projects. This information will be used to develop a framework for financing and completing projects. The Team will also determine the risk profile for City community groups and suggest specific project types based on a group's level of acceptance of risk.

TEC has worked with a number of public agencies to identify low risk and cost effective financing options for energy efficiency projects through SoCalREN. Further, TEC has developed a process for minimizing risk in project identification, design and procurement. This is done by understanding the City's financial hurdle rates and helping to package projects accordingly. TEC will also include typical construction schedules to help the City understand how financing and payment schedules can match up to project cost savings and timelines.

Task 3.2	Seek potential for public-private partnerships that promote energy efficiency and economic vitality in the community and in municipal operations.
Deliverable:	1. Partnership strategy including desired qualifications and various levels of engagement 2. List of potential partners in the private sector, organized by the following: - Experience and expertise in the given market segment - Capacity to accelerate project delivery above and beyond traditional methods - Ability to mitigate operational and performance risk - Cost management over lifespan of partnership 3. Draft template document for partners to get aligned on goals and objectives desired through this partnership

TEC will coordinate with the team to outreach to private companies in the community and seek potential partnerships for the City that align with the energy visions and goals and economic vitality.

The team will identify the types of beneficial partnerships that can exist for the City and put together a draft list of potential partners for the City to review. Based on the City's decisions, the team will develop outreach materials and perform an initial outreach to gauge interest and understand the potential partnership opportunities. The Team will continue discussions with interested parties and develop a more detailed list of potential partners for the City. The detailed approach is below.

1. Understand what qualifications are desired in a partner for the City
2. Research relevant types of public-private partnerships for successful traits and recommendations
3. Coordinate with the Orange County Business Council, who represents and promotes the business community to enhance economic development, to understand the business's perspective in the sought after public-private partnership.
4. Engage with community stakeholders to garner interest in partnering and how to develop mutually beneficial relationships
5. Develop options for the various levels of partnerships the City can engage in such as strategic alliances and firm partnerships
6. Evaluate the available partnership opportunities and recommend key partnerships to pilot
7. Develop a template for goals and objectives to be achieved through these key pilot partnerships

Task 4: Stakeholder Input and Educational Opportunities	
Timeline: Q3 2018 – Q4 2019	Costs: $25,000
Lead: TEC	Support: Integral Group, UCI APEP

Engaging the community and receiving input from stakeholders is a valuable step of developing the Strategic Energy Plan. The Team understands the importance of this and how it is critical to the long-term success and implementation of the strategies. TEC and Integral have several years of experience working with key stakeholders and facilitating collaboration. In addition, both TEC and Integral have a proven track record performing outreach and engagement on energy topics, as well as developing materials for educational purposes. TEC also has a long history of working with the City and is familiar with the right organizations and groups who will provide valuable input. Integral has assembled and facilitated internal and external stakeholder groups to varying degrees of involvement ranging from providing input to, shaping, and sometimes co-developing strategic energy and sustainability plans. The Team's approach for this task is to identify strategies and opportunities for the City to get the most exposure for the least cost. Detailed information for each subtask is provided below.

Task 4.1	Engage stakeholders throughout the development of the Strategic Energy Plan and incorporate input from organizations representing businesses, educational institutions and other interested members of the community.
Deliverable:	1. Stakeholder interest and influence chart helping the City prioritize members 2. Combine list key organizations and how they will be integrated in the process 3. Engagement plan for stakeholders and community members 4. Support Advisory Committee meetings

The Team's approach to engaging stakeholders incorporates several steps. First, stakeholders will be identified in collaboration with the City. Some examples have already been communicated such as the Irvine Chamber of Commerce, Irvine Company, and the Green Ribbon Environmental Committee. Based on TEC's experience, recommended outreach may also incorporate the City's educational institutions including University of California, Irvine, Irvine Valley College, and Irvine Unified School District. Additionally, TEC will work with the City to consider residential outreach based on a list of groups and organizations previously engaged with as part of a partnership effort with the City. TEC will then develop a draft engagement plan with the identified organizations and begin approaching the organizations to gauge participation interest. TEC will have multiple options for each sector of the community including businesses, educational institutions and others groups as identified by the City.

The Team will then assess interest and influence by using a model such as the one presented below. See Figure 13. This is an example showcasing interest on the x-axis and influence on the y-axis. Different community groups are shown with different colors and then the names and/or types of firms are plotted on the graph. This tool will be developed to help the City prioritize stakeholder engagement. TEC will then form an Advisory Committee to provide input to the Strategic Energy Plan.

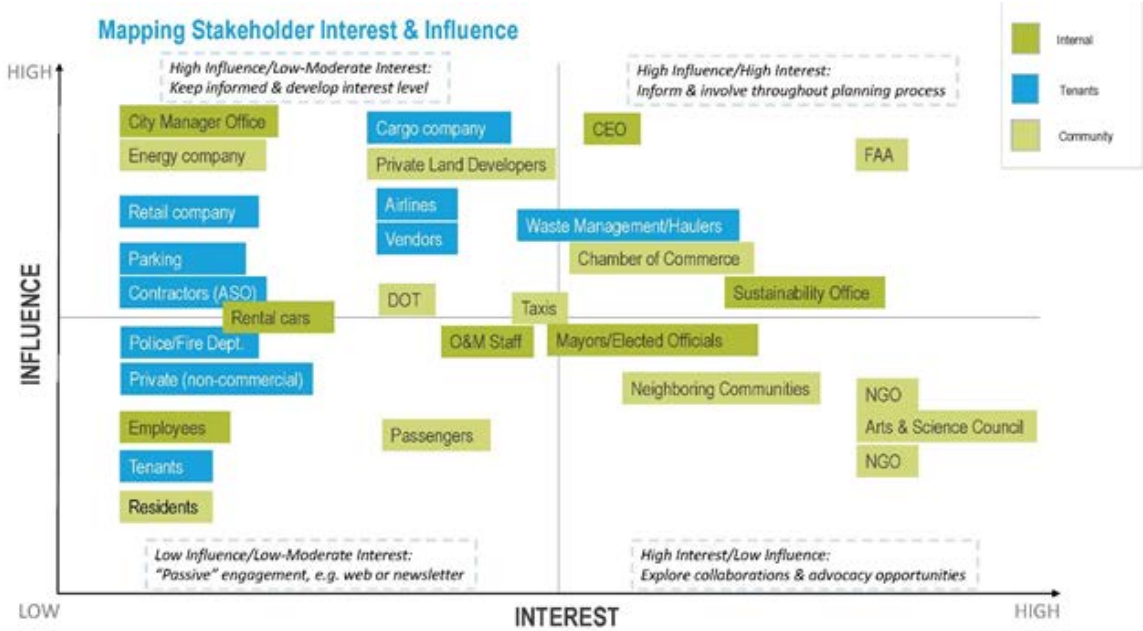


Figure 13. Sample stakeholder "mapping" output, emphasizing relative level of interest and influence in Plan outcomes.

The Team will help the City form the External Advisory Committee to provide input to the Strategic Energy Plan development process. The External Advisory Committee will be engaged at key milestones throughout the development of the Plan: (a) developing a vision and objectives; (b) providing input to strategies; (c) reviewing the draft Plan. TEC will coordinate the scheduling of the meetings, prepare agendas for the meetings in partnership with the City, facilitate the meetings and send out meeting minutes afterwards. Meeting locations will be varied throughout the City and stakeholders may be asked to host to further engage them in the process. Some initial ideas include the Irvine Civic Center and the Irvine Chamber of Commerce. Through experience with managing other stakeholder groups such as the SoCalREN Advisory Committee, TEC understands that 1:1 engagement with stakeholders is also beneficial. Therefore, TEC will build personal relationships with each stakeholder to maximize interest in the project.

TEC will coordinate with Integral to also prepare outreach materials to share with the City and host presentations as needed. TEC has designed and implemented engagement activities on energy efficiency and greenhouse gas emissions reduction topics for a number of clients, including the City of Irvine and the County of Los Angeles. TEC will also work with APEP to identify other key groups at the University of California, Irvine who can provide valuable insight and comments to the Strategic Energy Plan during the development. The Team will lead preparation, presentation and, debrief after each community meeting.

Task 4.2	Identify outreach and educational opportunities for City and stakeholders to host that highlight economically feasible technologies the community might consider to voluntarily reduce energy use.
Deliverable:	1. Report outlining potential energy projects linked with various community sectors 2. Targeted outreach plan mapping events and opportunities

The City has clearly established a strong level of environmental leadership in the community and continuing this stewardship through education and outreach events will be an important part of realizing its goals and vision. TEC's approach to this task is to first identify key subjects of interest based on the community's natural propensity. Possible topics include installation of renewable energy systems, battery electric vehicle charging, and fuel cell electric vehicle fueling. Other topics may include energy efficiency retrofits, transportation and mobility, battery storage, distributed energy resources, and net energy metering. In addition to interest, TEC will help the City choose technologies that

highlight successful projects and connect back to the Strategic Energy Plan. The Team will engage City staff to help disseminate information where possible to encourage involvement and allow those individuals to take pride in the success of their project.

The Team will work to identify opportunities to showcase the Strategic Energy Plan and highlight the economically feasibility of technologies or projects to increase community interest. Typical project timelines will be used to indicate which technologies the community can move on in the short versus long term. The Team will provide a list of recommendations, a timeline, and proposed outreach channel for each of the selected technologies. The plan will include exploring multiple events or workshops, leveraging pre-existing events where possible. TEC will support development of any outreach and education materials for these workshops in coordination with the UCI research centers and local technology companies to highlight innovative opportunities. The structure of the workshops or events will vary in topic, audience, and location. In addition to economically feasible projects, the team will support identification of demonstration opportunities for interested community members who are looking to achieve significant energy savings or production and showcase innovative and leadership.

8. REFERENCES

The following references are provided to showcase similar work that our firm has provided within the last three years.

Integral Group

Reference 1

Client Name:	The District of Columbia Department of Energy & Environment
Contact Information:	Marshall Duer-Balkind - Program Analyst, Data and Benchmarking Division 1200 First St. NE, 5th Floor, Washington, DC 20002 (202) 671-3042 | marshall.duer-balkind@dc.gov
Date of Services Performed:	Oct 2015 – Present
Description of Services:	Integral Group was retained to develop a Comprehensive Energy Plan (CEP) for the District of Columbia Department of Energy and Environment (DOEE). The CEP must account for all energy use within the City as well as the District's energy supply, including buildings, transportation, renewable energy, and grid modernization. Working with D.C. staff, Integral developed a methodology to forecast energy and emissions use over time in a customized Excel-based model that DOEE will continue to use beyond the project. The model simulates energy and emissions from buildings and transportation out to 2032 based on various policy and energy infrastructure decisions. The Integral team is now leading the development of communication and engagement materials and sessions intended to effectively communicate the CEP objectives and strategies and offer stakeholders the opportunity to provide input and Integral's role was recently expanded to conduct deeper analysis into high priority building and renewable policies, including net zero building codes and the design of a renewable portfolio standard that drives renewable energy generation.

Reference 2

Client Name:	Carbon Neutral Cities Alliance and City of Boulder, CO
Contact Information:	Brett KenCairn – Senior Environmental Planner, City of Boulder 1777 Broadway, Boulder, CO 80302, USA (303) 441-3272 | kencairnB@bouldercolorado.gov
Date of Services Performed:	Jan 2016 – Oct 2016
Description of Services:	In collaboration with three Carbon Neutral Cities Alliance (CNCA) member cities (Boulder, Seattle and Minneapolis), Group developed and tested an Energy System Transformation Playbook. The playbook framework includes guidance on policy, planning and land-use issues, as well as key infrastructure investments that will be required to transition away from fossil fuel use in both buildings and transportation. The framework was tested on three specific neighborhoods in Seattle, WA, Boulder, CO, and Minneapolis, MN. The pilot tested the proposed strategies to ground truth the financial modeling done for the project. Final deliverables included three neighborhood-scale energy transformation strategies and a playbook for municipal governments to use to design and implement their own city- or neighborhood-wide energy transformation strategies.

Reference 3

Client Name:	Pacific Gas & Electric, 2050 Partners
Contact Information:	Kelly Cunningham 77 Beale Street, San Francisco, CA 94105 (530) 757-5271 | KACV@pge.com
Date of Services Performed:	2017 - Present
Description of Services:	Integral Group serves as the building technical lead on PG&E's Code Readiness program, focused on the acceleration of future Codes and Standards (C&S) for California's Zero Net Energy goals in 2020 and 2030. The program aims to produce high-quality information and data that demonstrates cost-effectiveness, feasibility, and compliance efficacy for strategically selected technologies, systems, or practices in C&S rulemakings.The goals of the project are to gather real market information on construction and building operations to demonstrate effective energy efficiency strategies. Data being gathered includes cost-effectiveness, feasibility, and compliance pathways and barriers to adoption.

Reference 4

Client Name:	City of Santa Monica
Contact Information:	Joel Cesare – Sustainable Building Advisor 1685 Main St., Santa Monica, CA 90401 (310) 458-8549 | joe.cesare@smgov.net
Date of Services Performed:	April 2015 – Oct 2016
Description of Services:	The City of Santa Monica commissioned Integral Group to execute a feasibility study to provide useful information for project teams that are considering high performance designs, but are concerned about cost implications. The feasibility study and subsequent report analyzed costs and performance of a prototypical, 44,963 square foot midrise multifamily mixed use building in Santa Monica. Three performance levels were studied: 2013 Title 24 Part 6 Compliance (baseline), LEED v4 Platinum Certified, and Living Building Challenge (LBC) v2.1 Certified. Integral Group also performed a Life Cycle Cost Analysis (LCCA), which included project costs, ongoing utility costs, and repair and maintenance (R&M) costs over a 30-year period.

The Energy Coalition

Reference 5

Client Name:	County of Los Angeles
Contact Information:	Demetra McBride – Environmental Initiatives Manager 1100 N. Eastern Avenue, Los Angeles, CA 90063 (562) 471-2051 | dmcbride@isd.lacounty.gov
Date of Services Performed:	2013- Present
Description of Services:	TEC designed and is implementing the SoCalREN Public Agency Program which identifies energy efficiency saving measures and works side-by-side with agency staff from project identification to construction completion. Services include project start- to-finish management support, technical assistance, benchmarking and energy use analysis access to financing, competitively bid specialty contractors, funding and financing assistance with utility rebates and incentives. TEC also managed a marketing, outreach, education and training program that included workshops, case studies, newsletters, online resource library and more. In addition, TEC led stakeholder management and community engagement.

Reference 6

Client Name:	Southern California Edison
Contact Information:	Scot Mann – Program Manager 2244 Walnut Grove Ave, Rosemead, CA 91770 (626) 302-0659 | scot.mann@sce.com
Date of Services Performed:	1998- Present
Description of Services:	TEC works with both Southern California Edison and Southern California Gas Company as the implementer of two Local Government Partnerships (LGPs) which were created to bring about greater energy efficiency through leadership and collaboration. TEC was the implementer of the very first LGP in California, the Community Energy Partnership (CEP), which was a pilot effort embarked on with the City of Irvine. This pilot Partnership paved the way for more than 100 statewide LGPs built under all four investor owned utilities. TEC currently serves 15 partner cities through two LGPs, assisting with energy retrofits, outreach, and strategic planning

Reference 7

Client Name:	UCLA Institute of the Environment and Sustainability
Contact Information:	Dr. Stephanie Pincetl - Professor LaKretz Hall, 619 Charles E Young Dr E #300, Los Angeles, CA 90024 spincetl@ioes.ucla.edu
Date of Services Performed:	2015 – Mar 2018
Description of Services:	TEC is working with UCLA on the Advanced Energy Community (AEC) project, which aims to design and plan clean energy systems in a disadvantaged Los Angeles community. Both teams have worked together to design a strategic plan to establish a zero net electricity community, perform energy analysis on community buildings and determine the energy and economic impact of the proposed project design. TEC and UCLA have worked together on characterizing the energy profiles of the buildings in the community and developed analysis models to estimate the impact of proposed energy efficiency measures and renewable energy systems.

University of Irvine, Advanced Power and Energy Program

Reference 8

Client Name:	California Energy Commission
Contact Information:	Rachel Salazar – Contract Manager 1516 Ninth Street, MS-51, Sacramento, CA 95814 (916) 445-5316 | Rachel.Salazar@energy.ca.gov
Date of Services Performed:	2016 – 2018
Description of Services:	The Advanced Power and Energy Program (APEP) is collaboratively teamed with a local government (City of Huntington Beach), a built environment technology developer (Altura Associates, Inc.), gas and electric utilities (Southern California Edison, Southern California Gas), a national laboratory (National Renewable Energy Laboratory), and a community based organization (ComUNIDAD) to address the EPIC Challenge of creating an Advanced Energy Community in the disadvantaged community of Oak View. In this project the team is designing renewable distributed generation (DG), targeted building energy efficiency retrofits (EER), electrification, and microgrid upgrades, to improve air quality (AQ) and electric grid operations in dense urban areas, while also substantially reducing greenhouse gas emissions in the community.

Reference 9

Client Name:	Itron, Inc.
Contact Information:	Jonathan Wanjiru – Senior Engineer 2800 Fifth Street, Suite 110, Davis, CA 95618 (509) 891-3192 | Jonathan.Wanjiru@itron.com
Date of Services Performed:	2010 - 2013
Description of Services:	Research and development funded by the California Solar Initiative (CSI) program of the California Public Utilities Commission (CPUC) entitled "Demonstration-Driven Model Validation and Field-Testing of a Smarter Distribution System Accommodating High PV Penetration"

Reference 10

Client Name:	U.S. Department of Energy; Energy Efficiency and Renewable Energy (EERE)
Contact Information:	Jerry Parker – Senior Engineer and Project Manager 626 Cochrans Mill Road, Pittsburgh, PA 15236 (412) 580-9351 | walter.Parker@NETL.DOE.GOV
Date of Services Performed:	2008 - 2012
Description of Services:	Research and development for novel controls for buildings and energy conversion technologies, in particular focused upon the Combined Cooling Heating and Power (CCHP) technology that could produce large energy efficiency improvements and significant reductions of greenhouse gas emissions

Termination: There have not been any cases where either TEC, Integral Group or UCI APEP have ever had a contract terminated for cause or convenience.

APPENDIX A: RESUMES

Andrea Traber, AIA, LEED Fellow
Senior Principal, US West Sustainability & Resilient Design Leader

Internationally recognized as a green building and sustainability expert, Andrea contributes over 20 years of experience as Project Architect and Principal on numerous green building projects, climate action plans, and sustainability and energy programs, to the Integral team.

Delivering a holistic, integrated approach to design is Andrea's mission. Serving as a "translator," Andrea bridges the design and communication gaps naturally occurring between A/E/C disciplines, while identifying opportunities for increased resource efficiency and sustainability through informed, holistic building systems design. Her ability to translate complex technical information to understandable and actionable strategies, and alternatives, has resulted in projects which have achieved the highest sustainability and energy efficiency goals.

In 2013, Andrea joined Integral Group following a seven year tenure at a leading global energy and sustainability consulting firm, where she led the Sustainable Buildings and Communities consulting group in the Americas. Andrea has personally worked on 70+ LEED projects.

KEY PROJECTS | Corporate Offices

City Place Mixed-Use Development
Santa Clara, CA
Zero Net Energy, Net Zero Water + LEED ND Targets
Role: Strategic Advisor
8 Million gsf; 215 Acres

California State University, Monterey Bay Master Plan
Seaside, CA
Carbon Neutral Campus Plan, Zero Net Energy Campus + LEED-ND Platinum Targets
Role: Principal in Charge, Energy & Sustainability Consulting

San Francisco State University Infrastructure & Utilities Master Plan
San Francisco, CA
Campus Zero Net Energy + Net Zero Water Targets
Role: Principal in Charge

University of California, Santa Cruz Climate and Energy Strategy
Santa Cruz, CA
Role: Principal in Charge, LEED Consulting

University of California, Irvine Stem Cell Research Facility*
Irvine, CA
LEED Platinum Certified
Role: Principal in Charge, LEED Consulting

North Oakland EcoBlock Pilot
Oakland, CA
Zero Net Energy + Net Zero Water Targets
Role: Principal in Charge

Station 1300
Menlo Park, CA
Zero Net Energy + LEED Platinum Office Buildings, Carbon Neutral site, + LEED Gold Multifamily Residential Targets
Role: Principal in Charge

California High Speed Rail Station Vision Plan
Various Locations, CA
LEED Target
Role: Project Manager

SPECIALTIES
- 2013 Climate Leader
- EcoDistricts
- LEED, all systems
- Living Building Challenge
- Energy Efficiency and Renewables
- Water planning
- Community Planning
- Indoor Environmental Quality
- Materials selection
- Energy and Sustainability Programs

EDUCATION
- Bachelors of Architecture, University of California at Berkeley

PROFESSIONAL DESIGNATIONS/MEMBERSHIPS
- Licensed Architect, State of California, C26564
- LEED Accredited Professional BD+C, #1756, 6/25/2002
- LEED Fellow, 2013

PUBLICATIONS & PRESENTATIONS
- Meeting of the Minds 2014: Richmond's Waterfront Re-Imagined - UC Berkeley's New Global Campus, October 2015
- Living Future 2015: Designing a Carbon Neutral Regenerative Research Campus as a Catalyst to Neighborhood Revitalization, April 2015
- Building Health Forum 2014: Biophilia for Health and Wellness, December 2014
- Agrion Member Meeting: Microgrid Task Force, State of the Art of Microgrids, April 2013
- Infocast Military and Commerical Microgrids Summit, #1 and #2: The Future of Utilities and Microgrids, San Diego, CA November 2012; Washington DC, April 2013.
- The Future of Community Planning and the Smart Grid. Keynote, Greenbuilding Brazil, São Paulo, Brazil: 2012
- Defining Zero Net Energy: One Utility's Approach, ACEEE Summer Study: 2012
- Sonoma Mountain Village, One Planet Living, Rio+20 Conference, Rio de Janeiro, Brazil:2012
- Regenerative Network Salon, Five Great LEED Platinum Projects in 5 Minutes!:2012
- Green Architecture Symposium, Brazilian Institute of Architects (IAB), State of the Art Green Building, Rio de Janeiro, Brazil: 2012
- Smart Grid – Smart Communities: A Real World View. Greenbuild 2011

* Resume encompasses experience prior to joining Integral Group

Neil Bulger, PE, LEED AP BD+C
Principal | Building Performance Team Lead

Neil leads the building performance modeling team for Integral Group's west coast offices. Neil provides thermal comfort and low energy system design strategies for buildings, leveraging world class simulation tools and years of experience in building science and HVAC.

Providing design consulting support that goes back to the basics in using simulated models, Neil focuses on illustrative options, while always asking how a design move provides true value to the people experiencing a proposed environment. Relying on expertise in thermal comfort, daylighting, systems design, and energy, the team deploys models to validate designer driven ideas and test designer posed questions.

Neil provides technical design support Zero Net Energy projects, all facets of energy and comfort regarding LEED certification, and submission and documentation of code compliance and utility incentives. Using research-grade simulation tools, such as EnergyPlus and Radiance, along with best in class digital environments like Rhinoceros and Autodesk's Revit, his team builds on years of design and analysis experience to align high performance tools with key design solutions and questions. They are active users of a multitude of energy modeling tools, including IES-VE, OpenStudio, Comfen, Sefaira, Trane Trace, and eQuest.

KEY PROJECTS

DPR Construction ZNE Office
San Francisco, CA
Zero Net Energy (IFLI) Certified + LEED v4 Platinum Certified

David & Lucile Packard Foundation Headquarters
Los Altos, CA
Zero Net Energy (ILFI) Certified + LEED Platinum Certified

Bishop O'Dowd High School
Center for Environmental Sciences (CES)
Oakland, CA
Zero Net Energy Measured & Verified + LEED Platinum Certified

University of California, Merced
Zero Net Energy Downtown Administration Center
Merced, CA
Zero Net Energy + LEED Platinum Targets

Exploratorium
San Francisco, CA
LEED Platinum Certified, Zero Net Energy, Net Zero Carbon

City of Watsonville
Watsonville Water Resources Center
Watsonville, CA
LEED Platinum Certified + Zero Net Energy

Hanover Page Mill Building
Palo Alto, CA
Zero Net Energy Electric Target + LEED v2009 CS Platinum Certified

Kaiser Permanente Santa Rosa Medical Office Building
Santa Rosa, CA
Zero Net Energy + LEED NC Platinum Targets

Kaiser Baldwin Hills Medical Office Building
Los Angeles, CA
Zero Net Energy + LEED Platinum Targets

PG&E Prop 39 Pilot Program for Zero Net Energy Schools
Various Locations, CA
Role: Technical Advisor

SPECIALTIES

- Energy Modeling
- Zero Net Energy Design
- Radiant Cooling System Design
- Natural Ventilation
- Thermal Comfort
- EnergyPlus
- Rhino / Grasshopper
- eQuest

EDUCATION

- Bachelor of Science, Mechanical Engineering, California Polytechnic State University, San Luis Obispo

PROFESSIONAL DESIGNATIONS/MEMBERSHIPS

- Registered Mechanical Engineer, California #M36625
- American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
- International Building Performance Simulation Association (IBPSA)

David Kaneda, PE, FAIA, LEED Fellow
Managing Principal, San Jose | Electrical Principal

Over the past three decades, David has designed high performance and resource efficient electrical systems, resulting in cutting-edge, sustainable projects operating at and attaining certifications for zero carbon emissions, CHPS, Zero Net Energy, and LEED Platinum.

David co-chairs GSA's Net Zero Energy Task Group and the AIA California Council COTE and serves as an advisor to a number of key organizations focused on sustainability issues including: the GSA Net Zero Energy Professionals, California Building Standards Commission - Green Building Code, CPUC Zero Net Energy Action Plan, and DOE/ CEC PIER High Performance Building Façade Research Program. He has spoken on sustainable engineering issues at the National Academies, the Pacific Energy Center, Penn State University, Sustainable Silicon Valley, the American Institute of Architects and the US Green Building Council.

David is a professional engineer, a registered architect, AIA Fellow and a LEED Fellow.

KEY PROJECTS | Zero Net Energy

David & Lucile Packard Foundation Headquarters
Los Altos, CA
Zero Net Energy (ILFI) Certified + LEED Platinum Certified

Integral / IDeAs Z Squared Building
San Jose, CA
Zero Net Energy Certified (ILFI)

435 Indio Building Renovation
Sunnyvale, CA
Zero Net Energy

Clif Bar Headquarters
Emeryville, CA
Zero Net Electric Energy

Mathilda Office Building Renovation
Sunnyvale, CA
Zero Net Energy

110 1st St
Los Altos, CA
LEED Platinum Registered
Role: Electrical Principal

Samsung Research Park
Mountain View, CA
LEED-NC Platinum Certified, Zero Net Energy Ready

City of Watsonville
Watsonville Water Resources Center
Watsonville, CA
LEED Platinum Certified + Zero Net Energy

J Craig Venter Institute
La Jolla, CA
LEED Platinum Registered, Zero Carbon, Zero Energy

Confidential Urban Campus
West Hollywood, CA
Net Zero Water, Zero Net Energy + LEED Platinum Targets

Evergreen School District
Leyva Middle School Administration Building
San Jose, CA
Zero Net Energy

SPECIALTIES

- High Performance Electrical Systems
- Energy Efficient Electrical Systems
- Sustainable Electric Design
- Sustainable Lighting Design
- Zero Net Energy Buildings
- Zero Net Carbon Emission Buildings
  Daylighting Design

EDUCATION

- Master of Business Administration, London Business School, London, UK
- Bachelor of Architectural Engineering, Penn State University, University Park, PA

PROFESSIONAL DESIGNATIONS/MEMBERSHIPS

- Registered Professional Engineer, California #E14003, Illinois, Nevada, Colorado
- Registered Architect, Wisconsin
- LEED Fellow
- European Engineer, Chartered Engineer, United Kingdom

PROFESSIONAL LEADERSHIP

- The American Institute of Architects, Fellow California Council: Chair - Energy and the Built-Environment Steering Committee (2013-present), Representative the CEC (2013), Committee on the Environment (2006-Present), Recognition Advisory Committee (2002-2007), Long Range Planning Committee (2004-2006), Planning and Finance Committee (2005), Board of Directors (2000-2001)
- Sustainable Silicon Valley: Advisory Board (2010-present), Board of Directors (2008–2010)
- City of Cupertino: Planning Commission (2007-2010)
- The American Institute of Architects, Santa Clara Valley Chapter: President (2001), Vice President (2000), Board of Directors (1998-2003)
- The American Institute of Architects, Bay Area Regional Forum: Co-chair (2005-2006)
- U.S. Green Building Council Northern California: Co-chair Nominating Committee (2006-2007), Resource Committee (2005-2007); Advocacy Committee (2008-2011)

Rachel Moscovich, MES, LEED AP
Associate, Planner

Rachel is a planner, strategist and project manager who has worked for over ten years in sustainability and resiliency planning, green building and corporate sustainability. Rachel's experience ranges from research and analysis to policy development to program design and implementation. A skilled writer, Rachel has authored a variety of policy reports, white papers and articles on sustainability and urban design.

Rachel's ability to collaborate and coalesce a range of ideas and competing priorities makes her an effective project manager. She has the proven ability to see projects through from conceptualization to implementation and refinement. With extensive training and practical experience in urban planning, green building and sustainable business, Rachel brings a broad understanding of current sustainability issues and solutions in the public and private sectors.

KEY PROJECTS

Charlotte Douglas Airport Comprehensive Sustainability Plan
Charlotte, NC
Role: Project Manager

Vancouver Airport Authority Environmental Performance Benchmarking & Target Setting
Richmond, BC
Role: Lead Researcher and Project Manager

California High Speed Rail Authority, Station Area Planning (Sustainability Requirements)
California (Multiple Locations)
Status: In Process
Role: Strategy Development

DC Department of Energy and Environment, Sustainable DC Review and Analysis
Role: Project Manager

Toronto + Ontario Reporting Requirement for Large Buildings: Policy Development Consultations
Toronto, ON
Role: Lead Researcher
Green Buildings and Workplace Productivity Swiss Real
Vancouver BC
Role: Project Design & Research Lead

Salvaged Materials Market: Feasibility of Salvage from Regional Disposal Facilities
Metro Vancouver, BC
Role: Lead Researcher and Project Manager

Comprehensive Energy Plan for Washington D.C.
District of Columbia
Role: Project Management, Process Design and Research

City of Cambridge Getting to Net Zero Task Force
Cambridge, MA
Role: Lead Researcher and Project Manager

Benchmarking Policy Options Analysis
Victoria, BC
Role: Lead Researcher and Project Manager

SPECIALTIES

- Green building and sustainability
- Resilience planning
- Corporate sustainability strategy development
- Renewable energy solutions
- Energy conservation and efficiency

EDUCATION

- Master in Environmental Studies, Graduate Diploma, Business and Environment, York University, Toronto, ON, 2007
- Diploma in Environment, McGill University, Montreal, PQ, 2004
- Bachelor of Arts, History, Barnard College, Columbia University, New York, NY, 2002

PROFESSIONAL DESIGNATIONS/MEMBERSHIPS

- Urban Land Institute
- CaGBC
- USGBC
- Cascadia Green Building Council
- Board Member, Icarus Foundation, June 2011 - 2013

PUBLICATIONS

- "Vancouver's Greenest City Action Plan Enabling Deep Efficiency Improvements," ACEEE Summer Study on Energy Efficiency In Buildings, 2014
- "Green Walls for Greener Cities: Policies", Living Architecture Monitor, Vol. 15, Issue 3, Fall 2013
- "Deconstruction Strategy: Reduce Waste, Create Green Jobs", Construction Business Magazine, Vol. 10, No. 3, March/April 2013
- The Challenge Series. Millennium Water: The Southeast False Creek Olympic Village. Available in print and web: www.thechallengeseries.ca 2009
- "Millennium Water: Vancouver's Olympic Village." In: A. Ritchie and R. Thomas (Eds.) Sustainable Urban Design: An Environmental Approach. UK: Taylor and Francis, 2008

* Denotes experience prior to joining Integral Group

Andrew Reilman, PE, LEED AP BD+C
Principal | Mechanical Engineer

Andy is a Principal and a mechanical engineer with over 17 years of experience in HVAC systems design and integrated sustainable project design. His expertise in sustainable architecture and green buildings includes building designs for passive, low energy systems such as natural and mixed-mode ventilation, displacement ventilation, radiant heating and cooling, and building integrated renewable energy systems.

Andy is skilled in project coordination with the electrical, plumbing, and fire protection trades, and has led integrated design teams and supported production of plans and specifications.

Prior to joining Integral Group, Andy was an associate partner at Syska Hennesy Group, where he worked on multi-disciplinary and sustainable projects as well as spearheaded the implementation of Revit MEP to assist in the design of Zero Net Energy buildings.

KEY PROJECTS | Master Planning
City Place Mixed-Use Development
Santa Clara, CA
Zero Net Energy, Net Zero Water + LEED ND Targets
Role:
8 Million gsf; 215 Acres

Downtown Las Vegas Master Plan
Las Vegas, Nevada
Zero Net Energy Target

KEY PROJECTS | Civic + Community
City of Hayward
Hayward Zero Net Energy Library
including community gathering spaces
Hayward, CA
Zero Net Energy + LEED Gold Targets
Role:
58,000 ft²
Completion Date: 2017
Construction Cost: $59.9 Million

Downtown Las Vegas Master Plan
Las Vegas, Nevada
Zero Net Energy Target

Mid-County Courthouse
Menifee, CA
LEED Silver Target

Lions Park Library & Community Center
Costa Mesa, CA
LEED Gold (Library) + Silver (Community Center) Targets
Role:
29,892 ft²
Construction Cost: $34.5M

City of Los Angeles
Earvin "Magic" Johnson Park
Los Angeles, CA
LEED Silver Target
Role: Principal in Charge
150,750 ft²

City of Santa Monica High Performance Buildings Design Guidelines
Santa Monica, CA
Living Building Challenge Target
Role: Principal in Charge

KEY PROJECTS | Programs
Southern California Gas Savings by Design Program
Southern California

SPECIALTIES
- HVAC Systems
- LEED Project Design
- Integrated Design

EDUCATION
- Bachelor of Science, Mechanical Engineering, University of California, Davis, Davis, CA

PROFESSIONAL DESIGNATIONS/MEMBERSHIPS
- Registered Mechanical Engineer, California #M33227
- Vice-Chair, Center for the Built Environment
- Member, USGBC-LA Chapter
- American Society of Mechanical Engineers (ASME)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Planning Commissioner, Culver City, CA

* Resume encompasses experience prior to joining Integral Group

Janika McFeely, LEED AP BD+C, Architect
Associate, Senior Sustainability Consultant

Janika joins Integral Group with over ten years of experience in the sustainable building industry. Working as an architect for eight years, Janika collaborated with Integral Group on multiple Integral Group projects, including the Millikan Laboratory and Andrew Science Hall at Pomona College, the Packard Foundation, and the Exploratorium. During that time she acted as a designer and internal sustainability consultant, working with teams to explore innovative strategies to allow their projects to hit higher sustainability goals, including Zero Net Energy and LEED Platinum. Most recently she worked for the University of California Office of the President on climate action planning and reporting, green building policy and implementation, systemwide stakeholder engagement and training, and sustainability metric tracking and analysis. Janika has certified over 25 LEED projects, worked on over a dozen projects that achieved LEED Platinum certification, and has assisted with the ZNE analysis for over a dozen projects.

In her role at Integral Group, Janika focuses on holistic sustainable planning and design, working with clients on integrated planning efforts on projects including strategic action plans, campus-scale master plans, and working to merge large-scale policy with planning. With a specialty in higher education and campuses, Janika works with organizations to take a deeper look at long-term planning and the implications of development.

KEY PROJECTS | Policy + Planning

University of California Office of the President*

- UCOP Climate Action Plan and GHG Reporting
- Carbon Neutrality Charrettes
- Cool Campus Challenge
- Green Building Policy Development
- Energy Efficiency Training Development
- Student Engagement and Mentorship
- Drought Planning

KEY PROJECTS | Civic + Community

Lands End Lookout Visitor Center*
San Francisco, CA
Role: Architectural Designer, Sustainability Consultant*

San Mateo Public Library*
San Mateo, CA
LEED NC Gold Certified
Role: LEED / Sustainability Consultant*

KEY PROJECTS | Cultural

Aquarium of the Pacific
Pacific Visions Expansion*
Green Globes
Long Beach, CA
Role: LEED / Sustainability Consultant*

Berkeley Art Museum and Pacific Film Archive*
Berkeley, CA
LEED NC Gold Target
Role: LEED / Sustainability Consultant*

Exploratorium*
San Francisco, CA
LEED Platinum Certified, Zero Net Energy, Net Zero Carbon
Role: Architectural Designer, Sustainability Consultant*
210,000 ft²
Construction Cost: $220 Million

SPECIALTIES

- Design and Management of Green New Construction and Renovation Projects
- Community Engagement, Education and Group Facilitation
- Green Building Design and Material Specifications
- Consensus-Based Policy Development
- Sustainability Metric Data Collection, Analysis and Reporting
- Climate Action Planning and Greenhouse Gas Reporting
- LEED Certification

EDUCATION

- Master of Architecture, University of British Columbia, Vancouver, BC
- Bachelor of Fine Arts, Emily Carr University of Art + Design

PROFESSIONAL DESIGNATIONS/MEMBERSHIPS

- Licensed Architect, California, C34632
- Member, US Green Building Council
- LEED Accredited Professional

SPEAKING ENGAGEMENTS

- UC's Amazing Race to Carbon Neutrality Greenbuild, 2016
- Transformational Sustainability Leadership Workshop Association for the Advancement of Sustainability in Higher Education Annual Conference, 2016
- Lifecycle of a Project: Inception to Operations UC Capital Programs Institute, 2016
- Communicating with Senior Leadership California Higher Education Sustainability Conference, 2016
- LEED V4 Integrated Design Credit USGBC - NCC, 2014

*Resume encompasses experience prior to joining Integral Group

Ryan Sit, CEM
Building Performance Engineer

Ryan brings over five years of experience to Integral Group, where he is a key member of the Building Performance Team. Ryan has a track record of assisting clients in achieving their energy-related goals by combining an understanding of the big picture and outlining the details of execution. Ryan has experience with managing successful statewide energy programs and performing campus-level sustainability and energy studies.

In addition to his strong technical background, Ryan enjoys conveying complex technical information to non-technical audiences. He brings his expertise in energy engineering to effectively collaborate with architects, planners, utility representatives, and clients.

