# EDUCATION AND OUTREACH MEASURES TO REDUCE GREENHOUSE GASES

## EDUCATION TRENDS

The City of Fort Collins has stressed the importance of public education and outreach in all of its activities. The hierarchy of actions identified in the City's Air Quality Action Plan calls for education and incentives to precede any actions that the City requires others to take via ordinance and law.

## CITY EDUCATION POLICIES

> **Policy T-4.5. Education.** The City will improve safety and encourage increased transportation bicycling through a comprehensive, on-going set of education programs targeted at motorists, pedestrians and bicyclist of all ages….
>
> **PRINCIPLE ENV-4.** Energy efficiency and use of renewable energy resources will be encouraged, facilitated, and regulated in both the public and private sector through information and educational services, financial incentive programs, requirements and incentives in the planning process, and enforcement of regulations such as the Energy Code.

## EDUCATION MEASURES

A number of strategies have been combined under one broad "Education and Outreach Measure". Implementation of this measure will be enhanced by hiring a new position within the City, a "Climate Change Education and Outreach Coordinator." However, some of the strategies identified under the Education measure either are already underway to some extent, or can be conducted by existing City staff. The Education strategies are grouped below according to the target audience:

MUNICIPAL GOVERNMENT EDUCATION

1) Provide an education campaign with city staff about energy usage.
2) Conduct an interdepartmental (or interbuilding) energy challenge.
3) Educate City departments about fuel-efficient purchases.

RESIDENTIAL EDUCATION

4) Promote the sale of compact fluorescent bulbs for residences (goal: 1 in 10 residences have CF bulbs by 2010).
5) Increase repair and installation of Solar Thermal Systems.
6) Promote alternatives to residential air conditioning .
7) Promote the sale of energy efficient large appliances.
8) Provide information to neighborhood associations on the benefits of a variety of greenhouse gas reducing activities.

COMMERCIAL/INDUSTRAL EDUCATION

9) Promote efficient lighting in commercial buildings.
10) "Night lighting" energy use education campaign.
11) Promote Performance Contracting for small and medium sized businesses.
12) Promote daycare in work places.

EDUCATION – GENERAL PUBLIC

13) Publicize the environmental value of Fort Collins Utilities.
14) Solar Energy Incentives.
15) Conduct citizen driving reduction campaign.
16) Promote the sale of fuel efficient cars to the public.
17) Increase education and incentives for citizen tree planting.
18) Develop "Green Guide" for environmental products.

SCHOOL DISTRICT PUBLIC OUTREACH

19) Design a "Powerpoint" presentation for schools/organizations.
20) Develop global warming teacher kits.

## GENERAL CLIMATE CHANGE EDUCATION AND OUTREACH

**Status:** New Measure
**Staff Team Ranking:** 2nd out of 12 New Measures
**Citizen Committee Ranking:** 5th out of 12 New Measures

**Estimated CO2 Savings in 2010:** 24,290 tons/ year

- If 25% of Poudre School District students reduce energy consumption 15% from 2010 per capita levels: 22,104 tons CO2

- If 25% of City of Fort Collins employees reduce energy consumption 15% from 2010 per capita levels: 2,186 tons CO2

**Supporting Policy Direction:**

> **Policy T-4.5. Education.** The City will improve safety and encourage increased transportation bicycling through a comprehensive, on-going set of education programs targeted at motorists, pedestrians and bicyclist of all ages….
>
> **PRINCIPLE ENV-4.** Energy efficiency and use of renewable energy resources will be encouraged, facilitated, and regulated in both the public and private sector through information and educational services, financial incentive programs, requirements and incentives in the planning process, and enforcement of regulations such as the Energy Code.

**Description:**
The City of Fort Collins has stressed the importance of public education and outreach in all of its activities. An extremely important component of the Cities for Climate Protection Campaign is to get the "messages" out to the citizens of the community.

Many City departments are already working actively on education campaigns that reduce greenhouse gas emissions. However, in order to assist the departments with added climate change messages and to work closely with Poudre School District and community groups, a central education coordinator could be established and housed either within the City Manager's Office or the Natural Resources Department. This person would coordinate climate change outreach activities, and assist with outreach as requested by individual departments, as well as act as lead for assisting applicants to the Development Review process to use Pollution Prevention (P2).

