

## WEEKLY INFORMATION PACKET

**To:** Mayor Shaun McGrath and Members of City Council

**From:** Frank Bruno, City Manager  
Stephanie Grainger, Deputy City Manager  
Maureen Rait, Executive Director of Public Works  
Bill Boyes, Acting Facilities and Fleet Manager  
Jonathan Koehn, Environmental Affairs Manager

**Date:** May 1, 2008

**Subject:** Information Item: City of Boulder Operations - Energy Strategy

---

### **PURPOSE:**

At the April 22, 2008 Budget Study Session, the City Council requested that future budgets illustrate how energy savings are achieved in city operations. Additionally, council requested an update on energy savings initiatives involving city operations. This memo provides information about energy use in city operations, a brief summary of past and recent initiatives and outlines the actions being taken by the city organization to manage energy use and reduce its greenhouse gas (GHG) emissions.

### **EXECUTIVE SUMMARY:**

In recent years, the city has experienced dramatic increases in natural gas and electricity costs. Energy rate increases have consistently exceeded annual budget guideline increases for non-personnel expenses (NPE). The average annual increase for all types of fuel purchased by the city for its vehicles has been 19.5 percent per year and this trend is expected to continue. Despite these challenges, the city continues to invest in energy reduction initiatives. Since 1998, the city has completed 114 projects and spent approximately \$3 million on equipment that improved the efficiency of city buildings. In 2008, \$370,677 will be invested in energy savings efforts involving nine additional projects. Additionally, private-public partnerships are supporting the installation of solar photovoltaic systems at city facilities. Other city practices that reduce GHG emissions include purchasing hybrid and alternative fuel vehicles, and replacing traffic signals with high-efficiency light emitting diode (LED) lamps.

An interdepartmental Energy Strategy Team is being convened by OEA and Facilities & Fleet Services staff to continue with the implementation of sustainable energy management in city operations. The 2009 budget will also highlight energy issues and illustrate how energy savings are proposed to be achieved.

### **FACILITIES MANAGEMENT:**

Facilities & Asset Management (FAM) provides services to the public and staff that use General Fund facilities and manages 37 of the 98 larger buildings in the city's overall inventory. Public Works/Utilities, Public Works/Transportation, Downtown and

University Hill Management District, Open Space/Mountain Parks and Housing & Human Services are also responsible for the management of public facilities. The goal for all city facilities is to establish proven methods of facility management for its assets and promote cost-effective programs that provide safe, clean and efficient environments for customers and city staff. An energy strategy for city operations is intended to address all city facilities.

The FAM Master Plan was originally accepted by the City Council in August 1996. It was updated and accepted in February 1998 to include all Parks & Recreation facilities in response to City Council direction. The major focus of the 2005 FAM Master Plan update was to promote and implement sustainable practices in accordance with the Boulder Valley Comprehensive Plan and City Council goals.

The FAM Master Plan describes three levels of funding for operations and infrastructure: Fiscally Constrained (current funding), Action Plan and Vision Plan, and focuses on the major challenges related to General Fund facilities facing the city through the year 2014. The 2005 update to the FAM Master Plan prioritized the accomplishment of energy reduction/efficiency projects and investment strategies, for FAM maintained facilities, as follows:

Fiscally Constrained - all projects with less than three year simple payback will be completed.

Action Plan - all projects with less than five year simple payback will be completed.

Vision Plan - all projects with less than 10 year simple payback will be completed.

Funding levels for FAM continue to be fiscally constrained which means that energy efficiency improvements are made as-needed and in coordination with maintenance activities. FAM subscribes to a service that provides monthly energy consumption data, which allows staff to track the impact of energy-saving retrofits and identify equipment or operational problems.

#### **ENERGY AND FUEL COSTS:**

In recent years, the city has experienced dramatic increases in natural gas and electricity costs. Energy rate increases have consistently exceeded annual budget guideline increases for non-personnel expenses (NPE). Based on information from the federal Energy Information Administration (EIA), short-term energy projections and 2000 – 2006 actual city energy expenditures, it is projected that energy rates for 2008 will be six percent higher than 2007 rates with an additional six percent increase projected for 2009.