KEY PROJECTS

California Energy Commission Zero Net Energy Research Roadmap
Various Locations, CA
Role: Project Manager

San Francisco State University Infrastructure & Utilities Master Plan
San Francisco, CA
Campus Zero Net Energy + Net Zero Water Targets
Role: Project Manager

San Francisco Unified School District
Zero Net Energy Modeling
San Francisco, CA
Role: Project Manager

Bishop O'Dowd High School
Center for Environmental Sciences (CES)
Oakland, CA
LEED Platinum Certified + Zero Net Energy Designed
Role: Building Performance Engineer
3,700 ft²
Construction Cost: $2.4 Million

Mark Day School
San Rafael, CA
LEED Gold Target
Role: Building Performance Engineer
50,000 gsf
Construction Cost: $8 Million

Las Lomitas Elementary School District
Las Lomitas Elementary School
Energy Modeling
Atherton, CA

Rocklin Unified School District
PG&E Prop 39 Pilot Schools
Rocklin, CA
Zero Net Energy Targets

Las Lomitas Elementary School District
La Entrada Middle School
Energy Modeling
Menlo Park, CA

San Luis Coastal Unified School District
Los Osos Middle School
PG&E Prop 39 Pilot School
Los Osos, CA

SPECIALTIES

- Sustainability Master Planning
- Energy Program Management
- Energy Engineering
- Post-Occupancy Analysis

EDUCATION

- Master of Engineering, Clean Energy Engineering, University of British Columbia, Vancouver, BC
- Bachelors, Honours Chemical Engineering with Distinction, University of Waterloo, Waterloo, ON

PROFESSIONAL DESIGNATIONS/MEMBERSHIPS

- APEGBC

* Resume encompasses experience prior to joining Integral Group

ALLISON HART
Principal / Executive Vice-President

Education

University of Southern California
Ph.D. in Public Administration

University of Colorado
M.P.A. in Public Administration,

University of Colorado
B.A. Political Science,

Professional Experience

The Energy Coalition — *2008 - Present*
Executive Vice-President and Board of Director — *Irvine, CA*

City of Irvine — *1989 - 2005*
City Manager (Emeritus); Assistant City Manager — *Irvine, CA*

City of Santa Ana — *1984 - 1989*
Executive Director, Human Resources;
Executive Assistant to the City Manager — *Santa Ana, CA*

University of Colorado — *1982 - 1984*
Executive Director Advanced Leadership Training Institute — *Boulder, CO*

Boise State University — *1979 - 1981*
Assistant Professor — *Boise, ID*

Adams County District Attorney — *1975 - 1979*
Executive Director, Juvenile & Adult Diversion — *Adams County, CO*

Professional and Civic Affiliations

California League of Cities
California League of Cities, City Managers Department

The Africa Project
President, Board of Directors

Children First Foundation
Advisory Board

Irvine Public Schools Foundation
Executive Director (Human Resources)

Irvine Valley Community College Foundation
Board of Directors

Irvine Barclay Theatre
Board of Directors

the Energy Coalition
energycoalition.org

LAUREL A. ROTHSCHILD
Director, LEED O+M, CEA

Education

University of California, Santa Barbara, 2003
BA, Business Economics

Professional Certifications

- LEED Accredited Professional in Existing Buildings: Operations + Maintenance, GBCI, 2009
- Certified Energy Auditor, Association of Energy Engineers, 2010
- ENERGY STAR Portfolio Manager Trainer

the Energy Coalition
energycoalition.org

Professional Experience

The Energy Coalition *Dec. 2016 - Present*

Director of Energy Programs *Irvine, CA*

- Oversee implementation and management of Southern California Regional Energy Network Public Agency Program (SoCalREN). The program serves over 100 public agencies and is supported by 30 staff and eight (8) subconsultants.
- Led SoCalREN program to deliver over 30 million kWh in annual savings in 2017
- Oversee implementation of eleven contracts, totalling approximately $10 million annually

Director of Engagement & Education/ Program Manager *Nov. 2010 - Nov. 2016*

- Designed and oversee engagement activities for the SoCalREN Public Agency program
- Maintained a 100% realization rate for enrollment
- Organized Advisory Committee activities for the SoCalREN program on behalf of the client
- Established successful coordination of program offerings with the IOUs and other stakeholders for the SoCalREN program
- Managed ongoing coordination and communication among stakeholders
- Oversight of TEC's local government partnerships (LGP) and Education portfolios
- Directed the completion and closeout of the Palm Desert Demonstration Project
- Successfully designed, marketed and co-delivered hands-on ENERGY STAR Portfolio Manager Workshops in partnership with local and federal agencies to create a successful program
- Composed and sent out a monthly benchmarking newsletter
- Assisted municipalities with energy management planning for municipal facilities, including benchmarking and climate action planning
- Initiated Peer to Peer LGP Implementers group that continues to meet quarterly with IOUs to discuss program challenges & solutions

Project Analyst/Manager/Coordinator *Jan. 2007 - Oct. 2010*

- Implemented municipal project tracking system that has been praised as a best practice among LGPs
- Managed implementation of PEAK Plus Demand Response pilot and supported program evaluation
- Coordinated program activities, including community outreach events, promotion of in-house Direct Install program to residential and small business customers
- Coordinated Efficiency First! Campaign in successful compilation and distribution of 50,000 efficiency kits across 10 communities

Special Services Assistant *Apr. 2006 - Dec. 2006*

- Served Assistant to the Executive Director and supported all programs and staff as office manager
- Assisted accounting functions and development of time and expense reporting for organization

Associations / Community Involvement

- Association of Women Water Energy & Environment - *Former Chair to Regional Leadership Team*
- USGBC - *Orange County Chapter*
- San Clemente Green Ribbon Panel - *Energy Conservation Chair*

IVANA DORIN
Program Manager, LEED GREEN ASSOCIATE

Education

Colorado State University, 2009
M.A., Political Science; Emphasis in Environmental Politics & Policy and American Government

University of California, San Diego, 2006
B.A., Environmental Politics

LEED Green Associate Credential, 2013
Professional Credentials for Green Building Principles and Practices

Associations / Community Involvment

- **Association of Women in Water, Energy, and The Environment**
  (January 2012 – Present)
- **Shea Center for Equestrian Therapy,**
  San Juan Capistrano, CA
  (November 2012 – Present)
- **Community Emergency Response Team,**
  Irvine, CA (September 2012 – Present)
- **Coalition for Clean Air,**
  Los Angeles, CA
  (June 2010 - September 2010)
- **Environment Now Foundation,**
  Santa Monica, CA
  (October 2009 - February 2010)

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Professional Experience

The Energy Coalition *Nov. 2011 - Present*
Program Manager (Local Government Partnerships) *Irvine, CA*
- Managing 2 Local Government Partnerships, 4 contracts and their associated budgets
- Supervising Local Government Partnership team of 3 and preparing resource allocations
- Coordinating with Utility Partners for program oversight of administrative, direct implementation, and outreach activities
- Serving as Contractor Manager for grant project with oversight of administrative and coordination processes

The Energy Coalition *Feb. 2011 - Nov. 2011*
Project Coordinator (PEAK) *Irvine, CA*
- Coordinated professional development trainings for educators throughout Southern California
- Trained educators in energy science and conservation curriculum
- Organized regional data to track and analyze student behavioral change and knowledge improvement
- Coordinated and executed interactive energy educational events with 500+ students
- Managed program purchases of collateral and educational supplies within program budget

Colorado State University *Aug. 2007 - May 2009*
Graduate Teaching Assistant *Fort Collins, CO*
- Assisted professors in conducting undergraduate level lectures in American and Comparative Politics
- Developed content and lectured classes of 100-200 students on topics in U.S foreign and social policy
- Composed and graded exams and essays and conducted study review sessions
- Held regular office hours for individual assistance to students
- Managed administrative office tasks for the department as needed

Environment Now Foundation *May 2008 – Aug. 2008*
Sustainability Program Intern *Santa Monica, CA*
- Researched potential grant projects and partner organizations
- Summarized 3 research projects on urban sustainability issues
- Produced 3 reports and comprehensive PowerPoint presentation for staff
- Collaborated with community leaders, non-profit organizations, and government to advance urban sustainability
- Coordinated Environment Now's 2nd Annual Top Achievements Report Awards Luncheon

Canyon Policy Project *Sep. 2006 - Jun. 2007*
Policy Analyst *San Diego, CA*
- Conducted research and evaluation of the city of San Diego's environmental policies and practices
- Produced multivolume community reports on the Multiple Species Conservation Program (MSCP)
- Evaluated stakeholder involvement and equity in San Diego environmental policymaking
- Participated in city meetings and working groups to discuss local policymaking practices
- Interviewed federal, state, and city employees for MSCP research

MARC COSTA
Program Manager,
LEED AP BD+C Analyst

Education

Cal State Long Beach
Bachelor of Science in Construction Engineering Management

University of California, San Diego
Bachelor of Science in Management Science

Memberships/Credentials

- ASHRAE Member
- Building Operator Certification Level II
- CABEC – Member
- CEC – Benchmarking Data Alignment
- CGBP – Build it Green
- DOE Asset Score - Data Intake Work Group
- LEED AP BD+C
- LBNL – SEED/BEDES Development TF
- OSHA 10 Construction Safety Certification
- USGBC Center for Green Schools, National Chair
- USGBC Pacific Regional Cmte Secretary

Skills

- Adobe Master Suite
- ArcGIS
- Archicad
- AutoCAD
- CBECC
- EnergyPlus
- ENERGY STAR Portfolio Manager
- EMD Intl EnergyPro
- Experience in BEDES
- LEED Online
- MS Excel
- OpenStudio, PAT
- Outlook
- PowerPoint
- Prezi
- R Studio
- SEED
- Social Media campaigns
- SureTrak
- Word

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Professional Experience

The Energy Coalition — *Jul. 2011 - Present*
Program Manager — *Irvine, CA*

- Policy Team: Generate, comment, submit and file regulatory and legislative comments in CPUC and CEC Proceedings.
- CEEPMS: Manage overall design and implementation of software that matches building permits and rebates.
- CAP: Manage budget and technical input on Energy Atlas Tool, database fields and metrics for analysis.
- Project Delivery Team: Assigned Project Manager to San Bernardino developing streetlighting and mechanical retrofits.
- Community Energy Partnership: Train and Coach staff to manage municipal retrofits, as well as manage city contacts.
- LGSEC To Code Committee: Contribute comments to regulatory proceedings on data, C&S, and Regulatory Matters.
- Benchmarking and Ordinances: Serve as a subject matter expert to REN cities on Federal resources on policy and tools.
- DOE Grant: OpenEfficieny Initiative: With PSD, NREL, Cadmus, Xcel Energy and SoCalREN create and deploy data infrastructure for energy management resources.
- Serves as main contact between SCE and SCG Account Executives and Cities to identify, track, implement and troubleshoot municipal energy efficiency projects and rebate/incentive applications.
- Responsible for meeting SCE Energy Leader Partnership Strategic Planning goals including T24 Code Compliance Workshops, Utility Manager Software implementation, Benchmarking Policies, and Energy Action Plan formation resources.

Long Beach City College — Feb. 2010 - Jul. 2011
Presenter — Long Beach, CA

- Served as a key contact between LBCC, training agencies, non-profits, a municipalities to promote and develop the largest green job training and placement program in the nation, the Clean Energy Workforce Training Program (CEWTP)
- Identified, worked with, and served on stakeholder groups in LA County for energy and water efficiency upgrade programs including Energy Upgrade California, Lawn to Garden Programs, and NSP initiatives.
- Conducted technical presentations on home performance contractortraining, placement and economic outlook to industry stakeholders including the California Workforce Assoc., USGBC, and the American Comfort Institute.
- Managed, obtained and analyzed data related to job and internship placement and provided statistical reports to manager of Environmental Tech. Programs related to program effectiveness, growth and progress
- Possesses extensive knowledge of green emerging industry; maintained knowledge of changing local labor markets, associations, industry needs, analyzed available job market economic data and information and researched job market trends and requirements for program area
- Initiated and developed strong relationships with management at CBPCA, LA County, USGBC, CalCERTS, LB CAP, LA Conservation Corps, all trainers, utility companies, and major employers of efficiency upgrade programs.

Presentations and Awards

- *ACEEE Summer Study:* A National Framework for Audit Ordinances" 2016
- *ACEEE Summer Study:* Unlocking the Power of Energy Consumption and Asset Data for Program and Policy Design" 2014
- *USGBC – MGBCE Presentation* *2014*
- *DOE Better Buildings Challenge Judge* 2014

REBECCA HAUSHEER,
Program Manager,
LEED AP O&M

Education

University of California, Santa Barbara, 2012
Master of Environmental Science and Management

University of California, Los Angeles, 2007
Bachelor of Arts in Psychology with minor in Anthropology

Expertise

- Strong relationship builder across diverse industries, sectors and constituent bases
- Proven ability to effectively manage highly complicated projects and programs
- Solid track record of developing and improving projects, services and processes for clients
- Accomplished self-starter and team builder

Skills

Computer:
- Salesforce,
- Google Docs,
- Microsoft Office Suite
- CEDA Greenhouse Gas Inventory
- GaBi

Certifications:
- LEED AP O&M
- Building Operator Certification,
- PSIA Snowboard Instructor Level 1

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Professional Experience

The Energy Coalition *Nov. 2016 - Present*
Program Manager Irvine, CA
- Oversee project delivery for a regional portfolio of public agency energy efficiency projects with a pipeline of 10 million kilowatt hours in annual savings
- Supervise and lead a team of 5 Project Managers and Project Coordinators
- Communicate regularly and discuss program challenges with Investor Owned Utility SoCalREN liaisons
- Manage sub-consultant project and program related budgets
- Provide program with data management oversight and develop enhancements to program metric tracking and analysis capacity

The Energy Coalition *Aug. 2012 - Nov. 2016*
Project Manager; Irvine, CA
Project Coordinator
- Project manage and implement energy efficiency projects across diverse public agencies
- Provide subject matter expertise to team on Southern California Edison and Southern California Gas incentive, rebate, and On-Bill Financing offerings.
- Act as team's liaison between Project Managers and Investor Owned Utilities on incentive and OBF issues and questions.
- Maintain and develop financial analysis tools and templates; provide team with training and guidance on tools.
- Coordinate with TEC data management team on incentives and finance reporting.
- Foster positive relationships with public agency staff, utility representatives and consultants.

Coastal Stewardship & Policy Program, *Feb. 2012 - May 2012*
Sustainable Business Development Intern (UCSB) Santa Barbara, CA
- Conducted outreach via phone calls, letters, and in-person meetings to develop partnerships with local businesses
- Facilitated the certification of 2 local automotive businesses with the Green Business Program of Santa Barbara.
- Developed workbook in Excel to analyze financial and environmental savings from program participation.

Strategic Energy Innovations *Jun. 2011 - Sept. 2011*
Sustainable Communities Intern Marin, CA
- *Wrote, revised and finalized an energy management study for Bitter End Yacht Club.*
- *Assisted in the procurement of a DOE Energy Solar Rooftops grant for more than $800,000.*
- *Created educational activities, developed agenda, and conducted speaker outreach for the Climate Corps Bay Area (offshoot of AmeriCorps program) 9-day training program for incoming Corps.*

Master's Thesis

Evaluating Energy Storage Options: A Case Study at Los Angeles Harbor College Client: AECOM, Santa Maria, CA (4/11- 4/12)
- *Developed a tool for electricity customers to analyze the profitability of an energy storage system*
- *Applied this tool to Los Angeles Harbor college to evaluate an investment in energy storage*

K. SHAWN THOMPSON, PE
Project Manager, LEED AP O+M

Education

California Polytechnic State University, Pomona, 1983
Bachelors of Science, Civil Engineering
General Civil Engineering with an Emphasis on Structures

University of CA, Irvine - Extension, 1994
Certificate in Hazardous Materials Management

Professional Experience

The Energy Coalition *Feb. 2013 - Present*
Project Manager *Irvine, CA*

- Provide local public agencies (Cities, Districts, Schools, etc.) throughout the Southern California Regional Energy Network (SoCalREN) with services to design, propose, procure, finance, and execute energy efficiency projects.
- Serve as Advisor to Subject Matter Experts (SME) for the Construction Management process of Project Delivery and Street Light Retrofit.
- Manage program consultants, utility representatives, and other stakeholders simultaneously for public agencies implementing lighting, HVAC, pumping, controls, and other energy efficiency projects.

City of Irvine *Oct. 2006 - Dec. 2011*
Energy Manager *Irvine, CA*

- Developed 20-year Energy Plan for the City which was adopted July 2008.
- Prepared budgets for energy and green building programs.
- Working with developers and staff, administered, promoted, and addressed issues for the City's green building program, "Irvine Build Green."
- Distributed 60,000 Compact Fluorescent Light bulbs to Irvine residents through the "Brighter Future" campaign, a project regulated by the California Public Utilities Commission.
- Managed the OC Great Park Green Team process for Energy, Water, Transportation and Design
- Standards to help promote dialog and solutions for sustainable development in both the Great Park and Heritage Fields.
- Served as the technical advisor for City staff, City Council and residents on green building, sustainability, and energy.
- Represented City at conferences for energy efficiency, green building, and sustainability.
- Supervised 1-2 interns to help with the various environmental programs.

City of Irvine *Jul. 2003 - Oct. 2006*
Senior Civil Engineer, *Irvine, CA*

- Formed and administered new assessment districts totaling over $500 million.
- Prepared and managed budgets, and oversaw acquisition of capital improvement projects using district funds for six active districts and ten inactive districts totaling over $1 billion.
- Between 2003 and 2006, approved reimbursement to developers of approximately $160 million.
- Developed the acquisition agreement for the City's first Community Facilities Districts (CFD); that agreement became the model for subsequent CFDs in the City.

Other Experience

- *California Public Utilities Commission (CPUC) Committee Member*
  August 1998 – April 1999

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ERIC G. BORNSTEIN
Project Manager

Education

Mercy College, 2007
Bachelor of Science: Psychology;
Minor: Economics

American University, 2003
Major: Political Science

Expertise

- Problem solving
- Project management
- Program design
- Community outreach

Professional Experience

The Energy Coalition *Feb. 2012 - Present*
Project Manager *Irvine, CA*

- Management of Local Government Partnerships including, but not limited to, oversight over outreach implementation, marketing message and design, and regulatory consultation
- Inception and management of company-wide Intern program.
- Program design for groundbreaking non-profit/public engagement program maximizing the potential of existing communication channels.
- Extensive Project Management experience with more than 20 different public agencies including water, wastewater, lighting and other mechanical projects
- Served as Engagement Project Manager, introducing and subsequently enrolling more than 20 public agencies in the SoCalREN Program

Diane Smith for Montana *Dec. 2011 - Feb. 2012*
Finance Director *Whitefish, MT*

- Drafted and implemented ambitious financing plan for first time candidate.
- Researched, coordinated and executed both grassroots and max donor fundraising drives and events
- Collaborated with regional and national organizations to gain endorsement and funding

DraftFCB *Mar. 2011 - Oct. 2011*
Community Manager *Irvine, CA*

- Developed and implemented a regional Field Plan for a statewide energy efficiency campaign
- Coordinated local government officials for public relations effort
- Conceptualized and negotiated Memorandum of Understanding between Engage360 and City of Irvine
- Liaison between Engage360 and local governments, including Congresswoman Loretta Sanchez

Memberships

- New Leaders Council Orange County
  Chapter Director / Finance Director
- United States Green Building Council Orange County Member

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JAKE ANDERSON
Project Manager

Education

UC Irvine, 2014
B.S. Earth and Environmental Science; Minor in Global Sustainability; Magna Cum Laude; Certificate in Environmental Sustainability

U.S. Green Building Council
LEED Green Associate

Panelist at 2017 Statewide Energy Efficiency Collaborative Forum

Skills

- SalesForce CRM
- Energy Star Portfolio Manager
- Microsoft Office Suite
- Google Drive
- Building Performance Database (BPD)
- Insightly CRM

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Professional Experience

The Energy Coalition *Aug. 2015 - Present*
Project Manager; *Irvine, CA*
Project Coordinator

- Oversee daily operations of the NOCC Energy Partnership with an emphasis on maintaining relations with city and IOU partners
- Develop and track municipal energy efficiency projects and manage deliverables to meet city and partnership goals
- Assist partner cities with development of Energy Action Plans, city informational kiosks, distribution of bill and magazine inserts to residents, and coordination of outreach presentations to city staff, city council, and local community; Design and create Energy Use Reports and provide debrief to city partners.
- Manage Technical Assistance process and lead coordination between consultants, city and IOU partners for city facility audits; Work with consultants to receive project timeline updates; Facilitate information requests and dialogue between client and consultant and perform QA/QC of final consultant deliverables
- Collaborate across organization with Southern California Regional Energy Network staff for identification and implementation of energy efficiency projects to achieve energy savings; Support efforts to identify and enroll new agencies; Coordinate sharing of project updates, templates, tools, and best practice between programs
- Develop and implement project scope for partnership-wide facility energy benchmarking initiative
- Provide support in developing new Local Government Partnership business opportunities through IOU Strategic Planning efforts.

FirstCarbon Solutions *Jul. 2014 - Aug. 2015*
Sustainability Consultant *Irvine, CA*

- Prepare project budgets and Gantt/RASCI charts for internal and customer use
- Schedule and lead customer status meetings
- Create project dashboard and weekly billing calculator; Track team billing on regular basis
- Establish cadence for client status updates and process for submitting inquiries
- Develop data collection system and manage data acquisition from client for project deliverables
- Conduct over 140 CDP score feedback calls with company representatives
- Lead efforts in CDP, DJSI, and EcoVadis questionnaire improvements using sustainability reporting methodologies
- Draft customer deliverables including Energy Audit and Reduction Target Reports, CDP Scoring Analysis Reports, Water Risk Analysis Reports, and Energy Rebate Research
- Train new team members in drafting and managing project deliverables

JULIE M. CASTRO,
Project Manager, LEED GA

Education

University of California Los Angeles, 2014
M.U.R.P., Concentration: Environmental Analysis and Policy

University of California Santa Barbara, 2010
B.A., Global Studies and International Studies

Skills

- Adobe Creative Suite
- ArcGIS
- IBM SPSS (Predictive Analytic Software)
- Microsoft Office

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Professional Experience

The Energy Coalition *Oct. 2016 - Present*
Project Manager *Irvine, CA*

- Provide public agencies with turnkey solutions to meet local and statewide energy efficiency and climate action planning goals.
- Collaborate with agencies and utility partners to identify opportunities for energy efficiency projects
- Manage consulting firms and oversee delivery of energy audits and analysis
- Consult on applicable incentives and financing tools to remove barriers to implementation
- Develop portfolio-wide benchmarking tools to enhance data-driven insights and decision-making

Chai Energy *Oct. 2014 - Oct. 2016*
Director of Strategic Partnerships *Los Angeles, CA*

- Leverage Chai's behavioral energy efficiency technology to help Chai's partners educate clients, customers, and residents about their own energy use data, and empower them to conserve using personalized, strategic nudges.
- Prepare research grants and manage Chai's ongoing pilots by coordinating with third-party research teams and overseeing staff resources, budgets, and deliverables.
- Advocate for statewide and national policies that promote: energy efficiency and conservation, renewable energy, and smart grid infrastructure.
- Analyze the economic and operational feasibility of demand response and energy efficiency markets throughout the US, and develop an entry strategy for viable markets.
- Design innovative, residential demand response and energy efficicency programs that have measurable outcomes and that provide value to Chai and Chai's customers.

UCLA Luskin School of Public Affairs *June 2013 - June 2014*
Rosenfield Fellow *Los Angeles, CA*

- Project managed an EPA environmental and community health assessment grant for Council for Watershed Health. Developed an assessment framework to determine community, ecological, and economic health of the Los Angeles River Watershed.
- Worked directly with the Urban Waters Federal Partnership Ambassador of Los Angeles to cultivate stakeholder relationships with 35 organizations and 13 federal agencies, and to create a cohesive community of action with this diverse group.
- Facilitated 5 strategic working groups to produce recommendations for federal partner engagement. Recommendations included the identification of infrastructure investment needs and barriers to innovative LA River projects.

Green Urbanism Program, Global Green *June 2011 - October 2012*
Program Assistant *Los Angeles, CA*

- Consulted over 20 multifamily affordable housing communities through the LEED for Homes certification process. Led green building charrettes with construction teams to collectively determine how to create a healthy, sustainable home for future residents and community members.
- Assessed the sustainability of several underserved neighborhoods across the U.S. using LEED for Neighborhood Development, and recommended strategic changes to transportation, land use, building codes, and energy and water management.

Related Publications and Thesis

- *Publication in IWA Watershed and River Basin Management September 2014 Conference: "The Impossible Los Angeles River"*
- *Graduate Thesis: "Preparing for Uncertainty: Assessing LA's Water Management Regime"*
- *Undergraduate Thesis: "Weatherization, Climate Change and the Water-Energy Nexus"*

SAMANTHA K. MEZA
Project Coordinator

Education

Arizona State University, 2013
BA in Sustainability – Focus on Urban Planning

Computer skills

- Microsoft Office
- Google Drive
- Salesforce
- Outlook
- Photoshop
- Prezi

Professional Experience

The Energy Coalition *Mar. 2015 - Present*
Project Coordinator *Irvine, CA*

- Focus day-to-day efforts on implementation of Local Government Partnership (LGP) programs including the West Side Energy Partnership and North Orange County Cities Energy Partnership.
- Maintain trusted relations and open communication with City and Utility Partners for positive stakeholder engagement
- Carry out administrative program tasks, meeting coordination, preparation, and follow up.
- Lead LGP goal attainment related to marketing and outreach efforts across all Partnerships while working to continuously evaluate and improve program offerings based on partner and program needs.
- Promote educational and training opportunities through Partnership websites, e-blasts, articles, Lunch N Learn Presentations, and collaboration with outside organizations.
- Maintain familiarity with projects, tracking, data uploading, and updated general knowledge of IOU program offerings.

HBW Advisory Services LLC *Jul. 2014 - Mar. 2015*
Executive Assistant *Stevenson Ranch, CA*

- Manage phone calls, schedule appointments, maintain master calendar, and ensure staff members remain on schedule and organized.
- Review financial documents, record account transfers, completing accounts payable transactions, and maintain spreadsheets.
- Resolve conflicts, answer questions, and keep communication between corporate, agents, clients, and affiliates.

City of Santa Clarita *Apr. 2014 - Mar. 2015*
Recreation Leader II - Community Development *Santa Clarita, CA*

- Update graffiti cases in City database to reflect 'zone maps' and identify trends, maintain data and create reports.
- Review and file invoices, abatement notices, budget information, and other documents to insure information is accurate and readily accessible.

Expertise/Involvement

- Total of seven years' experience in Project Coordination and Administrative Assistance – BA in Sustainability, Summa Cum Laude, and Honors Society for Sustainability.
- Solid understanding of energy efficiency concepts, IOU programs and processes, and best practices.
- Reputation for holding positive relations with supervisors, co-workers, stakeholders, while working effectively alone or as a member of a team.
- Adaptable to organization and program needs.
- Ability to interpret and apply information in a timely manner, effectively coordinate multiple projects simultaneously, and communicate clearly and concisely through written and verbal communications.
- Active participation in the Association of Women in Water Energy and the Environment Orange County/Inland Empire Leadership Team.

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Prof. Jacob (Jack) Brouwer, Ph.D.
Professor: Mechanical & Aerospace Engineering, Civil & Environmental Engineering
Associate Director: Advanced Power and Energy Program, National Fuel Cell Research Center
221 Engineering Laboratory Facility
University of California, Irvine, CA 92697-3550
949-338-5953 / jbrouwer@uci.edu

Education and Training

Institution	Major	Degree	Year
University of California, Irvine	Mechanical Engineering	B.S.	1987
University of California, Irvine	Mechanical Engineering	M.S.	1989
Massachusetts Institute of Technology	Mechanical Engineering	Ph.D.	1993

Research and Professional Experience

7/17 – present *Professor,* Mechanical and Aerospace Engineering, Civil and Environmental Engineering, U.C., Irvine
7/13 – 6/17 *Associate Professor,* Mechanical and Aerospace Engineering, Civil and Environmental Engineering, U.C., Irvine
8/97 – present *Associate Director*, National Fuel Cell Research Center, UC Irvine
7/11 – 6/13 *Assistant Professor,* Mechanical and Aerospace Engineering, Civil and Environmental Engineering, U.C., Irvine
7/08 – 6/11 *Adjunct Associate Professor,* Mechanical and Aerospace Engineering, UC Irvine
6/04 – 6/08 *Adjunct Assistant Professor,* Mechanical and Aerospace Engineering, UC Irvine
7/96 – 7/97 *R&D Program Manager,* Reaction Engineering International
6/93 – 7/97 *Research Assistant Professor,* Mechanical Engineering, University of Utah
1/93 - 5/93 *Post-Doctoral Researcher*, Chemical Engineering Department, M.I.T.
9/89 - 12/92 *Research Assistant*, Chemical Engineering Department, M.I.T.
6/91 - 9/91 *Staff Scientist,* Sandia National Laboratories, Livermore, California

Recent Publications (161 refereed articles; 81 conference papers/presentations)

1. Rinaldi, Giorgio, McLarty, Dustin, Brouwer, Jack, Lanzini, Andrea, Santarelli, Massimo, *Study of CO_2 recovery in a carbonate fuel cell tri-generation plant*, Journal of Power Sources, Volume 284, pp. 16-26, 2015.
2. Martinez, Andrew S., Brouwer, Jacob, and Samuelsen, G. Scott, *Comparative analysis of SOFC–GT freight locomotive fueled by natural gas and diesel with onboard reformation*, Applied Energy, Volume 148, , Pages 421-438, 2015.
3. Nakayama, K., Zhao, C., Dillencourt, M., Bic, L., and Brouwer, Jacob, Distributed Power Flow Loss Minimization Control for the Future Grid, International Journal of Circuit Theory and Application, Volume 43, Pages 1209-1225, 2015.
4. Vaghefi, Seyed, Jafari, Mohsen A., Bisse, Emmanuel, Lu, Yan, and Brouwer, Jacob, Modeling and Forecasting of Cooling and Electricity Load Demand, Applied Energy, Volume 136, Pages 186-196, 31 December 2014.
5. Flores, Robert J., Shaffer, Brendan P**.,** Brouwer, Jacob, Dynamic Distributed Generation Dispatch Strategy for Lowering the Cost of Building Energy, Applied Energy, Volume 123, Pages 196-208, 15 June 2014.
6. McLarty, Dustin, Brouwer, Jacob, and Samuelsen, Scott, *Fuel cell–gas turbine hybrid system design part II: Dynamics and control*, Journal of Power Sources, Vol. 254, pp. 126-136, 2014.
7. Shaffer, Brendan, Jacob Brouwer, *Feasibility of solid oxide fuel cell dynamic hydrogen coproduction to meet building demand*, Journal of Power Sources, Volume 248, Pages 58-69, 15 February 2014.

8. McLarty, Dustin, Brouwer, Jack, and Samuelsen, Scott, *A spatially resolved physical model for transient system analysis of high temperature fuel cells*, International Journal of Hydrogen Energy, Volume 38, pp. 7935-7946, 2013.
9. Shaffer, Brendan P., and Brouwer, Jacob, *Dynamic Model for Understanding Spatial Temperature and Species Distributions in Internal-Reforming Solid Oxide Fuel Cells*, Journal of Fuel Cell Science and Technology, Vol. 9, pp. 041012-1– 041012-11, 2012.
10. Margalef, Pere, Brown, Tim, Brouwer, Jacob, Samuelsen, Scott, *Conceptual design and configuration performance analyses of poly-generating high temperature fuel cells*, International Journal of Hydrogen Energy, Volume 36, Issue 16, Pages 10044-10056, 2011.
11. Nakajo, Arata, Mueller, Fabian, Brouwer, Jacob, Van herle, Jan, and Daniel Favrat, *Mechanical reliability and durability of SOFC stacks. Part II: Modelling of mechanical failures during ageing and cycling*, International Journal of Hydrogen Energy, Volume 37, pp. 9269-9286, 2012.
12. Margalef, Pere, Brown, Tim, Brouwer, Jacob, and Samuelsen, Scott, *Short communication: Efficiency of poly-generating high temperature fuel cells*, Journal of Power Sources, Volume 196, Issue 4, Pages 2055-2060, 15 February 2011.
13. Mueller, F., Tarroja, B.J., Maclay, J.D., Jabbari, F., Brouwer, J., and Samuelsen, G.S., *Design, Simulation and Control of a 100 Megawatt Class Solid Oxide Fuel Cell Gas Turbine Hybrid System*, Journal of Fuel Cell Science and Technology, Vol. 7, pp. 03107-1-11, 2010.

Synergistic Activities

1. >15-years' experience studying the science & engineering of energy conversion, coupled mass, energy and momentum conservation, chemical and electrochemical reaction and heat transfer dynamics and thermodynamics.
2. Primary developer and mentor of students and post-doctoral researchers developing steady-state & dynamic physical models of the fundamental processes that govern energy conversion devices such as fuel cells, electrolyzers, batteries, and gas turbines.
3. Testing, experimentation, and evaluation experience with gas turbines, fuel cells, electrolyzers, PV and wind power systems including the world's first solid oxide fuel cell gas turbine hybrid system and the world's first high temperature fuel cell tri-generation system.
4. Developing and applying steady state and dynamic models for gas turbines, fuel cells, fuel cell systems and integrated solar and renewable systems in the Simulink™ framework.
5. Led the establishment of National Fuel Cell Research Center and Advanced Power and Energy Program with Professor Scott Samuelsen supported by the U.S. Department of Energy, California Energy Commission, and at least 15 industrial partners.

Current Support

Source:	Abbreviated Title:	Amount:	Dates:	Role:
CEC	FuelCell Energy H2 Storage	$148K	2015-2018	PI
CEC	Lightsail Compressed Energy	$248K	2015-2018	PI
U.S. DOE	CERC Power Plant Dynamics	$356K	2015-2018	PI
U.S. DOE	Reformer, Electrolyzer, Purifier	$147K	2015-2016	PI
Microsoft	Fuel Cell DC-Power Data Center	$390K	2014-2017	PI
U.S. DOE	Low Temperature SOFC Integ.	$456K	2014-2017	PI
SoCalGas	Methane Emissions Assessment	$358K	2015-2017	PI
SoCalGas	Power to Gas & Pipeline Injection	$1.43M	2015-2017	PI
CEC	Solar, Natural Gas Chilling	$350K	2012-2015	PI
CPUC	Amonix CPV Integration	$997K	2011-2015	Co-PI
U.S. DOE	Irvine Smart Grid Demonstration	$1.45M	2010-2015	Co-PI

Li Zhao, P.E., Ph.D.
Associate Manager of Fuel Cell Technology: National Fuel Cell Research Center
221 Engineering Laboratory Facility
University of California, Irvine, CA 92697-3550
949-824-1999 / lz@nfcrc.uci.edu

Qualifications and Skills

- Professional Engineer; 12 years of engineering experience in designing, manufacturing, testing, evaluating and modeling fuel cell technologies and fully integrated fuel cell systems.
- Experienced in initiating, planning and leading research projects across multiple teams.
- Experienced in scoping the project and breaking down goals to specific research tasks.
- Experienced in research project management, facilitating progress across multiple teams.
- Expertise in design of experiments, characterization techniques and power system testing.
- Expertise in multidisciplinary R&D and energy system characterization and integration.
- Expertise in distributed generation, energy storage technologies and system integration.
- Expertise in dynamic energy system modeling, control and integration with energy storage.
- Expertise in ceramic processing, fuel cell fabrication and fuel cell system operation.
- Proficient with Matlab, Simulink, Comsol, Aspen, Solidworks, LabView, SGCT.
- Team spirited with effective communication and presentation skills.
- Over 20 research publications in the field of power and energy.

Work Experience

Associate Manager, *2015-present, Advanced Power and Energy Program, University of California, Irvine*

- Supervise and support 5 projects involving research and demonstration of fuel cells, electrolyzers, other electrochemical technologies, hydrogen systems, energy storage systems and microgrid.
- Management of research studies, the design of new test facilities and capabilities, the mentoring of graduate and undergraduate researchers in the safe and timely completion of experimental and analytical research work, and assuring that project deliverables are met.

Senior Research Scientist, *2011-2015, National Fuel Cell Research Center, University of California, Irvine*

- Developed new opportunities and projects.
- Led the Microsoft datacenter project phase I and II, installed, tested, analyzed and demonstrated a 10 kW PEMFC system and two 2.5 kW SOFC systems for datacenter applications.
- Developed fuel cell system testing protocol, designed and performed the experiments for Microsoft data center application with combined heat and power system.
- Led the development of experimental and simulation capabilities for investigation of fuel cells and other advanced power and energy technologies.
- Led the solid oxide fuel cell manufacturing and system simulation and integration research.
- Generated a microbial fuel cell system dynamic model integrated with waste water treatment.
- Directed the research on compressed hydrogen energy storage, system integration and renewable hydrogen fueling station modeling and analysis.
- Developed Li-ion battery, ultra-capacitor dynamic models to integrate with industrial buildings and distributed energy sources in data centers.

- Produced deliverables to government agencies and industrial partners, presented complex sets of results to cross functional teams.

Education

University of California, Irvine 2006-2011, Irvine
Ph.D. in Mechanical & Aerospace Engineering (GPA 3.8/4.0)
Advisor: Prof. Scott Samuelsen; Co-Advisor: Prof. Jack Brouwer
Institute of Process Engineering, Chinese Academy of Sciences 2003-2006, Beijing
M.S. in Chemical Engineering (GPA 3.1/4.0)
Tsinghua University 1999-2003, Beijing
B.S. in Mechanical Engineering (GPA 82/100)

Recent Publications

- L. Zhao, J. Brouwer. Dynamic operation and feasibility study of a self-sustainable hydrogen fueling station using renewable energy sources, International Journal of Hydrogen Energy, 40(10), 3822-383, 2015.
- L. Zhao, J. Brouwer, J. Liu, S. James, J. Siegler, A. Kansal, E. Peterson. Fuel Cells for Data Centers: Power Generation Inches from the Servers, Microsoft Research Tech Report, MSR-TR-2014-37, http://research.microsoft.com/apps/pubs/?id=210641, 2014.
- L. Zhao, J. Brouwer, S. James, J. Siegler, A. Kansal, E. Peterson, J. Liu. Servers Powered by a 10kW In-rack Proton Exchange Membrane Fuel Cell System, Proceedings of the 12th International Fuel Cell Science, Engineering and Technology Conference, ES-FuelCell2014-6331, 2014.
- L. Zhao, J. Brouwer, J. Naviaux, A. Hochbaum. Modeling of Polarization Losses of a Microbial Fuel Cell, Proceedings of the 12th International Fuel Cell Science, Engineering and Technology Conference, ES-FuelCell2014-6388, 2014.
- L. Zhao, R. Flores, J. Brouwer. Economical Dispatch of CCHP Systems with Emissions Constraints and Thermal Load Following Capability, California Energy Commission Energy Research and Development Division Final Project Report, CEC-500-2014-089, 2014.
- L. Zhao, Dynamics of Data Center Distributed Generation, 14th International Colloquium on Environmentally Preferred Advanced Power Generation Conference, Newport Beach, CA, 2014.
- J. Maton, L. Zhao, J. Brouwer. Dynamic Modeling of Compressed Gas Energy Storage to Complement Renewable Wind Power Intermittency, International Journal of Hydrogen Energy, 38(19), 7867-7880, 2013.
- L. Zhao, Compressed Gas Energy Storage for Renewable Power, 13th International Colloquium on Environmentally Preferred Advanced Power Generation Conference, Newport Beach, CA, 2013.

