2010 Status Report

Fort Collins Climate Action Plan

2010 Status Report

City of Fort Collins

July 2011

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Fort Collins Climate Protection

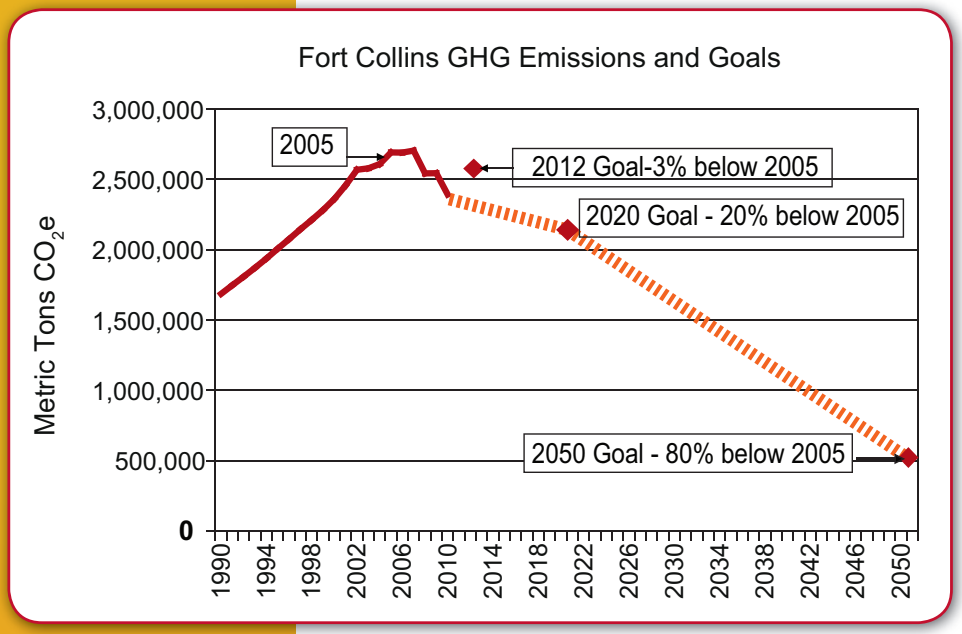
Climate change poses a real and serious threat to the world at large and to the quality of life that we value in Fort Collins. Climate change can affect us locally by contributing to more frequent and severe storms, increased drought and risk of forest fires and changes in the timing and amount of spring runoff.

Impacts in Colorado include:

- Since 1900, the average annual temperature in Fort Collins has increased by 4.1° F.
- Precipitation has generally increased in the state's high altitudes (5–20% in the 20th century) and decreased slightly in the leeward Eastern plains.
- Overall snowpack has decreased and earlier spring melting occurs in the Rocky Mountains.
- Colorado ski areas are predicted to lose 50-80% of their snow by 2085, having huge impacts on the state's tourism industry.

Because local governments like Fort Collins make critical decisions on land use, transportation and energy choices that affect carbon emissions, we can affect our carbon footprint. Reducing the community carbon footprint brings many benefits including reducing exposure to risk from a changing climate. Doing so also allows us to capitalize on local green technology research and development, and to be prepared as carbon regulations come into force.

Fort Collins has a 10-year history of embracing a pragmatic approach to climate protection called "No Regrets." This approach entails making economically sound choices to curb greenhouse gas emissions, while providing multiple benefits to the community and support for existing community goals.



In 2008 City Council adopted new carbon reduction goals for the Fort Collins community. The 2020 and 2050 goals align with goals established for the state of Colorado.

Fort Collins Climate Stewardship

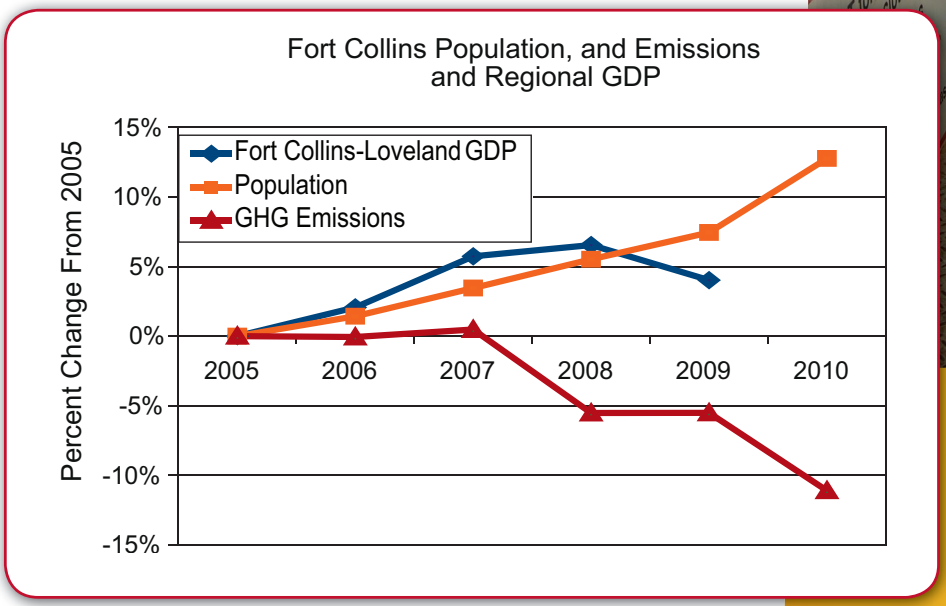
Fort Collins greenhouse gas emissions are now 11% lower than they were in 2005, despite a population growth of 13%.

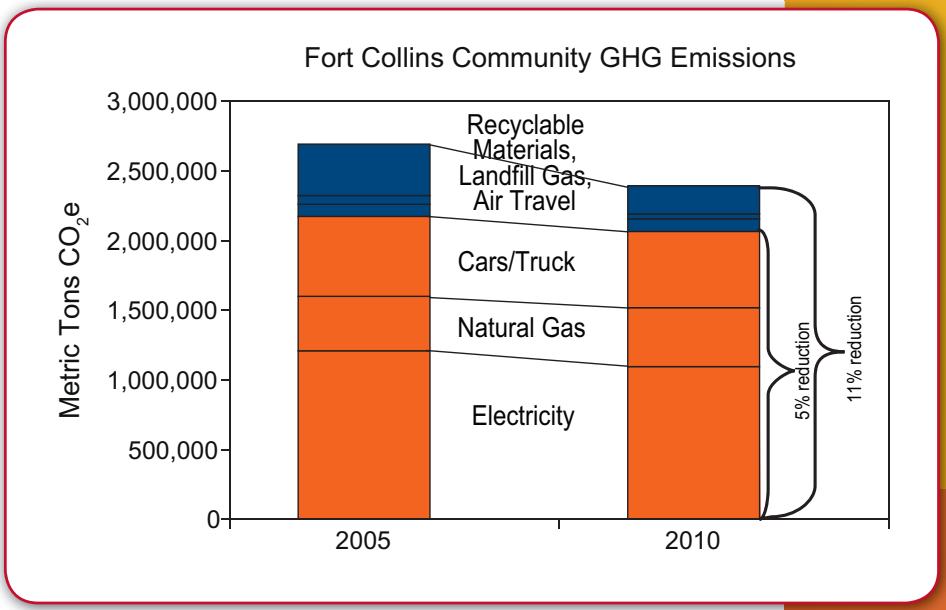
Core community emissions (electricity, natural gas and vehicle travel) dropped by 5%.

And, during 2010, Fort Collins was ranked 4th Best Place for Businesses and Careers (Forbes, April 2010) and 6th Best Place to Live in the Nation (*Money Magazine,* July 2010), confirming that carbon reductions and high quality of life can, and do, go hand in hand.

Some of the drop is no doubt attributable to the economic downturn. Communities around the country are seeing decreases in solid waste as people buy less and construction declines. High fuel prices lead people to drive less. But some of Fort Collins' drop is rightly attributable to programs and efforts of many in the community. Pay-As-You-Throw trash policies, energy efficiency awareness and rebates, and renewable energy increases all contribute to the drop in greenhouse gas emissions.

This is good news for Fort Collins.





Good News by the Numbers

Between 2005 and 2010:

- Total community GHG emissions dropped by 11%.
- Core community emissions (electricity, natural gas and vehicle travel) dropped by 5%.
- Per capita GHG emissions dropped by 21%.
- Energy efficiency programs avoided more than 60,000 metric tons of CO_2e in 2010.
- Per capita electricity use dropped by 9%.
- 6.5% of our electricity is generated by clean, renewable energy.
- Annual transit ridership increased by 37%.
- Tons of waste sent to the landfill dropped by 45%.
- Community waste diversion rate has increased to 43%.
- Climate Wise partners avoided more than 136,000 metric tons of CO_2e while saving more than $13M in 2010 alone.
- The number of VanGo vans increased by 53% from 2005.
- Transfort saw more than 2 million riders in 2010, a 37% increase from 2005.

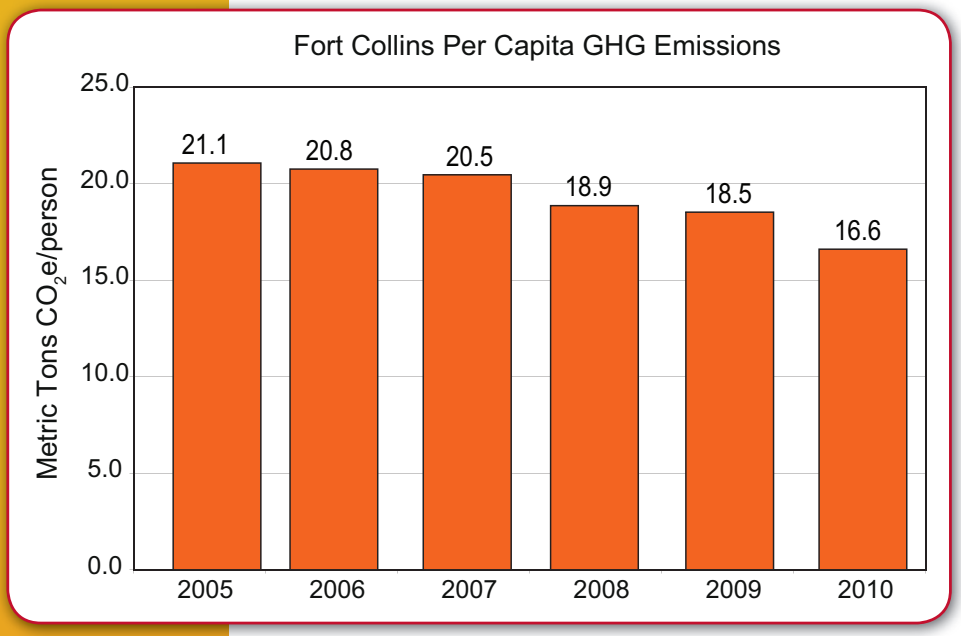
The Fort Collins community collectively avoided more than 456,000 metric tons of CO_2e in 2010 alone. These reductions are comparable to avoiding:

- Annual GHG emissions of more than 89,000 passenger cars
- Emissions from the energy used in 39,000 homes for one year
- Carbon sequestered in more than 11 million tree seedlings grown for 10 years
- GHG emissions avoided by recycling more than 158,000 tons of material each year

Air Pollution Benefits

2010 climate mitigation actions also reduced air pollution in Fort Collins:

- 127 tons nitrogen oxides avoided
- 47 tons sulfur oxides avoided
- Carbon monoxide, VOCs, and particulates (tons avoided not quantified)



Action Highlights

Energy Policy

The primary goals of the Energy Policy (adopted in January 2009) are to sustain high system reliability and to contribute to the community's climate protection goals and economic health.

Key outcomes from implementation of the Energy Policy in 2010 include:

- 2010 efficiency programs avoided more than 20,500 MWh, or 1.4% of the total community electric use. This is equivalent to the annual electric use of more than 2,250 typical Fort Collins homes.
- 2010 lifecycle cost of energy conserved through efficiency programs was 3.8 cents per kilowatt-hour, cheaper than an average wholesale electricity cost of 4.5 cents per kilowatt-hour.
- 6.5% of our electricity is generated by clean, renewable energy.
- Local on-site photovoltaic capacity grew to more than 350 DC kW in 2010.
- Efficiency programs in 2010 generated more than $13.7 million in local economic benefits through reduced utility bills, incentives, leveraged investment and indirect activity.

More than 129,000 metric tons of annual carbon emissions were avoided from Energy Policy-related programs.

Climate Wise

During 2010 the Climate Wise program grew by 54 organizations to include 247 local business partners. With 74% of partners reporting, the number of GHG reduction projects implemented by Climate Wise partners grew to almost 1,000 in 2010.

In 2010 Climate Wise partners avoided more than 136,000 metric tons of CO_2e. The projects saved the partners $13 million in 2010 alone, and more than $39 million cumulatively since the program began in 2000.

Water Conservation: Cumulative savings since 2000 - 6.3 billion gallons of water.

Electrical Energy: Cumulative savings since 2000 - 480,000,600 kWh.

Natural Gas: Cumulative savings since 2000 - 12,000,000 therms.

Reduce, Reuse, Recycle: Cumulative savings since 2000 - 170,000 tons of materials diverted (equivalent to the weight of 12,000 Transfort City buses).

Solid Waste/Recycling

Fort Collins documented a 19% drop in tons of garbage collected in 2010 in the community, a decrease of 30,000 tons compared to 2009. Recycling volumes grew by 1,005 tons – about 1%.

The community-wide waste diversion rate now stands at 43%. Citizens of Fort Collins generated 3 pounds of recycling and 5.1 pounds of landfill waste per day, compared to the statewide average (2009) of 1.7 pounds of recycling and 6.8 pounds of trash per day.

