



The United States Conference of Mayors

1620 Eye Street, N.W. • Washington, D.C. 20006
Phone (202) 293-7330 • Fax (202) 293-2352
E-mail: info@usmayors.org URL: usmayors.org

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Contact: Rhonda Spears Bell (301) 651-2126 cell
rspears@usmayors.org
Elena Temple (202) 861-6719
etemple@usmayors.org

MAYORS SOUND ALARM ON RISING FUEL COSTS AND ENERGY CRISIS

U.S. Conference of Mayors Hosts National Summit On Energy and the Environment May 10-11 -- Chicago, IL

Washington, D.C. – With record-level gas prices and rising fuel costs in America, The United States Conference of Mayors (USCM), led by Conference President Long Beach Mayor Beverly O’Neill and Chicago Mayor Richard M. Daley, hosted an urgent **National Summit on Energy and the Environment on May 10-11th in Chicago** to sound a national alarm on the country’s energy/environmental challenges and to stress the importance of energy/environmental conservation. Approximately 35 mayors joined with industry experts and the private sector to discuss a broad range of topics including air quality, climate change, alternative energy sources, alternative vehicles, public transit and green housing and buildings.

“Mayors are very concerned about the recent spike in fuel and energy costs and the financial burden it places on American citizens and their families. We know that aggressive action is necessary to turn this tide, and we are taking the lead in addressing the nation’s energy challenges to reduce our dependency on foreign oil. We can not wait on the federal government; we must do what mayors do best and act now,” said Conference President Beverly O’Neill.

The nation’s mayors have heard President Bush’s declaration that America is “addicted to oil,” and the Conference is on the forefront of the national effort to find comprehensive, long-term solutions to move the country from this energy crisis toward energy independence.

Already, mayors have implemented innovative programs in their cities that provide short-term solutions to energy dependence, and released a best practice guide that outlines these programs at the Summit. Numerous cities like Chicago, IL, Austin, TX, Los Angeles, CA and Charlotte, NC, contributed to the guide that illustrates specifically how mayors are dealing with this crisis on a local level.

Mayor Daley underscored the importance of the best practice guide saying, “There are things that mayors can do to help our constituents deal with the energy crisis. And that’s why we’re having this conference – to share ideas on how we can conserve energy and encourage the development of new forms of energy.”

During the Summit, the mayors also pledged to develop an Energy/Environment Conservation Action Agenda to be issued at the Conference’s Annual Meeting in June in Las Vegas, NV. Among the items to be included in the Action Agenda, the mayors are calling for the following six initial steps to help alleviate energy problems:

- 1) Invest more money in transportation options including public and mass transit, bike paths, etc.
- 2) Encourage at the local, state, and federal level the building or rehabilitation of more energy efficient buildings in both the public and private sector.
- 3) Encourage automakers to make more energy efficient cars as well as encouraging individuals to buy vehicles that are more energy efficient including alternative fuels, hybrids, and plug-in hybrids.
- 4) Encourage more investment in renewable and alternative energy through additional incentives.
- 5) Encourage more mixed-use development to allow people to have more walkable communities.
- 6) Encourage the public and private sector, as well as citizens, to do their part in conserving energy.

The following mayors participated in the U.S. Conference of Mayors Summit on Energy and the Environment:

Long Beach, CA Mayor Beverly O'Neill, USCM President
Dearborn, MI Mayor Michael A. Guido, USCM Vice President
Austin, TX Mayor Will Wynn, USCM Energy Committee Chair
Charlotte, NC Mayor Patrick McCrory, USCM Environment Committee Chair
Chicago, IL Mayor Richard M. Daley, Host
Salt Lake City, UT Mayor Ross "Rocky" Anderson
Racine, WI Mayor Gary Becker
Highland Park, IL Mayor Michael Belsky
Santa Barbara, CA Mayor Marty Blum
Carmel, IN Mayor James Brainard
East Cleveland, OH Mayor Eric Brewer
North Miami, FL Mayor Kevin Burns
Albuquerque, NM Mayor Martin Chavez
Arlington, TX Mayor Robert Cluck
New Berlin, WI Mayor Jack Chiovatero
Carbondale, IL Mayor Brad Cole
Fayetteville, AR Mayor Dan Coody
Hayward, CA Mayor Roberta Cooper
Des Moines, IA Mayor T.M. Franklin Cownie
Manitowoc, WI Mayor Kevin Crawford
Louisville Metro, KY Mayor Rudy Davidson
Mount Vernon, NY Mayor Ernest Davis
Palm Desert, CA Mayor Jim Ferguson
Carol Stream, IL Mayor Ross Ferraro
Portsmouth, VA Mayor James Holley III
Pleasanton, CA Mayor Jennifer Hosterman
Rio Rancho, NM Mayor Kevin Jackson
Normal, IL Mayor Chris Koos
La Mesa, CA Mayor Art Madrid
Northbrook, IL Mayor Eugene Marks
Palatine, IL Mayor Rita Mullins
Akron, OH Mayor Donald L. Plusquellic
Vancouver, WA Mayor Royce E. Pollard
Mansfield, OH Mayor Lydia J. Reid
Fort Wayne, IN Mayor Graham Richard
Green Bay, WI Mayor Jim Schmitt

The U.S. Conference of Mayors is the official nonpartisan organization of cities with populations of 30,000 or more. There are 1,139 such cities in the country today, each represented in the Conference by its chief elected official, the Mayor.

The United States Conference of Mayors



Energy & Environment
Best Practices

*National Summit
on Energy & the Environment
May, 2006*





The United States Conference of Mayors

Beverly O'Neill, Mayor of Long Beach, CA
President

Michael A. Guido, Mayor of Dearborn, MI
Vice President

Douglas H. Palmer, Mayor of Trenton, NJ
Advisory Board Chair

Patrick McCrory, Mayor of Charlotte, NC
Environment Committee Chair

Will Wynn, Mayor of Austin, TX
Energy Committee Chair

Donald L. Plusquellic, Mayor of Akron, OH
Energy Council Chair

Tom Cochran
Executive Director

Acknowledgement

The United States Conference of Mayors would like to acknowledge and thank the mayors and their staff who provided the wealth of information for this document.

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1620 I Street, NW
Washington, DC 20006
202-293-7330
www.usmayors.org

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About the Energy & Environment Best Practice Report

The Energy and Environment Best Practices Report is a work in progress, done in preparation for U.S. Conference of Mayors President and Long Beach Mayor Beverly O'Neill's Cities for a Strong America Summit on Energy and the Environment. The report illustrates what cities nationwide are doing to address the challenges associated with the interface of energy scarcity and environmental concerns.

The U.S. Conference of Mayors initially asked mayors and their staff to fill out a short survey that asked for background, benefits and costs of any particular energy or environmental policy or practice in their community, based on several categories: Air Quality; Climate Change; Energy Sources; Fuels, Vehicles & Transit; Housing; Municipal Buildings, Facilities & Operations; and an Other category. Cities received encouragement to contribute as many best practices as they would like. Dozens of cities contributed a best practice to this publication; of those, many provided a great deal of information in one or more of the categories. In many cases, the best practices defy categorization, but the document endeavors to give due credit to each city in a category that seems most appropriate to its best practice contribution.

The best practices in this document represent some of the many innovative ways Mayors and their cities approach complex energy and environmental issues. A major theme that emerged among the different approaches toward energy independence and conservation, along with a common environmental ethic, is leadership by example. Through using alternative fuels in fleet vehicles, adopting "Green Building" policies in municipal facilities, or purchasing energy from carbon-free sources, for example, cities are proving that they can realize increased energy security, environmental health and economic benefits.

Each city's best practice represents an opportunity for Mayors of other cities to learn, to interact with each other, and improve the quality of life for citizens in their own cities. The U.S. Conference of Mayors welcomes all cities to continue to submit innovative best practices.

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Air Quality

Albuquerque, New Mexico

Martin T. Chavez, Mayor

Mayor Chavez is extremely involved with monitoring Albuquerque's environment. Air quality is of particular concern because it also directly affects the health and safety of the citizens of Albuquerque.

Albuquerque's "Air Aware-Gas Cap Exchange Project" was conducted in Albuquerque and the surrounding area from March through August 2004. During this period 641 leaking, missing, off-specification or otherwise faulty gas caps were exchanged for new ones. Participating vehicles included gasoline-powered passenger cars, trucks, and recreational vehicles. The estimated volatile organic compound reduction is 58.8 tons. This project was funded with Special Project dollars from the U.S. EPA.

The Air Aware project is important to Albuquerque because its air shed is within 91% of the National Ambient Air Quality Standard for ground-level ozone, meaning that the region is very close to meeting its air quality goals. Faulty gas caps can leak volatile organic compounds into the air, contributing to the formation of ground-level ozone.

The City of Albuquerque also operates a high density, automated ambient air monitoring system for the Albuquerque area. Data from the system enable the City to demonstrate compliance with the Federal ambient air quality standards and to effectively utilize staff resources. The system enables the City to be proactive in developing programs, campaigns and approaches to address weather that can impact the Albuquerque air quality.

Contact Information

Contact name: Richard Kennedy

Title: Deputy Director

Department: Environmental Health Department

E-mail address: rkennedy@cabq.gov

Phone number: (505) 768-2625

Charlotte, North Carolina
Patrick McCrory, Mayor

Regional Air Quality Board

The Regional Air Quality Board was formed in 2005 by the Regional Planning Alliance, the City of Charlotte, Mecklenburg County, the Centralina Council of Governments, and the Catawba Council of Governments to foster collaborative business sector and public sector initiatives to improve air quality in the sixteen county Charlotte Region.

The Regional Planning Alliance brings business perspectives and participation from regional businesses and chambers of commerce and the public sector entities provide perspectives from elected officials and public staff working in the areas of air quality and transportation.

Currently, the Regional Air Quality Board is sponsoring a pilot project to involve businesses in a voluntary program to motivate their employees to try alternative means of commuting to and from work. This pilot, known as “Clean Air Works!” also includes programs to foster company changes in operational activities that will reduce NO_x emissions. The pilot project will provide action-oriented research on which program elements are the most effective in creating positive, sustainable change.

The “Clean Air Works!” pilot project is being jointly funded with \$1 million from Mecklenburg County and the federal/state/local CMAQ fund. The business community is providing significant resources through program participation and leadership and donated in-kind services.

Contact Information

Name: Emmy Lou Burchette
Title: President,
Organization: Burchette & Associates
Phone: 704-367-9580
Email: Emmylouburchette@aol.com

Dearborn, Michigan
Michael A. Guido, Mayor

TreeCity USA

The City of Dearborn has a well-developed urban forestry program that sustains approximately 36,000 trees along city streets and in city parks. Preventative trimming for proper shape and removal of deadwood is conducted on a five-year cycle for all trees. Professional management of a mature urban forest helps maintain clean air and reduces cooling costs during the summer. This program is supported by General Fund monies and costs approximately \$350,000 per year. The City of Dearborn has received the “TreeCity USA” award for the past eighteen years.

Contact Information:

Contact name: Kurt A. Giberson

Title: Director of Public Works

Department: Public Works

Email address: kurtgiberson@ci.dearborn.mi.us

Phone number: (313) 943-2496

Dublin, California
Janet Lockhart, Mayor

A resolution adopted in 2003 by the City of Dublin City Council approved the adoption of the Clean Air Consortium Checklist and the execution of the Voluntary Agreement. To be in compliance with the checklist, City Department heads work with employees to follow guidelines in the Clean Air Consortium for ongoing use and those for using energy on *Spare the Air* days.

The Clean Air Consortium Checklist follows.

Ongoing

- ☀ Stop at the click, do not overfill gasoline tanks.
- ☀ Maintain equipment, turn engines, sharpen blades and clean the underside of mower deck.
- ☀ Tightly seal all solvent containers; properly dispose of rags containing solvent waste.
- ☀ Keep vehicles tuned up and tires properly inflated.
- ☀ Avoid idling.
- ☀ Have material available to the public on summertime ozone pollution.
- ☀ Encourage the use of alternative transportation, trip linking and trip reduction.

Contact Information

Contact name: Melissa Morton
 Title: Public Works Director
 Department: Public Works
 Email address:
 Melissa.Morton@ci.dublin.ca.us
 Phone number: (925) 833-6636

Spare the Air Day Activities

- ☀ Avoid using hand-held, gas-powered equipment like lawn mowers, trimmers and chain saws.
- ☀ Use hand tools or electric equipment when possible.
- ☀ Reschedule painting/stripping projects.
- ☀ Refuel as late in the day as possible.
- ☀ Reschedule large-scale surface coating.
- ☀ Avoid idling.
- ☀ Reschedule vehicle painting.
- ☀ Reschedule storage tank filling.
- ☀ Notify employees of *Spare the Air* days and provide employees with recommendations on how they can reduce ozone pollution.
- ☀ Place *Spare the Air* alert on local cable channel scroll.
- ☀ Display signage signifying that it is a *Spare the Air* day.
- ☀ Publicize Agencies' participation and accomplishments.

The cost of checklist compliance, including curtailment of certain activities during the *Spare the Air* days, is nominal. All costs for checklist compliance are incorporated into the operating budgets for City maintenance work.

Portland, Oregon

Tom Potter, Mayor

Background

The City of Portland's Transportation Options Division developed an innovative outreach project to improve air quality by promoting smart travel and reducing car trips. In 2005 the TravelSmart Hub Project reached over 20,000 households (50,000 people) in seven different South East Portland neighborhoods. The project's success in South East Portland led to an expanded project to cover 24,000 households in 13 North East Portland neighborhoods in 2006.

The project uses direct mail, individualized marketing, and hands-on clinics and workshops to help those residents who want to walk, bike, take transit or carpool more often. Each resident in the selected area receive an order form in the mail. They can select from a variety of transportation related information including bicycle or walking maps, TriMet information or other travel tools. The travel tools can include schedules of guided walks and rides. Project staff filled the orders for materials and incentives and delivered them by bicycle usually within two days.

Benefits and Costs

The response to this program has been overwhelmingly positive. Community partnerships with health providers Kaiser Permanente and Providence Portland Medical Center increased budget savings for the City. The development of relationships with these organizations also promoted healthy travel and living. At least 35 percent of the 20,000 residents actively participated in the Hub program in 2005 and 100 percent of the residents heard from Portland's Transportation Options Division at least five times throughout the program.

A 9 percent reduction in solo trips translates into a reduction in vehicle miles traveled of over 24 million miles last year—that's (an annual savings of) over 700,000 gallons of gas and 13,630,000 pounds of CO2 ... by the TravelSmart Hub Project.

Surveys conducted before and after the project with control and test groups indicate the program reduced drive-alone or solo car trips by 9 percent, increased bicycling by 23 percent, increased transit use by 41 percent and walking by 7 percent. A 9 percent reduction in solo trips translates into a reduction in vehicle miles traveled of over 24 million miles last year—that is over 700,000 gallons of gas and 13,630,000 pounds of CO2 saved annually by the project.

The total project cost was \$500,000, including \$227,000 for materials and services. The Transportation Options Division received \$95,000 in sponsorships or grants to help defray project costs. The total project works out to cost about \$0.02 per vehicle-mile traveled reduced.

Contact Information

Contact name: David Tooze
 Title: Sr. Energy Specialist
 Department: Office of Sustainable Development
 Email address: dtooze@ci.portland.or.us
 Phone number: (503) 823-7582

Climate Change

Albuquerque, New Mexico

Martin T. Chavez, Mayor

Albuquerque is undertaking many initiatives to combat climate change. As early as 1995, Mayor Martin Chavez demonstrated leadership in a long-term environmental strategy for Albuquerque by implementing a City resolution, which approved Albuquerque's membership in the Cities for Climate Protection Campaign. His leadership and commitment continued in 2003 with his support of the Climate Protection Agreement and his signing of the U.S. Conference of Mayor's Climate Protection Agreement in June 2005, committing to meeting or exceeding the Kyoto Protocol on a local level.

Leadership and commitment at the executive level, coupled with effective environmental management policies have and will continue to result in the City of Albuquerque's ability to perform beyond mere compliance with environmental, health, and safety regulations. Mayor Chavez's strategic environmental and management style integrates all City departments, which include many diverse and related activities. The results are powerful. Most notably, as of 2005, the City of Albuquerque has decreased municipal service greenhouse gas emissions to 64% of its 1990 GHG emissions.

The City has also completed a greenhouse gas emissions inventory for the geographic area of Albuquerque and Bernalillo County, including a greenhouse gas emissions inventory for the City of Albuquerque Government Operations.

Contact Information

Contact name: Richard Kennedy
Title: Deputy Director
Department: Environmental Health Department
E-mail address: rkennedy@cabq.gov
Phone number: (505) 768-2625

Chapel Hill, North Carolina

Kevin C. Foy, Mayor

The Chapel Hill Town Council voted in September 2005 to participate in a Carbon Reduction Program. Initially established in England, this program challenges participants to substantially reduce existing levels of carbon dioxide emissions (see www.cep.unc.edu/cred). The Town of Chapel Hill and UNC-Chapel Hill are joint participants, and Chapel Hill is the first U.S. town to participate. Separate goals will be proposed for 2025 and 2050, culminating in a total reduction of 60 percent over that time period.

Chapel Hill is the first U.S. town to participate in a Carbon Reduction Program...with goal for 2050 culminating in a total carbon dioxide emission reduction of 60 percent.

The Town’s participation means that it commits to adopting a timeline and a plan for achieving the carbon dioxide emissions goal. The plan currently being developed will guide not only future development in the area, but will alter existing development as needed. Based on the plan some buildings will need to be retrofitted for energy efficiency.

The Town Council will determine how the reductions in carbon emissions can be made in the most cost-effective manner. University students and faculty have developed an inventory of carbon dioxide releases from Chapel Hill. The Town Council will use this inventory to develop short, medium and long-term strategies for carbon emissions reductions. The data is gathered from reviewing electricity and natural gas consumption rates, water usage, the number of miles driven by public transit buses, employee transportation patterns and more.

“A spreadsheet will be presented to the Council (in May 2006) so (viewers) can see the carbon emission levels and make adjustments in each category,” said Dr. Douglas Crawford-Brown, director of the Carolina Environmental Program. “We make calculations based on carbon reduction and costs associated. Municipal leaders decide which strategies to implement.”

Some strategies to reduce carbon emissions include replacing the Chapel Hill Transit fleet with hybrid buses, replacing heating and cooling units with more efficient models, installing vestibule doors in public buildings, and more innovations approved by the Town Council.

Because this program is in its early planning stages, a summary of benefits is not available. The Program’s ambitious goal of 60 percent reduction in carbon emissions by 2050 is anticipated to have a lasting impact on the community including addressing one variable related to climate change. Many agree that climate change may be one of the greatest threats facing the planet. Recent years show increasing temperatures and increasing extremities in weather patterns. While there is disagreement about the extent of climate change that will take place if society continues emitting carbon dioxide at today’s levels, there is broad scientific consensus that the problem is real and must be addressed in the coming decades.

Contact Information
Contact name: Catherine Lazorko
Title: Town Information Officer
Department: Town of Chapel Hill
Email address: clazorko@townofchapelhill.org
Phone number: (919) 968-2893

Denver, Colorado

John W. Hickenlooper, Mayor

In 2005, the City of Denver and Mayor Hickenlooper provided leadership for local and regional efforts to reduce global warming, in keeping with the goals of the Kyoto Protocol. As one of the first 25 ICLEI “Cities for Climate Protection” program participants in the early 1990s (which now includes over 400 cities internationally), the City of Denver met all milestones for that program, and continues to pursue a greenhouse gas reduction goal of 10% per capita by 2011 from the 1990 baseline of 20.2 tons per capita per year.

Other energy and climate change leadership activities:

- Denver was a signatory to the U.N. Urban Environmental Accords, and the U.S. Mayor's Climate Protection Agreement in June 2005.
- Denver was a participant in the Sundance Summit: A Mayors’ Gathering on Climate Protection in July, 2005.
- Denver International Airport uses a state-of-the-art Environmental Management System and has helped lead progress in climate protection within the City and County of Denver.

Contact Information

Contact name: Andrew Wallach

Title: Assistant to Mayor

Department: Mayor’s Office

E-mail address: andrew.wallach@ci.denver.co.us

Phone number: (720) 865-9033

Medford, Massachusetts

Michael J. McGlynn, Mayor

Background

The City of Medford has lead in addressing air quality and climate change issues in Massachusetts since it became one of the first in the State to join the Cities for Climate Protection™ Campaign in 1999. To fulfill its commitment the City conducted a greenhouse gas (GHG) emissions inventory, set GHG reduction targets, approved the first Climate Action Plan in Massachusetts, implemented a vehicle emissions reduction program, initiated an anti-idling campaign, developed an energy efficiency policy, installed solar panels on municipal buildings and initiated a Clean Energy Choice Campaign. Medford's Vehicle Emissions Reduction Program (VERP) exemplifies what other municipalities can do when developing strategies to reduce GHG emissions and air pollutants.

