Fort Collins Climate Action Plan

2009 Status Report

City of Fort Collins

July 2010

ACKNOWLEDGEMENTS

Congratulations Fort Collins, community greenhouse gas emissions are leveling off. This has required leadership on the part of many.

Thank you to Fort Collins citizens and businesses for providing input to City planning and policy decisions and for participating in programs to reduce greenhouse emissions, save energy, and improve the environment.

Thank you to Fort Collins City Council for establishing carbon emissions reduction goals and adopting the 2008 Climate Action plan and supportive policies and programs.

Doug Hutchinson, Mayor

Kelly Ohlson, Mayor Pro Tem, District 5

Ben Manvel, District 1

Lisa Poppaw, District 2

Aislinn Kottwitz, District 3

Wade Troxell, District 4

David Roy, District 6

Thank you to the 2007/2008 Fort Collins Climate Task Force for their significant contribution to the 2008 Climate Action Plan and their inspiring vision of Fort Collins as a carbon neutral, environmentally sustainable, economically healthy community that offers its citizens a high quality of life.

Thank you to numerous City Council advisory boards who provided input to the 2008 Climate Action Plan and on-going related policy issues, and who track progress on community goals.

Air Quality Advisory Board, Economic Advisory Commission, Electric Board, Natural Resources Advisory Board, and Transportation Board.

Thank you to the Fort Collins City Manager for leadership in all areas of sustainability and to City staff for working to implement carbon reduction strategies.

Darin Atteberry, City Manager

Thank you to the City's Energy Management Team for compiling this report and for discussing, tracking and reporting on community carbon emissions and reductions since 2000.

Ken Mannon (Lead), Lucinda Smith (Coordinator), Kathy Collier, Susie Gordon, Dave Grice, Felix Lee, Tracy Ochsner, Jim O'Neill, John Phelan, Stu Reeve, Rosemarie Russo, John Stokes, Steve Strickland, Norm Weaver.

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(Revised September 2010, incorporates corrections to Executive Summary page 7.)

Fort Collins Climate Action Plan

2009 Status Report
EXECUTIVE SUMMARY

City of Fort Collins

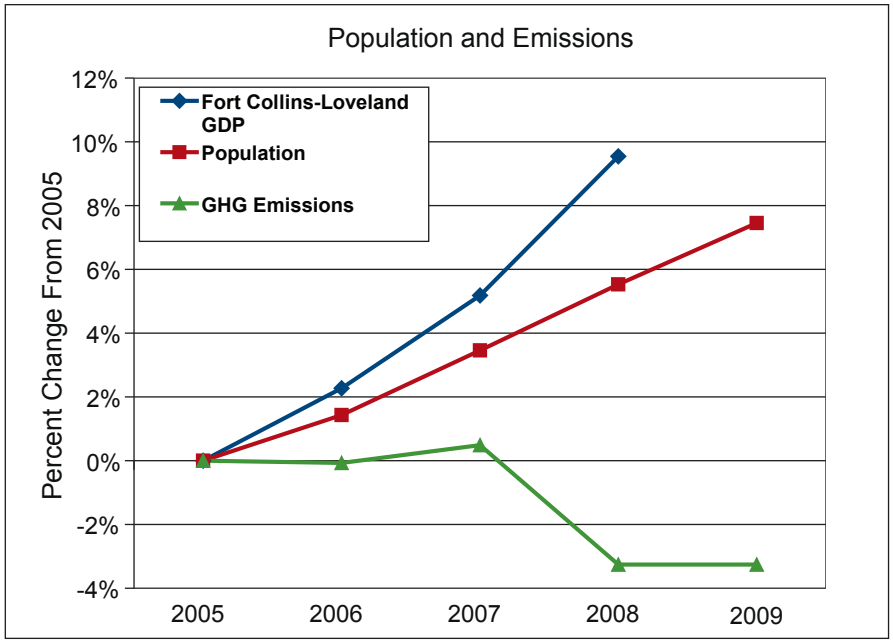
Congratulations Fort Collins

Community Greenhouse Gas (GHG) Emissions are Leveling Off

More than 10 years ago, Fort Collins was among the first wave of communities in the nation to commit to reducing local greenhouse emissions. Through innovation, leadership and local involvement, the community has benefited significantly from climate protection actions. For example, Climate Wise partners saved more than $8.4 million while avoiding more than 100,000 metric tons of carbon dioxide equivalent (CO_2e)

Today, thanks to the efforts of the entire community, we have changed the trajectory of the emissions growth curve.

Despite a 7.5% growth in population and rising regional Gross Domestic Product (GDP), our community emissions have dropped slightly since 2005.



GHG Emissions Avoided

Together, we avoided more than 312,000 metric tons CO_2e in 2009, or just over 10% of the total inventory.

This is equivalent to annual GHG emission from:

- 60,000 passenger cars
- Energy used in 26,000 homes
- Recycling more than 105,000 tons of material

Action Highlights

Climate Wise partners avoided over 100,000 metric tons CO_2e and saved more than $8.4 million in 2009 alone.

Citizens and businesses participating in City energy efficiency programs avoided almost 28,000 metric tons CO_2e in 2009.

6.4% of our electricity is generated by clean, renewable energy.

Transfort ridership grew by 422,000 riders/trip from 2005 levels; or a 28% increase.

The number of VanGo vans increased by 53% since 2005.

We are sending 78,000 tons less solid waste to the landfill than in 2005.

Community waste diversion rates increased to 38%.

Air Pollution Reduction

2009 community actions also reduced the following air pollutants that contribute to ground-level ozone:

- 50,000 pounds nitrogen oxides
- 12,400 pounds carbon monoxide
- 2,600 pounds VOCs

HOW DOES FORT COLLINS COMPARE?

Fort Collins' 2009 per person emissions were 19 metric tons CO_2e, just below the Colorado and US average.

Average Per Person GHG Emissions (Metric tons/year)

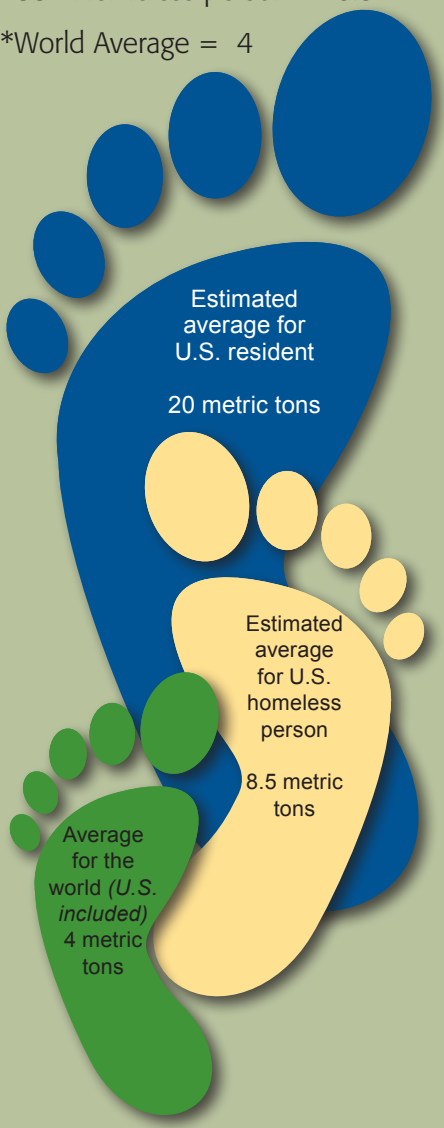
Colorado average = 21

*USA average = 20

Fort Collins average = 19

*USA Homeless person = 8.5

*World Average = 4

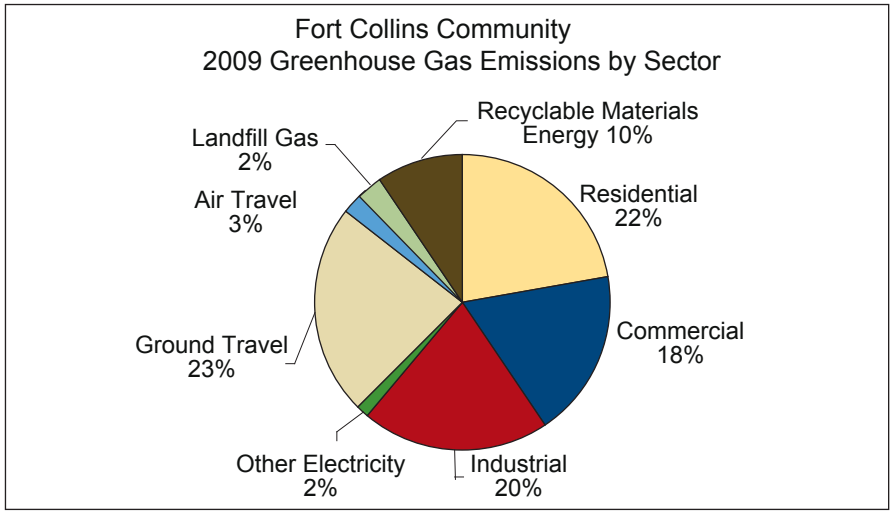


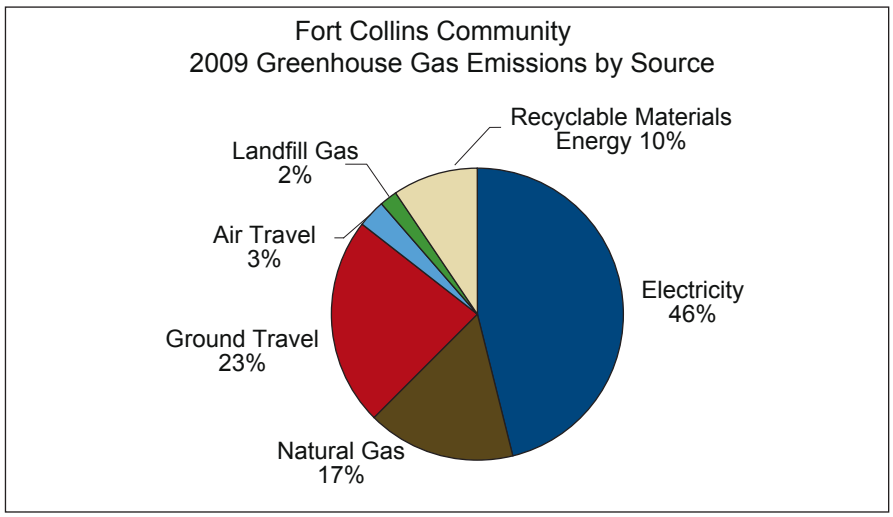
*Source = MIT Study, *www.sciencedaily.com*

COMMUNITY CARBON FOOTPRINT

In 2009, the Fort Collins community emitted 2,692,000 metric tons of CO_2e. This includes:

- Combustion of fossil fuel that occurred inside the community boundary—specifically, fuel for ground transportation and building heating
- Emissions from electricity used in the community but generated outside the community
- Indirect emissions that result from Fort Collins' activities which physically occur outside the community boundary, including:
  - emissions from trash thrown in the landfill
  - emissions from embodied energy of potentially recyclable materials thrown in the landfill
  - airline travel by Fort Collins citizens and businesses

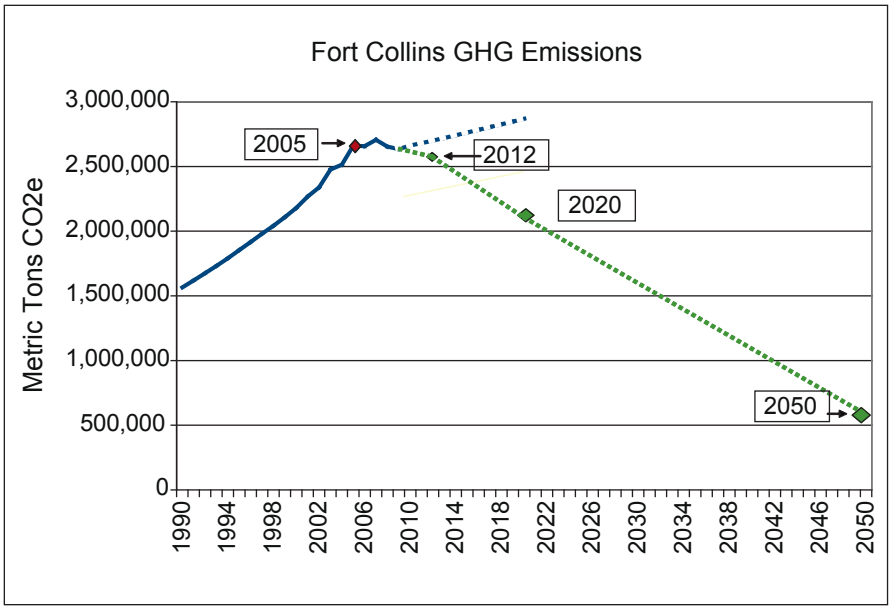




OUR GOALS

There is widespread scientific consensus that human emissions of greenhouse gases are impacting the Earth's climate system, causing the potential for unprecedented large-scale adverse health, social, economic and ecological effects. Climate disruption may already be causing damage to the economic health and environment of Colorado communities. In recognition of the local and global risks of climate change, as well as the benefits that come from proactive action, 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



A vision without a plan is just a dream.

A plan without a vision is just drudgery.

But a vision with a plan can change the world.

Proverb

Shared goal to reduce emissions 20% below 2005 levels by 2020 include:

- State of Colorado
- Fort Collins community
- City of Fort Collins municipal government

How much is a metric ton of CO_2 anyway?

A metric ton weighs 2,200 pounds. One metric ton of carbon dioxide gas would fill a 30-foot diameter balloon.

One metric ton of CO_2 contains 600 pounds of carbon. This is the amount of carbon released from burning 120 gallons of gasoline.

The average per capita emissions in Fort Collins is 19 metric tons CO_2e per year. That equates to a 10 square blocks of carbon for each person.