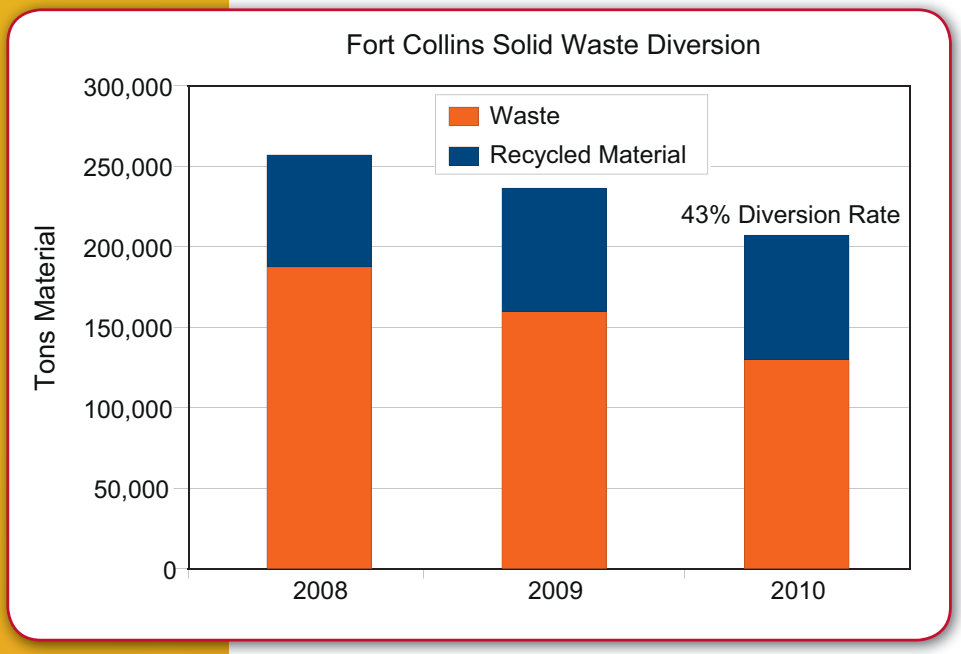
Local programs are contributing to the reductions. In 2010, 54% of Fort Collins curbside recyclers moved up to larger recycling poly-carts. Citizens increasingly express interest in diverting more organics from landfill disposal, as evidenced in 2010 by two companies in Fort Collins that began to offer food scrap collection/ composting.

Transportation

Transfort ridership levels in 2010 reached more than 2 million trips, a 37% increase from 2005. Ridership in the "General Public" sector (excluding students, seniors and disabled people) grew by 68% in the same period. At 3.9 miles per bus trip on average, Transfort helped avoid more than 7.9 million miles of vehicular travel in Fort Collins in 2010.

Also in 2010, Fort Collins received more than $895,000 in grants to advance bicycling in the city. To date, more than 3,000 residents, students, and visitors have become members of the Bike Library.

The 2010 "Safe Routes to School" program included Bike to School Day and weekly Walking and Wheeling Wednesdays. School site audits were conducted in coordination with Poudre School District, various City departments, and parents and students.



Municipal GHG Goals

City government provides numerous services to Fort Collins citizens and businesses, including electricity delivery; water treatment and delivery; wastewater treatment; traffic signals and streetlights; construction and maintenance of parks, natural areas, roads and trails; and recreation facilities. Municipal GHG emissions are 2% of community emissions.

In 2009, the City of Fort Collins set a goal to reduce GHG emissions from municipal operations at least 2% per year starting in 2009 in order to achieve a reduction of 20% below 2005 levels by 2020; ultimately to achieve carbon neutrality for the municipal organization.

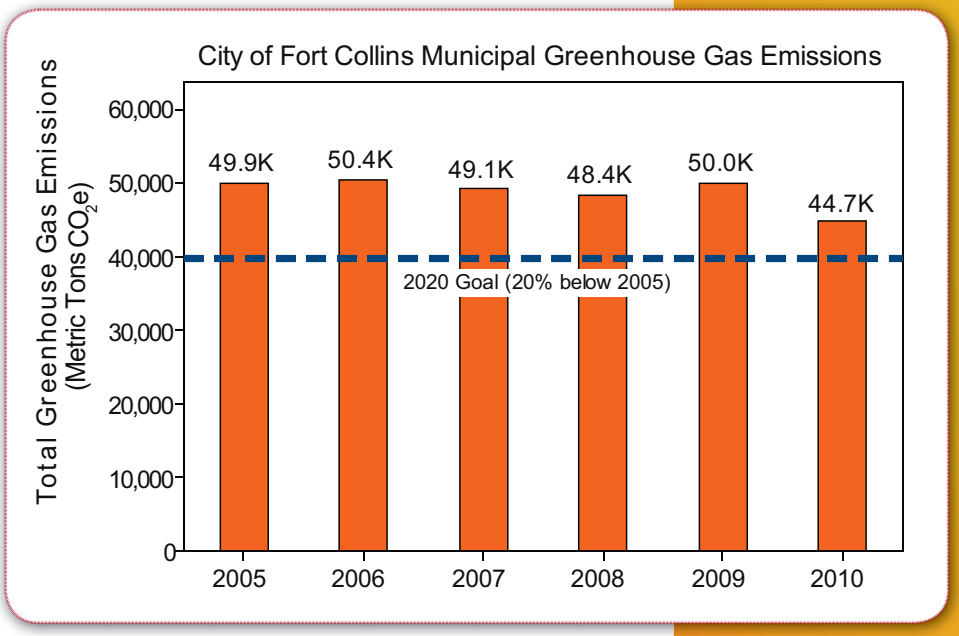
2010 Municipal Progress

- Net municipal emissions have declined 10% from 2005.
- Per capita emissions have declined from .39 $MTCO_2e$ in 2005 to .31 $MTCO_2e$ in 2001, a 20% decline.

This reflects conscious choices to reduce the carbon footprint of the organization, increased operational efficiencies, and financial savings through lower utility usage to deliver services.

City of Fort Collins 2010 Action Highlights

- A solar thermal system that captures sunlight to generate heat was installed at EPIC. It is expected to save $8,500 per year in heating bills.
- A 5 kW PV system was installed at the City office building at 215 N. Mason St.
- The Fort Collins Museum/Discovery Science Center and the Lincoln Center construction projects are being built to meet LEED standards for certification.
- Local on-site photovoltaic capacity increased by 374 kilowatts in 2010. Total capacity at the end of 2010 was 711 kilowatts.
- An in-vessel composting system demonstration project was installed using federal funding.
- Big Belly Solar trash/recycling compactors were installed at Rolland Moore Park and Oak Street Plaza.
- Six new compressed natural gas Transfort buses were placed in service.
- 155 employees participated in Bike to Work Day, avoiding 782 miles driven.
- Parks' electric golf carts avoided the combustion of 2,000 gallons of fuel.



Fort Collins Climate Action Plan - 2010 Status Report

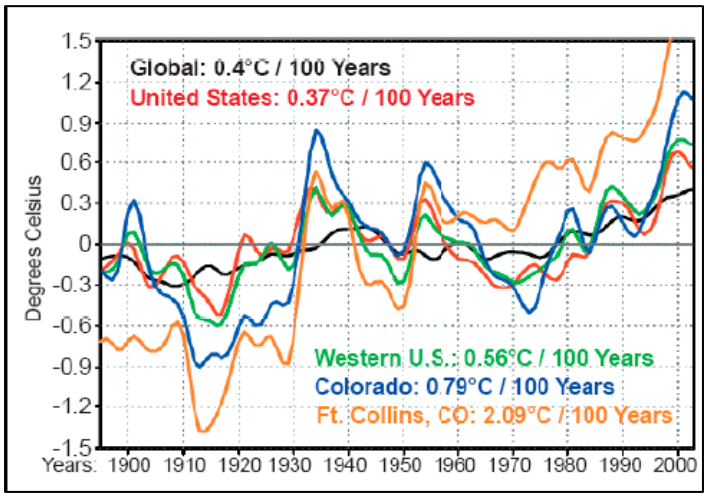
I. INTRODUCTION

Climate Change

Climate change poses a real and serious threat to the world at large and to the quality of life that we value in Fort Collins. Climate change can affect us locally by contributing to more frequent and severe storms, increased drought and risk of forest fires, and changes in the timing and amount of spring runoff. A 2008 study on the economic impacts of climate change in Colorado[1] found the following:

Impacts that have occurred:

Figure 1. Average Annual Temp. Change in Colorado Relative to U.S. [1]



Since 1900, the average annual temperature at Fort Collins has increased by 4.1° F.

Precipitation has generally increased in the state's high altitudes (5-20 % in the 20th Century) and decreased slightly in the leeward Eastern plains.

Overall snow pack has decreased and earlier spring melting occurs in the Rocky Mountains.

Impacts predicted to occur:

Extreme events such as drought and catastrophic forest fire will become more prevalent as a result of arid weather and longer growing seasons.

Flooding may also become a factor because arid weather makes the soil less permeable to rain and more rain is expected to fall in heavy events.

Under a scenario of continued GHG emissions (700 ppm of CO2 by 2100), the snowline could increase in elevation by 328-1,312 feet and the snow season could become 30 days shorter.

Colorado ski areas are predicted to lose from 82% (Telluride) to 50% (Copper Mountain) of their snow pack by 2085.

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[1] "Economic Impacts of Climate Change on Colorado", *Center for Integrative Environmental Research (CIER) at the University of Maryland (2008), Retrieved 6/23/11 from http://www.cier.umd.edu/climateadaptation/Colorado%20Economic%20Impacts%20of%20Climate%20Change.pdf*

Fort Collins Climate Protection Commitments

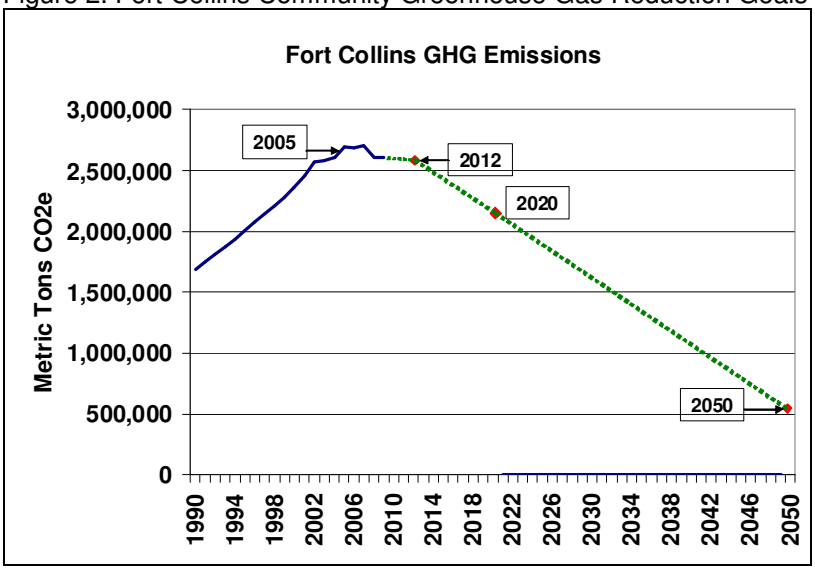
Over a decade ago Fort Collins was among the first wave of communities in the nation to commit to reducing local greenhouse emissions. The City Council adopted a greenhouse gas reduction goal for 2010 and a plan to meet it.

In 2008 City Council adopted new carbon reduction goals for the Fort Collins community:

- Reduce communitywide emissions 20% below 2005 levels by 2020
- Reduce communitywide emissions 80% below 2005 levels by 2050
- Intent to reduce emissions to a level comparable to 3% below 2005 by 2012

The 2020 and 2050 goals align with goals established for the state of Colorado as well.

Figure 2. Fort Collins Community Greenhouse Gas Reduction Goals



In December 2008, City Council adopted an updated Climate Action Plan for the entire community. (See http://www.fcgov.com/climateprotection/pdf/climate_action_plan.pdf .)

Fort Collins has long been committed to reducing our community's carbon footprint.

1997 – City joins *ICLEI- Local Governments for Sustainability*'s Cities for Climate Protection Campaign
1998 – Fort Collins is first community in Colorado to offer voluntary wind power subscription
1999 – Community carbon reduction goals and Local Action Plan adopted
1999 – Goal adopted to divert 50% of the community's waste stream from landfill disposal
2000 – Climate Wise program for businesses initiated
2003 – Energy Policy adopted; Fort Collins becomes first entity in Colorado to set renewable energy standards
2004 -- Residential energy code updated
2006 – Fort Collins becomes the first community in Colorado to ban electronic waste from landfill disposal
2008 – Fort Collins moves to single stream recycling
2008 – Community carbon reduction goals updated for 2020 and 2050, and Climate Action Plan adopted
2009 – Revised Energy Policy adopted by Council, with carbon metrics and new goals
2010 – Second progress report for the 2008 Climate Action Plan showing 3% reduction below 2005

Community Climate Initiatives

Many entities in Fort Collins are working simultaneously on carbon reduction goals. A few examples are listed below.

Platte River Power Authority – PRPA's 2009 Climate Action Plan lays out a path to meet the State of Colorado goals to reduce carbon dioxide emissions 20% below 2005 by 2020. (See http://www.prpa.org/environment/i/capjune2009.pdf.)

FortZED - FortZED is a community initiative with a mission to transform the downtown area and the main campus of Colorado State University into a net Zero Energy District through conservation, efficiency, renewable sources and smart technologies. FortZED represents about 10 - 15% of Fort Collins' energy consumption, peak demand, and number of customers.

Colorado State University - In 2008, CSU signed the American College & University Presidents Climate Commitment (ACUPCC), whereby CSU agrees to set climate neutrality as a long-term climate goal. In 2010 CSU developed a plan to achieve climate neutrality by around 2050 through the use of renewable energy, energy efficiency, carbon sequestration in forests, solid waste diversion, water conservation, transportation measures and green building.
(See http://www.fm.colostate.edu/sustain/downloads/climate_action_plan_2010.pdf.)

Poudre School District - PSD's 2006 Sustainability Management System sets a goal to reduce energy and water GHG emissions by 1.5% per year until 2016, for a total reduction of 15% in 10 years. As of 2009, PSD had reduced its GHG emissions 16% below the district's 2005 baseline level.

Climate Wise Gold and Platinum Partners - In order to achieve Gold or Platinum status, Climate Wise partners in the community must create and share a GHG reduction goal, and indicate strategies and measures planned to achieve their goal. By April 2011, there were 53 Gold and Platinum partners working toward a GHG reduction goals.

City of Fort Collins – 2011 City Plan policy ENV 11.4 states the City will "Lead by example in efforts to improve local air quality by identifying and implementing best practices in municipal operations to prevent air pollution at its source and reduce greenhouse gas emissions from municipal operations 20% below 2005 levels by 2020." (See http://www.fcgov.com/planfortcollins/pdf/cityplan.pdf.)

