

STAFF REPORT

To: Honorable Mayor and Council Members
From: Kelsey De Forge, Customer Service Coordinator
Date: September 21, 2010
Subject: Approval of the City of Beaumont's "Energy Action Plan" per requirements of the Southern California Edison's "Energy Leaders Partnership"

Background and Analysis:

In 2008, the Beaumont City Council approved Resolution 2008-15, supporting an energy efficiency partnership between Southern California Edison, our "hometown electric company" and the City of Beaumont.

The goal of the "Energy Leaders Partnership" (ELP) is to assist the City of Beaumont in reducing our municipal energy usage by 20% by the year 2012 as well as to jointly deliver marketing, education, and outreach to the community focusing on energy efficiency and resource conservation.

As a vital component of the ELP, the City of Beaumont must submit an "Energy Action Plan" (EAP) outlining the following information:

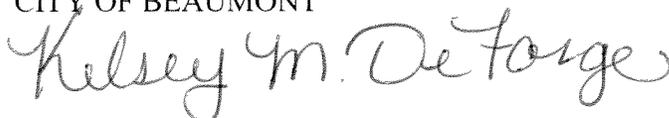
- History of energy planning in the City of Beaumont
- Calculation of baseline municipal energy usage
- Identification of accounts with the greatest energy usage
- Identification of target energy reduction goals
- Potential funding sources for energy efficiency projects
- Current and future programs/policies relating to energy efficiency and sustainability.

The EAP is a *living document* which may be revised and altered to accommodate additional energy efficiency components and any future needs that the City of Beaumont may encounter.

Recommendation:

Staff recommends APPROVAL of the proposed Energy Action Plan.

Respectfully submitted;
CITY OF BEAUMONT



Kelsey De Forge,
Customer Service Coordinator





Minutes
Beaumont City Council
Beaumont Redevelopment Agency
Beaumont Financing Authority
Beaumont Utility Authority
Beaumont Charitable Foundation
Beaumont Conservation Authority
550 E. 6th Street, Beaumont, California
Regular Session (6:00 p.m.)
Tuesday, September 21, 2010

"Materials related to an item on this agenda submitted to the City Council after distribution of the agenda packet are available for public inspection in the City Clerk's office at 550 E. 6th Street during normal business hours"

REGULAR SESSION

Regular Session to began at 6:00 p.m.

Place: Civic Center, Room 5

Roll Call: Mayor De Forge, Mayor Pro Tem Berg, Council Member Fox, Council Member Gall, Council Member St.Martin were present.

Invocation: Ken Spicer – New Creations Church
Pledge of Allegiance: Council Member Gall
Presentation: James Walrath – Update on Global Young Leaders Conference
Mickey Valdivia – Update on Beaumont Cherry Valley Recreation and Parks District
Helen Putnam Award - Beaumont Stimulus Program
"This program is the first of its kind in the nation—a city stepping up to the plate with its own stimulus package," then Beaumont Mayor Jeff Fox.

Adjustments to Agenda: None

ORAL AND WRITTEN COMMUNICATIONS: Anyone wishing to address the City Council on any matter not on the agenda of this meeting may do so now. The oral communications portion of the agenda is to hear public comments. Anyone wishing to speak on an item on the agenda may do so at the time the Council considers that item. All person(s) wishing to speak must fill out a "Request to Speak Form" and give it to the City Clerk at the beginning of the meeting. The forms are available on the table at the back of the room. There is a three (3) minute limit on public comments. There will be no sharing or passing of time to another person.

- **Victor Dominguez - Campaigning issues**
- **Judy Bingham - Contracts for Mr. Kapanicas and Mr. Aklufi**
- **Chad Scott - Fairway Canyon Improvements**
- **Adam Wagner- Fairway Canyon Maintenance**
- **Brian Levensen - Palmer Park Improvements**
- **Mary Daniel - Stimulus Plan**
- **Victor Young – On street parking at Veile and 4th Street**
- **Sara Lockhart - Thank Beaumont – great community**
- **Jim Stewart - Beaumont should be proud for the retail strength ranking in California**
- **Alan Gooch - Beaumont is a great community to live in**

1. COUNCIL REPORTS

(This is the portion of the agenda where the city council will present updates on city actions taken, committee assignments, and training and travel)

- a) Mayor De Forge - Fairway Canyon Meeting, Fairway Canyon HOA Meeting, Senator Emerson office here at the Civic Center, Spirit Run, United Way Day of Caring, AYSO opening day Ceremony, Oktoberfest, Relay for Life Car Show, Evening with Mark Twain at the Women's Club,
- b) Mayor Pro Tem Berg - League of California Cities Conference
- c) Council Member Fox - Thank Council Member Gall and St.Martin for being the voting delegates, Helen Putnam Award, Thank staff
- d) Council Member Gall - League of California Cities
- e) Council Member St.Martin - League of California Cities Conference

2. CITY MANAGER REPORTS

(City of Beaumont Core Values: Treat everyone right; Keep a customer service focus; Effective communication; Present opportunity; Operate like a great business; Eliminate bureaucratic solutions; Embrace positive change)

- a. Community Information and Local Project Update
 - 1) Sustainability Update
 - a) Kari Mendoza completion of Command College
 - b) Ice Cream Social
 - c) BYAL (Beaumont Youth Activities League) – Cpl. John Combado
 - d) Lt. Acosta Annual Golf Tournament Update – Cpl. Ron Morning
 - e) COP on Top – Liam Doyle
 - f) Thank you from Beaumont Unified School District
 - 2) Project Update
 - a) Beaumont Cares
 - 1) Animal Care Update
 - 2) Veteran's Update
 - 3) Update on Interchange on State Route 60 & Potrero Blvd.
 - b) Signs
 - 1) Caltrans expected to do study of I-10 Routes, Ramps and Stop Signs
 - 2) Election Signs – September 17, 2010 through November 12, 2010
 - c) Civic Center Campus Update
 - 3) Financial Update
 - a) August Financial Update
 - b) Retail Commercial Relative Strength Rankings in California
- b. Calendar of Events
 - 1) September 24, 2010 – Ice Cream Social 5:30 p.m. Beaumont Civic Center
 - 2) October 1, 2010 – Candidates Forum hosted by Chamber of Commerce 6-8 pm Civic Center
 - 3) October 6, 2010 – Community Awareness Team – Civic Center Room 5 6:00 p.m.
 - 4) October 9, 2010 – Chamber of Commerce - 4th - Annual Pass Area Business Expo
 - 5) October 9, 2010 – Home Depot Safety Fair
 - 6) October 11, 2010 – Columbus Day - Civic Center Offices Closed
 - 7) October 16, 2010 – Community Recycling Event Stewart Park – 8 am – 1 pm
 - 8) October 27 – 30, 2010 - Haunted Halloween Maze Civic Center 6pm
 - 9) October 31, 2010 – Trunk or Treat & Zombie Walk – Sports Park
 - 10) Second and Third Wednesday of Each Month – Story Time Café
- c. Rumor Control, and Report on Oral and Written Communications
 - 1) Update on Oral & Written Communications from George and Ann Connors

3. CONSENT CALENDAR

(This portion of the Agenda is for items that do not require a public hearing or discussion.)

- a. Approval of all Ordinances and Resolutions to be read by title only and publish by summary
- b. Approval of the Minutes of the City Council Meeting August 17, 2010
- c. Approval of the Warrant List for September 21, 2010
- d. Denial of Claim – Larry Malone
- e. Approval of Supplemental Agreement for CDGB 2010-2011.
- f. Adoption of Resolution No. 2010-23 – Resolution Support Measure U to Bring Jobs and Educational Opportunities to the Pass Area.
- g. Approval of Fund Raising Activities – City Cook Book, Fire Department Open House/Spaghetti Dinner and Beaumont Youth Activities League, Ironman Triathlon Sponsorship of Officer Devlin, and BCVRPD Winterfest/Pumpkin Carving Event.
- h. Authorization to Accept an Offer of Dedication – 10-D-01, 10-D-02, and 10-D-03 for Brookside Avenue Landscaping within Oak Valley Greens.
- i. Approval of the City of Beaumont's Energy Action Plan per requirements of the Southern California Edison's Energy Leaders Partnership.
- j. Approval of Temporary Bike Lane Modifications on Sixth Street.
- k. Authorization for Funds for Weed Abatement for property located in the 1100 block of Pennsylvania and Michigan with all costs to be applied to the Annual Property Tax Bill.
- l. Ratification of the Mayor's Signature on Resolution No. 2010-24 for 2009/10 Prop 1B California Transit Security Grant Program, California Transit Assistance Fund.
- m. Approval of Task Order for Anti-degradation Analysis for the Beaumont Management Zone.
- n. Authorize the City Manager to assist with the Safety Fair within authorized spending limits.