Robert Flores, Ph.D.

Advanced Power and Energy Program
Research Scientist
University of California, Irvine, CA 92697-3550
(949) 824-7302
rjf@apep.uci.edu

Education and Training:

University of California, Irvine	Mechanical Engineering	Ph.D.	2016
University of California, Irvine	Mechanical Engineering	M.S.	2013
Santa Clara University	Mechanical Engineering	B.S.	2009

Research Focus:

Optimal design of distributed energy resources, interaction between buildings, distributed energy resources (both renewable and conventional), local utility resources, and the transportation sector. Optimal control of distributed energy resources. Redesign of conventional power plants to improve interaction with renewable resources. Evaluation of alternative transportation fueling infrastructure.

Professional Experience:

Sept 16-Present Associate Development Engineer, APEP

Publications (Examples):

1. Flores, Robert J., Brendan P. Shaffer, and Jacob Brouwer. "Electricity costs for a Level 3 electric vehicle fueling station integrated with a building." Applied Energy 191 (2017): 367-384.
2. Flores, Robert J., Brendan P. Shaffer, and Jacob Brouwer. "Electricity costs for an electric vehicle fueling station with Level 3 charging." Applied Energy 169 (2016): 813-830.
3. Flores, Robert J., Brendan P. Shaffer, and Jacob Brouwer. "Economic and sensitivity analyses of dynamic distributed generation dispatch to reduce building energy cost." Energy and Buildings 85 (2014): 293-304.
4. Flores, Robert J., Brendan P. Shaffer, and Jacob Brouwer. "Dynamic distributed generation dispatch strategy for lowering the cost of building energy." Applied Energy 123 (2014): 196-208.

Synergistic Activities:

1. Facilitation of communication and planning of collaboration among community members, research agencies, and local government in the planning and implementation of an advanced energy community/Microgrid.

APPENDIX B:
CITY OF IRVINE – COMPARATIVE ENERGY ANALYSIS REPORT

Comparative Energy Analysis Report

Comparative Energy Analysis

Prepared for

City of Irvine

Prepared by

Southern California Regional Energy Network (SoCalREN)

Date

1/18/2018

Table of Contents

1. Overview 1
2. Total Energy Portfolio 2
3. Waste & Water Pumping 3
4. Street & Traffic Lights 4
5. Building Summary 5
6. Outdoor & Park Lights 7

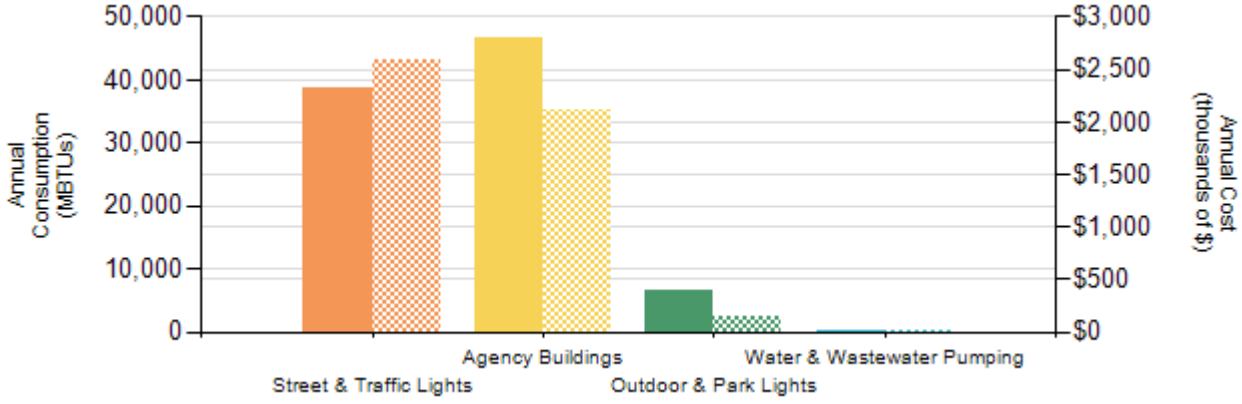
Appendix A - Methodology 8

1. Overview

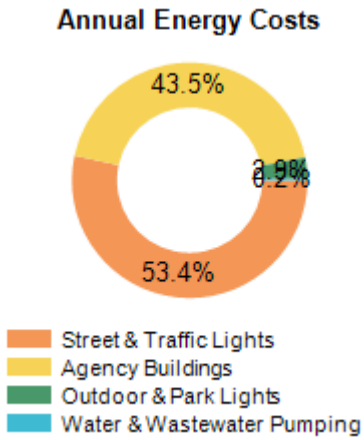
This report is intended to provide a framework for the City of Irvine, referred to as “Agency” herein, to identify inefficient facilities and prioritize further investigation and energy efficiency retrofit work. This analysis uses the energy billing data provided by the Agency to provide an overview of energy use in Agency facilities and to help identify individual locations with the potential for energy efficiency improvements. Many factors affect the energy use in different facilities, including age, type of heating, ventilation, air conditioning (HVAC), and lighting equipment, facility occupancy and hours, plug loads, and climate. Once individual facilities with the greatest potential for energy savings are identified, a more detailed screening of those facilities can be performed to identify the specific sources of the inefficiencies. Further analysis can identify inefficient equipment, malfunctioning equipment, equipment not operating as designed, or suboptimal operational procedures.

2. Total Energy Portfolio

Your Total Annual Energy Cost is $4,866,722



Key: Solid color represents consumption, hashed color represents cost

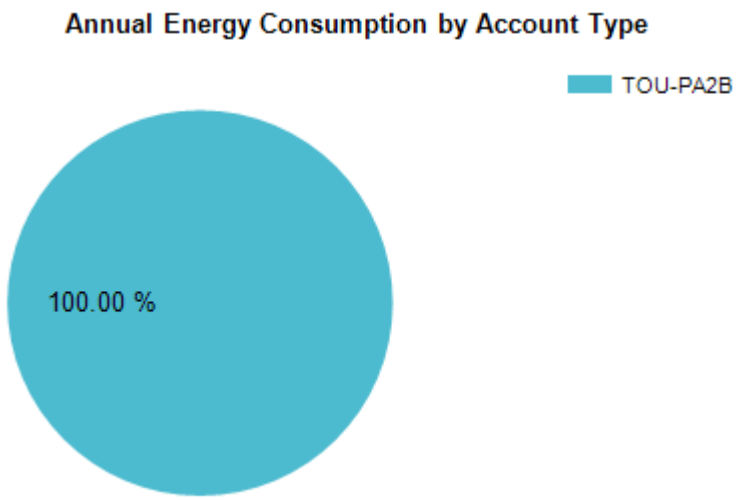


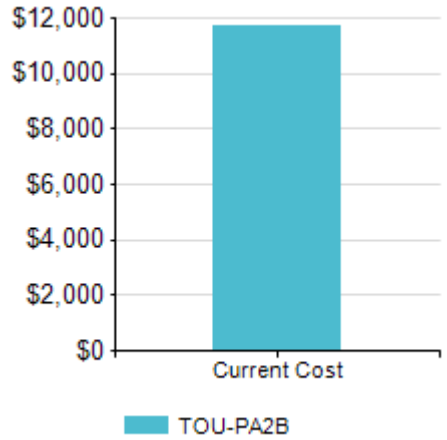
Agency Energy Use	Annual Electric Cost ($)	Annual Electric Consumption (kWh)	Annual Electric Rate ($/kWh)	Annual GHG Emissions (lbs CO2)
Street & Traffic Lights	$2,596,690.11	11,349,957	$0.23	5,867,928
Agency Buildings	$2,117,301.57	13,671,289	$0.15	7,068,057
Outdoor & Park Lights	$141,016.51	1,934,383	$0.07	1,000,076
Water & Wastewater Pumping	$11,713.54	15,937	$0.74	8,239

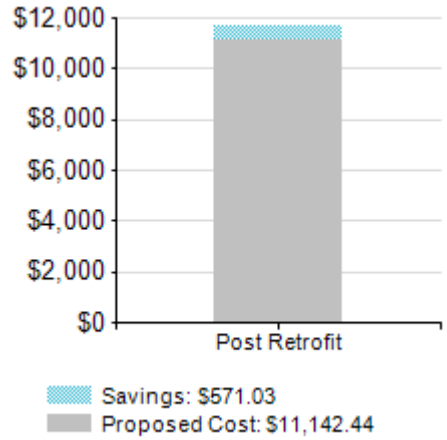
Table 1: Total Energy Portfolio

3. Water & Wastewater Pumping

Your Annual Energy Cost for Water & Wastewater Pumping is $11,714 and 0.2% of the Total Cost.







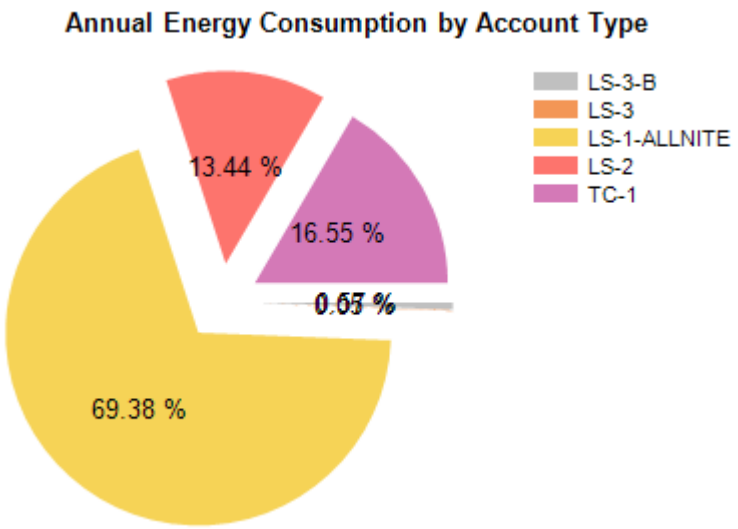
Assumption - 65% of all pumps need to be upgraded. Those pumps will reduce consumption by 7.5% kWh post retrofit.
Calculation - projected savings are 7.5% of 65% of the total PA consumption (for ALL pump accounts)

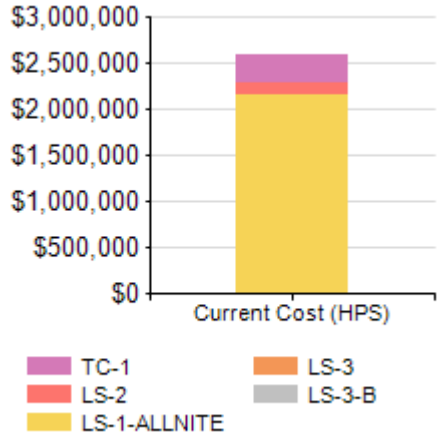
Site Name	Address	Tariff	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
Pumping	Various	TOU-PA2B	15,937	$11,713	$0.74

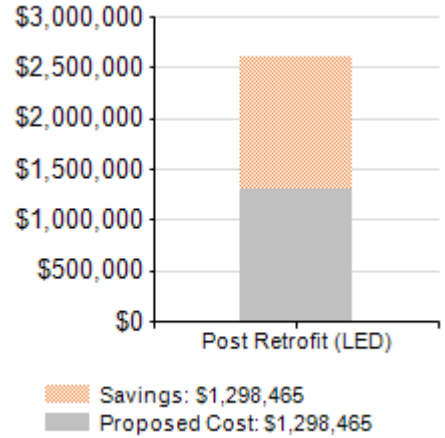
Table 2: Water & Wastewater Pumping

4. Street & Traffic Lights

Your Annual Energy Cost for Street & Traffic Lights is $2,596,690 and 53.4% of the Total Cost.







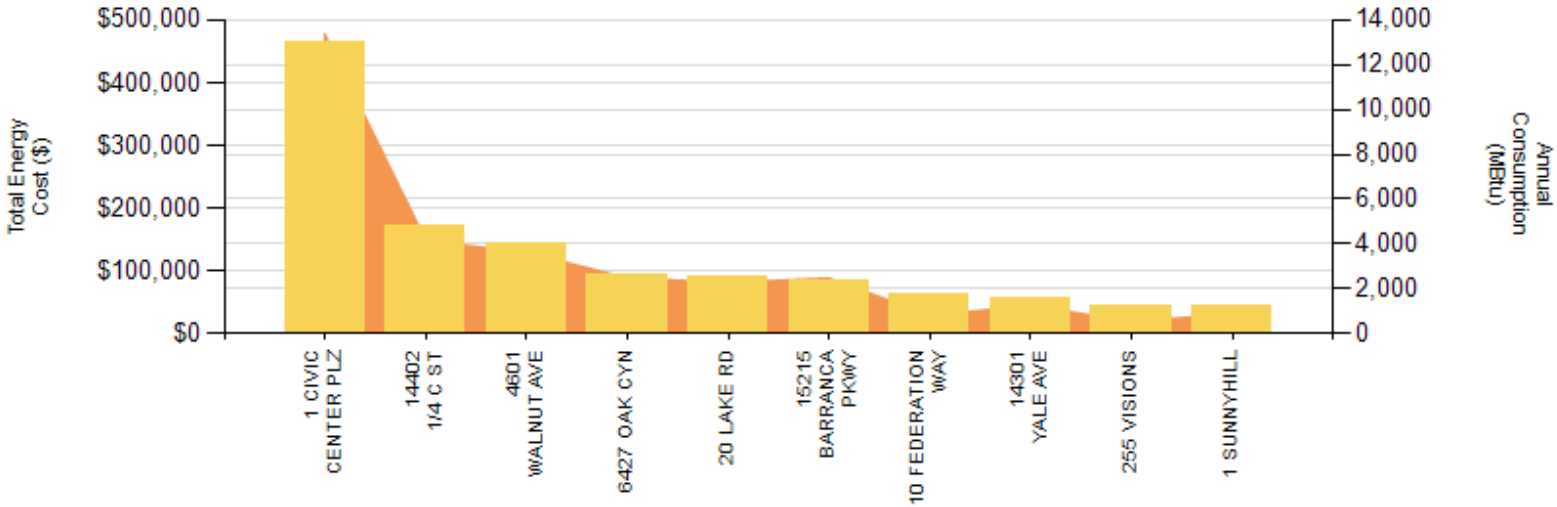
Assumption -agencies can save 50% on annual street & traffic light kWh consumption by converting HPS to LED.
Calculation – projected savings are 50% of the total kWh consumption of street and traffic lights (TC-1, LS-1, LS-2, and LS-3).

Light Type	Light Description	Annual Electric Consumption (kWh)	Annual Electric Cost ($)
LS-1-ALLNITE	Street Lights (SCE Owned)	7,877,323	$2,145,901
TC-1	Street Lights (Agency Owned)	1,879,051	$314,560
LS-2	Street Lights (Agency Owned)	1,526,196	$129,665
LS-3-B	Street Lights (Agency Owned)	64,966	$6,263
LS-3	Street Lights (Agency Owned)	5,945	$542

Table 3: Street & Traffic Lights

5. Building Summary

Your Annual Energy Cost for Buildings is $2,117,302 and 43.5% of the Total Cost.



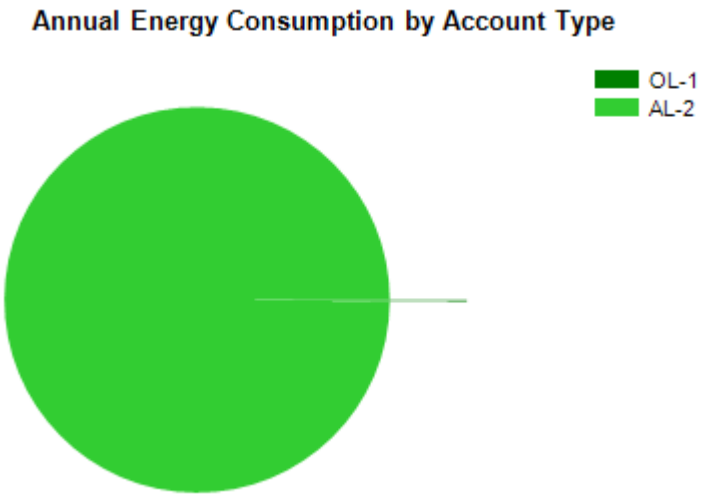
Key: Displays the top 10 consuming Buildings. Columns represent Cost, Area represents Consumption.

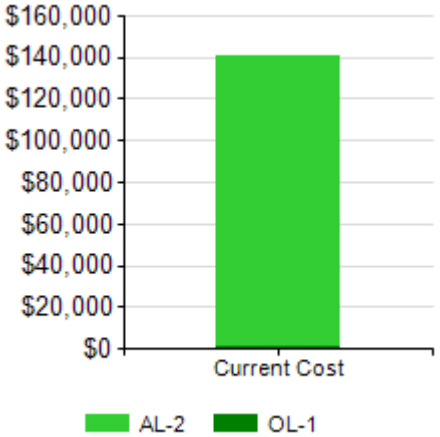
Name	Address	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
Irvine Civic Center	1 CIVIC CENTER PLZ	3,919,716	$464,486	$0.12
Great Park	14402 1/4 C ST	1,217,325	$170,912	$0.14
Woollett Center	4601 WALNUT AVE	1,069,968	$144,981	$0.14
Operations Support	6427 OAK CYN	732,034	$93,261	$0.13
Lakeview Center	20 LAKE RD	671,544	$92,807	$0.14
Amtrak Station	15215 BARRANCA PKWY	731,290	$84,391	$0.12
Las Lomas Park	10 FEDERATION WAY	243,343	$62,758	$0.26
Heritage Center	14301 YALE AVE	370,844	$56,479	$0.15
Cypress Rec Center	255 VISIONS	165,941	$44,688	$0.27
Turtle Rock Center	1 SUNNYHILL	260,302	$43,132	$0.17

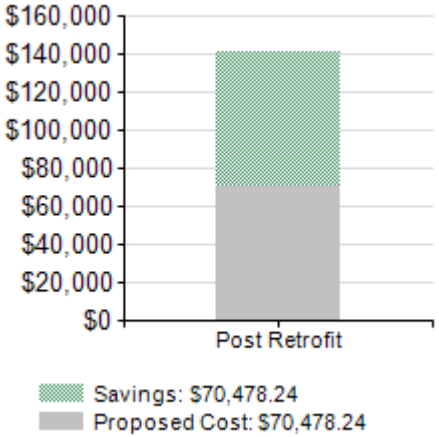
Table 4: Building Summary

6. Outdoor & Park Lights

Your Annual Energy Cost for Outdoor & Park Lights is $141,017 and 2.9% of the Total Cost.







Assumption -agencies can save 50% on annual outdoor & park light kWh consumption by converting HPS to LED.
Calculation – projected savings are 50% of the total kWh consumption of outdoor & park lights.

Name	Address	Tariff	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
Area Lighting	Various	AL-2	1,932,311	$140,192	$0.07
Area Lighting	Various	OL-1	2,064	$764	$0.37

Table 5: Outdoor & Park Lights

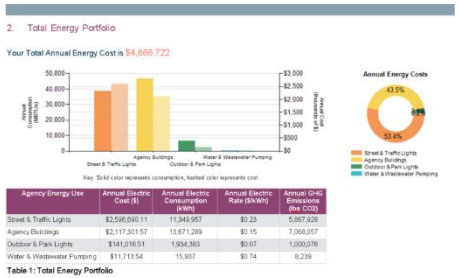
Appendix A - Methodology

1. Data Sources

- Building information, energy usage and cost data used in this analysis were derived from: utility consumption billing data provided by agency staff.
- Utility consumption billing data used in this analysis were derived from SCE electric tariffs
- For more information about the utility tariffs included in this analysis refer to:
    - SCE Electric Tariff: For more information about Southern California Edison tariffs; https://www.sce.com/wps/portal/home/regulatory/tariff-books/rates-pricing-choices
- All electricity results were based on usage during period June 30, 2016 – June 30, 2017.
- In some cases, multiple meters were associated with a single facility or asset type. For such facilities, to generate estimates of facility-wide energy use and energy intensity, energy usage and cost values were aggregated by summing the average daily energy usage and cost values for each day in the analysis period.
- GHG emissions data used in this analysis were calculated using the conversion: 517 lb CO2/MWh + 11.91 lbs CO2/therm.[1,2]

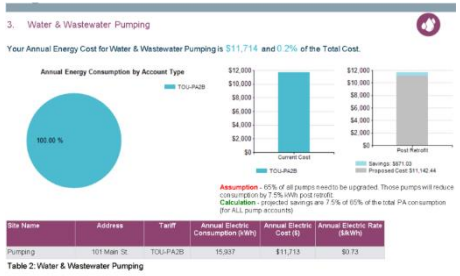
2. Total Energy Portfolio

- Total Energy Portfolio data represents an analysis of each agency facility type annual energy costs, annual electric cost, annual electric consumption (kWh), GHG Emissions and total annual energy costs for agency facility types based on MBtus.
- The following agency assets are included in the Total Energy Portfolio:
    - Water and Wastewater Pumping
    - Street & Traffic Lights
    - Buildings
    - Outdoor & Parks Lights



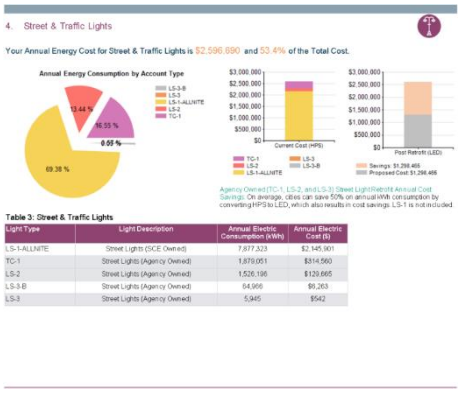
3. Water & Wastewater Pumping

- Water and wastewater data represents an analysis of annual energy costs, annual electric cost, annual energy consumption (kWh), per Water & Wastewater Pumping tariff type.
- Water pump conversion data used in this analysis is derived on the assumption that 65% of all existing pumps need to be upgraded. Of the 65% of pumps requiring upgrades, it is assumed that the pumps will save 7.5% of their annual kWh consumption.[3]



4. Street & Traffic Lights

- Street & traffic light data represents an analysis of annual energy costs, annual electric cost, and annual energy consumption (kWh) per SCE street & traffic light tariff type.
- On average, agencies can save 50% on annual kWh consumption by converting HPS to LED, which also results in cost savings.[3]



Light Type	Light Description	Annual Electric Consumption (kWh)	Annual Electric Cost ($)
LS-1-ALLNITE	Street Lights (SCE Owned)	7,877,323	$2,145,901
TC-1	Street Lights (Agency Owned)	1,879,051	$314,560
LS-2	Street Lights (Agency Owned)	1,526,196	$129,665
LS-3-B	Street Lights (Agency Owned)	54,966	$9,263
LS-3	Street Lights (Agency Owned)	5,945	$542

5. Building Summary

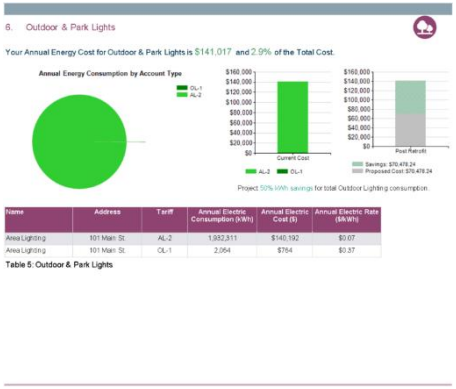
- Building summary data represents an analysis of the top ten highest energy consuming agency buildings annual energy costs, annual electric cost, annual energy consumption (kWh), and total annual energy costs based on MBtus.

Name	Address	Annual Electric Consumption (kWh)	Annual Electric Cost ($)	Annual Electric Rate ($/kWh)
1 CIVIC CENTER PLZ	1 CIVIC CENTER PLZ	3,919,716	$464,486	$0.12
14402 1/4 C ST	14402 1/4 C ST	1,217,325	$170,912	$0.14
4601 WALNUT AVE	4601 WALNUT AVE	1,069,968	$144,961	$0.14
6427 OAK CYN	6427 OAK CYN	732,034	$93,261	$0.13
20 LAKE RD	20 LAKE RD	671,544	$92,807	$0.14
15215 BARRANCA PKWY	15215 BARRANCA PKWY	731,290	$84,391	$0.12
10 FEDERATION WAY	10 FEDERATION WAY	243,343	$62,758	$0.26
14301 YALE AVE	14301 YALE AVE	370,844	$56,479	$0.15
255 VISIONS	255 VISIONS	165,941	$44,688	$0.27
1 SUNNYHILL	1 SUNNYHILL	260,302	$43,132	$0.17

Table 4: Building Summary

6. Outdoor & Park Lights

- Outdoor & park lights data represents an analysis of annual energy costs, annual electric cost, annual energy consumption (kWh), and total annual energy costs based on MBtus per SCE outdoor and park lighting tariff type.



Certain properties did not have energy usage data for the range of the analysis period and were excluded:

Tariff Type	Meter Number
LS-1	41298671
LS-2	27993888, 45671867, 45672088, 45672217, 46118988, 46253511, 46321250, 46358157, 46390477, 46390658, 46417278, 46625247
LS-3	15432657, 17138995, 29328209, 43779641
Traffic Control	694512, 1361012, 1361186, 1361252, 3223196, 21338758, 26706968, 27783831, 27783856, 30962226, 46024173, 46101314, 46473063, 46473070, 46473073

Endnotes

[1]Corporate Responsibility Report. (2015). In Southern California Edison. Retrieved from https://www.sce.com/wps/wcm/connect/c0fceef5-e04a-4287-8301-8e66e3e5fbac/2014_Corporate+Responsibility+Report_FINAL+single-page.pdf?MOD=AJPERES&ContentCache=NONE

[2]Adams, L.S., Nicols, M.D., Goldstene, J. N. (2008). Climate Change Scoping Plan. In California Air Resources Board. Retrieved from https://www.arb.ca.gov/cc/scopingplan/document/appendices_volume2.pdf

[3]Based on SoCalREN previous project estimates.

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Integral Group is committed to technical accuracy, quality control and reliable high performance systems which is evidenced in each project. We recognize the importance of providing our clients with the necessary services and resources to increase efficiencies and longevity of their systems, while mitigating long-range costs. These services include design, feasibility studies, peer reviews, energy audits, construction administration and commissioning. Additionally, we implement a technically innovative approach to defining clients' requirements and providing a fully integrated product that supports their business objectives.

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9. PRICING PROPOSAL

The total not to exceed budget estimate from the team is shown below.

Tasks	City of Irvine *excluding* Great Park	Great Park component	Total City of Irvine *including* Great Park
Task 1 – Energy Profiles	$20,000	$1,500	$21,500
Task 2 – Vision, Goals & Strategies	$41,000	$3,000	$44,000
Task 3 – Funding Sources	$16,000	$1,000	$17,000
Task 4 – Engagement	$21,000	$2,000	$23,000
Total	**$98,000**	**$7,500**	**$105,500**

The above pricing proposal breaks out a cost for each task described in the RFP. The pricing proposal has been broken out further to account for costs associated with undertaking the tasks with specific focus on the Great Park site. The City currently has three service accounts with Southern California Edison and one service account with Southern California Gas at the Great Park. The 286-acre Great Park includes a sports complex which will comprise a significant variety of sports and recreation facilities. The Great Park is and will be a significant component of the municipal energy profile.

The consultant team's approach in developing the pricing proposal is to look holistically at the City's municipal and community-scale energy profiles, and develop a strategic approach to energy use over time. The Great Park component of the analysis and strategic planning and engagement are separated in the above breakdown, indicating the level of effort associated with that particular exploration as an element of the larger, holistic effort.

The Team plans on utilizing a fee structure based on time and materials. The following tables outline the rates per hour for each firm: Integral Group, The Energy Coalition and UCI APEP.

Integral Group	
Managing Principal	$310/ hr
Principal	$285/ hr
Senior Energy Consultant	$245/ hr
Senior Sustainability Consultant II	$195/ hr
Associate	$180/ hr
Senior Sustainability Consultant	$160/ hr
Project Coordinator	$100/ hr
The Energy Coalition	
Executive	$250/ hr
Director	$200/ hr
Program Manager/ Engineer	$150/ hr
Project Manager	$125/ hr
Accountant	$150/ hr
Project Coordinator	$90/ hr
University of Irvine, Advanced Power and Energy Program	
Professor	$156 hr
Researcher/ Associate	$102/ hr

AGREEMENT FOR CONTRACT SERVICES

THIS AGREEMENT FOR CONTRACT SERVICES (the "Agreement") is made and entered into as of _____, by and between the CITY OF IRVINE, a municipal corporation ("City"), and EES CONSULTING, INC., a Washington corporation ("Contractor"). (The term Contractor includes professionals performing in a consulting capacity.)

PART I

FUNDAMENTAL TERMS

A. Location of Project: The City of Irvine location(s) as set forth in PART IV, Scope of Services, included herein.

B. Description of Services/Goods to be Provided: Community Choice Energy Feasibility Study and Technical Assessment in accordance with PART IV, Scope of Services, included herein (reference RFP 18-1357).

C. Term: Unless terminated earlier as set forth in this Agreement, the services shall commence on _____ ("Commencement Date") and shall continue through _____ The City reserves the right to extend this Agreement for up to four (4) additional one (1) year periods. Such extension shall only be valid if effectuated in writing by the City.

D. Party Representatives:

D.1. The City designates the following person/officer to act on City's behalf: Angie Burgh, email: aburgh@cityofirvine.org.

D.2. The Contractor designates the following person to act on Contractor's behalf: Gary Saleba, email: saleba@eesconsulting.com.

E. Notices: Contractor shall deliver all notices and other writings required to be delivered under this Agreement to City at the address set forth in Part II ("General Provisions"). The City shall deliver all notices and other writings required to be delivered to Contractor at the address set forth following Contractor's signature below.

F. Attachments: This Agreement incorporates by reference the following Attachments to this Agreement:

F.1.	Part I:	Fundamental Terms
F.2.	Part II:	General Provisions
F.3.	Part III:	Special Provisions
F.4.	Part IV:	Scope of Services
F.5.	Part V:	Budget

G. Integration: This Agreement represents the entire understanding of City and Contractor as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with regard to those matters covered by this Agreement. This Agreement supersedes and cancels any and all previous negotiations, arrangements, agreements, and understandings, if any, between the parties, and none shall be used to interpret this Agreement.

IN WITNESS WHEREOF, the parties have executed and entered into this Agreement as of the date first set forth above.

CITY OF IRVINE

By: _____

Its: Director of Public Works

Attest:

By:

_____
Molly McLaughlin
City Clerk

APPROVED AS TO FORM:
RUTAN & TUCKER, LLP

_____
Jeffrey Melching

EES CONSULTING, INC.

By: _____

Its: _____

By: _____

Its: _____

Contractor Information
Address for Notices and Payments:
570 Kirkland Way, Suite 100
Kirkland, WA 98033

Attn: Gary Saleba
Telephone: 425-889-2700
Email: saleba@eesconsulting.com

PART II

GENERAL PROVISIONS

SECTION ONE: SERVICES OF CONTRACTOR

1.1 Scope of Services. In compliance with all terms and conditions of this Agreement, Contractor shall provide the goods and/or services shown on Part IV hereto ("Scope of Services"), which may be referred to herein as the "services" or the "work." If this Agreement is for the provision of goods, supplies, equipment or personal property, the terms "services" and "work" shall include the provision (and, if designated in the Scope of Services, the installation) of such goods, supplies, equipment or personal property.

1.2 Changes and Additions to Scope of Services. City shall have the right at any time during the performance of the services, without invalidating this Agreement, to order extra work beyond that specified in the Scope of Services or make changes by altering, adding to, or deducting from said work. No such work shall be undertaken unless a written order is first given by City to Contractor, incorporating therein any adjustment in (i) the Budget, and/or (ii) the time to perform this Agreement, which adjustments are subject to the written approval of the Contractor. City approval and/or payment for work claimed by Contractor as changed or additional shall not act to prevent City at any time to claim such work is covered by the Scope of Work and should be performed by Contractor without additional consideration due. It is expressly understood by Contractor that the provisions of this Section 1.2 shall not apply to services specifically set forth in the Scope of Services or reasonably contemplated therein. Contractor hereby acknowledges that it accepts the risk that the services to be provided pursuant to the Scope of Services may be more costly or time consuming than Contractor anticipates and that Contractor shall not be entitled to additional compensation therefor.

1.3 Standard of Performance. Contractor agrees that all services shall be performed in a competent, professional, and satisfactory manner in accordance with the standards prevalent in the industry, and that all goods, materials, equipment or personal property included within the services herein shall be of good quality, fit for the purpose intended.

1.4 Performance to Satisfaction of City. Notwithstanding any other provision herein, Contractor agrees to perform all work to the satisfaction of City within the time specified. If City reasonably determines that the work is not satisfactory, City shall have the right to take appropriate action, including but not limited to: (i) meeting with Contractor to review the quality of the work and resolve matters of concern; (ii) requiring Contractor to repeat unsatisfactory work at no additional charge until it is satisfactory; (iii) suspending the delivery of work to Contractor for an indefinite time; (iv) withholding payment; and (v) terminating this Agreement as hereinafter set forth.

1.5 Instructions from City. In the performance of this Agreement, Contractor shall report to and receive instructions from the City's Representative designated in Paragraph D.1 of Part I ("Fundamental Terms") of this Agreement. Tasks or services other than those specifically described in the Scope of Services shall not be performed without the prior written approval of the City's Representative.

1.6 Familiarity with Work. By executing this Agreement, Contractor warrants that Contractor (i) has thoroughly investigated and considered the scope of services to be performed, (ii) has carefully considered how the services should be performed, and (iii) fully understands the

facilities, difficulties, and restrictions attending performance of the services under the Agreement. If the services involve work upon any site, Contractor warrants that Contractor has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services hereunder. Should the Contractor discover any conditions, including any latent or unknown conditions, which will materially affect the performance of the services hereunder, Contractor shall immediately inform the City of such fact in writing and shall not proceed except at Contractor's risk until written instructions are received from the City's Representative.

1.7 Identity of Persons Performing Work.

(A) Contractor represents that it employs or will employ at its own expense all personnel required for the satisfactory performance of any and all tasks and services required hereunder. Any personnel performing the services under this Agreement on behalf of Contractor shall at all times be under Contractor's exclusive direction and control. Contractor shall pay all wages, salaries, and other amounts due such personnel in connection with their performance of services under this Agreement and as required by law.

(B) Contractor represents that the tasks and services required hereunder will be performed by Contractor or under its direct supervision, and that all personnel engaged in such work shall be fully qualified and shall be authorized and permitted under applicable State and local law to perform such tasks and services. Contractor will exclusively determine the means, methods and details of performing the services subject to the requirements of this Agreement.

(C) This Agreement contemplates the personal services of Contractor and Contractor's employees, and it is recognized by the parties hereto that a substantial inducement to City for entering into this Agreement was, and is, the professional reputation and competence of Contractor. Neither this Agreement nor any interest therein may be assigned by Contractor, except upon written consent of City.

1.8 Prohibition Against Subcontracting or Assignment. Contractor shall not contract with any other entity to perform in whole or in part the services required hereunder without the express written approval of City. In addition, neither the Agreement nor any interest herein may be transferred, assigned, conveyed, hypothecated, or encumbered voluntarily or by operation of law, whether for the benefit of creditors or otherwise, without the prior written approval of City. In the event of any unapproved transfer, including any bankruptcy proceeding, City may void the Agreement at City's option in its sole and absolute discretion. No approved transfer shall release any surety of Contractor of any liability hereunder without the express written consent of City.

SECTION TWO: INSURANCE AND INDEMNIFICATION

2.1 Insurance. Without limiting Contractor's indemnification obligations, Contractor shall procure and maintain, at its sole cost and for the duration of this Agreement, insurance coverage as provided below, against all claims for injuries against persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees, and/or subcontractors. In the event that Contractor subcontracts any portion of the work in compliance with Section 1.8 of this Agreement, the contract between the Contractor and such subcontractor shall require the subcontractor to maintain the same policies of insurance that the contractor is required to maintain pursuant to this Section 2.1.

2.1.1 <u>Insurance Coverage Required</u>. The policies and amounts of insurance required hereunder shall be as follows:

A. Comprehensive General Liability Insurance which affords coverage at least as broad as Insurance Services Office "occurrence" form CG 00 01 including completed operations and contractual liability, with limits of liability of not less than $1,000,000 per occurrence and $2,000,000 annual aggregate for liability arising out of Contractor's performance of this Agreement. The limits shall be provided by either a single primary policy or combination of policies. If limits are provided with excess and/or umbrella coverage the limits combined with the primary will equal the minimum limits set forth above. If written with an aggregate, the aggregate shall be double the each occurrence limit. Such insurance shall be endorsed to:

(1) Name the City of Irvine and its employees, representatives, officers and agents (collectively hereinafter "City and City Personnel") as additional insured for claims arising out of Contractor's performance of this Agreement.

(2) Provide that the insurance is primary and non-contributing with any other valid and collectible insurance or self-insurance available to City.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement.

B. Automobile Liability Insurance with a limit of liability of not less than $1,000,000 each occurrence and $1,000,000 annual aggregate. The limits shall be provided by either a single primary policy or combination of policies. If limits are provided with excess and/or umbrella coverage the limits combined with the primary will equal the minimum limits set above. Such insurance shall include coverage for all "owned," "hired" and "non-owned" vehicles, or coverage for "any auto." Such insurance shall be endorsed to:

(1) Name the City of Irvine and its employees, representatives, officers and agents as additional insured for claims arising out of Contractor's performance of this Agreement.

(2) Provide that the insurance is primary and non-contributing with any other valid and collectible insurance or self-insurance available to City.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement.

C. Workers' Compensation Insurance in accordance with the Labor Code of California and covering all employees of the Contractor providing any service in the performance of this agreement. Such insurance shall be endorsed to:

(1) Waive the insurer's right of Subrogation against the City and City Personnel.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement unless your insurance carrier is the State of California Insurance Fund (SCIF) and the endorsement numbers 2570 and 2065 are referenced on the certificate of insurance.