II. COMMUNITY GHG EMISSIONS

The main purposes of the community greenhouse gas inventory are to track progress on community carbon reduction goals, raise awareness about emissions sources and reduction opportunities, and inform policy and budgeting decisions. The community inventory does not represent asset ownership of emissions or reductions, but is intended to illustrate local emission trends. Several entities within Fort Collins (including Colorado State University, Fort Collins Utilities, New Belgium Brewing and Platte River Power Authority) are reporting their emissions via formal reporting registries such as the Climate Registry, Chicago Climate Exchange, and the Global Reporting Initiative. These registries have clear guidelines for establishing ownership boundaries for emissions.

2005 Community Baseline Inventory

The year 2005 serves as the community's "baseline" or benchmark against which progress will be measured. In 2005, a total of 2,692,000 metric tons (MT) of carbon dioxide equivalent[1], or CO_2e, were emitted by the Fort Collins community.[2]

Table 1. Fort Collins 2005 Baseline Greenhouse Gas Emissions (Metric Tons CO2e*)

Source	MT CO2e*	Type
Electricity	1,209,359	Indirect (Scope 2)
Natural Gas	391,192	Direct (Scope 1)
Ground Travel	573,190	Direct (Scope 1)
Air Travel	86,933	Indirect (Scope 3)
Landfill Gas**	62,731	Indirect (Scope 3)
Recyclable Materials Energy***	368,433	Indirect (Scope 3)
Total	**2,691,839**	
Benefit of RECs	-11,050	
Benefit of Known Offsets	0	
Revised Total	**2,680,789**	

* Carbon dioxide equivalents calculated for landfill gas and natural gas only

** Landfill gas emissions incorporate the benefit of landfill gas capture system

*** Recyclable Materials Energy refers to the GHG emissions associated with having to manufacture new products when recyclable materials are thrown in the landfill.

RECs = Renewable Energy Certificates

Offsets = Certified carbon offsets purchased by Fort Collins residents or businesses

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[1] Carbon dioxide equivalent or CO_2e: Each GHG has a "global warming potential" which refers to its heat-trapping ability relative to carbon dioxide. Methane in 21 times more potent than CO_2 and nitrous oxide is 310 times more potent. CO_2e refers to the summed impact of gases quantified, in terms of carbon dioxide.

[2] Contact the City of Fort Collins Natural Resources Department (970-221-6600) for details on the methodology used to calculate the community GHG inventories.

2010 Community Inventory

The 2010 community GHG inventory was calculated using the same approach as the 2005 baseline.

Table 2. Fort Collins 2010 Greenhouse Gas Emissions (Metric Tons CO2e)

Source	MT CO2e	Type
Electricity	1,096,499	Indirect (Scope 2)
Natural Gas	421,762	Direct (Scope 1)
Ground Travel	547,282	Direct (Scope 1)
Air Travel	90,226	Indirect (Scope 3)
Landfill Gas	35,757	Indirect (Scope 3)
Recyclable Materials Energy	201,274	Indirect (Scope 3)
Total	**2,392,800**	
Benefit of RECs	-32,737	
Benefit of Known Offsets	-332	
Revised Total	**2,359,731**	

Figure 3. 2005 Baseline Emissions by Source
2,692,000 Metric Tons CO2e

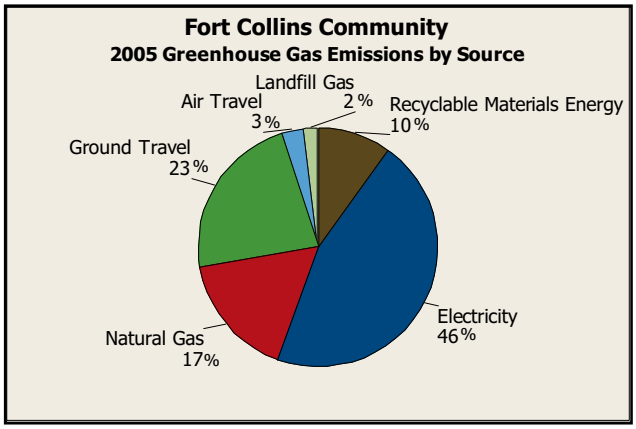


Figure 4. 2005 Baseline Emissions by Sector

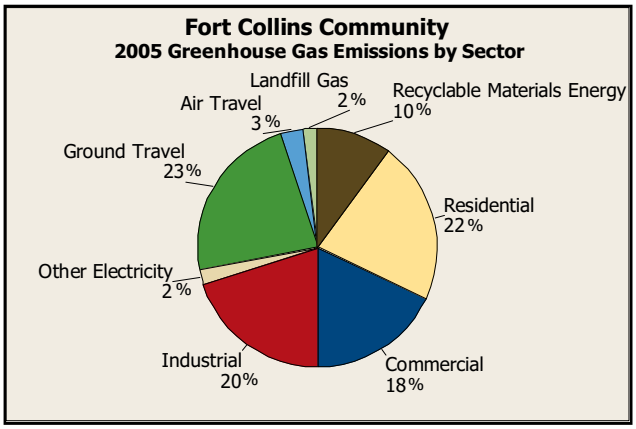


Figure 5. 2010 Emissions by Source
2,393,000 Metric Tons CO2e

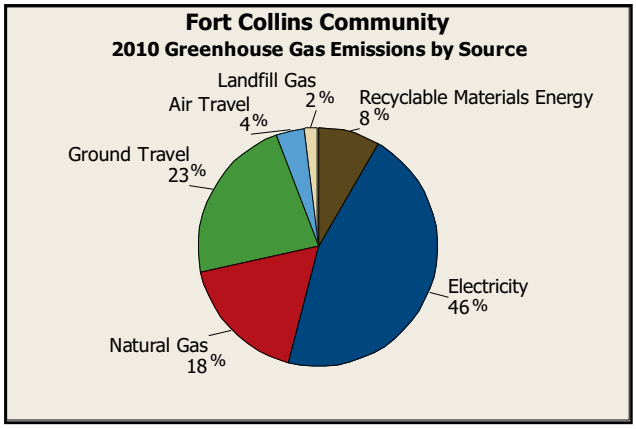
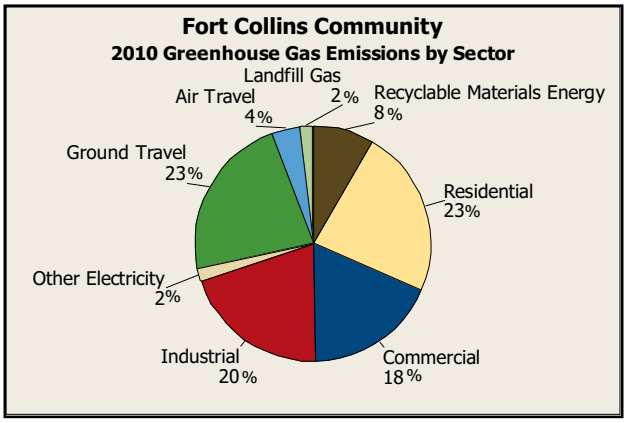


Figure 6. 2010 Emissions by Sector



"Other electricity" in Figures 4 and 6 refers to traffic signals, streetlights, and electricity transmission/distribution losses.

III. COMMUNITY PROGRESS

Greenhouse Gas Trends

Progress on the community GHG goals is measured by changes in the total emissions level. Fort Collins' reduction goals are not a "per capita" measurement. Progress must be made in lowering total emissions, regardless of population growth rates.

In 2010, community greenhouse gas emissions dropped by 11% from 2005 levels, while population grew by 13% during this period. Regional gross domestic product (GDP) grew as well from 2005 through 2009. In 2010, Fort Collins was ranked 4th Best Place for Businesses and Careers (Forbes, April 2010) and 6th Best Place to Live in the Nation (Money Magazine, July 2010), confirming that carbon reductions and high quality of life can, and do, go hand in hand.

Figure 7. Fort Collins GHG Emissions Trend

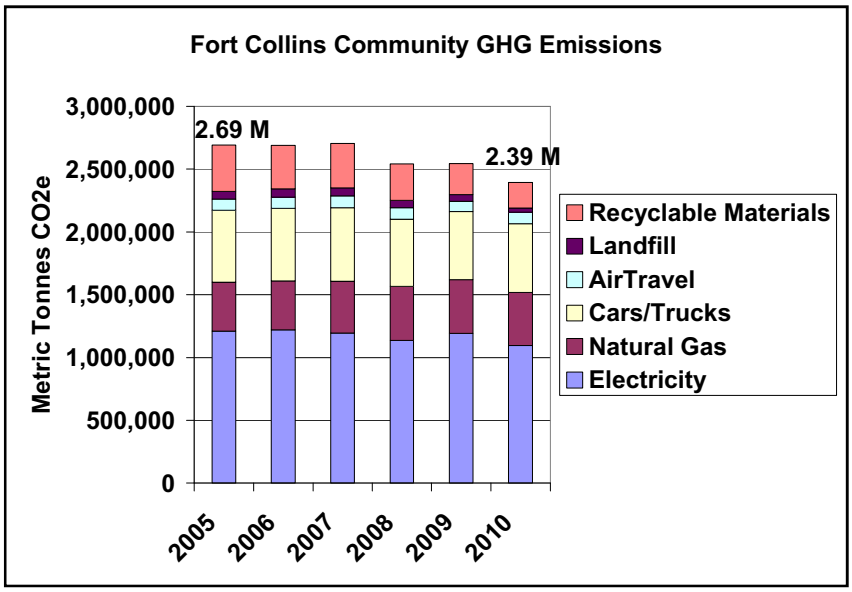


Figure 8. Fort Collins GHG Emissions and Population, and Regional GDP Trend

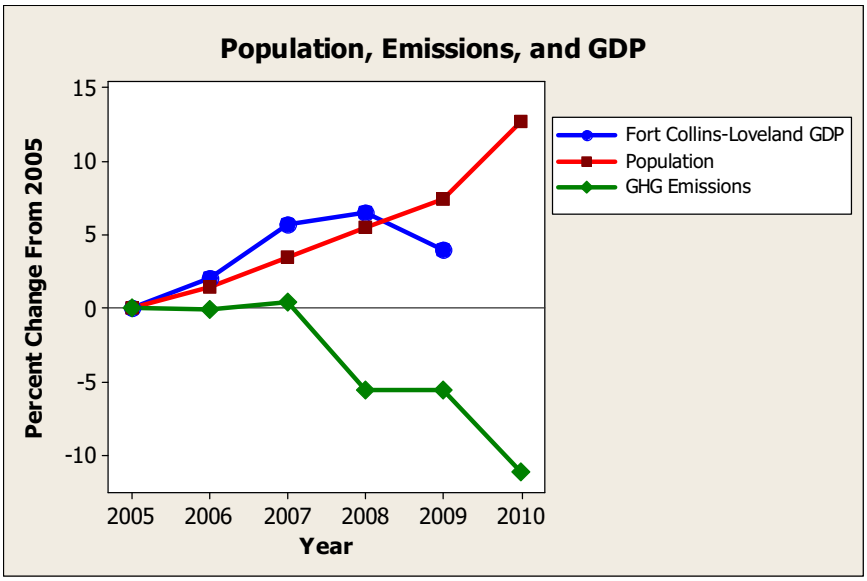


Table 3. Fort Collins Greenhouse Gas Emissions (2005 through 2010)

Greenhouse Gas Emissions	2005	2006	2007	2008	2009	2010	% Change 2005 to 2010
Population	127,686	129,511	132,101	134,743	137,200	143,986	12.77%
	Metric tons CO2e	Metric tons CO2e	Metric tons CO2e	Metric tons CO2e	Metric tons CO2e	Metric tons CO2e	
Electricity	1,209,359	1,219,570	1,194,703	1,135,603	1,192,558	1,096,499	**-9.33%**
Natural Gas	391,192	389,209	411,439	432,310	428,105	421,762	7.81%
Ground Transportation	573,190	580,221	587,338	534,099	540,650	547,282	**-4.52%**
Air Travel	86,933	88,742	93,405	92,082	82,538	90,226	3.79%
Landfill Emissions	62,731	64,202	64,707	58,367	52,026	35,757	**-43.00%**
Energy in Recyclable Materials	368,433	348,215	353,084	290,582	247,498	201,274	**-45.37%**
Total GHG Emissions	**2,691,839**	**2,690,160**	**2,704,675**	**2,543,043**	**2,543,375**	**2,392,800**	**-11.11%**
Benefits of RECS and Offsets	-11,050	-16,833	-48,590	-53,488	-56,769	-33,069	**199.28%**
Revised Total Emissions	2,680,789	2,673,327	2,656,085	2,596,531	2,486,606	2,359,731	**-11.98%**
Per Capita GHG Emissions	21.1	20.8	20.5	18.9	18.5	16.6	**-21.17%**
Subtotal Scope 1 and 2 Only	2,173,741	2,189,001	2,193,480	2,102,012	2,161,312	2,065,543	**-4.98%**

Even Scope 1 and 2 emissions only (those from electricity, natural gas and cars and trucks) declined 5% in 2010, compared to 2005 levels. Several things impact greenhouse gas emissions including the emissions factor used to convert electricity (MWh) into tons of greenhouse gases. This factor is updated annually to reflect the actual mix of sources that comprises Platte River Power Authority's electricity portfolio. The electricity emissions factor went down in 2010 compared to 2009 because the amount of owned wind energy generation in Fort Collins' electricity portfolio more than doubled and the amount of fossil fuel generated electricity declined.

Key Community Indicators

Between 2005 and 2010:

- Total community GHG emissions dropped by 11% while population grew by almost 13%.
- Core community emissions (electricity, natural gas and vehicle travel) dropped by 5%.
- Per capita GHG emissions dropped by 21%.
- Per capita electricity use dropped by 9%.
- 6.5% of our electricity was generated by clean, renewable energy in 2010.
- Tons of waste sent to the landfill dropped by 45%.
- Community waste diversion rate increased to 43%.
- Climate Wise partners avoided over 136,000 metric tons CO2e while saving over $13M in 2010 alone.
- Number of VanGo vans increased by 49% from 2005.
- Transfort saw over 2 million riders in 2010, a 37% increase from 2005.