Recommendation: Approval of the Consent Calendar as presented.

Council Member Berg and Council Member Gall both requested item 3.f be pulled for discussion.

Motion by Council Member St.Martin, Seconded by Council Member Berg to approve the Consent Calendar with the exception of Item 3.f. Vote: 5/0

San Jacinto Representatives on Measure U.

**Adam Wagner - Opposed
Victor Dominguez - Opposed**

Motion by Council Member Berg, Seconded by Council Member Fox to deny Resolution No. 2010-23 as presented. 5/0

4. ACTION ITEMS/PUBLIC HEARING/REQUESTS

(This portion of the Agenda is for items that require a public hearing, discussion, and/or Council direction.)

- a. **Ordinance No. 972– An Ordinance of the City Council of the City of Beaumont, California Requiring Payment of Development Impact Fees for Recycled Water Facilities, Appointing Time and Place of a Public Hearing and Directing Notice Thereof, Describing Proposed Boundaries of Benefit Area. (Continued from August 17, 2010)**

Recommendation: Continue the Open Public Hearing to the Regular City Council Meeting of December 7, 2010.

Staff report was given by Kyle Warsinski, Staff Planner

Motion by Council Member Fox, Seconded by Council Member St.Martin to continue to the regular City Council meeting of December 7, 2010. Vote: 5/0

- b. **Cooperative Memorandum with Morongo Band of Mission Indians**

Recommendation: Approval of the Project Progress Report and Cooperative Memorandum and Authorization of the Mayor to execute the Project Progress Report and Cooperative Memorandum subject to the authority of the City Attorney to make non-substantive changes.

Staff report was given by Alan Kapanicas, City Manager

Speakers:

John Ohanian - In Favor

Motion by Council Member Berg, Seconded by Council Member St. Martin to approve the Cooperative Memorandum with Morongo Band of Mission Indians. Vote: 4/1 (Council Member Gall voted no)

- c. **Ordinance No. 971 – An Ordinance of the City Council of the City of Beaumont, California Amending Section 17.04.080 of the Beaumont Municipal Code Entitled “Regulating Enclosures for Solid Waste and Recycling Materials”**

Ordinance No. 974 – An Ordinance of the City Council of the City of Beaumont, California adding Section 9.03.155 to the Beaumont Municipal Code Entitled “Special Events Recycling”

Ordinance No. 975 – An Ordinance of the City Council of the City of Beaumont, California Adding Chapter 8.13 to the Beaumont Municipal Code Entitled “Mandatory Recycling of Construction and Demolition Waste”

Ordinance No. 976 – An Ordinance of the City Council of the City of Beaumont, California Adding Chapter 8.14 to the Beaumont Municipal Code Entitled “Mandatory Recycling Requirements for Commercial Facilities”

Recommendation: Hold a Public Hearing and Approve the first reading of Ordinance No. 971, 974, 975, and 976 as presented.

Staff Report was given by Rebecca Deming, Asst. Director of Planning

Open Public Hearing 9:03 p.m.

No Speakers

Closed Public Hearing 9:04 p.m.

Motion by Council Member Fox, Seconded by Council Member Berg to approve the 1st reading on Ordinance No. 971, 974, 975, and 976 as presented. Vote: 5/0

d. Transit Fare Structure Review

Recommendation: Open Public Hearing, Take Testimony, and Approve the fare structure as presented.

Staff report was given by Elizabeth Gibbs-Urtiaga, Resources Director

Open Public Hearing 9:10 p.m.

No Speakers

Closed Public 9:11 p.m.

Motion by Council Member Fox, Seconded by Council Member Gall to approve as presented. Vote: 5/0

e. "Shop the Pass" Buy Local Program

Recommendation: Review and Approve the Pass EDA "Shop the Pass" and approve funding in the amount of \$4,577.08 from the General Fund.

Staff report was given by Kyle Warsinski, Staff Planner

Speakers:

Brian Contreres – Pass EDA

Motion by Council Member Berg, Seconded by Council Member Gall to approve and authorize the City Manager to adjust the rate on a per capita if necessary. Vote: 5/0

Adjournment of the City Council Meeting at 9:20 p.m.

Respectfully Submitted,

Alan Kapanicas
City Manager





City of Beaumont Energy Action Plan

Prepared by the Beaumont Energy Commission

*Kelsey DeForge, Customer Service Coordinator
Rebecca Deming, Assistant Director of Planning
Beaumont City Council*

2010-2012



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- Appendix B – Monrovia City Electrical Historic, Baseline and Goals Detail
- Appendix C – Monrovia City Natural Gas Historic, Baseline and Goals Detail
- Appendix D – Energy Efficiency Measure Recommendation Summary
- Appendix E – Energy Efficiency Measure Details
- Appendix F – Monrovia 2006 Pumping Plant Report
- Appendix G – Monrovia Renewable Fuels
- Appendix H – Monrovia City Fleet Baseline and Goals Detail



1. Executive Summary

With the unprecedented energy challenges resulting from increased import dependency, concerns on supply of fossil fuels worldwide, and an undoubtedly discernable climate change, it is clear that action needs to be taken. In order to combat these problems, a relationship has been formed between Southern California Edison and the City of Beaumont to create and implement an Energy Action Plan. This EAP lists goals for the city's future and sets forth commitments to achieve these goals through specific actions. These actions will ensure that sufficient, dependable, and reasonably-priced electrical power and energy supplies are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for the city's consumers and taxpayers. This plan looks at retrofitting municipal facilities to provide greater energy efficiency, various methods for reducing the overall carbon footprint of the City of Beaumont and its community of energy users, and demand reduction strategies that can further offset the energy needs for the City of Beaumont, including the use of renewable energy sources. **This EAP is a living document meant to change with time, experience, introduction of new technologies and needs as the city progresses toward a sustainable future.**

The City of Beaumont is committed to address these challenges and take environmental leadership in producing a sustainable future. In light of this commitment, the Beaumont City Council approved Resolution 2008-11, in which the City officially recognized the need for energy conservation and resource sustainability.

The City of Beaumont has partnered with their "hometown utility," Southern California Edison (herein referred to as The Partnership) to provide the community of Beaumont with vital energy efficiency information, training, and materials. The program is community-based and helps public agencies, businesses, and residents reduce energy use and expenses. The Partnership provides project identification analysis for city facilities, Energy Action Plans (EAP's) and implementation of the recommended energy efficiency projects in the city facilities.

California Legislation

California passed legislation, AB32 which provides goals that the state will reduce greenhouse gas emissions to 1990 levels by the year 2020. This is especially significant for California since the state has been identified as being the 12th most significant emitter of greenhouse gases in the world. It is essential that California take the leadership and put an aggressive program in place for mitigating GHG emission.

The greenhouse gases targeted by this legislation are those contributed by human activity such as water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Natural greenhouse gases are beneficial for warming the earth to a certain temperature, but those additional gases produced by humans trap in infrared rays causing the earth's atmosphere to overheat. Carbon dioxide is the most common greenhouse gas focused on by scientists and the general public and will be the target of reduction in this Energy Action Plan.

In order to accomplish this goal the state needs to partner with cities and counties so that they can drive this effort on the local level.



With imperative energy efficiency on the rise and the strong support and incentives that local utilities provide its customers, it is more feasible for cities to take actions that make meaningful changes. Cities can receive incentives to have audits conducted where energy conservation HVAC and lighting consultants determine energy efficiency opportunities at city facilities along with incentives to implement suggested actions. These audits fuel awareness in city management structures and governments. The bottom line is that energy efficiency projects are easier to do now more than ever as funding is provided for both the means and the ends.

The Partnership supports the City of Beaumont in being a leading partner in meeting California's goal of carbon emission reduction as well as on establishing a policy on carbon emissions reduction.

The City of Beaumont has already made significant inroads of carbon emissions reduction on a local level with the numerous energy efficiency projects completed. Details of these efforts, along with their environmental impact, are outlined throughout this document.