Community Action Matters

How We'll Get There

In 2008, City Council adopted the 2008 Fort Collins Climate Action Plan to guide community progress towards the adopted reduction goals. See *fcgov.com/climateprotection.*

Future Actions

(All actions that require Council approval will be considered by Council along with cost and benefit information.) High priority actions include:

- Implementation of 2009 Fort Collins Energy Policy
- Continued growth of the Climate Wise program
- Completion of Plan Fort Collins process with future focus on community sustainability and carbon reduction
- Expansion of recycling and waste reduction programs
- Progress on Mason Corridor and Transfort Strategic Plan
- Advancement of Green Building Program and building code updates
- Community Climate/Action Challenge

Funding Assistance

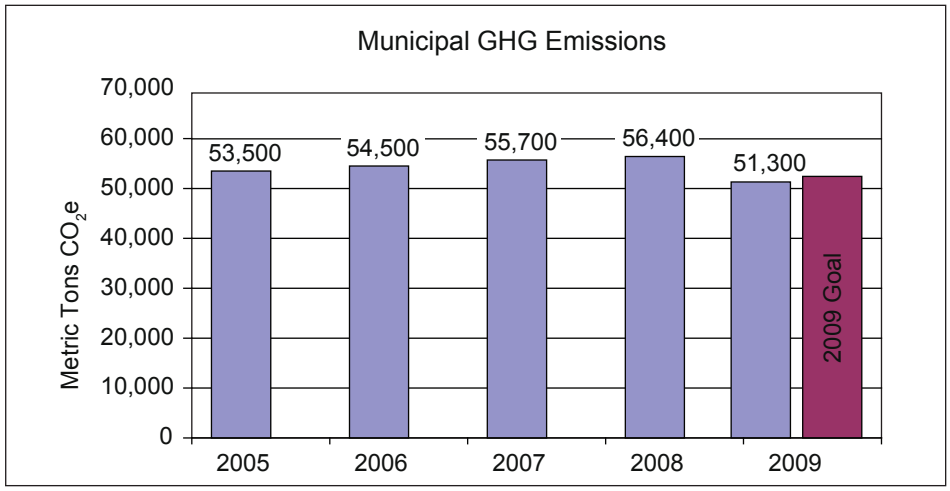
- $15M from U.S. Department of Energy to support creation of Advanced Meter Infrastructure
- $2.4M federal stimulus funds for six compressed natural gas Transfort buses
- $1.3 million in federal stimulus funding through the Energy Efficiency and Conservation Block Grant Program to implement carbon reduction projects within City government and in the community
- $993,603 from Platte River Power Authority to fund energy efficiency programs in Fort Collins
- $72,000 from the Colorado Governor's Energy Office to implement a Sustainability Information Management System to help focus business customer outreach, programs and education
- $ 6.3M from U.S. Department of Energy and $2.8M from Colorado Department of Local Affairs to move forward with FortZED, an effort to create a zero-energy district in Fort Collins
- $11.8M in the FY2009 federal Appropriations Bill to cover project development costs for the Mason Corridor

Municipal GHG Goals and Progress

The City of Fort Collins has 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 Dec. 31, 2020; and ultimately to achieve carbon neutrality for the municipal organization. This goal is in harmony with the community and state-wide 2020 reduction goal.

From 2005 to 2009, municipal greenhouse gas emissions dropped by 4%, or 2,200 metric tons. The GHG reductions are equivalent to:

- Annual greenhouse gas emissions from about 400 passenger vehicles
- CO_2e emissions from the energy used by more than 260 homes for one year
- Carbon sequestered by over 50 million tree seedlings grown for 10 years
- GHG emissions avoided by recycling 725 tons of material each year (equal to the weight of 3,625 gorillas)



City Government 2009 Environmental and Financial Highlights

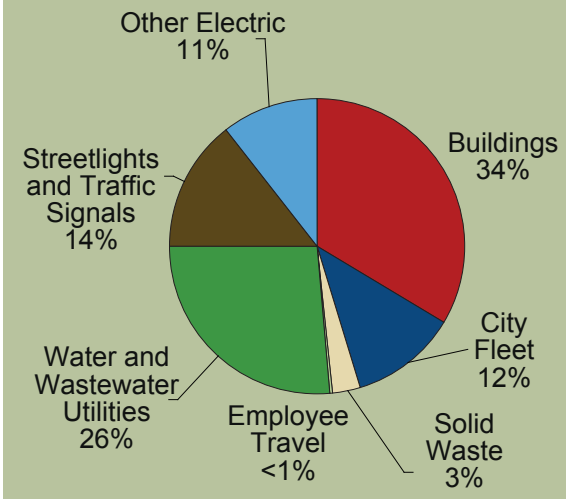
The City saved more than $500,000 in 2009 alone from implementing projects to reduce greenhouse gas emissions including:

Project	Annual Savings
Asphalt, Concrete and Toilet Rebate/Recycling	$313,360
Building Energy Challenges	$79,820
Metal Recycling	$69,000
Wastewater Load Shedding	$54,000
Parks Water Savings	$19,024
EPIC Lighting Retrofits (High Bay Fluorescent)	$14,259
Lincoln Center Lighting	$10,606
Wood Recycling	$6,545
HVAC & Variable Frequency Drives	$5,212
Trash Downsizing	$5,000
Operation Services Lighting Retrofit	$4,535
Water Treatment Lighting Retrofits	$1,470
Coffee Pot Timers	$301
TOTAL	$583,132

Municipal Government Carbon Footprint

The City of Fort Collins emitted 51,300 metric tons CO_2e in 2009, or 2% of the communitywide emissions. In 2009, 75% of total municipal emissions came from electricity use, followed by 12% from transportation. 40% of emissions come from providing public services such as water treatment and wastewater reclamation, streetlights and traffic signals.

2009 City of Fort Collins
Municipal Greenhouse Gas Emissions



Simple Things You Can Do To Reduce Your Carbon Footprint

Use Power Strips and Timers

SAVE $21/yr. - AVOID 485 lbs CO_2

Plug loads for household electronics account for 5–10% of residential energy use. Using power strips makes it easier to turn everything completely off at once. *(Payback in only 6 months!)*

Trip Chain *(Combine errands into one trip)*

SAVE $25+/yr. - AVOID 190+ lbs CO_2

Combining three short trips into one trip chain every week could eliminate about 200 miles on your vehicle each year. That adds up to a savings of 10 hours and 9.5 gallons of gas each year.

Check Your Tire Pressure

SAVE $80+/yr. - AVOID 570+ lbs. CO_2

About one in four cars, SUVs, vans and pickups have tires filled at least eight pounds below proper levels. Properly inflated tires can save up to 5% on gasoline.

Subscribe to Green Energy

PAY $64/yr. - AVOID 5,100+ lbs. CO_2

Residents can purchase clean renewable energy to guarantee that it comes from the cleanest sources available. The average household uses 700 kWh of electricity each month. A 263 kWh block costs $5 per month. Contact Fort Collins Utilities at 221-6700 for more info.

Install Four Compact Fluorescent Lights (CFLs)

SAVE $120/bulb life - AVOID 2,800 lbs. CO_2

Install four CFL bulbs to save time, energy and money. Today's ENERGY STAR® CFLs last up to 10 times longer than standard bulbs and use 2/3–3/4 less energy than standard bulbs.

Reduce Hot Water Heater Temperature to 120° F

SAVE $30/yr. - AVOID 200 lbs. CO_2

For each 10ºF reduction in water temperature, you can save between 3–5% in energy costs. Although some manufacturers set water heater thermostats at 140ºF, most households usually only require them set at 120ºF or even 115ºF. Water heated at 140ºF also poses a safety hazard—scalding. Lower temperatures also reduce mineral build-up.

Wash Clothes in Cold Water

SAVE $18/yr. - AVOID 230 lbs. CO_2

If you wash with warm water and rinse with cold water, switching to cold could save you up to $20 a year—your savings can be more than double if you currently wash and rinse with warm. Since 80–90% of the energy used in doing the wash is used to heat the water, you may save both energy and money by switching your washing machine dial to cold and leaving it there!

Simple Things You Can Do To Reduce Your Carbon Footprint *(Continued)*

Dry Clothes on a Clothes Line

SAVE $34/yr. - AVOID 4,400 lbs. CO_2

It's easier on your clothes, will save you money, and is better for the environment, not to mention the fresh smell your clothes will have.

Right-Size Your Trash Bin

SAVE $60/yr. - AVOID 136 lbs. CO_2

Fort Collins has a volume-based trash rate system, called "Pay-As-You-Throw," that provides direct economic rewards for people who reduce the amount of waste they generate. Residents are charged for trash in the same way they get billed for the amount of electricity, gas and other utilities that they use, therefore the less you throw away, the less you pay. Contact your hauler to minimize you trash bin size and maximize your recycling bin size.

Reduce your Food Footprint

- Eat more local, organic, in-season foods.
- Plant a garden-it doesn't get more local than that.
- Shop at your local farmer's market or natural foods store.
- Choose foods with less packaging to reduce waste.
- Buy local and reduce the amount of energy required to bring your materials to the store.

Become a smart water consumer

- Water the lawn only when needed.
- Reduce your daily shower by 45 seconds and save 2 gallons of water each day. Showers account for 2/3 of all water heating costs
- Check toilets for leaks and fix immediately. Pick up free dye tablets at the Utility Billing Offices.
- Replace older toilets with low-flow (1.6 gallons per flush) fixtures; or put a filled plastic bottle in the tank.

City of Fort Collins

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I. INTRODUCTION

Widespread scientific consensus exists that human emissions of greenhouse gases (GHG) are impacting Earth's climate system, causing the potential for unprecedented, large-scale, and adverse health, social, economic and ecological effects. In May 2010, 255 scientists from the National Academy of Sciences published an open letter that expressed their significant concerns about climate change. They said, "There is compelling, comprehensive and consistent objective evidence that humans are changing the climate in ways that threaten our societies and the ecosystems on which we depend." They adhere to these fundamental conclusions about climate change:

> (i) The planet is warming due to increased concentrations of heat-trapping gases in our atmosphere. A snowy winter in Washington does not alter this fact.
>
> (ii) Most of the increase in the concentration of these gases over the last century is due to human activities, especially the burning of fossil fuels and deforestation.
>
> (iii) Natural causes always play a role in changing Earth's climate, but are now being overwhelmed by human-induced changes.
>
> (iv) Warming the planet will cause many other climatic patterns to change at speeds unprecedented in modern times, including increasing rates of sea-level rise and alterations in the hydrologic cycle. Rising concentrations of carbon dioxide are making the oceans more acidic.
>
> (v) The combination of these complex climate changes threatens coastal communities and cities, our food and water supplies, marine and freshwater ecosystems, forests, high mountain environments, and far more.

In April 2010, the U.S EPA released a report titled "Climate Change Indicators in the United States". (See http://www.epa.gov/climatechange/indicators.html.) This report identifies a number of climate change impacts that are already occurring in the U.S., including:

- Greenhouse gas emissions from human activity increased 14% in the U.S from 1990 to 2008.
- Radiative forcing from all greenhouse gasses increased 26% from 1990 to 2008. (Radiative forcing measures how substances like greenhouse gases affect the amount of energy absorbed by the atmosphere. An increase in radiative forcing leads to warming.)
- 2000 – 2009 was the warmest decade on record worldwide.
- The frequency of heat waves in the U.S. decreased in the 1960's and 1970's and has increased steadily since then. The percentage of the U.S. experiencing heat waves has also increased.
- Glaciers in the U.S. and around the world have generally shrunk since the 1960's, and the rate at which glaciers are melting appears to have accelerated over the past decade.

Over a decade ago Fort Collins was among the first wave of communities in the nation to commit to reducing local greenhouse emissions. City Council adopted a greenhouse gas reduction goal for 2010 and a plan to meet it. Through innovation, leadership and local involvement, the community has benefited significantly from climate protection actions. Thanks to the efforts of the voluntary Climate Wise Program business partners, for example, in 2009 innovative businesses avoided emitting more than 105,000 metric tons of CO_2e, while saving over $8.4 million.

In May 2008, via Resolution 2008-051, City Council set new communitywide goals that align with state goals:

- Reduce community emissions 20% below 2005 levels by 2020
- Reduce community emissions 80% below 2005 levels by 2050

At the same time, City Council expressed their intent to reduce communitywide emissions to a level comparable to 3% below 2005 by 2012, indicating their interest in making timely progress towards the 2020 goal. 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 Climate Protection Timeline

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

1997 – City joins *ICLEI- Local Government's 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, making Fort Collins the 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
2009 – First progress report for the 2008 Climate Action Plan

In addition to adopting an updated Climate Action Plan in 2008, City Council Resolution 2008-051 calls for an annual report tracking progress toward attainment of the goals. The Resolution directs the annual report to evaluate community greenhouse gas emissions and list quantified reduction activities for the prior year. This report is prepared by the City's Energy Management Team and presented to the City Manager no later than June for the prior year. This report for 2009, written in 2010, is the second annual progress report on the 2008 Climate Action Plan.

II. COMMUNITY GHG EMISSIONS

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 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 (i.e., 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, or 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*, or CO_2e, were emitted by the Fort Collins community, after accounting for the benefits of metered wind energy from the Platte River power Authority Medicine Bow site. The community baseline inventory includes the following emissions:

- Combustion of fossil fuel that occurred inside the community boundary; specifically, fuel for ground transportation and building heating (defined as Scope 1 emissions)
- Indirect emissions from electricity purchased by Fort Collins Utilities for use in the community but generated outside the community boundary (Scope 2 emissions)
- Indirect emissions that result from Fort Collins' activities which occur outside the community boundary, such as emissions from trash thrown in the landfill, emissions from embodied energy of potentially recyclable materials thrown in the landfill and emissions from airline travel by Fort Collins citizens (Scope 3 emissions).

Table 1 identifies Fort Collins' baseline emission in metric tons of CO_2e.

---

* 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.

Table 1. Fort Collins 2005 Baseline Greenhouse Gas Emissions

Source	MT CO2e	Type
Electricity	1,209,359	Indirect (Scope 2)
Natural Gas	391,192	Direct (Scope 1)
Ground Transport	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**	

RECs = Renewable Energy Certificates
Offsets = Certified carbon offsets purchases by Fort Collins residents or businesses

2009 Community Inventory

The 2009 community GHG inventory was calculated using the same approach as the 2005 baseline. Results are shown below in Table 2.

Table 2. Fort Collins 2009 Greenhouse Gas Emissions

Source	MT CO2e	Type
Electricity	1,192,558	Indirect (Scope 2)
Natural Gas	428,105	Direct (Scope 1)
Ground Travel	601,835	Direct (Scope 1)
Air Travel	82,538	Indirect (Scope 3)
Landfill Gas	52,026	Indirect (Scope 3)
Recyclable Materials Energy	247,498	Indirect (Scope 3)
Total	**2,604,559**	
Benefit of RECs	-56,684	
Benefit of Known Offsets	-85	
Revised Total	**2,547,790**	

The graphs in Figures 1 and 2 on the next page show the 2005 baseline and 2009 emissions according to source categories.

Figure 1. 2005 Baseline Emissions by Source

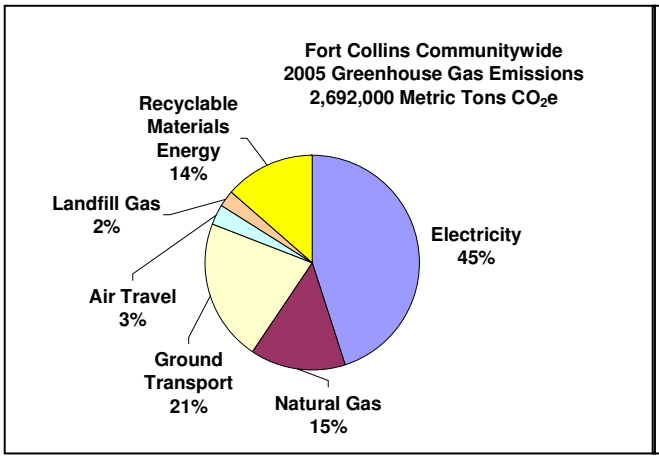
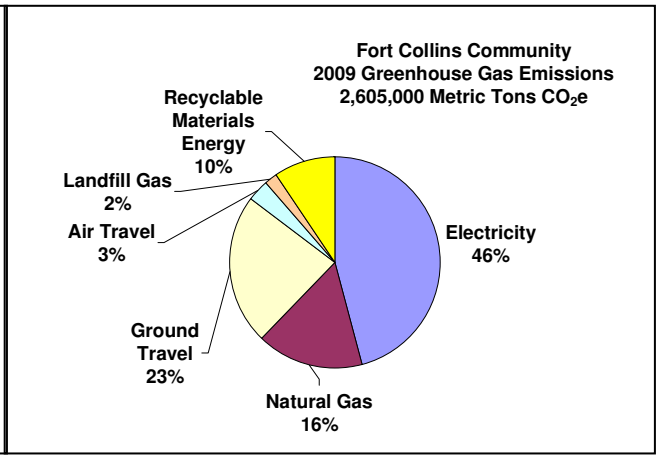


Figure 2. 2009 Emissions by Source



The graphs in Figures 3 and 4 show the 2005 baseline and 2009 emissions according to end user categories.