Total community emissions include landfill gas from trash thrown in the landfill and upstream emissions associated with recyclable materials that were instead thrown away. The larger reduction in total community emissions from the baseline year reflects, in part, significant reductions in solid waste generated. Following the economic downturn, communities around the country have been seeing decreases in solid waste as people buy less and construction declines. In addition, Fort Collins' pay-as-you-throw program encourages increased waste reduction and diversion.

Table 4. Key Community Indicators

Key Community Indicators	2005	2010	Percent Change 2005 to 2010
Fort Collins population	127,686	**143,986**	12.77%
RESIDENTIAL			
Residential Electricity (MWh)	454,070	494,670	8.94%
Per Capita Electricity (MWh/person)	3.6	3.4	-3.39%
Residential Natural Gas (DTH)	2,968,669	3,543,627	19.37%
Per Capita Natural Gas (DTH)	23.2	24.6	5.85%
Per Capita Residential Buildings- Tons CO2/person	4.2	3.8	-8.65%
COMMERCIAL			
Commercial Electricity (MWh)	474,176	500,619	5.58%
Commercial Natural Gas (DTH)	1,207,770	1,302,271	7.82%
INDUSTRIAL			
Industrial Electricity (MWh)	464,278	448,107	-3.48%
Industrial Natural Gas (DTH)	3,051,712	2,946,521	-3.45%
TOTAL ENERGY			
Electricity (MWh)*	1,459,322	1,501,204	2.87%
Per Capita MWh	11.4	10.4	-8.78%
Natural Gas (DTH)	7,228,151	7,792,419	7.81%
Per Capita DTH	56.6	54.1	-4.40%
TRANSPORTATION			
Estimated Vehicle Miles Traveled	997,420,380	1,060,112,242	6.29%
VMT/person/yr	7,812	7,363	-5.75%
VMT/person/day	23.7	22.3	-5.75%
Annual Transit Ridership	1,481,000	2,034,195	37.35%
WASTE and RECYCLING			
Short Tons Waste Generated	237,747	129,867	-45.38%
Tons Recycled Material	**	76,698	
Percent Waste Diversion Including Pay-As-You-Throw Benefit	**	43.13%	

* Includes MWh electric sales from Fort Collins Utilities and Xcel Energy.

** Data not available using current methodology.

IV. 2010 COMMUNITY ACTION HIGHLIGHTS

Quantified Community Greenhouse Gas Reductions

In 2010, Fort Collins avoided over 456,000 metric tons of CO_2e from specific, quantified communitywide projects. Although numerous other projects may have occurred during 2010, they were not evaluated for their carbon reduction benefits in this report. Progress on the community GHG reduction goal is tracked through changes in total emission levels, not by quantified annual GHG reductions.

Table 5. 2010 Estimated Community GHG Reductions

Community Reductions Project name	2010 Metric tons CO2e/yr
Climate Wise Program	
Electric Energy Efficiency projects	68,356
Renewable Energy Projects**	12,877
Natural Gas Projects	17,569
Recycling/Waste Diversion	29,566
Transportation	1,147
Water	1,254
Misc Other Projects	5,646
Climate Wise Total	**136,415**
ENERGY	
Electric Efficiency Program Savings (2002 - 2010)	
Electricity Savings	59,368
Natural Gas Savings	47
RFR Program CFC-11 Destruction	6,955
Metered Renewable Energy	30,012
On-site Renewable Energy	752
Renewable Energy Certificates**	32,737
Energy Total	**129,871**
WASTE REDUCTION	
Communitywide Recycling	239,921
Concrete and Asphalt	6,061
Waste Reduction Total	**245,982**
TRANSPORTATION	
Transfort Bus	3,744
Van Go vanpool	260
Transportation Total	**4,004**
TOTAL QUANTIFIED REDUCTIONS*	**456,380**

* Total is corrected for double-counting across programs

** These GHG reductions are calculated according to Green-E protocols for reporting carbon equivalents.

These reductions are comparable to avoiding:

- Annual GHG emissions of over 89,000 passenger cars
- Emissions from the energy used in 39,000 homes for one year
- Carbon sequestered in over 11 million tree seedlings grown for 10 years
- GHG emissions avoided by recycling over 158,000 tons of material each year

Air Pollution Benefits

The actions listed in this report are estimated to have avoided over 127,920 MWh of electricity and 3,252 decatherms of natural gas. In addition to reducing greenhouse gas emissions, these improvements helped prevent emissions of other, more traditionally recognized air pollutants that are harmful to human health and the environment. Nitrogen oxides, volatile organic compounds (VOCs), and carbon monoxide all contribute to ground level ozone.

Table 6. Air Pollution Benefits from 2009 GHG Reduction Actions

Pollutant	Avoided in 2010 from GHG Reduction Actions in Fort Collins
Nitrogen Oxides*	127 tons
Sulfur Oxides*	47 tons
Carbon Monoxide**	7 tons
Volatile Organic Compounds (VOC)**	1.5 tons
Particulates (PM10)**	0.8 tons

*Calculated using estimated factors based on Fort Collins' electricity portfolio
**Calculated using CACP Software, Version 2009, based on national averages

Fort Collins Energy Policy Programs

The primary goals of the Energy Policy (adopted in January 2009) are to sustain high system reliability and to contribute to the community's climate protection goals and economic health. The purpose of the Policy is to provide strategic planning guidance for Fort Collins Utilities (Utilities). The Energy Policy 2050 vision is to ensure highly reliable, competitive, carbon neutral electricity supplies, managed in a sustainable, innovative, responsible and efficient manner for the Fort Collins community.

The Fort Collins 2008 Climate Action Plan references the Energy Policy for goals and objectives related to energy efficiency, conservation and renewable energy.

Key outcomes from implementation of the Energy Policy in 2010 include:

- Highly reliable electric service, with new initiatives to modernize the distribution grid and maintain utility assets for the future.
- Customer electricity savings from 2010 efficiency programs totaling over 20,500 megawatt-hours (MWh) in annual electricity use, or 1.4% of the community's electric use. This is equivalent to the annual electric use of over 2,250 typical Fort Collins homes.
- Efficiency programs in 2010 saved electricity at a cost-of-conserved energy of 3.8 cents per kilowatt-hour, compared to an average wholesale electricity cost of 4.5 cents per kilowatt-hour.

- Electricity savings from 2002 through 2010 efficiency programs totaling over 84,000 megawatt-hours in annual electric use.
- Expanded local on-site renewable energy generation.
- Efficiency programs in 2010 generated over $13.7 million in local economic benefits through reduced utility bills, incentives, leveraged investment and indirect activity.
- Avoided annual carbon emissions of over 129,000 metric tons from Energy Policy related programs.

Major activities and highlights from 2010 include:

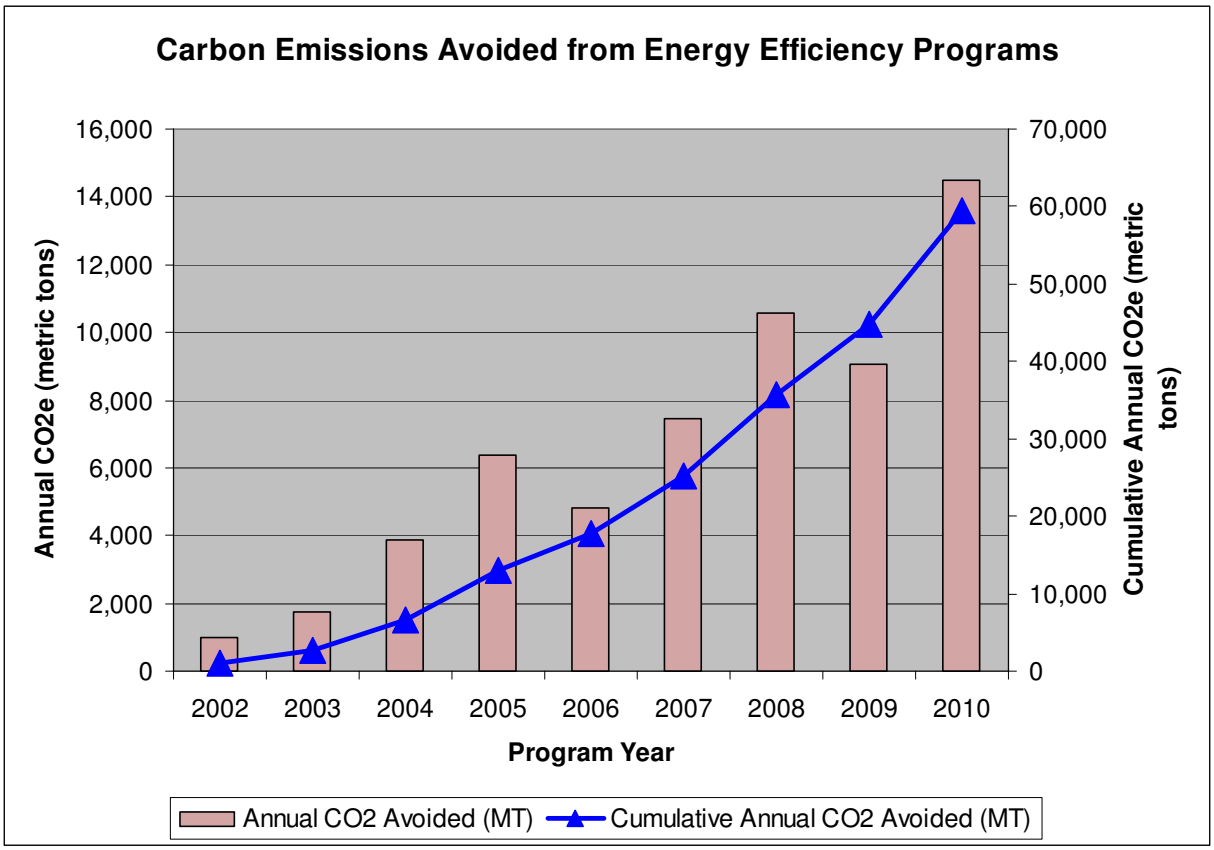
- The Home Energy Report Program provided periodic reports to over 20,000 homeowners with educational information about their electricity use compared to similar homes in Fort Collins. Report recipients achieved electric savings of over 2%.
- The Home Efficiency Program, launched January 2010, completed over 450 comprehensive home efficiency audits, leading to over 100 energy retrofit projects. The program also developed a comprehensive home energy contractor network through training and structured quality assurance.
- Fort Collins City Council adopted a set of amendments designed to "Green" the City's building codes (March 2011). Funding from the federal Energy Efficiency and Conservation Block Grant program was used to support the staffing for the code development aspects of the Green Building Program.
- The contract for the Fort Collins Smart Grid Implementation Grant with the Department of Energy was completed.
- Load management and demand response programs for residential air conditioning, residential hot water heaters and commercial/industrial customers maintained a capacity of over 9.6 megawatts of summer peak demand.
- Renewable energy comprised 6.5% of total electrical energy purchased in 2010. Renewable energy purchases were 96,000 megawatt-hours.
- Photovoltaic (PV) capacity additions in 2010 totaled 374 kW (100 kW residential and 274 kW commercial).

Energy Efficiency Programs

Fort Collins Utilities has provided programs and services to help customers manage their energy use for over 25 years. Energy efficiency and load management are also called "demand side management" (DSM). Efficiency programs are a reliable energy resource for Utilities and Platte River Power Authority. Many of the programs are a collaborative effort, both in funding and implementation, between the two organizations.

Information about energy efficiency programs for residential, commercial and industrial customers is available at fcgov.com/conserve.

Figure 9: Annual & Cumulative Carbon Emissions Avoided from Energy Efficiency Programs, 2002–2010



Renewable Energy Programs

Fort Collins Utilities renewable energy strategy is designed to meet policy initiatives to increase use of renewable energy. They support customers who voluntarily subscribe for additional renewable energy or who want to install on-site renewable energy systems.

The Energy Policy sets a goal of meeting the State of Colorado Renewable Energy Standard (RES) which requires Fort Collins to have a minimum of 1% renewable energy through 2009, 3% in 2011, 6% in 2015 and 10% in 2020. In addition, renewable energy is the backstop measure for reaching the Energy Policy carbon reduction goals, which places the priority on efficiency and conservation.

Fort Collins Utilities has offered renewable energy to customers since 1998. The Green Energy Program is a voluntary premium-priced rate option for customers who wish to have all or a portion of their electricity generated from renewable energy sources.

Fort Collins Utilities purchases renewable energy for the RES and Green Energy Program from Platte River Power Authority under their Tariff 7. In 2009, the City's renewable program was supplied from two types of sources. Wind turbines at Platte River Power Authority's Medicine Bow Wind Project in Wyoming provide both energy and Renewable Energy Credits or RECs (combined). In addition, RECs with no

associated energy are purchased by Platte River from multiple renewable sources in the region. Renewable energy sold by Fort Collins' Green Energy Program is "Green-E" certified. Figure 10 below shows Green Energy purchases made for voluntary Green Energy Program subscribers as well as "rate-based" renewables purchased on behalf of all rate-payers.

Fort Collins also offers rebates for on-site renewable projects, which have generally been comprised of photovoltaic (PV) systems on residential and commercial customer buildings. Fort Collins' net metering offers residential and small commercial electric customers full retail buy-back provisions for electricity generated by solar PV systems that are connected to the electric grid. The large increase in PV capacity additions shown in Figure 11 below reflects a significant increase in budget allocation for renewable rebates in those years.