Other cities throughout the San Geronio Pass Area can benefit from the structure and commitment Beaumont has already exemplified and the ground they've covered in its efforts to reduce their carbon emissions.

Impacts of Different Levels of Actions

An Energy Action Plan entails considerable effort and expense. Reduction of carbon emissions involves the implementation of energy-efficiency retrofit projects in buildings, replacement of fleet vehicles, and a more disciplined attitude towards resource conservation. Realizing an effective Energy Action Plan requires more than just consent from elected officials and municipal staff. It requires a very active role that involves all policy-makers and implementation staff at all levels. Funding for these projects must be made available either through budgeted items and the appropriate leveraging of existing rebates and incentives.

All efforts to reduce carbon emissions have to be funded to a certain extent. In a world of limited resources, priorities must be established and acted upon. This is true whether the carbon emission reduction effort involves hardware installation (more efficient lighting, HVAC, Photovoltaic's, etc) or an education campaign urging city staff to be more energy conscious.

Priorities should be established on what measures provide the largest reduction per dollar. To this end our EAP evaluates all options based on cost, energy savings, carbon emission reduction, and payback considerations.

2. Beaumont Energy Action Plan Overview

The Partnership recognizes Beaumont as a forerunner in taking action to be as energy efficient as possible, given the various constraints attached to operating a public agency. To assure success in their commitment, Beaumont city staff has consistently met with representatives from Southern California Edison on a monthly basis to determine future energy efficiency projects as well as tracking and monitoring ongoing projects. Projects include municipal retrofits as well as marketing, education, and outreach campaigns. The Partnership



Team has submitted special projects to coincide with the City’s annual fiscal budget. In June of this year, the City Council adopted their annual budget to include funding for several energy efficiency projects to be completed within the next three years. At each City Council meeting, the City Manager provides a “Sustainability Update” detailing the progress that has been made in the City’s efforts toward promoting a “green” and sustainable community.

Although the City of Beaumont is involved in numerous projects related to the goal of sustainability, the focus of this report will be on energy efficiency and conservation of natural resources.

Beaumont capitalized on incentive opportunities to obtain a free assessment through the Partnership whereby a team of energy professionals visited the city’s facilities and provided detailed recommendations on ways to increase energy efficiencies and obtain their goals. The assessment acts as a guide for Beaumont to make informed energy upgrade decisions.



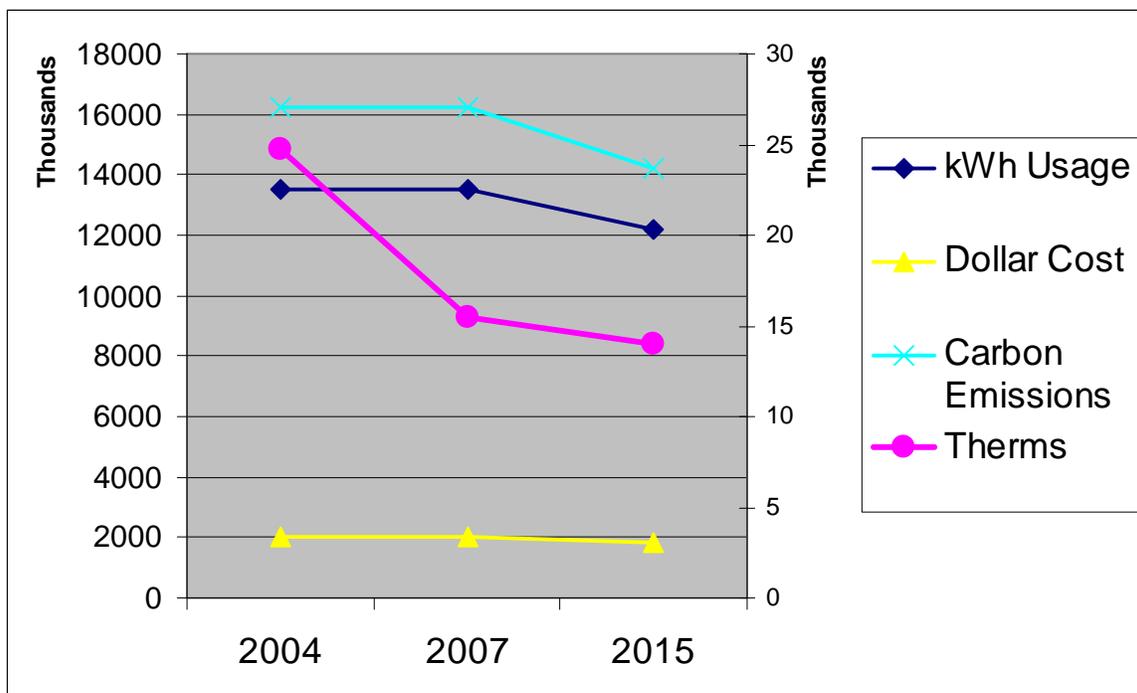
Quantifiable Results to Date and Future Goals

Historical data illustrates the emissions that can be attributed to Beaumont's past energy usage during the last 5 years dating back to Fiscal year 2003/2004 (herein referred to as Fiscal year 2004). Fiscal Year 2003/2004 data was chosen to represent the costs, energy, gas, and carbon emission changes already taking place from the energy-efficiency installations performed by the City of Beaumont. Comparable data from Fiscal year 2008/2009 (herein referred to as Fiscal year 2007) forms the current baseline measurement that The Partnerships' Reduction Proposal uses as a starting point. It is important to note, however, that the City of Beaumont has experienced significant growth in the last ten years; therefore, the comparison of baseline data from 2003/2004 may not necessarily illustrate a dramatic reduction in energy usage when compared to the most current data available.

Moving forward, Beaumont has identified future goals to reduce the city's peak electric load by 20 percent within two years (by Fiscal year 2011/2012 (herein referred to as Fiscal year 2012)) through energy efficiency, shifting the timing of energy demands, and other conservation measures.

City Buildings

Comparison of Electrical and Natural Gas Usage, Cost, and Carbon Emissions in Fiscal Year 2004, 2007, and Anticipated 2015 Goals



See **Appendix B** for electrical back up details.



See **Appendix C** for natural gas back up details.



3. Moving Forward: Achieving Future Goals

City Buildings Site Information

City staff, in conjunction with SCE, conducted an Energy Efficiency Assessment of the Beaumont City Buildings in order to explore opportunities for reducing energy demand and utility costs; several areas of improvement have been identified and provided to city staff for consideration. SCE continues to support the city in its quest to be more energy efficient by way of access to technical resources, guidance throughout the rebate/incentive process, funding for marketing, education and outreach programs for the community and assistance in identifying potential energy efficiency projects.

All of these improvements form the basis for the projected emissions into the future. The difference between projected and base line emissions constitute the GHG reductions that Beaumont is projected to realize. The analysis for future trends for energy-efficiency is based on projects currently in the works and those scheduled.

The current GHG emission inventory is attributable to the everyday operation of the City of Beaumont. The buildings surveyed include: City Hall, Police Department (old), Police Administration Building Complex (includes an OES training center, future IT facility, and additional office space for future expansion), Fire Station #66 and #22, Albert A. Chatigny, Sr. Community Recreation Center, Maintenance Yard, Transit Yard/Garage, old Beaumont Unified School District offices, and the Waste Water Treatment facility.

A comprehensive list of Energy Efficiency Measures were identified and evaluated including the lighting fixtures of the buildings, and the possibility of additional energy efficiency measures for the pumps at the Waste Water Treatment facility.

All city buildings have some office, storage, or classroom space. Plug load equipment is primarily comprised of computers, printers, and copiers. There is also a substantial load providing interior lighting to all of the structures. The occupancy hours of every building varies and were taken into consideration in the analysis.

During the survey, numerous opportunities for energy efficiency improvements were identified and categorized by equipment type. Installation costs are based on discussions with lighting and HVAC professionals, and cost data from SCE.

Appendix D summarizes the energy efficiency measure recommendations and energy and cost savings, grouped by HVAC and lighting measures.

Appendix E provides Energy Efficiency Measure and Site Location details for a full understanding of the suggested options.

Potential Savings:



Overall, the identified potential energy costs savings are **\$19,348** per year (minimum rate using charge of \$0.149 per kWh). Attaining these energy costs will provide a rebate to the City of **\$19,613**, which equals a combined investment of **\$38,961**.