Figure 3. 2005 Baseline Emissions by End User

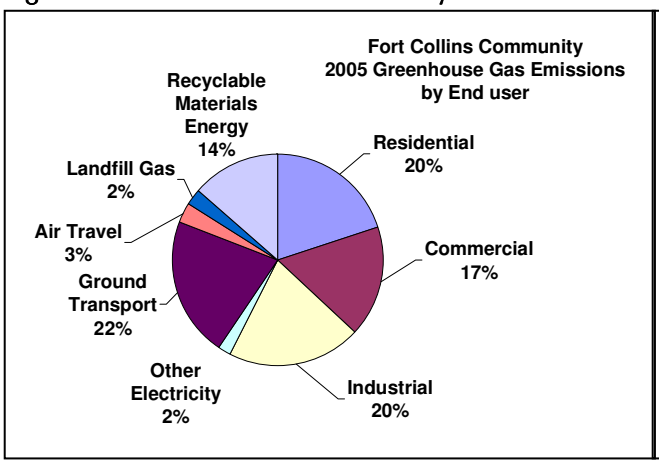
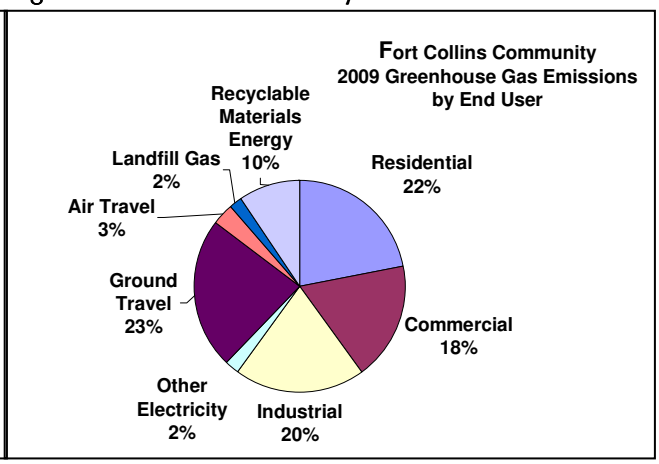


Figure 4. 2009 Emissions by End User



III. COMMUNITY PROGRESS

Greenhouse Gas Trends

Progress on the community GHG goals is measured by changes in the total emissions level. As adopted, Fort Collins' reduction goals are not a "per capita" measurement. That means progress must be made in lowering total emissions, regardless of population growth rates. From 2005 to 2009, community greenhouse gas emissions dropped by 3.2% from 2005 levels, while population grew by 7.5% during this period and regional gross domestic product grew as well from 2005 through 2008. Figures 5 and 6 illustrate this trend.

Figure 5. Fort Collins GHG Emission Trend

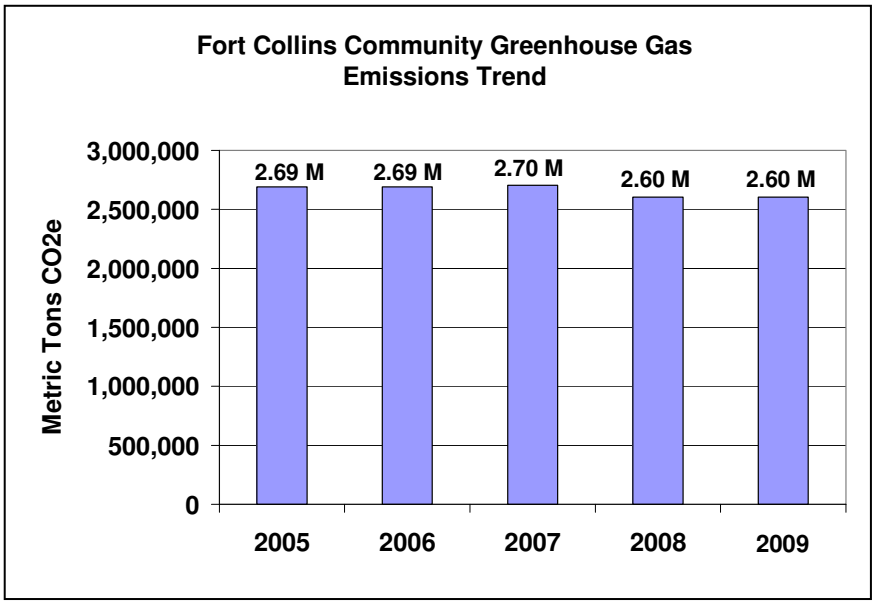
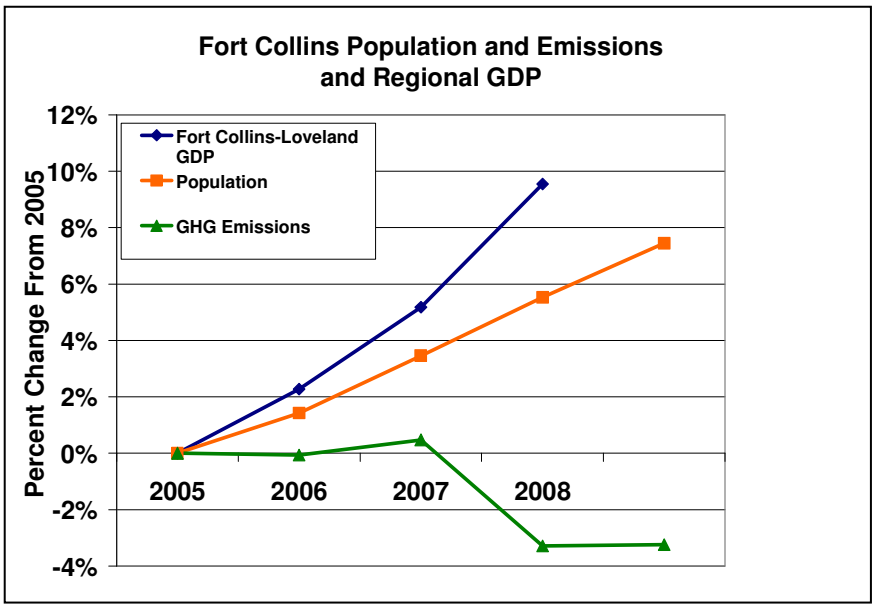


Figure 6. Fort Collins GHG Emissions and Population, and Regional GDP Trend



The tables below illustrate emissions trends in various sectors over time.

Table 3. Fort Collins Greenhouse Gas Emissions; 2005 through 2009

GREENHOUSE GAS EMISSIONS	2005	2006	2007	2008	2009	Percent Change 2005 to 2009
Population	127,686	129,511	132,101	134,743	137,200	7.45%
	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	-1.39%
Natural Gas	391,192	389,209	411,439	432,310	428,105	9.44%
Ground Transportation	573,190	580,221	587,338	594,542	601,835	5.00%
Air Travel	86,933	88,742	93,405	92,082	82,538	-5.06%
Landfill Emissions	62,731	64,202	64,707	58,367	52,026	-17.06%
Energy in Recyclable Materials	368,433	348,215	353,084	290,582	247,498	-32.82%
TOTAL EMISSIONS	**2,691,839**	**2,690,160**	**2,704,675**	**2,603,486**	**2,604,559**	**-3.24%**
Per Capita Net GHG Emissions	21.1	20.8	20.5	19.3	19.0	-9.95%
Benefits of RECS and Offsets	-11,050	-16,833	-48,590	-53,488	-56,769	413.77%
Revised Total Emissions	2,680,789	2,673,327	2,656,085	2,549,999	2,547,790	-4.96%

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 (PRPA) electricity portfolio. The electricity emissions factor went up in 2009 because PRPA's mix of sources in 2009 included less (cleaner) hydro-electric power than in 2008. If the electricity emissions factor was held constant at 2008 levels, 2009 community emissions would be almost 3% lower than they are.

Key Community Indicators

Table 4 on the next page identifies the trend in many indicators that contribute to greenhouse gas emissions in Fort Collins.

Table 4. Key Community Indicators

	2005	2009	Percent Change 2005 to 2009
Fort Collins population	127,686	137,200	7.45%
RESIDENTIAL			
Residential Electricity (MWh)	454,070	466,229	2.68%
Per Capita Electricity (MWh/person)	3.6	3.4	-4.44%
Residential Natural Gas (DTH)	2,968,669	3,582,743	20.69%
Per Capita Natural Gas (DTH)	23.2	26.1	12.32%
Per Capita Residential Buildings- Tons CO2/person	4.2	4.2	-1.26%
COMMERCIAL			
Commercial Electricity (MWh)	474,176	492,961	3.96%
Commercial Natural Gas (DTH)	1,207,770	1,352,791	12.01%
INDUSTRIAL			
Industrial Electricity (MWh)	464,278	446,090	-3.92%
Industrial Natural Gas (DTH)	3,051,712	2,974,045	-2.55%
TOTAL ENERGY			
Electricity (MWh)*	1,459,322	1,479,538	1.39%
Per Capita MWh	11.4	10.8	-5.65%
Natural Gas (DecaTherms)	7,228,151	7,909,579	9.43%
Per Capita DecaTherms	56.6	57.6	1.84%
TRANSPORTATION			
Estimated Vehicle Miles Traveled	997,420,380	1,047,266,505	5.00%
VMT/person/yr	7,812	7,633	-2.28%
VMT/person/day	23.7	23.1	-2.28%
Annual Transit Ridership	1,481,000	1,904,229	28.58%
WASTE and RECYCLING			
Short Tons Waste Generated	237,747	159,708	-32.82%
Tons Recycled Material	**	76,494	
Percent Waste Diversion Including Pay-As-You-Throw Benefit	**	38.38%	

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

** Data not available using current methodology

Summary of Highlights: 2005 to 2009

- Total community GHG emissions dropped by 3% while population grew by over 7%.
- Per capita GHG emissions dropped by 10%.
- Per capita electricity use dropped by 6%.
- Annual transit ridership increased by 29%.
- Tons of waste sent to the landfill dropped by 33%.

IV. 2009 COMMUNITY ACTION HIGHLIGHTS

Quantified Communitywide Greenhouse Gas Reductions

In 2009, Fort Collins avoided over 257,000 metric tons of CO_2e from specific, quantified communitywide projects before the benefits of green energy are factored in. The tons avoided rise to over 312,000 metric tons when green energy is factored in. Although countless other projects may have occurred during 2009, they were not evaluated for their carbon reduction benefits because progress on the goals is tracked primarily through changes in overall emission levels.

Table 5. 2009 Estimated Community GHG Reductions

Community Reductions	2009
Project name	Metric tons CO2e/yr
Climate Wise Program	
Electric Energy Efficiency projects	42,549
Renewable Energy Projects**	13,849
Natural Gas Projects	15,413
Recycling/Waste Diversion	30,432
Transportation	2,144
Water	1,130
Climate Wise Total	**105,518**
ENERGY	
Electric Efficiency Program Savings (2002 - 2009)	46,979
Metered Renewable Energy	10,013
Renewable Energy Certificates**	56,685
RFR Program CFC-11 Destruction	5,919
Building Codes Changes Since 2005	2,474
Energy Total	**122,070**
WASTE REDUCTION	
Residential Recycling	43,055
Commercial Recycling	104,320
Waste Reduction Total	**147,376**
TRANSPORTATION	
Transfort Bus	3,479
Van Go vanpool	264
BioDiesel (City of Fort Collins)	128
Bike Library and Bike To Work Day	23
Transportation Total	**3,894**
TOTAL QUANTIFIED REDUCTIONS without RECs *	**255,811**
TOTAL QUANTIFIED REDUCTIONS with RECs *	**312,495**

* Total corrected for Double-counting

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

These reductions are comparable to avoiding:

- Annual GHG emission of over 49,000 passenger cars
- Emissions from the energy used in 28,000 homes for one year
- Carbon sequestered in over 8 million tree seedlings grown for 10 years
- GHG emissions avoided by recycling over 111,000 tons of material each year

Air Pollution Benefits

The actions listed in this report are estimated to have avoided over 146,657 MWh of electricity and 2,856,000 therms of natural gas. In addition to reducing greenhouse gas emissions, these changes helped prevent emissions of other, more traditional air pollutants that are harmful to human health and the environment.

Table 6. Air Pollution Benefits from 2009 GHG Reduction Actions

Pollutant	Pounds avoided in 2009 from GHG Reduction Actions in Fort Collins
Nitrogen Oxides*	50,000
Carbon Monoxide*	12,400
Volatile Organic Compounds*	2,600
Sulfur Oxides	1,900
Particulates (PM10)	1,500

*** Contributes to ground-level ozone pollution**

(As calculated by ICLEI CACP Software, April 2010)

Fort Collins Energy Policy

Fort Collins City Council adopted a new Energy Policy in January 2009. The primary goals of the *Energy Policy* are to sustain high-system reliability and to contribute to the community's climate protection goals and economic health. The Energy Policy 2050 vision is to ensure for the Fort Collins community highly reliable, competitive, carbon neutral electricity supplies, managed in a sustainable, innovative, responsible and efficient manner. 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 2009 include:

- Highly reliable electric service, with new initiatives to modernize the distribution grid and maintain utility assets for the future.
- Continued expansion of efficiency program results, leading to customer savings of over 50,000 megawatt-hours and $2.75M.
- Expansion of both utility scale and local on-site renewable energy generation.
- Leverage of private investment with Utilities rebates driving over $3M in local economic activity.
- Avoided annual carbon emissions of over 120,000 metric tons from Energy Policy related programs.

Major activities and highlights from 2009:

- Continuing implementation of the wide-ranging initiatives, programs and services related to implementation of the Energy Policy.
- Electricity use in the community decreased by 1.4% from 2008 to 2009.
- Electricity savings from 2009 efficiency programs totaled over 10,200 megawatt-hours in annual electricity use, or 0.7% of the community's electricity use. This is equivalent to the annual electricity use of over 1,150 typical Fort Collins homes.
- Electricity savings from 2002 through 2009 efficiency programs totaled over 50,000 megawatt-hours in annual electricity use. This is equivalent to the annual electricity use of over 6,000 typical Fort Collins homes.
- Development of a plan to meet the policy goal for verifiable efficiency program savings reaching 1.5% of the community's electric use. For 2010, this translates to a goal of 22,000 megawatt-hours of savings. The efficiency plan was the basis for a revised budget for Utilities Energy Services.
- Development and roll-out of a new program, Home Energy Reports. The Home Energy Reports program provides periodic reports to 25,000 homeowners about their own electricity use, including how the use compares to a group of similar homes in Fort Collins.
- Development of the elements of a new comprehensive Home Efficiency Program, which targets performance-based improvements in existing homes. The program launched in January 2010.
- Utilities applied for and received a $30M grant from the Department of Energy for implementation of Advanced Metering Infrastructure (AMI) and Smart Grid. The grant is the basis for a modernization of the electric metering system, aspects of distribution grid automation and a platform for future demand response and energy efficiency measures.