Contractor's completion of the form attached hereto as Exhibit 1 shall be a condition precedent to Contractor's rights under this Agreement. Should Contractor certify, pursuant to Exhibit 1, that, in the performance of the work under this Agreement, it shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, Contractor shall nonetheless maintain responsibility for requiring that any subcontractors performing work under this Agreement have and maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the work performed under this Agreement.

D. Professional Liability Insurance with minimum limits of $1,000,000 each claim. Covered professional services shall include all work performed under this Agreement and delete any exclusion that may potentially affect the work to be performed.

E. Evidence of Insurance: Contractor shall provide to City a Certificate(s) of Insurance evidencing such coverage together with copies of the required policy endorsements no later than five (5) business days prior to commencement of service and at least fifteen (15) business days prior to the expiration of any policy. Coverage shall not be suspended, voided, cancelled, reduced in coverage or in limits, non-renewed, or materially changed for any reason, without thirty (30) days prior written notice thereof given by the insurer to City by U.S. mail, or by personal delivery, except for nonpayment of premiums, in which case ten (10) days prior notice shall be provided.

The City project title or description MUST be included in the "Description of Operations" box on the certificate.

The City's insurance certificate tracking services provider, Exigis, LLC, will send Contractor an email message providing instructions for submitting insurance certificates and endorsements.

Certificate Holder:

City of Irvine, California
c/o: Exigis LLC
PO Box 4668 ECM #35050
New York, NY 10168-4668

F. Endorsements: A statement on an insurance certificate will not be accepted in lieu of the actual endorsement. Insurance policies shall not be in compliance if they include any limiting provision or endorsement that has not been submitted to the City for approval.

Additional Insured Endorsements shall not:

1. Be limited to "Ongoing Operations"
2. Exclude "Contractual Liability"
3. Restrict coverage to the "Sole" liability of Contractor
4. Contain any other exclusion contrary to the Agreement.

G. Any Deductible in Excess of $50,000 and/or Self-Insured Retentions must be approved in writing by the City.

H. Acceptability of Insurers. Each policy shall be from a company with current A.M. Best's rating of A- VII or higher and authorized to do business in the State of California, or otherwise allowed to place insurance through surplus lines brokers under applicable provisions of the California Insurance Code or any federal law. Any other rating must be approved in writing by the City.

I. Insurance of Subcontractors. Contractor shall be responsible for causing Subcontractors to maintain the same types and limits of coverage in compliance with this Agreement, including naming the City as an additional insured to the Subcontractor's policies.

2.2 Indemnification. Contractor shall indemnify, defend, and hold City and City Personnel harmless from and against any and all actions, suits, claims, demands, judgments, attorney's fees, costs, damages to persons or property, losses, penalties, obligations, expenses or liabilities (herein "claims" or "liabilities") that may be asserted or claimed by any person or entity arising out of the willful or negligent acts, errors or omissions of Contractor, its employees, agents, representatives or subcontractors which directly or indirectly relate to the work being performed or services being provided under this Agreement, whether or not there is concurrent active or passive negligence on the part of City and/or City Personnel, but excluding such claims or liabilities arising from the sole active negligence or willful misconduct of City or City Personnel in connection therewith:

2.2.1 Contractor shall defend any action or actions filed in connection with any such claims or liabilities, and shall pay all costs and expenses, including attorney's fees incurred in connection therewith.

2.2.2 Contractor shall promptly pay any judgment rendered against City or any City Personnel for any such claims or liabilities.

2.2.3 In the event City and/or any City Personnel is made a party to any action or proceeding filed or prosecuted for any such damages or other claims arising out of or in connection with the work being performed or services being provided under this Agreement, Contractor shall pay to City any and all costs and expenses incurred by City or City Personnel in such action or proceeding, together with reasonable attorney's fees and expert witness fees.

SECTION THREE: LEGAL RELATIONS AND RESPONSIBILITIES

3.1 Compliance with Laws. Contractor shall keep itself fully informed of all existing and future state and federal laws and all county and city ordinances and regulations which in any manner affect those employed by it or in any way affect the performance of services pursuant to this Agreement. Contractor shall at all times observe and comply with all such laws, ordinances, and regulations and shall be responsible for the compliance of all work and services performed by or on behalf of Contractor. When applicable, Contractor shall not pay less than the prevailing wage, which rate is determined by the Director of Industrial Relations of the State of California.

3.2 Licenses, Permits, Fees and Assessments. Contractor shall obtain at its sole cost and expense all licenses, permits, and approvals that may be required by law for the performance of the services required by this Agreement. Contractor shall have the sole obligation to pay any fees, assessments, and taxes, plus applicable penalties and interest, which may be imposed by law and arise from or are necessary for Contractor's performance of the services required by this Agreement,

and shall indemnify, defend, and hold harmless City against any such fees, assessments, taxes, penalties, or interest levied, assessed, or imposed against City thereunder.

3.3 Covenant against Discrimination. Contractor covenants for itself, its heirs, executors, assigns, and all persons claiming under or through it, that there shall be no discrimination against any person on account of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status of any person, in the performance of this Agreement. Contractor further covenants and agrees to comply with the terms of the Americans with Disabilities Act of 1990 (42 U.S.C. §12101 et seq.) as the same may be amended from time to time.

3.4 Independent Contractor. Contractor shall perform all services required herein as an independent contractor of City and shall remain at all times as to City a wholly independent contractor. City shall not in any way or for any purpose become or be deemed to be a partner of Contractor in its business or otherwise, or a joint venturer, or a member of any joint enterprise with Contractor. Contractor shall not at any time or in any manner represent that it or any of its agents or employees are agents or employees of City. Neither Contractor nor any of Contractor's employees shall, at any time, or in any way, be entitled to any sick leave, vacation, retirement, or other fringe benefits from the City; and neither Contractor nor any of its employees shall be paid by City time and one-half for working in excess of forty (40) hours in any one week. City is under no obligation to withhold State and Federal tax deductions from Contractor's compensation. Neither Contractor nor any of Contractor's employees shall be included in the competitive service, have any property right to any position, or any of the rights an employee may have in the event of termination of this Agreement.

3.5 Covenant against Contingent Fees. Contractor warrants that it has not employed or retained any company or person other than a bona fide employee working for Contractor, to solicit or secure this Agreement and that it has not paid or agreed to pay any company or person any fee, commission, percentage, brokerage fee, gift, or any other consideration contingent upon, or resulting from, the award or making of this Agreement. For breach or violation of this warranty, City shall have the right to annul this Agreement without liability or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

3.6 Use of Patented Materials. Contractor shall assume all costs arising from the use of patented or copyrighted materials, including but not limited to equipment, devices, processes, and software programs, used or incorporated in the services or work performed by Contractor under this Agreement. Contractor shall indemnify, defend, and save the City harmless from any and all suits, actions or proceedings of every nature for or on account of the use of any patented or copyrighted materials consistent with Section 2.2 herein.

3.7 Proprietary Information. All proprietary information developed specifically for City by Contractor in connection with, or resulting from, this Agreement, including but not limited to inventions, discoveries, improvements, copyrights, patents, maps, reports, textual material, or software programs, but not including Contractor's underlying materials, software, or know-how, shall be the sole and exclusive property of City, and are confidential and shall not be made available to any person or entity without the prior written approval of City. Contractor agrees that the compensation to be paid pursuant to this Agreement includes adequate and sufficient compensation for any proprietary information developed in connection with or resulting from the performance of Contractor's services under this Agreement. Contractor further understands and agrees that full

disclosure of all proprietary information developed in connection with, or resulting from, the performance of services by Contractor under this Agreement shall be made to City, and that Contractor shall do all things necessary and proper to perfect and maintain ownership of such proprietary information by City.

3.8 Retention of Funds. Contractor hereby authorizes City to deduct from any amount payable to Contractor (whether arising out of this Agreement or otherwise) any amounts the payment of which may be in dispute hereunder or which are necessary to compensate City for any losses, costs, liabilities, or damages suffered by City, and all amounts for which City may be liable to third parties, by reason of Contractor's negligent acts, errors, or omissions, or willful misconduct, in performing or failing to perform Contractor's obligations under this Agreement. City in its sole and absolute discretion, may withhold from any payment due Contractor, without liability for interest, an amount sufficient to cover such claim or any resulting lien. The failure of City to exercise such right to deduct or withhold shall not act as a waiver of Contractor's obligation to pay City any sums Contractor owes City.

3.9 Termination by City. City reserves the right to terminate this Agreement at any time, with or without cause, upon written notice to Contractor. Upon receipt of any notice of termination from City, Contractor shall immediately cease all services hereunder except such as may be specifically approved in writing by City. Contractor shall be entitled to compensation for all services rendered prior to receipt of City's notice of termination and for any services authorized in writing by City thereafter. If termination is due to the failure of Contractor to fulfill its obligations under this Agreement, City may take over the work and prosecute the same to completion by contract or otherwise, and Contractor shall be liable to the extent that the total cost for completion of the services required hereunder, including costs incurred by City in retaining a replacement contractor and similar expenses, exceeds the Budget.

3.10 Right to Stop Work; Termination by Contractor. Contractor shall have the right to stop work and terminate only if City fails to timely make a payment required under the terms of the Budget. Contractor shall provide City thirty (30) day prior written notice of such claimed payment owed and City shall have an opportunity to remedy any such claimed breach during such time with no legal consequence to City. Contractor shall immediately cease all services hereunder following the thirty (30) day notice, except such services as may be specifically approved in writing by City. Contractor shall be entitled to compensation for all services rendered prior to termination and for any services authorized in writing by City thereafter. If Contractor terminates this Agreement because of an error, omission, or a fault of Contractor, or Contractor's willful misconduct, the terms of Section 3.9 relating to City's right to take over and finish the work and Contractor's liability shall apply.

3.11 Waiver. No delay or omission in the exercise of any right or remedy by a nondefaulting party with respect to any default shall impair such right or remedy or be construed as a waiver. A party's consent to or approval of any act by the other party requiring the party's consent or approval shall not be deemed to waive or render unnecessary consent to or approval of any subsequent act. A waiver by either party of any default must be in writing.

3.12 Legal Actions. Legal actions concerning any dispute, claim, or matter arising out of or in relation to this Agreement shall be instituted and maintained in the Superior Courts of the State of California in the County of Orange, or in any other appropriate court with jurisdiction in such County, and Contractor agrees to submit to the personal jurisdiction of such court.

3.13 Rights and Remedies are Cumulative. Except as may be expressly set forth in this Agreement, the rights and remedies of the parties are cumulative and the exercise by either party of

one or more of such rights or remedies or other rights or remedies as may be permitted by law or in equity shall not preclude the exercise by such party, at the same or different times, of any other rights or remedies to which such party may be entitled.

3.14 Attorneys' Fees. In any action between the parties hereto seeking enforcement of any of the terms or provisions of this Agreement or in connection with the performance of the work hereunder, the party prevailing in the final judgment in such action or proceeding, in addition to any other relief which may be granted, shall be entitled to have and recover from the other party its reasonable costs and expenses, including, but not limited to, reasonable attorney's fees, expert witness fees, and courts costs. If either party to this Agreement is required to initiate or defend litigation with a third party because of the violation of any term or provision of this Agreement by the other party, then the party so litigating shall be entitled to its reasonable attorney's fees and costs from the other party to this Agreement.

3.15 Force Majeure. The time period specified in this Agreement for performance of services shall be extended because of any delays due to unforeseeable causes beyond the control and without the fault or negligence of City or Contractor, including, but not restricted to, acts of nature or of the public enemy, unusually severe weather, fires, earthquakes, floods, epidemics, quarantine restrictions, riots, strikes, freight embargoes, wars, litigation, and/or acts of any governmental agency, including City, if the delaying party shall within ten (10) days of the commencement of such delay notify the other party in writing of the causes of the delay. If Contractor is the delaying party, City shall ascertain the facts and the extent of delay, and extend the time for performing the services for the period of the enforced delay when and if in the judgment of City such delay is justified. City's determination shall be final and conclusive upon the parties to this Agreement. In no event shall Contractor be entitled to recover damages against City for any delay in the performance of this Agreement, however caused. Contractor's sole remedy shall be extension of this Agreement pursuant to this Section 3.15.

3.16 Non-liability of City Officers and Employees. No officer, official, employee, agent, representative, or volunteer of City shall be personally liable to Contractor, or any successor in interest, in the event of any default or breach by City, or for any amount which may become due to Contractor or its successor, or for breach of any obligation of the terms of this Agreement.

3.17 Conflicts of Interest.

A. No officer, official, employee, agent, representative or volunteer of City shall have any financial interest, direct or indirect, in this Agreement, or participate in any decision relating to this Agreement that affects his or her financial interest or the financial interest of any corporation, partnership, association or other entity in which he or she is interested, in violation of any federal, state or city statute, ordinance or regulation. Contractor shall not employ any such person while this Agreement is in effect.

B. Contractor represents, warrants and covenants that he, she or it presently has no interest, direct or indirect, which would interfere with or impair in any manner or degree the performance of Contractor's obligations and responsibilities under this Agreement. Contractor further agrees that while this Agreement is in effect, Contractor shall not acquire or otherwise obtain any interest, direct or indirect, that would interfere with or impair in any manner or degree the performance of Contractor's obligations and responsibilities under this Agreement.

C. Contractor acknowledges that pursuant to the provisions of the Political Reform Act (Government Code section 87100 *et seq.*), City may determine Contractor to be a

"Consultant" as that term is defined by the Act. In the event City makes such a determination, Contractor agrees to complete and file a "Statement of Economic Interest" with the City Clerk to disclose such financial interests as required by City. In such event, Contractor further agrees to require any other person doing work under this Agreement to complete and file a "Statement of Economic Interest" to disclose such other person's financial interests as required by City.

3.18 Contractor Ethics. Contractor represents and warrants that it has not provided or promised to provide any gift or other consideration, directly or indirectly, to any officer, employee, or agent of City to obtain City's approval of this Agreement. Contractor shall not, at any time, have any financial interest in this Agreement or the project that is the subject of this Agreement other than the compensation to be paid to Contractor as set forth in this Agreement. In the event the work and/or services to be performed hereunder relate to a project and/or application under consideration by or on file with the City, (i) Contractor shall not possess or maintain any business relationship with the applicant or any other person or entity which Contractor knows to have a personal stake in said project and/or application, (ii) other than performing its work and/or services to City in accordance with this Agreement Contractor shall not advocate either for or against said project and/or application, and (iii) Contractor shall immediately notify City in the event Contractor determines that Contractor has or acquires any such business relationship with the applicant or other person or entity which has a personal stake in said project and/or application. The provisions in this Section shall be applicable to all of Contractor's officers, directors, employees, and agents, and shall survive the termination of this Agreement.

3.19 Compliance with California Unemployment Insurance Code Section 1088.8. If Contractor is a Sole Proprietor, then prior to signing the Agreement, Contractor shall provide to the City a completed and signed Form W-9, Request for Taxpayer Identification Number and Certification. Contractor understands that pursuant to California Unemployment Insurance Code Section 1088.8, the City will report the information from Form W-9 to the State of California Employment Development Department, and that the information may be used for the purposes of establishing, modifying, or enforcing child support obligations, including collections, or reported to the Franchise Tax Board for tax enforcement purposes.

3.20 CalPERS Annuitants. If Contractor is a California Public Employees' Retirement System ("CalPERS") annuitant, Contractor must provide the City with written notification of such fact a minimum of 14 calendar days prior to commencement of services under this Agreement. Failure to provide such notification may result in termination of the Agreement, and any penalties or other costs relating thereto shall be borne by Contractor. If this Agreement remains in place, Contractor shall execute any amendment(s) to this Agreement requested by the City in order to comply with all laws and regulations applicable to CalPERS annuitants.

SECTION FOUR: MISCELLANEOUS PROVISIONS

4.1 Records and Reports. The City Manager of the City of Irvine or his/her designee reserves the right to perform such audits, performance reviews, and other evaluations (collectively 'audit') that relate to or concern this Agreement at any time. Contractor agrees to participate and cooperate in up to five (5) hours of meetings and interviews (at no additional cost to City), if the same are requested by the City in connection with such an audit. Further, provided that the City pays Contractor's commercially reasonable hourly rate for services, Contractor agrees to participate and cooperate in such additional meetings and interviews (in excess of five (5) hours),

if the same are requested by the City in connection with such an audit. Upon request by City, Contractor shall prepare and submit to City any reports concerning Contractor's performance of the services rendered under this Agreement. City shall have access, with 72 hours advance written notice delivered to Contractor, to the books and records of Contractor related to Contractor's performance of this Agreement in the event any audit is required. All drawings, documents, and other materials prepared by Contractor in the performance of this Agreement (i) shall be the property of City and shall be delivered at no cost to City upon request of City or upon the termination of this Agreement, and (ii) shall not be made available to any individual or entity without prior written approval of City. The obligations of this Section 4.1 shall survive the expiration (or earlier termination) of this Agreement for a period of three (3) years. During said three (3) year period, Contractor shall keep and maintain all records and reports related to this Agreement, and City shall have access to such records in the event any audit is required.

4.2 **Notices**. Unless otherwise provided herein, all notices required to be delivered under this Agreement or under applicable law shall be personally delivered, or delivered by United States mail, prepaid, certified, return receipt requested, or by reputable document delivery service that provides a receipt showing date and time of delivery. Notices personally delivered or delivered by a document delivery service shall be effective upon receipt. Notices delivered by mail shall be effective at 5:00 p.m. on the second calendar day following dispatch. Notices to the City shall be delivered to the following address, to the attention of the City Representative set forth in Paragraph D.1 of the Fundamental Terms of this Agreement:

To City: City of Irvine
One Civic Center Plaza (92606) (Hand Deliveries)
P. O. Box 19575
Irvine, CA 92623-9575

Notices to Contractor shall be delivered to the address set forth below Contractor's signature on Part I of this Agreement, to the attention of Contractor's Representative set forth in Paragraph D.2 of the Fundamental Terms of this Agreement. Changes in the address to be used for receipt of notices shall be effected in accordance with this Section 4.2.

4.3 **Construction and Amendment**. The terms of this Agreement shall be construed in accordance with the meaning of the language used and shall not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction which might otherwise apply. The headings of sections and paragraphs of this Agreement are for convenience or reference only, and shall not be construed to limit or extend the meaning of the terms, covenants and conditions of this Agreement. This Agreement may only be amended by the mutual consent of the parties by an instrument in writing.

4.4 **Severability**. Each provision of this Agreement shall be severable from the whole. If any provision of this Agreement shall be found contrary to law, the remainder of this Agreement shall continue in full force.

4.5 **Authority**. The person(s) executing this Agreement on behalf of the parties hereto warrant that (i) such party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said party, (iii) by so executing this Agreement, such party is formally bound to the provisions of this Agreement, and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which said party is bound.

4.6 **Special Provisions**. Any additional or supplementary provisions or modifications or alterations of these General Provisions shall be set forth in Part III of this Agreement ("Special Provisions").

4.7 **Precedence**. In the event of any discrepancy between Part I ("Fundamental Terms"), Part II ("General Provisions"), Part III ("Special Provisions"), Part IV ("Scope of Services"), and/or Part V ("Budget") of this Agreement, the order of precedence shall be as follows.
Part III
Part II
Part IV
Part V
Part I

PART III

SPECIAL PROVISIONS

1) **Business License Requirement.** Contractors who provide services for the City of Irvine within the city limits of Irvine shall obtain, within five (5) days of executing this Agreement and prior to commencing any work herein, a City of Irvine business license and shall maintain a current business license throughout the term of this Agreement.

PART IV

SCOPE OF SERVICES

Services shall be performed as set forth below and in accordance with ATTACHMENT I.

Project Specifications

Contractor shall provide a Feasibility Study and Technical Assessment (Study) that evaluates the viability of launching and operating a Community Choice Energy (CCE) program in the City of Irvine. Contractor shall provide alternatives to improve the cost-effectiveness, stability, and beneficial impacts of the CCE program as part of the Study. Results from the Study will be presented to the City Council for consideration and direction prior to moving on to the next tasks associated with the Implementation Plan. Pending direction from the City Council, Contractor will prepare and submit an Implementation Plan to the California Public Utility Commission (CPUC).

As part of the Study, Contractor will review options for the City to operate an independent CCE program, partner with other interested cities/counties/public agencies as applicable, or join an existing CCE program through a Joint Powers Authority (JPA), and consider the benefits and risks for each option.

Contractor will identify costs for services associated with two key areas: development of the Feasibility Study and the drafting and submission of the Implementation Plan. As part of the Study, Contractor will estimate costs of future phases of the operation of a CCE program (e.g. Program Launch and Program Operation). Contractor shall also include details on the feasibility of scenarios in which the City would incur no upfront costs during the Program Launch phase of the CCE program.

Should the City choose not to move forward with development of the CCE program, Contractor will be paid for services rendered and the Agreement for Contract Services will be terminated. Upon completion of the Feasibility Study, the City reserves the right to solicit a third party peer review of the findings before moving on to subsequent phases of the program.

Feasibility Study and Technical Assessment:

This Study will incorporate load data from Southern California Edison (SCE) and other sources as appropriate to assess the overall electricity and capacity requirements to serve residential, municipal and commercial electricity customers in the community, as well as examine other CCE Programs. The load data for Irvine has already been received from SCE.

The Study will identify pertinent technical parameters of a CCE Program for the City of Irvine, including the number of prospective customers, the tariff designations under which such customers will take electric service, anticipated customer energy requirements (hourly) throughout the CCE's defined implementation period, expected peak demands (for purposes of quantifying the CCE's anticipated resource adequacy requirements

across each applicable capacity designation: system, local and flexible), and renewable energy requirements to achieve compliance with California's Renewables Portfolio Standard (RPS) Program, as well as other pertinent information that may be required to develop supplier bid specifications and promote successful CCE implementation.

The Study will examine the CCE's ability to achieve rate competitiveness with the incumbent utility (Southern California Edison) in consideration of then-current market prices including scenarios that incorporate any potential exit fees to be charged to the CCE. The Study will also examine the projected financial impacts of varying levels of renewable energy integration and of increasing the procurement of renewable energy built with strong labor standards and prevailing wages, as well as the impacts of procuring renewable energy from projects of varying sizes – from residential solar to utility-scale solar photovoltaic. The Study will examine the potential for emissions reductions through the use of varying levels of renewable/clean energy, including an assessment of the emissions reduction potential from in-state renewable energy projects compared to the use of unbundled renewable energy certificates.

The Study shall generate and validate tools needed to prepare a CCE business plan to quantify resource needs, prioritize resource preferences and other relevant energy procurement policies to guide the electricity procurement process of the CCE.

The Study shall identify strategies, tactics, and planning tools for developing a CCE consistent with the following goals:

- Achieve rate parity or better with SCE, and a lower rate escalation than SCE over time
- Provide and maintain an energy supply portfolio with overall carbon content lower than SCE's energy supply profile carbon content.
- Meet or exceed the California RPS Program.
- Differentiated energy options (e.g. same as SCE, 33%, or 50% qualified renewable) for default service, and a 100% renewable content option in which customers may "opt-up" and voluntarily participate.
- Provide an energy purchase portfolio that excludes specific purchases of coal and minimizes purchases of system power.
- An energy portfolio that prioritizes the use and development of local renewable resources and minimizes the use of unbundled renewable energy credits.
- Provide a project development and ownership strategy that increases the development of renewable energy projects statewide and locally to achieve reductions in emissions from electrical energy generation, and expands opportunities for local ownership and investment in energy assets.
- Provide an energy portfolio that includes the maximum amount of local renewable energy possible.
- Develop a financially sustainable and flexible business model that supports investment in, and the local development of, distributed energy resources and local energy efficiency and conservation programs including but not limited to: solar photovoltaic, solar hot water, combined heat and power, small wind, demand

response and dispatch, energy efficiency, electric vehicle managed charging, advanced energy storage and nanogrids/microgrids.
- Identify potential regional economic benefits including job creation, increased local energy investment, and reduced energy imports.
- An energy portfolio that incorporates energy efficiency and demand response programs and has aggressive reduced consumption goals.

Deliverables: The following tasks are included as the minimum services required by the awarded Contractor.

Task 1. Program Development and Technical Study

Contractor will include the following seven tasks in the development of this comprehensive Feasibility Study and Technical Assessment (Study).

- Task 1.1: Load Analysis
- Task 1.2: SCE Rate Analysis
- Task 1.3: Preferred Supply Portfolio Selection & Sensitivity Analysis
- Task 1.4: Cost-of-Service Analysis
- Task 1.5: Risk Analysis
- Task 1.6: Report of Technical Study Results
- Task 1.7: Developing Support Information for City Council and Community Engagement

Task 1.1: Load Analysis

1. Define regionally and/or geographically appropriate aggregated load categories that may include combinations of residential, commercial, industrial, municipal, institutional, agricultural, and transportation end-use electric consumer groups within the City of Irvine.
    a. Receive and review SCE data.
    b. Format and import data into analytical framework.
    c. Prepare summary level data.
2. Analyze impacts to energy use and energy requirements to quantify resource needs. Identify regional growth projections.
    a. Determine if a review of California Independent System Operator (CAISO) sales data is appropriate, and if so, which data shall be reviewed.
    b. Estimate potential load reduction from energy efficiency or distributed generation.
    c. Estimate potential opt-out rates (model at least 20%).
    d. Estimate energy use and reflect change in data set.
3. Render a composite CCE electric load and load shape forecast based on the electric energy and demand load profiles for regionally and/or geographically appropriate aggregated load categories. Recommendations shall include determining whether or not load categories shall be developed to model a phase-in of the Program.

    a. Identify projected future energy consumption for CCE customers, being sure to account for any areas with an influx of seasonal residents to avoid any costly spot-market power purchases.
    b. Discuss projections with designated stakeholders. Finalize forecast to be used in feasibility assessment.
4. Determine additional energy requirements based on factors such as load profiles, geography, distribution line losses, RPS requirements, and resource adequacy obligations. Energy requirements considered shall include: peak demand requirements, resource adequacy/capacity reserve obligations, energy needed to compensate for distribution line losses, RPS supply requirements, and any other Contractor-identified energy requirements.
    a. Prepare summary in format suitable to support power solicitation.
    b. Discuss projected requirements with staff and stakeholders.
5. Specifically address the impact of any new, high energy demand industries.

Task 1.2: SCE Rate Analysis

1. Develop rate projection forecasts. Include the following:
    a. Review current and historic SCE rate trends and structures to develop rate projections over 5-, 10-, 15-, 20-year forecasts based on RPS scenarios.
    b. Identify other factors that may affect rate comparison, including combinations of the following: high gas, low gas, high hydro, low hydro, and rate restructuring.
    c. Identify SCE costs embedded in rate forecasts for direct comparisons to CCE costs, including development of several scenarios to forecast any potential exit fees charged to the CCE.
    d. Discuss assumptions with designated staff and stakeholders and agree on pertinent items affecting SCE rate projections.
2. Prepare utility rate forecast under continued SCE service scenario.
    a. Compile electric generation service cost/payment estimates for prospective CCE customers in consideration of applicable SCE rate schedules based on SCE rate forecasts and other independent rate forecasts.
3. Specifically examine and analyze the past five and ten-year historic SCE tariffs and energy costs to determine if a CCE could withstand a future recession.

Task 1.3: Preferred Supply Portfolio Selection & Sensitivity Analysis

1. Define electric supply scenarios based on variations in the overall renewable energy content, renewable resource composition (e.g., in-state, in-county, out-of-state, renewable energy credits, technology preferences), and non-renewable portfolio attributes (e.g., system purchases, natural gas, hydro-electric). Scenarios may be further defined based on input from Contractor in coordination with City staff. At a minimum, analyze the following electric supply scenarios:
    a. Option 1: Consistent with SCE's current RPS.
    b. Option 2: Minimum 33% RPS compliance to meet or exceed the State's 2020 RPS minimum of 33% at the time of service commencement. This

33% level can be assumed to be flat during the course of the CCE Program or at least be equal to SCE (if the RPS increases after 2020).

c. Option 3: Minimum 50% California Qualified Renewable Portfolio with less GHG intensity than SCE.
d. Option 4: Start with 50% renewable and build up to 80% of the CCE's total load being met by California eligible renewables by the end of Year 5 of the Program.

Note: All scenarios shall consider that consumers would be able to sign up for a 100% renewable option, which would be offered on a premium, voluntary basis, with a substantial portion of that coming from in-State and local renewable resources in the County and general region (Contractor shall assume participation rates similar to Lancaster, MCE Clean Energy, and Sonoma Clean Power's 100% voluntary programs).

2. Identify CCE cost of power working with designated electric supply scenarios.
    a. Correspond with potential electric service providers to determine indicative energy, capacity and renewable energy pricing as well as CAISO and administrative costs of CCE operation.
    b. Evaluate potential electric service providers in the region. Present a variety of renewable energy providers that could be resources for a CCE in Orange County. The Study shall evaluate these potential power sources, the cost of using these power sources, and their capacity to serve a CCE for Irvine.
    c. Determine CAISO and administrative costs of CCE operation.
    d. Discuss assumptions and planned operational/organizational elements of a CCE program with designated City staff to develop accurate cost projections.
    e. Document cost-based assumptions/inputs for future reference.
    f. Quantify cost of service under each scenario and related rate impacts and estimate the projected costs for each supply portfolio scenario.
    g. Discuss analytical results with designated City staff and stakeholders.
3. Estimate projected environmental impacts (i.e., the projected GHG emissions profile for each supply portfolio scenario) using publicly available data sources.
4. Prepare a sensitivity analysis for each supply scenario showing the projected impact to program costs for variations in the following input cost variables:
    a. Market prices for conventional (non-renewable) energy.
    b. Market prices for renewable energy based on preferred technologies.
    c. SCE generation rates and customer surcharges (considering the effect of the 33% RPS).
    d. Customer opt-out rates.
5. Discuss findings and strategies with designated staff and stakeholders, and modify parameters, as appropriate, based on discussions.
6. Develop presentation materials and present results of cost comparison and prospective modifications to CCE Program design structure with City staff, stakeholders and City Council.

Task 1.4: Cost-of-Service Analysis

1. Provide insight on how best to achieve the CCE Program's goals and capture those activities in the modeling. Consider current CCE program designs and implementation pathways, and recommend improvements that minimize risks to the City of Irvine and accelerate the timeline.
2. Assemble known and predictable cost-of-service variables and incorporate these variables into base-case analyses. Create pro forma developments considering each preferred supply portfolio selection. Predictable cost-of-service variables include:
    a. Energy costs
    b. Start-up costs
    c. Cost of capital
    d. Operating and maintenance costs including:
        i. Administrative and general expenses.
        ii. Staffing.
        iii. External technical/legal/marketing/public relations support.
        iv. Billing, metering, and collections.
        v. Customer service (e.g., call center) and data management.
        vi. Scheduling and coordination.
    e. Uncollected accounts.
    f. Program reserves.
    g. CCE bonding for re-entry fees.
    h. SCE surcharges and cost-recovery mechanisms (exit fees).
    i. Characterize and evaluate feed-in tariff and net energy metering programs that encourage development of renewable energy generation projects in the region by offering customers a sustained reliable payback on their investment in renewable energy and a sustainable local generation system.
3. Perform 5-, 10-, 15-, and 20-year term consistent with term of financing Investor Owned Utility (IOU) versus CCE cost comparisons.
4. Determine potential economic benefits, challenges and strategies for reducing costs and/or administrative/organizational overhead and enhancing customer benefits.
5. Evaluate alternative structural approaches to CCE implementation, as necessary. This analysis shall include evaluation of the most efficient structure for a CCE including the following scenarios:
    a. CCE operated by one or more individual jurisdictions
    b. CCE operated independent regions (e.g. LA County, Orange County, etc.)
    c. CCE operated collectively
    d. CCE operated by a third party administrator
6. Identify the estimated cost for preparation of the comprehensive Technical Study for the City of Irvine. This estimate could be used by the City to establish any cost-sharing arrangements with other cities for further CCE exploration.
7. Develop presentation materials and present results of cost comparison and prospective modifications to CCE Program design with City staff, stakeholders and City Council.

Task 1.5: Risk Analysis

1. Contractor shall analyze the potential risks to a CCE Program in Irvine, as well as outline risk mitigation measures. Such risks could include, but not be limited to:
    a. Financial risk to the City in the event that the CCE fails.
    b. The financial risk to a CCE that procures too much or too little electricity and what the reasons might be for missing demand forecasts (e.g. higher than expected opt-out rate).
    c. Address instances where a CCE has failed or has had to wind down its program.
    d. Regulatory and legislative risk, due to rules changes at the CPUC or changes in state law that affect the ability of CCEs to be competitive.
    e. Ability to procure the necessary amounts of renewable energy in order to meet RPS standards, particularly if the RPS rises to 50% by 2030 and the demand for renewable energy spikes. Contractor shall examine concerns expressed by some in the region that there may not be enough renewable energy supply with a number of new CCEs potentially coming into the market.
    f. Financial risks of establishing competitive electrical generation rates, including analysis of rate setting, local control and transfer of revenues generated.
    g. Financial risks to the City and CCA if a significant number of customers opt out and return to SCE or Direct Access Service.

Task 1.6: Report of Technical Study Results

1. Prepare a draft Study report that details the results of the technical study, including recommendations for CCE organization and implementation and an assessment of the overall cost-benefit potential to support a threshold decision to move forward with CCE. Costs shall include upfront program development and implementation costs as well as net rate-payer costs over the forecast period. The estimated cost of the CPUC-required Implementation Plan for a CCE in the City of Irvine shall be included in this study report. Quantifiable benefits shall include net GHG reductions, expanded use of renewable energy resources, local economic development, and reduced exposure to volatile fossil fuel costs.

    Provide the following reports:
    a. Pro forma report, including cash flow analysis, detailing costs and projected benefits under three electric supply scenario assumptions.
    b. Pro forma reports detailing costs and projected benefits under sensitivity case assumptions, and of phasing in customer load over time.

2. First Draft: Prepare the report in draft form and submit to City staff for review and approval in accordance with the deliverables timeline. City staff will return one (1) copy of the draft report with comments or approval in writing within fourteen (14) business days.

3. Subsequent Draft(s): If City staff requests revisions, revisions shall be made and the draft report resubmitted to City staff for approval within seven (7) business days.
4. Final: Following City staff's approval and prior to City Council acceptance of the final report, Contractor shall submit the final approved report to City staff.
5. Develop presentation materials and deliver presentation regarding feasibility report and related recommendations to City staff, stakeholders and City Council.

Task 1.7: Developing Support Information for City Council and Community Engagement

1. Review economic impact of a CCA program to the City including local jobs generated, other direct and indirect impacts such as development of local renewable energy projects and other energy innovations located within Irvine.
2. Contractor shall develop a summary of other Orange County municipalities interested in developing CCE programs. Contractor shall identify opportunities for the City to work with other communities to coordinate development and operation of CCE programs cooperatively in order to reduce administrative costs and achieve common goals while maintaining local control of their programs.
    a. The County of Orange and other Orange County Cities may begin exploring CCE; assess the possibility for the City of Irvine to combine efforts with these other organizations versus operating a stand-alone CCE.
3. Contractor may be asked to assist the City with engaging local officials, policymakers, community members, groups and organizations (City Councilmembers, City staff, Green Ribbon Environmental Committee, etc.) on the basics of Community Choice Energy, highlighting the experience of CCE programs to date and detailing the benefits and challenges of running an effective CCE.
4. Contractor will assist the City with refining a timeline for CCE formation and implementation. The timetable shall include a schedule of all steps needed to launch. As part of this task, Contractor may also be asked to provide detail on operational structures and procedures.
5. Contractor will assist the City with refining and defining the CCE program priorities and goals to support evaluating the environmental benefits and cost implications of the range of scenarios explored during the technical analysis. The estimated cost of developing and submitting the Implementation Plan should also be included.

Before proceeding to tasks associated with the Implementation Plan, Contractor will assist City staff in presenting findings from the Technical Study to the City Council.

Task 2. Implementation Plan

Performance of Task 2 is contingent upon City direction. Assuming there are no critical barriers to a successful CCE identified in the Technical Study, Contractor will address all of the tasks required to submit the Implementation Plan to the CPUC. These tasks are outlined below.

- Task 2.1: Implementation Plan/Perform All Regulatory Functions

- Task 2.2: CCE Organizational Infrastructure
- Task 2.3: Customer Engagement
- Task 2.4: Rate Setting & Distributed Generation Policies

Task 2.1: Implementation Plan/Perform All Regulatory Functions

1. Contractor will undertake all functions necessary to comply with CPUC regulations related to launching a CCE program. For example, the CPUC, which ultimately has to approve the program, requires that the CCE submit an Implementation Plan that covers all aspects of the set-up and operation. The plan will include the following:
    a. Process and consequences of aggregation.
    b. Organizational structure of the program, its operations and funding.
    c. Rate setting and other costs to participants.
    d. Disclosure and due process in setting rates and allocating costs among participants.
    e. Methods for entering and terminating agreements with other entities.
    f. Participant rights and responsibilities.
    g. Termination of the program.
    h. Description of third parties that will be supplying electricity under the program, including information about financial, technical and operational capabilities

The Implementation Plan must also include a statement of intent indicating that the program must provide universal access, reliability and equitable treatment of all classes of customers, and to meet any other requirements established by state law or by the CPUC. Contractor will be responsible for drafting the Plan and ensuring its certification by the CPUC.

Task 2.2: CCE Organizational Infrastructure

Contractor will assist the City with creating the necessary organizational documents, procedures, and systems to successfully operate the CCE, including:

1. Business and operations plan
2. Operational policies and procedures
3. Committee structures and processes
4. Independent review and oversight of contractor and City staff activities and recommendations.

Task 2.3: Customer Engagement

Contractor will assist the City with developing, implementing and managing a plan for engaging the customers prior to launch. Contractor will be required to work with the City to ensure the community outreach plan is being implemented.

Task 2.4: Rate Setting & Distributed Generation Policies

Contractor will need to conduct an analysis to assist the CCE in establishing a rate regime that meets the annual budgetary revenue requirement developed by the program. This will include recovery of all expenses and any reserves or coverage requirements set forth in bond covenants or other debt-service requirements. The City anticipates a rate structure similar to, but lower than, SCE's rate schedule at the outset. Included in the rate structure shall be consideration of policies that further encourage renewable energy development including, but not limited to:

1. A feed-in-tariff program to incentivize renewable energy projects within the CCE service territory.
2. A net energy metering tariff that encourages solar installation on the customer side of the meter.

A 100% renewable, opt-in choice. Customers would be offered a 100% renewable energy option at a premium price, based on the costs of a 100% renewable supply.