Already Achieved Savings:

The City of Monrovia has already achieved a cost savings of **\$36,082** (also using the minimum savings rate) this year in their projects completed (FY 2007-2008). This has returned a rebate of **\$25,167** back to the City, which has brought a total savings of **\$61,249**.

All calculations were based upon an electricity rate of \$0.12/kWh, and rebate levels of \$0.10/kWh saved for lighting and \$0.14/kWh saved for HVAC (Applies to 2007 ONLY and future rates are uncertain).

City Buildings Recommendations

2.2.1. Conservation

The most obvious and sensible way for the City of Monrovia to reduce CO2 emissions and become more energy efficient is to conserve and decrease their use of energy. Programs such as “Flex Your Power” or “Energy Star” allow for simple, effective ways to accomplish this. Educating employees, citizens, and local businesses on small changes they can make throughout the day in order to conserve energy can make a dramatic difference in the amount of energy saved. Finding ways to promote public awareness and purchase products that reduce energy use will be vital for the City of Monrovia to incorporate in their budgets and events in order to meet their goals.

Demand Response

Demand Response is a growing area of programs by SCE. Generally, this requires cities to be willing to reduce electrical usage particularly peak demand at the request of the utility. They are generally given 1 hours notice to reduce down to a level arranged in advance by contract with the utility.

We believe a study should be initiated to determine the extent Demand Response can be contracted for at larger City locations such as City Hall and the Corporate Yard. Incentives are currently available up to \$250/kW for engineering and installation of the systems which are needed to be able to deliver these reductions at the request of SCE. These systems generally work with lowering lighting levels and reducing HVAC per a planned sequence



2.2.2. Saving Calculation Process

The energy and cost saving calculations for the measures specifically identified at the sites are based on standard DEER demand reduction (wattage) values multiplied by the annual hours of operation. The measures are grouped according to no-cost, low-cost, and investment categories based on project costs. The no-cost category also includes measures for which the San Gabriel Valley Energy Wise Partnership can provide incentives to cover all installation costs.

2.2.3. Current Efficient Technologies

A number of energy-using technologies were found inside and outside of the city's buildings that were of a high enough efficiency, or low enough usage, as to not warrant any changes. These included CFL's, T8 fixtures, and low pressure sodium lights.

No-Cost Measures

Office Equipment

- Turn on the energy saving features for all computers. These can turn off monitors and turn the computers to standby mode when they are not being used, providing an easy way to save electricity. Most screen savers do not save electricity.
- Turn off computers, printers and copiers when you leave the building. Even in standby mode these systems will use a small amount of electricity.

Lighting

Since lighting consumes a great amount of energy we cannot overlook the no-cost saving opportunities such as:

- Turn off lighting in unoccupied areas.
- Turn off lighting when the building is vacant.
- Encourage occupants to turn their lights off when they will be out of the office for more than 15 minutes.
- If dimmers are installed, the lighting levels can usually be reduced without affecting occupant comfort. Essentially, reducing the light level by 10% can save almost 10% of the energy consumption, and the 10% lighting reduction is difficult to detect by the human eye. It pays to use the dimmers you have installed.

HVAC

- Clean coils, repair leaking ductwork.
- Check economizer operation.
- For cooling, set the thermostat to 78° F during the workday and to 85° F or off when your facility is vacant. For heating, set to 68° F during the workday and to 63° F after hours. A study was performed on the difference between setting the thermostat in the Youth Center (Temporary library) at 73° F and 78° F. Calculations demonstrate a savings of 3.44 kW and 8,300 kWh, which means a



minimum dollar savings of \$1,237 (using a minimum rate of \$0.149 per kWh), could be achieved from changing the setting on the thermostat.

Low-Cost Measures

Lighting

- Remove and replace yellowed diffusers on lighting fixtures.
- Title 24 AB switch lighting circuits allow the user to control individual lamps in a fixture with more than one lamp; they are typically used with linear “tube” fluorescent lighting. They are a very efficient way to cut energy usage when there is no need for maximum lighting levels. If dual-switch circuits are installed, use them to adjust lighting levels. For example, in an area with day lighting from windows or skylights, switch off one circuit when the daylight levels provide sufficient lighting for the area.

HVAC

- Establish a maintenance contract for the furnace and air conditioner units.
- Change filters regularly.
- Repair or replace defective door and window seals.

Additional Savings Opportunities

City-Owned Street Lights and Traffic Signals

Given that there is much energy conservation and GHG reduction opportunities available in street lights and traffic signals, Monrovia’s systems were analyzed for energy-efficiency and suitability for retrofits.

The Partnership would like to promote induction lighting as both innovative, and economically feasible as retrofits for existing Metal Halide street lights. Induction lighting is most known for its incredibly long lifetime. Since there are no electrodes or cathode coating to deplete, induction lighting can have lifetimes as long as 100,000 hours. Induction lighting is also able to endure tough weather and outdoor conditions due to its good vibration resistance. The City would benefit from reduced maintenance and replacement costs due to the longer lifetimes of induction lights. The crisp color and fade-resistance provided by induction lighting is a reliable source drivers can count on while viewing street lights. The payback in maintenance will more than offset the initial cost of induction lighting.

LED retrofits are another option the Partnership promotes as a replacement to the less energy-efficient Metal Halide street lights. LED lights also provide long life spans allowing them to be changed less frequently and also save costs. Although LED lights do not provide as much lumens per watt, they are highly energy-efficient and still offer a more pleasant spectrum of light than sodium lamps do. LED lights are typically twice as expensive as normal streetlights, but will save money in both the energy and maintenance costs saved. The cost of LED lights should continue to drop as supply for these products increase throughout the years.



New Construction

Title 24, the energy efficiency standards for residential and non residential buildings, was established in order to reduce energy consumption throughout California. One of the most significant ways to conserve energy is through utilizing the current, efficient technology and methods available in the market, which are mandated by Title 24.

In order to maximize the energy efficient standards on a building most architects/builders will follow LEED qualifications. Leadership in Energy and Environmental Design (LEED) is the next step above Title 24 and is based around a rating system stating the performance level of the green building. There are numerous categories and measurements within the rating scale that need to be met in order for the building to be authorized as a sustainable green building.

The Partnership would like to encourage the City of Monrovia to take the initiative and receive LEED certification on all new construction. This will provide Monrovia with energy and cost savings in both the long-run and short-run. Instead of having to perform costly retrofits in the future by replacing older non-efficient equipment, city buildings will already be a step ahead and have the necessary energy efficient technology.

Monrovia City Buildings Status Update

The City of Monrovia worked fervently in Fiscal Year 2007-2008 to renovate and upgrade city facilities in order to conserve energy and decrease carbon emission. There are various projects the City is pursuing throughout all of their facilities and this section only includes those completed by May 2008. The City has accomplished the following measures:

- Placed 22 water free urinals throughout facilities in order to conserve water and improve sanitation.
- Common T-12 lighting has been switched out with either T-8 or T-5 lighting fixtures along with electronic ballasts in order to reduce wattage and increase visibility in multiple locations.
- Incandescent light bulbs have been replaced with CFL's (Compact Fluorescent Lamps) to also decrease wattage loads.
- Occupancy sensors have been installed to decrease lighting usage during unoccupied times.
- Cool roofs have been applied and are continually being considered for other locations with the purpose of preventing heat transmission into facilities.

Water Pumping Site Information



The water pumping and treatment is performed at six (6) facilities. Many of the processes are performed outside. There is limited building and coverings for equipment.

Providing water to businesses and residents of Monrovia is a service provided by the City. The water is generally pumped out of the ground with well pumps (50-300 HP) and booster pumps to holding tanks/reservoirs. As the city is located in the foothills of the San Gabriel Mountains a significant amount of pumping is required. The traditional process has been to first treat the water after pumped out of the ground to then be sent up to the reservoirs in the mountains. The water is then distributed from the reservoirs by gravity to the customers in the City. This process uses a large amount of pumping power since the water needs to be pumped from up to 450 feet below ground. All pumps are driven by electric motors and the natural gas driven pumps have been abandoned.

Replacing water pump motors with newer energy-efficient models will not only save energy but will also contribute to the efficiency of the water pumping system.

The water pumping facilities are generally not staffed. City staff visits the sites periodically. Pump testing is periodically provided by SCE's pump testing group.