- Load management and demand response programs for residential air conditioning, residential hot water heaters and commercial/industrial customers were documented to avoid over 12.8 megawatts of summer peak demand.
- Renewable energy comprised 6.4 percent of total electrical energy purchases in 2009. Renewable energy purchases were 95,000 megawatt-hours.
- 284 kilowatts of photovoltaic (PV) capacity were added in on-site customer renewable energy systems. Over $40,000 in grant funds from the Governor's Energy Office were delivered to customers.
- Utilities received $320,000 in stimulus funds through the Energy Efficiency and Conservation Block Grant (EECBG) program. Funds are being applied to the development of the Green Building Program and Solar Thermal system rebates.

Energy Efficiency Programs

Fort Collins Utilities has provided programs and services to help customers manage their energy use for over 25 years. This section summarizes energy efficiency programs and services for residential, commercial and industrial customers. 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 and many of the programs are a collaborative effort, both in funding and implementation, of both organizations.

Business Efficiency Program (See fcgov.com/conservation/biz-index.php)

- Commercial efficiency assessments
- Rebates
- Education and outreach

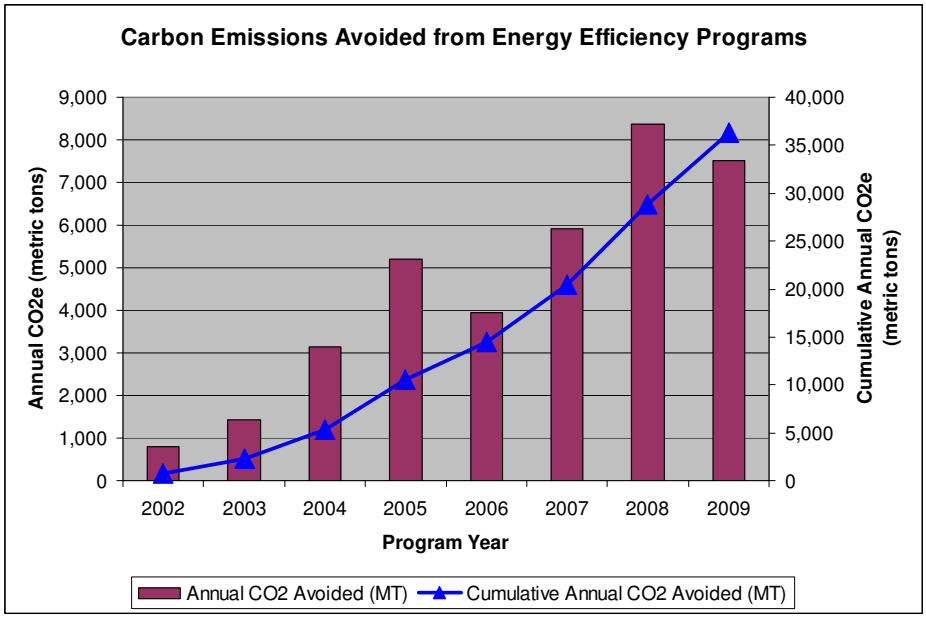
Consumer Products Program (See www.fcgov.com/conservation/res-index.php)
This program provides rebates for ENERGY STAR qualified products at local retailers for clothes washers, dishwashers, compact fluorescent light bulbs, and special promotions. This program also includes the Refrigerator and Freezer Recycling Program.
Home Energy Reports (See fcu.opower.com)
The Home Energy Reports program started in late 2009, providing customized reports for 25,000 customers which put their electric use in the context of similar homes.

Table 7: 2009 Energy Efficiency Program Results

Description	Business Efficiency Program	Consumer Products	Home Energy Reports*	Total
Activity results (projects, units, bulbs, etc)	136	52,430	25,000	77,566
Customer gross savings (MWh)	9,779	2,782	281	12,842
Customer gross savings (kW)	2,240	318	32	2,590
Net-to-gross discount factor	85%	49%	100%	78%
Customer net savings (MWh)	8,312	1,363	281	9,956
Customer net savings (kW)	1,904	80	32	2,016
Utility distribution efficiency	97.5%	97.5%	97.5%	97.5%
Utility net savings (MWh)	**8,525**	**1,398**	**288**	**10,212**
Utility net savings (kW)	**1,953**	**82**	**33**	**2,068**

* one month of savings reported for 2009

Figure 7: Annual & Cumulative Carbon Emissions Avoided from Energy Efficiency Programs, 2002–2009



Renewable Energy Programs

Fort Collins Utilities renewable energy strategy targets meeting policy initiatives to increase use of renewable energy and supporting 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) that 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 to reach 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 (combined). In addition, Renewable Energy Credits (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.

Platte River Power Authority added new wind plant capacity to their portfolio with the Silver Sage project, located in southern Wyoming, which began operation in fall 2009. Platte River's portion of

Silver Sage is 12 megawatts of wind capacity, providing both energy and Renewable Energy Credits (combined).

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. Support for on-site renewable energy installations expanded in 2009. The pilot net metering program initiated in 2005 was formally adopted under new City ordinances in 2009 and the incentive program for rooftop PV nearly doubled from 2008. Fort Collins' net metering offers residential and small commercial electric customers full retail buy-back provisions for electricity generated by solar PV systems connected to the electric grid.

Figure 8. Renewable energy purchases, 1998–2009

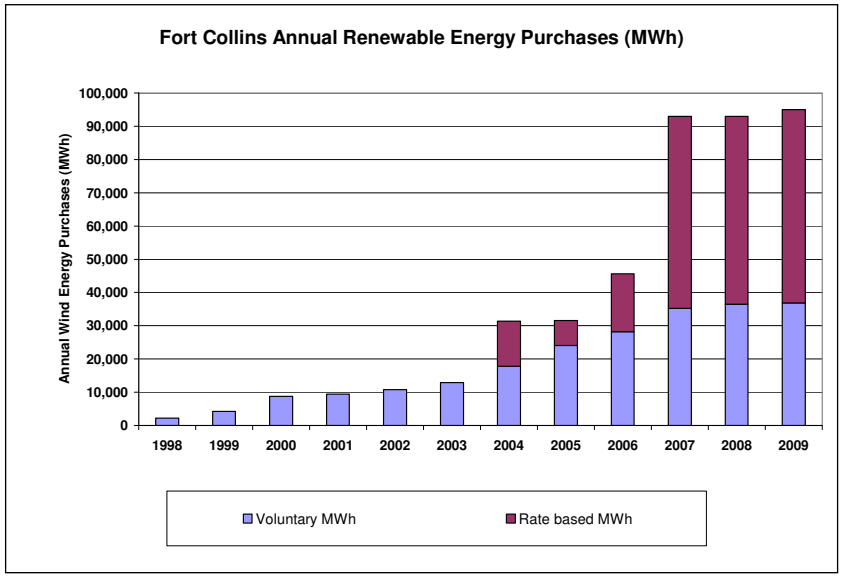
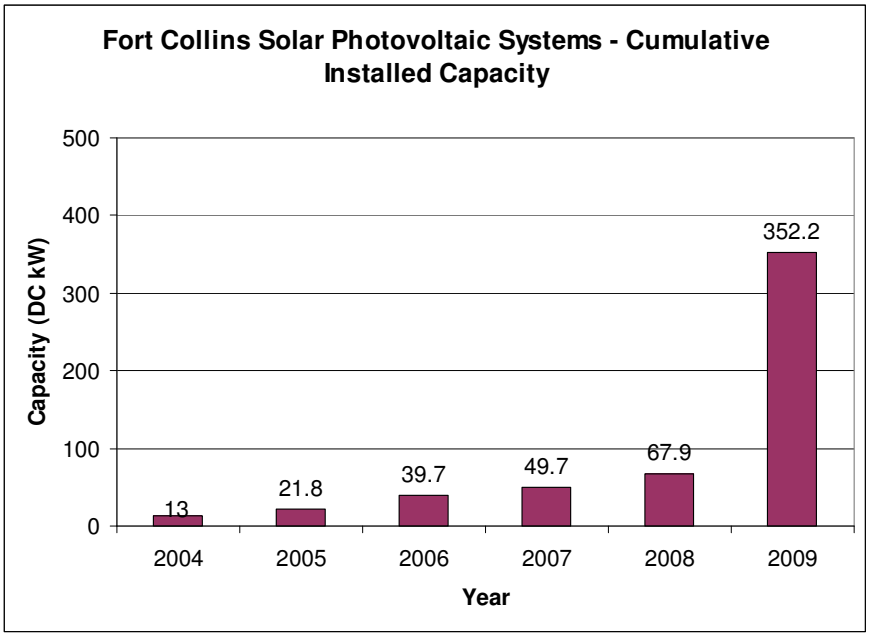


Figure 9. Installed Solar PV Capacity '04-'09



Climate Wise

During 2009 the Climate Wise program grew by 69 organizations to include 193 business partners. With 78% of partners reporting, the number of Climate Wise partners' GHG reduction projects grew from nearly 400 in 2007 to more than 969 in 2009. In 2009, Climate Wise partners avoided over 105,518 metric tons of CO_2e. The projects saved the partners $8.4 million in 2009 alone, and over $33 million cumulatively since the program began in 2000.

Figure 10 shows the growth in Climate Wise partners and projects since 2000. Figure 11 on the next page 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 10. Climate Wise Program Growth, in Numbers of Partners and Projects

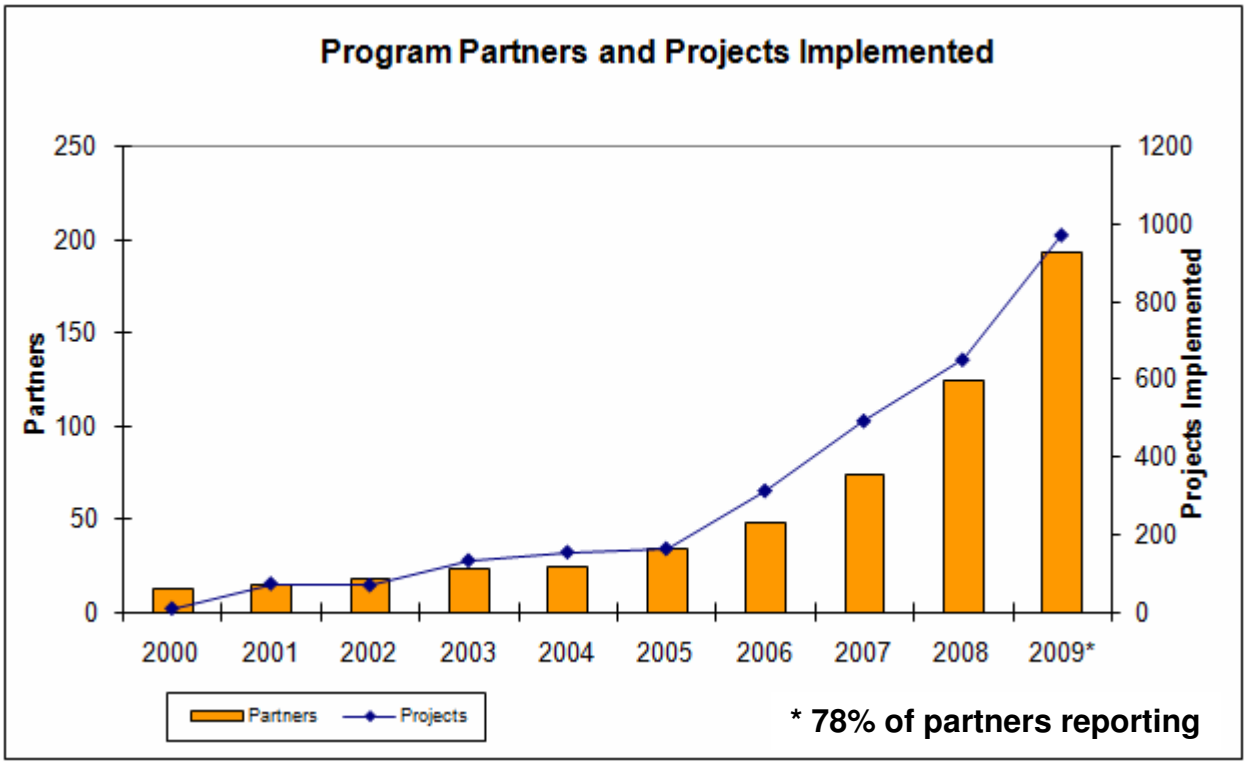
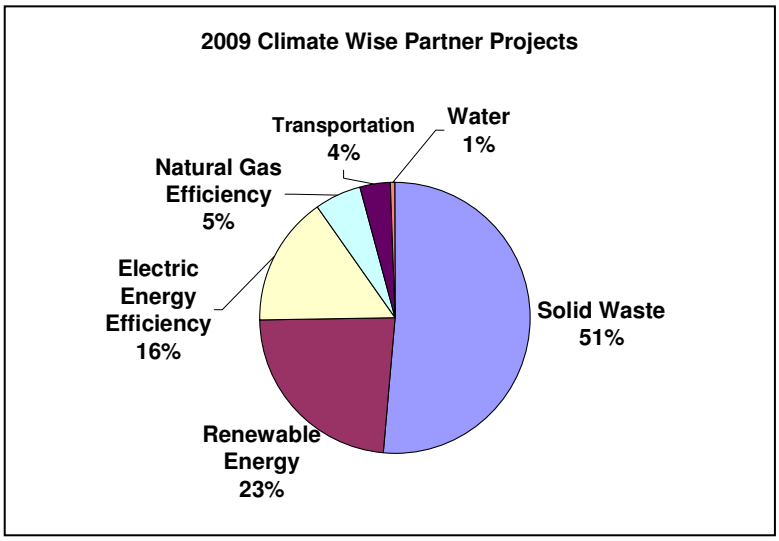


Figure 11. 2009 Climate Wise Partners' GHG Reductions by Percent of Tons CO_2e Avoided



Climate Wise Measures That Matter

Water Conservation: Cumulative savings since 2000: saved almost 5 billion gallons of water (equivalent to filling City Park Pool 24,000 times annually).

Electrical Energy: Cumulative savings since 2000: 369,000,600 kWh (equivalent to the annual energy use of 33,600 homes).

Natural Gas: Cumulative savings since 2000: 9,470,000 therms (equivalent to the annual natural gas usage of 13,300 homes).

Reduce, Reuse, Recycle: Cumulative savings since 2000: 110,200 tons of materials diverted (equivalent to the weight of 7,900 Transfort City buses).

Awards

Harvard University - 2008 Innovations in American Government Award

Climate Wise was selected as one of the top 50 Innovative Government Programs in the US from more than 1,000 applicants.