The City's VERP seeks to improve air quality by retrofitting all of the major fleets with routes in Medford. These fleets include vehicles used in the City's municipal Department of Public Works; Waste Management's refuse haulers and recycling trucks; and school buses. By focusing on minimizing potential pollutants from the fleets used in the City of Medford, it is anticipated this will improve the quality of the air in the City.

The VERP has two phases. Phase I will retrofit the Department of Public Work's (DPW) fleet including diesel vehicles used by the highway, parks, water and sewer, forestry and cemetery divisions and refuse haulers and recycling trucks on contract that provide service to the City. A Climate Protection grant awarded from the Massachusetts Department of Environmental Protection and Executive Office of Environmental Affairs will be used to retrofit a portion of the DPW fleet by June 2006.

The City also began integrating alternative fuels and vehicles that use them into its municipal fleet. The cemetery fleet now uses biodiesel fuel (B-20). Seven electric vehicles were added to the fleet used by the Energy and Environment Department, DPW, the Engineering Department, School Department, Building Department and the Department of Weights and Measures. By the end of 2006 all DPW vehicles will be using ultra low sulfur diesel as mandated by federal law.

Phase II of the VERP is known as Medford's Clean School Bus USA Program. This program will be used to retrofit the entire school bus fleet. The Clean School Bus Project received funding from the U.S. Environmental Protection Agency to install diesel filters and diesel oxidation catalysts on the 70 buses owned by its bus contractor. All buses converted from using standard diesel fuel to using low sulfur diesel fuel. While the City only uses 19 of these buses, officials chose to address the air quality needs of the entire region. This led to the City installing diesel filters on 29 of the buses and diesel oxidation catalysts on the remaining 41, thus enabling 13 other communities who use the same contractor to also benefit from improved air quality.

Concurrent with the Clean School Bus Project, the City implemented an Anti-Idling policy. This policy was put into force on January 11, 2005 and creates No Idle Zones around every school in the City. The policy stipulates neither buses nor passenger vehicles should be left running outside of the schools. Both of these campaigns were welcomed by the Community and the Energy and Environment Department. These departments worked very closely with the School Department to educate the staff and the parents on the benefits of reduced idling and using clean diesel fuel.

This effort to lessen pollutants from City operated vehicles strengthens Medford’s voluntarily efforts to reduce emissions as part of its Climate Action Plan and serves as an excellent best practice example. These efforts earned the City of Medford the 2004 U.S. Environmental Protection Agency Clean Air Excellence Award for Regulatory Policy and the 2005 Commonwealth of Massachusetts Environmental Purchasing and Sustainability Award.

Benefits and Costs

The ultimate goal of the VERP is to improve air quality and public health. Studies have shown that the rates of childhood asthma in the Northeast region of the United States are higher than the rest of the country. Medford is located just five miles northwest of Boston in Middlesex County. According to Environmental Defense Scorecard, Middlesex County ranked among the dirtiest 10 percent of all U.S. counties where the cancer risk from hazardous pollutants exceeds one in 10,000. Environmental Defense also noted that 92 percent of this air cancer risk comes from mobile sources, particularly diesel emissions. In addition, the Commonwealth of Massachusetts was classified as being in "serious non-attainment" of the one hour ozone standard since the early 1990s. Massachusetts also exceeded the standards for both 2.5 and 10 microns of particulate matter pollution on several occasions.

Given these statistics the City of Medford embarked on making progress to improve air quality through the VERP. By installing diesel particulate filters and Diesel Oxidation Catalysts in the school buses and DPW fleet, the City continues to reduce the amount of hydrocarbons (HC), particulate matter (PM), and carbon monoxide (CO) emitted in and around the City. Hydrocarbons are known to contribute to the formation of ozone and particulate matter is a primary source of respiratory illnesses. Although it is difficult and cost prohibitive to conduct actual air pollution measurements to determine emissions from the retrofitted buses, the EPA has estimated emissions reductions resulting from retrofitting diesel buses based on numerous studies they conducted. EPA’s estimated emissions reductions from the specific technology used in Medford’s program are summarized below.

Diesel Particulate Filters (DPF)	Diesel Oxidation Catalysts (DOC)
HC = 60%	HC = 50%
PM = 60%	PM = 20%
CO = 60%	CO = 40%

With the addition of the ULSD, the reductions for the DPF increase up to 90% and up to 60% for the DOC.

City of Medford received \$460,000 to implement Phase II of the VERP from the US Environmental Protection Agency’s Clean School Bus USA Grant Program and received \$5,000 from the Massachusetts

Department of Environmental Protection for a portion of Phase I of the VERP.

Contact Information:
 Contact name: Patricia L. Barry
 Title: Environmental Agent
 Department: Energy & Environment Office
 Email address: pbarry@medford.org
 Phone number: (781) 393-2137

Portland, Oregon

Tom Potter, Mayor

Background—Traffic Signal Optimization

Portland's Offices of Sustainable Development and Transportation are working with the Climate Trust on project to improve the timing of traffic signals in seventeen major metropolitan arteries. This five-year project began in January 2005.

The project is to help reduce carbon dioxide emissions from vehicles by reducing the amount of time cars spend idling at and accelerating between traffic lights. Improved traffic flow will reduce fuel wasted during stop-and-go driving. Signal timing efficiency will therefore decrease carbon dioxide released into the atmosphere.

This project allots funding for traffic signal system operators to conduct studies. These studies will help identify specific steps to optimize traffic flow in some of Portland's most congested thoroughfares. While this project will reduce carbon dioxide emissions, it also will reduce other air pollutants from exhaust pipes.

Costs and Benefits

Program costs are absorbed in a pay-for-performance contract with the Climate Trust. After the signal timing has been completed, the Climate Trust pays Portland based on the amount of carbon dioxide emissions that will be avoided. The City of Portland transfers ownership of the carbon dioxide offsets created by these reduced emissions to the Climate Trust. The Climate Trust's funding for the traffic signal optimization was critical as government funding sources were not available.

Other benefits unrelated to decreasing greenhouse gas emissions include:

- ✱ Commuters save time traveling across town.
- ✱ Commuters save on gasoline costs.
- ✱ Reductions in other vehicular air pollutants.
- ✱ The development of a useful model for efficiently using energy and traffic signals.

Contact Information

Contact name: David Tooze
 Title: Sr. Energy Specialist
 Department: Office of Sustainable Development
 Email: dtooze@ci.portland.or.us
 Phone: (503) 823-7582

Saint Paul, Minnesota

Chris Coleman, Mayor

Saint Paul's Climate Change Action Plan, the Saint Paul Environmental-Economic Partnership Project (E-EPP), was initiated in 1993 to implement the City's Urban CO₂ Reduction Plan, with the goal to encourage present activities and identify future activities that improve both the environmental and economic health of Saint Paul.

The City's CO₂ Reduction Plan involves six strategies and targets:

Strategy #1 - Municipal Action Plan - City government taking the lead by making equipment changes and being efficient in energy use in City-owned buildings and vehicles. Purchasing policies to benefit from environmentally friendly products. CO₂ reduction target: 10,800 tons/year.

Strategy #2 - Diversification of the Transportation Sector - Reduce reliance on automobiles by increasing public transportation options and planning toward reducing the need for private transportation. CO₂ reduction target: 731,000 tons/year.

Strategy #3 - Urban Reforestation - Fix carbon emissions by expanding green space and strategic planting of trees and shrubs to shelter buildings and reduce fuel consumption needed to cool buildings. CO₂ reduction target: 3,600 tons/year.

Strategy #4 - Energy Efficiency - Reduce energy use through installation of cost-effective efficiency measures such as lighting, air-handling, and insulation in residential, commercial, and industrial sectors. CO₂ reduction target: 1,354,400 tons/year.

Strategy #5 - Energy Supply - Promote the use of alternative energy sources such as photovoltaic, wind, biomass and fuel cells. CO₂ reduction target: 283,200 tons/year.

Strategy #6 - Recycling and Waste Prevention - Prevent pollution and reduce use of resources by reusing materials, limiting packaging, reducing purchases, and recycling. CO₂ reduction target: 10,800 tons/year.

Phase One, completed in 1993, concluded with Council adoption of the CO₂ Reduction Plan, and Phase Two is a 20-year implementation effort. These activities are paying off with significant economic and environmental savings. Ongoing and planned CO₂ reductions total 960,000 tons per year, with total cost savings of \$59,000,000. The City of Saint Paul has been recognized by ICLEI, the U.S. Environmental Protection Agency, Harvard University, Sierra Club Cool Cities, and the Green Guide to America's Top 10 Green Cities: 2006.

Contact Information

Contact name:	Rick Person
Title:	Program Administrator
Department:	Public Works
E-mail:	rick.person@ci.stpaul.mn.us
Phone:	651-266-6122

Salt Lake City, Utah
Ross “Rocky” Anderson, Mayor

As part of its Salt Lake City’s Green Program, the City has implemented a Local Climate Action Plan. The Plan’s goal is to show that the City can do its part to reduce global warming and health-endangering air pollution, and provide an example for other governmental entities, businesses, and individuals. As part of this goal, Salt Lake City has committed to meeting the standards of the Kyoto Protocol (7% reduction of carbon dioxide emissions from 1990 levels)

Major Steps so far include implementation of a state-of-the-art software system for tracking emissions, establishing a baseline, and monitoring progress. Salt Lake City is the first in the nation to implement the system. Furthermore, the citywide recycling program has decreased CO₂ emissions by 30,550 tons per year.

2004 Emissions Reduction Measures	Equiv. CO₂ Reduced (tons)
Lighting efficiency retrofits	344
Blue Sky wind power purchase	796
1630 LED traffic signals	661
CNG fuel at SLC Airport	1,758
Biodiesel	238
Cogeneration at water treatment plant	3,059
Methane capture at landfill	16,500
TOTAL	23,356

The City funds three full time staff positions from within existing budgets. Grants and donations have financed minimal additional costs.

Contact Information

Contact name: Dorothy Stangle
 Title: Assistant to the Mayor
 Department: Mayor’s Office
 E-mail: dorothy.stangle@slcgov.com
 Phone: (801) 535-7743

Seattle, Washington

Gregory J. Nickels, Mayor

Greenhouse Gas Neutrality

Seattle City Light, the municipally owned electric utility serving the City of Seattle, has a policy of greenhouse gas neutrality. The utility avoids emissions through using conservation and, when practical, renewable, non-greenhouse gas emitting energy. City Light also purchases offsets equal to its fossil fuel emissions to meet electrical demand and from operations such as vehicle use and airline travel. Through these actions, City Light reached its goal of greenhouse gas neutrality in 2005.

The program results in greenhouse gas reduction and several other co-benefits, including energy savings for their customers, reduction in emissions of other air pollutants and their associated health and environmental impacts, avoidance of land filling of waste material, and potential for local economic development. City Light purchased over 250,000 metric tons of greenhouse gas offsets to cover its emissions in 2005. The budget is approximately \$750,000 per year and is funded through the electric rates.

Cruise Line Offsets

As part of its greenhouse gas mitigation program, Seattle City Light purchases greenhouse gas offsets from a cruise line company that switches from diesel fuel to electricity for its ships docked at in Seattle. Electricity use instead of diesel fuel results in overall reduced emissions of greenhouse gases, estimated to be about 1,300 metric tons per year from the current contract.

The program results in greenhouse gas emissions reductions and reduction in emissions of other air pollutants and their associated health and environmental impacts. Diesel fuel combustion results in emissions of toxic and carcinogenic materials. Diesel emissions have been identified as the primary threat to air quality in the Puget Sound region. Providing an alternative to diesel use helps avoid those emissions. The budget for the cruise ship offsets is \$10,000 per year and is funded through the greenhouse gas mitigation program, which is covered by electric rates.

Kyoto Challenge

In February 2005, Mayor Nickels issued the "Kyoto Challenge," a national effort to take on climate disruption and implement the Kyoto Protocol in cities across the United States. With hundreds of mayors across the US now participating, the US Mayors Climate Protection Agreement continues to gain support. To meet the Kyoto goal locally and to provide a "green print" for others to use elsewhere, the Mayor appointed the Green Ribbon Commission on Climate Protection, which includes 18 leaders from Seattle's business, labor, non-profit, government and academic communities. Their goal is to find local solutions to global climate disruption and begin the development of a Climate Action Plan.

Contact Information

Contact name: Kristine Kertson
 Title: Public Information Officer
 Department: Office of Intergovernmental Relations
 E-mail: Kristine.kertson@seattle.gov
 Phone: (206) 233-0073

The Green Ribbon Commission Report and Recommendations describes a suite of climate protection actions that will allow Seattle to meet or beat the Kyoto Protocol greenhouse gas emissions reduction goal. After presenting findings to the Seattle community and gathering input, the City will develop a Seattle Climate Action Plan, including a detailed implementation strategy by September 2006. The cost is to be determined because this is a very comprehensive effort.

Energy Sources

Albuquerque, New Mexico

Martin T. Chavez, Mayor

Solar Power

Albuquerque is in a partnership with the U.S. Department of Energy “Million Solar Roofs” program. With this program, solar thermal and solar photovoltaic systems will be installed in public buildings. The City is currently installing solar pool heating and photovoltaic systems at five City swimming pools.

Albuquerque is also involved in a collaboration with Sandia National Laboratory, New Mexico Tech, Technology Ventures Corporation and other partners to develop a hybrid renewable energy project for Albuquerque’s Sandia Science and Technology Park. The proposed project design includes both photovoltaic solar and methane gas-to-energy projects. The energy produced will power the park.

Hydrogen

The City’s Aviation Department, in a partnership with the New Mexico Hydrogen Technology Partnership, the U.S. Army National Automotive Center, the Department of Defense, other government agencies and a major petroleum company, is establishing a hydrogen production, storage and dispensing pilot project facility on airport property. The facility will be co-located with an existing compressed natural gas (CNG) refueling station at the airport and will be used in conjunction with demonstrating hydrogen internal combustion engine vehicles to be provided to the Department of Defense and the Aviation Department.

Landfill Gas

Albuquerque has been involved in monitoring close City-owned or City operated landfills and related issues for approximately 20 years. They have also commissioned a comprehensive study of the City owned or operated closed landfills to determine appropriate land usage and economic development opportunities as well as investigating landfill gas production and alternate energy opportunities.

In 1998, the City installed a landfill gas (LFG) collection and control system at the closed Los Angeles landfill and in 2005 the control system was modified with a renewable energy system that generates 70 kWh of electricity which powers a groundwater remediation system removing contaminants that have leaked from the landfill to the underground drinking water aquifer.

The Mayor is currently working with New Mexico’s Congressional delegation to secure federal funding for additional LFG renewable energy systems for other closed City landfills. Additional landfill greenhouse gas reduction results from other gas controls systems such as LFG collection and control systems installed at the Cerro Colorado landfill; currently gas-to-energy systems alternatives are under evaluation.

Contact Information

Contact name: Richard Kennedy
Title: Deputy Director
Department: Environmental Health
Department
E-mail: rkennedy@cabq.gov
Phone: (505) 768-2625

Ann Arbor, Michigan

John Hieftje, Mayor

The City of Ann Arbor has operated the Ann Arbor Energy Office and employed a full time, professional Energy Coordinator for the past 17 years. This has enabled Ann Arbor to become a regional and national leader in municipal energy programs. The Energy Office has been successful at monitoring and reducing energy use at all City owned facilities, implementing energy efficiency and renewable energy programs related to the Ann Arbor Energy Plan, purchasing natural gas and electricity in the new, deregulated markets, creating and implementing energy policy, obtaining and managing grants, and serving as the City's liaison with the local utility companies and the Ann Arbor Energy Commission.

The Ann Arbor Energy Office has saved the City over \$6 million in energy costs and successfully managed over \$800,000 in federal and state grant funds for local energy projects.

The Energy Coordinator manages the local coalition for the federal Clean Cities program which has brought over 600 alternative fuel vehicles and associated fueling infrastructure to the community for the Cities for Climate Protection Program to reduce global warming emissions, and the Green Fleets Program which

has reduced petroleum fuel use by 10% for the municipal fleet in its first year. The Ann Arbor Energy Office has saved the City over \$6 million in energy costs and successfully managed over \$800,000 in federal and state grant funds for local energy projects.

Ann Arbor has shared its energy office learning experiences and successful programs across the country through presentations at national and regional conferences including DOE, EPA, APA, APWA and many more. The Ann Arbor Energy Office has also been instrumental in helping other communities across the country to create their own municipal energy offices.

As Ann Arbor moves towards its new stated goals of 30% renewable energy for municipal operations by 2010, 20% renewable energy for the whole community by 2015 and a 20% reduction in global warming emissions from 2000 levels by 2015. The Ann Arbor Energy Office plays a key role in the planning and implementation.

With the recent large increases in energy costs and continued instability in the energy market, municipalities that do not yet have an energy office would do well to follow Ann Arbor's example and establish their own municipal energy program.

Contact Information

Contact name: David Konkle
 Title: Energy Coordinator
 Department: Public Services
 Email: dkonkle@ci.ann-arbor.mi.us
 Phone: (734) 996-3150

Boston, Massachusetts
Thomas M. Menino, Mayor

Renewable Energy Procurement

In conjunction with the bulk procurement of 200 million kWh/year electricity, the City of Boston procured 8.6% of its load from renewable sources and was named to the EPA's Green Power Leadership Club.

Boston's Wind Energy Program

The City is promoting pilot projects to examine the potential for wind power in Boston. City staff work with the Community Wind Collaborative of the Massachusetts Technology Collaborative to study the feasibility of installing wind turbines on Long Island in Boston Harbor. This study builds upon the MTC-funded Boston Harbor Islands Renewable Planning Guide, which analyzes the resources of the grid-tied Boston Harbor Islands and identifies alternative technologies and sites. It also assessed environmental, community, and regulatory issues. The City is coordinating this project with another wind turbine project in Boston Harbor proposed by the Massachusetts Water Resources Authority.

Both energy projects have submitted Notices of Proposed Construction to the Federal Aviation Administration for aeronautical study.

Contact Information

Name: Bradford Swing
Title: Director of Energy Policy
Department: Office of the Mayor and
Environmental and Energy Services
E-mail: brad.swing@cityofboston.gov
Phone: (617) 635-1210

Chicago, Illinois

Richard Daley, Mayor

As a major element of his 2006 Environmental Action Agenda, Mayor Richard M. Daley announced that four wind turbines will be erected on the roof of the Richard J. Daley center to generate electricity and lead toward the development of more renewable energy sources.

According to Mayor Daley, “These turbines will serve as a demonstration project that could lead to new technologies and move us toward our goal of generating 20 percent of the electricity in City buildings from renewable sources by 2010.”

Known as aeroturbines, the devices were invented by Bil Becker, a professor of industrial design at the University of Illinois at Chicago, and were manufactured in Chicago’s Pilsen community by Aerotecture International, Inc.

At 680 feet in the air, the aeroturbines will be the highest wind turbines attached to a building anywhere in the world. The aeroturbines are small, modular and well suited for urban rooftops. They are also quiet, self-regulating, vibration-free and are designed to be more bird friendly than utility scale turbines. The four turbines will produce a small portion of the Daley Center’s electricity.

The 2006 Environmental Action Agenda can be accessed at the City of Chicago’s website at www.cityofchicago.org/Environment.

Contact Information

Name: Brendan Daley
Title: Deputy Commissioner
Department: Environment
Email: bdaley@cityofchicago.org
Phone: (312) 744-8901

Colorado Springs, Colorado (1)

Lionel Rivera, Mayor

Background

Colorado Springs Utilities owns five hydropower units capable of generating 35 megawatts (MW) of power – 5% of the power generated by all Utility-owned resources. The largest unit is the 28 MW Tesla hydroelectric turbine, operating since 1997. Of the smaller units, the oldest has been in operation 100 years and the newest one was put into service in March, 2006. Since Colorado Springs Utilities is a four-service utility – water, electric, gas and wastewater, these turbines are entirely contained within the raw water delivery system. Environmental impacts from additional reservoirs and water releases are eliminated. A sixth turbine will be constructed next year. An additional 10 to 12 sites will be evaluated in 2006.

Benefits & Costs

These programs improve air quality and reduce the use of fossil fuels. In 2004, Utilities-owned hydropower units eliminated over 200 tons of sulfur dioxide, over 100 tons of nitrogen oxides and over 64,000 tons of carbon dioxide emissions.

In 2004, Utilities-owned hydropower units eliminated over 64,000 tons of carbon dioxide emissions.