The annual electrical usage for water pumping based on 5/11/06 report from SCE was 8,266,860 kWh.

Appendix E provides Energy Efficiency Measure and Site Location details for a full understanding of the suggested options.

Appendix F presents a pumping plant report that was completed by SCE in 2006 in order to display a cost analysis summary on the current water pumping system.

Water free urinals reduce water and sewer costs, maintenance and repair bills, and create more hygienic, odor-free restrooms. A patented, sealed cartridge eliminates the need for water, conserving an average of 40,000 gallons per unit each year. The purchase and installation of water-free urinals is less expensive than manual and automatic flush units because flush valves and associated piping are not required. Maintenance costs and vandalism problems associated with flush valves are also eliminated. The City of Monrovia has installed 22 water free urinals up to date, which provide significant savings in electricity, natural gas, and carbon emissions as demonstrated in the table below.

Annual Savings:

| Water: | Electrical | Natural Gas: | Carbon Emissions: |
|-----------------|--------------|---------------|---------------------------------|
| 880,000 gallons | 3,171.96 kWh | 108.25 therms | 3,806.4 lbs. of CO ₂ |



Water Pumping Site Recommendations

2.2.4. No-Cost Measures

The city currently uses their SCADA system to not pump during the hours of 11:30 AM to 6:00PM during the summer months to assist the utility in controlling peak demands.

The city also minimizes pumping based on the use of level measurements in their tanks and reservoirs. The water usage of the customers can be matched closely to the water removed from the wells.

Demand Response

Monrovia has six water pumping locations. The pumps are controlled by a central SCADA system. The city is currently not operating pumps where possible during the noon to 6:00 PM period during the summer months as designated by SCE.

We believe a study should be initiated to determine the extent the system at all locations can participate in an SCE demand response program. Incentives are currently up to \$250/kW for engineering/installation of the systems to be able to deliver these reductions at the request of SCE.

2.2.5. Low-Cost Measures

Customer Usage Reduction

- Establish a homeowner/business toilet exchange program
- Provide other water saving devices to homeowners/businesses
- Resident education

2.2.6. Higher-Cost Measures

Pump/Motor Upgrades

Water pump testing is provided periodically by SCE's pump testing group. They make recommendations on applicable pumps and this is attached in Appendix F. This shows annual energy usage per motor/pump and potential for annual energy savings. The details for the cost savings will need to be obtained from the SCE pump department.

The total savings shown are \$64,017. Based on \$.12/kWh the annual usage reduction is 533,475 kWh. This represents a 6.5% savings. The cost to implement was not provided by SCE pump testing. A similar program was implemented in South Pasadena and their payback was .9 years to 10 years.

Power Factor Correction



We investigated briefly Power Factor correction. Due to the fact the well pumps run generally at constant volumes except when the water table changes due to rainfall power factor was not taken any further during this audit. We looked at three pump reports with the following loading:

| <u>Pump/Motor</u> | <u>Motor Load (%)</u> |
|-------------------|-----------------------|
| Sta#1 Bst#4 300HP | 91% |
| Booster #3 250HP | 117.1% |
| Well#4 200HP | 92.9% |

Just for clarification a 200HP has the following power factors:

The impact of loading on power factor is as shown below:

| <u>Loading</u> | <u>Power Factor</u> |
|----------------|---------------------|
| One half | .85 |
| Three-fourths | .89 |
| Full | .90 |
| 120% | .86 |

The booster pumps do vary in volume in many cases and some have variable frequency drives. Generally the power factor is held over 90% with variable speed controllers.

We suggest that as the motors/pumps are tested the motor load % be reviewed for a one week period. If the loads go under three-fourths then a power factor study should be initiated. Also if overload conditions are near 120% then a study to evaluate the cost/benefits of correcting power factor.

Suggestions for Further Study

A considerable amount of water is consumed by landscaping throughout the city. In order to conserve water and decrease the amount of pumping power placed on pumps, recycled water could be allotted to landscaping and other areas that may be able to use it. The City of Monrovia does not currently provide recycled water to customers as it is not yet available through distribution channels. There have been discussions with Upper San Gabriel Valley Municipal Water District in the past, but the decision to bring recycled water to Monrovia was not approved. The Partnership recommends that the City of Monrovia readdress this topic with Upper San Gabriel Valley to examine their ability to transport recycled water into the City of Monrovia. Before deciding on this as an option, the City of Monrovia should perform a study on the comparisons of efficiency between trucking in water versus hosting an on-site reservoir.

Renewable Energy



Intergy has worked with Southern California Edison to identify what percentage of their peak electric load comes from renewable energy. SCE then provided a statement indicating that preliminary data shows in 2006 they delivered about 13 billion kilowatt-hours of renewable energy, 17 percent of its total power deliveries. Furthermore SCE is targeting to have renewable energy contracts that, when fully operational, will represent 3 percent more of its customers' energy needs by 2010 to hit 20 percent total. **SCE's additional 3 percent reduction by 2010 contributes to Monrovia's 2015 goal; leaving an additional 7 percent for Monrovia to reduce to meet its goal.**

In order to achieve this goal of an additional 7 percent with minimal cost and quick payback periods for the City of Monrovia, it is important that they choose projects sensibly. There will only be particular projects that will suit Monrovia's needs in a particular timeframe. In order to ensure that this takes place, the City should engage in a cost benefit analysis or a lifecycle analysis for any renewable energy projects they would like to pursue. Provided below is a table listing the certain elements a project should entail before the City of Monrovia moves forward with it.

| <u>Topic</u> | <u>Question to Ask</u> | <u>Rating Points*</u> |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Mission/Vision | Does this project relate/help achieve with the City's plans or goals? | 3 |
| Land Area Available | Is there land/space available for this project? | 3 |
| Financial Capability | Are there any loans or financial assistance available for project? | 3 |
| | Are there any other pressing projects the budget should focus on besides this one? | 3 |
| | Is the payback period practical for the project or will more efficient technology be available by the time the project is paid off? | 3 |
| Legal | Are there any legal issues conflicting with this project? | 4 |
| Timing | Will the weather permit for this project to be completed in a timely manner? | 2 |
| Perception | Will the community and other members of the city agree with this project taking place? | 3 |
| | If they are not in agreement at this time, how much time/effort will it take to educate them on the importance of this project? | 2 |
| Resources | Has any other City done this before and did they benefit from it? | 3 |
| Risk | What could be the outcome if this project is not completed successfully? | 4 |

*33 points possible from rating scale



If Project receives a total of 27 points or above: Move forward with project
between 20 and 26 points: Correct some issues before progressing
below 19 points: Progression is not recommended

A current project the City is examining is a system. Although solar energy technologies are a great renewable energy by transferring sunlight into photovoltaic system is not always the best option. A advantage of photovoltaic systems is that they do not emissions or incur any costs during operation, thus cleaner energy source. However, these systems are having either long payback periods or other difficulties. should follow the rating system above to look further feasibility of constructing a photovoltaic system. The already identified some of the answers, but the recommends other topics be covered as well before moving ahead with this project.



photovoltaic resource of electricity, a great produce leading to a known for This project into the City has Partnership



Transportation Information

Given that 43 percent of greenhouse gases derive from transportation, a major portion of California legislation related to the environment and carbon emission focus on this sector. The only way to essentially reach goals established by AB32 or other types of bills is by finding transportation solutions. Not only are harmful emissions mounting, but also gasoline prices are soaring causing an increased demand on a renewable fuel source. It is important for the City of Monrovia to acquire fleet vehicles as well as motivate their residents to utilize zero or low emission vehicles that will be able to suit their needs.

There are a number of options available in the marketplace today, but there are advantages and disadvantages to each one. *Appendix G* will provide detailed information regarding each of the options along with their pros and cons.

Transportation City Goals

The City of Monrovia's fleet information was gathered in order to conduct an audit on the carbon emissions and provide recommendations on decreasing this number. The calculated number of vehicles included in this fleet audit was one hundred (100) passenger cars, fourteen (14) trucks, and two (2) hybrid trolleys. These vehicles are used by the police, water, public transit, and fire departments. The estimated annual mileage is based on FY 2006-2007, the chosen baseline year, with additional information on of the fleets included in Appendix H.