PART V

BUDGET

Pricing shall be as set forth below and in accordance with ATTACHMENT II.

	Task 1	Task 2	Total
City	$72,434	$47,059	**$119,493**
Great Park	$5,036	$3,271	**$8,307**
Total	**$77,470**	**$50,330**	**$127,800**

Included in the Budget are all ordinary and overhead expenses incurred by Contractor and its agents and employees, including meetings with City representatives, and incidental costs incurred in performing under this Agreement. The total compensation for the Task 1 Scope of Services set forth herein shall not exceed **$72,434.00 for City** services; and **$5,036.00 for Orange County Great Park** services; with the total Agreement amount not to exceed **$77,470.00**, including all amounts payable to Contractor for its overhead, payroll, profit, and all costs of whatever nature, including without limitation all costs for subcontracts, materials, equipment, supplies, and costs arising from or due to termination of this Agreement.

No work shall be performed in connection with this Agreement until the receipt of a signed City of Irvine Purchase Order; and no work shall be performed with a value in excess of the Purchase Order amount as the City has not authorized nor is it obligated to pay Contractor any such excess amount.

In the event Contractor anticipates the potential need to perform services beyond those set forth herein where additional funding may be needed, Contractor shall notify City in writing allowing sufficient time for City to consider further action.

Payment for services will be made monthly on invoices deemed satisfactory to the City, with payment terms of net 30 days upon receipt of invoice. Contractor shall submit invoices within fifteen (15) days from the end of each month in which services have been provided. Contractor shall provide invoices with sufficient detail to ensure compliance with pricing as set forth in this Agreement. The information required may include: date(s) of work, hours of work, hourly rate(s), and material costs.

The Purchase Order number must be included on all invoices, along with the City Representative's name. Failure to include this information on the invoice shall result in the return of the unpaid invoice.

Contractors should submit invoices electronically to:

invoicesubmittal@cityofirvine.org

Payment by City under this Agreement shall not be deemed as a waiver of the City's right to claim at a later point that such payment was not due under the terms of this Agreement.

Pricing shall remain firm for the entire one (1) year Agreement term. Thereafter, any proposed pricing adjustment for follow-on renewal periods shall be submitted to the City Representative in writing at least ninety (90) days prior to the new Agreement term. The City reserves the right to negotiate any proposed pricing adjustment not to exceed the Bureau of Labor Statistics Consumer Price Index (CPI) data as follows: Los Angeles-Riverside-Orange County, CA; All Items; Not Seasonally Adjusted; annualized change comparing the most recent month's reported data to the same month of the prior year. (This information may be found on the U.S. Department of Labor's website at www.bls.gov.)

Exhibit 1

WORKERS' COMPENSATION INSURANCE CERTIFICATION

Contract Services Description: Community Choice Energy Feasibility Study

WORKERS' COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

(CHECK ONE APPLICABLE BOX BELOW)

☐ **I have and will maintain workers' compensation insurance**, as required by Section 3700 of the Labor Code, for the performance of the work to be performed under this Agreement and shall submit insurance certificates evidencing such coverage as set forth herein.

☐ I certify that, in the performance of the work under this Agreement, **I shall not employ any person** in any manner so as to become subject to the workers' compensation laws of California, and I hereby agree to indemnify, defend, and hold harmless the City of Irvine and all of its officials, employees, and agents from and against any and all claims, liabilities, and losses relating to personal injury or death, economic losses, and property damage arising out of my failure to provide such worker's compensation insurance. I further agree that, **if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions and immediately furnish insurance certificates** evidencing such coverage as set forth herein.

WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

Dated:	
Contracting Firm:	EES Consulting, Inc.
Signature:	
Title:	
Address:	570 Kirkland Way, Suite 100, Kirkland, WA 98033

ATTACHMENT I

Experience/Qualifications Information

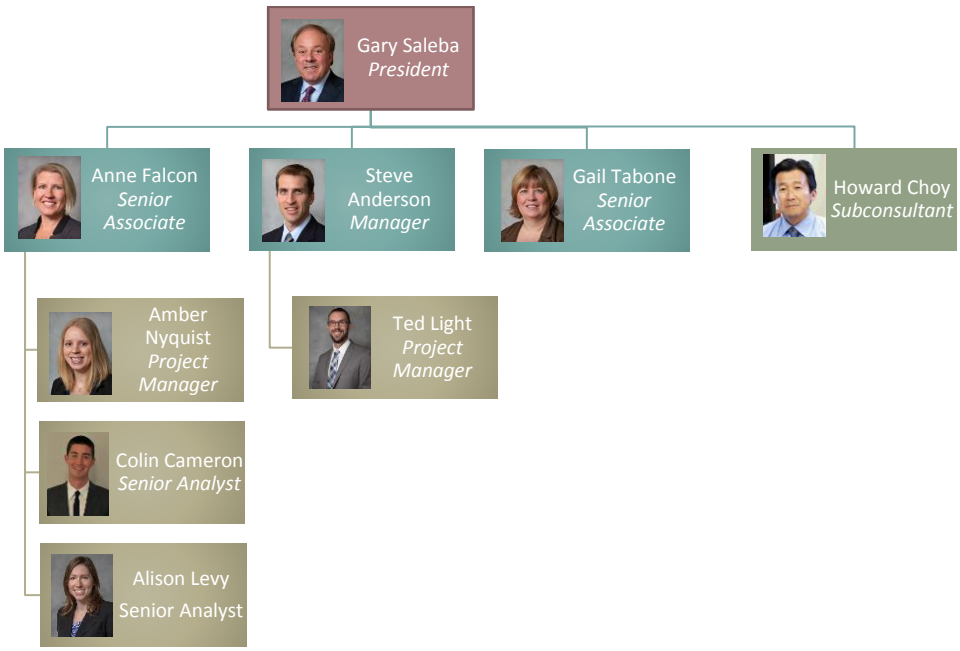
EES Consulting, Inc. (EES) is a registered professional engineering and management consulting firm that has been serving the utility industry since 1978 with offices in Kirkland, Washington; Portland, Oregon; and La Quinta, California. We have over 500 regular utility clients across North America with our primary focus within the Western Electricity Coordinating Council reliability area. EES's professional staff have backgrounds in the areas of engineering, economics, power procurement, rate setting, finance, public administration, operations research and general management. Our Project Team offers a range of utility management services including resource planning, financial analysis, cost of service analysis, rate studies, load forecasting, market analysis, and regulatory compliance and analysis. A full description of EES's lines of business, personnel, and clientele can be found on our website at: www.eesconsulting.com.

CCE Experience: EES has previously prepared CCE Feasibility Analyses and CCE Business Plans for the County of Los Angeles, the San Bernardino Associated Governments, the Coachella Valley Association of Governments, Western Riverside Council of Governments, and the City of San José, and is currently preparing CCE feasibility studies for Butte County and the cities of Carlsbad, Del Mar, Oceanside, and Encinitas. EES has also provided CCE Feasibility Peer Review services for Alameda County, the City of Solana Beach, the City of San Diego, and King City. In addition, EES Consulting is currently serving as the implementation technical consultant for Los Angeles Community Choice Energy, Western Community Energy, and San Jose Clean Energy. EES is an ongoing participant in numerous CCE-related regulatory proceedings at the California Public Utility Commission (CPUC), including the Resource Adequacy hearings and the current Power Charge Indifference Adjustment (PCIA) review proceeding (R.17-06-026).

Vanir is an award-winning program, project, and construction management corporation operating strategically throughout the United States. Vanir streamlines the connection between buildings, people and sustainability, particularly in clean energy and energy efficiency. Vanir has contracted with Howard Choy, recently retired from the Los Angeles County Office of Sustainability. While developing and administering a variety of community, clean energy programs, Howard also led the efforts for the County to assess and move forward with a Countywide CCE which could include the eligible 82 cities within the County. He also led the development of the initial Feasibility Study/Business Plan and the initial plan to implement CCA within the County. Today Howard and continue to work on behalf of local governments and public agencies on assessment and development of local/regional clean energy programs.

The following organizational chart outlines EES's management consulting team:

Figure 1
Organization Chart



Project Team Staffing

As noted in the previous section, EES has worked with ten CCE clients throughout California fulfilling tasks including feasibility analysis, peer review, and CCE implementation technical consulting. The team proposed for this project is the same team to have completed all of EES's previous CCE work, and; therefore, brings substantial experience and subject-specific knowledge on CCE issues. Narrative resumes for staff members are included in Appendix A.

Name	Position	Project Role
Gary Saleba	President and CEO	Project Lead, Primary Contact
Anne Falcon	Senior Associate	Project Management, Financial Analysis
Gail Tabone	Senior Associate	Quality Assurance
Howard Choy	Community Energy Specialist	Community Energy and Distributed Energy Resources
Steve Andersen	Manager	Power Supply
Amber Nyquist	Project Manager	Load Analysis
Ted Light	Project Manager	Energy Efficiency and Distributed Energy
Colin Cameron	Senior Analyst	Load & Regulatory Analysis
Alison Levy	Senior Analyst	Financial Analysis

Gary Saleba, President/CEO
Role: Quality Assurance and Control, Project Leader

Gary Saleba has over 35 years of experience in providing consultant services to electric power utilities. Gary started EES in 1978 and has worked for our electric power utility clients ever since.

Gary's areas of specialty include overall quality control for EES's projects as well as development of corporate management, financial and strategic planning models primarily for electric, natural gas and water utilities. He has extensive experience in the areas of utility rate design, revenue requirement analysis, cost of service, financial planning, management audits, professional development educational seminars, marketing, consumer research, forecasting, integrated resource planning, cost-benefit analyses, overall strategic planning, power procurement, and mergers and acquisitions.

Having worked as a utility employee, Gary combines an extensive background as both a utility industry expert and a management consultant. He is able to draw upon this professional and educational experience to manage projects including comprehensive utility cost of service studies, strategic planning, and management critiques for clients throughout North America. His experience extends to alternative fuel cost comparisons, econometric forecasting models, resource planning and reliability studies. Gary has participated in numerous generic utility proceedings, testified before over 200 regulatory bodies and courts of law and coordinated over 500 utility planning studies.

Gary has served on numerous energy and natural resource-related trade associations, including as Chairman of the American Water Works Association Financial Management Committee and Management Division. He has also served on the board of directors for the Northwest Public Power Association and on the Board of Directors for ENERconnect, Inc., a bulk power aggregation and procurement entity serving the municipal utilities in the Province of Ontario. Gary is located in our Kirkland, Washington office.

> Education: M.B.A., Finance, Butler University, Indianapolis, IN; B.A., Economics and Mathematics, Franklin College, Franklin, IN
>
> Affiliations: American Water Works Association, American Public Power Association, Northwest Public Power Association, Canadian Energy Association, California Municipal Utilities Association

Anne Falcon, Senior Associate
Role: Project Manager

Anne Falcon has over 20 years of experience providing integrated resource planning, financial analysis, cost of service and rate design services to electric utility clients. She has provided financial analysis assistance to our electric power utility clients since then. Anne provides project management and technical support for all types of utility studies. She has managed projects concerning cost of service and rate design analyses, financial planning including estimation of power and non-power supply costs, and regulatory proceedings for electric, natural gas, water, and wastewater utilities. Her expertise includes restructuring, strategic planning, forecasting, unbundled cost-of-service studies, optimization research, and specialized statistical studies.

Through her research and analysis of the current state of the industry, Anne has assisted many California and Northwest electric power utility clients in preparing for the changes that are taking place. Her work has included developing wholesale power price forecasts, unbundled rates,

average embedded and marginal cost-of-service studies, analysis of stranded costs, development of direct access programs, research on Independent System Operators (ISOs) and power markets, development of customer choice programs and conservation, market-based and green rate designs.

At EES, Anne has been involved in all aspects of the integrated resource planning process from the initial identification of demand and supply-side resources to the final ranking of resource portfolios. She has developed numerous decision models for United States and Canadian utilities and performed resource evaluations by applying social costing principles and risk analysis.

Anne applies her extensive economic and technical knowledge in the development of resource-related computer models for use by electric, gas, water, wastewater, and solid waste utilities. Her work also includes the development of a multitude of econometric forecasts for electric, gas, and water utilities. She has developed disaggregate energy and demand forecasts using a variety of forecasting and econometric tools. Anne is located in our Kirkland, Washington office.

Education: M.S., Operations Research, Stanford University; B.A., Economics, University of San Francisco, Summa Cum Laude

Affiliations: Operations Research Society of America

Gail Tabone, Senior Associate
Role: Assistant Project Leader, Quality Control
Years of Employment with EES: 25 years
M.S., Agricultural and Applied Economics, University of Minnesota / B.S., Economics, University of Minnesota

Gail has over 25 years of experience in short- and long-term utility planning related to both operations and financial analysis. Gail has managed projects concerning power supply planning, load aggregation, cost of service and rate analyses, and regulatory proceedings. Her experience includes power supply management for a large public utility. This project included load forecasting, optimization of resource and contract options, procurement and negotiations for power supply, power supply cost estimation, negotiating transmission contracts, auditing of scheduling and dispatching services, rate design and devising customer choice programs.

Gail participated in the deregulation process very early on when she assisted an Alberta municipal utility through the deregulation that occurred in that Province resulting in the establishment of a power pool and a grid operating company. She was involved in strategic planning and regulatory intervention for the utility and performed an unbundled cost of service study incorporating the new power supply and transmission costs.

Ms. Tabone participated in various aspects of changing utility regulation, from early deregulation in Alberta, pooling of transmission costs in Texas, and formation of CCAs in California. She has been involved in strategic planning and regulatory intervention for existing utilities facing changes in the industry structure and reviewing the feasibility of forming new utilities under CCA regulation in California. Gail is skilled at determining clients' needs in the changing utility environment. She develops unique approaches to the analysis of issues facing each client. While

her primary focus is economic, she also has a thorough knowledge of the technical issues related to power supply diversification.

Steven Andersen, Manager, Project Evaluations
Role: Power Supply Cost Estimation

Steve has over 20 years of experience in developing wholesale power supply pricing and financial analysis for electric utilities. Steve's broad knowledge of the engineering field enables him to handle technical issues and provide economic and technical analyses for utility and industrial clients of EES. He has evaluated power supply proposals for many utilities in the northwest. He has calculated the potential savings in total power supply costs offered by competing suppliers. With his background in power engineering, he is able to assess the technical barriers to potential savings in today's changing electric industry.

Steve has been responsible for managing the interplay of multiple power supply contracts for a major electric utility. He has monitored the hourly loads and power schedules of the utility and recommended changes to economically optimize the utility's various resources. He has also negotiated and implemented short and long-term power supply and transmission contracts on behalf of the utility.

Steve has prepared integrated resources plans for both large and small utilities and has performed resource feasibility studies for both utility and industrial clients. He has performed cost of service analyses for many utilities. This analysis includes developing rates for residential, commercial and large industrial customer classes. He has also audited the power supply costs of large industrial corporations and suggested options for reducing their overall costs.

Steve has experience monitoring gas and electric markets and recommending purchases based on potential savings in total power supply costs. He is familiar with the functionality of hourly, daily, monthly, and long-term energy markets. Steve is located in our Portland, Oregon office.

Education: B.S., Electrical Engineering, University of Washington

Amber Nyquist, Senior Project Manager
Role: Load Forecasting

Amber has over 10 years of experience providing analytical expertise for EES in support of economic and financial studies. She offers experience and knowledge to a wide range of topics related to regulated utilities. Her background includes cost of service analysis, electric rate design, wholesale rate setting, and other power supply costs or related information. She assists in Integrated Resource Planning as well as independent resource evaluation. Specific areas of expertise include demand-side and conservation resources, geothermal, wind, renewable energy credits, gas-fired, and other resources.

In addition to resource planning, Amber uses her background in econometrics and data analysis to develop load forecasts, normalize electric loads according to weather, and to develop market price forecasts. She also conducts conservation program evaluations and provides utilities with

statistically significant results, which assist in utility program planning, data collection, and presentation.

Finally, Amber and her staff have performed over 50 conservation potential assessment studies for electric utilities on the west coast. Amber is located in our Kirkland, Washington office.

> Education: M.A., Economics, Simon Fraser University; B.A., Economics, Western Washington University

Ted Light, Project Manager
Role: Analytical Support

Ted is a Project Manager with a specialty in energy efficiency and demand-side management. He brings nearly nine years of experience to EES, having worked previously for the Energy Trust of Oregon, the non-profit energy efficiency and renewable energy program administrator for Oregon's investor-owned utilities. He has expertise and knowledge on a broad array of energy efficiency program management and planning topics including: conservation/DSM potential assessments, conservation program planning, program data analysis, and cost-benefit analyses. Mr. Light is a Certified Energy Manager with the Association of Energy Engineers and holds a B.A. in Aerospace Engineering from Purdue University.

> Education: B.S., Aeronautical & Aerospace Engineering, Purdue University
>
> Certifications: Certified Energy Manager

Colin Cameron, Senior Analyst
Role: Analytical Support and Communications

Colin provides analytical expertise for EES on economic and regulatory issues. He brings experience in least-cost and econometric model development, benefit-cost analysis, and regulatory research.

Prior to joining EES, Colin worked on energy system modeling teams at the U.S. Environmental Protection Agency and the International Institute for Applied Systems Analysis in Vienna, Austria. In these roles, Mr. Cameron led analysis of energy subsidies, emission taxation, and rapid implementation of new power generation technologies. He has published research on water-energy nexus issues in the United States and on fuel affordability in South Asia. Colin is located in our Kirkland, Washington office.

> Education: M.S., Environmental Science and Engineering, University of North Carolina, Chapel Hill; B.A., Neuroscience and Behavior, Columbia University

Alison Levy, Senior Analyst
Role: Financial Proforma and Analysis

Alison Levy provides analytical and research expertise for EES in support of financial studies. Ms. Levy offers experience in a wide range of topics, including data analytics, strategy development, power plant facilities operation, emissions technology, and oil and gas processing. Prior to joining EES, Ms. Levy's experience included viability assessments of renewable energy storage and supply chain carbon emissions reduction, as well as many years performing engineering and economic analyses within the oil and gas industry.

> Education: M.B.A., University of Michigan, High Distinction; B.S., Chemical and Biomolecular Engineering, Cornell University

Vanir Staffing

Randy Britt, Principal
Role: Energy Program Support

Randy has over 35 years of experience developing and managing projects and programs in the sustainability areas of energy conservation, water use maximization, energy efficient building design and renewable energy. At Vanir, he is responsible for leading sustainability strategies and initiatives and overseeing energy efficiency and renewable energy sustainability projects across the United States. Notably, Randy provided feasibility studies for 20 MW at various Los Angeles Unified School District (LAUSD) locations.

> Education: Bachelor of Science, Illinois State University.
>
> Certifications: Leadership in Energy and Environmental Design (LEED) Accredited Professional; Green Business Certification.
>
> Affiliations: Construction Management Association of America's Sustainability Committee Chair; U.S. Green Building Council-Los Angeles (USGBC-LA) Chapter Board Member Emeritus; USGBC-LA Greenbuild Host Committee Co-Chair; Los Angeles Business Council Energy Committee member; Association of Energy Engineers member; Sustainable Remediation Forum member.

Howard Choy, Community Choice Technical Support
Role: Energy Program Support

Howard brings more than 30 years of diversified experience in the energy industry. He spent the past 17 years managing Los Angeles County's Office of Sustainability which oversees energy and environmental programs for both municipal operations and the Los Angeles County regional community budgeted at about $250 million per year. Notably, Mr. Choy acquired nearly $100 million for the County and the region in federal and state funding for these programs; including $25 million annually for the Southern California Regional Energy Network (SoCalREN). Mr. Choy initiated the County's Property Assessed Clean Energy (PACE) financing programs and led the

development of L.A. County's CCA initial assessments, Feasibility Study and plan for implementation. Mr. Choy also oversaw the County's energy-related legislative and regulatory efforts and is recognized as an industry leader in clean energy programs in the State legislature, California Public Utilities Commission, California Energy Commission, and within local government energy venues.

Education: Bachelor of Science, Mechanical Engineering, University of California at Berkeley.

Certifications: Registered Professional Engineer (Mechanical); Certified Energy Manager.

Affiliations: (all past) Local Government Sustainable Energy Coalition Board Chair; CA Energy Efficiency Coordinating Committee member; Los Angeles Regional Collaborative for Climate Action and Sustainability (LARC) Executive Committee member.

Jenny Whitson, Program Manager
Role: Energy Program Support

Jenny is a sustainability leader with over 15 years of industry experience focused on the built environment. She brings extensive knowledge of the integrated design process, program management, sustainable systems, renewable energy, materials, resiliency, benchmarking, and paybacks. Jenny successfully managed the sustainability program for the largest airport to be newly constructed within the last 40 years targeting challenging on-site renewable energy goals. She combines her design expertise and hands-on project management skills to drive programs to success. Her public agency projects include the New International Airport of Mexico City managing the design through construction phases for LEEDv4 Platinum certification; Honolulu Authority for Rapid Transportation, Airport Guideway and Stations developing their Sustainability Action Plan; Sound Transit, Link Operations and Maintenance Facility, Bellevue, WA developing preliminary energy modeling and life cycle cost analysis; Royal Commission Headquarters, Yanbu, Saudi Arabia managing constructability review and gap analysis for a 300,000 square foot LEEDV4 Platinum building goal.

Education: Master of Science, Sustainable Design, Philadelphia University; BAAS, Emphasis in Design, San Diego State University

Certifications: Certified Interior Designer, #7002; National Council for Interior Design Qualification, #30350; LEED Accredited Professional;

Affiliations: L.A. Resilience Initiative, Steering Committee Member; USGBC-LA Member

Project Approach/Methodology

EES President and CEO, Gary Saleba, will serve as Project Manager and Point of Contact for staff on this project. Gary has lead the EES team in the development of several CCE Feasibility Analyses for other municipal entities across California to date. Gail Tabone, Anne Falcon, and Steve Andersen all have over 25 years of relevant utility experience. Leveraging this experience, the Project Team can guarantee its ability to deliver results on schedule and on budget. EES will work closely with staff from the City to account for the City's priorities and concerns in the analysis. These priorities include offering competitive rates, creating local economic benefits, and reducing environmental impacts from electricity generation.

Our Project Team will then develop a load forecast, power supply scenarios, a comparative rates analysis, an economic impacts assessment, and a pro-forma analysis for the potential CCE. EES will also conduct an extensive sensitivity analysis exploring a range of possible outcomes for key variables in the analysis. This will be combined with an analysis of possible regulatory changes and risks to the CCE. Finally, the Project Team will explore possible models for the CCE's governance and management as well as funding.

Our Project Team will prepare the study such that the assumptions are consistent with following CCE goals:

- Rate parity or better with SCE, with lower rates over the study period.
- Energy portfolio content that has lower overall carbon content compared with the SCE portfolio.
- Meet or exceed California RPS.
- Differentiated energy options for default service with voluntary 100% renewable option.
- Provide energy purchase portfolio the excludes purchases of coal fired resource output.
- Energy portfolio that prioritizes the development of local renewable resources.
- Project development and ownership strategy that increases the development of renewable energy projects statewide.
- Maximize local renewable energy content, conservation, and distributed energy resources within the CCE portfolio.
- Develop a financially sustainable and flexible business model that supports investment in local development of distributed energy resources, energy efficiency, and conservation.
- Identify local economic and regional benefits of the CCE program.

Throughout the study process, the Project Team will check-in regularly with staff from the City to provide updates, solicit feedback, and ensure client expectations are fulfilled. The Project Team will document all methods and assumptions used in the analysis and provide the City with its analytical modeling tools to ensure that the City is comfortable with the model inputs and results. A draft study will be provided to the client for review at least three weeks before the agreed on final study submission date. The Project Team will then be available to present the study to staff,

City councils, or community groups as needed by the City. Each of the key components of the scope of work are detailed below.

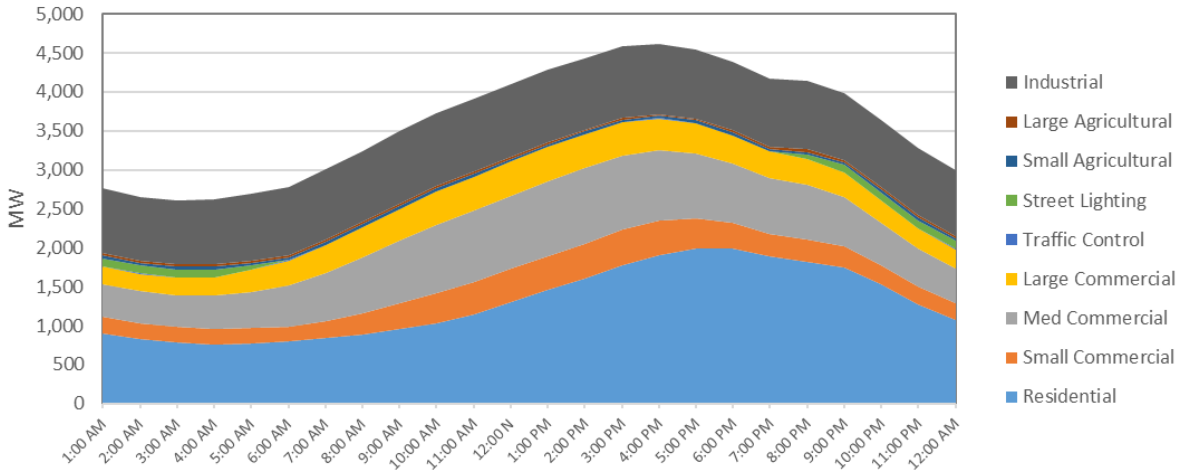
Task 1 – Program Development and Technical Study

Task 1.1 – Load Analysis

The Project Team will clean and verify the load data the City has already received from SCE and review whether or not additional data is needed. Load data will be aggregated by rate schedule for monthly energy use, peak demand, and number of accounts. Customers currently receiving Direct Access (DA) service will be excluded from the analysis, as these customers do not typically do not participate in CCEs. The Project Team will draw on the customer participation rates at other CCEs across California as well as local demographic factors to estimate a base-case opt-out rate for the City. The Project Team will model opt-out rates of at least 20% as the City requests. the Project Team will use energy use growth rate forecasts by the California Energy Commission to model a base-case scenario of load growth into the future.

The Project Team has already developed the model to process raw SCE customer data and translate it into the necessary load curves such as in Figure 2 below. The SCE load shapes will be reviewed to ensure any seasonal variations in customer types are accounted for (seasonal customers). The Project Team will use this model to estimate monthly peak demand for each rate class to determine the CCE's resource adequacy requirements (RAR). SCE standard transmission and distribution losses will then be applied to evaluate wholesale energy purchase needs. Load reduction from energy efficiency or distributed energy resources, such as from small-scale solar or from energy storage, will be modeled separately to allow for analysis of several scenarios based on economic and technical potential.

Figure 2
Sample Load Profile – Typical Summer Weekday Load Profile



Based on the load-forecast output, the Project Team will work with the City to develop a possible phase-in scenario for the CCE. CCE phases typically use rate schedule, account ownership, or

geographic regions to differentiate customers into groups for a staggered CCE roll-out that can then be implemented more smoothly than if all accounts were launched simultaneously.

EES will summarize the resulting forecast in a format suitable to support power solicitation. Load scenarios will be developed that address the impact of new, high energy demand industries. Load data will be summarized according to energy and peak demand requirements, losses, geography, renewable energy requirements, and resource adequacy. Energy requirements will be utilized to identify resource needs including an evaluation of CAISO prices.

Task 1.2 – SCE Rate Analysis

Electricity rates for CCE customers include three components: the CCE's cost of generation, SCE's cost for transmission and distribution (T&D), and regulated charges such as the Power Charge Indifference Adjustment (PCIA) an exit fee. Based on the outputs of the load forecast and CCE power supply scenario analysis, EES will develop a rate projection for each of these components for the potential CCE, as well as the competing SCE rates in 5 year increments out to 20 years.

The Project Team will project SCE's power supply rate based on SCE's latest power supply filings, procurement strategy, projected generation costs, and RPS requirements. SCE's T&D rates will be forecast based on distribution system investment trends, recent rate filings, and the revenue requirements stated in SCE's most recent California Public Utilities Commission (CPUC) filing.

Additional sources of variability, such as high and low gas and hydro pricing, rate restructuring, hydro scenarios, and larger economic trends will be explored as part of a sensitivity analysis. All rate forecast assumptions will be discussed with City staff and stake holders to reach an agreement on the inputs to SCE rate projections

As part of the feasibility test, the Project Team will prepare utility rate forecasts for continued SCE service. Additionally, the Project Team will review historic SCE tariffs and energy costs to evaluate the sustainability of the CCE to withstand future recessions. The stability of the CCE will be evaluated per the risk assessment discussed later in this scope.

The Project Team will also evaluate the range of possible regulated surcharge costs, such as for the PCIA. The PCIA is a charge enforced by the CPUC to ensure that stranded generation costs are not disproportionately passed on to SCE's remaining bundled customers as CCEs are formed. The Project Team monitors all CCE-relevant CPUC proceedings very closely to ensure our regulated charge forecast accounts for the most up-to-date regulations. The sensitivity analysis will also explore a range of possible PCIA rates and scenarios.

Task 1.3 – Preferred Supply Portfolio Selection & Sensitivity Analysis

The Project Team will work with staff from the City to develop multiple power supply scenarios that match the needs and priorities of the four communities. Scenarios may vary in their share of renewable energy, greenhouse-gas free energy, locally generated energy, and use of specific generation technologies. All scenarios will consider that consumers would be able to opt-up to a

100% renewable option, which would be offered on a premium, voluntary basis, with a substantial portion of the electricity from in-State and local renewable resources. The participation rates for 100% renewable programs will be based on the participation rates for currently operating CCEs (Lancaster, MCE, Sonoma, etc.). The following scenarios will be modeled:

- **Option 1:** Match SCE's share of RPS-compliant and GHG-free generation.
- **Option 2:** Minimum 33% RPS per 2020 RPS.
- **Option 3**: Minimum 50% California Qualified Renewable Portfolio with less GHG intensity than SCE.
- **Option 4**: 50% renewable and build to 80% by the end of year 5 (California eligible renewables).

The project team will review potential electric service providers, the cost of using these power sources, and their capacity to serve the City. The cost of service will be quantified under each scenario, and related rate impacts and estimates of the projected costs for each supply portfolio scenario will be provided. To evaluate such local opportunities for the CCE, the project team will correspond with potential electric service providers to determine indicative pricing, as well as CAISO and administrative costs. This analysis will also estimate costs associated with scheduling and ancillary services. The portfolio analysis will also estimate the GHG emissions reductions of each power supply scenario to ensure the resource portfolios meet each jurisdiction's GHG reduction goals.

The energy procurement analysis will explore alternative supply options such as energy efficiency programs and local renewable projects (e.g., net energy metering, distributed generation, community solar, etc.). The Study shall address the CA energy marketplace with respect to the local development of a variety of distributed energy resources (DERs). Within CA a number of programs and opportunities exist and are being developed for deployment of DERs. The Study will assess these opportunities within the CA Public Utilities Commission (under existing IOU grid programs and solicitations, and under ongoing DER proceedings), the CA Energy Commission (through EPIC and other grant programs), the CA Independent System Operator (under existing grid management programs and development of additional DERs integration markets), the investor-owned utilities as grid operators, and for CCAs themselves as load serving entities.

CCAs have access to CPUC energy efficiency funding, and possibly other CPUC program funding. EES will analyze energy portfolios that incorporate energy efficiency and demand response programs in aggressive reduced consumption goals. As part of serving customer loads and developing resource plans, CCAs may procure the benefits of DERs, incentivize their development, or participate in existing and future market programs that similarly seek to deploy DERs. Additionally, as local governments, CCAs may access government program funding available under Cap & Trade and other State clean energy programs. The Study shall address these opportunities in detail.

The Project Team will examine CCE viability under a wide range of values for all key inputs in the analysis. This analysis will ensure that the recommended resource plan is appropriate under

unexpected market and regulatory conditions. The sensitivity analysis will include the following variables:

- Market prices for conventional and renewable energy (high and low price scenarios for gas, hydro, solar, etc.)
- Program phase-in at varying supply levels
- Changes in SCE generation rates, Power Charge Indifference Adjustment (PCIA), and other customer surcharges
- Customer participation rates
- Rate sensitivity to the inclusion of local renewable generation, energy efficiency, demand response, and demand reduction programs
- Identification of any anomalies, either challenges or opportunities, in the service area related to geographic, demographic, or economic circumstances

The Project Team will discuss the assumptions and planned operational/organization elements of the CCE with City staff to develop accurate cost projections. All assumptions will be cost-based and clearly documented for each power supply portfolio scenario. The results will be discussed with City staff and stakeholders. The Project Team will prepare presentation materials showing cost comparisons and projected environmental impacts such as GHG emissions and present to stakeholders and the City Council.

Task 1.4 – Cost of Service Analysis

Now that many CCEs have been launched or the Project Team will prepare a cost of service projection based on best practices and professional experience on how to best achieve CCE program goals at minimum risk to the City. The Project Team will estimate operating and administrative costs for running the CCE and develop a proforma analysis that can be continually updated as the City moves from feasibility to implementation. Costs (budget items) to be included in the proforma include:

- Load forecasts
- Power supply costs
- Start-up costs
- Capital costs
- Operating and maintenance such as administration and general; staff; external technical, marketing, public relations, and legal support; billing, metering, and collections; customer service and data management; and scheduling and coordination.
- Uncollected accounts
- Financial reserves and debt service coverage ratios
- CCE bonding for re-entry fees
- SCE surcharges and cost recovery (exit fees)

The Project Team will detail collection of reserves to provide emergency rate stabilization for the CCE in the future. These operating costs will be based on the operating costs of existing CCEs and scaled for the size of the program. Based on these expenses, the Project Team will estimate the

total CCE revenue requirement and resulting unit costs for 20-years of operation. The analysis will address the minimum viable number of customers for each CCE. The Project Team will also explore the benefits of different possible phasing strategies. To tie these components together, the pro-forma will develop a cost-benefit analysis of the potential program.

In addition, the Project Team will develop multiple financing plans for major capital expenditures and credit facilities, including additional debt and cash requirements. For each financing plan, the project team will determine the impact of projected revenues and expenses on the CCA's debt-related financial ratios. If the financial targets are not met, the plan will identify deficiencies in revenues and the resulting needed rate changes.

The Project Team will also identify strategies to minimize program costs. For example, behind the meter demand-side management costs may be reduced by offering a standardized menu of options from which all CCA participants may select. By standardizing options, the administrative and implementation costs can be reduced without diminishing the benefits of the programs. A second cost minimization strategy is to arrange power procurement, scheduling, dispatching, and balancing with an entity that already provides these services to other electric utilities.

The resulting CCE program rates will be compared with SCE rate forecasts to determine if the CCE program is financially feasible over 5-, 10-, 15-, and 20-year terms.

Task 1.5 – Risk Analysis

The Project Team will evaluate a range of risks and risk mitigation strategies associated with CCA formation and operation. The risk analysis will evaluate which parameters result in CCE retail rates that are no greater than SCE rates over the study period. The analysis will address challenges faced by existing CCAs, as well as those anticipated for new CCAs over the next 10 to 20 years. For each risk category identified in the RFP, the study will describe causes, effects, potential impact, likelihood of occurrence, and strategies to mitigate them. Based on the results of this analysis, risks can then be anticipated and addressed through changes in program policy, contract terms, insurance, financing, and modification of management practices. Specific risks to be analyzed include:

- Risk of over- or under-procurement of electric power
- Market availability of renewable power
- Regulatory and legislative changes impacting CCA financial viability
- Financing and debt risks
- Financing of renewable and distributed energy resource (DER) facilities
- Power Charge Indifference Adjustment (PCIA) and other regulated surcharges
- Labor cost risk
- Changes in federal energy policy
- Large opt-out rate
- CCE failure

The Project Team is a party on many key CCE-related proceedings at the California Public Utilities Commission and continuously monitors activity on key issues at the California Energy Commission and California Air Resources Board. In addition, the Project Team monitors federal energy policies, such as the Investment Tax Credit (ITC) for solar developers and the possible solar import tariff. Changes in energy regulation at the state and local level can have significant impacts on CCE viability. The Project Team will evaluate these regulatory risks and provide guidance on their likelihood and potential impacts.

Task 1.6 – Report of Technical Study Results

The Project Team will provide regular updates on the progress of the project. In the past, the Project Team has held weekly calls with the client to provide these updates, discuss key decisions, and solicit feedback. We can work around any update schedule requested by the City. As noted above, the Project Team will involve staff from the City to ensure the study design, power portfolio scenarios, and other key decisions are consistent with the vision of the Cities. Key decisions and discussions will be documented for reference by City staff. The Project Team will then provide a draft Technical Study in MS Word format as well as a draft pro-forma model in MS Excel for Staff review. We will also make our work available to a third-party reviewer as needed, which we've done for several previous CCE Feasibility studies.

After review is complete, the Project Team will provide a final version of the study and the pro-forma model. The Project Team will present the study findings to staff, City Councils, or community groups as needed. Finally, the Project Team will support the City in educating local stakeholders and presenting the draft Plan at up to six community events. The Project Team members have extensive experience developing web sites, providing collateral materials, and supporting public meetings and events to introduce energy programs. The Project Team stands ready to provide additional services beyond the scope of this proposal to support the development of the CCE. The scope and costs of these additional services will be negotiated separately and will not be performed until the City has issued the appropriate authorization.

The first draft will be provided to City staff no later than May 7, 2018. Subsequent drafts will be provided based on City staff comments. A final report will be delivered by June 1, 2018 once the City staff have approved of all changes. The Project Team will also prepare presentation materials for stakeholder and City Council meetings.

Task 1.7 – Developing Support Information for City Council and Community Engagement

Perhaps the greatest benefit of a CCA is to bring economic vitality to the communities it serves. The project team will use an economic input-output model to estimate the magnitude of CCA impacts on the economy. Specifically, the Project Team will use the National Renewable Energy Laboratory's (NREL) Jobs and Economic Development Impact (JEDI) model to evaluate the impact of local projects on jobs, and increased local spending. In addition, the project team will estimate the benefit to the local economy of trickle-down effects due to any bill savings to CCA customers. These bill savings will be evaluated using MIG's IMPLAN input-output model. Potential economic impacts will be reviewed and presented as appropriate.

Currently there is a high level of interest in CCE programs and many jurisdictions are in various stages of studying and implementation. The Project Team will provide a summary of other Orange County municipalities interested in CCE programs and identify opportunities for coordination. Cooperation with other municipalities can reduce administration costs meanwhile achieving common goals such as local control. The Project Team will assess the possibility of forming a joint powers agreement with other interested jurisdictions.