As a municipal entity, all of the programs highlighted are funded through avoided or deferred operational costs or rates. Wind power is the only exception and is funded by program participants.

Contact Information

Contact name: Vicki Care
 Title: Permitting Services Supervisor
 Department: Environmental Services
 Dept., Colorado Springs Utilities
 Email: vcard@csu.org
 Phone: (719) 668-4463

Colorado Springs, Colorado (2)

Lionel Rivera, Mayor

Background

The Colorado Springs Utilities Green Power program offers customers the option to pay a premium on their bill to receive electricity from wind power sources. The wind power comes from the Ponnequin Wind Facility on the Colorado-Wyoming border. Since wind power has no fuel costs, participating customers receive a credit on their bill for fuel and purchased power costs associated with the amount of wind power they purchase. Over 900 customers participate in the program.

Benefits & Costs

In 2005 Green Power customers purchased 2,140 MWh of wind power.

As a municipal entity, all of the programs highlighted are funded through avoided or deferred operational costs or rates. Wind power is the only exception and is funded by program participants.

Contact Information

Contact name: Simon Baker
Title: Sr. Conservation Specialist
Department: DSM & Renewable Energy
Solutions Dept., Colorado Springs Utilities
Email: sebaker@csu.org
Phone: (719) 668-8231

Dayton, Ohio (1)
Rhine McLin, Mayor

Background

In 2005, the City established the “Energy Team” to provide guidance, expertise and insight into the purchasing, utilization, and conservation of energy. The team consists of current employees that manage significant amounts of the City’s diverse energy needs and have expertise in the following areas:

- ✱ Electric and Natural Gas
- ✱ Heating Oil, Gasoline and Diesel Fuels
- ✱ Energy Markets, Procurement and Pricing

Benefits & Costs

The goal of the Energy Team is to make the City a “smart” energy workplace by means of:

- ✱ Leveraging procurement through pooled acquisitions,
- ✱ Establishing metrics to monitor and reduce energy consumption,
- ✱ Evaluating possible energy conservation through reduction/recycle opportunities,
- ✱ Obtaining favorable energy price structures and tariffs, and
- ✱ Using available technology to reduce or monitor energy consumption.

There are no additional budgetary costs for salaries since all team members are current staff of the City. Training and development costs, however, are approximately \$25,000 per year.

Contact Information:

Name: Diane Shannon
Title: Economist
Department: Management & Budget
Email: diane.shannon@cityofdayton.org
Phone: (937) 333-3762

Dayton, Ohio (2)
Rhine McLin, Mayor

Background

The City's Wastewater Treatment Plant has a co-generation facility that can parallel electrical demand to provide electricity to the plant. Energy recovered from its engines also is used to heat buildings. Its engines use methane gas produced at anaerobic digester facilities. This provides demand side management for offsetting peak costs while it offers a stand-by source for emergency outage.

Benefits & Costs

Benefits include low emissions from lean burning engines and reduced electric and natural gas consumption. The Co-generation facility was installed as part of a 75 percent federal grant in 1989. The total construction cost was \$7 million.

Contact Information:

Name: Diane Shannon
Title: Economist
Department: Management & Budget
Email: diane.Shannon@cityofdayton.org
Phone: (937) 333-3762

Eugene, Oregon

Kitty Piercy, Mayor

Background

Eugene has a full-time staff person whose responsibility is implementing energy savings. The City has partnered with Eugene Water and Electric Board (EWEB), a local public utility, with amazing savings, both in electricity and money. Eugene has secured over \$1.5 million in incentives from EWEB and implemented measures recommended by the utility, including installing solar water heaters on city swimming pools, making operational changes in city buildings and requiring more stringent energy efficient standards for city buildings.

Benefits & Costs

This partnership between Eugene and EWEB has resulted in EWEB acquiring 9,000 MWh of installed energy efficiency, and reduced carbon emissions by 4,500 tons.

The City of Eugene's Energy Analyst works directly with the EWEB's staff to evaluate city electric bills and energy projects. Together they determine the best utility program to apply to a given situation. All projects have been funded by the utility, with the savings going to the City as well as the utility as this reduces the utility's cost of buying more power.

Contact Information

Name: Lynne Eichner-Kelley
Title: Maintenance Technician/Energy Analyst
Department: Central Services/Facility Management
Division
E-mail: lynne.m.eichnerkelley@ci.eugene.or.us
Phone: (541) 682-5083

Hayward, California
Roberta Cooper, Mayor

Solar Power Generation Program

Hayward operates a 276 kW Roof Top Solar array, covering 60,000 square feet. The system generates enough power during the day to power 275 homes. The average savings are \$51,400 annually. Carbon dioxide will be reduced by 2,000 tons over 30 years, which is equivalent to planting 600 acres of trees.

The approximate cost is \$1.8 million, and 50% is paid by the City's General Fund, and 50% (\$900,000) is from PG&E Solar Power Grant.

Methane Gas Recovery

For many years Hayward has reduced its consumption of power company electricity by using methane gas previously flared off at the water pollution control facility, as fuel for engines driving electric generators. This co-generation plant provides about 300 kWh of electricity which is equal to a third of the facility's energy needs.

Using the methane, a byproduct of the sewage treatment process, has eliminated a source of air pollution and reduced the amount of electricity the local energy supplier would otherwise have to deliver. The City has realized savings of between \$300,000 and \$400,000 a year for purchased electricity.

The program results in an overall savings through cost avoidance, which benefits wastewater system rate payers.

Contact Information

Contact name: Alex Ameri
Title: Deputy Director of Public Works --
Utilities
Department: Public Works--Utilities
Email: alex.ameri@hayward-ca.gov
Phone: (510) 583-4720

City of Houston, Texas

Bill White, Mayor

Consumer Choice Initiative

The market for retail electric competition in the State of Texas opened in January 2002 and has been successful to varying degrees based upon the class of electric customer. The Large Commercial/Industrial customers have broadly embraced the new market with the percentage of load served by non-incumbent suppliers now at or above 70%. Similarly, the Small Commercial customers have taken a proactive role in the market with over half of this load now served by new competitors. The Residential sector has been far less open to the concept of switching due, in large measure, to a lack of understanding of the associated risks and benefits. More than 70% of the residential consumers in the State remain with their traditional suppliers at the highest rates available in the marketplace.

The Consumer Choice Initiative was conceived to educate the average residential consumer about how the market works, the safeguards in place and to “qualify” suppliers using a combination of financial and customer service standards slightly more stringent than those imposed by the Texas Public Utility Commission. As in most new markets, there have been a material number of new entrants who have failed and others who have employed questionable business practices in acquiring and serving their customers. The standards imposed by the City are intended to provide a higher degree of certainty so that customers electing to switch providers under the program will have a positive experience.

A brief overview of the Initiative from conception to date is as follows:

- ✱ The City retained a private consulting firm in late November 2005 to design the program and draft the RFP for review and comment by potential participants.
- ✱ Comments were consolidated and incorporated into the final RFP, which was issued in late February 2006.
- ✱ Submissions were received, reviewed and “qualified” participants were notified in late March 2006.
- ✱ Contemporaneously with the RFP process, a new City-sponsored website (www.houstonconsumerchoice.com) was developed to provide a user friendly, informative platform for customer education and facilitate the comparison of offers from participating Suppliers.
- ✱ The Initiative, website and supporting media campaign were launched on April 5, 2006 at a press conference held by the Mayor.

The primary goal of the program was and remains the broader education of Houston consumers on the choices they have available to manage the cost of energy in their homes as this becomes an increasingly larger share of their disposable income. The program features three product categories, Fixed Price, to provide price stability; Variable Price, to offer the possibility of even greater savings; and Renewable, which is consistent with the City’s strong desire to reduce emissions from both stationary and mobile sources. In view of the high volume of web traffic and the correspondence received by the City’s consultant regarding the Initiative, it is clear that the educational goals of the program are being achieved. The total cost of the program to date has been roughly \$800,000 inclusive of fees paid to the City’s consultant and the cost of Media purchases made to support the Initiative. This cost has been almost completely underwritten by the local Electric Distribution Company that allocated a portion of its annual public education budget toward this effort.

Contact Information

Name: Ann Travis
Title: Director of Government Affairs
Department: Mayor’s Office of Government Affairs
E-mail: ann.travis@cityofhouston.net
Phone: (713) 247-1520

Jamestown, New York

Samuel Teresi, Mayor

Background

The City of Jamestown, New York, Board of Public Utilities (BPU) installed an award-winning district heating energy conservation system to maximize the useful energy from fossil fuel energy burned at the BPU's power plant. District heating is a cogeneration system that utilizes waste heat from combustion that would otherwise be released into the atmosphere. The BPU began installation of this system in the mid-1980s and has significantly expanded the system to over 60 customers. Installation of the system has also allowed the retirement of many older and less efficient boilers, with resulting decreases in greenhouse gas emissions.

Benefits & Costs

The district heating system utilizes heat that would otherwise be wasted and improves the load efficiency of the municipal utility's plant, thereby reducing greenhouse gas emissions. Also, many of the systems customers have replaced older inefficient steam boilers with district heating. This source of energy not only saves the customers from 25 to 50% on their heating and domestic hot water bills, but also saves the customer considerable expense for boiler maintenance, chemical treatment and possible stack emission assessments.

Bond money was secured for construction of the pilot district heating system. The project is paid for through rates to the district heating customers. The project is cost-effective because it uses a product (steam) that would otherwise be wasted and saves many customers the costs associated with older less efficient boilers that used to provide heating

Contact Information

Contact Name: Walter Haase
Title: General Manager
Department: Jamestown Board of Public Utilities
E-mail: whaase@jamestownbpu.com
Phone: (716) 661-1670

Lakeland, Florida

Ralph L. "Buddy" Fletcher, Mayor

LED Traffic Signal Lamps and Off-Grid Lighting

The City of Lakeland retrofitted 156 intersections with LED lamps. The replaced incandescent lamps used 135 watts each and the installed LED lamps use only 11 watts. This upgrade resulted in a savings of more than 90 percent. Additional benefits include reduced emissions, cost savings to the Public Works Department and reduced maintenance time and expenses. The cost of the LED lamps exceeded \$100,000 and a \$50,000 federal grant absorbed some of these costs.

The City also has 20 solar powered streetlights located at sites where electricity is unavailable, including in parks or on boat ramps, or where the cost to provide electricity is prohibitive. These lights increase safety to public in areas that otherwise would not be lit, therefore preventing injuries and reducing crime. The lights were purchased at a then-high cost of nearly \$50,000.

City Owned Solar Water Heating Program

Lakeland's electric utility owns and operates 55 "metered" solar residential water heaters. The City installs these individual solar heaters directly onto the roofs of residential customers. Utility grade metering equipment quantifies this solar energy (heat) and it is sold to customers as a separate product. The solar energy charge is a separate line item on customers' monthly bills.

Benefits of using solar water heaters include reduced electricity use during peak times, an enhanced image with conservationists, access to a new revenue source, reduced emissions, improved health, and satisfied customers. Customers benefit from the lack of risks associated with owning solar heaters, not having to pay maintenance costs for heaters, gaining a real estate asset, having hot water during outages, and by being exempt from solar heat rate increases. The purchase and installation cost for solar water heaters was \$2200. Grants supplemented the cost of the first 50 systems and the city will fund additional solar heaters or expansions of this program.

Solar Photovoltaic Generators

Lakeland is the host location for 23 photovoltaic (PV) systems; 17 are utility-owned and six are privately owned. These systems produce 53 kilowatts and are grid-linked. Customers with PV systems receive credit for surplus energy entering the grid at the full retail electric rate.

The community benefits from PV systems in several ways. The 17 systems installed on public schools and provide educational materials to those schools. All of the systems called "distributed generators" are in neighborhoods where the energy is most needed. These systems have cash value through Renewable Energy Credits (REC's). They increase the utility's use of alternative fuels and enhance their public image. Use of PV systems also reduces emissions to the environment subsequently enhancing the health of Lakeland citizens.

The total cost for all the PV systems was nearly \$500,000. DOE and the State of Florida funded about 80 percent of this cost and the remainder was cost-shared with the City of Lakeland's salaries.

Contact Information

Contact name: Jeff Curry
 Title: Alternate Energy Coordinator
 Department: Electric Utility
 Phone: (863) 834-6853
 Email: jeff.curry@lakelandelectric.com

Long Beach, California

Beverly O'Neill, Mayor

Background

Within the downtown area and along the seashore of Long Beach is one of the largest oil operations in the world. In a partnership with the State of California, the City of Long Beach manages the oil operations with its contractor Occidental Petroleum to ensure all environmental aspects and concerns are addressed while still providing all mineral interest owners substantial revenue from the oil and gas production.

The challenge has been to develop the vast oil field without adversely affecting the scenic beauty, natural resource, or quality of life in and around the City of Long Beach. The unique result has been the creation of four 10-acre islands just offshore to house the oil facilities. The islands were built to resemble resort islands to blend in with the surrounding coastal environment. Now it is a model operation demonstrating how technology can be used to mitigate the impact of oil operations in and around sensitive environments. The islands were constructed to present the smallest possible area towards the shoreline while still maximizing the usable area on the island for the oil operations. To enhance the four islands, waterfalls as well as palm trees and shrubs set against abstract concrete walls and 180 foot tall towers all dramatically lit at night to camouflage and to ensure any noise from the oil derricks and day to day operations is contained.

Benefits of Program

Only due to the City's proactive management of all environmental concerns of the oil operations such as noise, odors, and visual aesthetics has the continued production of oil and gas been allowed to continue. The oil operation has produced over 900 million barrels of oil that has fed the local refiners, reducing both the amount of ships entering the Port supplying oil and reliance on foreign supplies. The oil and gas production has provided the State of California over \$4.2 billion in revenues since 1965. The continued operations afford and opportunity to the surrounding community in providing over 500 skilled jobs.

Cost of Program

The project is self-funded by the revenue generated by the oil and gas revenue. The current fiscal budget has over \$270 million in expenditures and generates over \$300 million in net revenue.

Contact Information

Contact name: Christopher J. Garner
Title: Director
Department: Long Beach Gas and Oil
E-mail: Chris_Garner@longbeach.gov
Phone: (562) 570-2001

St. Paul, Minnesota
Chris Coleman, Mayor

Background

As part of St. Paul’s CO₂ Reduction Plan and Environmental/Economic Partnership Project, the City Council adopted policy to reduce CO₂ emissions by 20% and contains a detailed listing of City projects to achieve this goal. A major component of the Partnership involves providing clean energy to commercial, residential and municipal customers.

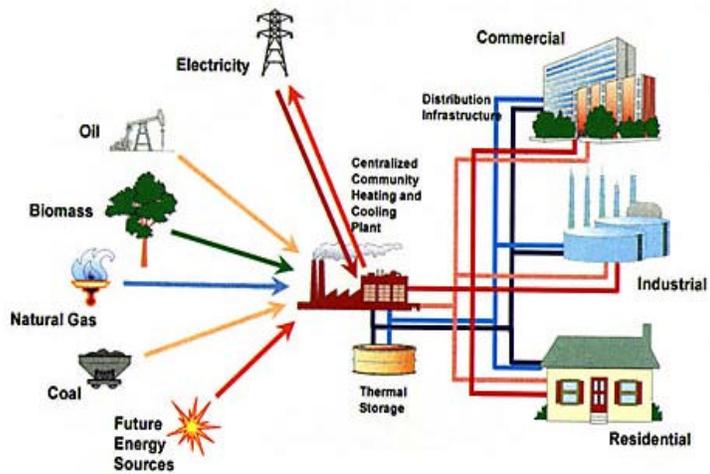
District Energy Saint Paul owns and operates the largest hot water district heating system in North America, in addition to a large chilled water cooling system. District Energy brings green energy to downtown buildings from a new combined heat and power plant fueled by 100% clean wood waste from throughout the Twin Cities Metro Area.

- Estimated Annual Savings**
- Tons CO₂ reduction = 280,000
 - \$10,000,000 to customers vs. operating their own on-site heating and cooling systems (grows with price of natural gas)
 - Total production capacity of 1,293,000 MMBTU combined heat and power at 100% efficiency

District Energy Saint Paul currently provides heating service to more than 170 buildings and 300 single-family homes, representing over 29 million square feet of building space, or 80 percent of Saint Paul’s central business district and adjacent areas. District Energy continues expanding service areas well beyond downtown every year.

Buildings connected to a district heating system do not need boilers and auxiliary equipment, freeing up valuable space for other uses. Each building has its own heat exchanger and control valve, which transfers thermal energy from the district heating system water to the building’s heating system water. Cooled water is then returned to District Energy’s main plant to be reheated and circulated once again to buildings connected to the system.

District Energy St. Paul uses wood chips, natural gas, oil or clean-burning coal to fuel its district heating and cooling systems. With the April 2003 startup of an on-site wood-waste-fired combined heat and power facility, managed by an affiliate, the company has reduced its reliance on coal and oil by 80 percent and its soot (particulate) emissions by 50 percent.



This produces significant environmental benefits and helps the community solve a local wood waste disposal problem. Efficiency gains over the previous steam heating system allow District Energy to heat twice the building space with the same amount of

fuel, and the closed-loop distribution system has eliminated the use of groundwater for heating and cooling. The district cooling system utilizes two chilled water storage tanks which produce chilled water at night using off-peak electricity for daytime distribution to customers.

District energy systems can offer many environmental benefits. They increase energy efficiency; reduce greenhouse gas emissions and other air pollution; decrease emissions of ozone-depleting refrigerants; enhance fuel flexibility; facilitate the use of renewable energy; and help manage the demand for electricity.

Contact Information

Contact name: Rick Person
Title: Program Administrator
Department: Public Works
E-mail: rick.person@ci.stpaul.mn.us
Phone: 651-266-6122

Saint Paul Cogeneration, the wood-fueled combined heat and power (CHP) plant that provides heat to District Energy Saint Paul and electricity to Xcel Energy, and the largest wood-fired CHP plant serving a district energy system in the United States, won the 2005 Minnesota Environmental Initiative Award in the Energy category.

San Jose, California

Ron Gonzales, Mayor

Background

In 2003, the San Jose City Council adopted the San Jose Sustainable Energy Policy and Action Plan. Within that Policy, goals were adopted to 1) lead by example in pursuing the most efficient use of energy in city facilities and activities; 2) explore opportunities to improve energy reliability, supply and price stability to meet current and future needs; 3) promote collaboration on energy issues; 4) promote and achieve a cleaner and healthier environment, including improving air quality and reducing greenhouse gas emissions; and 5) encouraging the development and use of renewable energy sources and alternative fuels.

An annual action plan provides a comprehensive, city-wide series of programs and activities to achieve the goals adopted as part of the Sustainable Energy Policy.

Benefits & Costs

Since April 2001, City departments have achieved an overall 18% reduction in electricity usage, exceeding the 12% goal established by the Mayor. City departments have avoided more than \$17M in electricity utility expenditures since April 2001 through a combination of behavioral changes and energy efficiency improvements.

As a result of a collaboration between the City and Pacific Gas & Electric, more than 600 small businesses received direct incentives and installations of energy efficiency measures, totaling more than \$850,000, equating to 1,163 kW of energy saved.

The City has joined with major businesses and organizations throughout San Jose/Silicon Valley and achieved emission reductions in city facilities of over 89,000 metric tons of carbon dioxide.

The Environmental Services Department has 0.5 FTE allocated to the coordination of all energy programs across the City at a cost of approximately \$47,000. The General Services Department has 0.5 FTE allocated to coordination of city facility/energy installations at a cost of approximately \$37,000.

In 2004, the City established a City Energy Efficiency Fund with an initial allocation of \$56,000 for the installation of energy efficiency measures in City facilities. Capital improvement budgets for energy installations were also adopted for Public Safety and Parks facilities at an allocation of \$130,000. Recently, a capital allocation of \$200,000 was approved for the rehabilitation of the cogeneration system at the City's Convention Center.

The City is completing a two year, \$2.1M contract with Pacific Gas & Electric that provided incentives and rebates for energy installations in the small business community. Negotiations are underway for a 2006-08 contract with Pacific Gas &

Electric for a \$500,000 contract to provide training, education and outreach for the San Jose community on energy efficiency.

The San Jose City Council is providing \$1M for a low-income energy installation program for eligible households in San Jose.

This is just a preliminary listing of the activities underway in San Jose. Not listed are the time and resources provided by the members of the Interdepartmental Energy Team--staff from across the City Departments who meet to plan and act on energy activities throughout the City, including the implementation of green building design for new city facilities.