City Accord Action 14: Implement programs that phase down sulfur emission in diesel and gasoline fuels by 50 percent concurrent with using advanced emission controls on all buses, taxis, and public fleets to reduce particulate matter and smog-forming emissions from those fleets by 50 percent by 2015.

Particulate matter and smog-forming emissions are important to define in order to understand what the City Accord Action is aimed at accomplishing. Particulate matter, also known as PM, is liquid droplets of acids, untreated chemicals, metals, and soil or dust elements. These particles can lead to health problems when consumed by the general public through the throat and nose into the lungs to then damage the heart or cause lung cancer. Automobile gas emissions in the air are one of the major ways particulate matter is caused. By decreasing the amount of particulate matter, the City is creating a healthier environment for their citizens.

Smog-forming emissions are those contributing to air pollution by combining a combustion product and gaseous emission. Nitrogen oxides and various hydrocarbons experiencing photochemical reactions are an example of a smog-forming emission. Particles such as soil, dust, and various exhaust particles may mix with the ozone and create a brownish, thick haze. Smog also poses health risks as particulate matter does, but also damages crops, rubber, and other materials. As Monrovia is located in Southern California where smog has been a growing concern, it is vital for Monrovia to contribute to finding any solution to the issue.

The year 2020 was included in the CO₂ goal due to its important relation with AB32. This bill includes other greenhouse gases in the chart and not just carbon dioxide, but also methane, nitrous oxide (NO_x), Sulfur Oxide



(Sox), and Particulate Matter (PM). These sources of pollution are commonly derived from the transportation segment in which City fleet vehicles are included. A goal of reducing Monrovia’s fleet carbon emissions by approximately 25 percent before 2020 was used in conjunction with AB32’s stated amount.

City Fleet Baseline → Goals

| | 2007 CO2 | 2020 CO2 Goal | 2007 PM10 | 2015 PM Goal | 2007 SOx | 2015 SOx Goal | 2007 NOx | 2015 NOx Goal |
|---------------------|---------------------|---------------------|------------|---------------|--------------|---------------|------------------|-----------------|
| TOTAL PASSENGER | 999,093.61 | 749,320.21 | 76 | 38.13 | 9.73 | 4.86 | 1,095.28 | 547.64 |
| TOTAL TRUCK | 216,682.25 | 162,511.69 | 66 | 33.09 | 1.91 | 0.95 | 1,823.64 | 911.82 |
| TOTAL CONTRACTED | 990,795.79 | 743,096.84 | 331 | 165.63 | 9.56 | 4.78 | 9,129.10 | 4,564.55 |
| GRAND TOTALS | 1,215,775.86 | 1,654,928.74 | 474 | 236.85 | 21.20 | 10.60 | 12,048.02 | 6,024.01 |

See **Appendix H** for back up details and calculation formulas. ^Contracted Fleet include Refuse and Street Sweepers

Transportation Recommendations

The City of Monrovia is involved with the San Gabriel Valley Council of Government’s Energy and Environment Committee in order to coordinate educational workshops on renewable fuels with AQMD (Air Quality Management District). This acknowledges the importance the City of Monrovia has already placed on transportation and finding a sustainable solution. It is recommended for the City to continue researching the various options with transportation specialists on finding the right vehicle for their department’s needs.

Conservation is the most reliable and simple way for the City of Monrovia to reach their goal. The city should ensure that each employee is using the smallest vehicle possible and limiting their non-essential travel. A no-idling policy should also be adapted by the city to ensure employees are not wasting fuel and greenhouse gases at unnecessary times.

In order to help meet the greenhouse gas reduction goal, the Partnership would like to recommend the use of hybrids as a viable renewable fuel option for the present moment. Hybrids produce decreased emissions during operation with the additional battery powered motor. Not only do the majority of hybrids have three times (3x) the amount of gas mileage available compared to regular vehicles, but also do not idle with the help of the electric motor. This renewable fuel source can provide for a multitude of needs ranging from quick engine power for a police car to heavy duty utility trucks for a fire department.

These vehicles can cost approximately \$7,000 more than the average vehicle, which could be costly for the city to afford. One way the City of Monrovia can afford this expense is to reassess the number of fleet they realistically need and cut down if possible. Another could be concentrating at first on replacing old, inefficient vehicles then assigned to employees who drive the most to maximize the results. The Partnership recommends the City of Monrovia to replace at least half of their fleet vehicles with hybrids by the year 2030.



As this is a living document, the plan recognizes the need to reassess the future options available that may be more suitable for the City of Monrovia. Until that time comes, the hybrids are the most viable option.

Other emissions reduction opportunities

Recognizing that Monrovia is located in Los Angeles County, a strong reduction opportunity exists in capitalizing on the infrastructure already set in place as well as be an active role model for the other 9.6 million people in the area. The Metro Rail, specifically it's Gold Line, provides an easy, low cost transportation system in which Monrovia residents can take advantage of. Other available options may be Amtrak, Metrolink, locating convenient ridesharing groups through Southern California Ride Share, or by riding the local bus system. The City of Monrovia should encourage local residents to make the most out of these resources available.

The city employees should be the first to take part in increasing the amount of ridesharing or other methods of transportation to reduce carbon emissions from commuting. The City of Monrovia should pursue a goal of 20% of employees to take part in carpooling, riding a bicycle, or taking public transportation to work. The Partnership recommends an incentive available in order to motivate the targeted 45 employees (20% of 225 employees) for choosing a renewable method. The City has already integrated their employees into a 4/10 work schedule, which removes a day from them commuting to work. The Partnership recommends this schedule to continue with all city employees.

Decreased Energy Dependence

The basic issue for Monrovia and other cities is what they will do about the ongoing Energy Crisis. Monrovia needs to establish a Community Vision, which is then translated into goals that can help them become more sustainable. There are other communities, like colleges and universities that are doing just that. Note the diagram below that outlines what the new "paradigm" is: relying less on a central grid to providing local community power generation through renewables. The concept is called "agile energy systems" (see Clark and Bradshaw, 2004) and encourages communities to rely more on renewable energy/photovoltaic's while still linked to the grid for redundancy and back-up if needed.



Consider one example: the American Association of Sustainable Higher Education. Over 1,000 American colleges and universities have joined the organization and made the above vision a firm commitment. Each campus has its own specific goals and objectives, but they have agreed to move ahead aggressively with this vision. The college and university community(s) is very similar to a small town and city. In short, there are strong parallels and hence lessons to be learned and implemented.

The LA Community College District (LACCD), with its nine campuses throughout LA County, has such a program. The idea is to use renewable energy for power generation (solar for example; see planning diagram below) along with other power sources such as wind (small wind as part of the building design) and geothermal among others. The campuses average about 2-3 MW per site so with the installation of that amount of solar (which is currently being done --- see below for East LA College) the demand is met as well as planned for future demand increases. Colleges are similar to City government building centers (City Hall, Court Houses, Fire and Police Stations etc.) as well as office building complexes, shopping malls, and residential communities.

One key element and concern, in the case of LACCD, and other communities is to implement US Green Building Standards called Leadership in Energy, Environment and Design (LEED). This standard has become very popular (it has five levels of ranking each building) and has now expanded somewhat into "neighborhoods" or clusters of buildings.

Similarly, there is a national Clean Cities organization. Monrovia should join and learn what it can do to accomplish its vision (the one above or another) or that of the Clean Cities Association. Over 350 American cities and towns have signed on to participate in the program. Monrovia would join and work with the Clean Cities national program to get ideas and share programs, policies and expertise with other cities. Certainly, Monrovia should consider registering with the California Climate Registry to set up an annual process to measure (see base load model below) their "carbon footprint" and hence from which to reduce it through energy programs, incentives, strategies and conservation.

Monrovia should also consider setting a strong goal of having 10% renewable energy within the community by 2010 or another date certain in the near term. This will lead the community by being pro-active and aggressive. The State of California and Los Angeles Department of Water and Power (LADWP) as well as Southern California Edison both have their goal as 20% by 2010. This is very well possible by enacting in some creative and aggressive ways. Edison is at 17% now (2008) so that it appears it will exceed the 20% goal before 2010. LADWP is another story. However, recently (early June 2008) the senior management and Board have taken dramatic steps to meet the 20% goal by 2010.