Figure 10. Renewable Energy Purchases, 1998–2010

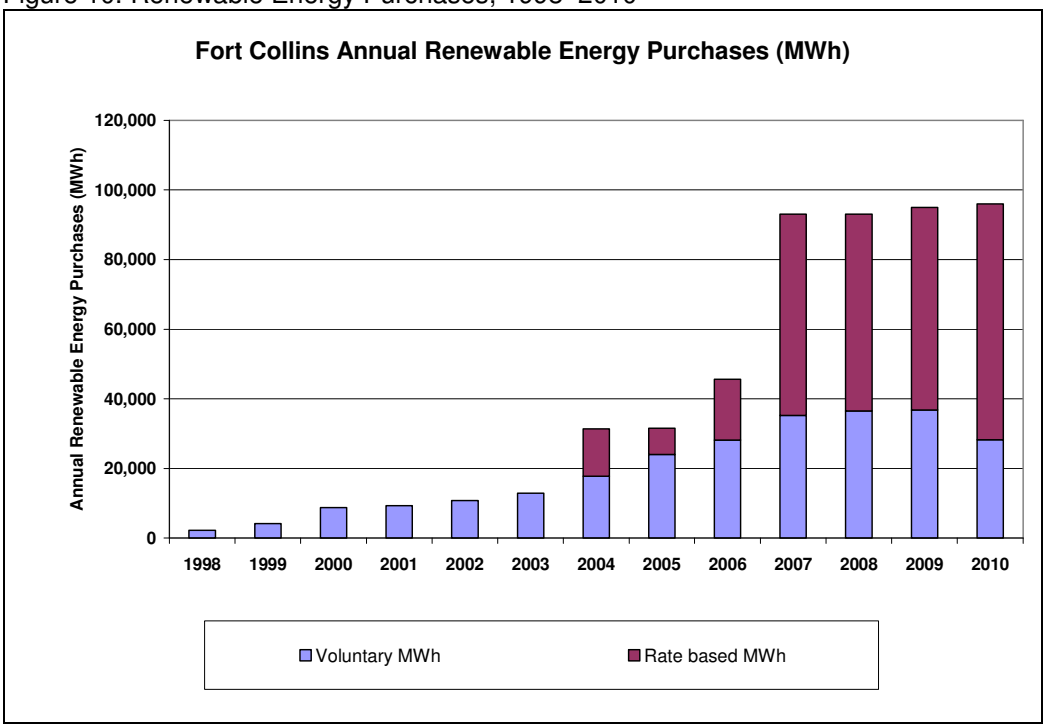
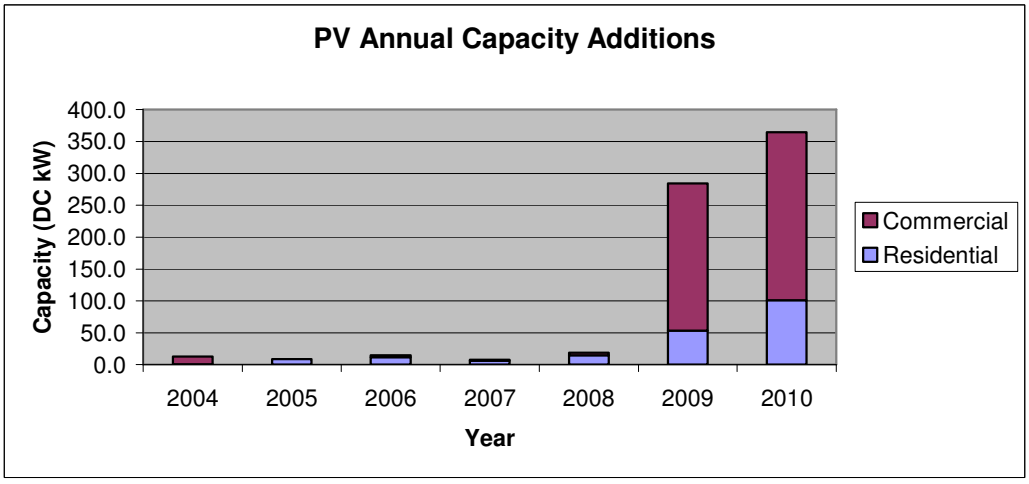


Figure 11. Installed Solar PV Capacity '04-'10



Climate Wise Program

In 2010 the Climate Wise program grew by over 54 organizations to include more than 247 local business partners. With 74% of partners reporting, the number of GHG reduction projects implemented by Climate Wise partners grew to almost 1,000 in 2010.

Also in 2010, Climate Wise partners avoided over 136,000 metric tons of CO_2e. The projects saved the partners $13 million in 2010 alone, and over $39 million cumulatively since the program began in 2000.

Figure 12 shows the growth in Climate Wise partners and projects since 2000. Figure 13 shows the distribution of projects by type. For more information, see the 2009 Climate Wise Annual Report at http://www.fcgov.com/climatewise/reports.php

Figure 12. Climate Wise Program Growth, in Numbers of Partners and Projects

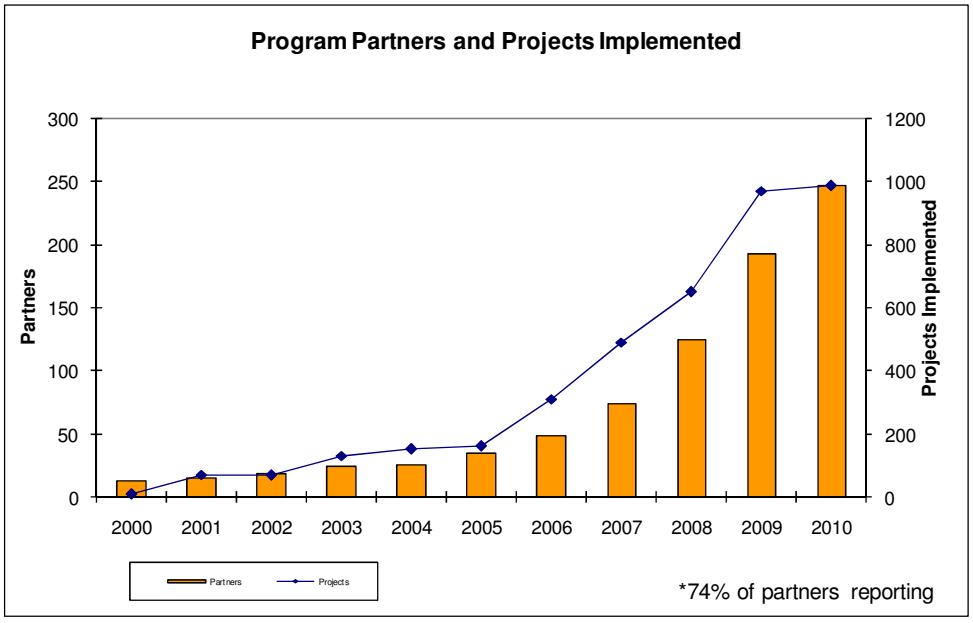


Figure 13. 2010 Climate Wise Partners' GHG Reductions by Percent of Tons CO_2e Avoided

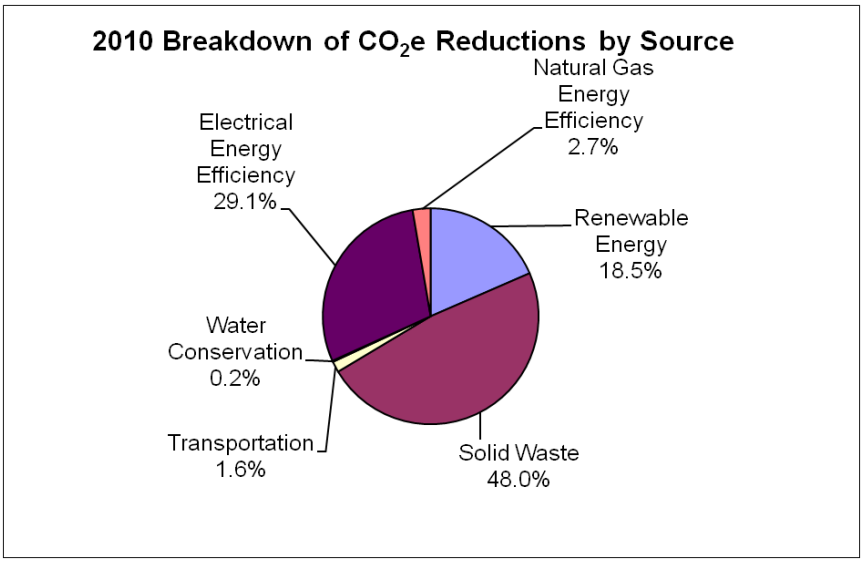
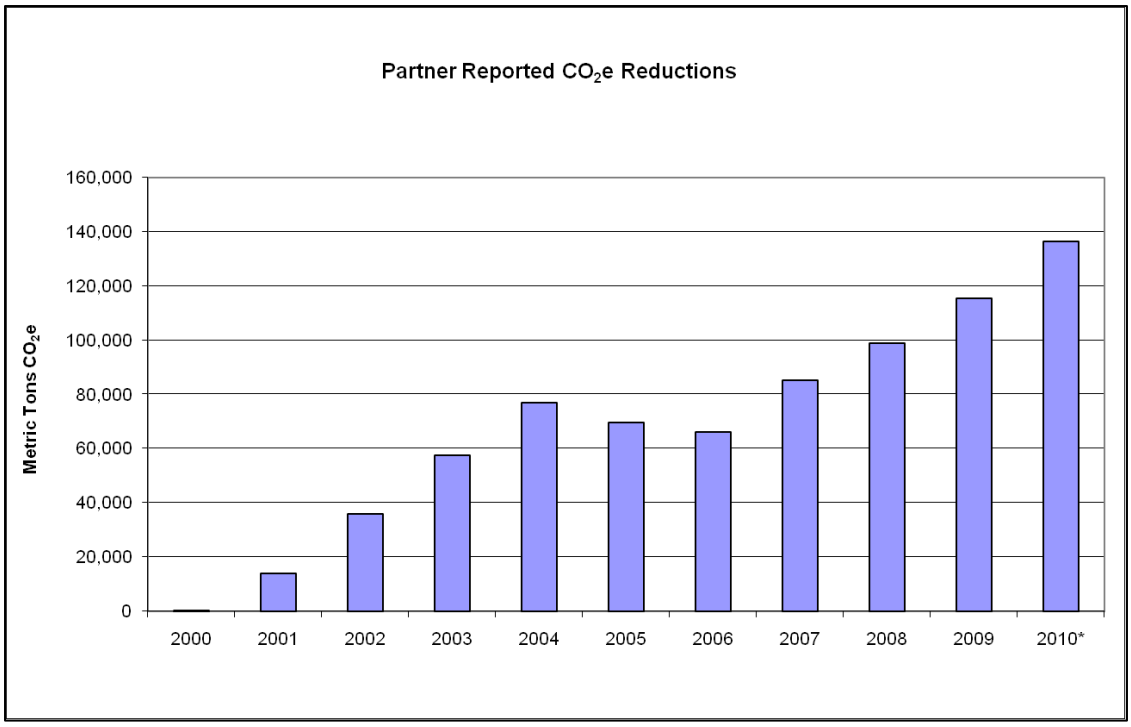


Figure 14. 2010 Climate Wise Partners' Metric Tons CO_2e reported



*74% of partners reporting

Climate Wise Measures That Matter

Water Conservation Cumulative savings since 2000: 6.3 billion gallons of water (equivalent to filling City Park Pool 30,000 times.)

Electrical Energy Cumulative savings since 2000: 480,000,600 kWh

Natural Gas Cumulative savings since 2000: 12,000,000 therms

Reduce, Reuse, Recycle Cumulative savings since 2000: 170,000 tons of materials diverted (equivalent to the weight of 12,000 Transfort City buses).

FortZED

FortZED is a community initiative with a mission to transform the downtown area and the main campus of Colorado State University into a net zero energy district through conservation, efficiency, renewable sources and smart technologies. Over 20 projects were installed and tested during 2010, located at five FortZED electric end-users, for a combined controllable load of 5 megawatts. Testing occurred on two of the eight electric feeders serving the FortZED area with a peak demand of 7-8 megawatts per feeder.

The FortZED Community Energy Challenge, launched in September 2010 by The Atmosphere Conservancy and UniverCity Connections, is a grassroots outreach initiative to engage and empower the

residential sector to contribute to the net-zero energy district. More than 400 residents joined by the end of 2010. (As of June 2011, over 1,000 residents had signed up for the FortZED Energy Challenge.)

Advance Meter Fort Collins

During 2010, much progress was made to develop plans for the 'Advance Meter Fort Collins' project. This project will upgrade electric and water meters in homes, schools and businesses to provide two-way communication between the meter and Fort Collins Utilities, eliminating the need to send a technician to customers' homes and businesses to manually read meters. Actual meter installation will begin in early 2012.

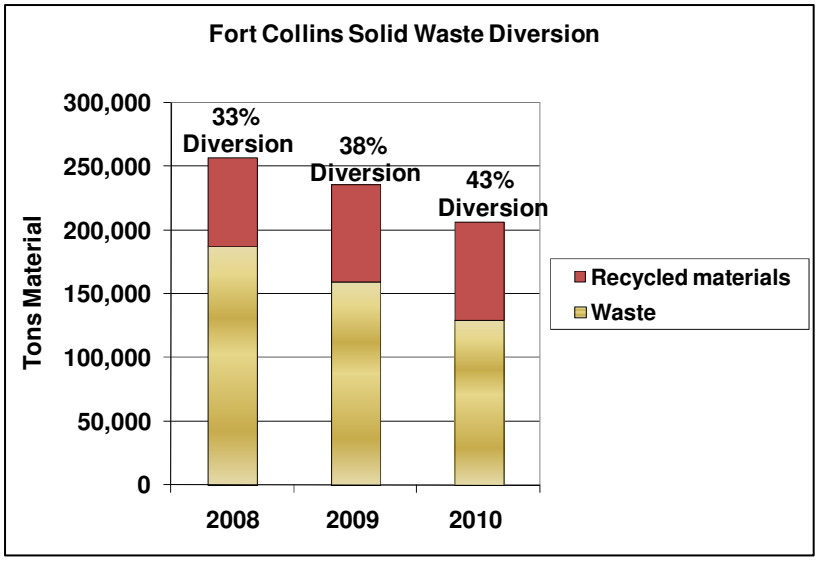
Ultimately, customers will have online access to more information about their electric and water usage. Somewhat similar to cell phones, customers will be able to manage and track their usage. The benefits of upgrading the meter system–which includes system efficiency, increased customer choice and positive environmental impacts–are important aspects in continuing to serve the community well. This represents a positive economic return and a solid investment for the community's future.

The cost of the electric portion of the project is $31.4 million. A three-year, $15.7 million matching grant through the 2009 American Recovery and Reinvestment Act (ARRA) is helping to finance half of this portion of the project. Fort Collins Utilities is among 100 utilities nationwide to receive a grant to develop a "smart" utility grid that includes advanced metering. The balance of the electric project expense is being paid by bonds to enable the costs to be spread out over a longer time period based on project savings. The project will not increase customer electric rates.