The average annual increase (2000 – 2007) for all types of fuel purchased by the city for its vehicles has been 19.5 percent per year and this trend is expected to continue. In 2000, the average price paid for unleaded gasoline was \$0.97 per gallon. However, the average cost in 2007 was \$2.20 per gallon. Total energy and fuel costs for the city are significant as shown below:

**2007 Actual Energy / Fuel Expenditures  
by Fund**

<u>Fund</u>	<u>Fund Title</u>	<u>Energy Costs</u>	<u>Fuel Costs</u>
010	General Fund	\$ 662,792	\$ 355,338
112	P&DS	\$ 2,246	\$ 14,563
117	.15 Cent Sales Tax	\$ 3,289	\$ 227
118	.25 Cent sales Tax	\$ 20,081	\$ 20,081
120	Library	\$ 130,208	\$ 611
130	Recreation Activity	\$ 614,382	\$ 8,023
150	OSMP	\$ 46,867	\$ 63,875
170	Airport	\$ 19,012	\$ 285
180	Transportation	\$ 997,411	\$ 149,772
230	Permanent Parks	\$ 0	\$ 5,541
510	Water	\$ 525,116	\$ 65,931
520	Wastewater	\$ 528,589	\$ 34,922
530	Flood	\$ 79	\$ 22,181
540	CAGID	\$ 176,316	\$ 5,598
550	UHGID	\$ 9,152	\$ 2,081
TOTAL		\$ 3,733,297	\$ 732,149

**ENERGY EFFICIENCY AND RENEWABLE ENERGY INITIATIVES IN CITY OPERATIONS:**

The city has been engaged in energy reduction initiatives for over 15 years. Since 1998, the city has completed 114 projects and spent approximately \$3 million on equipment that improved the efficiency of city buildings. In 2008, \$370,677 will be invested in energy savings efforts involving nine additional projects. Additionally, \$200,000 in one-time funds could be allocated during the first budget adjustment in 2008 for other energy-savings efforts, as noted below.

<u>Year</u>	<u>Number of Projects</u>	<u>Costs</u>
1998	8	\$ 240,033
1999	22	\$ 276,236
2000	22	\$ 203,550
2001	5	\$ 173,698
2002	14	\$ 724,925
2003	11	\$ 186,227
2004	6	\$ 453,267
2005	7	\$ 164,801
2006	12	\$ 421,569
2007	7	\$ 86,884
2008	9	\$ 370,677
Total	123	\$ 3,301,867

In general, higher efficiency equipment was installed to replace equipment that had reached the end of its useful life, and in some cases investments were made specifically to improve efficiency. These efforts include HVAC system replacements, lighting upgrades, additional roof insulation, and achieving a Leadership in Energy and Environmental Design (LEED) Silver rating at the North Boulder Recreation Center, the latter meeting the 2001 city adopted a policy that all new construction and significant renovations of city facilities be certified to the LEED-NC Silver Standard. The city's next LEED building will be the administration building of the new Fire Training Center, scheduled to break ground later this year.

Through the energy efficiency initiatives above, the city has been able to manage growth in consumption and reduce consumption. The city's energy use is tracked as part of the city's commitment to the Chicago Climate Exchange (CCX) as a component of the CAP. The CCX is a voluntary, legally binding cap and trade pilot program. The city originally became a member in 2005 and staff tracks and reports GHG emissions from city operations annually.

The city organization has achieved a 10.7 percent reduction from the program baseline. The CCX baseline is defined as the city's average annual emissions from 1998-2000. CCX members commit to a reduction schedule that requires year 2010 emission reductions of 6 percent below the baseline. This reduction is a result of city efforts to improve efficiency including facility efficiency upgrades and increasing the use of hybrid and flex fuel vehicles. Compared to the baseline, electricity use has decreased 8.1 percent natural gas use has increased by 12.6 percent and vehicle emissions have been reduced by 41 percent

In response to requested information about improvements made to the Council Chambers, it has been confirmed that lighting upgrades were completed in 1999. A new HVAC system and computerized controls were also installed for the Council Chambers during 2005. Energy assessments of city facilities are planned for 2008 and will include the Municipal Building and that work will inform future improvements to the facility, including the Council Chambers.

In 2008, \$200,000 of one-time money in the General Fund (currently being held in contingency pending approval of the 1<sup>st</sup> budget supplemental of 2008 in May that includes additional 2008 funding for the Boulder Mobile Manor project and the Economic Vitality program) will be allocated to FAM. If City Council approves the budget adjustment, the one-time funds will be used to help reduce the facilities maintenance backlog and pursue more energy-saving opportunities including:

1. Relamp / Reballast lighting systems at the Main Library (\$30,000).
2. Upgrade HVAC Controls at the Main Library. The software was upgraded in recent years, but the hardware that controls the individual dampers is obsolete and needs to be replaced (\$40,000).
3. Leverage funding to take advantage of Xcel energy-saving programs such as Recommissioning and Engineering Analysis (\$130,000).

In November 2007, City Council approved a ground lease agreement with EyeOn Solar for the purpose of constructing and operating a one megawatt photovoltaic (PV) solar power generating system at the 75<sup>th</sup> Street Wastewater Treatment Plant at no additional cost to the city. The project will generate economic savings as the Power Purchase Agreement with EyeOn Solar will result in a fixed rate over time. The system is expected to provide approximately 20 to 25 percent of the facility's annual electricity use. The renewable energy certificates (RECs) will be assigned to Xcel Energy through the Solar Rewards program and the system is expected to be completed in 2008.