The public outreach strategies listed below summarize all the education components of the proposed new measure, and provide additional education suggestions. In the absence of dedicated funding or resources, each department will be responsible for carrying out the climate change education activities to the extent that resources allow.

**Implementing Department:** Cross-departmental

**Estimated Implementation Cost:** Unknown

**Estimated Annual Operating Cost:** $ 60,000 (one FTE for Outreach Coordinator), or existing staff resources, to the extent possible

**Potential Funding Source(s):** General fund; productivity savings, etc.

**Annual Cost Savings:** Unknown

**Other Benefits:**

- Education is the first approach used by the City, before incentives or regulation.

## MUNICIPAL GOVERNMENT EDUCATION

### 1) Provide an education campaign with city staff about energy usage.

This education campaign will focus on encouraging city staff to reduce their personal energy usage. Current departmental energy usage would be provided to educate employees on their energy use practices. It is important for City employees to take the first step in reducing energy usage. There are many simple things that can be done daily which would have an tremendous impact – such as turning off hallway and office lights at the end of the day, or allowing computers to return to energy saving mode.

### 2) Conduct an interdepartmental (or interbuilding) Energy challenge

Along with the education campaign to city employees about energy waste, a yearlong contest will be initiated to get the spirit of the campaign rolling. The challenge would encourage employees to reduce their departmental energy consumption some percentage,(e.g. 10%), by waging the service areas, departments, or buildings against one another. The winner would be provided with a prize as well as recognition through various outlets, such as the Coloradoan, so that citizens of Fort Collins could learn about the efforts that are being made by City to reduce energy consumption.

### 3) Educate City departments about fuel-efficient purchases.

This program would provide an aggressive education campaign to City departments that purchase vehicles on a regular basis. Fleet Services would encourage departments to only purchase those cars which are fuel-efficient and are best suited to their needs. They would discourage purchasing larger automobiles when they are not necessary for the jobs being performed. In addition, Fleets would provide each department with a summary of their fuel consumption and publicize the information in hopes of encouraging departments to be more conscientious about vehicle usage.

## RESIDENTIAL EDUCATION

### 4) Promote the sale of compact fluorescent bulbs for residences (goal: 1 in 10 residences have CF bulbs by 2010)

**Estimated CO2 Savings in 2010: 682 tons**

Compact fluorescent lamps produce an equivalent amount of light for about 70% less power. In addition compact fluorescent lamps last for about 7 years, or 10,000 hr. This is an average of 12 times longer than conventional incandescent lamps. Although these lamps last longer and are less expensive to operate, the initial cost of a lamp can be 10 times more expensive. Despite the cost difference, a compact fluorescent lamp will pay for itself in about 3.5 years, depending on usage. By subsidizing the cost of compact fluorescent through a rebate program, an increased number of lamps may be purchases and used in local homes. If a 20 Watt CF bulb replaced a 75 Watt lamp in every home, a savings of 4,400 tons of CO2 could be realized in the year 2010.

**Alternative Approaches for Implementation:**

I) Fort Collins Utility could subsidize the sale of compact fluorescents through a customer-leasing program, where customers would pay for the bulbs in installments added directly to their utility bills. The saving realized would somewhat offset the price of the bulb, allowing residents to purchase them at a very low cost.

II) Fort Collins Utility could develop an agreement with Energy Federation, Inc. EFI would then market CF's (though Web catalogues, assistance with utility bill inserts, flyers, toll free customer assistance number, etc.), and handle the customer billing and product distribution, EFI's profit is built into the cost of the bulbs. Fort Collins Utility could subsidize the sale of bulbs directly through the contract with EFI, as is done by many other utilities. This type of program has been used successfully by Connecticut Light and Power, who has sold ~ 70,00 CF lamps and fixtures through EFI in 1998.

III) Fort Collins Utility could partner with Colorado State University to conduct a "Halogen Torchiere" exchange event where citizens and students could bring in their inefficient and dangerous halogen torchier lamps and receive a subsidized rebate coupon for the purchase of a compact fluorescent bulb.