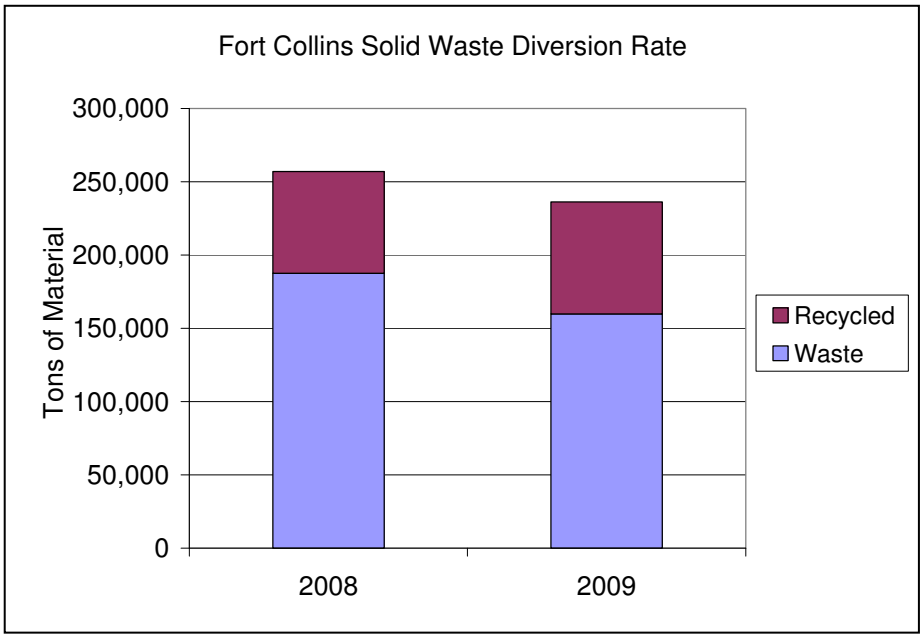
Alliance for Innovation – 2009 Outstanding Achievement in Local Government Innovations Award

Climate Wise was one of the Top 10 recipients in 2009.

Waste Reduction and Diversion

The City of Fort Collins established a goal to divert 50% of the community waste stream by the year 2010. For 2009, Fort Collins' community diversion rate-- including a 6% factor[1] for waste reduction that is attributed to the City's Pay-As-You-Throw (PAYT) trash ordinances-- was reported by Natural Resources Department staff to have reached 38%. (See Figure 12 below.) Fort Collins' calculation is made using the U.S. EPA methodology[2] for municipal solid waste (MSW) diversion.

Figure 12. Fort Collins Community Waste Diversion Rate



Accurate measurements of waste diversion are inherently problematic. For instance, although recycled electronic waste and tires qualify as MSW diversion[3], the City's current lack of access to local data about volumes prevent them from being included, and there are undoubtedly many local recycling activities that "fly beneath the radar". Another aspect is the EPA's exclusion of industrially generated waste materials; materials such as the 100,000 tons of asphalt that are recycled into road-base by the Streets Department, for instance, are not factored into the City's waste diversion calculation.

[1] Attributed to source reduction behavior; see Fort Collins' 2006 draft Strategic Plan for 50% Waste Diversion, by SERA (http://www.fcgov.com/recycling/pdf/ftcollins_5yr_sw_plan_2006-0208_v15.pdf).

[2] http://www.epa.gov/osw/conserve/tools/recmeas/docs/guide.pdf

[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.

Recently (2008-09), the Colorado Department of Public Health and the Environment began collecting trash and recycling data[4]. For the same materials that Fort Collins measures as waste diversion, CDPHE reported a 20% "recycling rate" state-wide in 2009. Another way to look at it is on a daily per-capita basis. Based on 2009 population data[5], Fort Collins citizens generated 3.02 pounds of recycling and 6.38 pounds of trash (total 9.40 pounds of material) per day. Throughout the state, the rest of Colorado generated 1.90 pounds of recycling and 7.60 pounds of trash (total 9.5 pounds of material per day).

The economic downturn that occurred in 2009 was likely to have been an important factor in the 15% drop in Fort Collins' trash volumes (compared to 2008 levels). Nationally observed trends in less waste may be attributed to lower levels of manufacturing and home construction, and fewer new products purchased by American consumers.

Market conditions also have a critical impact on recycling programs. Significantly, in 2009 the number of tons of recycling in Fort Collins rose by 9% compared to 2008, in spite of very poor market prices for commodities world-wide. Local prices for commingled/single stream materials (i.e., curbside recycling) dropped from $5/ton to zero.

Major Changes to Pay-As-You-Throw Ordinance

Several amendments were made to Fort Collins' Pay-As-You-Throw (PAYT) trash ordinance in May of 2009. A new requirement was adopted for haulers to report on the number of customers at each level of service for both trash and recycling. This means that in 2010, baseline data will be established for the first time that may be used to measure individual households' progress in "down-sizing" the size of residential trash containers and increasing curbside recycling.

Also, the PAYT ordinance now requires haulers to weigh trash on a routine basis and report sample weights quarterly. This will significantly improve the accuracy of local trash volumes data, which previously relied on converting measurements that were taken volumetrically, in yardages. What will also work in the community's favor to better monitor trash is that increasingly, weight-based data will become the norm for trash as new national standards are implemented for regulating methane emissions from landfills. At the Larimer County Landfill, the Solid Waste Management Division anticipates installing three sets of in-ground scales within the next year. A nearby private landfill has already added an in-ground scale to weigh loads of trash.

Large Recycling Carts Replace Curbside "Tubs"

Another important change is the new requirement for licensed trash haulers to begin to offer 65-gallon and 96-gallon wheeled recycling carts to their customers upon request. The larger capacity bins provide greater convenience for households to pull more material out of the residential waste

[4] 2009 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).

[5] Fort Collins' 2009 population was 137,200 (see http://www.fcgov.com/advanceplanning/trends.php).

stream. Upon upgrading to larger capacity carts, haulers may switch recycling to every-other-week collection, thereby reducing truck traffic in neighborhoods.

Separated-Glass Program Expanded

In an effort to provide better recovery rates for glass than is available from single-stream systems, the City developed a second drop-off location for glass-only recycling. The separated glass program was initiated after a 2007 investigation, which established that less than 30% of glass actually gets recycled in single-stream collection due to breakage and other issues. In 2009, the volume of clean glass collected in Fort Collins quadrupled to 196 tons in comparison to 2008 volumes.

Transportation

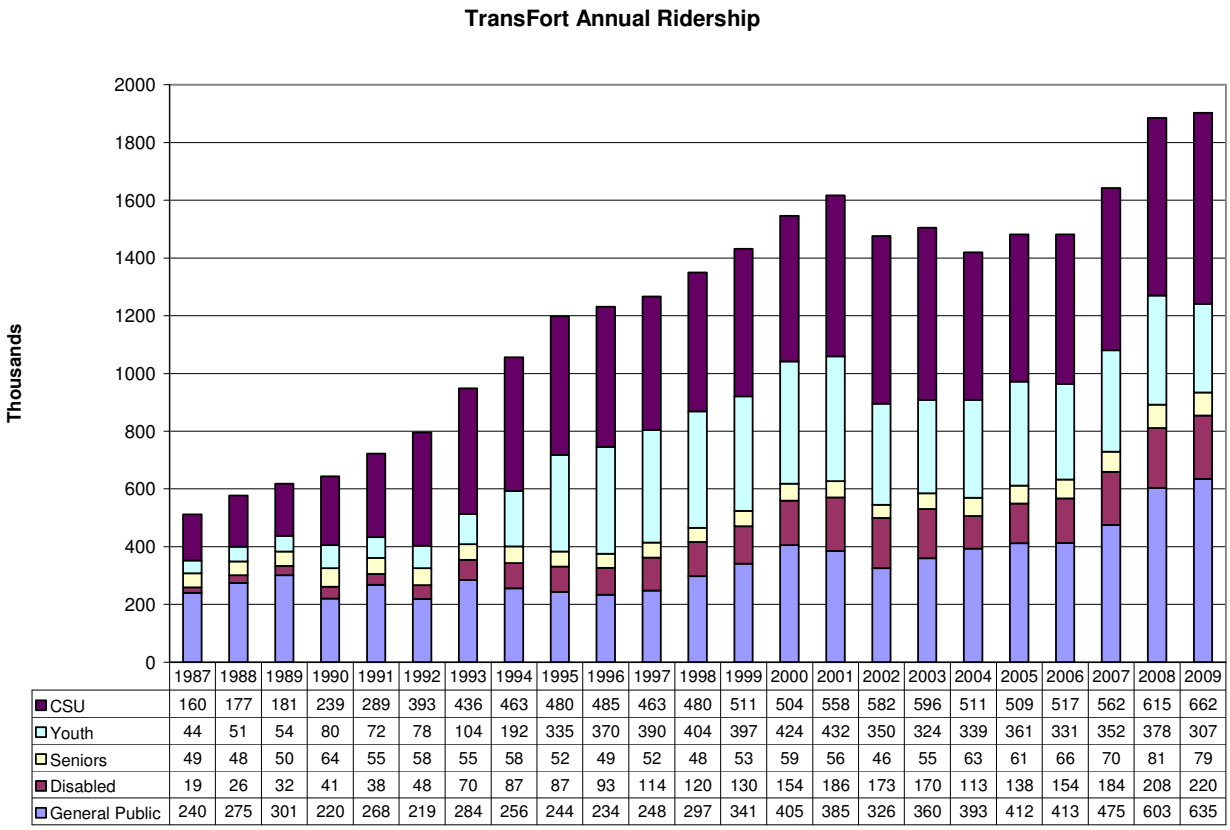
Transfort Bus Program

Transfort is a municipal agency that provides bus service in Fort Collins along 18 different routes (17 local and one regional). Ridership levels in 2009 reached over 1.9 million trips, a 29% increase from 2005. Ridership in the "General Public" sector (excluding students, seniors and disabled people) grew by 54% in the same period. At 3.9 miles per bus trip on average, Transfort helped avoid over 7.4 million miles of vehicular travel in Fort Collins in 2009. See Figure 13 on the next page.

Biodiesel

In 2005 the City of Fort Collins piloted the use of biodiesel (B20) in all municipal fleet vehicles and equipment. Since 2006, the City has used biodiesel (B20) exclusively in place of regular diesel fuel for all applications, including on-road vehicles and heavy equipment. In 2009, the City used 336,936 gallons of biodiesel.

Figure 13. Transfort Ridership Trends

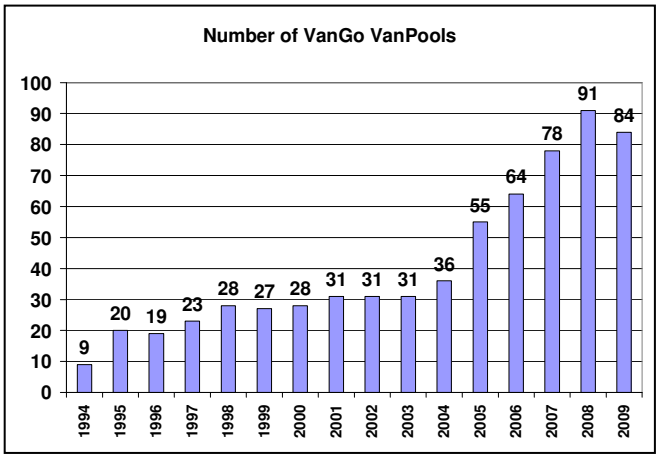


	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CSU	160	177	181	239	289	393	436	463	480	485	463	480	511	504	558	582	596	511	509	517	562	615	662
Youth	44	51	54	80	72	78	104	192	335	370	390	404	397	424	432	350	324	339	361	331	352	378	307
Seniors	49	48	50	64	55	58	55	58	52	49	52	48	53	59	56	46	55	63	61	66	70	81	79
Disabled	19	26	32	41	38	48	70	87	87	93	114	120	130	154	186	173	170	113	138	154	184	208	220
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

VanGo Vanpool Program

In 2009, the North Front Range Metropolitan Planning Organization had a total of 84 VanGo vans in daily operation that saved a total of 12,549,910 miles in that year. Of those, 47 vans originated from, or traveled into, Fort Collins City limits, avoiding approximately 564,000 vehicle miles traveled (VMT) in Fort Collins. VanGo ridership dropped off slightly in 2009 probably due to the slow regional economy and lower fuel prices, but remained generally strong in the region.

Figure 14. Growth in VanGo Ridership



Progress on "Anticipated Next Steps"

When City Council adopted the 2008 Climate Action Plan, a series of "next steps" were identified. The table below summarizes progress on implementing those measures.

Table 8. Climate Action Plan: Anticipated Next Steps and Status as of December 2008

Anticipated Action (as of 12/08)	Anticipated Timing (as of 12/08)	Status as of May 2010
Budget request to expand Climate Wise resources	2009 exceptions request, or request in 2010/2011 Budgeting for Outcomes (BFO).	In addition to the base offer, three "enhancement" offers for Climate Wise were submitted in 2009 for the 2010/2011 budget cycle. The enhancements were withdrawn following an evaluation that Fort Collins Utilities could cover some of the elements in the enhancements.
Community Climate Challenge (CCC)	Pilot challenge in 2009	Following initial work to prepare a Community Climate Challenge, the City decided to postpone implementation of a pilot until a broad interdepartmental environmental communication plan was developed.
Colorado Carbon Fund (CCF)	Formalize relationship via small outreach grant	Although the CCF has been promoted at Climate Wise events, a contractual relationship with the Governors Energy Office to promote CCF was not established.
Potential trash services strategies to be implemented included increased education and outreach, larger recycling containers, revise the Pay-As-You-Throw ordinance, offer curbside yard waste/compost options, and ban cardboard from waste stream.	2009, 2010	In May 2009, City Council amended the PAYT ordinance to require licensed haulers to charge more "transparent" variable rates and to provide larger recycling carts to customers by January 2010.
Develop Implementation Plans for 2009 Energy Policy	First quarter 2009	Done

Begin implementing strategies for 2009 Energy Policy	2009	Continued implementation of energy efficiency, load management and community renewable energy programs. Started new public engagement initiatives, including community benchmarking and "Fort Collins Conserves" campaign.
Update Residential Building Code	2009	In 2010, City Council will consider code updates to the 2009 International Residential Code, 2009 International Energy Conservation Code, and ASHRAE 90.1-2010 Energy Code. Another effort is underway to consider the National Green Building Standard.
Transit Strategic Plan	2009	The Transit Strategic Plan was adopted by City Council in August 2009.
BFO requests to implement actions in the Climate Action Plan, including consideration of Natural Gas Franchise Fee starting in 2010, with resources to monitor and track progress, etc.	November 2009	BFO requests were submitted to support numerous CAP actions. Stimulus funding was obtained to support enhanced GHG tracking and reporting.

V. WHERE WE'RE GOING

Revised 2020 Forecast

The City of Fort Collins updates its community GHG inventory biennially, in preparation for the biennial budget process. The 2020 forecast was revised in April 2010 using the most recent projections for utility usage and population growth. During 2008 and 2009, local, national and global economies experienced significant downturns. The revised forecast results in minor changes to community GHG projections. It is important to note that the forecast by the Fort Collins Utilities and Xcel Energy have begun to incorporate some of the planned benefits of policy and mandated reductions. Modifications to the 2020 GHG forecast are discussed in more detail in Appendix A.

Figure 15 below identifies the growth of emissions by source category, incorporating the new assumptions.