Contact Information:

Contact name: Mary Tucker
Title: Supervising Environmental Services Specialist
Department: Environmental Services Department
Email: mary.tucker@sanjoseca.gov
Phone: (408) 975-2581

San Marcos, Texas
Susan Narvaiz, Mayor

San Marcos PowerHouse Energy Investigation Program

The San Marcos PowerHouse Energy Investigation Program focuses on electricity generation, transmission and the use of renewable and non-renewable resources. It was developed for and is offered to all Wholesale Customers in Central Texas by the Lower Colorado River Authority.

The City of San Marcos Electric Department purchases program materials for the 600 sixth grade students in the area, at an annual cost of \$14,000 to raise awareness of energy efficiency and resource conservation. Each student is given a workbook to take home and fill out with parents. The PowerHouse workbook asks for details concerning electrical appliances and water use, and other energy resources used at the student's home. Students and parents alike learn about the everyday impacts they have on natural resources.

Benefits include lessons in energy efficiency, safety and resource conservation. Furthermore, customer awareness and knowledge are increased and future purchases and electric use can be positively affected.

San Marcos Electric Outreach

The City of San Marcos Electric Department provides an ongoing outreach program as part of standard customer service. The program, open to all customers and the public, promotes electricity safety, best comfort and use of energy practices, unbiased advice on appliance purchases, and a non-commercial source of energy information. The program provides visits and presentations to groups as needed or requested.

Benefits include increased awareness by customers of electricity used and impacts on their budget and the environment. The program costs the City of San Marcos Electric Department an estimated at \$6,500 per year, plus the salaries of Electric Department Personnel.

Contact Information

Contact name: Oscar Hairell
Title: Equipment Services Manager
Department: Public Works
Email: hairell_oscar@ci.san-marcos.tx.us
Phone: (512) 393-8034

Santa Barbara, California

Marty Blum, Mayor

Background

The City of Santa Barbara uses digester gas from the anaerobic digesters at its wastewater treatment plant and two 250 kW fuel cells to generate electricity and heat for use at the treatment plant. The fuel cells are sized to supply the baseline energy requirements for the plant, and are able to produce approximately half of the plant's total electricity demand. The project is noteworthy both for the use of molten carbonate fuel cells with digester gas as a hydrogen source and for the manner in which it is managed. The project is a public/private partnership whereby the fuel cells are located on City property, but are owned and operated by Alliance-Monterey LLC., who is selling the generated electricity to the City for use at the plant.

Benefits and Costs

Benefits of the fuel cell program are three-fold: 1. Electricity generated from the fuel cells is sold to the City at a cost below that of the local electric utility. Further, there are no peak rates or demand factors for electricity from the fuel cells. 2. Prior to installation of the fuel cells, digester gas was flared. Using the electrochemical process of the fuel cells reduces air emissions by up to 5,000 lbs per year. The economic value of the reduced air emissions, if sold as pollutant credits, is approximately \$50,000 per year. 3. Because the fuel cells are among the first installed at a wastewater treatment plant, this project serves as a demonstration for other wastewater plants.

The project is a public/private partnership. Because the electricity generated by the fuel cells is less expensive than that sold to the City by the local electric utility, there is a net economic benefit to the City of approximately \$20,000 per year given current electricity prices. All capital and operating costs are paid by Alliance-Monterey LLC, the private partner. Costs for purchasing electricity are paid from the City's wastewater fund operating budget.

Contact Information

Name: Rebecca Bjork
Title: Wastewater System Manager
Department: Public Works
E-mail: rbjork@SantaBarbaraCA.gov
Phone: (805) 897-1914

Santa Monica, California
Richard Holbrook, Mayor

Through a Million Solar Roofs grant, the City of Santa Monica performed a detailed analysis of the physical potential of the community's building infrastructure. The study concluded that integration of energy efficiency, solar, and clean distributed generation efforts over the next 15-20 years would result in the on-site generation of enough power to meet the net annual energy requirements of the City and may even allow the community to become a net exporter of electricity.

This policy initiative would move Santa Monica toward community energy independence. The City Council approved a two year Community Energy Independence Initiative (CEII) demonstration project that will demonstrate to residents and businesses how effectively energy efficiency, solar energy, and distributed generation work together and how energy independence provides economic benefit to the community. Up to 50 residential, commercial, and municipal buildings are being solicited to voluntarily participate in the demonstration program.

The table below illustrates the numerous benefits of the CEII.

kWh saved per year	Annual value of energy saved	Tons of CO₂ mitigated
Year 1 293,095	Year 1 \$ 43,964	Year 1 103.2
Year 2 927,465	Year 2 \$139,120	Year 2 326.7
Total 1,220,560	Total \$183,084	Total 429.9

The 15 months of the demonstration project (through FY 2006-2007) will be funded by the City's Energy Efficiency/Conservation Fund that was established in 2001 with one-time utility user tax revenues totaling over \$600,000.

Contact Information
 Contact name: Susan Munves
 Title: Energy and Green Building Administrator
 Department: Environmental and Public Works Management
 Email: susan.munves@smgov.net
 Phone: (310) 458-8229

Yuma, Arizona

Larry Nelson, Mayor

Background

Reusable Solar Energy: The City of Yuma and Arizona Public Service (APS) have installed a Solar Garden at the Yuma West Wetlands. It is a solar energy plant that contains 24 single axis photovoltaic trackers that rotate approximately 80 degrees from 9:30 am to 3:30 pm. The rotation of the panels utilizes a clock, controller and a hydraulic pump that move each photovoltaic panel two degrees every eight minutes. Currently, the 24 single axis photovoltaic trackers produce a total of 86.4 kW of power that is fed directly into the electrical grid. This generates enough electricity to power 20 homes in the area and will become a future energy source for the park.

Benefits & Costs

The Yuma West Wetlands' APS Solar Garden is an innovative approach to alternative energy. It serves as an educational tool where the community is able to experience the fascinating breakthrough technology in solar energy. It also comes equipped with an educational area where it explains the advantages of solar energy and how the photovoltaic panels work. It has also created vast awareness in the community regarding clean, reusable energy.

This project was funded through the APS Technology Development Department and the City of Yuma partnership. The total cost incurred for the development of the Yuma West Wetlands' Solar Garden Power Plant was \$500,000.

Contact Information

Contact name: Diana Aguirre
Title: City Administration Intern
Department: City Administration
E-mail: diana.aguirre@ci.yuma.az.us
Phone: (928) 373-5000, Ext. 1010

Fuels, Vehicles & Transit

Albuquerque, New Mexico
Martin T. Chavez, Mayor

On March 1, 2006, Mayor Chavez issued Executive Instruction Number 19 requiring that all City of Albuquerque motor vehicle purchases be alternative fuel vehicles. Ultimately, the City's target is for 100% of its rolling fleet to be powered with alternative energy sources.

In addition, the City of Albuquerque's Transit Department, ABQ Ride, provides carpool matching. The program is currently in the process of acquiring new software that will enable all customer service representatives to provide carpool matches when they call 243-RIDE. With the introduction of Albuquerque's Rapid Ride system, additional hybrid diesel/electric buses will provide and enhance transportation alternatives for Albuquerque's citizens.

Contact Information

Contact name: Richard Kennedy

Title: Deputy Director

Department: Environmental Health Department

E-mail: rkennedy@cabq.gov

Phone: (505) 768-2625

Asheville, North Carolina

Terry Bellamy, Mayor

Overview

In 2000, the City adopted an Alternative Fueled Vehicle Policy. Along with its State grant, partners, the City constructed and put into service a public access compressed natural fueling station in November 2005. Currently 23 alternative fueled vehicles are in service (CNG, electric and hybrids). Low sulfur diesel fuel also was purchased.

Benefits and Costs

The City has realized emission reductions, fuel savings by decreasing its vehicle fleet by 70 vehicles and leadership in the community.

The CNG fueling station cost was \$400,000. The City received a \$100,000 grant. Matching and Incremental costs at about 25 percent were paid from the General Fund and grants.

Contact Information

Contact name: Terry Albrecht
Title: WRP Program Director, Land of Sky
Regional Council
Email: Terry.Albrecht@ncmail.net
Phone: (828) 251-6622

Austin, Texas
Will Wynn, Mayor

Background

Austin’s Plug-in Partners Campaign, is a national grass-roots initiative, initiated and organized by the City of Austin, to demonstrate to automakers that a market for Flexible-Fuel Plug-in Hybrid Electric Vehicles (PHEVs) exists today. Our National Campaign will demonstrate the viability of this market by:

- ✿ Garnering support in the form of online petitions and endorsements by cities across the country.
- ✿ Procuring “soft” fleet orders.
- ✿ Developing rebates and incentives.

Plug-In Hybrid Electric Vehicles are outfitted with a battery pack sufficient to power the vehicle from 20 to 60 miles on battery charge alone. Considering that half the cars on America’s roads are driven 25 miles a day or less, a plug-in with a 25-mile range battery could eliminate gasoline use in the daily commute of millions of Americans. The cost of an equivalent electric gallon of gas is estimated to be less than \$1.00.

Basically, PHEVs use the same technology as the popular hybrids on the road today, but have a larger battery that can be recharged by plugging into a standard home outlet.

Key PHEV Attributes:

- ✿ Gets about twice the fuel economy of a conventional vehicle and 30-50% better fuel economy than a standard hybrid.
- ✿ Plugs into a standard electrical outlet to receive charge.
- ✿ Depending on design and battery size, it can be driven 20 to 60 miles without the use of gasoline.

PHEV technology can also be combined with existing flexible fuel technology to increase fuel efficiency even further as well as further reduce greenhouse gases and imported oil.

Benefits & Costs

The primary focus of the Plug-in Partners campaign is to reduce dependency on foreign oil, reduce greenhouse gas emissions, and improve the American economy. In recent

A motorist driving 9,000 annual gasoline-free miles and 3,000 using gasoline would get 100 mpg (based on vehicles that get 25 mpg).

years, a growing awareness has developed that the United States' dependence on foreign oil is a national security issue. Recently, a bipartisan coalition of leaders in the field of national security joined with environmental and renewable

energy advocates to sign an *Open Letter to the American People*. The letter calls on the nation to implement strategies for energy independence on the scale of the space program of earlier decades. The letter was also sent to President George W. Bush. Signers included, among many others, former CIA Director James Woolsey, former National

Security Advisor Robert McFarlane, and former Secretary of Energy James Watkins. Widespread development of PHEVs is a prime recommendation of the group.

Environmentally, plug-in hybrids could give millions of American commuters a “gasoline-free” daily commute, slashing the amount of greenhouse gases and other pollutants being released into the environment. Also, the air quality benefits would be magnified if plug-in hybrids were combined with already existing flexible fuel technology. Flexible fuel plug-in hybrids would also benefit American agriculture. For instance, biofuels could come from corn crops, which would give American farmers more business. Additionally, plug-in hybrids, like conventional hybrids, do not idle when sitting still. Estimates are that in urban driving, idling translates to about 10%-15% of total vehicle carbon emissions.

Economically, Plug-in hybrids vehicles have several advantages. Plug-in hybrid vehicles can range from 20 to 60 miles without the use of gasoline after being charged in a standard electrical outlet. That means tens of millions of motorists could make their daily commute using little, if any, gasoline. A motorist driving 9,000 annual gasoline-free miles and 3,000 using gasoline would get 100 mpg (based on vehicles that get 25 mpg). These savings would be even more dramatic if plug-in technology is combined with already-existing flexible fuel technology. Also, in using flexible-fuel, American crops, such as corn, could be used to fuel the vehicles. This, in turn makes American agriculture a fuel source while also creating and saving American jobs.

The City of Austin allocated \$1,000,000 to achieve all aspects of this campaign.

Contact Information

Contact name: Lisa Braithwaite
Title: Municipal Program Professional
Department: Austin Energy
Email: lisa.braithwaite@austinenergy.com
Phone: (512) 322-6511

Boston, Massachusetts

Thomas M. Menino, Mayor

City of Boston Fleet Policy and Promotion of Alternative-Fuel Vehicles

In September 2005, Mayor Menino announced that all new vehicles purchased by the City of Boston will be alternative fuel vehicles or vehicles with similar fuel economy. Additionally, 450 City vehicles that currently run on diesel fuel will begin using bio-diesel, a clean, domestically produced fuel, blended with ultra-low-sulfur diesel (ULSD).

Beyond its own procurement, Boston actively promotes the wider use of alternative-fuel vehicles. Mayor Menino supports the National Plug-In Partner Campaign, a national effort to encourage manufacturers to produce flexible-fuel plug-in hybrid vehicles. In 2006, Boston will co-host the 4th annual AltWheels Transportation Festival at City Hall Plaza. The festival exhibits working electric, solar, flex-fuel and hybrid vehicles and discusses the issues—practical, economic, and political—surrounding their use.

Retrofit of School Bus Fleet with Pollution Control Equipment

Using \$3.25 million from an EPA enforcement case settlement with a local power plant, Boston is retrofitting 500 school buses with pollution control equipment and supplying them with ultra-low sulfur diesel fuel (ULSD).

Once completed in 2006, Boston will be the first major city in the country to retrofit its entire school bus fleet. The project will reduce tail pipe emissions from the buses, primarily SO₂, CO, and particulates by more than 90%. Additionally, there will be a slight reduction in CO₂ emissions

Transportation Access Plan Agreements (TAPAs)

The Boston Transportation Department negotiates TAPAs for large projects and institutional master plans subject to review by the Boston Redevelopment Authority. A central component of these agreements is the transportation demand management (TDM) measures to reduce the dependence of residents, employees, and visitors on their automobiles and encourage trip reduction and the use of mass transit and to manage the flow of workers and equipment during construction.

Parking: Freezes, Stickers & Rates

Boston administers several parking programs that work together to discourage commuters, especially those in single-occupancy vehicles, from driving into the city. Parking freezes administered by the Air Pollution Control Commission in three areas of the city place caps on the number of off-street parking spaces of various types (e.g. commercial, residential).

In many Boston neighborhoods, residents with Boston-registered vehicles are eligible for parking stickers that allow them to park on street in spaces reserved for neighborhood use. The rates and maximum times at on-street parking meters and rates at some parking garages are set to deter commuters from using those spaces.

Save Gas, Walk Boston

Boston is implementing a campaign to encourage more people, residents and visitors, to walk around the city. Most recently, the City experienced “Sneakers on Statues” where people were invited to “visit...famous statues and see what they’ve got on their feet.”

On a more practical level, the City has developed pedestrian safety guidelines to ensure that streets, intersections, and other parts of the city’s infrastructure are designed with pedestrians in mind. The City is investing \$24 million in City Walks, and aggressive three-year road and sidewalk repair project, and \$450,000 in the Walk Safe initiative, launched by Mayor Menino in May, to repaint crosswalks, especially at busy intersections, to provide safe pedestrian access in the city’s neighborhoods.

Contact Information

Name: Bryan Glascock
Title: Director
Department: Environment Department
E-mail: bryan.glascock@cityofboston.gov
Phone: (617) 635-3850

Charlotte, North Carolina

Patrick McCrory, Mayor

The Charlotte Area Transit System (CATS) has made significant strides in lowering vehicle emissions and promoting environmental stewardship in its operating practices since its inception. Some of the major initiatives and programs that CATS has implemented recently include:

Early Implementation of Ultra Low Sulfur Diesel (ULSD)

Since June 2003, CATS has been introducing ULSD into its fleet. Currently, CATS fuels more than 60 vehicles with ULSD, which is currently trucked in from Doraville, Georgia. CATS also partners with CMS on the ULSD purchase so that the CMS fleet with diesel particulate filters installed can operate on ULSD. In October 2007, the entire CATS fleet will be using ULSD as part of an EPA mandate. The use of ULSD in diesel vehicles alone will reduce the soot in diesel exhaust by up to 20 percent.

Diesel Particulate Filter (DPF) Installation

In June 2003, CATS began a pilot program to install DPFs on three buses operating on ULSD. The pilot was so successful in reducing emissions that all new buses since 2005 have come with DPFs already installed. Furthermore, CATS has obtained grant funding to purchase over 90 DPFs in the coming year to retrofit older buses with a useful life of more than ten years. DPFs in conjunction with ULSD fuel have proven to reduce 90 percent of Particulate Matter (PM), Hydrocarbon and Carbon Monoxide emissions

Hybrid Bus Pilot Program

In August 2005, CATS put into service two hybrid buses as part of a pilot program. To date, the vehicles are performing as expected and provide many benefits to the operations and well as CATS customers. These include: improved fuel economy, lower emissions, and a smoother and quieter ride for customers. The fuel economy alone has improved by as much as 50 percent, depending upon the operating environment.

Hybrid Staff Car Program

Since hybrid cars have been available to purchase via City contracts, CATS has been an active participant in this program. To date, CATS has purchased six hybrid staff cars.

Contact Information

Name: Elizabeth Presuitti
Title: Transit Project Planner
Department: CATS, Charlotte Area
Transit System
Phone: 704-432-1275
Email: epresuitti@ci.charlotte.nc.us

Anti-Idling Policy

In October 2004, CATS implemented an Anti-Idling Policy for all CATS vehicles. CATS-owned transit and service vehicles are not permitted to idle for more than 10 minutes at a CATS Operations Facility or while in service (including layover) and not idle for more than 5 minutes in an enclosed area, unless in an extraordinary operating condition. This has proven to be very effective in reducing the fuel consumption by CATS vehicles by as much as 20 percent.

Clear the Air Program

Since 1997, the transit system has conducted an annual "Clear the Air" campaign during the heavy Ozone season. This annual program includes radio, billboard and newspaper messages on the issues of ground level ozone. Numerous transportation fairs are conducted with local businesses encouraging employees to carpool, especially on Ozone Action Days. CATS coordinates the Clear the Air Program to promote alternative methods of transportation within the region from May to September each year.

Denver, Colorado

John W. Hickenlooper, Mayor

The Mayor's Sustainable Development Initiative – Greenprint Denver – was announced in April 2005, and a city-wide inventory and strategic plan completed to determine priority activities, including energy and emissions as a priority area for action.

The 2007 Action Plan includes substantial reductions in city vehicle miles traveled, and conversion of the entire diesel fleet to B20 biodiesel. In addition, all general passenger vehicles and light duty trucks due for replacement will be replaced with hybrid powered vehicles or, where those are not available, the highest fuel mileage/lowest carbon emissions per mile vehicles available.

Denver also coined the term "green fleet" in the early 1990's and launched one of the first large-scale programs in the country. By 2005, this included a fleet of 57 hybrid electric vehicles, dozens of alternative fueled vehicles and a large portion of Denver's diesel fleet powered by B20 biodiesel.

Contact Information

Contact name: Andrew Wallach

Title: Assistant to Mayor

Department: Mayor's Office

E-mail: andrew.wallach@ci.denver.co.us

Phone: (720) 865-9033

Elkhart, Indiana
David L. Miller, Mayor

Background

The City of Elkhart continues to invest in initiatives designed to improve the local environment. One initiative, under the direction of the Department of Administration, entails the City's Central Garage using hybrid and flex-fuel (E-85) compatible vehicles. The City fleet uses two Toyota Prius hybrid vehicles and 24 Ford Taurus vehicles that operate on E-85 flex-fuel. Presently, it is not practical to convert the entire City fleet to hybrids or flex-fuel compatible vehicles. As older vehicles are phased out, however, environmentally friendly automobiles will be added to the fleet at an increasing rate.

Benefits and Costs

The most significant benefit of this initiative is the decrease of harmful exhaust emissions released by City vehicles. This not only directly influences the level of harmful exhaust emissions in the air, but also sets a positive example for citizens to follow. In addition, hybrid and flex-fuel vehicles are typically more fuel efficient, which decreases the cost of fuel.

Contact Information:

Contact name: Nicolas T. Schafer
Title: Environmental Programs Supervisor
Department: Public Works and Utilities
Email: nick.schafer@coei.org
Phone: (574) 293-2572

Hayward, California
Roberta Cooper, Mayor

Background

Hayward has implemented an Alternative Fuel Vehicle program. Currently, the city operates 12 AFVs operate on hybrid (gas/electric), compressed natural gas, liquid propane gas, or electric technology. The focus for the future is on hybrid vehicles. The City has four more hybrid vehicles on order for its fleet to replace standard gas engine vehicles.

Benefits & Costs

The use of AFVs has reduced fuel costs by about 35 to 40% over conventional gas engine powered vehicles. The City has also realized significant reductions in tailpipe emissions. Vehicles operating under full electric power do not produce any tailpipe emissions.

The Bay Area Air Quality Management District offers Vehicle Incentive Program funds to fleets to help offset their slightly higher purchase price. VIP grants up to \$2,000 per new AFV vehicle purchased. With the increased fuel efficiency and reliability of these AFVs, the reduced operating costs quickly recoup the extra money required to purchase the vehicle.