The Project Team is well versed in the presentation and education of community members, groups, and officials regarding CCE programs. Based on our experience in both feasibility and implementation plans, the Project Team can provide a comprehensive analysis of CCE program challenges and benefits over time. As the feasibility study progresses, the Project Team will assist the City in refining CCE program timelines, priorities, and goals. As cost estimates are refined and market conditions change, CCE program goals may need to be adjusted and timelines adjusted to allow for least cost and least risk planning. The Project Team will assist the City in navigating launch timelines, operational structures, and power supply planning as the planning environment evolves.

Prior to program implementation, the Project Team will present the results of the Technical Study to the City Council.

Task 2 – Implementation Plan

Provided that the City Council moves forward with the CCE program, the Project Team will provide the services detailed under Task 2, Implementation Plan.

Task 2.1 – Implementation Plan/Perform All Regulatory Functions

The Project Team will manage and complete all functions necessary to comply with CPUC regulations related to launching the CCE program. Most importantly, the Project Team will develop and submit an implementation plan that covers all aspects of the program set-up and operation such as process and consequences of aggregation, define organization structure and funding, develop rates and define costs to participants, detail disclosure and due process in rate setting and cost allocation to participants, describe methodology for entering and terminating agreements with other entities, define participant rights and responsibilities, termination of the program, and describe third parties electric suppliers including financial, technical, and operational capabilities.

The Implementation Plan will include a statement of intent, per CPUC regulations, stating that the program will provide universal access, reliability, equitable treatment to all classes of customers, and meet all other requirements established by the CPUC. The Project Team will both draft the Implementation plan and revise if necessary to achieve certification. Our Project Team has done several Implementation Plans and all have been certified by the CPUC.

Task 2.2 – CCE Organizational Infrastructure

EES will assist the City in developing necessary organization documents and structures to successfully operate the CCE including:

1. Business and operations plan
2. Operational policies and procedures
3. Committee structures and processes
4. Independent review and oversight of contractor and City staff activities and recommendations

The project team will evaluate three CCE governance structures: a CCE operated by a Joint Powers Authority (JPA) formed between the four likely CCE member governments, four separate, individual CCEs, or joining an existing CCE, such as in the City of Solana Beach, the City of San Diego, or another potential SCE area CCEs. EES will discuss the pros and cons of each structure as they pertain to management efficiency and effectiveness, financial impacts, and decision-making autonomy and discretion. Strategies to customize programs within each jurisdiction will also be discussed. EES will also discuss different management and staffing strategies for the CCE, ranging from a completely internally staffed program to a maximally outsourced program. The project team examined similar scenarios for governance and operation of CCEs in Los Angeles County, San Bernardino and Riverside Counties, and the City of San José.

EES' experience in establishing organizational infrastructure for both LACCE and EBCE will assist the City in developing infrastructure that reflects best practices and recent experience.

Task 2.3 – Customer Engagement

EES will support the City in educating local stakeholders and presenting the Plan at up to ten community events. EES members have extensive experience developing web sites, providing collateral materials, and supporting public meetings and events to introduce energy programs.

Task 2.4 – Rate Setting & Distributed Generation Policies

The proforma developed under Task 1 will be updated and used to assist the City in developing rates for each class. Generally, the initial rates for CCE programs reflect incumbent rates, but lower. Additional programs such as feed-in-tariff (FIT) and net energy metering rate will be developed as well. These rate schedules and policies will encourage the development of renewable energy projects in the County. The proforma will also be updated as necessary to develop rates for the CCE's 100% renewable energy choice.

Schedule

EES will complete a draft feasibility analysis by May 8. EES will then solicit feedback and comments from the staff managing the project, implement those changes, and turn around a final report. The expected schedule for Task 1 is detailed in the following chart.

	April				May				June			
Notice to Proceed	2-Apr											
Receive Process and Validate Data												
Task 1 Technical Study												
1.1 Load Study												
1.2 SCE Rate Analysis												
1.3 Portfolio Selection & Sensitivity												
1.4 Cost of Service Analysis												
1.5 Risk Analysis												
1.6 Report of Technical Study Results												
Draft Report						8-May						
Final Report									1-Jun			
Presentation City Council												
1.7 Information and Community Engagement												

A detailed schedule for Task 2 is provided below. The following indicative assumes that the City would elect to proceed with a CCA as a single jurisdiction. An additional schedule illustrating steps to form a JPA with other Orange County municipalities can be provided at the City's request. In addition, this schedule assumes that the City would target a January 1, 2020 to start of CCA service. This schedule is based on the recently approved CPUC Resolution E-4907, which prevents CCAs that have not yet submitted an Implementation Plan to the CPUC as of March 1, 2018 from launching service prior to January 1, 2020. The schedule could be truncated if these regulatory requirements are amended.

City of Irvine CCA Implementation Schedule

		2018							2019												2020		
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Decision to Proceed	City Votes to Proceed with CCA Implementation	■																					
Personnel	Post Job Opening for Executive Director		■																				
	Select Executive Director and Negotiate Contract			■																			
	Staff Recruitment				■	■	■	■															
Regulatory Compliane	Develop Implementation Plan					■	■																
	City approves Implementation Plan							■															
	File Implementation Plan with CPUC							■															
	CPUC certifies implementation plan							■	■	■													
	Complete Service Agreement with SCE									■													
	Submit Surety Bond and Register with CPUC										■												
	Submit Year-Ahead Resource Adequacy Load Forecast											■											
Consultant Solicitation	Develop RFPs: Financing, Data Mngr, Portfolio Mngr & SC							■															
	Issue RFPs: Financing, Data Mngr, Portfolio Mngr & SC								■	■													
	Negotiate Contracts										■	■											
	City approves contracts												■										
	Power Supply RFP													■	■	■							
	Set Rates																■						
	Prep Systems and Call Center																■	■					
Service Launch and Customer Outreach	Opt Out notice 1																		■				
	Opt Out Notice 2																			■			
	Phase 1 Launch of Service																				■		
	Opt Out notice 3																					■	
	Opt Out Notice 4																						■

EES Consulting

July 3, 2018

Ms. Angie Burgh
Senior Management Analyst
City of Irvine
One Civic Center Plaza
Irvine, California 92606

SUBJECT: Addendum: CCE Feasibility and Technical Assessment Proposal

Dear Ms. Burgh:

EES Consulting, Inc. (EES) received the City's request for a detailed cost break-out by task, hours, and staff member. The tables attached to this letter provide this cost break-out for Tasks 1 and 2. For the cost allocation to Great Park, we estimate that 6.5% of the budget should be allocated to the park based on an estimate of kWh consumption for the Great Park as a share of total City consumption. This allocation may be updated at a later date when kWh information is made available.

Thank you for your consideration and please do not hesitate to contact us with any questions.

Very truly yours,

Gary Saleba
President/CEO

570 Kirkland Way, Suite 100
Kirkland, Washington 98033

Telephone: 425 889-2700 Facsimile: 425 889-2725

A registered professional engineering corporation with
offices in Kirkland, WA; Portland, OR; and La Quinta, CA.

Task	Hours	Rate	Total Cost	Great Park Share (6.5%)	City Share (93.5%)
1.1 Load Study and Forecast					
Amber Nyquist, Senior Project Manager	20	$235.00	$4,700.00	$305.50	$4,394.50
Kyle Morrill, Senior Analyst	24	$225.00	$5,400.00	$351.00	$5,049.00
Task 1.1 Subtotal			*$10,100.00*	$656.50	$9,443.50
1.2 SCE Rate Analysis					
Anne Falcon, Senior Associate	8	$245.00	$1,960.00	$127.40	$1,832.60
Amber Nyquist, Senior Project Manager	12	$235.00	$2,820.00	$183.30	$2,636.70
Task 1.2 Subtotal			*$4,780.00*	*$310.70*	*$4,469.30*
1.3 Portfolio Selection & Sensitivity					
Gary Saleba, President/CEO	8	$250.00	$2,000.00	$130.00	$1,870.00
Steve Andersen, Manager	54	$240.00	$12,960.00	$842.40	$12,117.60
Task 1.3 Subtotal			*$14,960.00*	*$972.40*	*$13,987.60*
1.4 Cost of Service					
Gary Saleba, President/CEO	5	$250.00	$1,250.00	$81.25	$1,168.75
Anne Falcon, Senior Associate	40	$245.00	$9,800.00	$637.00	$9,163.00
Kyle Morrill, Senior Analyst	40	$225.00	$9,000.00	$585.00	$8,415.00
Task 1.5 Subtotal			*$20,050.00*	*$1,303.25*	*$18,746.75*
1.5 Risk Analysis					
Anne Falcon, Senior Associate	10	$245.00	$2,450.00	$159.25	$2,290.75
Steve Andersen, Manager	5	$240.00	$1,200.00	$78.00	$1,122.00
Kyle Morrill, Senior Analyst	10	$225.00	$2,250.00	$146.25	$2,103.75
Zac Yañez, Senior Analyst	20	$225.00	$4,500.00	$292.50	$4,207.50
Task 1.5 Subtotal			*$10,400.00*	*$676.00*	*$9,724.00*
1.6 Report of Technical Study Results					
Gary Saleba, President/CEO	4	$250.00	$1,000.00	$65.00	$935.00
Anne Falcon, Senior Associate	8	$245.00	$1,960.00	$127.40	$1,832.60
Steve Andersen, Manager	4	$240.00	$960.00	$62.40	$897.60
Kyle Morrill, Senior Analyst	8	$225.00	$1,800.00	$117.00	$1,683.00
Howard Choy, Subconsultant, Vanir	20	$150.00	$3,000.00	$195.00	$2,805.00
Subtotal Task 1.6			*$8,720.00*	*$566.80*	*$8,153.20*
1.7 Information & Community Engagement					
Gary Saleba, President/CEO	8	$250.00	$2,000.00	$130.00	$1,870.00
Anne Falcon, Senior Associate	8	$245.00	$1,960.00	$127.40	$1,832.60
Kyle Morrill, Senior Analyst	20	$225.00	$4,500.00	$292.50	$4,207.50
Subtotal Task 1.7			*$8,460.00*	*$549.90*	*$7,910.10*
GRAND TOTAL	**336**		**$77,470.00**	**$5,035.55**	**$72,434.45**

Task	Hours	Rate	Total Cost	Great Park Share (6.5%)	City Share (93.5%)
2.1 Implementation Plan					
Gary Saleba, President/CEO	8	$250.00	$2,000.00	$130.00	$1,870.00
Anne Falcon, Senior Associate	8	$245.00	$1,960.00	$127.40	$1,832.60
Steve Andersen, Manager	16	$240.00	$3,840.00	$249.60	$3,590.40
Amber Nyquist, Senior Project Manager	20	$235.00	$4,700.00	$305.50	$4,394.50
Kyle Morrill, Senior Analyst	36	$225.00	$8,100.00	$526.50	$7,573.50
Howard Choy, Subconsultant, Vanir	30	$150.00	$4,500.00	$292.50	$4,207.50
Task 2.1 Subtotal			*$25,100.00*	*$1,631.50*	*$23,468.50*
2.2 CCE Org Infrastructure					
Gary Saleba, President/CEO	10	$250.00	$2,500.00	$162.50	$2,337.50
Anne Falcon, Senior Associate	12	$245.00	$2,940.00	$191.10	$2,748.90
Steve Andersen, Manager	8	$240.00	$1,920.00	$124.80	$1,795.20
Kyle Morrill, Senior Analyst	10	$225.00	$2,250.00	$146.25	$2,103.75
Task 2.2 Subtotal			*$9,610.00*	*$624.65*	*$8,985.35*
2.3 Customer Engagement					
Gary Saleba, President/CEO	2	$250.00	$500.00	$32.50	$467.50
Anne Falcon, Senior Associate	2	$245.00	$490.00	*$31.85*	*$458.15*
Kyle Morrill, Senior Analyst	18	$225.00	$4,050.00	*$263.25*	*$3,786.75*
Task 2.3 Subtotal			*$5,040.00*	*$327.60*	*$4,712.40*
2.4 Rate Setting					
Anne Falcon, Senior Associate	20	$245.00	$4,900.00	$318.50	$4,581.50
Steve Andersen, Manager	8	$240.00	$1,920.00	$124.80	$1,795.20
Amber Nyquist, Senior Project Manager	16	$235.00	$3,760.00	$244.40	$3,515.60
Task 2.4 Subtotal			*$10,580.00*	*$687.70*	*$9,892.30*
GRAND TOTAL	**224**		**$50,330.00**	**$3,271.45**	**$47,058.55**

AGREEMENT FOR CONTRACT SERVICES

THIS AGREEMENT FOR CONTRACT SERVICES (the "Agreement") is made and entered into as of _____ by and between the CITY OF IRVINE, a municipal corporation ("City"), and Integral Group, Inc., a California corporation ("Contractor"). (The term Contractor includes professionals performing in a consulting capacity.)

PART I

FUNDAMENTAL TERMS

A. Location of Project: The City of Irvine location(s) as set forth in PART IV, Scope of Services, included herein.

B. Description of Services/Goods to be Provided: Develop Strategic Energy Plan in accordance with PART IV, Scope of Services, included herein (reference RFP 18-1379).

C. Term: Unless terminated earlier as set forth in this Agreement, the services shall commence on _____ ("Commencement Date") and shall continue through _____.

D. Party Representatives:

D.1. The City designates the following person/officer to act on City's behalf: Angie Burgh, email: aburgh@cityofirvine.org.

D.2. The Contractor designates the following person to act on Contractor's behalf: Andrea Traber, email: atraber@integralgroup.com.

E. Notices: Contractor shall deliver all notices and other writings required to be delivered under this Agreement to City at the address set forth in Part II ("General Provisions"). The City shall deliver all notices and other writings required to be delivered to Contractor at the address set forth following Contractor's signature below.

F. Attachments: This Agreement incorporates by reference the following Attachments to this Agreement:

F.1.	Part I:	Fundamental Terms
F.2.	Part II:	General Provisions
F.3.	Part III:	Special Provisions
F.4.	Part IV:	Scope of Services
F.5.	Part V:	Budget

G. Integration: This Agreement represents the entire understanding of City and Contractor as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with regard to those matters covered by this Agreement. This Agreement supersedes and cancels any and all previous negotiations, arrangements, agreements, and understandings, if any, between the parties, and none shall be used to interpret this Agreement.

IN WITNESS WHEREOF, the parties have executed and entered into this Agreement as of the date first set forth above.

CITY OF IRVINE

By: _____

Its: Director of Public Works

By: _____
John A. Russo

Its: City Manager

Attest:

By:

_____
Molly McLaughlin
City Clerk

APPROVED AS TO FORM:
RUTAN & TUCKER, LLP

Jeffrey Melching

INTEGRAL GROUP, INC.

By: _____

Its: _____

By: _____

Its: _____

Contractor Information
Address for Notices and Payments:
15760 Ventura Blvd., Suite 1902
Encino, CA 91436

Attn: Andrea Traber
Telephone:
Email: atraber@integralgroup.com

PART II

GENERAL PROVISIONS

SECTION ONE: SERVICES OF CONTRACTOR

1.1 Scope of Services. In compliance with all terms and conditions of this Agreement, Contractor shall provide the goods and/or services shown on Part IV hereto ("Scope of Services"), which may be referred to herein as the "services" or the "work." If this Agreement is for the provision of goods, supplies, equipment or personal property, the terms "services" and "work" shall include the provision (and, if designated in the Scope of Services, the installation) of such goods, supplies, equipment or personal property.

1.2 Changes and Additions to Scope of Services. City shall have the right at any time during the performance of the services, without invalidating this Agreement, to order extra work beyond that specified in the Scope of Services or make changes by altering, adding to, or deducting from said work. No such work shall be undertaken unless a written order is first given by City to Contractor, incorporating therein any adjustment in (i) the Budget, and/or (ii) the time to perform this Agreement, which adjustments are subject to the written approval of the Contractor. City approval and/or payment for work claimed by Contractor as changed or additional shall not act to prevent City at any time to claim such work is covered by the Scope of Work and should be performed by Contractor without additional consideration due. It is expressly understood by Contractor that the provisions of this Section 1.2 shall not apply to services specifically set forth in the Scope of Services or reasonably contemplated therein. Contractor hereby acknowledges that it accepts the risk that the services to be provided pursuant to the Scope of Services may be more costly or time consuming than Contractor anticipates and that Contractor shall not be entitled to additional compensation therefor.

1.3 Standard of Performance. Contractor agrees that all services shall be performed in a competent, professional, and satisfactory manner in accordance with the standards prevalent in the industry, and that all goods, materials, equipment or personal property included within the services herein shall be of good quality, fit for the purpose intended.

1.4 Performance to Satisfaction of City. Notwithstanding any other provision herein, Contractor agrees to perform all work to the satisfaction of City within the time specified. If City reasonably determines that the work is not satisfactory, City shall have the right to take appropriate action, including but not limited to: (i) meeting with Contractor to review the quality of the work and resolve matters of concern; (ii) requiring Contractor to repeat unsatisfactory work at no additional charge until it is satisfactory; (iii) suspending the delivery of work to Contractor for an indefinite time; (iv) withholding payment; and (v) terminating this Agreement as hereinafter set forth.

1.5 Instructions from City. In the performance of this Agreement, Contractor shall report to and receive instructions from the City's Representative designated in Paragraph D.1 of Part I ("Fundamental Terms") of this Agreement. Tasks or services other than those specifically described in the Scope of Services shall not be performed without the prior written approval of the City's Representative.

1.6 Familiarity with Work. By executing this Agreement, Contractor warrants that Contractor (i) has thoroughly investigated and considered the scope of services to be performed, (ii) has carefully considered how the services should be performed, and (iii) fully understands the

facilities, difficulties, and restrictions attending performance of the services under the Agreement. If the services involve work upon any site, Contractor warrants that Contractor has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services hereunder. Should the Contractor discover any conditions, including any latent or unknown conditions, which will materially affect the performance of the services hereunder, Contractor shall immediately inform the City of such fact in writing and shall not proceed except at Contractor's risk until written instructions are received from the City's Representative.

1.7 Identity of Persons Performing Work.

(A) Contractor represents that it employs or will employ at its own expense all personnel required for the satisfactory performance of any and all tasks and services required hereunder. Any personnel performing the services under this Agreement on behalf of Contractor shall at all times be under Contractor's exclusive direction and control. Contractor shall pay all wages, salaries, and other amounts due such personnel in connection with their performance of services under this Agreement and as required by law.

(B) Contractor represents that the tasks and services required hereunder will be performed by Contractor or under its direct supervision, and that all personnel engaged in such work shall be fully qualified and shall be authorized and permitted under applicable State and local law to perform such tasks and services. Contractor will exclusively determine the means, methods and details of performing the services subject to the requirements of this Agreement.

(C) This Agreement contemplates the personal services of Contractor and Contractor's employees, and it is recognized by the parties hereto that a substantial inducement to City for entering into this Agreement was, and is, the professional reputation and competence of Contractor. Neither this Agreement nor any interest therein may be assigned by Contractor, except upon written consent of City.

1.8 Prohibition Against Subcontracting or Assignment. Contractor shall not contract with any other entity to perform in whole or in part the services required hereunder without the express written approval of City. In addition, neither the Agreement nor any interest herein may be transferred, assigned, conveyed, hypothecated, or encumbered voluntarily or by operation of law, whether for the benefit of creditors or otherwise, without the prior written approval of City. In the event of any unapproved transfer, including any bankruptcy proceeding, City may void the Agreement at City's option in its sole and absolute discretion. No approved transfer shall release any surety of Contractor of any liability hereunder without the express written consent of City.

SECTION TWO: INSURANCE AND INDEMNIFICATION

2.1 Insurance. Without limiting Contractor's indemnification obligations, Contractor shall procure and maintain, at its sole cost and for the duration of this Agreement, insurance coverage as provided below, against all claims for injuries against persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees, and/or subcontractors. In the event that Contractor subcontracts any portion of the work in compliance with Section 1.8 of this Agreement, the contract between the Contractor and such subcontractor shall require the subcontractor to maintain the same policies of insurance that the contractor is required to maintain pursuant to this Section 2.1.

2.1.1 <u>Insurance Coverage Required</u>. The policies and amounts of insurance required hereunder shall be as follows:

A. Comprehensive General Liability Insurance which affords coverage at least as broad as Insurance Services Office "occurrence" form CG 00 01 including completed operations and contractual liability, with limits of liability of not less than $1,000,000 per occurrence and $2,000,000 annual aggregate for liability arising out of Contractor's performance of this Agreement. The limits shall be provided by either a single primary policy or combination of policies. If limits are provided with excess and/or umbrella coverage the limits combined with the primary will equal the minimum limits set forth above. If written with an aggregate, the aggregate shall be double the each occurrence limit. Such insurance shall be endorsed to:

(1) Name the City of Irvine and its employees, representatives, officers and agents (collectively hereinafter "City and City Personnel") as additional insured for claims arising out of Contractor's performance of this Agreement.

(2) Provide that the insurance is primary and non-contributing with any other valid and collectible insurance or self-insurance available to City.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement.

B. Automobile Liability Insurance with a limit of liability of not less than $1,000,000 each occurrence and $1,000,000 annual aggregate. The limits shall be provided by either a single primary policy or combination of policies. If limits are provided with excess and/or umbrella coverage the limits combined with the primary will equal the minimum limits set above. Such insurance shall include coverage for all "owned," "hired" and "non-owned" vehicles, or coverage for "any auto." Such insurance shall be endorsed to:

(1) Name the City of Irvine and its employees, representatives, officers and agents as additional insured for claims arising out of Contractor's performance of this Agreement.

(2) Provide that the insurance is primary and non-contributing with any other valid and collectible insurance or self-insurance available to City.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement.

C. Workers' Compensation Insurance in accordance with the Labor Code of California and covering all employees of the Contractor providing any service in the performance of this agreement. Such insurance shall be endorsed to:

(1) Waive the insurer's right of Subrogation against the City and City Personnel.

A statement on an insurance certificate will not be accepted in lieu of the actual endorsement unless your insurance carrier is the State of California Insurance Fund (SCIF) and the endorsement numbers 2570 and 2065 are referenced on the certificate of insurance.

Contractor's completion of the form attached hereto as Exhibit 1 shall be a condition precedent to Contractor's rights under this Agreement. Should Contractor certify, pursuant to Exhibit 1, that, in the performance of the work under this Agreement, it shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, Contractor shall nonetheless maintain responsibility for requiring that any subcontractors performing work under this Agreement have and maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the work performed under this Agreement.

D. Professional Liability Insurance with minimum limits of $1,000,000 each claim. Covered professional services shall include all work performed under this Agreement and delete any exclusion that may potentially affect the work to be performed.

E. Evidence of Insurance: Contractor shall provide to City a Certificate(s) of Insurance evidencing such coverage together with copies of the required policy endorsements no later than five (5) business days prior to commencement of service and at least fifteen (15) business days prior to the expiration of any policy. Coverage shall not be suspended, voided, cancelled, reduced in coverage or in limits, non-renewed, or materially changed for any reason, without thirty (30) days prior written notice thereof given by the insurer to City by U.S. mail, or by personal delivery, except for nonpayment of premiums, in which case ten (10) days prior notice shall be provided.

The City project title or description MUST be included in the "Description of Operations" box on the certificate.

The City's insurance certificate tracking services provider, Exigis, LLC, will send Contractor an email message providing instructions for submitting insurance certificates and endorsements.

Certificate Holder:

City of Irvine, California
c/o: Exigis LLC
PO Box 4668 ECM #35050
New York, NY 10168-4668

F. Endorsements: A statement on an insurance certificate will not be accepted in lieu of the actual endorsement. Insurance policies shall not be in compliance if they include any limiting provision or endorsement that has not been submitted to the City for approval.

Additional Insured Endorsements shall not:

1. Be limited to "Ongoing Operations"
2. Exclude "Contractual Liability"
3. Restrict coverage to the "Sole" liability of Contractor
4. Contain any other exclusion contrary to the Agreement.

G. Any Deductible in Excess of $50,000 and/or Self-Insured Retentions must be approved in writing by the City.

H. Acceptability of Insurers. Each policy shall be from a company with current A.M. Best's rating of A- VII or higher and authorized to do business in the State of California, or otherwise allowed to place insurance through surplus lines brokers under applicable provisions of the California Insurance Code or any federal law. Any other rating must be approved in writing by the City.

I. Insurance of Subcontractors. Contractor shall be responsible for causing Subcontractors to maintain the same types and limits of coverage in compliance with this Agreement, including naming the City as an additional insured to the Subcontractor's policies.

2.2 Indemnification. Contractor shall indemnify, defend, and hold City and City Personnel harmless from and against any and all actions, suits, claims, demands, judgments, attorney's fees, costs, damages to persons or property, losses, penalties, obligations, expenses or liabilities (herein "claims" or "liabilities") that may be asserted or claimed by any person or entity arising out of the willful or negligent acts, errors or omissions of Contractor, its employees, agents, representatives or subcontractors which directly or indirectly relate to the work being performed or services being provided under this Agreement, whether or not there is concurrent active or passive negligence on the part of City and/or City Personnel, but excluding such claims or liabilities arising from the sole active negligence or willful misconduct of City or City Personnel in connection therewith:

2.2.1 Contractor shall defend any action or actions filed in connection with any such claims or liabilities, and shall pay all costs and expenses, including attorney's fees incurred in connection therewith.

2.2.2 Contractor shall promptly pay any judgment rendered against City or any City Personnel for any such claims or liabilities.

2.2.3 In the event City and/or any City Personnel is made a party to any action or proceeding filed or prosecuted for any such damages or other claims arising out of or in connection with the work being performed or services being provided under this Agreement, Contractor shall pay to City any and all costs and expenses incurred by City or City Personnel in such action or proceeding, together with reasonable attorney's fees and expert witness fees.

SECTION THREE: LEGAL RELATIONS AND RESPONSIBILITIES

3.1 Compliance with Laws. Contractor shall keep itself fully informed of all existing and future state and federal laws and all county and city ordinances and regulations which in any manner affect those employed by it or in any way affect the performance of services pursuant to this Agreement. Contractor shall at all times observe and comply with all such laws, ordinances, and regulations and shall be responsible for the compliance of all work and services performed by or on behalf of Contractor. When applicable, Contractor shall not pay less than the prevailing wage, which rate is determined by the Director of Industrial Relations of the State of California.

3.2 Licenses, Permits, Fees and Assessments. Contractor shall obtain at its sole cost and expense all licenses, permits, and approvals that may be required by law for the performance of the services required by this Agreement. Contractor shall have the sole obligation to pay any fees, assessments, and taxes, plus applicable penalties and interest, which may be imposed by law and arise from or are necessary for Contractor's performance of the services required by this Agreement,

and shall indemnify, defend, and hold harmless City against any such fees, assessments, taxes, penalties, or interest levied, assessed, or imposed against City thereunder.

3.3 Covenant against Discrimination. Contractor covenants for itself, its heirs, executors, assigns, and all persons claiming under or through it, that there shall be no discrimination against any person on account of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status of any person, in the performance of this Agreement. Contractor further covenants and agrees to comply with the terms of the Americans with Disabilities Act of 1990 (42 U.S.C. §12101 et seq.) as the same may be amended from time to time.

3.4 Independent Contractor. Contractor shall perform all services required herein as an independent contractor of City and shall remain at all times as to City a wholly independent contractor. City shall not in any way or for any purpose become or be deemed to be a partner of Contractor in its business or otherwise, or a joint venturer, or a member of any joint enterprise with Contractor. Contractor shall not at any time or in any manner represent that it or any of its agents or employees are agents or employees of City. Neither Contractor nor any of Contractor's employees shall, at any time, or in any way, be entitled to any sick leave, vacation, retirement, or other fringe benefits from the City; and neither Contractor nor any of its employees shall be paid by City time and one-half for working in excess of forty (40) hours in any one week. City is under no obligation to withhold State and Federal tax deductions from Contractor's compensation. Neither Contractor nor any of Contractor's employees shall be included in the competitive service, have any property right to any position, or any of the rights an employee may have in the event of termination of this Agreement.

3.5 Covenant against Contingent Fees. Contractor warrants that it has not employed or retained any company or person other than a bona fide employee working for Contractor, to solicit or secure this Agreement and that it has not paid or agreed to pay any company or person any fee, commission, percentage, brokerage fee, gift, or any other consideration contingent upon, or resulting from, the award or making of this Agreement. For breach or violation of this warranty, City shall have the right to annul this Agreement without liability or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

3.6 Use of Patented Materials. Contractor shall assume all costs arising from the use of patented or copyrighted materials, including but not limited to equipment, devices, processes, and software programs, used or incorporated in the services or work performed by Contractor under this Agreement. Contractor shall indemnify, defend, and save the City harmless from any and all suits, actions or proceedings of every nature for or on account of the use of any patented or copyrighted materials consistent with Section 2.2 herein.

3.7 Proprietary Information. All proprietary information developed specifically for City by Contractor in connection with, or resulting from, this Agreement, including but not limited to inventions, discoveries, improvements, copyrights, patents, maps, reports, textual material, or software programs, but not including Contractor's underlying materials, software, or know-how, shall be the sole and exclusive property of City, and are confidential and shall not be made available to any person or entity without the prior written approval of City. Contractor agrees that the compensation to be paid pursuant to this Agreement includes adequate and sufficient compensation for any proprietary information developed in connection with or resulting from the performance of Contractor's services under this Agreement. Contractor further understands and agrees that full

disclosure of all proprietary information developed in connection with, or resulting from, the performance of services by Contractor under this Agreement shall be made to City, and that Contractor shall do all things necessary and proper to perfect and maintain ownership of such proprietary information by City.

3.8 Retention of Funds. Contractor hereby authorizes City to deduct from any amount payable to Contractor (whether arising out of this Agreement or otherwise) any amounts the payment of which may be in dispute hereunder or which are necessary to compensate City for any losses, costs, liabilities, or damages suffered by City, and all amounts for which City may be liable to third parties, by reason of Contractor's negligent acts, errors, or omissions, or willful misconduct, in performing or failing to perform Contractor's obligations under this Agreement. City in its sole and absolute discretion, may withhold from any payment due Contractor, without liability for interest, an amount sufficient to cover such claim or any resulting lien. The failure of City to exercise such right to deduct or withhold shall not act as a waiver of Contractor's obligation to pay City any sums Contractor owes City.

3.9 Termination by City. City reserves the right to terminate this Agreement at any time, with or without cause, upon written notice to Contractor. Upon receipt of any notice of termination from City, Contractor shall immediately cease all services hereunder except such as may be specifically approved in writing by City. Contractor shall be entitled to compensation for all services rendered prior to receipt of City's notice of termination and for any services authorized in writing by City thereafter. If termination is due to the failure of Contractor to fulfill its obligations under this Agreement, City may take over the work and prosecute the same to completion by contract or otherwise, and Contractor shall be liable to the extent that the total cost for completion of the services required hereunder, including costs incurred by City in retaining a replacement contractor and similar expenses, exceeds the Budget.

3.10 Right to Stop Work; Termination by Contractor. Contractor shall have the right to stop work and terminate only if City fails to timely make a payment required under the terms of the Budget. Contractor shall provide City thirty (30) day prior written notice of such claimed payment owed and City shall have an opportunity to remedy any such claimed breach during such time with no legal consequence to City. Contractor shall immediately cease all services hereunder following the thirty (30) day notice, except such services as may be specifically approved in writing by City. Contractor shall be entitled to compensation for all services rendered prior to termination and for any services authorized in writing by City thereafter. If Contractor terminates this Agreement because of an error, omission, or a fault of Contractor, or Contractor's willful misconduct, the terms of Section 3.9 relating to City's right to take over and finish the work and Contractor's liability shall apply.

3.11 Waiver. No delay or omission in the exercise of any right or remedy by a nondefaulting party with respect to any default shall impair such right or remedy or be construed as a waiver. A party's consent to or approval of any act by the other party requiring the party's consent or approval shall not be deemed to waive or render unnecessary consent to or approval of any subsequent act. A waiver by either party of any default must be in writing.

3.12 Legal Actions. Legal actions concerning any dispute, claim, or matter arising out of or in relation to this Agreement shall be instituted and maintained in the Superior Courts of the State of California in the County of Orange, or in any other appropriate court with jurisdiction in such County, and Contractor agrees to submit to the personal jurisdiction of such court.

3.13 Rights and Remedies are Cumulative. Except as may be expressly set forth in this Agreement, the rights and remedies of the parties are cumulative and the exercise by either party of

one or more of such rights or remedies or other rights or remedies as may be permitted by law or in equity shall not preclude the exercise by such party, at the same or different times, of any other rights or remedies to which such party may be entitled.

3.14 Attorneys' Fees. In any action between the parties hereto seeking enforcement of any of the terms or provisions of this Agreement or in connection with the performance of the work hereunder, the party prevailing in the final judgment in such action or proceeding, in addition to any other relief which may be granted, shall be entitled to have and recover from the other party its reasonable costs and expenses, including, but not limited to, reasonable attorney's fees, expert witness fees, and courts costs. If either party to this Agreement is required to initiate or defend litigation with a third party because of the violation of any term or provision of this Agreement by the other party, then the party so litigating shall be entitled to its reasonable attorney's fees and costs from the other party to this Agreement.

3.15 Force Majeure. The time period specified in this Agreement for performance of services shall be extended because of any delays due to unforeseeable causes beyond the control and without the fault or negligence of City or Contractor, including, but not restricted to, acts of nature or of the public enemy, unusually severe weather, fires, earthquakes, floods, epidemics, quarantine restrictions, riots, strikes, freight embargoes, wars, litigation, and/or acts of any governmental agency, including City, if the delaying party shall within ten (10) days of the commencement of such delay notify the other party in writing of the causes of the delay. If Contractor is the delaying party, City shall ascertain the facts and the extent of delay, and extend the time for performing the services for the period of the enforced delay when and if in the judgment of City such delay is justified. City's determination shall be final and conclusive upon the parties to this Agreement. In no event shall Contractor be entitled to recover damages against City for any delay in the performance of this Agreement, however caused. Contractor's sole remedy shall be extension of this Agreement pursuant to this Section 3.15.

3.16 Non-liability of City Officers and Employees. No officer, official, employee, agent, representative, or volunteer of City shall be personally liable to Contractor, or any successor in interest, in the event of any default or breach by City, or for any amount which may become due to Contractor or its successor, or for breach of any obligation of the terms of this Agreement.

3.17 Conflicts of Interest.

A. No officer, official, employee, agent, representative or volunteer of City shall have any financial interest, direct or indirect, in this Agreement, or participate in any decision relating to this Agreement that affects his or her financial interest or the financial interest of any corporation, partnership, association or other entity in which he or she is interested, in violation of any federal, state or city statute, ordinance or regulation. Contractor shall not employ any such person while this Agreement is in effect.

B. Contractor represents, warrants and covenants that he, she or it presently has no interest, direct or indirect, which would interfere with or impair in any manner or degree the performance of Contractor's obligations and responsibilities under this Agreement. Contractor further agrees that while this Agreement is in effect, Contractor shall not acquire or otherwise obtain any interest, direct or indirect, that would interfere with or impair in any manner or degree the performance of Contractor's obligations and responsibilities under this Agreement.

C. Contractor acknowledges that pursuant to the provisions of the Political Reform Act (Government Code section 87100 *et seq.*), City may determine Contractor to be a

"Consultant" as that term is defined by the Act. In the event City makes such a determination, Contractor agrees to complete and file a "Statement of Economic Interest" with the City Clerk to disclose such financial interests as required by City. In such event, Contractor further agrees to require any other person doing work under this Agreement to complete and file a "Statement of Economic Interest" to disclose such other person's financial interests as required by City.

3.18 Contractor Ethics. Contractor represents and warrants that it has not provided or promised to provide any gift or other consideration, directly or indirectly, to any officer, employee, or agent of City to obtain City's approval of this Agreement. Contractor shall not, at any time, have any financial interest in this Agreement or the project that is the subject of this Agreement other than the compensation to be paid to Contractor as set forth in this Agreement. In the event the work and/or services to be performed hereunder relate to a project and/or application under consideration by or on file with the City, (i) Contractor shall not possess or maintain any business relationship with the applicant or any other person or entity which Contractor knows to have a personal stake in said project and/or application, (ii) other than performing its work and/or services to City in accordance with this Agreement Contractor shall not advocate either for or against said project and/or application, and (iii) Contractor shall immediately notify City in the event Contractor determines that Contractor has or acquires any such business relationship with the applicant or other person or entity which has a personal stake in said project and/or application. The provisions in this Section shall be applicable to all of Contractor's officers, directors, employees, and agents, and shall survive the termination of this Agreement.

3.19 Compliance with California Unemployment Insurance Code Section 1088.8. If Contractor is a Sole Proprietor, then prior to signing the Agreement, Contractor shall provide to the City a completed and signed Form W-9, Request for Taxpayer Identification Number and Certification. Contractor understands that pursuant to California Unemployment Insurance Code Section 1088.8, the City will report the information from Form W-9 to the State of California Employment Development Department, and that the information may be used for the purposes of establishing, modifying, or enforcing child support obligations, including collections, or reported to the Franchise Tax Board for tax enforcement purposes.

3.20 CalPERS Annuitants. If Contractor is a California Public Employees' Retirement System ("CalPERS") annuitant, Contractor must provide the City with written notification of such fact a minimum of 14 calendar days prior to commencement of services under this Agreement. Failure to provide such notification may result in termination of the Agreement, and any penalties or other costs relating thereto shall be borne by Contractor. If this Agreement remains in place, Contractor shall execute any amendment(s) to this Agreement requested by the City in order to comply with all laws and regulations applicable to CalPERS annuitants.

SECTION FOUR: MISCELLANEOUS PROVISIONS

4.1 Records and Reports. The City Manager of the City of Irvine or his/her designee reserves the right to perform such audits, performance reviews, and other evaluations (collectively 'audit') that relate to or concern this Agreement at any time. Contractor agrees to participate and cooperate in up to five (5) hours of meetings and interviews (at no additional cost to City), if the same are requested by the City in connection with such an audit. Further, provided that the City pays Contractor's commercially reasonable hourly rate for services, Contractor agrees to participate and cooperate in such additional meetings and interviews (in excess of five (5) hours),

if the same are requested by the City in connection with such an audit. Upon request by City, Contractor shall prepare and submit to City any reports concerning Contractor's performance of the services rendered under this Agreement. City shall have access, with 72 hours advance written notice delivered to Contractor, to the books and records of Contractor related to Contractor's performance of this Agreement in the event any audit is required. All drawings, documents, and other materials prepared by Contractor in the performance of this Agreement (i) shall be the property of City and shall be delivered at no cost to City upon request of City or upon the termination of this Agreement, and (ii) shall not be made available to any individual or entity without prior written approval of City. The obligations of this Section 4.1 shall survive the expiration (or earlier termination) of this Agreement for a period of three (3) years. During said three (3) year period, Contractor shall keep and maintain all records and reports related to this Agreement, and City shall have access to such records in the event any audit is required.