Waste Reduction and Diversion Programs

Fort Collins documented a 19% drop in the number of tons of garbage collected in 2010 in the community, a decrease of 30,000 tons compared to 2009. Recycling volumes grew by 1,005 tons – about 1%. This corresponds to national trends during the economic recession; landfill managers throughout the country reported decreased volumes of garbage – on average 20% less material - were sent to landfills for disposal.

Figure 15. Fort Collins Community Waste Diversion Rate



The recent downturn in the economy clearly led people to buy fewer goods and to probably also make existing possessions and products last longer, thereby creating less waste. In addition, the development industry, normally a large contributor of construction and demolition (C&D) debris, was sluggish. As the economy improves, trash volumes may also rebound unless peoples' new-found habits of frugality are maintained.

Methodology

The City collects data directly from licensed trash haulers and recycling companies for weights of garbage and weights of recyclables and uses Environmental Protection Agency (EPA) classifications for discarded materials[3], which excludes many industrially-generated wastes. For instance, while the City notes the amount of asphalt and concrete recycled into road-base by the Streets Department (over 117,000 tons in 2010), as industrial material, these tons are not factored into the community waste diversion calculation.

A newly adopted amendment to the City's Pay-as-you-throw (PAYT) ordinance went into effect in 2010 that requires haulers to report their trash quantities by weight, a change from the previous system of reporting that now creates greater accuracy for waste diversion calculations. In late 2010, Larimer County Landfill installed three in-ground scales for their customers to use, which will allow haulers to more easily track their tonnages. The City applies EPA weight conversion coefficients for certain recyclable material categories which continue to be reported by volume, such as wood waste.

A communitywide (including both residential and commercial sectors) waste diversion rate of 43% stands as the City's final calculation for 2010. Based on a population total of 144,000[4], it appears that citizens of Fort Collins therefore generated 3.0 pounds of recycling and 5.1 pounds of landfill waste per day (total 8.1 pounds of material per day). The most recent (2009) data collected by the Colorado Department of Public Health and the Environment[5] show that the rest of Colorado's citizens generated 1.7 pounds of recycling and 6.8 pounds of trash (total 8.5 pounds of material per day).

2010 Enhancements to Waste Diversion & Recycling

A second new provision that was added to Fort Collins' PAYT ordinance requires haulers to report on the number of customers at each level of service for both trash and recycling. The City now has baseline data from 2010 with which to measure individual households' progress in "down-sizing" the size of residential trash containers and increasing the size of curbside recycling bins, and ascertain the overall number of customers in the community that subscribe to each level of service.

[3] EPA's MSW recycled materials classification list includes: paper, cardboard, plastic, glass, metals, electronics, yard/waste, food scraps, batteries, tires, commingled, textiles and Styrofoam.

[4] http://www.fcgov.com/advanceplanning/trends.php

[5] 2010 Annual Report to the Colorado General Assembly on the Status of the Solid Waste and Material Management Program in Colorado (http://www.cdphe.state.co.us/hm/sw/100201legrpt.pdf).

2010 Trash Service Subscription Levels (as a percentage of customers)

33.2% = one-can per week or less service

36.2% = two-can per week service

30.6% = three-can per week[6] service

The overall numbers of customers in the community who subscribe to recycling are also documented. The haulers' reports show that 54.5% of curbside recyclers moved up to one of the new poly-carts, since adoption of an additional 2009 PAYT ordinance amendment, which requires haulers to provide larger recycling carts upon request.

2010 Recycling Service Participation (as a percentage of customers)

45.5% =18-gal. tubs

36.5% = 65-gal. carts

18.4% = 95-gal. carts

Other Initiatives

Citizens increasingly express interest in diverting more organics from landfill disposal, as evidenced in 2010 by the emergence of two companies in Fort Collins that began to offer food scrap collection/composting. With 25-30% of Larimer County Landfill's space being consumed by organic material[7], there are large gains to be made in waste diversion, especially by certain types of businesses such as restaurants and groceries. A limiting factor is the extreme distance (60 miles each way) to transport loads to the nearest permitted composting facility that accepts food scraps. The City of Fort Collins piloted a small, in-vessel composting system using manufactured equipment known as Earth Tubs; five "client" restaurants and City buildings have been collecting food scraps that are made into compost. The compost is then used in flower pots that decorate the Old Town area.

Transfort Bus Program

Transfort is a municipal agency that provides bus service in Fort Collins along 18 different routes; 17 local and one regional. Ridership levels in 2010 reached over 2 million trips, a 37% increase from 2005. Ridership in the "general public" sector (excluding students, seniors and disabled people) grew by 68% in the same period. At 3.9 miles per bus trip on average, Transfort helped avoid over 7.9 million miles of vehicular travel in Fort Collins in 2010.

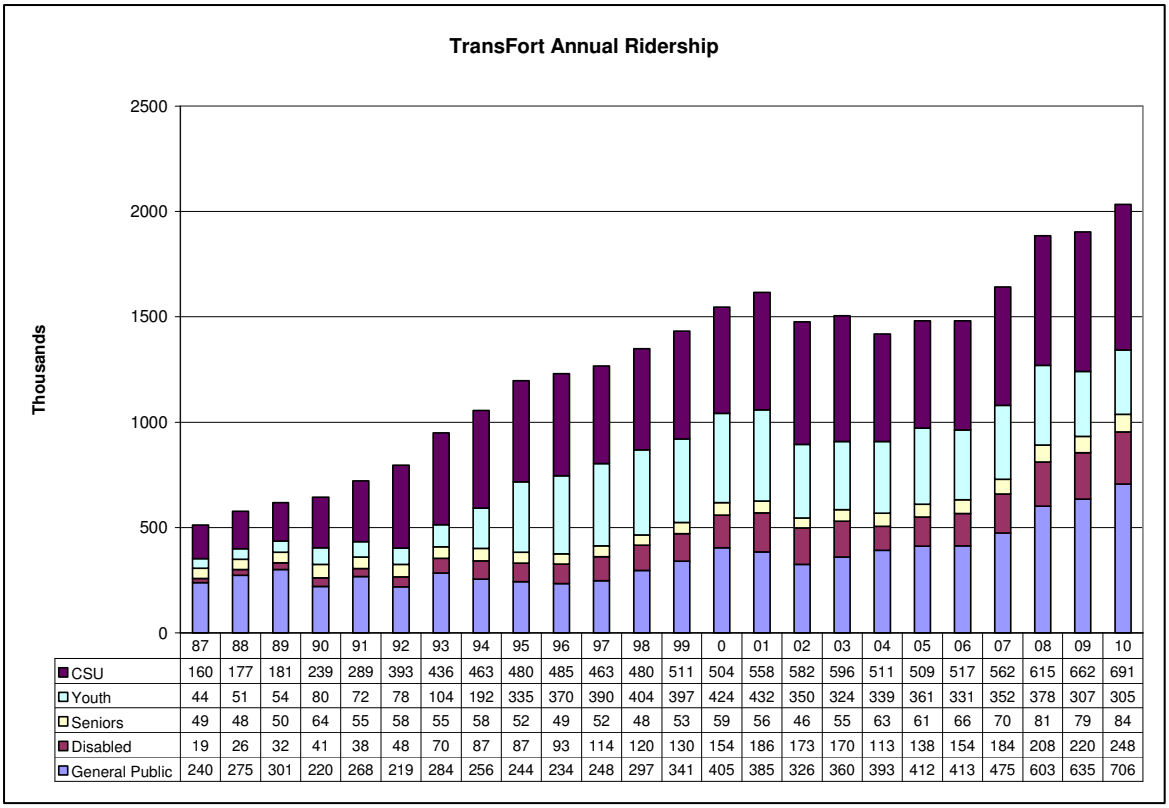
[6] Three-can service equates to a 95-gallon cart.

[7] 2007 Larimer County Landfill Waste Characterization citation

In 2010, the FoxTrot route between Loveland and Fort Collins was replaced with service that extends to Longmont, where it now connects for the first time with RTD. The new route was renamed as FLEX (Fort Collins Longmont Express). FLEX is funded with federal CMAQ grants as a 2- year pilot program.

In addition to adding route service, Transfort is steadily replacing older buses with new cleaner buses that run on compressed natural gas, reflecting the City's commitment to green practices. Four buses were purchased with 2010 American Recovery and Reinvestment Act funds.

Figure 16. Transfort Ridership Trends



	87	88	89	90	91	92	93	94	95	96	97	98	99	0	01	02	03	04	05	06	07	08	09	10
CSU	160	177	181	239	289	393	436	463	480	485	463	480	511	504	558	582	596	511	509	517	562	615	662	691
Youth	44	51	54	80	72	78	104	192	335	370	390	404	397	424	432	350	324	339	361	331	352	378	307	305
Seniors	49	48	50	64	55	58	55	58	52	49	52	48	53	59	56	46	55	63	61	66	70	81	79	84
Disabled	19	26	32	41	38	48	70	87	87	93	114	120	130	154	186	173	170	113	138	154	184	208	220	248
General Public	240	275	301	220	268	219	284	256	244	234	248	297	341	405	385	326	360	393	412	413	475	603	635	706

Mason Corridor

Several major milestones were completed in 2010 on the Mason Corridor Bus Rapid Transit project. Project engineering advanced to 65% final design and a key hurdle involving floodplain challenges for Spring Creek was resolved. Significant progress was also made toward obtaining the BNSF (Burlington Northern Santa Fe Railroad) right-of-way needed to construct the project. Construction is slated for late 2011 with service beginning in December 2013.

Bicycling

9.9% of Fort Collins' work forces cycles to their jobs each day, making it the third highest bike commute city in the nation according to the U.S. Census Bureau's 2009 American Community Survey. A recent NFRMPO survey found over 13% of workers commute by bike in Fort Collins. Bicycling is promoted locally through a strong system of bike trails, the Bike Co-op that collects and refurbishes bicycles locally,

and the Fort Collins Bike Library, a free service. To date, over 3,000 residents, students, and visitors have become members of the Bike Library.

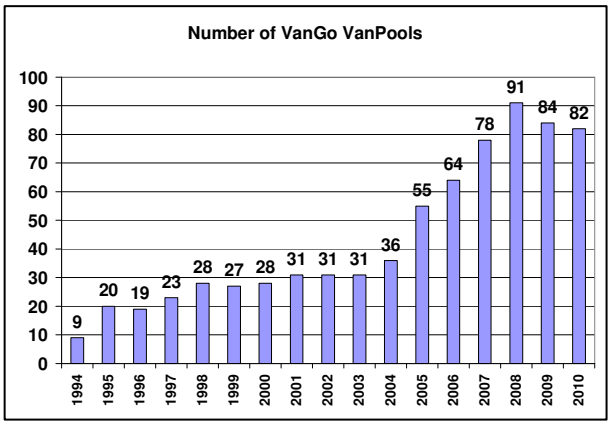
Safe Routes to School Program

The Safe Routes to School program received $38,500 in federal funding for the 2009-10 school year in addition to local and state funding from the City, CanDo, and Livewell Colorado. Specific program activities included Bike to School Day and weekly Walking and Wheeling Wednesdays. School site audits in coordination with Poudre School District, various City departments, and parents and student were completed as well.

VanGo Vanpool Program

In 2010, the North Front Range Metropolitan Planning Organization had a total of 82 VanGo vans in daily operation that saved a total of about 12,000,000 miles. Of those, 46 vans originated from, or traveled into, Fort Collins city limits, avoiding approximately 552,000 vehicle miles traveled (VMT) in the community. VanGo ridership dropped off slightly in 2010, perhaps due to the slow regional economy and lower fuel prices, but remained generally strong in the region.

Figure 17. Growth in VanGo Ridership



Street Improvements

Several street improvements were made in 2010 to Fort Collins' streets that contribute to reduced congestion or increased bicycling, and associated greenhouse gas reductions.

- In 2010, the busiest intersection in Fort Collins, at College and Harmony, was reconstructed. The project helped relieve congestion, improve safety, and improve bicycle and pedestrian facilities.
- As part of the East Harmony Road improvements, Harmony was restriped to include three travel lanes and bike lanes from Timberline to I–25.
- Improvements to North College and Willox Lane at the Marketplace Development included the construction of on-street bike lanes, and sidewalks. Willox Lane east of College was improved to minor arterial standards with a modern roundabout installed at the entrances to the Marketplace development on the north and the existing Albertsons Center on the south. (Construction of roundabouts is specifically identified in the 2008 Climate Action Plan as a carbon reducing strategy.)
- Laurel Street adjacent to CSU was placed on a modified "road diet" by re-striping the street to provide a continuous two-way center turn lane that improves traffic and pedestrian safety. New signal timing was added to maintain efficient traffic flow with the new striping plan.

Green Building

In October 2010, the 2009-I Codes became effective in Fort Collins. With passage of this suite of codes, construction in Fort Collins is now regulated by the most up-to-date nationally recognized construction standards published by the International Code Council.

2010 also brought significant work to develop a comprehensive Green Building program in Fort Collins. The Fort Collins Green Building Program has the primary goal of better aligning the built environment with community goals of reduced carbon emissions, reduced energy use and reduced water use. The Green Building Program framework is designed to support market transformation through a combination of regulatory and voluntary elements.

In 2010, Green Building Program work focused on developing a package of "green amendments" for incorporation into the Fort Collins Building Code for all new construction. The amendments, adopted by City Council in early 2011, address construction waste management, resource efficiency, energy efficiency, water efficiency, indoor and outdoor environmental quality, and buildings operation and maintenance and commissioning. Fort Collins' first-ever "green amendments" emphasize testing and measurement for intended design performance. Among other benefits, the proposed changes will provide energy, water, and carbon savings compared with buildings constructed to current Code requirements. The benefit:cost analysis for the green amendments shows an overall net positive benefit compared with buildings constructed to current code requirements. The Green Amendments will become effective on 1/1/2012.