The first way this has been done by both Edison and LADWP only buying "green power" or the percentage to meet their goals. The other significant way they have met this goal is by reducing energy use through conservation and efficiency methods: light bulbs, meters for the home and office, turn off lights and power, purchase LED lights for public areas among other things. Thirdly, Monrovia can start a Solar Roof Program following the example of Santa Monica, San Francisco and Berkeley who already have them. One creative approach from Berkeley is for the home and business owner to contract to take a percentage of their monthly power bill and allocate to the costs for solar systems. Finally, the City needs to create education and training programs which involves the public schools, City and private sector facility staff, include an annual public event

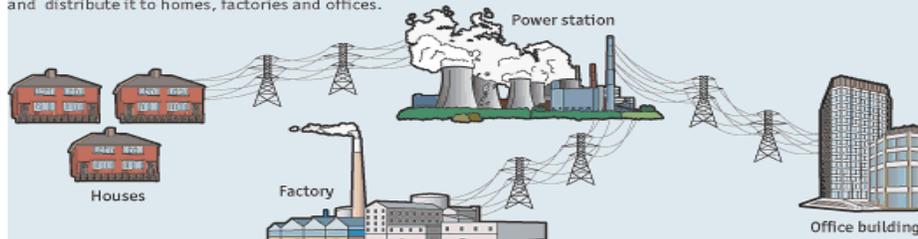
like an "eco or green fair" during the year for the entire community. There are other activities and programs that might best suit Monrovia which can be developed too.

Agile Energy Systems as illustrated in the Economist Journal from WW Clark and T Bradshaw, Agile Energy Systems: global lessons from the California energy crisis, Elsevier Press 2004: combination of grid connected energy but with far more generation coming from on-site power in communities, homes and clusters of buildings.

The shape of grids to come?

Conventional electrical grid

Centralised power stations generate electricity and distribute it to homes, factories and offices.

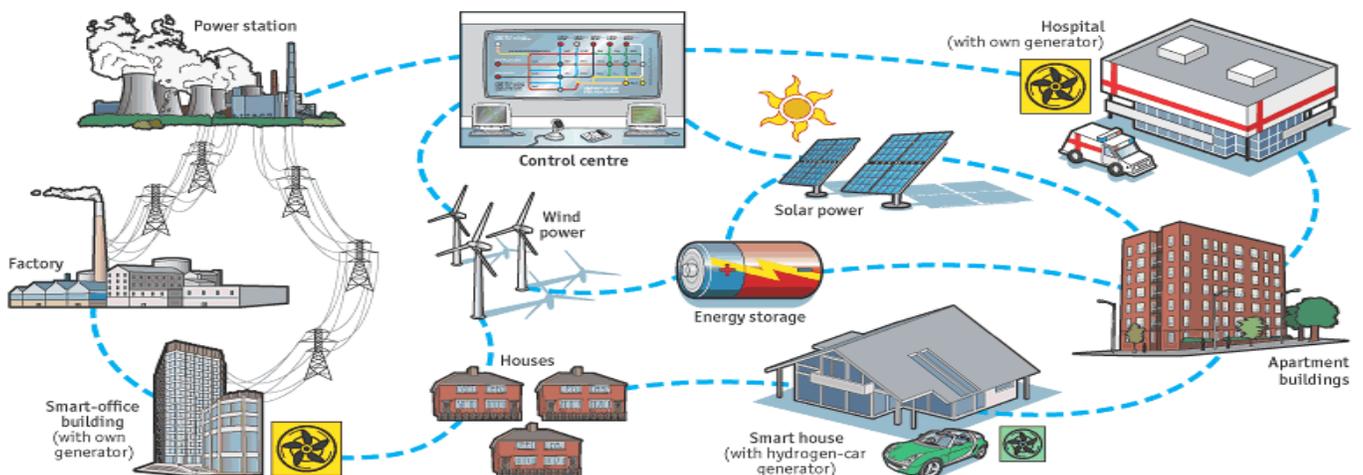


Energy internet

Many small generating facilities, including those based on alternative energy sources such as wind and solar power, are orchestrated using real-time monitoring and control systems.

Offices or hospitals generate their own power and sell the excess back to the grid. Hydrogen-powered cars can act as generators when not in use. Energy-storage technologies smooth out fluctuations in supply from wind and solar power.

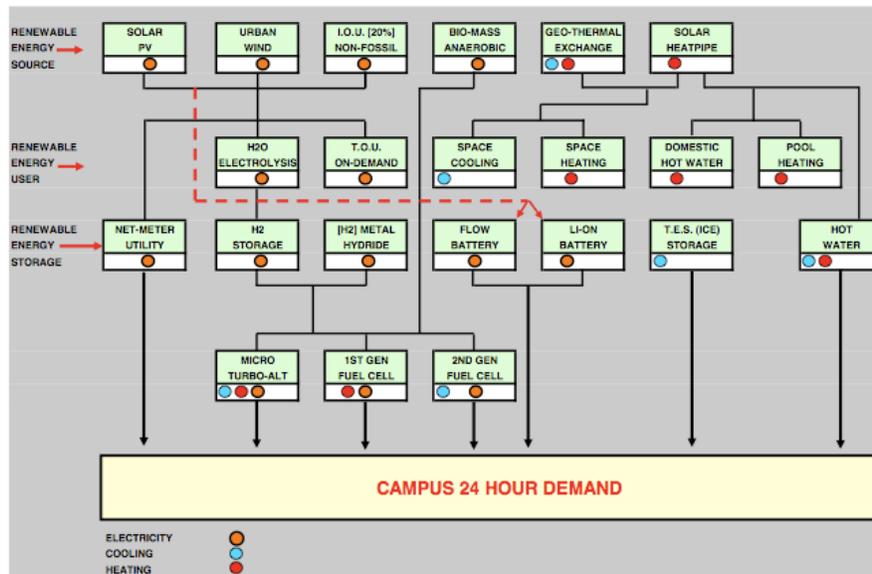
Distributing power generation in this way reduces transmission losses, operating costs and the environmental impact of overhead power lines.



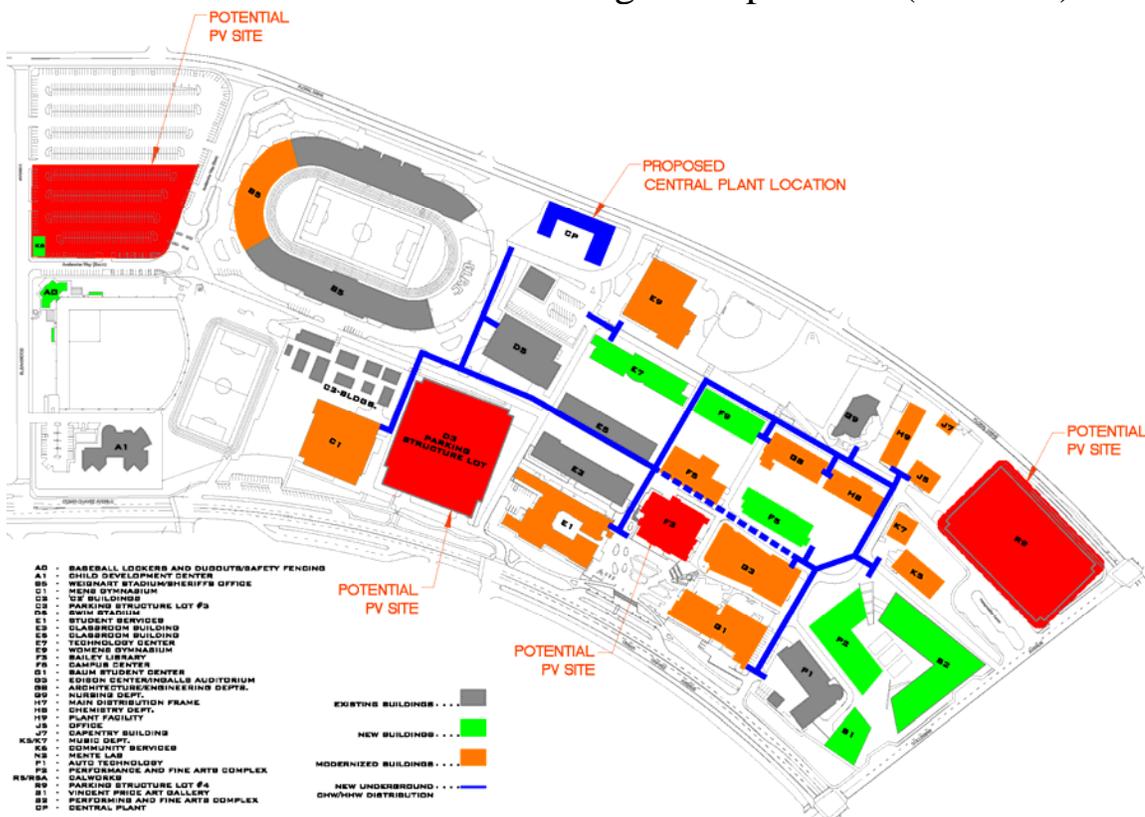
Sources: The Economist; ABB



LOS ANGELES COMMUNITY COLLEGE DISTRICT
RENEWABLE ENERGY LOAD SHIFTING TECHNOLOGIES



East LA College Campus Plan (LACCD)





4. Potential carbon emission reduction projects summary...

The City of Monrovia set a strong goal of achieving a 25% reduction in greenhouse gas emissions by 2030 as seen below in their City Accord Action 3. This is a difficult goal, but could be achieved if the city acts accordingly.