Figure 15. Community GHG Emissions and Projections

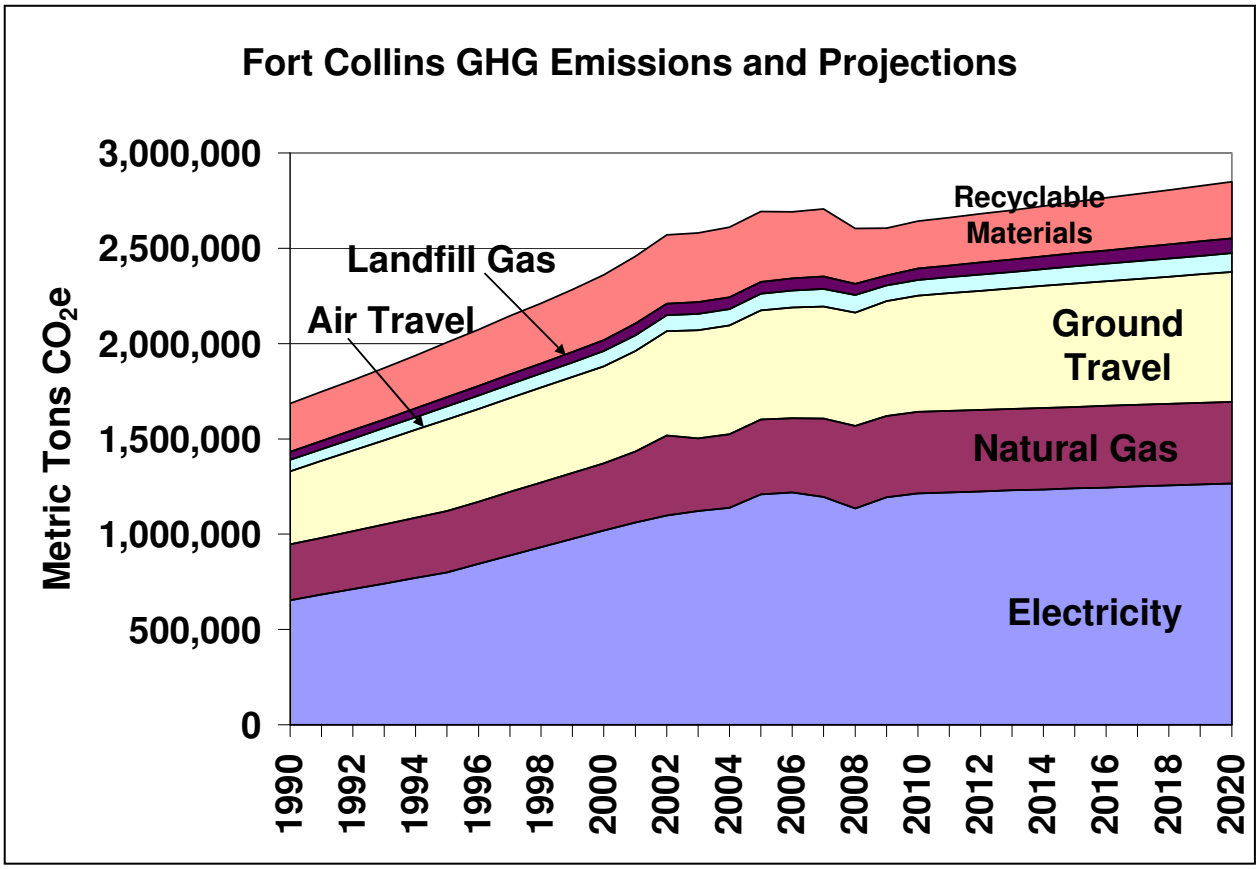
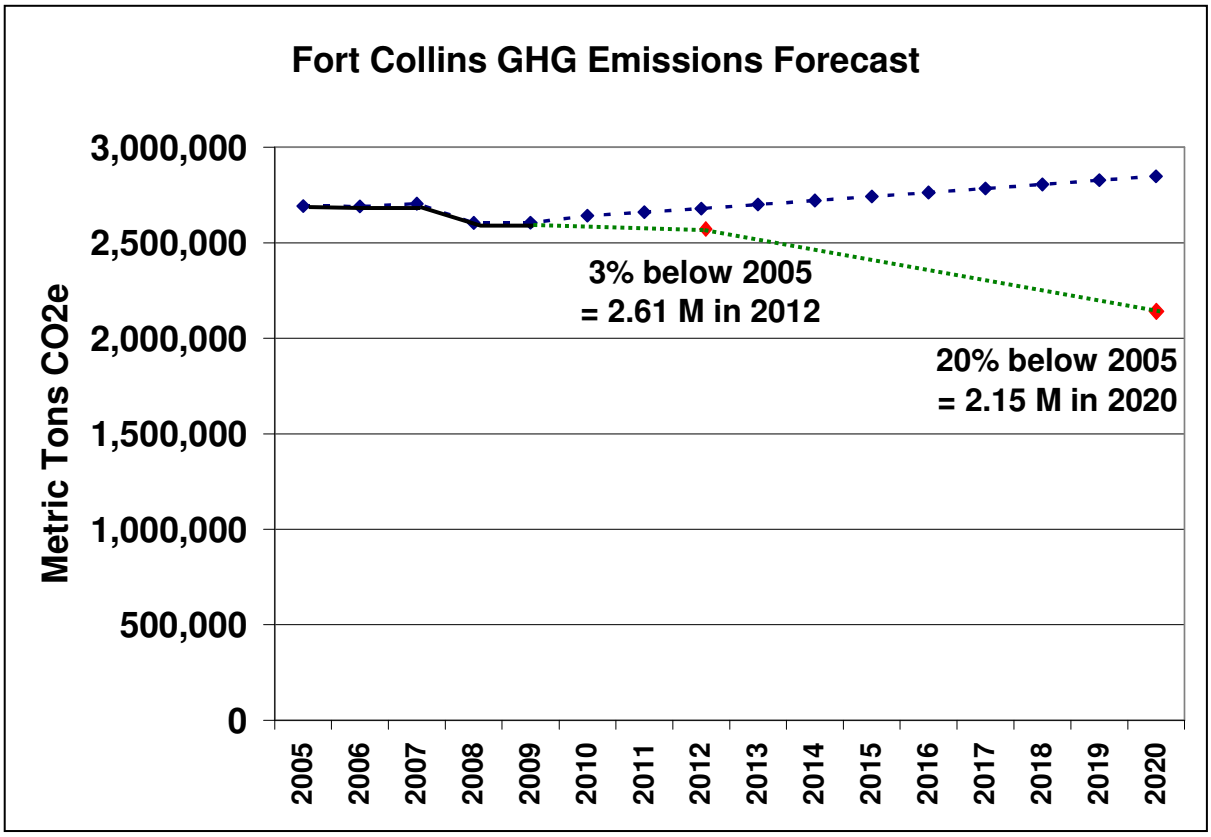


Figure 16 illustrates the revised forecast that incorporates these new assumptions relative to reduction goals.

Figure 16. Revised Forecast for Fort Collins Greenhouse Gas Emissions



In order to meet the 2012 reduction intent, additional GHG reduction actions are needed that would help avoid 68,000 metric tons of emissions by 2012, in addition to those already forecasted.

Table 9. GHG Reductions Needed to Meet Fort Collins' Goals Using New Forecast

Year	Projected Levels of GHG Emissions (Metric Tons CO2e)	Goal Level (Metric Tons CO2e)	Amount of Reductions Needed (Metric Tons CO2e)
2005	2,691,836		
2009	2,604,558		
2012	2,679,358	2,611,083	68,275
2020	2,848,759	2,153,471	695,289
2050	Not Projected	538,368	Not Estimated

Climate Mitigation Strategies Recommended for Progress Towards Targets

This section lists potential strategies that could help meet the 2012 intent. Table 10 summarizes the strategies, many of which are contained in the 2008 Climate Action Plan. The strategies are discussed in more detail below.

Table 10. Recommended Measures to Reach 2012 Reduction Intent

Strategy	2012 (Metric tons CO_2e)	Status
COMMUNITY LEADERSHIP		
Climate Wise *	48,000	in CAP
Government Orgs Set GHG Goals and Make Progress *	3,000	in CAP
Community Climate Challenge	25,000	in CAP
Colorado Carbon Fund	5,000	in CAP
WASTE REDUCTION		
Ban cardboard from waste stream	42,000	in CAP
Private paper-glass drop-offs	5,000	in CAP
Require haulers to provide yard waste pick-up	1,000	in CAP
Residential yard waste drop off and ban yard waste	2,000	in CAP
Construction & Demolition Debris Drop Off Site	15,000	in CAP
Construction & Demolition Debris Deposit	18,000	Potential
ENERGY		
2009 Energy Policy (above current forecast) *	Reductions embedded in updated forecast	in CAP
Green Building / Codes*	4,000	in CAP
Streetlight Upgrades and Replacements	1,000	Potential
TRANSPORTATION		
Roundabouts*	1,000	in CAP
TOTAL**	**123,500**	

* Existing Program

** Total Corrected to Account for Double-Counting

Climate Wise

The 2008 Climate Action Plan calls for the Climate Wise program to grow enough to achieve an emissions reduction of between 193,000 - 214,000 short tons CO_2e in the year 2012. During the 2010/2011 budget cycle, the program received funding to achieve 140,000 short tons CO_2e avoided in 2012, or 72% of the lower 2012 objective. If, through increased participation levels the program was able to meet the objective of 193,000 short tons avoided in 2012, it would result in an additional 53,000 short tons (48,000 metric tons CO_2e) avoided in 2012.

Local Governments Progress on GHG Goals

The City of Fort Collins has a municipal GHG goal to reduce emissions 20% below 2005 levels by 2020. If the City is able to reduce its municipal GHG emissions 2% each year from 2010 through 2012, the result would be over 3,000 metric tons CO_2e avoided. In support of that objective, a

proposal is currently under consideration for the 2011-12 budget cycle to develop an "Innovation Fund" that supports high-return efficiency projects. Other proposals currently under consideration include instituting a standardized data management "dashboard" to focus on progress and savings and/or to hire a data manager to help the City meet its objectives. These types of investments have resulted in significant savings when undertaken by other local governments.

Community Climate/Action Challenge

An important opportunity still remains to develop a local Community Climate/Action Challenge for the residential sector, focusing on an educational campaign that promotes carbon reducing actions. One key component would be youth focused programs (in-school programs, Scouts, youth groups, church groups, services groups, etc.) and another would be a neighborhood focus. This campaign could include strategies to reduce emissions from air travel as well, a new element of Fort Collins GHG inventory.

Colorado Carbon Fund

The City could pursue a grant-funded partnership with the Governor's Energy Office to promote the Colorado Carbon Fund that sells Colorado-generated carbon offsets. The City could help to market the program and urge citizens and businesses to purchase offsets to reduce their carbon footprint.

Waste Reduction Strategies

A number of strategies previously have been identified that are especially effective at reducing greenhouse gas emissions. These strategies include a residential yard waste drop-off site, the option to recycle yard waste at the curbside, and ultimately to ban yard waste from the waste stream. Construction and demolition debris recycling and banning cardboard from curbside collection are also strategies recommended to reduce GHG emissions. Whatever direction the City ultimately chooses to take will be influenced by a recently convened Council ad-hoc solid waste committee. The committee has undertaken an effort to examine the region's "wasteshed" and its waste products as a potential resource stream for energy or other innovative uses and technologies. The ad hoc committee may also make recommendations regarding more traditional strategies to divert waste from landfills into more productive uses.

Construction & Demolition (C&D) Debris Deposit

This strategy was identified in the Fort Collins report, "*Advancing Climate Protection Planning Through Municipal Solid Waste Programs*" (June 2007). This measure proposes to create a refundable C&D deposit system, potentially based on square footage of a project, type of building and type of work (new construction vs. remodel), or some comparable criterion, with exclusions for roofing jobs and potentially the smallest 25% of projects. The deposit would be refunded upon certification of appropriate levels of recycling (i.e., materials brought to a certified C&D sorting facility whereby a specified level percentage of recycling is achieved). Implementation of this strategy would logically follow a strategy already included in the Climate Action Plan to create a City-sponsored C&D drop-off

site. Even if new construction markets fall off for a period of time, recycling of demolition debris will remain a key opportunity for improvement in waste diversion rates.

Additional Benefits from the Adopted 2009 Energy Policy

The 2009 Energy Policy, adopted by City Council in January 2009, includes a primary goal to *"Support the community's carbon emissions goal of reducing the City's carbon footprint 20% below 2005 levels by 2020 and 80% by 2050".* Two objectives contained in the 2009 Energy Policy to meet this goal are to:

- Achieve annual energy efficiency and conservation program savings of at least 1.5% of annual energy use (based on 3 year historic average), and
- Increase the contribution of renewable energy to achieve a 20% carbon reduction goal by 2020, after accounting for the contributions of resource mix, energy efficiency, conservation, minimum renewable energy requirements, and voluntary renewable energy programs.

If community electricity consumption drops to 20% of 2005 levels, this will result in an additional 364,000 tons CO_2e avoided in the year 2020, above the Utilities forecast predictions for 2020 which conservatively don't fully incorporate all 2009 Energy Policy Goals.

Green Building Code Updates and New Measures

Fort Collins commercial and residential building/energy codes are regularly updated, as they are linked to national code standards (such as the International Energy Conservation Code and ASHRAE 90.1). In addition to the residential code update scheduled for 2010, an interdepartmental team will evaluate a newly available green-building standard (ANSI ICC-700-2008) for potential adoption by 2010. The evaluation will include reviewing the standard for impacts on development review and the building permit and inspection processes, as well as above-code voluntary programs.

The impact of new energy and green building codes on carbon emissions by 2012 likely will be minimal, and perhaps negligible, because new construction activity dropped dramatically following 2008's economic downturn. However, ongoing improvements to new buildings' energy efficiency through higher code standards would have an impact on 2020 carbon emissions. Preliminary estimates suggest that implementation of ongoing improvements to building energy codes through 2020 could avoid 4,000 tons CO_2e in 2012 and 50,000 tons in 2020 for commercial and residential properties.

Streetlights

Manufacturers are starting to develop better streetlights with light-emitting diodes (LEDs) as the illumination source. Costs for LED lighting are currently 5-6 times that of current high pressure sodium lighting, but as the demand for LED streetlights grows and the market shifts past recovering research and development expenses, the cost is likely to come down. Alternatively, if LED streetlight life spans are extended far enough beyond that of high pressure sodium (HPS) lights, a Triple Bottom Line analysis that considers the life-cycle cost of ownership could also justify the conversion.

In Fort Collins, the streetlight category with the largest consumption is 150W high pressure sodium lights. There are over 3,800 150W HPS streetlights in Fort Collins. These lights are typically used on Collector and Arterial Streets. If these streetlights were converted to LEDs, which are estimated to use approximately 50% of the power of the currently installed lights, over 1,000 tons of CO_2e could be avoided by 2012. LED street lighting options should be considered as long as the cost and/or funding is consistent with the results of a Triple Bottom Line cost/benefit analysis.