Climate Adaptation Planning

The City Council adopted a new City policy on climate adaptation when City Plan was updated in 2011. Principle ENV 12: says, *"The City will plan and integrate strategies to adapt to a changing climate into City operations, and will promote climate adaptation actions in the community."*

In 2008, the City of Fort Collins began work on assessing the potential impacts of climate change on its operations. Fort Collins Utilities was initially part of the ICLEI "Climate Resilient Communities" pilot program. This effort received guidance from a water and climate change advisor from NOAA/Western Water Assessment and also used additional advisors from Colorado State University and other City departments. Vulnerability and risk factors were identified based on anticipated impacts of climate change to the Fort Collins area.

In 2010, Fort Collins Utilities selected a consultant to pick up where the 2008 process ended. A key objective is to develop strategies to assist Utilities to evaluate possible impacts of climate change and help maintain the continuity of services. The planning process will assist staff in obtaining the best possible information when assessing capital projects and will help achieve a resilient and sustainable utility in the coming years. The scope of work will include assisting Utilities in synthesizing existing research and data on climate change to better inform water supply planning, asset management, and master plans. An additional outcome of this work will be a transferable framework for decision making that can be shared with other City departments to assist them in addressing potential climate change impacts to infrastructure and services.

V. CITY GOVERNMENT GHG EMISSIONS AND REDUCTIONS

City of Fort Collins Climate Protection Commitment

The City of Fort Collins has tracked its own municipal greenhouse gas emissions and produced biennial reports on efforts to reduce emissions since a Municipal Climate Protection Plan was adopted in 2001. However, the 2001 Municipal Plan did not establish a specific greenhouse gas reduction goal for the organization, nor were reduction efforts systematic or prioritized.

Building on early efforts and progress, the City joined its own Climate Wise program in April 2007. Becoming a Climate Wise partner created an opportunity to strategically evaluate carbon reduction potential across City operations, focus on systematic GHG emissions tracking and reporting, and set a GHG goal for City operations.

In 2009, the City set a goal to:

> ***Reduce GHG emissions from municipal operations at least 2% per year starting in 2009 in order to achieve a reduction of 20% below 2005 levels by 2020; ultimately to achieve carbon neutrality for the municipal organization.***

The municipal goal aligns with community and state goals to reduce emissions 20% below 2005 levels by 2020.

City of Fort Collins Greenhouse Gas Emissions

The City of Fort Collins has developed a greenhouse gas emissions inventory for its municipal operations, using the Climate Wise "Greenhouse Gas Baseline Tool". Figures 18 through 20 provide snapshots of the municipal 2005 baseline emissions and the current 2010 emissions.

Figure 18. 2005 Baseline Municipal Greenhouse Gas Inventory, by Source (49,900 Metric Tons CO_2e)

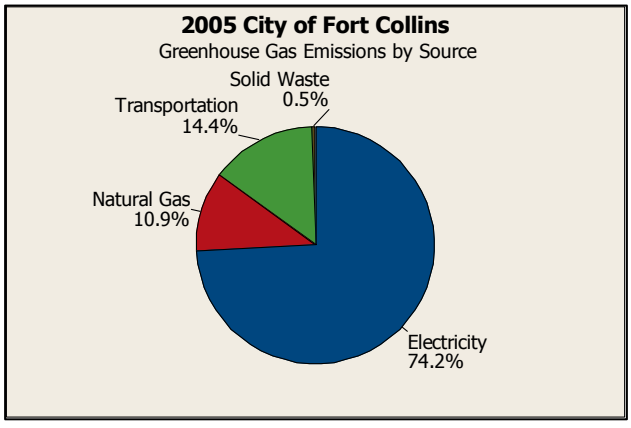


Figure 19. 2010 Municipal Greenhouse Gas Inventory, by Source (44,700 Metric Tons CO_2e)

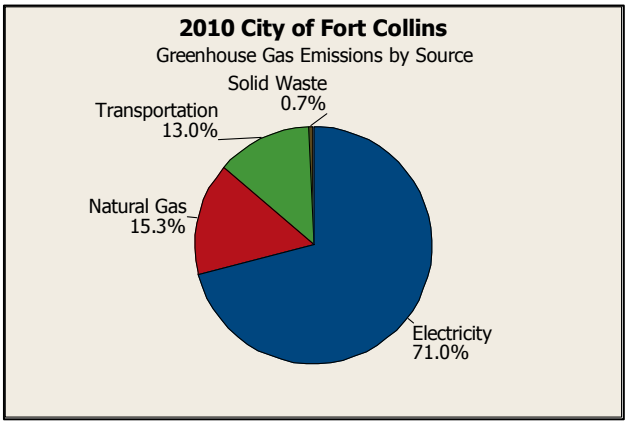
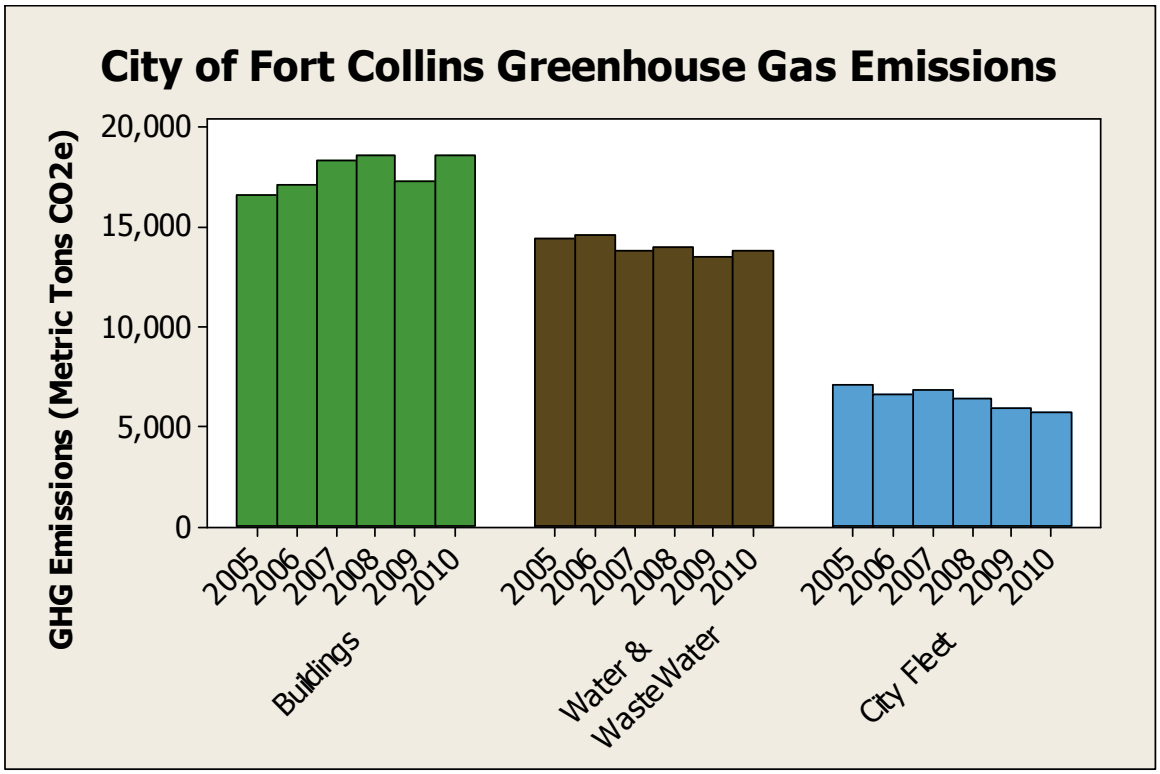


Figure 20. Trends in Major Components of Municipal Government GHG Emissions

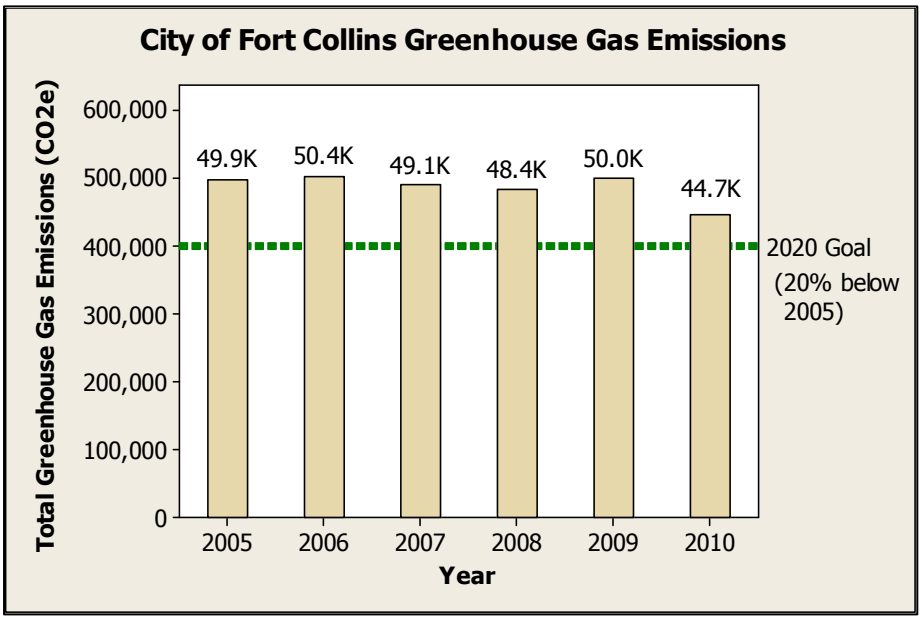


2010 Progress on GHG Reduction

The City of Fort Collins has adopted ten internal sustainability goals for its operations. The first goal is to reduce greenhouse gas emissions from municipal operations twenty percent below 005 levels by 2020.

From 2005 to 2010, greenhouse gas emissions dropped by 10 %, despite employee growth of over 1% in the same timeframe and a net increase in square footage of municipal buildings, as tracked in the City's Utility Manager database.

Figure 21. Total Municipal Greenhouse Gas Emissions (Metric Tons CO_2e)



Total municipal GHG emissions in 2010 were 5,170 metric tons lower than they were in 2005. This reduction is equivalent to:

- Annual greenhouse gas emissions from nearly 1,000 passenger vehicles
- CO_2e emissions from over 568,700 gallons of gasoline consumed
- CO_2e emissions from nearly 12,000 barrels of oil consumed

2010 Municipal Greenhouse Gas Reductions

Progress toward the City's goals is tracked by evaluating overall net emissions from municipal government activities. In addition, it is important to track and report GHG reduction from projects that contribute to the change in inventory levels. The GHG reduction benefit of several individual projects implemented by the City in 2010 is estimated below. Over 22,000 metric tons of CO_2e were avoided in 2010, based upon estimates for these projects. Many other actions were taken by City government to reduce emissions in 2010 that are not quantified below.

Table 7. City of Fort Collins 2010 GHG Reductions

City of Fort Collins Municipal Reductions Project	2010 Metric tons CO2e/yr
ENERGY	
Solid Waste Challenge	5
Earth Day Event	13
Waste Water Treatment Load Shedding	544
Computer Server Virtualization	21
Civic Center Parking	145
Electric Golf Carts	17
City Green Energy Purchases *	1,336
Northside Aztlan PV System	50
Methane Flaring/Heat Recovery at Wastewater Treatment Plant	939
Energy Total	**3,070**
RECYCLING	
Cardboard	90
Aluminum	1,583
Newsprint	2
Mixed Office Paper	179
Fiberboard	36
Food Waste	2
Commingled Recycling	337
Yard Waste (Cemetery)	10
Yard and Food Waste (Parks Dept)	100
Wood (mulched)	4,122
Scrap Metal	541
Asphalt& Concrete	9,395
Waste Reduction Total	**16,397**
TRANSPORTATION	
Hybrids (compared to average vehicle MPG)	19
Alternative Fuels (compared to traditional fuel)	1,350
Transportation Total	**1,369**
TOTAL QUANTIFIED REDUCTIONS	**22,172**

* These GHG reductions are calculated according to Green-E protocols regarding carbon equivalency statements.

City Government 2010 Action Highlights

Reduced Energy Use in Buildings

- A solar thermal system that captures sunlight to generate heat was installed on EPIC using $250,000 in funding from the Department of Local Affairs, the Bohemian Foundation, and the City. 96 tube collector panels and two hot water tanks were installed. The system is expected to save $8,000/year in heating bills at EPIC.
- A 5 kilowatt photovoltaic system was installed on the City office building at 215 N Mason.
- Operations Services adjusted Building Automated System building hours for coincident peak energy use and completed HVAC controls at 281 North College and 117 Laporte buildings.
- The MIS Department used $185,000 of ARRA funds for computer server virtualization to increase the efficiency of the system. 18 servers were "virtualized" in the last quarter of 2010 for a utility cost savings of $1,826 in the last quarter alone.
- The Fort Collins Museum/Discovery Science Center construction project and the Lincoln Center remodeling project are being built to meet LEED standards for certification.
- An audit of the Carnegie Building (formerly the Museum) was performed by Utilities, resulting in a number of recommendations for improving the efficiency of the building. The boiler was replaced, which will significantly improve the building's energy efficiency.
- Lighting fixtures at the Civic Center Parking Structure were replaced in 2010 with energy-efficient fixtures that require about half as much energy as the old fixtures. This has reduced the electricity usage in the garage and provided savings that will pay for the entire project in four to five years. (The useful life of the new fixtures is ten years.)
- The Natural Areas program installed solar-powered water pumps at Soapstone Natural Area.
- Among numerous efficiency measures, the Water Treatment Plant replaced six old 100-hp pump motors with new premium efficiency motors, installed a variable frequency drive on the administration area air handler motor, and installed computer control for the administration area HVAC system to allow for reduced heating and cooling during unoccupied hours.
- In 2010, the Drake Wastewater Treatment Facility avoided 771,428 kWh through load shedding and equipment replacements, saving $54,000 in 2010.
- Three City buildings were awarded ENERGY STAR plaques in 2010; 215 North Mason, 281 North College and the Operation Services building.

Recycling and Waste Diversion

- An in-vessel composting system demonstration project was installed using federal funding.
- Parks Maintenance installed BigBelly Solar compactors at Rolland Moore Park and Oak Street Plaza.
- The Natural Resources Department assisted with audits of the municipal organization's waste streams.