**Estimated Implementation Cost:**

**A) Marketing only:**
$1,730 – 2 weeks existing staff time

**B) Subsidy Program**
$ 1,730 – 2 weeks existing staff to administer subsidy
$8,192 – 10% subsidy for 5461 $15 bulbs
$11,650 TOTAL

| | |
|---|---|
| **Estimated Annual Operating Cost:** | $1,730 – 2 weeks existing staff marketing |
| **Potential Funding Source(s):** | Fort Collins Utility revenues<br>Community fundraising event, perhaps a 5 or 10K race offering a focal point for fundraising and education. |
| **Annual Cost Savings:** | City – none<br>Residences with one bulb: $7/yr |

**5) Increase repair and installation of Solar Thermal Systems**

**Estimated CO2 Savings in 2010: 538 tons**

**Supporting Policy Direction:**

> **ENV-4.1. Renewable Energy.** The use of solar energy and other renewable resources are recommended energy sources.
>
> **ENV-**4.6 Remove barriers to renewable energy. The City will eliminate unnecessary barriers to the utilization of renewable energy resources in new and existing buildings which arise through application and enforcement of City codes
>
> **Resolution 97-51**: **As a user of energy** the City administration shall, in the design and construction of all City facilities, emphasize and utilize the latest, available, proven technologies to provide energy efficient and cost effective heating, cooling, lighting and hot water service in buildings owned, co-owned, or leased by the City for municipal purposes. In particular, the City will utilize in the construction and remodeling of City facilities the most current solar heating technologies for hot water that are suitable for such facilities, using the expertise and resources of the City's electric utility staff in identifying or developing such technologies.
>
> **That as a community leader**, the City should also regularly evaluate means by which the City-wide demand and usage of fossil fuels can be reduced and should attempt to develop means by which it can further such goals, through the City's role as educator, promoter, and regulator. Accordingly, the City's energy-related work plans should address:.….4) the implementation of selected demand management strategies not only for City facilities but also for the City as a whole.

**Background :**

(Adapted from http://www.eren.doe.gov/erec/factsheets/solrwatr.html)
Solar thermal power is heat energy obtained by exposing a collection device to the rays of the sun. A solar thermal system makes use of the warmth absorbed by the collector to heat water or another working fluid, or to make steam. Solar water heaters can be either active or passive. An active system uses an electric pump to circulate the heat-transfer fluid; a passive system has no pump. Active systems range in price from about $2,000 to $4,000 installed. Passive systems move household water or a heat-transfer fluid through the system without

pumps. Although passive systems have no electric components to break, they are not ideal in our climate where temperatures can easily fall below freezing, and few have been installed locally in the past.

Over a decade ago, the federal government provided significant incentives for the installation of solar equipment. Solar thermal water heaters were among the most popular installations. It has been estimated that over 8000 of these systems were installed in the north front range by the mid '80's, when the tax incentives ended. Unfortunately, the solar industry was plagued by occasional bad equipment and bad installations. It is likely that more than half of these systems have fallen into disrepair and are not currently operating. Homeowners often remove the non-functional systems when selling their homes, rather than repairing them.

Despite the poor reputation that some solar systems have received, solar hot water heaters, especially in all-electric homes, are one of the best energy efficiency investments that a home owner can make.

In Fort Collins, only four ZILCH loans (2 Energy Score, 2 non-Energy Score) have been awarded for water heater upgrades since ZILCH was implemented. If marketing materials and incentives were developed to encourage the "green" contingent of Fort Collins citizens to install (or repair) solar hot water heater systems, it is likely that installations of these systems could be increased.

**Description:**
The city should develop a marketing and incentive program to boost the installation and repair of solar thermal systems. This program could set a goal of boosting installations of solar hot water systems from ~ 1per year to 20 per year, for a total of 200 new systems installed over the next 10 years. In addition, the program could set a second goal of repairing 25% of existing broken systems, at an average estimated repair costs of $500 per system.

If there are 5000 failed systems in Fort Collins, repair of 25% of these would result 250 systems revitalized. Assume that 20 new solar thermal systems are installed in homes each year between 2000 and 2010. If 90% of new and existing are in natural gas homes and 10% are in electric homes, the estimated CO2 savings in 2010 would be 581 tons.