Land Use and Transportation Planning

As City Plan and the Transportation Master Plan are updated through the 2010 Plan Fort Collins process, a number of key policy choices are being considered that would impact the community carbon footprint. These policy choices include Energy Use Reduction, Electric Grid Modernization, Linking Transportation to the Grid, Improve Performance of Existing Buildings, Water Supply Planning, Price Mechanisms to Shift Choices Towards Actions that Reduce Driving, and Transportation Fuels and Efficient Vehicles.

The Plan Fort Collins initiative has also identified a proposed vision for Fort Collins:

> *Implement and expand on ideas from the Climate Action Plan, Energy Policy and air quality plans, to reduce energy use and promote local and renewable energy sources, modernize the electric distribution system, promote sustainable transportation systems, reduce hazardous and solid waste, foster clean technology companies, incorporate carbon impact assessment into land use decisions, promote green building and efficiency improvements in existing buildings, and curb greenhouse gas emissions.*

Progress towards the proposed enhanced vision for Fort Collins will make a significant difference in the community's long term carbon impact.

In addition, transportation projects are being proposed in the 2011/2012 budget cycle that support activities in the Climate Action Plan. These include funding for two Enhanced Travel Corridor studies, Harmony Road and Mountain Vista/North College Avenue. These studies would include analyses for roundabouts, air quality impacts, mobility impacts, and even street design options that could better accommodate alternative modes of transportation. Other offers would enhance FC Bikes and the Safe Routes to School program, and conduct a Parking Plan update. School-based programs and parking strategies are called out in the Climate Action Plan.

Explore Creative Efficiency Financing Approaches

As more communities are striving to support residential and commercial efficiency upgrades, new and creative financing approaches are being explored. These approaches include Property-Assessed Clean Energy Bonds (PACE), revolving loan programs, and otherwise using public resources to leverage and attract private capital for energy performance contracting.

External Funding to Support Climate Protection Activities

The City of Fort Collins has received significant funding from various outside sources that supports Climate Action Plan goals along with other community goals.

American Recovery and Reinvestment Act (ARRA)

The City of Fort Collins has received several allocations of funding from The American Recovery and Reinvestment Act (ARRA).

- $15.3 million through the Department of Energy to support Advanced Meter Infrastructure, an important element of the 2009 Energy Policy
- $2.47 million for six compressed natural gas transit busses
- $1.34 million from the Energy Efficiency and Conservation Block Grant program to implement several internal projects such as computer server virtualization and PV expansion on the Aztlan Center, and several projects in the community such as more recycling containers in parks and natural areas, a solar-powered trash/recycling compactor, transportation improvements for bikes and pedestrians, incentives for solar thermal hot water systems, support for the Climate Wise business program and support for the Green Building Program.

FortZED

Fort Collins Zero Energy District, or FortZED, is a public/private partnership initiative to create a zero energy district in a northeast section of Fort Collins that serves 7000 residential and commercial customers. FortZED partners received a $6.3 million DOE grant that supports an $11.2 million project. The City of Fort Collins is lead agency on that project. The project goals are to reduce peak load by 20-30% on two distributions feeders within the FortZED boundaries by networking distributed energy resources. Fort Collins Utilities engineers will work with grant participants in the design stage to safely and reliably integrate this new technology into the distribution system, and partner in R&D and testing.

The City of Fort Collins, along with Larimer County, Fort Collins Housing Authority and Fort Collins Regional Library District, were recipients of a $778,000 grant from the Department of Local Affairs (DOLA), along with $430,000 from the Bohemian Foundation to go towards $3 million in efficiency and renewable energy projects in the FortZED area. Projects will include building energy efficiency projects at City, County and Library buildings, a solar thermal system at EPIC pool, and photovoltaic (solar electricity) projects for the City, County and Housing Authority.

Mason Corridor

Mason Corridor is a five-mile, north-south byway from Cherry Street to south of Harmony Road. It combines a bicycle and pedestrian trail with MAX, or "Metro Area Express", Bus Rapid Transit (BRT) system. The Corridor will also provide a framework for economic development and environmental sustainability, creating opportunities for new mixed-use and transit oriented developments (TOD), avoiding sprawl, and enhancing our community's active lifestyle.

The project received a significant boost in 2009 when federal funding was secured through President Obama's FY2009 Appropriations Bill. The $11.18 million will be used to cover project development costs such as acquisitions of right-of-way, design/engineering, utility clearances and other technical work.

Additional Efficiency Resources in Fort Collins

In addition to the energy rebates being offered to residential and business customers directly through Fort Collins Utilities, rebates are made available through other sources such as Platte River Power Authority and Xcel Energy.

- In 2009, Platte River Power Authority funded energy efficiency programs in Fort Collins worth $993,603, including business programs such as the Electric Efficiency Program, LightenUp, cooling rebates and the Building Tune Up program, and residential programs including Lighting With A Twist and Northern Colorado Energy Star Homes.

- Xcel Energy offers energy audits and rebates to customers in Fort Collins covering boilers, furnaces, and many other areas.

VI. CITY GOVERNMENT GHG EMISSIONS AND REDUCTIONS

City of Fort Collins 2005 Baseline Emissions

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. (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 of Fort Collins 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. The City has set a goal to reduce emissions from municipal operations 20% below 2005 levels by 2020, in alignment with community and state-wide 2020 goals.

In addition, the City developed specific goals to support GHG reductions from City activities including goals for transportation, energy use, solid waste reduction and purchasing. As with the community reduction goals, the year 2005 serves as the municipal baseline against which progress will be measured toward lowering total GHG emissions (regardless of the rate of growth for the organization).

Figure 17. 2005 Baseline Municipal Greenhouse Gas Inventory, by Source

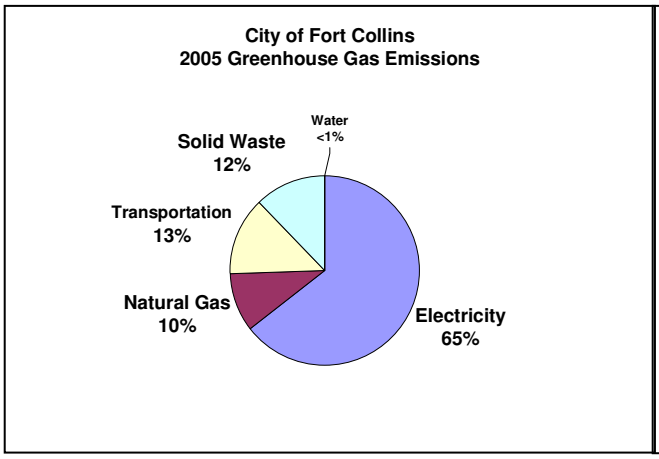
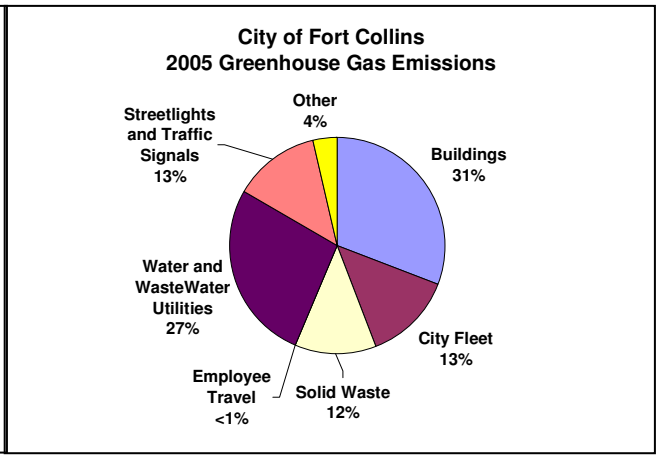


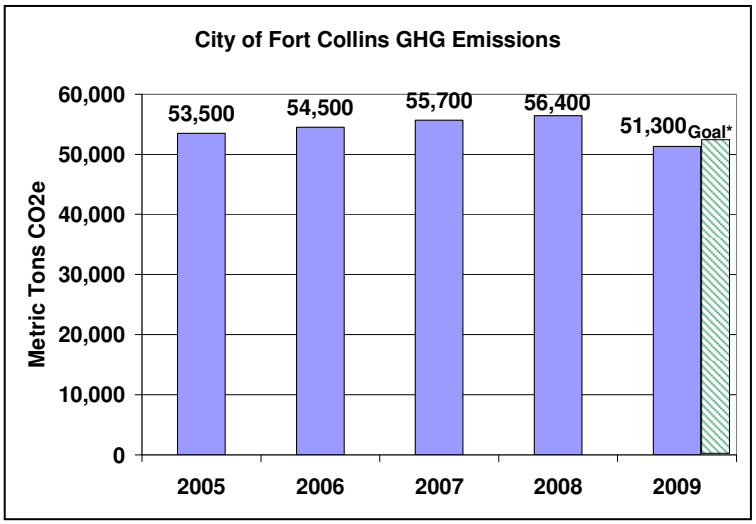
Figure 18. 2005 Baseline Municipal Greenhouse Gas Inventory, by End User



City of Fort Collins Progress on Greenhouse Gas Reductions

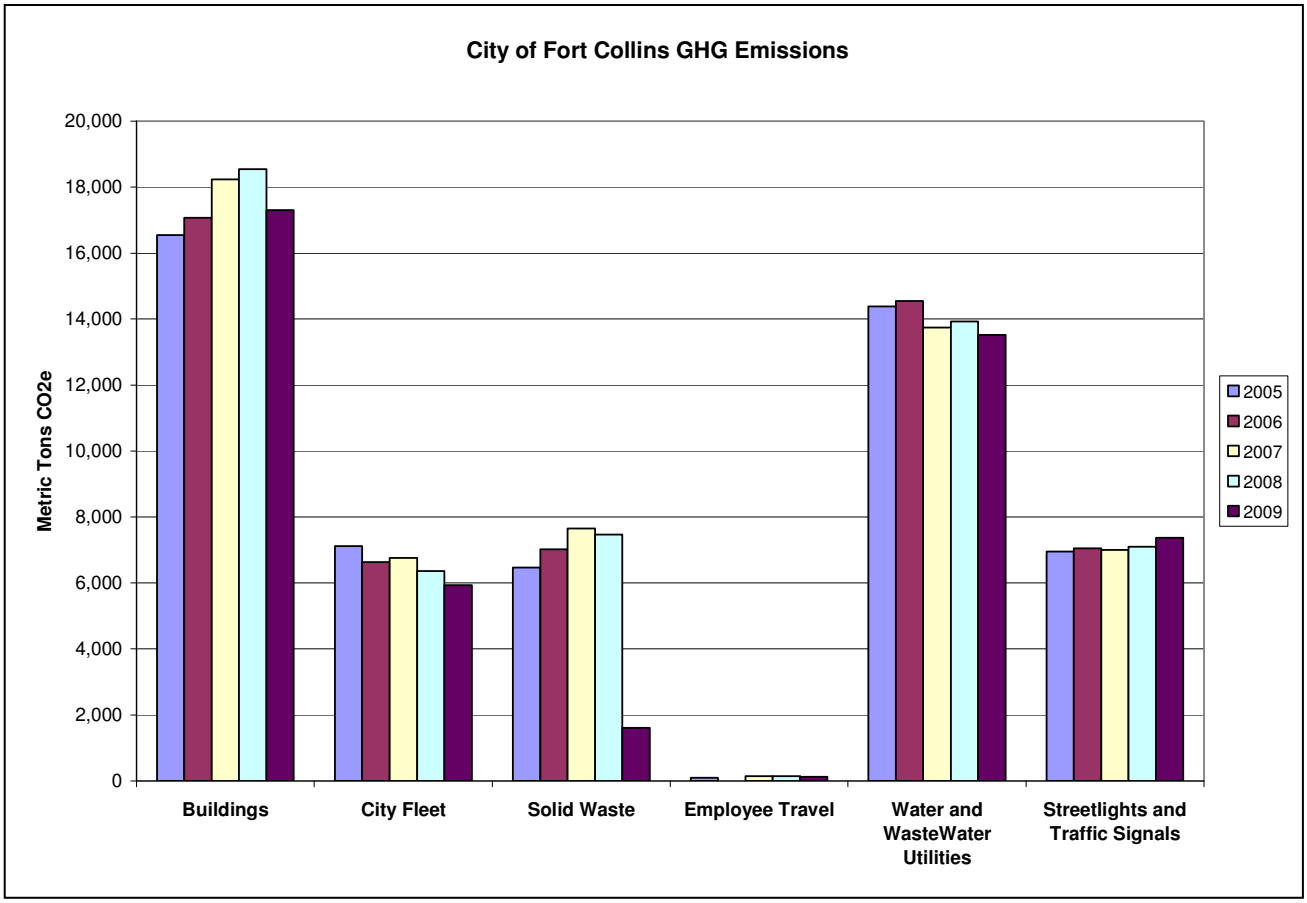
Carbon emissions from the municipal government dropped 4 percent between 2005 and 2009, despite employee growth of 1% in the same timeframe and a net 13% increase in square footage of municipal buildings, as tracked in the City's *Utility Manager* database. (See Figure 19.) Figure 20 illustrates that during this time, emissions from energy use in major buildings have risen while emissions from the Water and Wastewater Treatment facilities and City fleet vehicles have dropped.

Figure 19. Municipal Government GHG Emissions



*** Goal = 2%/year reduction below 2005 level, starting in 2009.**

Figure 20. Municipal Government Emissions, by Sector



2009 Quantified Greenhouse Gas Reductions by City Government

Progress toward the City's goals is tracked by evaluating overall net emissions from municipal government activities. However, it is important to track and report quantified GHG reduction from projects that contribute to the change in inventory levels. Several individual projects implemented by the City in 2009 were quantified for carbon reductions and showed that over 6,000 metric tons of CO_2e were avoided. This equates to 11% of 2009 municipal emissions.

Table 11. City of Fort Collins 2009 GHG Reductions

City of Fort Collins Municipal Reductions Project	2009 Metric tons CO2e/yr
ENERGY	
Employee Energy Challenge	1,009
Waste Water Treatment Load Shedding	566
High Bay Fluorescent	83
Building Lighting Retrofits	77
HotShot - Cooling and Ice Making	17
Water Treatment Plant HVAC upgrade	3
Coffee Pot Timers	3
Green Energy Purchases*	1,374
Methane Flaring/Heat Recovery at Wastewater Treatment Plant	1,332
Energy Total	**4,464**
WASTE REDUCTION	
Internal Recycling Commodities	710
Waste Reduction Total	**710**
TRANSPORTATION	
Hybrids (compared to avgerage vehicle MPG)	41
Alternative Fuels (compared to traditional fuel)	1,093
Transportation Total	**1,134**
WATER CONSERVATION	
Parks Irrigation Efficiencies	25
Water Total	**25**
TOTAL QUANTIFIED REDUCTIONS without Green Energy	**4,959**
TOTAL QUANTIFIED REDUCTIONS with Green Energy	**6,333**

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

In addition to quantified reductions listed above, numerous actions discussed below contribute to reduction in municipal emissions from the base year.

City Government 2009 Financial and Environmental Highlights

The City achieved significant savings from implementing GHG reducing actions. Highlights are discussed below.