4.2 **Notices**. Unless otherwise provided herein, all notices required to be delivered under this Agreement or under applicable law shall be personally delivered, or delivered by United States mail, prepaid, certified, return receipt requested, or by reputable document delivery service that provides a receipt showing date and time of delivery. Notices personally delivered or delivered by a document delivery service shall be effective upon receipt. Notices delivered by mail shall be effective at 5:00 p.m. on the second calendar day following dispatch. Notices to the City shall be delivered to the following address, to the attention of the City Representative set forth in Paragraph D.1 of the Fundamental Terms of this Agreement:

To City: City of Irvine
One Civic Center Plaza (92606) (Hand Deliveries)
P. O. Box 19575
Irvine, CA 92623-9575

Notices to Contractor shall be delivered to the address set forth below Contractor's signature on Part I of this Agreement, to the attention of Contractor's Representative set forth in Paragraph D.2 of the Fundamental Terms of this Agreement. Changes in the address to be used for receipt of notices shall be effected in accordance with this Section 4.2.

4.3 **Construction and Amendment**. The terms of this Agreement shall be construed in accordance with the meaning of the language used and shall not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction which might otherwise apply. The headings of sections and paragraphs of this Agreement are for convenience or reference only, and shall not be construed to limit or extend the meaning of the terms, covenants and conditions of this Agreement. This Agreement may only be amended by the mutual consent of the parties by an instrument in writing.

4.4 **Severability**. Each provision of this Agreement shall be severable from the whole. If any provision of this Agreement shall be found contrary to law, the remainder of this Agreement shall continue in full force.

4.5 **Authority**. The person(s) executing this Agreement on behalf of the parties hereto warrant that (i) such party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said party, (iii) by so executing this Agreement, such party is formally bound to the provisions of this Agreement, and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which said party is bound.

4.6 **Special Provisions**. Any additional or supplementary provisions or modifications or alterations of these General Provisions shall be set forth in Part III of this Agreement ("Special Provisions").

4.7 **Precedence**. In the event of any discrepancy between Part I ("Fundamental Terms"), Part II ("General Provisions"), Part III ("Special Provisions"), Part IV ("Scope of Services"), and/or Part V ("Budget") of this Agreement, the order of precedence shall be as follows.
Part III
Part II
Part IV
Part V
Part I

PART III

SPECIAL PROVISIONS

1) **Business License Requirement.** Contractors who provide services for the City of Irvine within the city limits of Irvine shall obtain, within five (5) days of executing this Agreement and prior to commencing any work herein, a City of Irvine business license and shall maintain a current business license throughout the term of this Agreement.

PART IV

SCOPE OF SERVICES

Services shall be performed as set forth below and in accordance with ATTACHMENT I.

Overview

Contractor shall assist with the development of a Strategic Energy Plan (Plan) with a defined energy vision for the City of Irvine's municipal operations and the community. The Plan should articulate goals that prepare for future energy demands, strategies and actions to meet these goals, and identify funding resources to support completion of these strategies.

The purpose for the development of a Strategic Energy Plan for the City of Irvine is to determine the current state of energy consumption communitywide and in municipal operations, evaluate best available technologies for the City to explore and/or implement that reduce energy usage at municipal facilities with a reasonable return on investment, identify funding to implement energy strategies, and engage stakeholders to identify voluntary strategies that encourage reduction of energy consumption in residential and business sectors and promote economic vitality. The Contractor shall include an assessment of energy storage, stationary fuel cells, microgrid technology, and renewable energy for municipal facilities, as well as consider the feasibility of battery electric vehicle charging infrastructure and hydrogen fuel cell vehicle fueling stations citywide.

In 2008 the City of Irvine adopted a 20-year Energy Plan to serve as a roadmap to encourage energy conservation communitywide and incorporate best practices to reduce energy consumption in its municipal operations. Since the adoption of the 2008 Energy Plan, the City has implemented energy efficiency projects, such as exterior and interior lighting upgrades, replacement of boilers and pool covers, and installation of variable frequency drives, resulting in savings of approximately 1 million kilowatts and over 45,000 therms annually. Ten years after the adoption of the City's first energy plan, it is timely to reassess the status of the City of Irvine's energy needs by developing a Strategic Energy Plan.

In addition to the 2008 Energy Plan, the City's General Plan contains an Energy Element to promote energy efficiency through land use and transportation planning and incorporate energy conservation in the City's municipal operations. The General Plan is in the process of being updated and will include a general emissions inventory and an assessment of climate adaptation strategies in the Safety Element. The Contractor will collaborate with the team working on the General Plan Update to incorporate information into this Plan as needed. The Contractor will also coordinate with the consultant team working on the feasibility assessment of a Community Choice Energy (CCE) program for the City of Irvine. The Contractor should consider in its recommendations whether CCE is an option the City can use to meet any future mandated reductions in emissions.

Project Deadline

Estimated time to complete the Scope of Work is 18 months.

Deliverables

Contractor shall develop a Strategic Energy Plan that includes the following sections:

- Task 1: Assess Current and Future Energy Profile
- Task 2: Develop Energy Vision, Goals and Strategies
- Task 3: Identify Funding Sources
- Task 4: Stakeholder Input and Educational Opportunities

Task 1: Assess Current and Future Energy Profile

1) Briefly summarize benchmark data from the 2008 Energy Plan.
2) Review current baseline energy usage and project future energy use and supply data for the City of Irvine.
3) Review greenhouse gas inventory, analyze current energy consumption and emissions communitywide and in municipal operations. For municipal operations, include a City fleet inventory and identify sites that have high utility usage (e.g. peak demand.)
4) Identify potential to significantly reduce energy usage through energy efficiency measures, renewable energy, stationary fuel cells, energy storage, and incorporation of battery electric vehicle charging and hydrogen fuel cell electric vehicle fueling in municipal operations and citywide.
5) Create an inventory of existing energy-related activities, projects, programs, and policies, including any regional or state mandates that may impact future energy use. Recommend strategies and measures for the City to meet any related State mandated requirements.

Task 2: Develop Energy Vision, Goals and Strategies

1) Based on the energy profile assessment, collaborate to create an effective energy vision statement representing what Irvine's energy composition should look like in the future.
2) Present tangible long-term goals and nearer-term strategies that are measurable and provide cost-effective actions to meet future needs and work towards the Energy Vision.
3) Identify an implementation strategy to include a list of actions, cost estimates, and implementation timetable for energy efficiency, renewable energy, stationary fuel cells, energy storage, and battery electric vehicle charging and hydrogen fuel cell electric vehicle fueling projects. List and describe strategies to encourage Irvine residents and businesses to seek opportunities to voluntarily reduce energy consumption.
4) Establish the role of microgrids citywide (e.g., shopping centers, commercial centers, educational institutions, city facilities) for efficiency, resiliency, and community safety. Provide a roadmap and overall strategy for the evolution of microgrid technology citywide.
5) Prioritize and rank potential actions to meet goals and strategies, considering a reasonable return on investment.
6) Review the policies in the General Plan Energy Element and Community Choice Energy feasibility study to incorporate strategies as needed.
7) Review energy audit information to identify potential energy efficiency and renewable energy measures, such as energy storage, building electrification, stationary fuel cells, and solar.
8) Provide information on resources available to implement clearly defined strategies.

9) Develop an annual data gathering and tracking and reporting template to monitor and present progress in meeting new or updated goals.

Task 3: Identify Funding Sources

1) Identify funding and financing options to implement energy efficiency projects, including grants and utility rebates/incentive programs for communitywide initiatives.
2) Incorporate risk profile and time horizon for financing options, and structure any recommended projects to minimize risk and align savings with repayment schedules.
3) Seek potential for public-private partnerships that promote energy efficiency and economic vitality in the community and in municipal operations.

Task 4: Stakeholder Input and Educational Opportunities (Community Engagement)

1) Engage stakeholders throughout the development of the Strategic Energy Plan and incorporate input from organizations representing businesses, educational institutions and other interested members of the community (e.g. Irvine Chamber of Commerce, Irvine Company, the Advanced Power and Energy Program at the University of California Irvine, and the Green Ribbon Environmental Committee.) This shall include preparation, presentation, and debrief of community meetings.
2) Identify outreach and educational opportunities for City and stakeholders to host that highlight economically feasible technologies the community might consider to voluntarily reduce energy use, such as installation of renewable energy systems, battery electric vehicle charging, and fuel cell electric vehicle fueling.

Public Meetings

1) Attend and respond to questions at meetings of the City Council and Green Ribbon Environmental Committee on the final draft of the Strategic Energy Plan.

PART V

BUDGET

Pricing shall be as set forth below and in accordance with ATTACHMENT II.

Included in the total compensation are all ordinary and overhead expenses incurred by Contractor and its agents and employees, including meetings with City representatives, and incidental costs incurred in performing under this Agreement. The total compensation for the Scope of Services set forth herein **shall not exceed $105,500**, including all amounts payable to Contractor for its overhead, payroll, profit, and all costs of whatever nature, including without limitation all costs for subcontracts, materials, equipment, supplies, and costs arising from or due to termination of this Agreement.

No work shall be performed in connection with this Agreement until the receipt of a signed City of Irvine Purchase Order; and no work shall be performed with a value in excess of the Purchase Order amount as the City has not authorized nor is it obligated to pay Contractor any such excess amount.

In the event Contractor anticipates the potential need to perform services beyond those set forth herein where additional funding may be needed, Contractor shall notify City in writing allowing sufficient time for City to consider further action.

Payment for services will be made monthly on invoices deemed satisfactory to the City, with payment terms of net 30 days upon receipt of invoice. Contractor shall submit invoices within fifteen (15) days from the end of each month in which services have been provided. Contractor shall provide invoices with sufficient detail to ensure compliance with pricing as set forth in this Agreement. The information required may include: date(s) of work, hours of work, hourly rate(s), and material costs.

The Purchase Order number must be included on all invoices, along with the City Representative's name. Failure to include this information on the invoice shall result in the return of the unpaid invoice.

Contractors should submit invoices electronically to:

invoicesubmittal@cityofirvine.org

Payment by City under this Agreement shall not be deemed as a waiver of the City's right to claim at a later point that such payment was not due under the terms of this Agreement.

Pricing shall remain firm for the entire one (1) year Agreement term. Thereafter, any proposed pricing adjustment for follow-on renewal periods shall be submitted to the City Representative in writing at least ninety (90) days prior to the new Agreement term. The City reserves the right to negotiate any proposed pricing adjustment not to exceed the Bureau of Labor Statistics Consumer Price Index (CPI) data as follows: Los Angeles-Riverside-Orange County, CA; All Items; Not Seasonally Adjusted; annualized change comparing the most recent month's reported data to the same month of the prior year. (This information may be found on the U.S. Department of Labor's website at www.bls.gov.)

Included in the Budget are all ordinary and overhead expenses incurred by Contractor and its agents and employees, including meetings with City representatives, and incidental costs incurred in performing under this Agreement. The total compensation for the Scope of Services set forth herein shall not exceed **$98,000.00 for City** services; and **$7,500.00 for Great Park** services; with the total Agreement amount not to exceed **$105,500.00**, including all amounts payable to Contractor for its overhead, payroll, profit, and all costs of whatever nature, including without limitation all costs for subcontracts, materials, equipment, supplies, and costs arising from or due to termination of this Agreement.

Exhibit 1

WORKERS' COMPENSATION INSURANCE CERTIFICATION

Contract Services Description: Develop Strategic Energy Plan

WORKERS' COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

(CHECK ONE APPLICABLE BOX BELOW)

☐ **I have and will maintain workers' compensation insurance**, as required by Section 3700 of the Labor Code, for the performance of the work to be performed under this Agreement and shall submit insurance certificates evidencing such coverage as set forth herein.

☐ I certify that, in the performance of the work under this Agreement, **I shall not employ any person** in any manner so as to become subject to the workers' compensation laws of California, and I hereby agree to indemnify, defend, and hold harmless the City of Irvine and all of its officials, employees, and agents from and against any and all claims, liabilities, and losses relating to personal injury or death, economic losses, and property damage arising out of my failure to provide such worker's compensation insurance. I further agree that, **if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions and immediately furnish insurance certificates** evidencing such coverage as set forth herein.

WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

Dated:	
Contracting Firm:	Integral Group, Inc.
Signature:	
Title:	
Address:	15760 Ventura Blvd., Suite 1902, Encino, CA 91436

6. TEAM ORGANIZATION

In addition to our qualifications and history, Integral recognizes that a Strategic Energy Plan requires a diverse team of experts in not only buildings and energy systems, electricity and natural gas, but also transportation fuels, and planning and stakeholder engagement. We have carefully reviewed the scope and understand the unique needs of the City. Integral will manage the overall development of the Strategic Energy Plan including project management as it relates to timeline, budget, administration, deliverables and vision and goals. TEC will leads Task 3 and 4 and UCI APEP will support Tasks 1, 2 and 4. The organizational chart below (Figure 1) summarizes each firm and the key personnel proposed for this project. Additional team member resumes are included in the *Appendix A* for your reference.

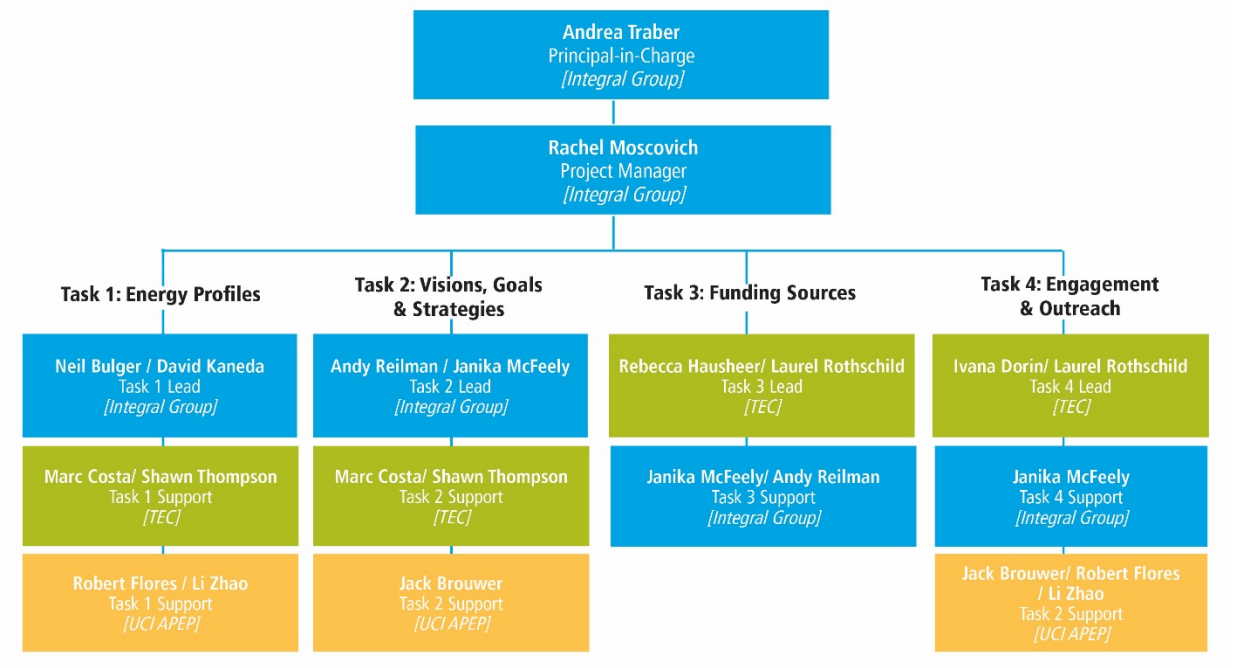


Figure 1: Organizational chart showing key personnel

7. PROJECT APPROACH & METHODOLOGY

Integral has established a proven method for working with cities and other organizations to develop comprehensive, effective and implementable plans. We are committed to the overarching project structure summarized as "discover, define, refine, implement."

DISCOVER	DEFINE	REFINE	IMPLEMENT
Discover project and team vision	Begin to define the current & desired future state: goals, targets & actions	Process of refinement through testing: modeling & engagement	Ensure team is well-positioned to hit the ground running and deliver impactful results

Figure 2: Project approach and methodology

This describes the arc of the project over the course of 18 months. In the "Discover" phase, the team will clarify the City's priorities and aspirations, specific project objectives; and past and current initiatives. The next phase will be to "Define" the desired future state by imagining what's possible by co-developing a set of goals, targets, and a comprehensive list of potential strategies, drawing from previous project experience, familiarity with leading-edge technology, and database of best practice approaches from other jurisdictions. The "Refine" stage is the opportunity to filter the list of potential strategies using factors such as engagement, modeling and analysis. This will produce a set of prioritized strategies specifically tailored to meet the City's objectives while optimizing return on investment. The final phase is "Implement" where the team proposes to deliver a detailed roadmap that will set up City staff for success in delivering and implementing each of the strategies articulated in the Plan. A detailed summary of the team's approach is provided below for each stage.

Stage 1 Discover

We will take care to ensure we have a strong understanding of the local context. While team members have a good deal of experience working within the City of Irvine, the first phase of work is focused on deepening our understanding of the current state. This is accomplished through a process of discovery, which can include, but is not limited to (a) a kick-off meeting where key staff members define the project and the current state in their own words; (b) a review of the City's 2008 and current emissions profile, past and current initiatives around energy efficiency, renewable energy and related actions; (c) identification of key stakeholders and their relative level of interest or impact; and (d) key informant interviews with staff and/or external stakeholders.

Stage 2 Define

The local context, including the City's emissions inventory, plans, policies, programs and key stakeholders will allow us to define both the current state and the desired future state. This phase involves developing the energy vision, goals and identifying the strategies that can be implemented in order to achieve the desired future state.

Stage 3 Refine

The process of refinement involves testing the above set of proposed strategies by: (1) modeling and analyzing associated impacts from a human resource (e.g. staff time), energy or greenhouse gas, and cost perspective; (2) testing the practicality and feasibility of proposed solutions in the 'real world' by way of engagement with internal and externals stakeholders; (3) identifying funding sources that will enable implementation of the proposed strategies.

Stage 4 Implement

Once the plan and the set of strategies are agreed upon, we will articulate the key steps to implementing each strategy. We take pride in our ability to not just deliver a plan, but to ensure that the individuals responsible for implementation are well-positioned to do so. Because members of our team have worked in municipal government we understand what

it takes to push a new policy or program forward. Our objective is that once the plan is complete, the responsible parties are able to hit the ground running and begin to see impacts in short order.

In addition, the team will plan out the four tasks specified by the City to ensure they are all completed within the 18 month timeframe. A draft project schedule is shown below. This general timeline will be discussed and finalized with input from the City to ensure the team is meeting any internal deadlines or goals the City may also have. The Team will then work with detailed dates and deadlines as agreed upon with the City.

		2018			2019			
Task	Description	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Access Current and Future Energy Profile							
2	Develop Energy Vision, Goals and Strategies							
3	Identify Funding Sources							
4	Stakeholder Input and Educational Opportunities							

Figure 3: Project schedule showing general timeline for key tasks

The City of Irvine has identified four key tasks to be included in the Strategic Energy Plan. The Team has carefully considered how best to approach each one of these to provide the highest level of product while also minimizing cost and risk for the City. Our detailed approach is provided below.

Task 1: Assess Current and Future Energy Profile	
Timeline: Q2 – Q4 2018	Costs: $23,000
Lead: Integral Group	Support: TEC, UCI APEP

The Team will begin this task by assessing the City's municipal and community-wide energy profile using 2008 information. We will then create forecasts for future energy profiles. Collecting and analyzing this information will allow two important outcomes. One outcome is to set energy goals that align with the the vision. The second outcome is to use the energy profiles to prioritize actions and investments that accomplish goals set forth in the Strategic Energy Plan. With a well-informed understanding of energy profiles, the Strategic Energy Plan can set an achievable trajectory to meet the City and its constituents' vision.

Our team's advantage is that we have obtained and analyzed the City's municipal building stock and energy usage from 2008 to present day. We have GIS maps of every building in the city. We have access to all commercial and residential business data through CoStar and the ESRI Business Analyst. This will allow our team to spend valuable time on transportation analysis, forecasting and developing strategies to accomplish the vision.

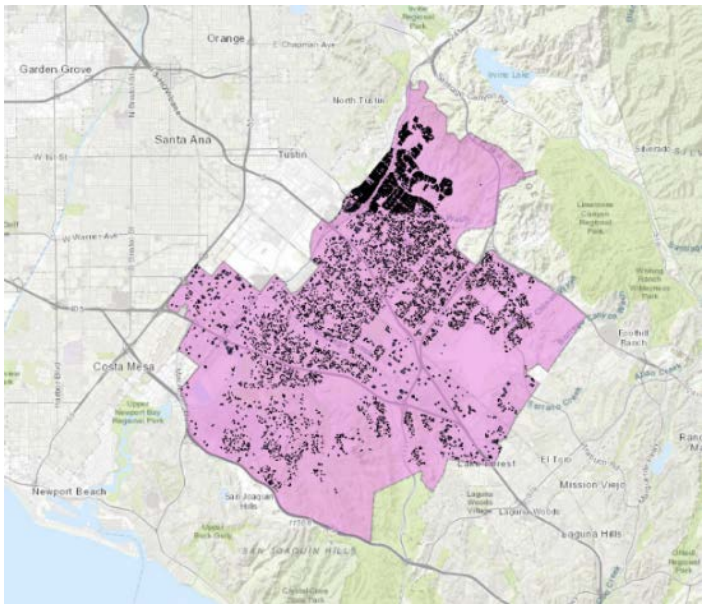


Figure 4: GIS Map of building footprints for City of Irvine

Through previous experience working with the City, the team has already collected over 60,000 building footprints. See Figure 4. The Team will leverage GIS visualization to spatially understand where, how and who is using energy. This powerful approach will allow the team to estimate energy consumption building-by-building for a highly accurate understanding of the current and future energy profiles. If our team accesses the Community Choice Energy program (CCE) data, the estimates can be turned into an enormous asset, for the City, in (1) forecasting energy procurement as a Load Serving Entity and (2) providing the foundation for investment-grade microgrid analysis and community solar plus storage. See Figures 5 and 6 to see preliminary mapping of buildings at the community and municipal asset level.

Figure 5: Solar rooftop potential for Irvine City Hall

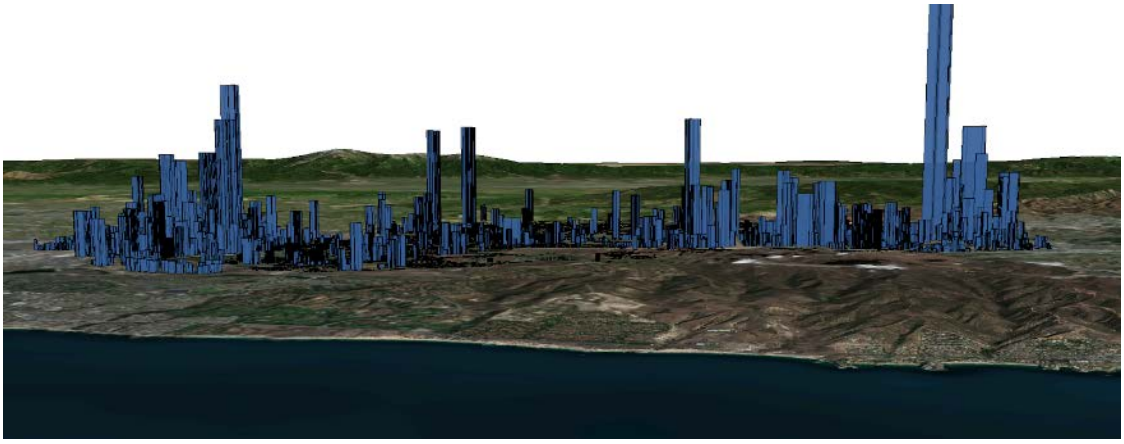


Figure 6: Municipal Asset Level - City of Irvine 3D Rendering by Rooftop Area

These figures help illustrate that the more the Team understands about how and where buildings are using energy, the better positioned the Team is to propose targeted strategies to improve efficiency or shift to a clean energy supply in areas of greatest opportunity. The Team also has an initial understanding of the solar potential for the City's buildings and can map this out visually for the City. See Figure 5 for example showing the solar potential for the Irvine City Hall rooftop.

The Team will then identify an initial list projects that can be used to significantly reduce energy usage and greenhouse gas emissions. Detailed information for each subtask is provided below.

Task 1.1 Briefly summarize benchmark data from the 2008 Energy Plan.
Deliverable: Brief summary of 2008 benchmark data.

To guide the Team's work throughout the duration of the project, the Team proposes to create a project steering committee, assembling key internal City staff representatives. The steering committee will review progress at key milestones, will advise on key decisions, and will review deliverables as needed.

Integral will review the 2008 Energy Plan to summarize benchmarked data and visualize key findings. Using the municipal portion of the City's energy usage, our team will provide baseline metrics on energy per square foot (energy use intensity), per capita, per vehicle miles traveled (VMT) and by economic factors such as gross city product for all municipal facilities. The Team will address this request by using the summary of benchmark data from the 2008 Energy Plan and to describe how this data will be used to influence the methodology for the analysis of current energy consumption data. The Team will also work with the City to get feedback (see Task 4) on how the team can build off the work that has been done and create a more effective plan. The goal is to leverage existing information and resources and ensure consistency across the original and updated plans.

In developing future targets and objectives for municipal operations and community-wide energy consumption it is crucial to establish a base year for comparison. This Strategic Energy Plan will build upon the work and analysis from the 2008 plan. In collaboration with the City and based on the data available, we will determine the optimal baseline year for this updated plan. Integral and TEC have experience performing using benchmark data for building level and community scale projects. Benchmarked data provides a snapshot of relative performance at a given time, and can be used as a baseline from which to build future projections.

Task 1.2 Review current baseline energy usage and project future energy use and supply data for the City of Irvine.

Deliverable: Summarized baseline data on energy generation, distribution and consumption.

Building off of the review of benchmarking data from the 2008 Energy Plan, the team will perform a detailed analysis of the City's current energy consumption and supply data. The team's approach is to review the entirety of the local energy system. The term energy system refers to the following three components: energy generation, energy distribution and energy use:

ENERGY GENERATION refers to the power plants and other energy generators that transform primary energy sources, such as coal, natural gas, wind, or sun, into usable energy.

ENERGY DISTRIBUTION refers to the network of pipes, power lines, and vehicles that deliver usable energy from where it is generated to where it is used. For electricity, this includes transmission and distribution.

ENERGY USE refers to both the total amount of energy consumed by our systems and technologies, as well as the demand for energy at a given moment in time. Energy use is shaped by the way we interact with and use these systems and technologies, including our expectations of consistent supply, convenience, and cost.

The Team will review the data provided by the City and incorporate other datasets the team has to create a comprehensive, portfolio view for analysis. TEC, through previous work in the City, has community-wide, building data as well as energy consumption data for public buildings. In addition to this existing data, both TEC and Integral have experience working with large datasets and understanding the importance of organizing data sets prior to analysis. The Team will coordinate with the City team and ensure that the proper set up is established prior to starting the data analysis.

Below is an example of the datasets the team will utilize:

- Municipal and communitywide data from the IOUs
- Monthly customer level data, if available, from the CCE analysis team
- ESRI and OCTA data on community vehicle inventory, vehicle miles traveled, gasoline and transportation fuel levels
- City of Irvine GIS department building footprints to further assess the building stock and locational baselines of energy

- ESRI Business Analyst data to inventory commercial business and apartment sectors for additional metrics on load growth, since these constituents and customers represent the highest load of the 2008 plan
- CoStar database
- Lawrence Berkeley Lab Tracking the Sun solar install database and Google Project Sunroof for total solar potential
- SCE DERiM Maps for grid interconnection potential

The Team will also develop a clear methodology for data analysis and identify what tools will be used. Integral Group will lead this building off of extensive experience performing energy data analysis and using in-house modelling and analysis tools. The Team will work to finalize the methodology and craft a narrative that explains the data analysis process for transparency into the eventual results.

Once the baseline is established the team will develop future energy use projections for a 20-year time horizon (or other target year as specified by the City or stakeholders). To determine future energy use and emissions projections, the team will take into account (a) the rate of development, renovation and building replacement within the City of Irvine; (b) information on age of HVAC equipment (if available); (c) community-scale fuel-switching and efficiencies (e.g. grid modernization, repair of gas leaks, as applicable); (d) evolving and future building codes; (e) future development on PPAs or CCAs. All of these data points will be entered into an energy and emissions modelling tool, which will be used to build out potential future energy scenarios for the City's municipal buildings and fleet, and for community-wide energy systems.

Task 1.3	Review greenhouse gas inventory, analyze current energy consumption and emissions communitywide and in municipal operations. For municipal operations, include a City fleet inventory and identify sites that have high utility usage (e.g. peak demand).
Deliverable: Emissions profile for both municipal operations and community wide emission.	

Community-wide emissions inventory

Depending on the granularity of the data included in the community wide emissions inventory, Integral will analyze energy use and emissions from buildings, classified by the following:

- Building type, e.g. large commercial, small commercial (retail), industrial, residential multi-unit, residential single family. Data sources are Assessor Data, GIS data, CoStar and ESRI Business Analyst, and City Permitting Data
- Fuel use by type, e.g. electricity, gas, renewable. Data sources include DOE Tracking The Sun database and City Permitting Data
- Emissions profile of each fuel source. Data source is from SCE and SoCalGas site and source energy GHG conversion rates.

This will allow the team at the outset of the project to begin to identify areas of opportunity for emissions reductions, to be realized by way of fuel switching and/or energy efficiency retrofits or behavior change.

Municipal buildings and fleet emissions inventory

For City-owned buildings and fleet vehicles the inventory and analysis will be more fine-grained, based on data provided by the City and data the team has from previous work. The recommended interventions will in turn be more specific and more targeted, due to the fact that (a) these buildings are City property, therefore retrofit investments and fuel switching decisions can be made internally by staff and decision makers, (b) more information about fuel sources, age of equipment, building performance will be accessible, and (c) the City should lead by example, demonstrating to private-sector owners what is possible, and a commitment to emissions reductions and transition to a cleaner energy system.

Risk mitigation strategy: Data access is often a time delay and risk to emissions inventories. The team proposes multiple pathways to data access. TEC already has municipal electricity and gas data. The team is prepared to sign an NDA to obtain the CCE electricity data. We are familiar with the data request procedures with SoCalGas for community wide data. Lastly we can derive hourly energy load profiles and forecasts in the building sector by leveraging Integral Group's energy modeling expertise by using the GIS data to create investment-grade energy forecasts that support CCE analysis and microgrid development.

Task 1.4	Identify potential to significantly reduce energy usage through energy efficiency measures, renewable energy, stationary fuel cells, energy storage, and incorporation of battery electric vehicle charging and hydrogen fuel cell electric vehicle fueling in municipal operations and citywide.
Deliverable: Summary of potentially viable energy use and emissions reduction strategies.	

To begin to frame what's possible in terms of energy and emissions goals and strategies for both municipally owned assets and community wide energy use, the team will engage the City's internal steering committee in an exploration of the City's sphere of influence relative to energy sources, energy systems, and energy consumption. See Figure 8 below. Public buildings, for example fall within the City's direct sphere of control, and the City has varying degrees of control over new construction (of privately owned buildings) and improvements or retrofits to existing buildings. This exploration will help determine the parameters of what tools and strategies will be included in the strategic plan.

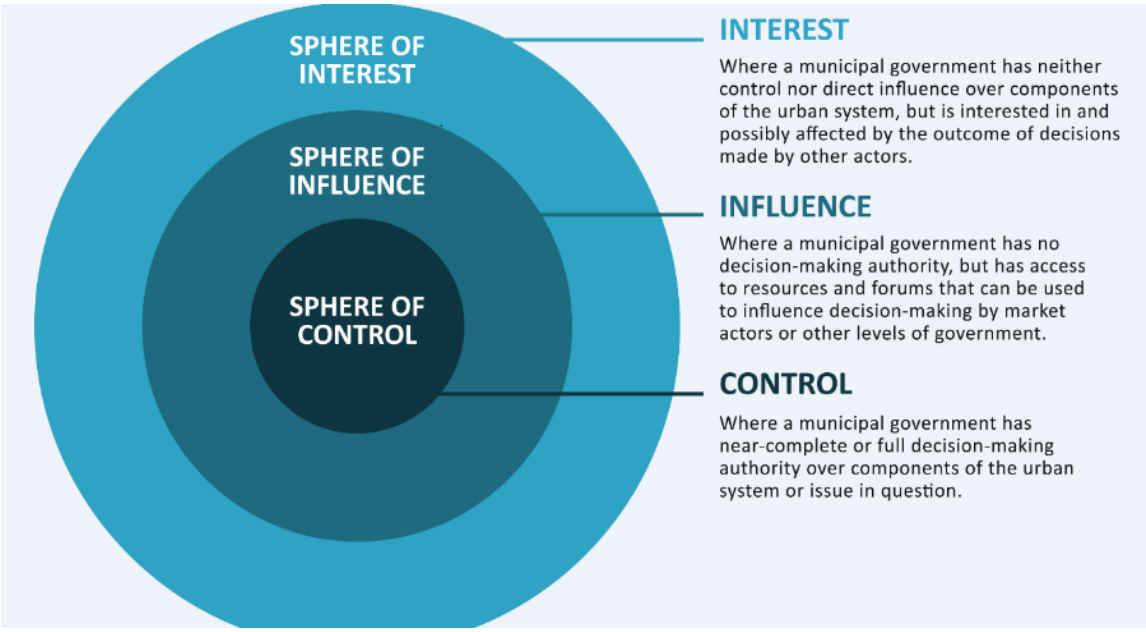


Figure 8: Framework for identifying the City's areas of interest, influence and control

The team will first present a comprehensive list of potential measures that could be implemented to address reductions from the municipally owned portfolio and the entire City. The team will derive this list from three sources:

1. Past and current measures already underway in the City;
2. Internal and external stakeholder input; and
3. Best practices from jurisdictions across North America.

This preliminary list of potential strategies will be tailored to what the team understands about the City of Irvine's energy use, building profile, municipally owned fleet, and related emissions.

At this stage the team will solicit feedback from internal and external stakeholders to gauge interest or readiness to explore new approaches to energy use and emissions reductions. This will help determine which measures should be examined and analyzed at a greater depth in Task 2.

Task 1.5	Create an inventory of existing energy-related activities, projects, programs, and policies, including any regional or state mandates that may impact future energy use. Recommend strategies and measures for the City to meet any related State mandated requirements.
Deliverable: Inventory, organized by scope and type, of existing energy initiatives in the City of Irvine.	

The Team will review all of the applicable energy related resources and mandates to create a comprehensive inventory for the City. The Team will also work with the City to understand what types of activities and initiatives should be included in the inventory. This information will be clearly presented in the overview of resources and mandates. The Team will then work together to propose a set of strategies and measures that help the City meet and exceed all applicable mandates.

This scan of existing energy-related activities will help the team to identify opportunities to leverage current initiatives locally, at the utility-scale and at other levels of government that will catalyze Irvine's ability to achieve its energy objectives. This will include collaborating with the respective teams working on the General Plan update and the feasibility assessment of a CCE program for the City.

Further, the team will identify other City priorities (outside of the realm of energy) that could be addressed by way of a Strategic Energy Plan. For example, through work for the District of Columbia, because social and racial equity were identified as key priorities for that jurisdiction, Integral convened a National Roundtable on Energy and Equity to identify ways to avoid introducing energy policies that could have adverse effects on disadvantaged communities, and moreover to identify policies that could have a positive impact from a social equity perspective.

Our team's advantage is that Integral Group has a long track record of energy planning, most recently with Washington D.C., as well as with international perspectives in the London, United Kingdom "London Energy Transformation Initiative." Furthermore TEC has already conducted energy audits and has strategies to reduce municipal energy consumption. This is rapid-start fodder for renewable energy strategy integration. Lastly, UC Irvine has pioneered strategies for fuel cells, transportation and stationary electric storage and microgrids. This combined experience will provide a pragmatic and sophisticated approach to the next twenty years of strategic energy communities in Irvine.

Task 2: Develop Energy Vision, Goals and Strategies	
Timeline: Q3 2018 – Q4 2019	Costs: $47,000
Lead: Integral Group	Support: TEC, UCI APEP

The Team will work with the City to understand what the key priorities are, and develop the vision, goals and strategies. Clear articulation of vision, goals and strategies will enable the team to analyze the impact and cost of specific measures, identify and prioritize ways to reduce risk and investigate more advanced energy projects, such as microgrids and deliver focused recommendations in the final plan.

Task 2.1 Based on the energy profile assessment, collaborate to create an effective energy vision statement representing what Irvine's energy composition should look like in the future.
Deliverable: Succinct, clear energy vision statement and rationale for Irvine's energy future.

Figure 9: Framework for feedback to and gathering input for vision, goals and strategies

The team will work with the City to develop a vision statement, supporting goals and strategies. As illustrated in Figure 9, the Team takes a top down and a bottom up approach to developing a vision and goals. This means taking into account external factors such as the impacts of climate change, regulatory frameworks, and best-in-class examples from other jurisdictions and organizations. The 'top-down' influences are weighted against a set of 'bottom-up' factors including stakeholder input, City priorities and budget, ROI, and project feasibility. The Team will work with the City and key community stakeholders, as specified in Task 4, to understand the desired community goals and objectives and will craft a vision statement that articulates a shared vision for the future, and will guide the development of the plan

Task 2.2 Present tangible long-term goals and nearer-term strategies that are measurable and provide cost-effective actions to meet future needs and work towards the Energy Vision.

Deliverable: A list of potential short- and long-term strategies supporting the Energy Vision, that will be tested (impacts measured) in future tasks.

Since 2008, the energy landscape has dramatically changed in California. Renewable portfolio standards are increasing, the movement towards customer choice and local, decentralized energy is blossoming faster than local governments had ever envisioned. Electrification of vehicles, new energy storage technologies and new issues on grid modernization leave uncertainty, yet create opportunity for those with a vision. This Team understands these industry dynamics and stands ready to help the City navigate through them successfully.

The Team will highlight the key findings from the energy data assessment and present a set of scenarios to the City. These scenarios will present the City with options and strategies for meeting goals supporting the vision of the Strategic Energy Plan. For example, the team can present scenarios that showcase pathways to meeting energy mandates (compliant), exceeding energy mandates (aggressive), and becoming a State leader in clean energy and greenhouse gas emissions reduction (exceptional). The Team will host discussions with key City members and finalize a clear vision and structure for the Strategic Energy Plan.