**Implementing Department:** Utilities

**Recommended Timeframe for Completion:** 2010

**Recommended Approach for Implementation:**

**PHASE I**

**A) Marketing Campaign**

Develop a marketing campaign to encourage both the repair of non-functioning solar thermal systems and the installation of more systems in new homes, when the costs can more readily be absorbed in the mortgage payments. Marketing efforts should target homeowners of all-electric homes first. The City should work with residential builders and

the real estate community to raise awareness about the benefits of solar thermal systems, so that they would encourage home owners to consider these systems, rather than discourage them.

**B) Expand ZILCH loan program** (Zero Interest Loans for Conservation Help) to include repair of solar thermal systems, not only installation of new systems.

**C) Remove barriers to installation of solar equipment.**

i. Remove barriers to the installation of solar equipment from existing City planning documents and develop specific policies to guide future planning document development such that solar equipment is allowed. This approach is supported in the following *City Plan* policy:

> **ENV-4.6. Remove barriers to renewable energy use**. The City will eliminate unnecessary barriers to the utilization of renewable energy resources in new and existing buildings which arise through the application an enforcement of City codes.

ii. Develop a mechanism to enforce the solar easement elements of the Land Use Code

iii. Some covenants in new neighborhoods prevent installation of solar equipment. The City could provide educational materials about the benefits of solar systems both at the time that development projects are undergoing preliminary development review and when the neighborhood associations are developing their convenants. Suggest that covenants identify an arbitration process that incorporates professional design recommendations when considering solar equipment installations, rather than outright banning solar equipment.

**PHASE II**

**A) Develop a local rebate or tax incentive for the installation of solar thermal equipment.**

DOE's Energy Efficiency and Renewable Energy network reports that some local and state governments offer tax incentives to encourage residents to invest in solar energy technologies. They also report that some electric utilities offer rebates to customers who install solar energy equipment because these installations help utilities reduce peak loads. (Peak loads are periods when the utility must generate extra power to meet a high demand. Heating water in the evening is one example.) Fort Collins Utility could work with PRPA to develop a rebate program for customers who install solar energy equipment because these installations will help reduce peak demand load, the number one issue PRPA faces. The City of Fort Collins could consider a tax rebate program for installation of these devices as well.

**Estimated Implementation Cost:** $ 1,250 EXISTING staff resources for promotion

**Estimated Annual Operating Cost:** $2,500 EXISTING staff - administration

**Potential Funding Source(s):** **NA**

**Annual Cost Savings:** Approximately $230/year per home on utility bill if electric household; Approximately $83/year if natural gas household.

**Other Benefits:**

- Reduction of electricity use at peak periods
- Lowered utility bill for homeowner.
- Reduction of adverse environmental impacts associated with conventional forms of electricity generation (coal mining, drilling for NG, damming rives, nuclear storage)

## 6) Promote Alternatives to Residential Air Conditioning

**Estimated CO2 Savings in 2010:** 768 tons

Electricity demand for residential air conditioning has been growing at a very rapid rate in recent years. Efforts to reduce customer energy demand at peak times would benefit both the customers, by lowering utility bills, and the utility, by easing electricity demand at peak times. Residential air conditioning loads can be reduced through strategic placement of trees on the east and west sides of buildings to shade the interior, by painting buildings and roof surfaces a light color to increase albedo and reduce space heating, through use of a whole-house fan rather than an air conditioning unit, and through proper sizing of air conditioning equipment. This measure would modify the ZILCH loan program to allow money to be used to install whole-house fans (rather than air conditioning units), and conduct an education campaign to raise awareness about cost savings and other benefits that result when air conditioning loads are decreased.

**Recommended Approach for Implementation**

This would be primarily an education program aimed at providing homebuilders and home buyers with information at the home design stage about alternatives for residential cooling. Alternatives include shading by trees, appropriate solar orientation, and appropriate building color.

If this program reduced AC demand in existing and new homes by 50%, home owners who avoided using AC would save about $30 on their annual utility bill. This would result in combined utility bill savings of $37,000 and a reduction of over 500 tons of CO2 in 2010 alone.

## 7) Promote the sale of energy efficient large appliances

To promote efficiency and conservation, in 1987 Congress passed the National Appliance Energy Conservation Act (NAECA), which mandates that manufacturers make use of readily available technologies to build home appliances that are 10-30% more efficient than previous models.