Table 12. Financial Savings from City Projects

Project	Annual Savings
Asphalt, Concrete and Toilet Recycling	$313,360
Building Energy Challenges	$79,820
Metal Recycling	$69,000
Waste Water Load Shedding	$54,000
Parks Water Savings	$19,024
EPIC Lighting Retrofits (High Bay Fluorescent)	$14,259
Lincoln Center Lighting	$10,606
Wood Recycling	$6,545
HVAC & Variable Frequency Drives	$5,212
Trash Services Downsizing	$5,000
Operation Services Lighting Retrofit	$4,535
Water Treatment Lighting Retrofits	$1,470
Coffee Pot Timers	$301
TOTAL	**$583,132**

Building Energy Use

- Load shedding (e.g. ability to lower costs during peak demand hours) was implemented for City pool equipment and ice rinks. The Waste Water treatment plant alone saved $54,000 in 2009 from load shedding.
- Fort Collins Housing Authority obtained HUD stimulus funds to perform energy upgrades and completed the Village on Stanford Green Community.
- The City saved approximately $116,000 in natural gas cost by renegotiating the contract.
- Energy Challenge competitions between employees at City buildings resulted in an annual savings of $79,820.

Recycling and Waste Diversion

- Office recycling increased by 111 metric tons from 2005 levels.
- Scrap metal recycling earned the City approximately $70,000.
- Recycled toilets are crushed at the Hoffman Mill Crushing Operations site, where the porcelain is mixed with broken concrete and asphalt. The City spends $2 per ton creating the mixture and sells it for $5.50 per ton or uses it for road maintenance. In 2009, Fort Collins recycled about 2,600 toilets and recycled a total of 100,000 tons of asphalt and concrete, for an avoided cost of over $300,000.
- New compost bins were purchased for City events.
- Updated recycling signs were distributed to all departments to post in collection areas to respond to frequently asked questions.

- The City holiday party team worked with a local vendor to minimize waste from food preparations and to purchase compostable serving ware. The amount of trash generated by the entire event was less than 32 gallons. The team also used the only hybrid taxi service in town for employees that preferred not to drive.
- A Triple Bottom Line (TBL) analysis was conducted to determine the benefits of switching from 100% recycled paper towels to electric hand dryers. Initial analysis indicated that the electric dryers are preferable in terms of GHG emissions so a pilot project will be implemented.
- The City issued a new performance-based contract for the trash and recycling services that will encourage the haulers to assist the City with achieving the waste diversion goals.

Transportation

- The City light duty fleet contains 28 light duty hybrid electric vehicles.
- Transfort received $2.4 million in federal grant funding to purchase six new CNG buses.
- Fleet Services took delivery on an International hybrid utility truck for the Electric Utility.
- An idling reduction program was successfully piloted with the City's Natural Areas crews by purchasing codura nylon material and making vehicle windshield covers that help reduce the amount of time it takes to warm up service vehicles.
- A case study was conducted to determine if electric or gas golf carts are more sustainable. The data showed for the best case scenario the electric golf carts are 90% better and the worst case scenario electric is 11% better.

Tracking and Reporting

- 215 N. Mason and 281 N. College received 2009 Energy Star certification.
- A Sustainability Progress Report was prepared for 2008 and 2009 detailing the various projects implemented to achieve the top ten internal goals.
- Monthly energy, trash and recycling reports by building/facility were posted to the City's internal sustainability Web page, "Green It, Mean It".
- Natural Areas was the first City department to calculate their carbon footprint. Mulberry Water Reclamation Facility and Drake Water Reclamation Facility are in the process of developing a carbon footprint.

Outreach

- Carbon Footprint posters for City buildings were revised to include energy costs, GHG reductions and tips. Small posters are distributed to departments on a monthly basis and the larger posters displayed in public access buildings are updated every quarter.
- 185 employees pledged to be a Sustainability Superhero at the fall Health Fair. Collectively 25,212 lbs of CO_2e or 13 tons of GHGs were avoided by employees' efforts.
- The City offered an environmental programs series for residences and for businesses.

2009 Progress on Municipal Goals

The City of Fort Collins has adopted 10 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 percent 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

From 2005 to 2009, greenhouse gas emissions dropped by 4% or over 2,000 metric tons. (See Figure 19 on page 32.) It is important to note that the number of employees and square footage of buildings increased during the 2005-2009 period. These GHG reductions are equivalent to:

- Annual greenhouse gas emissions from 400 passenger vehicles
- CO_2e emissions from 242,000 gallons of gasoline consumed
- CO_2e emissions from 5,000 barrels of oil consumed

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.

Overall energy use was essentially the same in 2009 as it was in 2005. Total electrical use was up 7% and natural gas was down 8% between 2005 and 2009. Water treatment sites use more energy than all other City buildings combined, so managing their electrical use is critical to meeting the City's goals. As water quality regulations become more stringent, energy use will increase at the water treatment plants.

Figure 21. Total City Electricity Use (kWh)

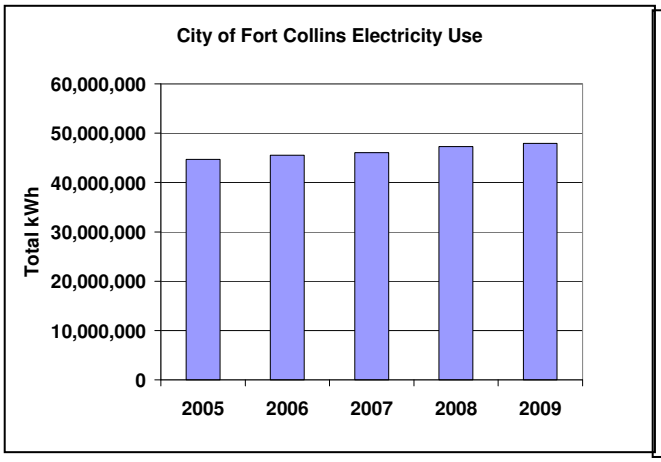
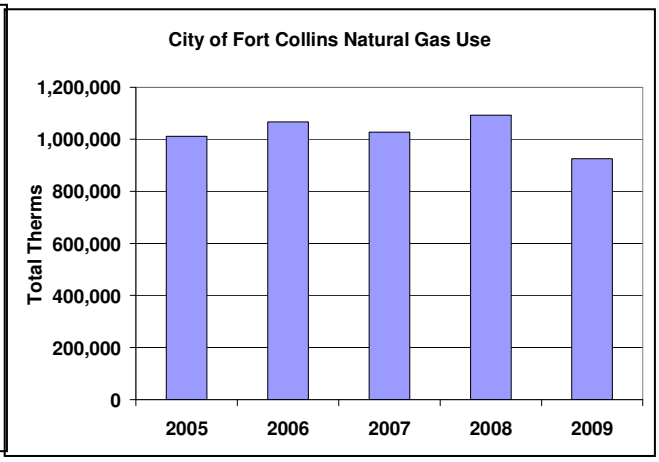


Figure 22. Total City Natural Gas Use (Therms)



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 (B-20), propane, compressed natural gas (CNG) and ethanol (E85). Considerable progress was made towards the 2020 goal, especially because the City moved from piloting biodiesel use for a portion of diesel vehicles in 2005 to complete biodiesel (B20) replacement of diesel fuels starting in 2006. By 2009, traditional fuel use dropped by 52% from 2005 levels.

Figure 23. City Fleets Traditional Fuel Use

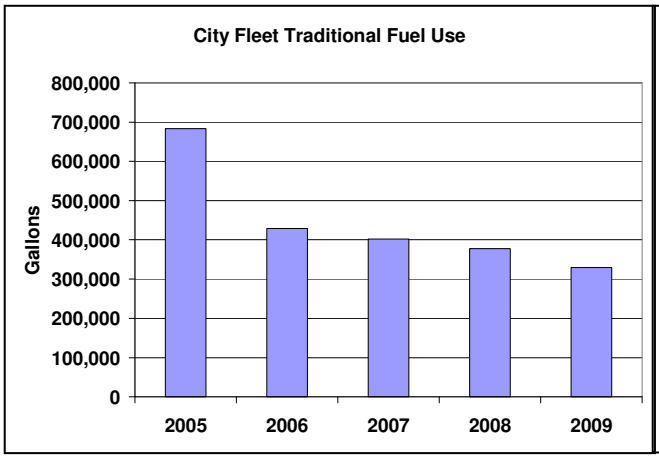
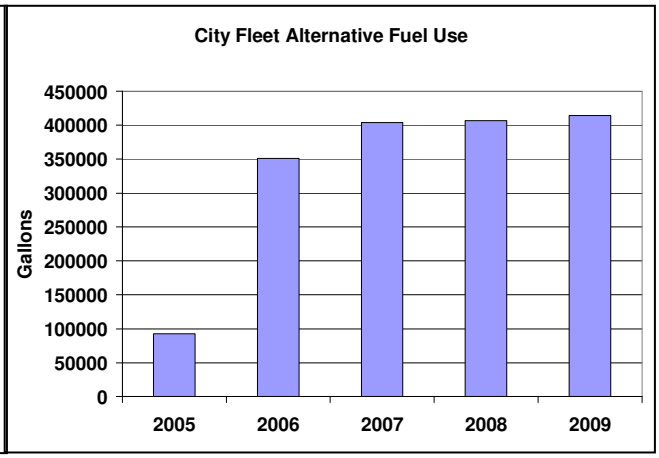


Figure 24. City Fleets Alternative Fuel Use



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

Waste volumes increased by 8% over the 2005 baseline, but a new trash collection contract has been signed (2010) that aims to reduce trash disposal. The City's recycling volumes have steadily increased since 2006, showing a 50% increase over 2005 levels.

Figure 25. City of Fort Collins Trash Volumes

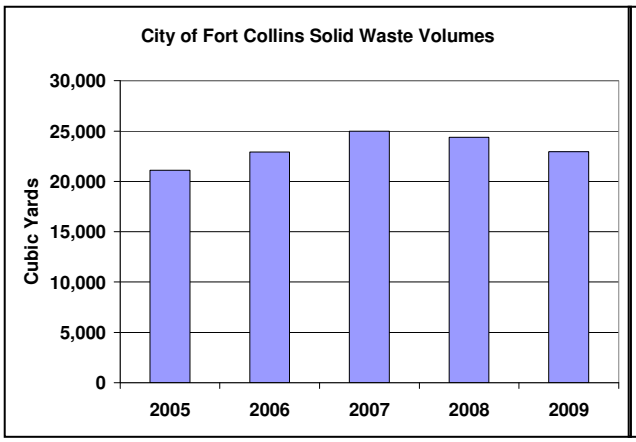
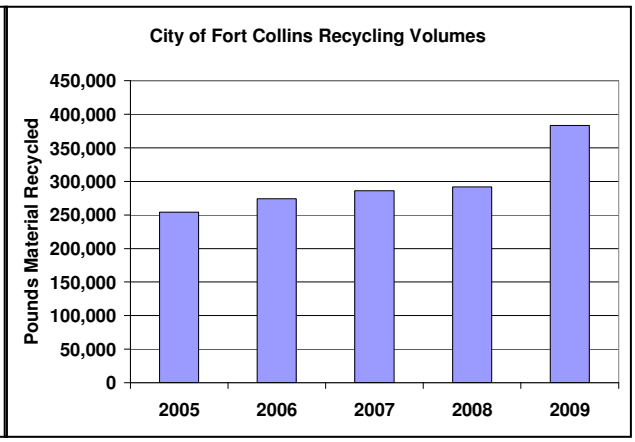


Figure 26. City of Fort Collins Recycling Volumes



APPENDIX A – Community GHG Accounting Summary

Inventory

Greenhouse gas accounting protocols have evolved rapidly over the past few years. 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 the methodology are anticipated. According to the City's policies, any future changes that would alter the 2005 baseline by more than 5% will trigger an update in the baseline inventory.

Three changes to the emissions inventory have occurred since the 2008 Climate Status Report.

1) Community electricity usage data was updated. The annual MWh now includes not only "Distribution" losses (line losses across Fort Collins Utilities underground power lines) but also "Transmission" losses (line losses across Platte River Power Authorities lines from the generation source to the distribution lines). This had the effect of increasing the baseline inventory and subsequent year inventories approximately 1.8%.

2) The electricity emissions factors for all reported years of 2005 through 2009 were modified to include "owned wind generation" (i.e. Fort Collins' share of Medicine Bow and recently Silver Sage wind) in the factor. This resulted in changes to the electricity emissions factor for each year.

3) This report uses community natural gas usage data that are not weather normalized, to be consistent with electricity data. Previous inventories used weather-normalized natural gas data.

More details on Fort Collins' GHG emissions inventory, forecast and accounting methodologies can be found in the report entitled ***Fort Collins Community Greenhouse Gas Emissions Quantification 2005, 2006, 2007, 2008, 2009 Inventory and 2020 Forecast***. Contact the City of Fort Collins Natural Resources Department at (970) 221-6600 for a copy.

Forecast

Table A on the next page identifies the updates that were made to the 2020 emissions forecast to reflect current growth predictions.

Table A. Revised Growth Assumptions

Emissions Source	Previous Growth Assumptions	Current Growth Assumptions
Electricity (from Fort Collins Utilities)	Estimates 23% growth in MWh purchased from 2009 through 2020.	1.5% drop from 2009 to 2010 1.77% drop from 2010 to 2011 0.43% growth from 2011-2012 0.42% growth from 2013-2018 0.41% growth from 2019-2020
Natural Gas (from Xcel Energy)	Estimates 0.1% annual growth with the benefits of their demand side management programs factored in.	Flat (no growth or decline)
Population	Estimates 1.5% annual growth	Apply DOLA annual growth projections for Larimer County, which show a net population growth of 21.8% from 2009 to 2020, or an average annual growth of 1.8%.
Solid Waste	Based on population growth estimates of 1.5%/year	16% drop from 2009 to 2010 (the average drop in Fort Collins solid waste in 2008 and 2009, reflecting the low economy) Increase 2.5% annually from 2011 to 2020, based on CDPHE projections for waste to landfills in Colorado.
Airline Travel	Based on population growth estimates	Based on population growth estimates
Energy in Recyclable Materials	Based on population growth estimates	Based on population growth estimates

The 2020 forecast will be updated biennially along with preparation of the Climate Action Plan's Biennial Review reports in advance of each City budget cycle.

Calculating 2009 Greenhouse Gas Emissions Reductions from Energy Measures

Development of the methodology for carbon emissions reporting is expected to evolve to reflect best practices and regulatory changes. The two primary considerations for the methodology are transparency and consistency. The intent is that carbon emissions reporting for the *Energy Policy,* 21st Century Utilities (via the Global Reporting Initiative) and the City of Fort Collins Climate Action Plan will be consistent and aligned.

The basic methodology for calculating carbon emissions and reduction from energy related measures is as follows:

- Fort Collins Utilities electricity related emissions inventory is estimated using a conversion factor based on Platte River Power Authority's resource mix that includes owned renewable generation but excludes RECs. The 2009 factor for this mix is 1,777 pounds of CO_2 per megawatt-hour.

- Energy efficiency program annual electricity savings are converted to carbon emissions reductions using a standardized conversion factor. The factor is 1,618 pounds of carbon dioxide avoided per megawatt-hour of electricity savings. It is based on the 2007 Environmental Protection Agency (EPA) "eGRID" non-baseload emission rate calculations for the Western Electric Coordinating Council (WECC) Rockies subregion.
- 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 2009 is 1,536 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).

Prepared by the City of Fort Collins Energy Management Team

(970) 221-6600