Contact Information

Contact name: Alex Ameri
Title: Deputy Director of Public Works --
Utilities
Department: Public Works--Utilities
Email: alex.ameri@hayward-ca.gov
Phone: (510) 583-4720

Irvine, California
Beth Krom, Mayor

ZEV-NET Shared-Use Vehicles

The City is one of only a few nationwide to support a zero-emission shared-use vehicle program using electric cars. Initiated in April 2002, the Zero Emission Vehicle-Network Enabled Transport program (ZEV-NET) makes zero-emission vehicles available to participating employers to transport employees to and from the Irvine Transportation Center.

The ZEV-NET initiative is a public-private partnership involving the City of Irvine, the University of California, Irvine (UCI), Toyota, The Irvine Company and the Orange County Transportation Authority. The UCI National Fuel Cell Research Center leads and manages ZEV-NET along with the UCI Institute of Transportation Studies. These two units also are affiliated with The Henry Samueli School of Engineering. Other collaborators include the California Air Resources Board and the UCI California Institute for Telecommunications and Information Technology.

The City (of Irvine) is one of only a few nationwide to support a zero-emission shared-use vehicle program using electric cars.

Using a web-based system the program enables authorized drivers to reserve vehicles online for their use during the day. At the close of each business day vehicles are returned to the train station and reconnected to battery chargers maintained by the UCI National Fuel Center

Research Center. Key benefits include less traffic congestion in Irvine, cleaner air quality, raising awareness of alternate fuels and promoting mass transit and carpooling.

Hydrogen Fuel Cell Partnership

The City of Irvine is partnering with the National Fuel Center Research Center at the University of California, Irvine and Toyota Motor Sales, USA to participate in a pilot program designed to showcase the future of urban transportation. The National Fuel Cell Research Center was the first university fuel cell research center established in the United States. The Center known to have been in the forefront of emerging hydrogen technology, in working with Toyota on fuel cell research by evaluating vehicle performance, reliability and usability.

Plug-in Partnership

The City of Irvine is a founding member of the Plug-in Partners, a national grass-roots campaign that promotes a market for flexible-fuel hybrid electric vehicles. The viability of this market will be demonstrated through development of rebates and incentives, "soft" fleet orders, petitions and endorsement by cities across the country. Partners envisioned in this campaign are local and state governments, utilities, and environmental, consumer and business organizations. In January 2006, the Irvine City Council approved a resolution authorizing the City to support a local "Plug-in City of Irvine" campaign. This campaign will work with local partners to advocate for the purchase of flexible-fuel plug-in hybrid vehicles.

Contact Information
Contact name: Marcia Beckett
Title: Fiscal and Environmental Programs Administrator
Department: Public Works
Email address: mbeckett@ci.irvine.ca.us
Phone number: (949) 724-6380

Los Angeles, California

Antonio R. Villaraigosa, Mayor

Background

In June 2000, the Los Angeles City Council adopted the Clean Fuel Policy for City-owned heavy-duty vehicles. This included vehicles in the Bureau of Sanitation's solid waste collection fleet.

In March 2006, Mayor Antonio Villaraigosa directed the Bureau of Sanitation to convert its entire fleet of solid waste collection vehicles from diesel to clean fuel by 2010. This initiative is part of the Mayor's commitment to ensure all City residents access to a better environment, improved health and a higher quality of life.

Benefits and Costs

Key accomplishments of the Alternative Fuel Program include:

- ✱ Enhancing the solid waste collection fleet to include 260 clean fuel vehicles. Now nearly 40 percent of residential curbside collection vehicles have liquefied natural gas (LNG) engines.
- ✱ For engines not yet equipped to operate on LNG, the City uses ultra-low sulfur diesel fuel to power solid waste collection vehicles.
- ✱ Reducing emissions from toxic air contaminants associated with diesel fuel exhausts including 46.3 tons per year of NO_x and 1.26 tons of PM per year.
- ✱ An estimated fuel cost saving of \$600,000 in fiscal year 2004-2005 by using LNG instead of diesel fuel in solid waste collection vehicles.
- ✱ The development and operation of three state-of-the-art liquefied natural gas/compressed natural gas (LNG/CNG) refueling stations for solid waste collection vehicles that have a total combined storage volume of LNG exceeding 110,000 gallons. These stations are in the City of Los Angeles East Valley and West Valley Yards and in the Harbor District Collection Yard.
- ✱ Plans to have another LNG/CNG refueling station operational by summer 2006 that will be located at the South Los Angeles District Yard.
- ✱ Plans underway to design a LNG/CNG station at the City of Los Angeles North Central District.

The differential cost to equip a solid waste collection vehicle with a natural gas engine and a diesel counterpart was \$25,000 to \$30,000. The cost to build a LNG storage facility and refueling station for a fleet of approximately 100 solid waste collection vehicles was about \$7,000,000.

The City of Los Angeles, Bureau of Sanitation received more than \$11,000,000 from external grants (Carl Moyer Program, Mobile Sources Air Pollution Reduction Review Committee, California Energy Commission, and U.S. Department of Energy) to support the Clean Fuel Program for solid waste collection vehicles. The City's General Fund supports the remaining costs for the program.

Contact Information

Contact name: Alex E. Helou
Title: Division Manager II
Department: Bureau of Sanitation – Solid Resources Support Services Division
E-mail: Alex.Helou@lacity.org
Phone: (213) 485- 3637

Minneapolis, Minnesota

R.T. Rybak, Mayor

Overview

As of March 2006 the City of Minneapolis fleets included 53 E85 vehicles, 5 hybrids, and 3 maintenance shop tricycles. In 2005 City of Minneapolis vehicles and equipment used 1,100,000 gallons of ultra low sulfur unleaded gasoline to lower emissions and 760,000 gallons of B5 fuel (5 percent biodiesel). In 2004 to 2005 the City contracted with a local gas station to provide E85 fuel to its vehicles but the lack of a convenient location made using E85 difficult. As a result, the City's 2006 budget includes the development of an E85 fueling station at its most heavily used maintenance facility in order to increase the usage of E85 fuel.

Other recent sustainability initiatives regarding City fleets include:

- ✱ Installed aqueous parts washer in lieu of using mineral solvents
- ✱ Installed stage-1 vapor recovery system at all City fuel stations prior to state mandates.
- ✱ Installing eight catalytic converters on eight diesel trucks to reduce carbon monoxide emissions.
- ✱ Maintain vehicles and equipment properly and timely to reduce emissions and improve fuel economy.
- ✱ Developed engine idling policy for Public Works 1200 employees
- ✱ Educating all drivers and operators on the harmful effects of needless engine idling and also policy requirements.
- ✱ Acquiring LED lights for squad cars to reduce current draw and corresponding fuel consumption to power the lights.
- ✱ Optimized fleet size, eliminating low-utilization vehicles and equipment.
- ✱ Entered into car sharing arrangement with HOURCAR (<http://www.hourcar.org/>) as an alternative to using city owned pool car vehicles. These hybrids are conveniently located and easy to access.

E 85 Benefits

- ✱ E85 reduces demand for oil imported from the Middle East and politically unstable regions.
- ✱ Ethanol is renewable. Minnesota ethanol is made from starch found in corn and cheese-making byproducts.
- ✱ E85 is a safe and fully approved fuel made from 85 percent ethyl alcohol (ethanol) and just 15 percent petroleum. Use of E85 is approved by all flexible fuel vehicle manufacturers.
- ✱ E85 is cleaner. E85 reduces ozone-forming pollution by 20% and greenhouse gas emissions by nearly 30%.
- ✱ Ethanol is less toxic. Gasoline contains compounds like benzene, toluene, and xylene. Use of E85 reduces the release of these chemicals into the environment.
- ✱ E85 has a 105 octane rating and provides a boost in engine horsepower. It burns cooler than gasoline and keeps engines clean.
- ✱ E85 is typically priced lower than gasoline.
- ✱ Ethanol degrades quickly in water. This reduces danger from gasoline spills and leaks.

Biodiesel Fuel Benefits

- ✿ It is made from non-petroleum, renewable resources that can be produced domestically
- ✿ It can be used in most diesel engines, especially newer ones
- ✿ It has less carbon monoxide, particulates, and sulfur dioxide emissions
- ✿ It produces less carbon dioxide (CO2)
- ✿ It is safer to handle

Costs

- ✿ FFV(E85) vehicles are about the same costs as regular vehicles
- ✿ E85 gallon of gas costs \$1.99 at area gas stations compared to over \$2.65 for regular unleaded gas.
- ✿ The new E85 Fueling Station is being jointly funded by the City of Minneapolis and Hennepin County. Hennepin also plans to purchase E85 vehicles.
- ✿ Using ultra low sulfur unleaded gasoline and bio diesel fuels is more expensive than using regular unleaded gas and the costs are borne by the users of the vehicles.
- ✿ HOURCAR car-sharing costs are borne by the users. At the close of 2006 there plans to conduct an analysis comparing costs of this project to the cost of using city car pool vehicles.

Contact Information

Contact name: Gayle Prest
Title: Environmental Manager
Department: Minneapolis Environmental Services
Email: Gayle.Prest@ci.minneapolis.mn.us
Phone: (612) 673-2931

Village of Palatine, Illinois

Rita L. Mullins, Mayor

Background

The Village of Palatine has purchased B20 Biodiesel for all Village diesel equipment since March of 2000. Five vehicles currently use E-85 and they have their own storage facility. Palatine Park District also uses the fuels. The Village of Palatine has also taken advantage of the Chicago area's Clean Air Counts Program and installed sixteen catalytic mufflers on some of its diesel vehicles.

Benefits and Costs

The main benefit is emission reductions through the use of catalytic mufflers. Clean Air Counts funded these projects.

Contact Information

Contact name: Bob Franz
Title: Fleet Services Coordinator
Department: Public Works
E-mail: rfranz@palatine.il.us
Phone: (847) 202-6976

Pekin, Illinois
Frank Mackaman, Mayor

**Fuels, Vehicles &
Transit**

Background

The City of Pekin is home to two ethanol plants and they are converting their vehicle fleets to flexible fuel (E-85) vehicles. They just purchased three and are specifying three more for this year.

Benefits & Costs

Local businesses benefit, becoming less reliant on foreign oil while running on cleaner-burning engines.

Joint funding exists for the vehicles: Public Utility and Private (Ethanol Plants)

Contact Information

Contact name: Dennis Kief
Title: City Manager
Department: City Manager's Office
E-mail: dkief@ci.pekin.il.us
Phone: (309) 477-2300

Portland, Oregon

Tom Potter, Mayor

Mobile Solar Generator for a Niche Market

A solar photovoltaic (PV) application for a unique market in the commercial industry has quick payback and health benefits. The City of Portland created a public/private partnership with the Office of Transportation – Bureau of Maintenance and Portland General Electric. Portland’s Office of Transportation engineered, designed, installed and monitored the 2,500-watt Mobile Solar Generator (MSG) in one of the City’s parking meter repair trucks. It is believed to be the nation’s first with its application designed for government and industrial maintenance operations.

Mobile solar generators provide a cost-effective way to reduce greenhouse gases through the use of renewable solar technology.

Mobile solar generators replace the use of fossil fuel generators mounted on the maintenance trucks and trailers. They are designed to meet the daily demands in field operations. The solar generators are made up of common commercially available components. Mobile solar generators provide a cost-effective way to reduce greenhouse gases through the use of renewable solar technology.

Benefits & Costs

The Mobile Solar Generator project reflects the community’s values and interest in obtaining cleaner city environments. The City’s goal is to increase the use of renewable technologies like photovoltaics and to encourage the public/private partnership concept. This concept continues to provide practical and innovative solutions. Portland’s interest in continuing to develop MSGs is supported by its desire for superior financial, health and environmental benefits in the work site and urban areas. Continuous exposure to high levels of exhaust and noise pollution is a health risk concern for workers and is subject to OSHA standards. The Mobile Solar Generator produces electricity at a lower life cycle cost than common fossil fuel generators. While the initial cost of a MSG is higher, the very low maintenance and downtime costs associated with using one recovers this cost in two years.

Contact Information

Contact name: David Tooze
Title: Sr. Energy Specialist
Department: Office of Sustainable Development
Email: dtooze@ci.portland.or.us
Phone: (503) 823-7582

Saint Paul, Minnesota (1)

Chris Coleman, Mayor

Background

Saint Paul is continuing to develop transit policies and practices that emphasize pedestrians, bikers, commuter rail, light rail, and busways as real alternatives to the automobile.

TRANSIT / TRANSPORTATION INITIATIVES

☀ Central Corridor – Light Rail Transit – <http://www.centralcorridor.org/index.asp>

- Connecting downtown Saint Paul and Minneapolis via the State Capitol -- One of the largest “unbuilt” transit corridors in the U.S.
- Project Description: Light Rail Transit on University Avenue has been pursued for well over 20 years. Now, however, the region is on the brink of proceeding forward. The project entails construction of LRT from the Union Depot in Saint Paul to the Metrodome in Minneapolis. There are 11 stations within Saint Paul. The estimated construction cost is \$840 million, although that estimate was made in spring, 2002. Currently the Ramsey County Regional Rail Authority (RCRRA) is the lead agency on LRT development.
- Project Status: There are two simultaneous processes underway: the environmental review process (EIS) and development of the “New Starts” application to the Federal Transit Administration (FTA). However, they are linked in one crucial factor - the development of the Cost Effectiveness Index (CEI). The EIS was released for public review/hearing fall 2005. The New Starts Application is a staff-generated document, and its development is moving forward. Subsequent to these processes is the Preliminary Engineering phase (PE), which takes about two years. Final design will take two years to complete. Construction will commence after final design.

☀ Union Depot – <http://www.co.ramsey.mn.us/rail/docs/LTKsummary.pdf>

- As part of the Federal highway bill passed by Congress in September 2005, the City of Saint Paul received \$50 million to jump-start the conversion of the Union Depot in Downtown Saint Paul into a regional transportation hub.
- For the past four years, the Ramsey County Regional Rail Authority (RCRRA) has sponsored the LOCATE Task Force to evaluate the location and design of a multi-modal transit hub in downtown Saint Paul. The first task was to look at alternative sites for such a facility, and not surprisingly, the Union Depot was selected. The second task was to evaluate the Union Depot head house, concourse and platform to see if it could accommodate all modes considered. The Study evaluated phasing of improvements over a 20-year period. The study concluded that the following could be accommodated:
 - One set of tracks for AMTRAK;
 - Two sets of freight tracks;
 - Three sets of commuter rail/high-speed rail tracks;
 - Two sets of LRT tracks;
 - One bay for taxis, airport shuttles and limousines;

- One bay for express buses;
 - One bay for local buses;
 - One bay for Greyhound and Jefferson Lines buses; and
 - Bikes would also be accommodated.
- The third task is to help relocate the U.S. Post Office (USPS) from downtown Saint Paul. Recently, the USPS agreed to relocate operations to Dakota County over the next 5 years. This sets the stage for more detailed planning with respect to use of the Depot and platform, as well as difficulties of track approaches from the southeast. Staff recently determined that the Post Office is just outside of the Lowertown Heritage Preservation District.
- Project Status: The City and RCRRA are beginning to negotiate acquisition of the concourse and platform from the USPS. Acquisition is to be negotiated by the end of 2005. Additional technical studies are anticipated in the near future. The Saint Paul Port Authority is staffing this project.
- ✿ **City Vehicle Efficiency Improvements** - The City is phasing in higher-mileage and flexible-fuel vehicles into the city's sedan and light utility vehicle fleet, and will increase the percentage of bio-fuels used in city vehicles, moving toward Ethanol-E85% and Biodiesel-B20% as feasible in 2006.
- ✿ **Downtown Employee Metropass** – Metro Transit offers programs to encourage transit use and relieve parking shortages in the Twin Cities. Employers can enroll in the Metropass program and sell the passes to employees at a discounted rate. Employers also receive a tax break for joining the Metropass program. Metropass transit passes provide over 3,000 Downtown Saint Paul workers unlimited transit system rides 24 hours a day anywhere in the metro area. The monthly fee is subsidized 50-90% by employers. The rates are cheaper as a greater number of riders use it per company. The City of a Saint Paul is a member of this program.
- ✿ **HOURCAR Car Sharing -- <http://www.hourcar.org/index.html>**
 - The City of Saint Paul supports HOURCAR, the Neighborhood Energy Consortium's new car-sharing program, by providing discounted parking space for HOURCAR vehicles in two city-owned parking ramps. Studies of North American car-sharing organizations show that every vehicle in a car-sharing fleet typically replaces up to 20 privately-owned vehicles. HOURCAR reduces traffic congestion, improves air quality, and saves members money by spreading the costs of ownership across several drivers. Each HOURCAR is a Toyota Prius hybrid, making the program an environmental standout.
 - HOURCAR got rolling spring 2005 with six cars distributed among hubs in the Uptown and Loring Park neighborhoods in Minneapolis and the Lowertown district of downtown Saint Paul. As the program grows, any neighborhood with a critical mass of members is a candidate for HOURCAR expansion. NEC launched HOURCAR with 240 members and twelve new hybrid vehicles.
 - With a fleet entirely of gas-electric hybrid vehicles and a flexible payment plan, HOURCAR aims to maximize car-sharing's proven benefits of cleaner air, reduced traffic, resource conservation, and greater mobility for residents at all

income levels. HOURCAR offers membership plans tailored to distinct needs of individual drivers, households, and businesses.

- HOURCAR members may save up to several thousand dollars each year by car-sharing. Members who pay \$5/month dues can use HOURCARs at a rate of \$6.95/hour plus \$0.45/mile. Members may choose to pay higher monthly dues of \$20 along with lower usage rates of \$4.95/hour plus \$0.39/mile. HOURCAR pays for everything else -- fuel, insurance, maintenance.

Contact Information

Contact name: Rick Person
Title: Program Administrator
Department: Public Works
E-mail: rick.person@ci.stpaul.mn.us
Phone: 651-266-6122

Saint Paul, Minnesota (2)

Chris Coleman, Mayor

Biodiesel Partnership

City cars are using a filling station at the University of Minnesota Saint Paul campus, paying a competitive rate for E85 gasoline. Besides E85 vehicles, the city's heavier trucks this summer will start running on B20, or fuel made with 20 percent biodiesel.

Although Saint Paul began purchasing flex-fuel fleet vehicles in 1997, initially the Ford Taurus, and more recently, the Ford Focus, the City could not justify building a fueling station for E85, considering each vehicle logged only about 5,500 miles per year.

The City's partnership with the University of Minnesota helps the fuel make more economic sense and reduces the cost of meeting its environmental goals.

E85 gets about 20 percent less mileage than gasoline, meaning the city will have to pay more to drive the same distance; however, it is cleaner burning than regular gasoline, which cuts down on greenhouse-gas emissions and other harmful pollutants. A 10 percent blend is typical, but flexible-fuel cars can run on blends with higher ethanol content.

In addition to an expansive curbside recycling program, which is heading toward a 75% residential recycling rate, Saint Paul's non-profit partner, Eureka Recycling has purchased a fleet of recycling trucks that run on biodiesel. The biodiesel in Eureka's fleet replaces 12,000 gallons of petroleum-based fuel with 216 acres of soybeans annually, at a cost of one penny per household per month.

Contact Information

Contact name: Rick Person
Title: Program Administrator
Department: Public Works
E-mail: rick.person@ci.stpaul.mn.us
Phone: 651-266-6122

Salt Lake City, Utah

Ross “Rocky” Anderson, Mayor

The Salt Lake City Green Program consists of environmental programs and goals to help preserve the health and vitality of the community, create efficiencies, and save tax payer dollars. Among its many goals, the City provides options for environmentally-responsible transportation, encourages the use of these options, and decreases dependence on automobile use.

Major steps so far include the promotion of cycling through creating of 45 miles of bike lanes, completion of the city’s first cross-downtown bike route on 200 South, 45 new bike racks throughout the CBD, and the “Bike Pool” program for employees at the City and County Building.

The City also promotes walking. A massive pedestrian safety program has reduced pedestrian accidents 16% in 2002, 20% in the CBD.

Salt Lake City promotes and has greatly expanded the use of mass transit. The City has successfully built the University TRAX line and expanded it to the Medical Center; and construction has recently commenced on a new inter-modal hub. It is working to fund light rail to the airport and also working to extend light rail hours on weekends,

Furthermore, the City is promoting use of alternative fuel vehicles, as evidenced by the conversion of the city’s fleet and Mayor Anderson’s personal vehicle.