ENERGY STAR® is a collaboration between the U.S. Department of Energy, the U.S. Environmental Protection Agency and many companies. The program is designed to prevent pollution by helping consumers buy products that use less energy. The ENERGY STAR® label and related outreach activities raise awareness about the environmental and economic benefits of energy efficient products, and help consumers easily identify them when shopping. In order for a product to receive an ENERGY STAR® rating, it must exceed the minimum federal standards by a specified amount, which varies from product to product.

In Fort Collins, building scale "appliances" such as furnaces and air conditioners are regulated under the City's existing Model Energy Code, but other large household appliances such as washing machines, dish washers, and refrigerators are not. These are regulated at the federal level through NAECA.

**Recommendations**

The City would develop an education campaign to encourage consumers to purchase energy efficient appliances. The campaign would work with local appliance vendors, urging them to stock and promote energy efficient appliances, as well as homebuilders, encouraging them to make information about efficient appliances available to buyers. This program would overlap with the education component of the Green Building campaign for residences. The City would also consider creating standards for large appliances in the Model Energy Code in the future, or include large appliances as one of the criteria in a future Green Building program for residences.

**8) Provide information to neighborhood associations on the benefits of a variety of greenhouse gas reducing activities.**

Encourage neighborhood associations to initiate or expand "drop-n-swap" events and seasonal yard waste pick-ups, conduct neighborhood tree plantings, and use low-impact lawn equipment such as push or electric mowers.

## COMMERCIAL/INDUSTRAL EDUCATION

### 9) Promote efficient lighting in commercial buildings.

This program would provide education on the energy and monetary savings obtained by using efficient lighting designs or retrofits.

### 10) "Night lighting" energy use education campaign.

This campaign would be aimed at local businesses that leave their lights on all night. Information would be provided for alternative lighting situations, which save money and also have the same benefit of security.

### 11) Promote Performance Contracting for small and medium sized businesses.

Under Performance Contracting, a private firm conducts an energy audit of a facility, and pays to implement the recommendations. The firm is repaid over the years by the energy savings realized at the business. This approach allows small companies to implement energy saving measures without having to provide the capital costs.

### 12) Promote daycare in work places.

Outreach would be provided to families and employers about the benefits of having in-house daycare facilities. Daycare would help to reduce the number of miles traveled by families to and from daycare to work places and provide an opportunity for easier use of alternative modes of transportation.

## EDUCATION – GENERAL PUBLIC

### 13) Publicize environmental value of Fort Collins Utilities.

This campaign would educate the citizens of Fort Collins about environmental benefits that the City Utilities provide, which might not be provided by competitors. Residents would be encouraged to think about greenhouse gas reductions as well as local environmental commitment when choosing their utility company.

### 14) Solar Energy Incentives

**Background:**
The costs of solar PV technology have dropped sharply in recent years, but PV applications are still not cost-competitive in urbanized areas where grid access is available. A 1996 LAW fund report, "How the West Can Win: A Blueprint for a Clean and Affordable Energy Future", recommends only minimal investment in solar power until after 2005, when solar technologies may begin to become economically competitive. However, the report does identify PV as cost –effective in niche applications such as flashing school crossing signs.

The bottom line is that customers don't buy PV systems because they are cost-effective. They buy them because they can afford the capital investment and they value long-term protection of the environment. The best way to reach this tiny segment of each community's population is to offer incentives. The economic incentives for PV systems available to Colorado residents are listed below:

A. **Colorado Solar Energy Industries Association (COSEIA) Rebate Program**. This program provides a cash rebate of up to $2,500 for new, grid-tied, photovoltaic applications installed in Colorado between June 22, 1998 and December 31, 1999.

B. **Million Solar Roofs Initiative.** On June 26, 1997 President Clinton announced the Million Solar Roofs Initiative. The goal of this program is to install one million solar energy systems (photovoltaic and thermal) on buildings across the United States by the year 2010. Some grants are available.

C. **Federal Investment Tax Credit for Solar Energy on Commercial Property.** The 10% investment tax credit, otherwise known as the business energy tax credit, has been permanently extended as part of the passage of the Energy Policy Act of 1992. Funding is not available for passive systems, and is capped at $25,000 or total amount taxable.

D. **Federal Accelerated Depreciation for Solar Energy on Commercial Property.** The federal government offers a five-year accelerated depreciation for all solar energy equipment (U.S. Code Citation: 26 USC Sec. 168).