- Using funds from the newly created Waste Innovation Program, Forestry is diverting large tree stumps and trunks from landfills through a wood grinding project.
- A pilot project was initiated at two City facilities (Northside Aztlan Center and 700 Wood Street) to receive organics recycling collection service.
- The Natural Resources Department assisted the Police Department in forming new partnerships to recycle evidence room items. Confiscated "grow lights" were donated to CSU for the new Sustainable Agriculture Program.

Transportation

- An electric cart at the Water Treatment Plant was converted to solar power.
- Six new compressed natural gas busses were placed in service.
- The Parks Department set a goal to reduce total fuel consumed by 2.5% from 2009 use. New ideas that were implemented included: use of bicycles by botanical teams, assigning mowing crews to clean restrooms while servicing park sites, and other responsibilities rearranged for efficiencies.
- 155 employees participated in Bike to Work Day, avoiding 782 miles driven.
- Parks' electric golf carts avoided the combustion of 2,000 gallons of fuel in 2010.

Tracking and Reporting

- Federal funding was used to develop a new Greenhouse Gas Carbon Accounting System for the organization to help streamline various carbon reporting activities across the City organization.

- Parks is partnering with CSU in a turf grass carbon accounting research study.

Outreach

- Seven Business Environmental Program seminars were presented during the fall to members of the local business community, including "Beyond the Bin - Advanced Recycling Strategies", "Water Smart Landscapes", and "Greening the Fort".
- The Sustainability Team hosted an educational seminar on transportation options in Northern Colorado. The new SmartTrips website was showcased that allows easy ways to reduce transportation related greenhouse gas emissions and track the savings through carpool and vanpool services (see *smarttrips.org).*
- Sustainability scholarships were awarded to staff.
- City of Olympia, WA, Public Works Director, Michael Mucha presented on Triple Bottom Line concepts to City managers at the Strategic Issues Team meeting, and held two trainings that over 80 employees attended.
- The City organized an Earth Day tree planting event. The trees were donated by local businesses and City staff volunteered their time.

- The City co-sponsored the Sustainable Living Fair in September 2010. Parks, Utilities and Natural Resources shared a booth with education activities.
- Throughout City buildings, 87 new placards and signs were posted to better communicate sustainability, safety and health goals to employees.

2010 Progress on Municipal Sustainability Goals

The City of Fort Collins has adopted ten internal sustainability goals. Progress on the goals that pertain to reducing municipal GHG emissions is summarized here. More comprehensive annual progress reports on municipal sustainability are posted to fcgov.com/sustainability/.

> ***GOAL #1: Reduce greenhouse gas (GHG) emissions (carbon dioxide and methane) from municipal operations at least 2 %t per year starting in 2009, in order to achieve a reduction of 20% below 2005 levels by December 31, 2020; and ultimately to achieve carbon neutrality for the municipal organization.*** **(See page 24 for progress.)**

> ***Goal #2: (Electricity and Natural Gas): Reduce City energy consumption by 20% below the 2005 baseline by 2020 (2% annually), and reduce peak demand use 15% by 2020.***

Total electrical use decreased 2.7% and natural gas increased 25% between 2005 and 2010. The decline in electricity reflects facility efficiency upgrades and user efficiencies. The increase in natural gas may be partly attributed to increased production of fuel for the CNG busses.

Total energy use for municipal operations (electricity and natural gas as MMBTU) increased 8% from 2005 to 2010. Because electricity is a significant component (~ 75%) of total municipal GHG emissions, and the electricity emissions factor declined 11% from 2005 to 2010 (reflecting increased clean renewable energy in our portfolio), total GHG emissions declined.

Figure 22. Total City Electricity Use (kWh)

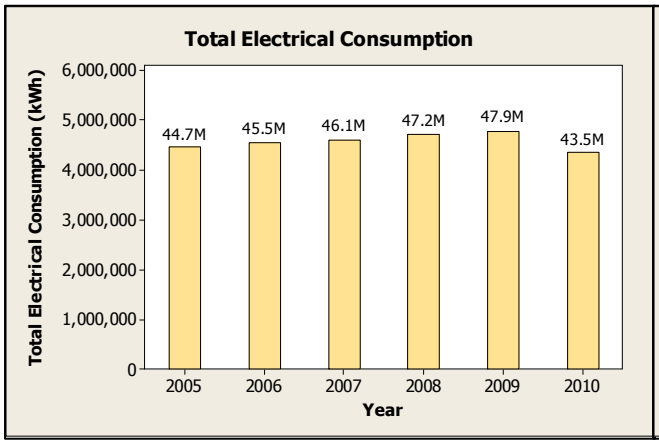
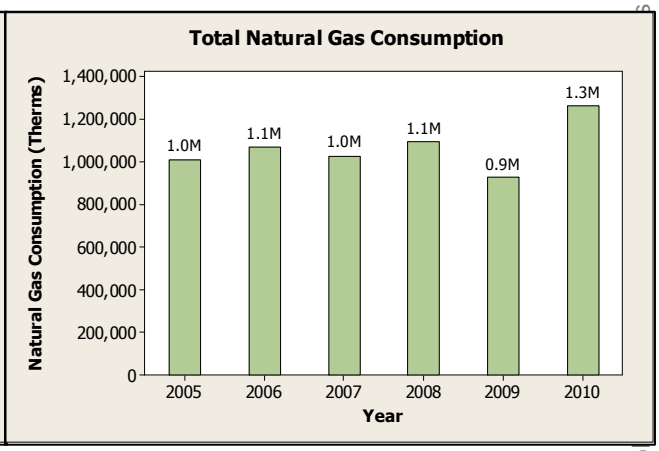


Figure 23. Total City Natural Gas Use (Therms)



Goal #3: (Fuel): Reduce traditional fuel use by the City's vehicle fleet 20% by 2020 and reach a 1.5 average vehicle ridership by 2020 for City employees.

Alternative fuels used by the City fleet include biodiesel, propane, compressed natural gas (CNG) and ethanol (E85). Considerable progress was made toward the 2020 goal when the City moved from piloting biodiesel use for a portion of diesel vehicles in 2005 to complete biodiesel (B20) use for all diesel engines in 2006. In 2010, the City was not able to obtain B20, and so used B10 in diesel powered engines. The City is currently meeting its goal to reduce traditional fuel use 20% below 2005 levels. Data are not available on "average vehicle ridership" of City employees.

Figure 24. City Fleets Traditional Fuel Use

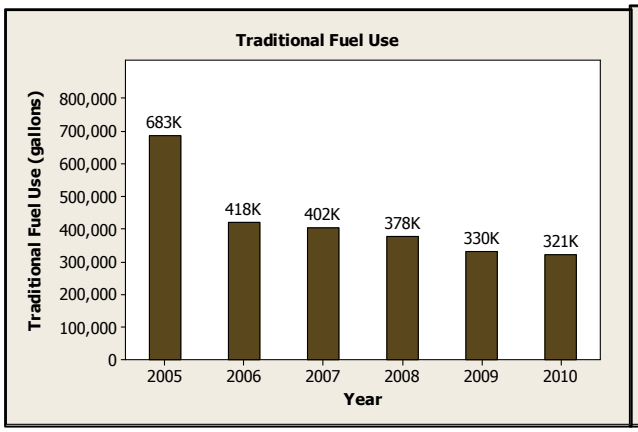
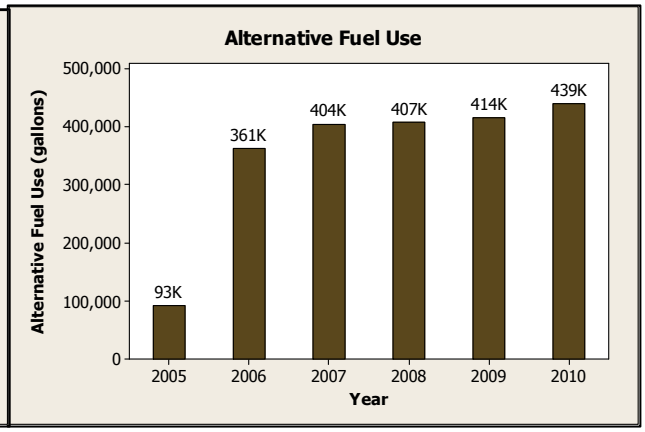


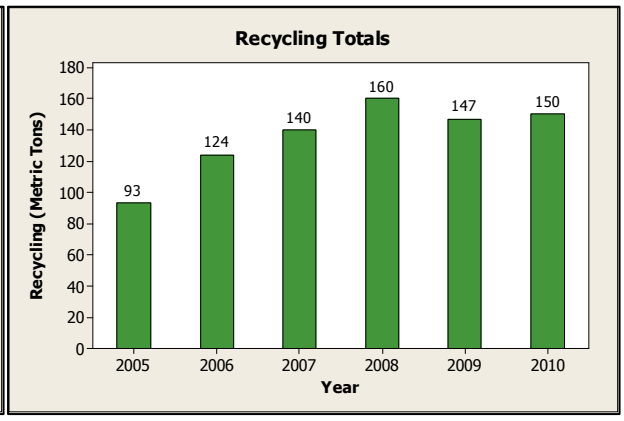
Figure 25. City Fleets Alternative Fuel Use



Goal # 4: (Solid Waste Reduction): Reduce solid waste generated by 50% of overall waste stream by 2012 and 80% by 2020. (Data as of July 18, 2011)

Figure 26. Municipal Trash Volumes

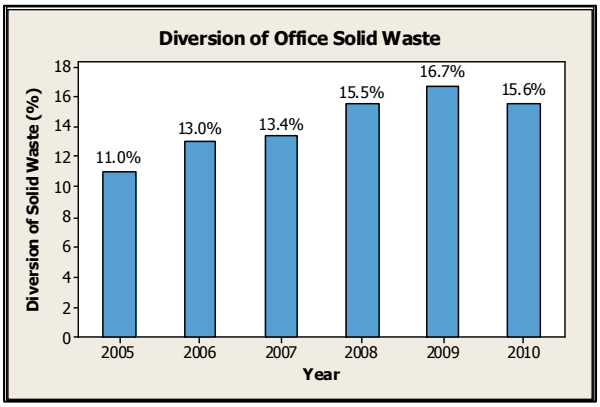
Figure 27. Municipal Office Recycling Volumes



Although waste volumes increased somewhat over the 2005 baseline, they have generally declined since a peak in 2007. This is in part attributable to increased recycling opportunities and outreach for City employees including a "Starve Your Trash" campaign. In 2010 a new trash collection contract was signed

that aims to reduce trash disposal and increase recycling. The City's recycling volumes have increased 62% above 2005 levels. By 2010, the City was diverting over 15% of its office-related waste stream. The diversion rate would increases significantly if "non-office" items such as asphalt and metal were included in the diversion rate calculation.

Figure 28. Municipal Office Waste Diversion Rate



APPENDIX A – Community GHG Accounting Summary

Greenhouse gas accounting protocols have evolved rapidly over the past few years and are continuing to evolve. In 2009 the City undertook a project to review and update community greenhouse gas accounting protocols to ensure we are using current best practices for community inventories. We evaluated our methodology with an eye towards relevance (percent of emissions total and ability to impact), completeness, consistency, transparency and accuracy. Fort Collins joins many other communities in conducting periodic methodology reviews and updates. As federal regulations regarding carbon reporting are promulgated, protocols will continue to evolve, and additional updates to Fort Collins' methodology are anticipated.

More details on Fort Collins' GHG emissions inventory, forecast and accounting methodologies can be found in the report entitled ***City of Fort Collins Community Greenhouse Gas Inventory Quality Management Plan***. Contact the City of Fort Collins Natural Resources Department at (970) 221-6600 for a copy.

GHG Inventory

- In the community GHG inventory, electricity-related emissions are estimated using a conversion factor based on Platte River Power Authority's resource mix that includes owned renewable generation but excludes Renewable Energy Certificates (RECs). The 2010 factor for this resource mix is 1,610 pounds of CO_2 per megawatt-hour. Although the benefits of RECs are not included when tracking the community inventory progress with respect to the 2005 baseline, they are factored into the "Revised Total Emissions" number. (See page 7.)
- Electricity and natural gas data are not "weather normalized" for the inventory.
- Landfill gas emissions reflect the benefit of the landfill gas capture system installed at the Larimer County Landfill in 2009. The community inventory does not "claim ownership" to these credits which are retired on behalf of the company who installed the system, but the community inventory aims to accurately portray the emissions associated with throwing trash in the landfill.
- "Energy in recyclable materials" reflects the embodied energy in these materials that could be avoided if they were instead recycled. It is calculated assuming Fort Collins still throws as much cardboard, newspaper, office paper, magazines, phonebooks, glass, aluminum, steel and wood into the landfill as we did in 2006.

GHG Reductions

- Energy efficiency program annual electricity savings are converted to carbon emissions reductions using a standardized conversion factor. The 2010 factor is 1,554 pounds of carbon dioxide avoided per megawatt-hour of electricity savings. It is based on the *US EPA eGRID2010 Version 1.1* non-baseload emission rate calculations for the Western Electric Coordinating Council (WECC) Rockies subregion for 2007.
- Renewable energy credits are reported in electricity units of megawatt-hours. Carbon emissions reductions are estimated and reported here ***for information purposes only***. The calculation uses

a method prescribed by Green-e for estimating GHG emissions reductions due to REC purchases. The factor for 2010 is 1,351 pounds of carbon dioxide avoided per megawatt-hour of electricity savings.

- The *Refrigerator and Freezer Recycling Program* provides an additional mechanism for reducing greenhouse gas emissions through the destruction of CFC-11 contained in the foam insulation of the recycled products. CFC-11 is a powerful greenhouse gas. The program collects the foam insulation from the de-manufactured appliances and destroys it by incineration. The impact of removing greenhouse gases other than carbon dioxide from the atmosphere is calculated with conversion factors known as GWP (global warming potential). The Intergovernmental Panel on Climate Change (IPCC 2001) lists the GWP of CFC-11 as 4,680. This multiplier also is known as a carbon equivalent factor (CO_2 has a GWP of 1.0).

- Transportation projects that reduce citizen driving assume these reductions occur in the light duty vehicle portion of miles driven in Fort Collins.

- Community carbon reductions from recycling are calculated based on emission factors from the Climate Wise Greenhouse Gas Baseline Tool. These factors are based on factors from EPA's WARM (Waste Reduction Model) model.

Prepared by the City of Fort Collins Energy Management Team

(970) 221-6600