Contact Information

Contact name: Dorothy Stangle

Title: Assistant to the Mayor

Department: Mayor’s Office

E-mail: dorothy.stangle@slcgov.com

Phone: (801) 535-7743

San Marcos, Texas

Susan Narvaiz, Mayor

San Marcos employs a number of emission reduction and fuel efficiency initiatives:

- ✿ San Marcos is a staunch coalition partner of Central Texas Clean Cities. The coalition is currently made up of over 60 motivated companies, agencies and municipalities working together to improve air quality standards, reduce vehicle emissions levels, promote alternative fuels and vehicles, and develop fueling infrastructure to make alternative fuels more convenient. This coalition provides options and flexibility to meet petroleum displacement goals. These options include anti-idling technologies, the expanded use of fuel blends, and higher efficiency vehicles and driving practices.
- ✿ Located in a near non-attainment area, San Marcos staff works with several air quality consultants to assist in developing emissions strategies and cost analyst studies under the Texas Emission Reduction Plan.
- ✿ The City staff is tasked to closely follow vehicle/equipment replacement guidelines and "right size" their fleet requirements based on functional operations and fuel usage. When practical, fleet vehicles operate on alternative fuels (Propane and Ethanol). The City and Texas State University have partnered to operate a local area Propane Re-Fueling Station.
- ✿ 90% of the City fleet has been converted to use full synthetic engine, transmission and hydraulic fluids. There has been a marked increase in fuel economy and fleet downtime. The City operates its fleets on recycled engine coolant.
- ✿ City fleet operations use only low volatile organic compound stripping material to avoid additional air pollution.

Contact Information

Contact name: Oscar Hairell
Title: Equipment Services Manager
Department: Public Works
Email: hairell_oscar@ci.san-marcos.tx.us
Phone: (512) 393-8034

Housing

Houston, Texas
Bill White, Mayor

Pleasantville Weatherization Program

Mayor Bill White has led a City of Houston neighborhood revitalization campaign which includes a weatherization program. The weatherization program will improve the energy efficiency of homes in an inner city 1950's neighborhood known as Pleasantville. The Mayor's goal is to have over five hundred homes weatherized by the end of the summer of 2006. The City of Houston's partner in this program is CenterPoint Energy, the energy services provider for the Houston area. As a partner, CenterPoint Energy has agreed to provide this service free of charge to Houston residents. The Mayor also has engaged the Houston Advanced Research Center to provide program management and to execute the science and data collection and analysis for the program.

This program, like all utility company-sponsored weatherization programs, requires the residents to meet income qualification guidelines to enroll in the program. The program was initiated on February 13, 2006. More than 500 of the 1,470 Pleasantville residents have enrolled to have their homes weatherized. The program is actively engaging the community currently, with over fifty per cent of the enrolled homes already complete as of May 1, 2006.

The weatherization program's scope of work may address many components of the resident's home which will provide reduced energy expenditures for the resident and improved energy efficiency. The possible scope of work includes the following: installing weather stripping on windows and doors; caulking windows; replacing incandescent lamps with compact fluorescent lamps; installing insulation in the attic; installing insulation on exposed hot water piping; and insulating water heaters with blankets. These energy efficiency tactics are not only beneficial to the city's neighborhoods and surrounding communities but can be a major factor in global warming.

Home weatherization programs such as this have the potential to produce important energy savings. The Mayor anticipates the weatherized homes to save as much as 10-13 percent in energy consumption. By reducing the amount of energy used in residential neighborhoods, this program helps to reduce air emissions from power plants in the Houston area. The reduction in emissions improves the air quality, both indoors and out, for the residents of this neighborhood, resulting in better human and ecosystem health.

This innovative energy program is one of the cornerstones of the Mayor's energy and environmental programs. The program demonstrates the City's involvement and commitment to the people of Houston. The Mayor insists that both quantitative and qualitative measurement of utility data created by the weatherization program be collected, analyzed and widely published. The City of Houston wants to ensure that everyone involved with the program has a better understanding of the improved quality of life received through this programs action. Mayor Bill White hopes to replicate the program in other communities throughout the City of Houston based upon the outcome of the Pleasantville Weatherization Program.

Contact Information

Name: Ann Travis
 Title: Director of Government Affairs
 Department: Mayor's Office of Government Affairs
 E-mail: ann.travis@cityofhouston.net
 Phone: (713) 247-1520

Municipal Buildings, Facilities & Operations

Alexandria, Virginia

William D. “Bill” Euille, Mayor

Background

The City’s Department of General Services developed a Green Building Policy and adopted it in February 2004. This policy establishes procedures for analyzing LEED feasibility for facilities 5,000 sq ft or greater, outlines staff resource and training goals, and it identifies program participation opportunities, including Energy Star, Rebuild America, and the USGBC. Since the establishment of the Green Building Policy:

- ✿ The City implemented several projects including rain gardens and vegetated green roofs.
- ✿ The City registered three USGBC LEED projects and has two more projects in planning phases.
- ✿ Made procurement changes in its Architectural/Engineering section including those affecting cleaning supplies and procedures, painting and flooring.
- ✿ Set up an Energy Conservation fund to assist with design and construction efforts and to reduce energy consumption in City facilities.

Benefits and Costs

Alexandria’s Energy Conservation program is funded through bond revenue and from \$200,000 budgeted per year for its activities.

The tables provide a thumbnail sketch of energy conservation projects completed since fiscal year 2003. It includes yearly, cumulative and total energy savings from fiscal year 2003- 2005 and estimated savings for fiscal year 2006.

Completed Projects & Projects Underway in the City of Alexandria, Virginia

Project, Scope	Cost	FY 03 Savings	FY 04 Savings	FY 05 Savings	FY2006 Savings estimate	To-date Savings
Fire Station 203: Retro-fit with energy-efficient lighting fixtures	\$13,500	\$908	\$883	\$900	\$900	\$3,591
Fire Station 205: Retro-fit with energy-efficient lighting fixtures	\$14,600	\$687	\$679	\$400	\$400	\$2,166
Beatley Library: HVAC modifications	\$3,000			\$20,000	\$35,000	\$55,000
Community Shelter: HVAC replacement	\$5,200				\$3,000	\$3,000
Torpedo Factory: HVAC replacement	\$9,000				\$5,000	\$5,000
Yearly Sub-total Savings	\$45,300	\$1,595	\$1,562	\$21,300	\$44,300	
GRAND TOTAL						\$68,757

Prospective Energy Conservation Projects

Alexandria's Department of General Services has several capital improvement projects in development and has identified their potential energy conservation elements. It should be noted that while the estimated payback total exceeds the seven-year window, the City will have long-term benefit from these improvements and some of them will be done as part of planned life-cycle equipment replacement requirements.

Contact Information

Contact name: Jeremy McPike
 Title: Project Manager
 Department: General Services
 Email: Jeremy.McPike@alexandriava.gov
 Phone: (703) 838-4770

<u>Project, Scope</u>	<u>Cost</u>	<u>Energy Savings/yr</u>	<u>Payback</u>	<u>Notes</u>
Beatley Library: Piping Modification	\$35,000	\$20,000	2 years	This re-work will allow more downtime for the system.
City Hall: Heating Plant replacement	\$40,000	\$4,000	10 years	This system is at the end of its useful life (25yrs)
Courthouse: Cooling tower replacement	\$100,000	\$35,000	Life Cycle replacement	Three part project: Life-cycle replacement total costs are approximately \$550k with an estimated annual savings rate of \$66k
Courthouse: VAV Box replacement	\$250,000	\$6,000	Life Cycle replacement	
Courthouse: Energy Management System replacement	\$200,000	\$25,000	8 years	
Gadsby's Tavern: Air Handler Replacement	\$50,000	\$1,000	Life Cycle replacement	Another multi part life-cycle project estimated at \$170K saving of approx. \$8K per yr.
Gadsby's Tavern: Heating Plant replacement	\$50,000	\$4,000	12 years	
Gadsby's Tavern: Cooling Plant replacement	\$70,000	\$3,000	3years	
Health Department: Variable Air Volume (VAV) Box replacement	\$130,000	\$7,000	20 years Life Cycle replacement	Life cycle payback
Public Safety Center: Cooling Tower replacement	\$120,000	\$4,000	Life Cycle replacement	Life-cycle (30 yr) payback
Various Facilities: IP Thermostat installation	\$500-\$3000 per building	\$30,000	(varies)	IP based for small to medium buildings
Sub-Total	\$1,045,500			
Grand Total Annual Savings (estimated)		\$139,000		

Arlington, Texas

Robert N. Cluck, MD, Mayor

Automatic Light Sensors

The City has installed over 170 occupancy sensors on light switches throughout City buildings. These sensors automatically turn off ceiling lights in offices where no motion is detected for 10 minutes.

To date, this program has saved the City nearly 13,000 kilowatt hours of electricity. Each unit costs \$50 and the total cost thus far has been approximately \$8,500. Given the current cost for building electric service is 11.86 cents per kWh, the City anticipates a return on its up-front costs within five years when it is estimated the sensors will have saved 70,000 kWh of electricity.

LED Traffic Signals

The City installed light-emitting diode (LED) lights as traffic signal replacements at the 263 intersections with signals it owns and at 39 of the 46 intersections it maintains through inter-local agreements with other governmental entities.

While the total cost of this program is projected to be \$1.1 million, the savings on electricity costs, are expected to be substantial. Considering the current cost for signal electricity is 13.86 cents per kWh, the project is anticipated to return its initial expense costs in less than three years. The LED signals use 82 percent less electricity than the old incandescent technology and this will result in an annual savings of over 2.8 million kWh of electricity.

Contact Information

Name: Steve Harper
Title: Acting Director,
Environmental Services
E-mail: harpers@ci.arlington.tx.us
Phone: (871) 459-5451

Bedford, Texas
Jim Story, Mayor

Background

Bedford's comprehensive program involves lighting retrofits, traffic lighting upgrades, water conservation, HVAC upgrades, and upgrading roofs on various buildings.

Benefits and Costs

The program has enabled Bedford to exceed the state-wide kWh usage reduction goals. The new HVAC systems are expected to reduce emissions. Additional reductions in energy usage are anticipated as the planned projects are implemented. While some cost savings will vary with the cost of electricity, it is anticipated savings will increase as energy usage declines.

The cost of the program is \$1.2 million.

Contact Information

Contact name: Michael Griffith
Title: Facility Maintenance Manager
Department: Facilities
Email: mgriffith@ci.bedford.tx.us
Phone: (817) 952-2149

Boston, Massachusetts

Thomas M. Menino, Mayor

Green Building Task Force

After the City of Boston built its first green building, the George Robert White Environmental Conservation Center, Mayor Menino used the lessons learned from the process to create his Green Building Task Force. He charged the experts – developers, financiers, contractors, designers, unions, and academics – to take a year-long, comprehensive look at the barriers to green building and to make recommendations based on their findings. In November 2004, Mayor Menino, based on the Task Force's recommendations, announced that the City would amend its zoning code to require LEED certifiable as the design and construction standard for all projects undergoing project review and would aim for LEED Silver in the new construction of its facilities. The Public Facilities Department has begun the design and construction of a new police station and is just beginning the design of a new library.

Some of the benefits of the City adopting the LEED standard will be energy cost savings and the public health impacts of emissions reductions, as well as indoor air quality improvements for the occupants and visitors of these buildings.

As LEED standards in City construction is a new policy, City staff needed training and assistance to understand LEED and how the standards interact with the state's complex public procurement and public construction laws. The City received grant funding support from the Massachusetts Technology Collaborative for the Task Force and for LEED training for 60 City staff members from nine departments. The City also received foundation support for the Green Roundtable (the local US Green Building Council affiliate) to work with the Public Facilities staff to green the RFP and design documents and select a team that could meet the LEED standard.

Green Roof Program

In 2005, Boston installed a demonstration green roof on the 8th and 9th floor balconies of City Hall. A green roof is a comprehensive system of waterproofing, growing medium, and plants that replaces conventional roofs.

Green roofs reduce energy consumption for heating and cooling, reduce the urban heat island effect, and reduce storm water run-off. There are already at least 10 green roofs in Boston, and several more are planned, including the private conversion of the former South End Police Station and the renovation of the McCormack Federal Building. In May 2006, the City will host the 4th Annual International Greening Rooftops for Sustainable Communities Conference Awards and Trade Show, a three day conference exploring policies for supporting green roofs, design and implementation issues, and research concerning green roof performance.

Integrated Energy Management Plan for Municipal Buildings

In 2003, Mayor Menino appointed an Energy Management Board, Chaired by the Chief of Environmental and Energy Services. In 2005, the Board completed an Integrated Energy Management Plan (IEMP), which studied energy use in 362 municipal buildings and identified potential savings, particularly in the “Top Ten.” The plan’s implementation steps, over which the Board exercises continuing authority, include:

- ✱ Establish comprehensive energy efficiency retrofit program for city facilities, beginning with the implementation of energy efficiency recommendations for the top two energy users, City Hall and Boston Public Library.
- ✱ Use energy efficiency standards and building commissioning template developed for the IEMP.
- ✱ Investigate distributed generation including co-generation and renewable energy in City facilities, building on the Boston Public Schools’ successful installation of 6MW co-generation (one half of its load) and solar voltaic panels on three schools.
- ✱ Update and streamline the administration of energy purchasing, and create a central database of financial, property, and utility information in order to analyze energy use.
- ✱ Participate in the ISO-NE Demand Response Program.

Contact Information

Contact name: Bradford Swing
Title: Director of Energy Policy
Department: Office of the Mayor, Environment & Energy Services
E-mail: brad.swing@cityofboston.gov
Phone: (617) 635-2886

Bridgeport, Connecticut

Mayor John Fabrizi

Bridgeport has implemented several program and practices to increase energy efficiency and reduce overall energy use in City facilities and operations:

1. Utility bill usage analysis and comparison to identify abnormalities among similar buildings or negative trends for specific buildings. Performed with in-house personnel.
2. Operational time changes with installed energy management systems.
3. Employee awareness to change habits regarding turning off lighting and computers not in use.
4. Installation of lighting controls switches and occupancy sensors.
5. Lighting fixture retrofit upgrades.
6. Replacement of antiquated major HVAC components.
7. Change over to LED traffic lights.
8. Replacement of vehicles with alternate fuel vehicles- natural gas and hybrids.

Benefits

Utility costs are reduced due to usage curtailment and efficiencies. Added benefits include emission reductions.

Funding

- ☀ Items 1, 2 and 3: Required no additional funding.
- ☀ Item 4: Cost was minimal, with controls and sensors purchased from operational accounts and installed by in-house staff.
- ☀ Item 5: Will be 50% funded by Energy Conservation Grants. Remaining 50% will be either funded by indirect three year financing from savings or direct capital outlays.
- ☀ Item 6: A five-year performance contract.
- ☀ Item 7: 80% Federal Grant with 20% State Grants for major projects. Operational funds for change-over occurring during bulb burn outs with 50% rebate from energy conservation fund.
- ☀ Item 8: Base cost of vehicle from capital replacement account. Differential upgrade is 100% State Grant.

Contact Information

Name: John F. Cottell Jr.
Title: Utilities Manager
Department: Public Facilities Department, City Hall Annex
e-mail: cottej0@ci.bridgeport.ct.us
Phone: (203) 576-7851

Chicago, Illinois

Richard Daley, Mayor

Chicago Mayor Richard M. Daley recently announced the City's 2006 Environmental Agenda, which reflects the work of more than 40 City departments and sister agencies and contains nearly 200 environmental accomplishments, as well as an ambitious set of initiatives and goals for 2006. The accomplishments and initiatives show that environmentally smart policies have begun to take root in every aspect of the City's operations and in the way it partners with Chicago citizens and businesses.

The new agenda sets a course for continued innovation in the coming year and reaffirms Mayor Daley's belief that a healthy environment is essential to a strong economy and improved quality of life for Chicagoans.

The Action Agenda commits the City to reducing its use of natural resources, improving the quality of life in the City as a whole, and saving taxpayer dollars through wise energy and resource conserving actions.

Highlights of the 2006 Agenda include:

Green Building: In 2005, 22 new City buildings, including fire stations, schools and libraries, registered for LEED certification, the national standard for energy efficient, cost-effective and healthy building. For 2006, Chicago has committed to building all of its new buildings at a minimum LEED Silver level with a target of Gold. Almost no other city in the country has established such ambitious environmental building standards.

Energy Efficiency: In 2005, Chicago completed energy efficiency retrofits at all City libraries, adding to the over 15 million square feet of citywide energy efficiency retrofits Mayor Daley has instituted. In 2006, the City will complete lighting retrofits at all 105 of its fire stations saving \$250,000 in annual electricity costs, and reducing emissions of carbon dioxide by 3,515 tons.

Renewable Energy: In 2005, Chicago purchased solar panels for hot-water heating capable of generating a total of 1.27 megawatts, the equivalent of heating 17 Olympic-sized swimming pools. In 2006, the City will provide grants for the installation of these solar panels at qualified affordable housing developments, social service organizations, coin laundries and health clubs. This will nearly double Chicago's installed solar power capacity.

Alternative Fuels: The number of hybrid vehicles in the City's fleet grew from 30 to over 100, with the addition of 13 new hybrid sedans and 57 new hybrid SUVs in 2005. These vehicles will use an estimated 10,000 gallons less than traditional vehicles over the course of 2006, saving the City tens of thousands of dollars. In addition, the City will retrofit 600 school buses with oxidation catalysts reducing an estimated 57 tons of carbon

monoxide, 27 tons of volatile organic compounds, and 3 tons of the particulate matter often linked to asthma over the life span of the retrofitted buses.

Green Roofs: More than 60 green roofs were installed or planned in 2005 through City initiatives, bringing the total of green roofs in the City to over 200 and creating over 3 million square feet of roofs that keep the city cool and reduce the amount of storm water directed to the City's sewer system.

Environmentally Friendly Streets: In 2006, the City will use 100% recycled aggregate in residential street construction throughout the city and up to 50% recycled aggregate in concrete mix for sidewalks. The City will continue to replace stop lights with high efficiency, low cost LED lights, use recycled rubber in its alley speed bumps, and plant medians and street trees throughout the City that clean the air, mitigate summer heat, and improve the overall quality of life in the City's neighborhoods.

The 2006 Environmental Action Agenda can be accessed at the City of Chicago's website at www.cityofchicago.org/Environment.

Contact Information

Name: Sadhu Johnston

Title: Commissioner

Department: Environment

Email: sjohnston@cityofchicago.org

Phone: 312-744-7609

Colorado Springs, Colorado (1)

Lionel Rivera, Mayor

Background

The new 48,000 square-foot Colorado Springs Utilities Laboratory was the first building in Colorado Springs to achieve LEED Silver level certification and the second in the City to be LEED certified. Energy and water conservation is evidence throughout the facility with the use of environmentally friendly materials, high-efficiency lighting, energy efficient windows, efficient boiler systems and natural lighting.

Benefits and Costs

Energy and water conservation measures at the new laboratory will save Colorado Springs Utilities and its customers \$50,000 annually in utility costs.

The cost for design and construction of the LEED building was approximately 4 percent of the construction cost. As a municipal entity, all of the programs highlighted are funded through avoided or deferred operational costs or rates. Wind power is the only exception and is funded by program participants.

Contact Information

Contact name: Bryan Aumiller
Title: Project Architect
Department: Facilities Dept., Colorado
Springs Utilities
Email: baumiller@csu.org
Phone: (719) 668-8317

Colorado Springs, Colorado (2)

Lionel Rivera, Mayor

Background

Colorado Springs Utilities wrote and adopted guidelines for Architects and Engineers who design new buildings for Colorado Springs Utilities. The guidelines in *Strategic Facilities Guidelines for Improved Energy Efficiency in New Utility and City Buildings* set the bar to exceed energy code requirements by no less than 30 percent and give guidance on how to achieve and exceed energy requirements.

Benefits and Costs

The City realizes approximately 40 percent in savings in electric and gas consumption compared to energy code minimum requirements.

The cost to prepare the guidance document was \$10,000. As a municipal entity, all of the programs highlighted are funded through avoided or deferred operational costs or rates. Wind power is the only exception and is funded by program participants.

Contact Information

Contact name: Alan Goins

Title: Facilities Manager

Department: Facilities Dept., Colorado Springs Utilities

Email: agoins@csu.org

Phone: (719) 668-8024

Dayton, Ohio (1)
Rhine McLin, Mayor

Background

The City is changing its 330 signalized intersection signals for vehicle and pedestrian fixtures from incandescent lights to light emitting diodes (LED).

Benefits and Costs

LEDs use approximately 88 percent less electricity. They also reduce pollution from electricity production. The life of a LED is five-times longer than an incandescent bulb. Using LEDs enhance safety by reducing exposure of maintenance personnel to high traffic intersections. Maintenance costs also declined due to less repair and replacement visits to intersections. The estimated cost savings per intersection over a seven-year useful life when using the LED fixtures is \$4,753.