In terms of electrical usage that emits greenhouse gas, the city will need to reduce their kWh by 3,386,698 (25% from baseline of 13,546,794 kWh in FY2007). The Partnership has recommended numerous retrofits throughout the city facilities that will accomplish a savings of 161,253 kWh. This means that the City will have to heavily rely on the local community to decrease their kWh usage as well in order to meet this goal. If half of the household reduce their electricity usage by 10% the City will meet this goal. In order for this to occur, the City of Monrovia needs to generate thorough energy awareness throughout the community by hosting events, visiting schools, or other types of programs.

The city will also need their citizen's help in order to reduce gas emissions. A reduction of 3,875 therms (25% from baseline of 15,503 therms in FY2007) is the target to help meet the overall greenhouse gas goal. Besides replacing the city facilities HVAC equipment with more energy efficient equipment and installing Intellicon's, they will also need to educate the importance of saving gas and how to do so throughout the community.

By replacing at least half of the fleet vehicles with hybrids, one-sixth (1/6th) of the reduction of 303,943 CO₂ will be met for the greenhouse gas goal. This means that it is important to also focus on the use of each vehicle. The city needs to ensure that all vehicles are driven when necessary and the most efficient vehicle for each job is used at all times. The fleet portion of this goal can be met, but changes need to be made in the amount of usage by all vehicles.

City Accord Action 3: Adopt a citywide greenhouse gas reduction plan that reduces the jurisdiction's emissions by twenty-five percent by 2030*, and which includes a system for accounting and auditing greenhouse gas emissions. (*Note: 2015 reduction was goal was set at 10%)

There are many funding strategies available today for the listed projects in this plan. As seen above, the utilities, such as Southern California Edison have rebate programs (San Gabriel Valley EnergyWise Partnership) for energy efficiency projects. Federal Tax incentives exist too but expire at the end of 2008. The 30% tax credit for companies is very attractive and being used by communities and colleges when they go out to bid and contract with companies for energy demand and generation services using renewable power sources. The for-profit companies can take and use the Federal Tax Credits.

Per California Government Codes and Proposition 96, Communities can ask the voters to pass bond measures. Many colleges have done so to upgrade and "green" their campuses. Another even more significant strategy is to use long term Power Purchase Agreements (PPA) which is legal agreements / contracts between the organizations to buy power from a company for 10-20 years. Often the PPA can be paid off sooner since the energy savings can be used to reduce the time of the contract. Along with this legal contract, there are economic and accounting analytical tools called "life cycle analysis" which can provide details as to the Return on



Investment (ROI) and measure the time along with “externalities” (e.g. other costs) to pay for the renewable energy systems.

A more recent strategy has come from the Clinton Climate Initiative (CCI) in Washington DC whereby private companies that contract for energy services are identified and screened in order to bid and contract for renewable energy and demand management services to non-profit or government organizations. This approach also includes low interest financing and bank support to communities. Soon some pilot projects will be identified and tested in Southern California as well as other regions in the USA.

5. Conclusion and Recommendation

The City of Monrovia has demonstrated an exceptional willingness to conserve energy, reduce the emission of Green House Gases (GHG), and become a greener city via the implementation of several measures. These measures include the replacement of inefficient hardware in favor of energy-efficient models within city facilities and behavior modification of city staff. These measures so far have yielded significant and measurable energy savings and reduction of GHG emissions. These energy savings and corresponding GHG reductions have been quantified with the use of utility consumption data obtained before and after the energy-efficient hardware was installed in Monrovia’s city facilities. The difference in energy usage between the relevant baselines (FY-2003-2004 and FY 2006-2007) establishes the integrity and soundness of the recommendations contained herein.

The accomplishment of these goals has required that every level of Monrovia’s governance structure support and work together towards this common good. Monrovia’s Mayor and City Council working alongside city staff have made this effort a success thus far. In order to make this into a city-wide success the City must explore ways to effectively involve Monrovia’s citizenry to adopt greener lifestyles by conserving water and becoming energy-efficient.

The creation of the Green Team has added an element of organized structure so often required in these city-wide efforts to helping conserve our environment. Comprised of representatives from each of the City’s departments the Green Team provides guidance and recommendations to the Public Works Department on how each respective department can contribute to the City’s energy conservation goals.

A Green Team concept can be further expanded to include Monrovia’s community leaders and volunteers from the various council districts. This city-wide Green Team would then explore ways to outreach to Monrovia’s residents and encourage their participation in a greener lifestyle. Monrovia’s population as per the 2000 Census data shows 13,957 housing units and approximately 40,000 residents. If the city-wide community Green Team were successful in its outreach efforts and realized an average savings of 10% in both water and energy conservation in each household this would translate into significant resource conservation and GHG emissions reduction. Based on average consumer use this would mean a total yearly water savings of 76.2 million gallons, 9.5 MWh of electricity, and 558,280 therms of natural gas. This would result in CO₂ emissions reduction of approximately 8 million pounds per year! This does not include the non-residential utility accounts for the Monrovia business community.



Despite Monrovia's status as an Energy Leader, it is also recognized that the City can do more to further its energy conservation goals and reduce its Carbon Footprint. For this reason the San Gabriel EnergyWise Partnership and the City of Monrovia have created this Energy Action Plan. This Energy Action Plan will also serve as a model which other cities in the San Gabriel Valley and elsewhere can adopt and implement. Change will not happen overnight and will require that all cities collectively work together in solving the Global Warming issue. The adoption of similar plans by other cities will help establish formal and realizable energy conservation and GHG reduction goals.

As the energy conservation industry grows so does the innovation and technology associated with the lighting and cooling systems often used in city facilities. During the last ten years there has been a push to introduce newer and more energy efficient technologies in these areas. This effort has given rise to what is known as *The Market Transformation* of energy-efficient equipment. Market Transformation has been promoted by the federal and state government as well as the utility companies to reduce the number of new generating plants in our communities.

The advent of newer technologies in lighting and cooling systems coupled with the continuous innovations in these areas allows for additional energy conservation opportunities. At this point in time, for example, the Market Transformation of tube lighting is well underway with many city facilities and businesses retrofitting their lighting systems from T12/magnetic ballasts to T8 with electronic ballasts. Continuous technological advancements in lighting systems have placed into the marketplace T5 lighting systems capable of engaging in demand response activities, daylight harvesting ballasts, internet driven lighting controls, induction lamps, and reduced wattage T8 lamps-just to name of few. The technologies allow for cities such as Monrovia that have already carried out the T12 to T8 retrofits to establish additional energy goals. As time progresses the Market Transformation of these technologies will drive down their prices and thus, make them more readily accessible.

The same concept applies to the efficiency of HVAC technology. Current Title 24 Standards require for the installation of HVAC units that have a minimum SEER 13 (Seasonal Energy Efficiency Ratio) in all residential and non-residential new construction and remodels. These standards will of course change as Title 24 is further updated in the coming years. This will provide cities such as Monrovia the opportunity to conserve additional energy and further reduce cooling costs.

This Energy Action Plan for the City of Monrovia is a living document. It is meant to establish energy conservation and GHG reduction goals during the next 22 years. It also establishes a current baseline by which to compare progress in meeting the goals as outlined herein. City staff will continuously monitor all progress in the future years and re-define goals as it becomes necessary.