**Suggested Actions**
- Publicize PV incentives via utility bill mailings and Internet.

- Study the potential for use of PV in niche applications, such as traffic signal timing clocks, school crossings, bike path lights, and pathway security lighting, etc.
- Encourage the State to offer tax deduction for renewable energy. The states of AZ, FL, MA, MN, and NJ have solar and/or renewable energy sales tax exemptions. Nineteen states allow a special assessment of other property tax reduction for various types of renewable energy equipment. Press for the State to enact tax exemptions for renewable energy property. In 1997, 13 states had exemption programs; all felt they were beneficial but none could quantify the results.
- Consider changes to the City's Legislative Policy to allow tax deductions for renewable energy.
- After deregulation legislation has been passed in Colorado, re-evaluate the potential for solar incentives.
- Consider a local donation program to support renewable energy. Fort Collins Utility could develop a Renewable Energy Trust, modeled after Public Service Company's program started in 1993, by asking customers to agree to have their monthly utility bill rounded up to the next highest dollar amount. The amount collected would be put into a trust fund to help develop renewable energy use. PSCO's trust supports primarily off-grid photovoltaic demonstration projects on nonprofit and government buildings, with the focus now turning to schools. Over 10,000 customers have signed up for Round Up for Renewables which has generated $102,000 per year. Public Service Company of Colorado has promoted the Trust and Round Up for Renewables through bill inserts, direct mail, articles, and print and radio advertisements.

**Other Benefits:**

- Reduced dependence on US foreign fuel imports.
- Reduction of adverse environmental impacts associated with conventional forms of electricity generation (coal mining, drilling for NG, damming rives, nuclear storage)

## 15) Conduct citizen driving reduction campaign.

This campaign would draw upon the resources of the TDM and Natural Resources Department **"**Breathing Lesson Campaign." The new campaign would center around the number of days per 7-day week that Fort Collins motorists need to use alternative modes of transportation in order to reach the City's VMT goal. The campaign would be conducted annually for the duration of the Cities for Climate Protection campaign.

Based on rough estimates, if each vehicle in Fort Collins were not driven three days out of seven, we would be able to meet the adopted goal of keeping the VMT growth rate from outpacing population growth rate. This could be achieved if vehicle owners used alternative modes three days per week. This campaign could provide compelling information about CO2 savings that would further "legitimize" the use of alternative modes of transportation.

## 16) Promote Sale of Fuel Efficient Cars to the Public

**Estimated CO2 Savings in 2010:** 14,508 tons

A general education campaign would be conducted to encourage citizens of Fort Collins to consider fuel efficiency when purchasing new vehicles. Information would be provided on the cost savings resulting from improved fuel economy, as well as the greenhouse gas reductions gained by purchasing certain vehicles.

The campaign would actively promote the "*Green Guide to Automobiles"* to local residents. The American Council for an Energy-Efficient Economy publishes the guide each year, ranking cars and trucks according to their environmental impacts: amount of air pollution, global warming, and fuel efficiency. The guide is available in brochure format and on the Internet.

### 17) Increase education and incentives for citizen tree planting.

Outreach and education would be provided to new homeowners and businesses on the benefits of planting trees for landscaping. Information would be provided on appropriate locations to help reduce cooling costs in the summer months and wind damage in the winter and spring. Incentives could be provided to residents (e.g., discounted tree prices) as well as businesses to encourage more tree planting on private property in Fort Collins.

### 18) Develop "Green Guide" to Environmental Products

Working with other partners, develop and distribute a guide for purchasing environmentally preferable products. This guide could provide facts and tips about how to be an environmentally conscious consumer, based on local market availability of goods and services.

## School District Public Outreach

### 19) Design a "Powerpoint" presentation for schools/organizations.

A CCP presentation would be created to be taken to elementary, junior high, and high schools. The focus would be on sustainable living in Fort Collins with a discussion of greenhouse gas emissions, residential practices, and small activities. This presentation might lead to developing further curriculum on climate change.

### 20) Global warming teacher kits

Other cities have designed public education campaigns around global warming curriculum. Chula Vista, CA has developed a 5-day curriculum for 6th graders that discusses greenhouse gases, global warming, and energy efficiency, along with links to the environmental system.