The cost of a LED fixture is \$260 per unit and incandescent fixture costs \$140 per unit. The ongoing replacement program is being paid through the General Fund. For new and rebuilt locations, the program is being paid with federal CMAQ funds.

Contact Information:

Name: Diane Shannon

Title: Economist

Department: Management & Budget

Email: diane.shannon@cityofdayton.org

Phone: (937) 333-3762

Dayton, Ohio (2)
Rhine McLin, Mayor

Background

The City's Fleet Management Division has replaced approximately 210 light fixtures with 107 new lights. The new lights require one-half of the power previously used and produce more light than the old lighting system. In addition, the Division installed a waste oil boiler to supplement its current heating system. The Division also tracks and monitors motor fuel consumption to make users more aware of their consumption rates.

Benefits and Costs

These programs increased energy savings or are projected to reduce energy costs. The new lighting program cut lighting costs in half. The newly installed boiler is projected to consume nearly 12,000 gallons of waste oil that is produced annually through equipment maintenance. The boiler's consumption of this oil eliminates the generation of a hazardous waste product. Using the waste oil boiler also saved almost \$22,000 in natural gas costs. Fuel tracking and monitoring led to better planning, reduced engine idling and resulted in a nearly 10 percent reduction in consumption.

The programs described were conducted using current budgetary levels.

Contact Information:

Name: Diane Shannon

Title: Economist

Department: Management & Budget

Email: diane.shannon@cityofdayton.org

Phone: (937) 333-3762

Dearborn, Michigan
Michael A. Guido, Mayor

Energy Efficient Lighting

The City of Dearborn has replaced nearly all the incandescent and older fluorescent lighting in its buildings with energy efficient fluorescent and compact fluorescent lamps. This includes buildings such as City Hall that are over 70 years old. While there is no way to separate the electrical lighting costs from total electrical costs, the energy efficient lighting replacements are believed to have reduced lighting costs by at least 20 percent. Support for this program is from the city's General Fund.

Green Roof

Since 1979, the City of Dearborn has maintained a turf based "green roof" over the Concourse area of its City Hall. This innovative landscape and energy efficient feature covers approximately 5,000 square feet of roof area and is planted in easy to maintain turf grass. Benefits of the green roof include a reduction in surface water run-off during rain events, as well as lower heating and cooling costs. The Concourse roof is maintained by the city's Parks Division, which is a general fund operation.

Contact Information:

Contact name: Kurt A. Giberson
Title: Director of Public Works
Department: Public Works
Email: kurtgiberson@ci.dearborn.mi.us
Phone: (313) 943-2496

Denver, Colorado

John W. Hickenlooper, Mayor

Denver continues to build on a strong foundation of excellence in energy conservation policies and practices in municipal buildings and facilities. Innovations and accomplishments include:

- ✱ Denver's pioneering Light Emitting Diode (LED) traffic signal retrofit program realized over \$817,114 in annual energy, labor and materials savings for the 2004-2005 time period.
- ✱ Denver formally committed to build and certify its new \$380 million Justice Center complex by the U.S. Green Building Council's LEED standard.
- ✱ The City's Sustainable Development Initiative worked with Colorado State University's Institute for the Built Environment to produce a Green Building Policy White Paper, *Developing a High Performance Building Policy for the City and County of Denver*, written in 2005 for consideration and adoption in 2006.
- ✱ The Mayor's office co-hosted the Denver World Oil Summit in November 2005, and worked with graduate students at the University of Colorado at Denver to complete a study of the vulnerability of the city budget related to oil price increases.
- ✱ Denver city government will reduce its consumption of electricity and natural gas one percent per year through 2011.
- ✱ Denver International Airport uses a state-of-the-art Environmental Management System and has helped lead progress in climate protection within the City and County of Denver.
- ✱ Additional accomplishments include the renewal of the Environmental Protection Agency's Energy Star Label award to the Webb Municipal Office Building; the installation of a solar wall at the Athmar Recreation Center; several fire station window retrofits that resulted in 10 times greater efficiency; and a contract in progress to install air destratifier units to increase building efficiency in the Webb Municipal Building.

Contact Information

Contact name: Andrew Wallach
Title: Assistant to Mayor
Department: Mayor's Office
E-mail: andrew.wallach@ci.denver.co.us
Phone: (720) 865-9033

Dublin, California

Janet Lockhart, Mayor

Background

The City of Dublin has implemented several programs to address energy efficiency, environmental performance and emissions reductions among the community and especially throughout City facilities and operations.

1. The City adopted the Clean Air Consortium Checklist, which includes *Spare the Air Days*. (See Air Quality best practices section). The cost of the checklist compliance, including curtailment of certain activities during *Spare the Air Days*, is nominal and is incorporated into the operating budgets for City maintenance work.
2. The City adopted Operational Guidelines for Green Building Practices, as required under City Ordinance 904. The ordinance mandates green building practices with the estimated cost of \$3 million or greater must meet the LEED “Silver” rating and must be registered and certified by the US Green Building Council. Much of the costs associated with this ordinance are borne by homebuyers or others who purchase or lease building constructed under the guidelines. These costs are estimated to be nominal.
3. The City executed a new franchise agreement with Amador Valley Industries for solid waste collection in January, 2005. This agreement includes requirements for natural gas to be used in collection vehicles in lieu of diesel fuel and specifies the use of recycled oil and lubricants. There is no direct cost to the City for this agreement. The cost is borne by customers served under the franchise agreement.
4. The City maintains a network of bicycle and pedestrian trail. These trails provide access for commuters to the Bishop Ranch Business Park, Hacienda Business Park and to the East Dublin BART (Bay Area Rapid Transit) station. New development projects include a requirement to provide connecting trails when possible. The City maintains nine miles of trail at a cost of \$47,000 annually. This cost is slightly over 1 percent of the City’s overall annual public works operating budget of nearly \$3 million.
5. The City approved the building of high-density residential housing developments to be built adjacent to the existing East Dublin and proposed West Dublin BART stations. There is no direct cost to the City for this program.

Contact Information

Contact name: Melissa Morton
Title: Public Works Director
Department: Public Works
Email: Melissa.Morton@ci.dublin.ca.us
Phone: (925) 833-6636

The City has not performed quantity analyses of the programs described to determine whether they have had an effect on air quality or energy use.

Elkhart, Indiana

David L. Miller, Mayor

Background

Over the last ten years, the City of Elkhart has been implementing initiatives to improve the environment. Under the direction of the Department of Public Works and Utilities, the Traffic Division decided to replace 100 percent of the traditional 100 to 160 watt bulbs in the City's traffic lights with LED bulbs. When the initiative is completed over 1,600 LED bulbs will be installed. Another initiative is to convert all pedestrian signals into LED-based lighting systems.

Benefits and Costs

These initiatives will conserve energy. LED traffic lights use only a minimal portion of the electricity used by traditional bulbs. The lifetime expectancy of LED lights also is five times greater than that of traditional bulbs. Traffic crews will no longer need to replace traditional bulbs every, instead they will be replacing LED lights every five years. Not only is this practice fiscally responsible, but it also will free traffic crews to devote their energies to other projects in the City.

Another benefit of this program will be increased traffic safety. Traffic signals with LED lights are easier to see in daylight and during nighttime. It is this increased visibility of LED-based traffic lights and signals that is expected to result in reducing accidents.

Contact Information:

Contact name: Nicolas T. Schafer
Title: Environmental Programs Supervisor
Department: Public Works and Utilities
Email: nick.schafer@coei.org
Phone: (574) 293-2572

Eules, Texas

Mary Lib Saleh, Mayor

Background

The City of Eules aims to keep its buildings and fleet maintained in a "green environment." Eules currently operates 37 vehicles, including dump trucks, that use alternative fuel sources.

A new policy was issued for all vehicles purchased by the City to be low emissions, ultra low emissions or zero emissions vehicles. Approximately 95percent of the City's fleet has met this mandate.

Eules adopted various forms of recycling or waste reduction technology to lower costs in its shop operations. Among these operations are Ethylene Glycol recycling, filtration and reuse; oil and fuel filter recycling; and maintaining a "dry cleaned" shop floor and workstations, thus eliminating gray water discharges into the waste stream. The City's use of a 100 percent digital work order system also promotes a paperless environment.

Facility maintenance uses ozone-friendly refrigerants, HVAC cleaners and solvents, and implemented various energy reduction programs. City staff administered and installed these programs without using a third party. These programs include the conversion of city traffic signals from incandescent to LED fixtures, relamping of city facilities to low-E type lighting that contains no PCB materials and the installation of three-zone programmable thermostats in all city structures. The installation of computer-controlled HVAC systems enable chilled water systems to go in economy mode during unoccupied times. The installation of automatic light dimming switches in bathrooms and closets so that they automatically turn off after a short time period also decreases energy use.

Benefits & Costs

The benefits of this program are far greater than we imagined. All measures implemented provide cost saving benefits. The recycling in fleet operations will lower costs and maintain the green environment. Using liquefied petroleum gas as an alternative fuel source is less expensive than using gasoline, better for the environment and the difference in car handling is negligible. Conversion of the city traffic signals will reduce average dollar cost and energy consumption by 75 percent. It is anticipated that these energy reduction measures will continue to save money for years to come.

Contact Information:

Contact name: Betsy Boyett
Title: Communications/Marketing
Manager
Department: City Manager's Office
Email: bboyett@ci.eules.tx.us
Phone: 817-685-1821

The energy reduction measures in this program were of comparable cost to expenses for previous business practices and were paid through the general fund.

Hayward, California

Roberta Cooper, Mayor

Green Building Program Certification

The City of Hayward's Equipment Management Division has been certified by the Bay Area Green Business Program as being a "Certified Green Business." With this certification comes the recognition that this facility has taken great steps toward the conservation of resources, pollution prevention, and strict environmental compliance.

As an automotive repair facility operated by the City, it is imperative to set the example as an environmental steward within the community. There are many Green Business Certification benefits among the 107 environmental incentives in the following nine categories:

- ✿ Records and Tracking
- ✿ Waste Reduction and Recycling
- ✿ Energy Conservation
- ✿ Water Conservation
- ✿ Pollution Prevention
- ✿ Good Housekeeping and Operating Practices
- ✿ Use of Safer Products and Practices
- ✿ Reuse or Recycle Hazardous Materials and Wastes
- ✿ Pollution Prevention from Vehicle Emissions

Implementation of these measures results in a reduction in energy costs, a safer environment and better quality of life.

Housing

Hayward has passed a Resolution calling for Residential Green Building Guidelines. The City Council's resolution calls for building methods that promote natural resource conservation, energy, and water efficiency, and also good indoor air quality.

Contact Information

Contact name: Alex Ameri
Title: Deputy Director of Public Works --
Utilities
Department: Public Works--Utilities
Email: alex.ameri@hayward-ca.gov
Phone: (510) 583-4720

Irvine, California
Beth Krom, Mayor

Irvine is the first city in Orange County to establish a comprehensive Green Building Program. In December 2005, the City Council approved the residential and municipal components of the program. The Program's residential component is known as the Irvine Green Homes Program and its municipal component is the LEED Certified/Silver Program. The Program's third component will focus on commercial green buildings and it is scheduled to be approved this summer. This voluntary program incorporates the use of energy and water efficient products, reused or recycled building resources, and non-toxic materials.

The City also developed a Green Building Resource Guide. This Guide will assist local residents and builders in identifying green building systems and materials available from local suppliers. To find out more about the program visit the City of Irvine's website at www.cityofirvine.org in the "Announcements" section.

The costs to implement the Municipal Green Building Program are expected to range between 1 and 3 percent of the construction costs for municipal facilities. The voluntary residential program costs to be paid by the development community will vary depending on the scale of development and options chosen.

Contact Information

Contact name: Marcia Beckett
Title: Fiscal and Environmental Programs
Administrator
Department: Public Works
Email: mbeckett@ci.irvine.ca.us
Phone: (949) 724-6380

Louisville, Kentucky

Jerry E. Abramson, Mayor

Background

With local technical assistance, Louisville began a program to conduct energy audits of governmental facilities. These audits were to identify opportunities to increase efficiency, conserve energy while reducing costs and to decrease air pollution.

The City also is converting traffic signals from incandescent bulbs to energy efficient, low maintenance LED's. This upgrade is to reduce energy used by traffic signals and to improve public safety.

LED traffic light displays reduced energy consumption by about 80 percent, increased savings and reduced air emissions including carbon dioxide, nitrogen oxides and sulfur dioxide.

Benefits & Costs

The implementation of these programs will result in increased energy efficiency, cost savings, reduced labor costs and reductions in air emissions. LED traffic light displays reduced energy consumption by about 80 percent, increased savings and reduced air emissions

including carbon dioxide, nitrogen oxides and sulfur dioxide. The longer life of LED's reduces the cost of preventive maintenance, emergency re-lamping labor and bulb disposal. Louisville will save \$250,000 and 7.5 million KWH per year.

Implementation costs range from zero for behavioral modification to about \$240,000 for window retro-fitting in one building. Funding options ranged from using budgeted general funds for capital improvements to securing energy savings performance contracts. Louisville is retrofitting almost 300 signals at a cost of \$620,000 from capital funds, a bond issue and federal CMAQ funds.

Contact Information

Contact name: Rudolph Davidson
Title: Cabinet Secretary
Department: Public Works and Services
Cabinet
E-mail: rudolph.davidson@louisvilleky.gov
Phone number: (502) 574-6260

Medford, Massachusetts

Michael J. McGlynn, Mayor

Background

To increase energy efficiency the City of Medford, Mayor Michael J. McGlynn and the Medford Energy Task Force converted all traffic lights in Medford to highly efficient light emitting diodes (LEDs). The technology reduces energy use by about 90 percent and lowers maintenance due to an increased life of a minimum of seven years. It also incorporates innovations such as battery backup using photovoltaics.

The effort to convert traffic lights to LEDs is just one of the actions proposed by the Energy Task Force in Medford's approved Climate Action Plan. This Climate Action Plan is a product of the City's participation in the Cities for Climate Protection Campaign sponsored by the International Council for Local Environmental Initiatives. Through the Mayor's ingenuity and the City Council's approval, Medford joined the CCP Campaign in 1999 to further environmental awareness and initiatives within the community.

Benefits & Costs

In addition to the environmental benefits there are economic incentives for the City proceed in implementing its Climate Action Plan. Over 45 percent (\$40,000) of the capital costs of the conversion was returned to the City in the form of a rebate from Massachusetts Electric. Since the conversion to using the more efficient LEDs in traffic lights, the average annual energy savings has been \$15,000.

To maintain the newly established higher efficiency standards in the City and per the Climate Action Plan, any new traffic lights added to the Medford system also will be LEDs.

Contact Information:

Contact name: Patricia L. Barry
Title: Environmental Agent
Department: Energy & Environment Office
Email: pbarry@medford.org
Phone: (781) 393-2137

Minneapolis, Minnesota

R.T. Rybak, Mayor

Background

The City recently installed two new solar arrays at its facilities to lower energy costs, make the buildings more environmentally friendly and to gain valuable experience in working with solar array systems.

The Royalston Maintenance Facility array, completed in January 2006, automatically tracks the sun's path throughout the day. It is designed to generate nearly 2.6 kilowatts of electrical power. Another array, mounted on top of Fire Station No. 6, is adjusted seasonally and can generate about 5 kilowatts of electricity. There are plans to install a third solar array at the Currie Maintenance Facility in the near future.

The City also recently installed green roofs on two City owned buildings and expects to install an additional green roof on City Hall in the near future.

Benefits & Costs

These solar arrays are connected in the power systems in the buildings and they do not require batteries. The panels will generate varying levels of power throughout the year depending on the duration and intensity of sunlight during the day.

Funding for the three projects is approximately \$125,000, not including staff costs, and was partially provided through an EPA grant (\$100,000), state tax rebates (about \$20,000) and in-kind costs.

Contact Information

Contact name: Gayle Prest
Title: Environmental Manager
Department: Minneapolis Environmental Services
Email: Gayle.Prest@ci.minneapolis.mn.us
Phone: (612) 673-2931

New Berlin, Wisconsin
Jack F. Chiovero, Mayor

The City of Berlin is working with utility companies to secure the best-rate for energy consumption. One initiative of the City is find ways to cut in fuel usage by 10 percent. All City employees were requested to car pool. Police are sharing patrol cars when possible.

Methods to conserve energy in the operations of facilities also are being considered. Some considerations include using oil burners in shop garages and opening windows on the upper floors of City Hall for ventilation to reduce their AC usage.

Contact Information

Contact name: Karen Nork
Title: Executive Assistant
Department: Mayor's Office
E-mail: knork@newberlin.org
Phone: (262) 797-2441

New Rochelle, New York

Noam Branson, Mayor

Background

The City of New Rochelle began a program to install over 2,700 energy-efficient traffic signals with assistance from the New York Power Authority (NYPA). These installations are among the first in Westchester County.

Using existing signal light housings, the new lighting technology has green, red, yellow and white precision-lensed light emitting diode (LED) modules. These will replace the current incandescent bulbs that use colored filters or lens. The LED signals have a longer operating life and lower maintenance cost, consume about 90 percent less energy and use no filters or lens.

In addition to electrical and financial savings, the project will improve safety at 170 signal intersections due to the increased visibility LED lights and by decreasing traffic signal failures.

Project management was conducted by NYPA staff, while the material and labor contracts were awarded by NYPA through competitive bid for timely and cost-effective installation. NYPA provides full turn-key services and finances the total cost of these LED traffic signal projects at very low interest rates. Verde Electric Corporation of Mount Vernon will perform installation and labor for the projects in New Rochelle. Municipalities have a payback period of usually less than five years depending on the quantity and signal types to be installed.

NYPA has been involved in a wide variety of LED signal projects including work with the Metropolitan Transit Authority, the New York City Rail Transit and also is installing energy efficient traffic signals in various parts of New York City. NYPA is the nation's largest state-owned electric utility. The Power Authority owns and operates 17 generating facilities across New York. NYPA also owns and operates over 1,400 circuit miles of transmission lines in various parts of the state. NYPA is a national leader in advancing energy efficiency, clean energy technologies and electric vehicles.

Benefits and Costs

The City of New Rochelle and its School District are government customers of the Power Authority and receive some of the lowest cost electricity in the state for operations. Since the early 1990s, NYPA has invested almost \$2 million in energy efficiency improvements at 9 New Rochelle facilities including several municipal facilities and schools. These initiatives have annually saved taxpayers over \$1.5 million in municipal electric cost and, reduced energy use by almost 800 kilowatts per year. They also eliminated over 1,500 tons of greenhouse gases each year, thus contributing to cleaner air.

The total cost of the project was nearly \$340,600. The monthly surcharge on the City electrical bill will be about \$5,854 for 60 months at a 1.22 percent interest rate for a total payment of nearly \$351,248. This cost will be offset by a monthly savings on the City electrical bill of nearly \$6,747. As a result, the annual net savings for the first five years will be about \$10,713 per year. After five years, the annual savings of \$80,963 will only be reduced by the increased cost of material. Material costs currently are estimated to be \$20,000 per year.

Contact Information

Name: Omar T. Small
Title: Asst. to the City Manager
E-mail: Osmall@ci.new-rochelle.ny.us
Phone: (914) 654-2140

Saint Paul, Minnesota

Chris Coleman, Mayor

The Saint Paul Sustainable Decisions Guide, when adopted in 1997, directs City departments to use environmental guidelines in the design, construction and management of City facilities. The Minnesota Sustainable Design Guide has been adopted by Saint Paul for managing City-owned facilities. This guide takes the place of the Sustainable Decision Guide.

- Conservation Improvement Programs (CIP) – The City has been working with Xcel Energy for 15 years to expand the CIP to city, school district, county, state government, and private sector buildings in Saint Paul and Minneapolis, Ramsey and Hennepin Counties. Saint Paul CIPs include facilities energy conservation and retrofits (over 100 city buildings since 1990), ENERGY STAR purchasing, street lighting and signal lamp conversion, pumping peak demand pricing, lime sludge dewatering, treatment chemical reduction, and private sector natural gas and electricity usage reductions.

- Estimated Annual Savings: 81,497 tons CO₂ and \$7,934,000 annually.

- City Wide-Energy Audit of Government Buildings

- ✓ The Weidt Group has been contracted by the State of Minnesota Departments of Administration and Commerce to conduct an examination of the energy use of 6,000 government buildings throughout the state.
- ✓ The first phase of the project is to collect basic building information about public buildings larger than 5,000 square feet. This information will include building name, size, basic use, and energy use – electric, gas, steam, chilled water, etc.
- ✓ Weidt is currently matching Saint Paul facilities with their respective district energy, electric and gas accounts (approximately 120 facilities).
- ✓ Public Works is working with Xcel Energy on a new project called Envinta, to establish a continuous energy management process involving conservation programs in city buildings and training for city employees. In 2005, Public Works, Xcel and District Energy submitted data to the Weidt Group. This data will be available for Saint Paul spring 2006, and will be checked and used as base data in the Envinta project.
- ✓ The Tier 1 analysis will identify those buildings which are performing poorly and will undergo the Tier 2 study using Envinta.