During 2008, a PV system is also planned for installation at the George Reynolds Branch Library. The system is being donated by Bella Energy, the city will own the system and will receive all electricity generated by the 9.72 kW system or approximately 30 percent of the facility's annual electricity use. Again, RECs will be assigned to Xcel Energy.

The city will soon be requesting bids to install two 10 kW PV systems on other city facilities. The systems are being donated by a local foundation. In addition, staff will be issuing a request for proposals to evaluate the most suitable city facilities and potential electricity generation in order to prioritize these PV installations and potential future projects.

Other city practices that reduce GHG emissions include purchasing hybrid and alternative fuel vehicles, and replacing traffic signals with high-efficiency light emitting diode (LED) lamps. Currently, 35 percent of the city's fleet is made up of alternatively fueled vehicles. This includes biodiesel (B20), flex-fuel (E85) (gas/ethanol), electric and hybrids (gas/electric).

The debate over biofuels has engendered community and nationwide discussion. It is an issue that calls into question the energy balance of producing the fuels, the amount of water needed to grow crops and refine the fuels, and the difficulty in quantifying the effects of nitrogen runoff and impacts on worldwide food price and availability. At the same time, many leaders in fuel and climate research maintain that biofuels, specifically biodiesel and ethanol, are less carbon intensive than the petroleum-based fuels they replace. Food-based biofuels are not a sustainable solution to reduce GHG emissions. However, food-based biofuels are expected to be replaced in the near future with cellulosic biofuels made from non-food feedstocks and with impressive energy balances.

By supporting biodiesel and ethanol now, we are creating a demand for the next generation of fuels that will replace petroleum in the long term. Fleet Services will continue to purchase diesel-powered and flexible fuel city vehicles and equipment as a priority whenever they are offered by manufacturers. These "alternative fuel" vehicles and equipment provide the option to use either biofuels or traditional petroleum-based fuels.

### **2008/2009 PROPOSED ACTIONS:**

With the passage of the Climate Action Plan (CAP) and the CAP Tax in 2006, the city embarked on an ambitious plan to reduce GHG emissions in our community. The CAP proposed that the city adopt policies to reduce the community's natural gas and electricity use by 20 percent and 10 percent respectively and also recommends that at least 20 percent of city energy use be from renewable sources, all by 2012. This goal is similar to Governor Ritter's "Greening the Government" initiative.

At the 2008 City Council retreat, the city manager proposed that the city become energy independent over the next 10 years. Developing and implementing a strategic vision and process for achieving GHG reductions, energy independence, increased renewable energy use and managing energy costs is an important focus for the organization. The city's efforts will help demonstrate leadership and reinforce our respective responsibilities in achieving these goals.

The Office of Environmental Affairs (OEA) and Facilities & Fleet Services are working with city departments to manage energy use and costs and assist departments with sustainable energy management. The work program being pursued during the next six to 18 months to meet city sustainability goals is as follows:

1. Through Xcel Energy's ConservationWise program<sup>1</sup>, complete 10 to 20 energy assessments in city facilities, including the Municipal Building, and recommissioning projects at the Main Library, Public Safety Building, and the East and North Recreation Centers;
2. Complete a cost-to-benefit analysis of various energy strategies, identified by assessments and recommissioning;
3. Evaluate the cost effectiveness of performance (financing) contracts to implement energy efficiency improvements for selected city facilities or projects;
4. Provide education and training for city employees;
5. Develop and implement a strategic plan to support longer-term strategies needed to manage future energy demands and costs to achieve the city's energy goals; and
6. Utilize the opportunity provided by the *Smart Grid* by initiating pilot projects such as plug in hybrids and vehicle to grid technology, additional energy sources such as wind and solar, and new and innovative efficiency technologies.

---

<sup>1</sup> ConservationWise is Xcel Energy's suite of energy conservation and energy management products that make up their demand side management efforts. These programs are geared towards reducing consumer demand of electricity by offering cash rebates for purchasing and installing eligible energy-efficient equipment and mechanical system components.

**NEXT STEPS:**

An interdepartmental Energy Strategy Team is being convened by OEA and Facilities & Fleet Services staff to continue with the implementation of sustainable energy management in city operations and the work program noted. The 2009 budget will also highlight energy issues and illustrate how energy savings are proposed to be achieved.

For additional information regarding Facilities and Fleet Services operations and on-going energy reduction initiatives, please contact Bill Boyes, Acting Facilities & Fleet Manager at (303) 441-4125 or [boyesb@bouldercolorado.gov](mailto:boyesb@bouldercolorado.gov)