With a firm understanding of the energy profiles and future trajectories of energy use, the Team will lead the City through a discovery process to create realistic sequences of goals, actions and internal systems to ensure twenty years of successful implementation.

First, a stakeholder process must be in place to establish a carbon reduction target across all energy uses in the City. From there, the carbon intensity of each fuel source needs to be calculated, which will be completed in Task 1.3. At this point, a menu of strategies will be created for each fuel source, for municipal operations in buildings, infrastructure and fleet, and then for energy uses in the community buildings and fleet. The highly experienced team at Integral will walk the City and stakeholders through this process of evaluating the costs and benefits of each strategy, and the interactive effects of implementing packages of strategies. The following is a sample of questions that will be used to facilitate the process.

- Will a 100% renewable energy CCA negate the need for energy efficiency?
- Will a high percentage of electric vehicle adoption curb vehicle GHGs, but dramatically increase electricity GHG emissions if there is not enough renewable energy?
- Where does a microgrid have the most value?

These are all questions that Integral Group has managed for its clients, questions that UCI APEP has tackled in their campus renewable energy transformation, and policies that The Energy Coalition is tackling at the CPUC, CEC and with the newly formed Clean Power Alliance of Southern California (formerly known as Los Angeles Community Choice Energy or LACCE).

Task 2.3 Identify an implementation strategy to include a list of actions, cost estimates, and implementation timetable for energy efficiency, renewable energy, stationary fuel cells, energy storage, and battery electric vehicle charging and hydrogen fuel cell electric vehicle fueling projects. List and describe strategies to encourage Irvine residents and businesses to seek opportunities to voluntarily reduce energy consumption.

Deliverable: List of proposed strategies including implementation details, such as estimated costs and impacts, for municipal operations, City-driven initiatives, and voluntary initiatives led by businesses and individuals.

Based on the findings of Task 1 and the outputs of Tasks 2.1 and 2.2, the Team will develop list of actions, costs, and timetables for specific strategies. The Team will highlight findings from the energy analysis to identify more immediate strategies for high impact projects/measures. The Team will also develop a plan to encourage residents and businesses to implement strategies by highlight cost effectiveness and/or highly innovative technologies. These strategies will be tested via stakeholder engagement as described in Task 4, and viable strategies will be modeled to measure impacts and further prioritize in task 2.5.

TEC will leverage its expertise in community messaging to engage residents and business to join the energy transformation. Being an Irvine headquartered company, and having staffed outreach events, walked the streets for direct install programs, hosted booths at Irvine Global Village, we have the knowledge of engaging local constituents. Additionally TEC has the marketing contract for the Clean Power Alliance of Southern California and can leverage best practices in working on CCE outreach.

Task 2.4 Establish the role of microgrids citywide for efficiency, resiliency, and community safety. Provide a roadmap and overall strategy for the evolution of microgrid technology citywide.

Deliverable: Briefing detailing the potential for microgrid development throughout the city, including potential applications and locations, and projected impacts and outcomes.
Please note: A more detailed feasibility analysis for any proposed system(s) can be undertaken at an additional fee.

The Team will put together a briefing focused on the benefits of microgrids, the appropriate application of microgrid technology and a high-level feasibility assessment of the implementation of microgrids in specific applications throughout the City. This will include aligning the benefits of microgrids with specific City priorities and objectives, including but not limited to emissions reduction, efficiency, resiliency and safety. The briefing will include examples of application in other cities in a range of contexts, to demonstrate the variety of possible applications. The Team will also identify specific applications within the City of Irvine, and provide an assessment as to which applications would be be most effective, feasible and beneficial. Finally, the team will integrate the above into an overall strategy for the evolution of microgrid technology citywide. This can include some example sites and case studies from other microgrid developments to help showcase the feasibility and impact.

Task 2.5 Prioritize and rank potential actions to meet goals and strategies, considering a reasonable return on investment.

Deliverable: Short-list of prioritized strategies to meet Irvine's Energy Vision, along with rationale and projected quantitative impact of each.

Having worked with the City and stakeholders to determine objectives and priorities, Integral will prioritize and rank the comprehensive list of actions to a shorter list of strategies that will maximize return on investment (ROI) from environmental, economic and social perspectives. Integral will use the energy and emissions planning tool to model the potential impact of each of the strategies, in terms of reducing energy consumption, increasing renewable energy supply, and reducing emissions (see Figure 11). In addition to quantifying the energy and emissions benefits associated with each strategy over time, the Team will also identify any co-benefits associated with each action. This could include:

- Water conservation
- Energy resilience and community preparedness
- Reduced operations and maintenance costs (fleet and buildings)
- Reduced air pollution
- Local job creation and economic development
- Social equity benefits
- Energy cost savings

Potential strategies will also be filtered by practical considerations such as:

- City staff needs (e.g. FTE)
- Cost of implementation
- Time to implement
- Return on investment or other financial metrics
- Funding or partnership opportunities
- Feasibility of implementation
- Regulatory hurdles

By way of this quantitative and qualitative analysis, the team will propose a set of complementary strategies that together will set up the City of Irvine to achieve its vision and goals. This draft set of strategies will be reviewed by the City's steering committee and external stakeholders. The wedge diagram in Figure 11 (see below) illustrates the outputs of the energy and emissions modeling tool. Each of the colored wedges represents a specific emissions-reduction strategy, and impacts of each are projected over time, based on research and data on uptake and implementation. The energy and emissions model will take into account "background" improvements to the energy profile such as grid-scale fuel switching, as well as City-driven and voluntary initiatives.

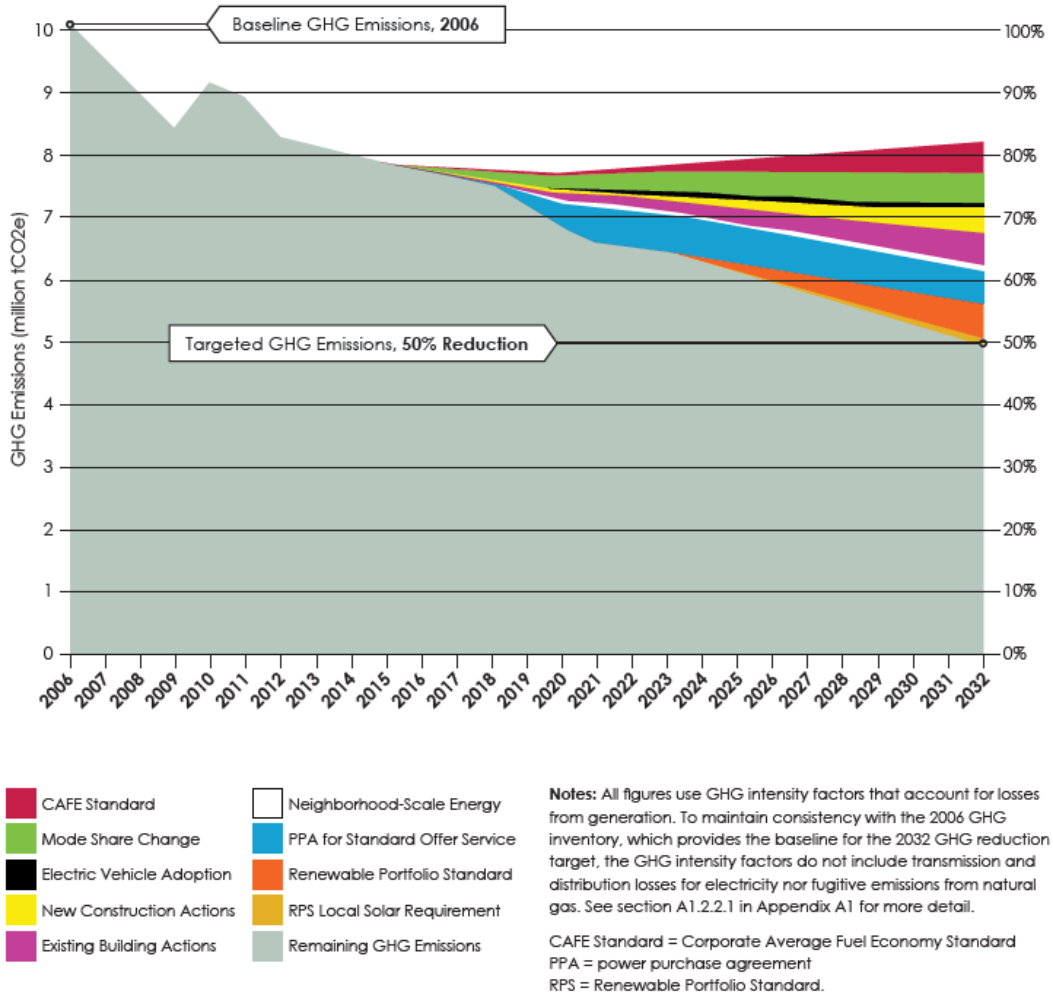


Figure 11. Example output of Integral's energy and emissions modeling tool.

Task 2.6 Review the policies in the General Plan Energy Element and Community Choice Energy feasibility study to incorporate strategies as needed.

Deliverable: Summary of how the proposed Strategic Energy Plan will interface with, incorporate, and/or complement the concurrent General Plan update and CCE feasibility study findings.

In order to create a comprehensive plan, the team will review the policies in the General Plan Energy Element and Community Choice Energy feasibility study to ensure alignment. This will build off findings of Task 1.5, where the time will have established a clear picture of the current state and parallel and supporting initiatives. Integral will lead this effort, with support from TEC, and work with the City and any consultants to incorporate the key goals from the feasibility study into strategies introduced in the Strategic Energy Plan. TEC has been very involved and engaged in policy discussions and the framing of Community Choice Aggregation (CCA) strategies. TEC has participated in planning and strategic visioning with Marin Clean Energy (MCE) and through our work with the County of Los Angeles we were on the ground floor helping develop the strategy for the LA County CCA. Moreover, TEC has delivered numerous presentations to local agencies on the strategy, opportunities and benefits of participation in CCAs. This experience and understanding of the CCA/CCE market will help the team communicate the results of the CCE feasibility study.

Task 2.7 Review energy audit information to identify potential energy efficiency and renewable energy measures, such as energy storage, building electrification, stationary fuel cells, and solar.

Deliverable: List of proposed targeted strategies based on energy audit outputs.

In addition to the assessment of energy consumption data, the team will also review energy audit information to identify more specific, targeted energy efficiency and renewable energy measures that have been suggested for specific building types. The Team will compile a list of commonly recommended measures from these energy audits and other potential measures identified from the energy consumption and building data assessment. Integral Group and TEC have experience identifying energy efficiency and renewable energy measures for clients, ranging from public agencies to commercial building owners. Both groups will draw from project records to identify commonly recommended measures for similar building types, as well as the estimated costs and savings.

Task 2.8 Provide information on resources available to implement clearly defined strategies.

Deliverable: Summary of available resources, delivery agents, and preliminary steps to implementation.

Integral Group will work with the Team to summarize the resources that are available to support the City with implementation of the Strategic Energy Plan. This will include funding and financing sources, design tools, data and analytical resources, risk management guidelines and best practices from projects. This will also include working closely with the City's project team and steering committee to articulate the process and parties (internal and external delivery agents) responsible for implementing each of the strategies. The team will identify preliminary steps (such as budget approvals, data needs or feasibility assessments) that may needed as preliminary steps to enable each of the strategies. The Team will include an overview of the available options in the Strategic Energy Plan and provide the City with the sources for the available resources.

Task 2.9 Develop an annual data gathering and tracking and reporting template to monitor and present progress in meeting new or updated goals.

Deliverable: Simple and user-friendly reporting and tracking template for City staff use to monitor progress as the Plan is implemented.

Finally, the team will finalize the list of strategies and develop a template to monitor energy data and measure progress towards goals. The Team will first review the City's current data gathering, tracking and reporting procedures and work with the City to identify what information should be prioritized. The Team will then develop a template that showcases key information for the City towards meeting goals and integrates with the format and structure of data that is being

tracked. Both Integral Group and TEC have experience working with and organizing large energy data sets, and will develop a template that can be easily managed by the City after the Strategic Energy Plan has been completed.

Figure 12 is an example of a simple schedule and tracking tool used to identify the various components of a plan and respective implementation and review timelines.

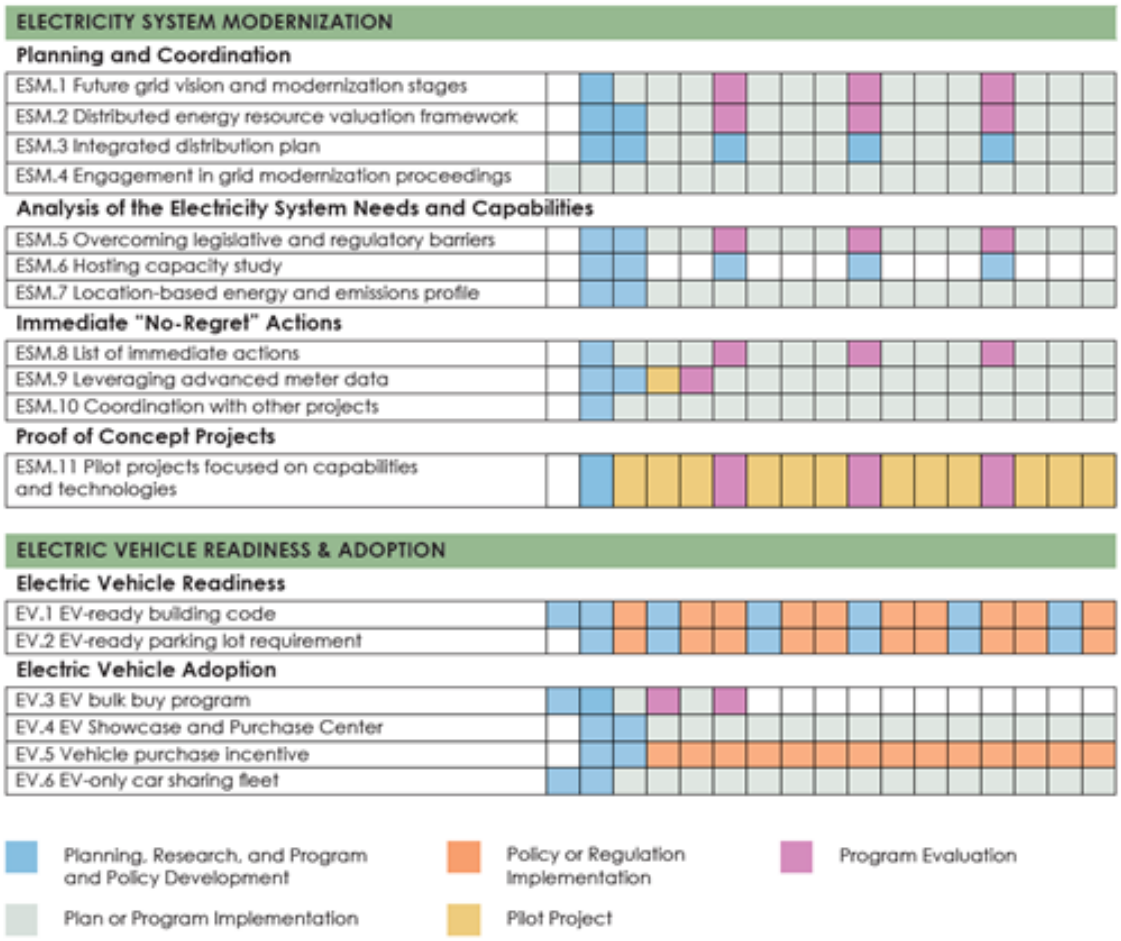


Figure 12. Sample Strategies and Timeline for Implementation

Task 3: Identify Funding Sources	
Timeline: Q1 – Q4 2019	Costs: $18,000
Lead: TEC	Support: Integral Group

TEC understands the importance of financial resources when prioritizing projects and ensuring successful implementation. Through its work under the SoCalREN Public Agency Program, TEC project managers provide financial advisory services to public agencies like the City of Irvine. In fact, the team has assisted in funding for 19 projects to date for the City. In addition, the team has assisted in identifying and securing over $250,000 in incentives and rebates. Analyzing risk profiles and understanding the details of financing options are a key expertise of TEC as is presenting the information in an executive format that allows the City to make informed decisions. The team also has extensive experience in developing strong partnerships, having worked with 75 firms that we have worked with on projects. Detailed information for each subtask is provided below.

Task 3.1 Identify funding and financing options to implement energy efficiency projects, including grants and utility rebates/incentive programs for community-wide initiatives.
Deliverable: 1. Summary of available funding sources for projects identified during Task 1 and 2 2. Table showing potential projects and which funding and financing resources are available and corresponding requirements and terms of each resource 3. Summary of financial resources available for the Irvine community

Our approach to identifying funding sources for energy efficiency projects starts with a summary of possible financial resources and their applicability to the City of Irvine. The idea will be to first leverage any existing resources that are available at no cost to the City i.e. SoCalREN, the Local Government Partnership, or California Energy Commission programs, then complement City staff with research and investigation. The team will develop a comprehensive list of available and applicable funding and financing options for the City to implement projects. This includes both internal and external resources. A sampling of the possible financial sources are below.

Internal - City Funding

The team will work with City staff to first understand internal funding sources such as existing contracts with vendors, maintenance funds, capital improvement budgets, general funds, enterprise funds, revolving loan funds or other budgets these projects can have access to. The team will then understand financial metrics and hurdle rates required to access those funds. In addition, the team will understand any deadlines for application and approval required. As mentioned above, TEC has a long history of working with the City of Irvine on the financial aspect of energy efficiency projects, so we should be able to move through this step quickly.

External - Utility Rebates and Incentives Funding

The team will review all applicable utility solution guides to match available incentives and rebates to projects identified. This work will be conducted in collaboration with SoCalREN since these resources are already offered to the City at no cost. The team will review the projects identified and summarize the customized and deemed financial incentives/rebates that will be applicable to the project creating a simple table summary table.

External - Utility and Utility Third Party Programs

The team will survey all relevant utility programs that may be applicable to the measures identified. Various programs exist to provide energy efficiency retrofits at no-cost or reduced costs to public agencies like Irvine. Further, specific programs and enhanced incentives are available for Irvine given that it is in the SONGS zone - zip codes identified in the target area for energy demand reduction. Some programs include SCE's Direct Install, Local Capacity Requirements initiative, and SCE's Midstream and Upstream lighting and HVAC programs.

External - Grant Funding

The Team will also identify unique opportunities for grant funding, including partnering with companies for demonstration projects. This can be a low cost option to test innovative technologies, and State or Federal grants for implementing new

technologies. TEC will review these funding resources quarterly to ensure it has the most up to date list of options available to the City. The team will work with SoCalREN to leverage any free resources available for this research.

External - On Bill Financing

On-bill financing (OBF) is a very cost effective and simplified method to securing financing for energy efficiency projects from utilities. The team will work with SoCalREN and the utilities to review projects identified and check eligibility for OBF. The team is also very knowledgeable on possible exceptions and will be sure to exhaust all possible avenues to maximize this 0% interest option.

External - Energy Lease Financing

TEC developed an innovative financing product called energy lease financing under the SoCalREN program. This financing option is available for a variety of energy projects including energy efficiency, renewable energy, etc. TEC will include this as an option for City and describe the requirements for eligibility, including general terms and conditions. TEC will discuss this option with Public Financial Management (PFM) a financing firm dedicated to the public sector.

External - CEC Financing

The California Energy Commission also has an option for financing energy efficiency and renewable energy generation projects. TEC will investigate the availability of these funds and determine if any of the City's projects would be good candidates. Traditionally, these funds are appropriated far in advance, so this could be a good long-term strategy for the City, especially where projects have a combined solution between energy efficiency and renewables.

External - CA IBank CLEEN Program

The California Infrastructure and Economic Development Bank has created a program to provide direct financing to the public sector to help meet the State's greenhouse gas reduction goals through energy efficiency, water conservation or even energy storage. TEC will determine if any of the City's projects would be good candidates and investigate the feasibility of leveraging this program.

Once all the financial resources have been identified, another analysis by sector will be conducted to understand the applicability across the full Irvine community. Information and resources will be identified for commercial, residential and other sectors as indicated by the City. TEC has experience performing similar work for these market segments during its management of the Energy Upgrade California Program and the Property Assessed Clean Energy financing program. TEC will research and speak with the administrators of the relevant funding and financing mechanisms to confirm availability and validate the fact that it is a good match for this community's energy projects.

Task 3.2 Incorporate risk profile and time horizon for financing options, and structure any recommended projects to minimize risk and align savings with repayment schedules.
Deliverable: 1. Summary of financing options, risk profiles and time horizons to inform the City's approval process 2. Table showing potential financing options for selected projects

After we have a summary of available financing and funding sources, the team will then work with the City to understand their desired level of risk and target for project cost effectiveness. Next, the team will evaluate the risk of the investment in relation to these options to inform the City's decision-making process. The evaluation will include the following factors:

1. Capital investment required for the project net of utility incentives and rebates
2. Availability of financing, sources and amounts
3. Financial metrics such as net present value, return on investment and simple payback
4. Project cost savings, terms of repayment, and how they align with equipment useful life
5. Risk profile of energy savings being realized across time

6. Repayment structures available that neutralize or yield net positive returns based on payments and energy bill savings
7. Cash flow analysis
8. The City's preferred financial analysis assumptions like discount rate
9. Eligibility requirements

These and other factors will be analyzed to understand the risk of each financing option. Then, financing options will be ranked and showcasing the ideal financing product and timeline for selected projects. This information will be used to develop a framework for financing and completing projects. The Team will also determine the risk profile for City community groups and suggest specific project types based on a group's level of acceptance of risk.

TEC has worked with a number of public agencies to identify low risk and cost effective financing options for energy efficiency projects through SoCalREN. Further, TEC has developed a process for minimizing risk in project identification, design and procurement. This is done by understanding the City's financial hurdle rates and helping to package projects accordingly. TEC will also include typical construction schedules to help the City understand how financing and payment schedules can match up to project cost savings and timelines.

Task 3.2	Seek potential for public-private partnerships that promote energy efficiency and economic vitality in the community and in municipal operations.
Deliverable:	1. Partnership strategy including desired qualifications and various levels of engagement 2. List of potential partners in the private sector, organized by the following: - Experience and expertise in the given market segment - Capacity to accelerate project delivery above and beyond traditional methods - Ability to mitigate operational and performance risk - Cost management over lifespan of partnership 3. Draft template document for partners to get aligned on goals and objectives desired through this partnership

TEC will coordinate with the team to outreach to private companies in the community and seek potential partnerships for the City that align with the energy visions and goals and economic vitality.

The team will identify the types of beneficial partnerships that can exist for the City and put together a draft list of potential partners for the City to review. Based on the City's decisions, the team will develop outreach materials and perform an initial outreach to gauge interest and understand the potential partnership opportunities. The Team will continue discussions with interested parties and develop a more detailed list of potential partners for the City. The detailed approach is below.

1. Understand what qualifications are desired in a partner for the City
2. Research relevant types of public-private partnerships for successful traits and recommendations
3. Coordinate with the Orange County Business Council, who represents and promotes the business community to enhance economic development, to understand the business's perspective in the sought after public-private partnership.
4. Engage with community stakeholders to garner interest in partnering and how to develop mutually beneficial relationships
5. Develop options for the various levels of partnerships the City can engage in such as strategic alliances and firm partnerships
6. Evaluate the available partnership opportunities and recommend key partnerships to pilot
7. Develop a template for goals and objectives to be achieved through these key pilot partnerships

Task 4: Stakeholder Input and Educational Opportunities	
Timeline: Q3 2018 – Q4 2019	Costs: $25,000
Lead: TEC	Support: Integral Group, UCI APEP

Engaging the community and receiving input from stakeholders is a valuable step of developing the Strategic Energy Plan. The Team understands the importance of this and how it is critical to the long-term success and implementation of the strategies. TEC and Integral have several years of experience working with key stakeholders and facilitating collaboration. In addition, both TEC and Integral have a proven track record performing outreach and engagement on energy topics, as well as developing materials for educational purposes. TEC also has a long history of working with the City and is familiar with the right organizations and groups who will provide valuable input. Integral has assembled and facilitated internal and external stakeholder groups to varying degrees of involvement ranging from providing input to, shaping, and sometimes co-developing strategic energy and sustainability plans. The Team's approach for this task is to identify strategies and opportunities for the City to get the most exposure for the least cost. Detailed information for each subtask is provided below.

Task 4.1 Engage stakeholders throughout the development of the Strategic Energy Plan and incorporate input from organizations representing businesses, educational institutions and other interested members of the community.
Deliverable: 1. Stakeholder interest and influence chart helping the City prioritize members 2. Combine list key organizations and how they will be integrated in the process 3. Engagement plan for stakeholders and community members 4. Support Advisory Committee meetings

The Team's approach to engaging stakeholders incorporates several steps. First, stakeholders will be identified in collaboration with the City. Some examples have already been communicated such as the Irvine Chamber of Commerce, Irvine Company, and the Green Ribbon Environmental Committee. Based on TEC's experience, recommended outreach may also incorporate the City's educational institutions including University of California, Irvine, Irvine Valley College, and Irvine Unified School District. Additionally, TEC will work with the City to consider residential outreach based on a list of groups and organizations previously engaged with as part of a partnership effort with the City. TEC will then develop a draft engagement plan with the identified organizations and begin approaching the organizations to gauge participation interest. TEC will have multiple options for each sector of the community including businesses, educational institutions and others groups as identified by the City.

The Team will then assess interest and influence by using a model such as the one presented below. See Figure 13. This is an example showcasing interest on the x-axis and influence on the y-axis. Different community groups are shown with different colors and then the names and/or types of firms are plotted on the graph. This tool will be developed to help the City prioritize stakeholder engagement. TEC will then form an Advisory Committee to provide input to the Strategic Energy Plan.

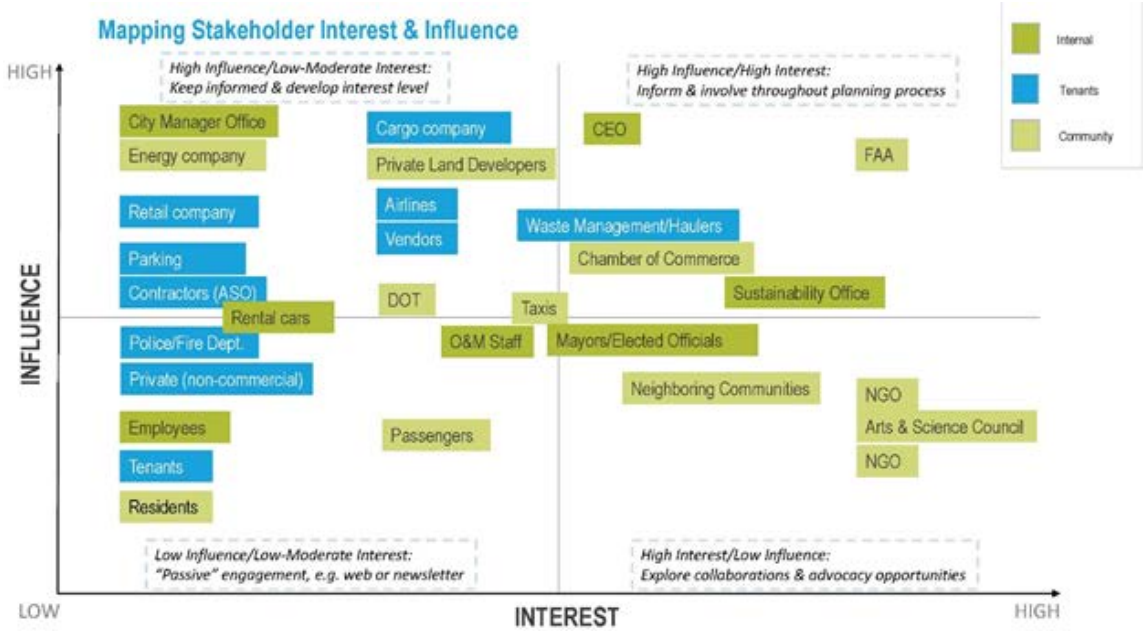


Figure 13. Sample stakeholder "mapping" output, emphasizing relative level of interest and influence in Plan outcomes.

The Team will help the City form the External Advisory Committee to provide input to the Strategic Energy Plan development process. The External Advisory Committee will be engaged at key milestones throughout the development of the Plan: (a) developing a vision and objectives; (b) providing input to strategies; (c) reviewing the draft Plan. TEC will coordinate the scheduling of the meetings, prepare agendas for the meetings in partnership with the City, facilitate the meetings and send out meeting minutes afterwards. Meeting locations will be varied throughout the City and stakeholders may be asked to host to further engage them in the process. Some initial ideas include the Irvine Civic Center and the Irvine Chamber of Commerce. Through experience with managing other stakeholder groups such as the SoCalREN Advisory Committee, TEC understands that 1:1 engagement with stakeholders is also beneficial. Therefore, TEC will build personal relationships with each stakeholder to maximize interest in the project.

TEC will coordinate with Integral to also prepare outreach materials to share with the City and host presentations as needed. TEC has designed and implemented engagement activities on energy efficiency and greenhouse gas emissions reduction topics for a number of clients, including the City of Irvine and the County of Los Angeles. TEC will also work with APEP to identify other key groups at the University of California, Irvine who can provide valuable insight and comments to the Strategic Energy Plan during the development. The Team will lead preparation, presentation and, debrief after each community meeting.

Task 4.2	Identify outreach and educational opportunities for City and stakeholders to host that highlight economically feasible technologies the community might consider to voluntarily reduce energy use.
Deliverable:	1. Report outlining potential energy projects linked with various community sectors 2. Targeted outreach plan mapping events and opportunities

The City has clearly established a strong level of environmental leadership in the community and continuing this stewardship through education and outreach events will be an important part of realizing its goals and vision. TEC's approach to this task is to first identify key subjects of interest based on the community's natural propensity. Possible topics include installation of renewable energy systems, battery electric vehicle charging, and fuel cell electric vehicle fueling. Other topics may include energy efficiency retrofits, transportation and mobility, battery storage, distributed energy resources, and net energy metering. In addition to interest, TEC will help the City choose technologies that

highlight successful projects and connect back to the Strategic Energy Plan. The Team will engage City staff to help disseminate information where possible to encourage involvement and allow those individuals to take pride in the success of their project.

The Team will work to identify opportunities to showcase the Strategic Energy Plan and highlight the economically feasibility of technologies or projects to increase community interest. Typical project timelines will be used to indicate which technologies the community can move on in the short versus long term. The Team will provide a list of recommendations, a timeline, and proposed outreach channel for each of the selected technologies. The plan will include exploring multiple events or workshops, leveraging pre-existing events where possible. TEC will support development of any outreach and education materials for these workshops in coordination with the UCI research centers and local technology companies to highlight innovative opportunities. The structure of the workshops or events will vary in topic, audience, and location. In addition to economically feasible projects, the team will support identification of demonstration opportunities for interested community members who are looking to achieve significant energy savings or production and showcase innovative and leadership.

9. PRICING PROPOSAL

The total not to exceed budget estimate from the team is shown below.

Tasks	City of Irvine *excluding* Great Park	Great Park component	Total City of Irvine *including* Great Park
Task 1 – Energy Profiles	$20,000	$1,500	$21,500
Task 2 – Vision, Goals & Strategies	$41,000	$3,000	$44,000
Task 3 – Funding Sources	$16,000	$1,000	$17,000
Task 4 – Engagement	$21,000	$2,000	$23,000
Total	**$98,000**	**$7,500**	**$105,500**

The above pricing proposal breaks out a cost for each task described in the RFP. The pricing proposal has been broken out further to account for costs associated with undertaking the tasks with specific focus on the Great Park site. The City currently has three service accounts with Southern California Edison and one service account with Southern California Gas at the Great Park. The 286-acre Great Park includes a sports complex which will comprise a significant variety of sports and recreation facilities. The Great Park is and will be a significant component of the municipal energy profile.

The consultant team's approach in developing the pricing proposal is to look holistically at the City's municipal and community-scale energy profiles, and develop a strategic approach to energy use over time. The Great Park component of the analysis and strategic planning and engagement are separated in the above breakdown, indicating the level of effort associated with that particular exploration as an element of the larger, holistic effort.

The Team plans on utilizing a fee structure based on time and materials. The following tables outline the rates per hour for each firm: Integral Group, The Energy Coalition and UCI APEP.

Integral Group	
Managing Principal	$310/ hr
Principal	$285/ hr
Senior Energy Consultant	$245/ hr
Senior Sustainability Consultant II	$195/ hr
Associate	$180/ hr
Senior Sustainability Consultant	$160/ hr
Project Coordinator	$100/ hr
The Energy Coalition	
Executive	$250/ hr
Director	$200/ hr
Program Manager/ Engineer	$150/ hr
Project Manager	$125/ hr
Accountant	$150/ hr
Project Coordinator	$90/ hr
University of Irvine, Advanced Power and Energy Program	
Professor	$156 hr
Researcher/ Associate	$102/ hr

Community Choice Energy Feasibility Study and Strategic Energy Plan

City Council

September 25, 2018

ATTACHMENT 8

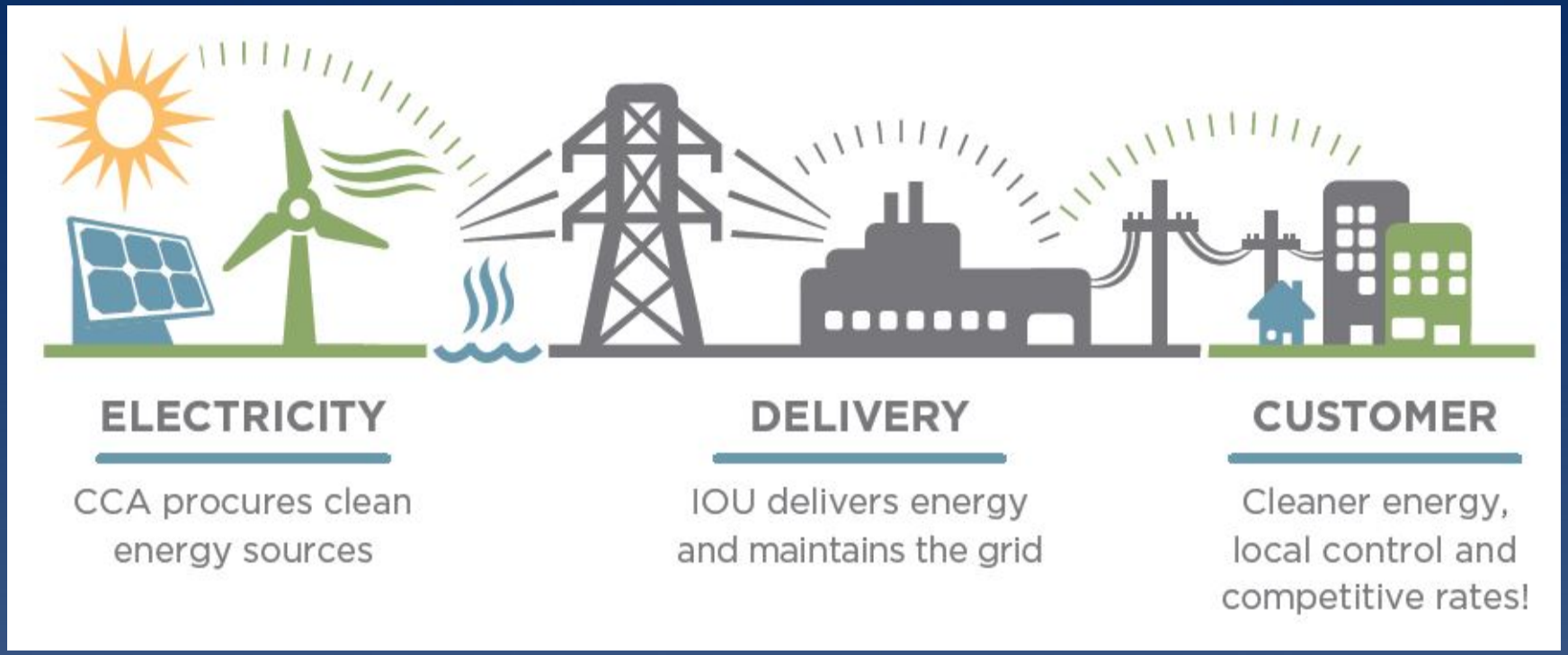
Overview

- Purpose of Energy Studies
- Objectives of the CCE Feasibility Study and Strategic Energy Plan
- Review Request for Proposal Results
- Financial Impact
- Next Steps for Energy Studies
- Recommended Action

Purpose of Energy Studies

- Define an Energy Vision for City of Irvine
  - Plan for Energy Resilience
  - Promote Energy Efficiency and Economic Vitality
  - Incorporate Distributed Energy Resources
  - Assess Potential for Local Control
- Support Comprehensive General Plan Update

Objectives of CCE Feasibility Study



Evaluate risks and benefits of implementing a CCE program; review potential to stabilize electricity rates and increase renewables

Objectives of Strategic Energy Plan

1. Evaluate Current and Future Energy Needs
2. Develop Economically Feasible Goals and Strategies to Conserve Energy
3. Identify Cost Savings and Funding Sources
4. Engage Stakeholders

RFP Process

CCE Feasibility Study

- 6 firms met minimum qualifications
- EES highest rated firm because of strong project approach and experience developing CCE studies for other municipal agencies

Strategic Energy Plan

- 8 firms met minimum qualifications
- Integral Group highest rated firm because of strong methodology and use of energy experts, engineers and scientists

Financial Impact

CCE Feasibility Study

- Total: $77,470
  - $72,434 funded from Public Works operations budget savings
  - $5,036 funded from Public Works Great Park operations budget savings

Strategic Energy Plan

- Total: $105,500
  - $98,000 funded from Public Works operations budget savings
  - $7,500 funded from Public Works Great Park operations budget savings

Next Steps for Energy Studies

- Project Timeframe:
  - CCE feasibility study: Complete Task 1 by first quarter of 2019
  - Strategic Energy Plan: 12-18 months

- CCE feasibility study and Strategic Energy Plan will be presented to City Council for consideration

Recommended Action

- Recommend that the City Council approve a budget adjustment for the reallocation of existing funds and authorize staff to award a professional services contract in the amount of $77,470 to EES Consulting, Inc. for a Community Choice Energy Feasibility Study.

- Recommend that the City Council approve a budget adjustment for the reallocation of existing funds and authorize staff to award a professional services contract in the amount of $105,500 to Integral Group, Inc. to develop the City of Irvine Strategic Energy Plan.

- Recommend that the City Council direct staff to establish a quarterly task force, comprised of one representative from each City Commission, to review the progress of the Community Choice Energy Feasibility Study and the Strategic Energy Plan.