Contact Information

Contact name: Rick Person
Title: Program Administrator
Department: Public Works
E-mail: rick.person@ci.stpaul.mn.us
Phone: 651-266-6122

See <http://www.stpaul.gov/depts/realestate/sustainable/>.

Sugar Land, Texas

David G. Wallace, Mayor

Traffic Operations

LED (light emitting diode) technology was implemented throughout the city streets by replacing 135 watt incandescent bulbs with 12 watt LED indications in all traffic signals. Also, school zone flashers now utilize LED technology. Solar technology has also been installed on most flashers and so the combination of LED and solar creates a long lasting, efficient, and environmentally sound product.

Benefits of LED technology include improved brightness, reduction in maintenance and electricity cost savings of approximately 80%.

It is estimated that the cost of the above programs will pay for themselves in a 5-7 year timeframe.

Utilities

A power usage analysis for water and wastewater facilities was conducted in June 2003. The study recommended that power factor correction capacitors be installed at water facilities to affect savings. The analysis anticipates a five year savings of \$181,459. The same study concluded that similar installations at the wastewater treatment plant and lift stations would not yield energy conservation or reduce costs.

Buildings

All new buildings will incorporate building automatic systems (BAS). These systems will provide the capability to remotely monitor the operation of a buildings HVAC system to insure that the system is operating within prescribed parameters and at optimum efficiency. Building lighting will be designed to permit two modes of operation: half-light and full-light through the use of timers and switches. The placement of interior and exterior windows in the new facilities will help to take advantage of natural light and thus reduce energy costs. The City anticipates a 5-7 year pay-back period.

Contact Information

Contact name: Kayla Samek
Title: Executive Assistant
Department: City Manager
E-mail: ksamek@sugarlandtx.gov
Phone: (281) 275-2710

Vancouver, Washington

Royce E. Pollard, Mayor

Background

The City of Vancouver's Facilities Executive Sponsor Team, the steering team for policy issues related to City facilities, recently adopted the following LEED policy for City buildings:

The City of Vancouver shall incorporate Leadership in Energy and Environmental Design (LEED) green building principles and practices into the design, construction, and operations of all new City facilities to the fullest extent possible. Furthermore, the City will provide leadership to encourage the application of green building practices in private sector development. This policy is expected to yield long-term cost savings to the City's taxpayers due to substantial improvements in life-cycle performance and reduced life-cycle costs.

The City's Firstenburg Community Center, which opened earlier this year, is the City's first new building since 1996 and was built LEED certified. The building was designed and built to take advantage of natural light and ventilation. Only in the areas where large groups meet are conventional HVAC systems used. The majority of the building is designed to automatically open or close at key set points during the day or night to maintain the internal temperature without mechanical heating or cooling.

The City is also in the process of switching out all fluorescent light fixtures from T-12 to T-8 and is starting to use T-5s in some locations, which is both improving energy efficiency and saving operational costs. For example, the City's Tennis Center recently converted its lighting at significant cost savings.

The City also heats its shop buildings with waste oil that is generated when servicing the City's fleet of vehicles.

Costs of most of these projects are built into building construction costs.

The Tennis Center retrofit was funded with an internal City FIRST grant, grants that are available to City departments to implement cost saving measures and/or measures to improve productivity.

Contact Information

Contact name: Betsy Williams

Title: Assistant City Manager

Department: City Manager Office

E-mail: betsy.williams@ci.vancouver.wa.us

Phone: (360) 696-8477

West Hollywood, California

Abbe Land, Mayor

Background

The City of West Hollywood recently passed a green building ordinance that will require all municipal buildings to receive a LEED certification.

Benefits and Costs

Implementation of their green building ordinance would reduce greenhouse gases, increase energy efficiency, save the city money and improve productivity.

Contact Information

Contact name: Susan Healy Keene
Title: Community Development Director
Department: Community Development
Email: shkeene@weho.org
Phone: (323) 848-6400

Other Categories

Asheville, North Carolina
Terry Bellamy, Mayor

Asheville has developed a program to encourage residential and commercial Green Buildings and energy efficiency. The main programmatic elements include:

- ✱ Educate City building inspectors about benefits of Green Building,
- ✱ Promote public education regarding green building,
- ✱ Eliminate disincentives to green building techniques,
- ✱ Promote green concepts via smart growth planning practices

Long term benefits include improved energy efficiency reduced emissions due to high density.

Contact Information

Contact name: Terry Albrecht
Title: WRP Program Director, Land of Sky
Regional Council
Email address: Terry.Albrecht@ncmail.net
Phone number: (828) 251-6622

Colorado Springs, Colorado (1)

Lionel Rivera, Mayor

Background

Colorado Springs Utilities initiated an ENERGY STAR Makeover Contest and provided the winning homeowner with energy efficiency measures worth more than \$25,000. Ten sponsors donated all the equipment and installation services. The more than 3,500 applications received for the contest were used to create a targeted mailing list of customers interested in energy conservation education.

Benefits and Costs

The contest created greater awareness of residential energy efficiency retrofits and their benefits. The winning home increased its efficiency by 65 percent earning it the ENERGY STAR.

The cost to administer and promote the program was \$20,000. As a municipal entity, all of the programs highlighted are funded through avoided or deferred operational costs or rates. Wind power is the only exception and is funded by program participants.

Contact Information

Contact name: Robin Spaulding
Title: Conservation Specialist
Department: DSM & Renewable Energy
Solutions Dept., Colorado Springs Utilities
Email: rspaulding@csu.org
Phone: (719) 668-8647

Colorado Springs, Colorado (2)

Lionel Rivera, Mayor

Background

Colorado Springs Utilities offers seven efficiency rebates for residential customers—clothes, washer, furnace, insulation, windows, programmable thermostats, lighting, and dual flush toilets. Similarly, Colorado Springs Utilities offers three efficiency rebates for commercial customers—business lighting, custom Peak Demand Rebates, and LED traffic signals.

In another, similar program, Colorado Springs Utilities offers customers a \$4 per watt rebate to install solar photovoltaic systems at their homes and businesses. The incentive structure is designed to optimize solar power production. Measures were implemented to monitor system performance and ensure sustained operation. Net metering allows participating customers to “spin the meter backwards” and get credit for the solar power their systems generate.

Benefits and Costs

In 2005 efficiency rebates saved 5,145 MWh of electric consumption, 4.67 MW of electric demand, 428,779 MCF of natural gas and 20,692,173 gallons of water.

In 2006 PV rebates are expected to produce 94.6 MWh of solar power and to average 21.3 kW in savings during summer peak demand periods.

The efficiency program cost was \$1.1 million in rebate expenditures. The photovoltaic system rebates program cost is \$220,000. As a municipal entity, all of the programs highlighted are funded through avoided or deferred operational costs or rates. Wind power is the only exception and is funded by program participants.

Contact Information

Contact name: Mark James
Title: Energy DSM Supervisor
Department: DSM & Renewable Energy
Solutions Dept., Colorado Springs Utilities
Email: mjames@csu.org
Phone: (719) 668-8017

OR

Contact name: Simon Baker
Title: Energy Sr. Conservation Specialist
Department: DSM & Renewable Energy
Solutions Dept., Colorado Springs Utilities
Email: sebaker@csu.org
Phone: (719) 668-8231

Los Angeles, California

Anthony Villaraigosa, Mayor

Background

The City of Los Angeles Department of Public Works, Bureau of Sanitation collects and disposes of one million tons of solid waste each year. Collection of recyclable and yard trimming solid waste is done separately. City officials decided disposing solid waste by landfilling is not the best practice. Los Angeles mayor Antonio Villaraigosa directed the Bureau of Sanitation to eliminate reliance on landfills by increasing recycling and establishing an alternative technology facility by 2010.

The City is currently engaged in a five-year Alternative Solid Waste Processing Technologies Program. This program is to identify alternative municipal solid waste processing technologies that will increase landfill diversion in an environmentally sound manner. It will also emphasize options that are energy efficient, socially acceptable and economical. When the program concludes in 2010 it would have executed three phases: Phase I—Evaluation of alternative solid waste processing technologies; Phase II—Facility siting, public education awareness, and Requests for Proposals; and Phase III—Design and construction of an alternative solid waste processing technology facility.

Completed in September 2005, Phase I of the Alternative Solid Waste Processing Technologies Program identified viable potential technologies that could meet the City's objectives. The technologies identified were advanced thermal recycling, gasification and pyrolysis. Research done in a study during this phase evaluated thermal technologies, biological/chemical technologies and physical technologies.

As part of the study, a life cycle analysis was performed to evaluate the energy and emissions associated with fuels, electrical energy, and material inputs for all stages of the waste management process. The life cycle study focused on differentiation between waste-to-energy (advanced thermal recycling), conversion technologies, and existing traditional solid waste management processes (landfilling). The issues were energy consumption, NO_x emissions, SO_x emissions, carbon monoxide and carbon dioxide emissions. Carbon dioxide emissions contribute to the greenhouse effect. These emissions are a by-product from fossil fuel combustion and the biodegradation of organic materials. Offsets of carbon dioxide emissions can result from the displacement of fossil fuels, materials recycling and the diversion of organic wastes from landfills.

Benefits and Costs

The life cycle scenarios analyzed are summarized in Figures 1 and 2. These results are presented as *net* life cycle totals for each scenario. A positive value represents a net life cycle burden and a negative value represents a net life cycle benefit, savings or avoidance. For example, a negative value for energy consumption in the advanced thermal recycling, anaerobic digestion, and conversion technology scenarios means that more energy is generated than consumed.

Figure 1 shows that using the advanced thermal recycling and gasification scenarios for the City of Los Angeles will result in large energy savings. While anaerobic digestion results in some energy savings, these savings are only about half the savings derived from using thermal technologies.

**FIGURE 1
ANNUAL NET ENERGY CONSUMPTION BY SCENARIO**

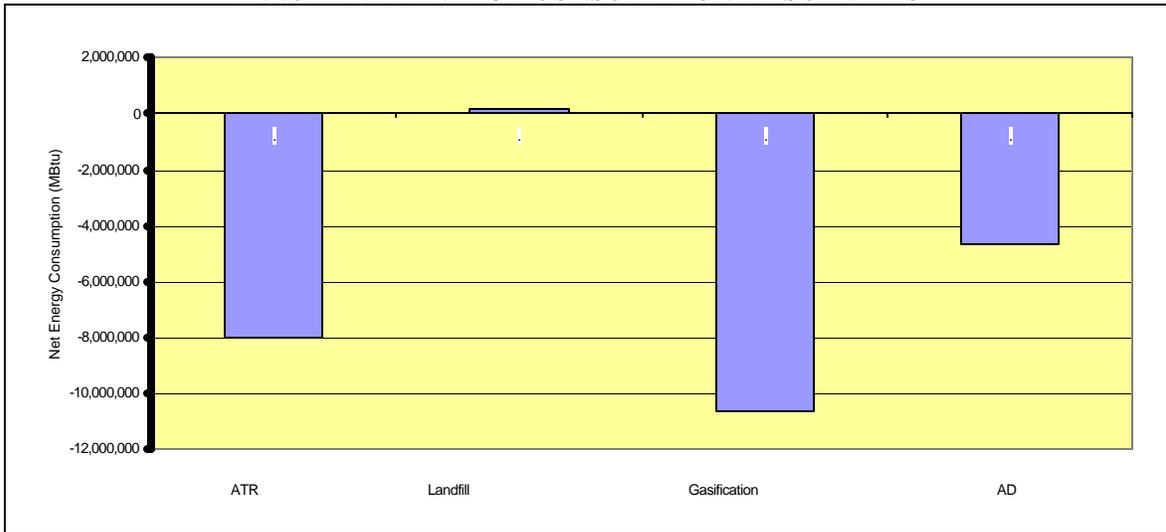
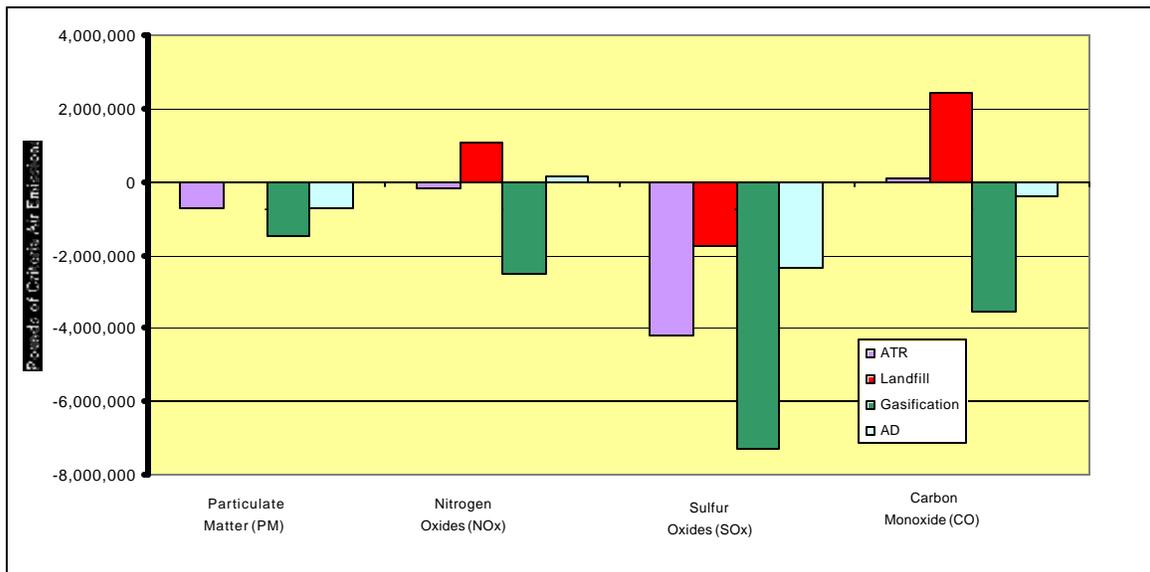


Figure 2, including particulate matter, SO_x, NO_x, and CO, are lower (i.e., exhibit a savings) for the advanced thermal recycling, gasification, and anaerobic digestion scenarios than for the landfill scenario. This is largely due to the electrical energy and recycling offsets created by these technologies. The anaerobic digestion alternative performs about on par with advanced thermal recycling and gasification, except that it has higher net NO_x emissions.

**FIGURE 2
ANNUAL NET POUNDS OF CRITERIA AIR EMISSIONS BY SCENARIO**



Based on the Phase I evaluation of alternative solid waste processing technologies, the City of Los Angeles would benefit from the developing thermal alternative technologies to process its

solid waste. Studies indicate thermal processing technology will reduce air emissions and increase energy production from alternative fossil fuel sources.

The evaluation, education awareness and siting costs are about \$1.7 million and will be funded by general funds. The estimated construction cost for one facility to process 1000 tons of solid waste is \$200 million and will be funded using private and government sources.

Contact Information

Contact name: Alex E. Helou

Title: Division Manager II

Department: Bureau of Sanitation – Solid

Resources Support Services Division

E-mail: Alex.Helou@lacity.org

Phone: (213) 485- 3637

Minneapolis, Minnesota

R.T. Rybak, Mayor

1. Zoning Code – Landscaping or Green Roofs

Green roofs and living walls are permitted in the zoning code and encouraged by staff. If a developer cannot meet their on site landscaping requirements as required by code, green roofs and living walls are allowable under the “alternative compliance” provision. Green roofs and living walls can be a negotiated element of a Planned Unit Development. The establishment of green roof performance standards is being explored.

2. Zoning Code – Travel Demand Management Plan

City Zoning Code requires non-residential developments with new or additional gross square feet of 100,000 or more to include a travel demand management (TDM) plan. This plan is to address the transportation impacts of the development on air quality, parking, and roadway infrastructure. It also is to identify measures to minimize transportation impacts of the development. The City works with the developments to fulfill on the goals and mitigating measures committed to in the TDM Plans. These TDM Plans include methods to encourage and coordinate carpooling among tenants and employees. There is also a zoning ordinance regarding bicycle facilities requirements in new developments of over 500,000 square feet or more of new or additional gross floor space in downtown districts. These facilities are to include secure bicycle parking spaces, shower facilities and clothing storage.

3. Zoning Code – Bonus for Energy Efficiency in Downtown Buildings

Buildings in the downtown districts may receive a bonus to increase the amount of allowable floor area by incorporating energy efficiency.

Determining energy efficiency is subject to the following standards:

- ✱ Submission of a high performance building plan. The applicant is to submit a high performance building plan. This plan is to demonstrate to the satisfaction of the planning director that a minimum increase of thirty-five percent in overall building energy efficiency will be achieved using Minnesota Energy Code. The demonstration shall include all reports, modeling, and approval processes described in the High Performance Building Policy Guide.
- ✱ Energy-saving strategies that are missing must be brought to design specification or installed within ninety days of the city's verification report or submittal to the city of a third-party commissioning report by a licensed engineer. Developers of buildings not in compliance with the approved energy efficiency premium can mitigate the deficiency through alternative actions as defined in the High Performance Building Policy Guide.
- ✱ The energy efficiency measures shall be maintained in good working order for the life of the principle structure.

4. Zoning Code – Density Bonuses

The City promotes increased density through a set of density bonuses. In January 2005, the City Council adopted amendments to the zoning code related to the Pedestrian Overlay District. The new provisions apply only to the Light Rail Train Station areas. These provisions incorporated a minimum density requirement, increased density bonuses and a bicycle parking requirement. Appropriate increases in allowable density, based on land use planning, can be accomplished largely through changes in underlying zoning. Nevertheless, City policy supports higher-density development in areas where there are amenities, services and transportation alternatives.

Additional density bonuses near LRT stations are tied to meeting certain policy objectives rather than outright increases. These policy objectives include underground parking, mixed use development and affordable housing. Density bonuses encourage smart choices on transit options, maximize a pedestrian character of the neighborhood and more efficiently use resources.

5. Zoning Code – Priority for Pedestrians and Transit Users

New buildings must be oriented toward pedestrians by being constructed close to the public sidewalk and must have a principal entrance facing the street. Clear and well lighted walkways must be provided. Vehicle parking may be reduced for buildings near transit stops or for buildings that incorporate a transit shelter or bicycle parking. Minimum window requirements for walls facing the street help to ensure a more interesting (and safe) pedestrian environment.

6. Zoning Code – Landscaping

Among the City’s landscaping requirements, landscaping proposed in new developments must consider the ecological issues that follow.

- (1) Interception and filtration of precipitation and stormwater through maximizing multiple layered vegetative cover.
- (2) Reduction of reflectance and urban heat island effects through increasing canopy cover.
- (3) Conservation of energy through strategic shading and the use of windbreaks.
- (4) Selection and placement of plant materials to limit required maintenance of landscaped areas.
- (5) Preservation or restoration of natural amenities.

The City Council adopted changes to the landscaping requirements in April 2005. Among the improvements specified is on requiring all parking lots over 10 spaces to have no parking space farther than 50 feet from an on-site tree.

Contact Information

Contact name: Gayle Prest
Title: Environmental Manager
Department: Minneapolis Environmental Services
Email: Gayle.Prest@ci.minneapolis.mn.us
Phone: (612) 673-2931

Vista, California
Morris B. Vance, Mayor

The City of Vista conducts several programs to improve energy efficiency, cut energy costs and reduce emissions.

- ✱ The City-owned and operated Wave Waterpark uses solar heat for heating pool water. This increases energy efficiency while it decreases operating costs. The Wave Waterpark is financed via the City's general fund.
- ✱ A small inventory of hybrid cars (Honda Civics) is part of the City's fleet and this promotes savings in fuel costs and it reduces air emissions.
- ✱ The City conducted an energy efficiency evaluation with help from the San Diego Regional Energy Office at all city-operated facilities. Once the suggestions are implemented, it is anticipated the City will realize 30 percent cost savings from improved energy efficiency.
- ✱ City employees work a 9/80 schedule. This was originally started to comply with the Regional Air Quality Control Board's standards to alleviate traffic congestion on roadways. This schedule, implemented at no cost, resulted in emissions reduction and improved energy efficiency due in part to electricity to facilities being off for two extra days per month.

Contact Information

Contact name: Brian Ambrose
Title: Management Analyst
Department: Engineering/Public Works
E-mail: Bambrose@ci.vista.ca.us
Phone: (760) 726-1340