



Fort Collins Climate Action Plan 2008 Status Report

July 2009

(Updated August 2009)



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Appendix A – Community Carbon Footprint and Emissions Forecast

August 2009 Updates To This Report

- *Table 5 on page 8 revised to show correct, increased total for recycling and total GHG reductions.*
- *Table 12 on page 22 revised to refer to new measures as “Potential”, not “Proposed”.*
- *Revised total dollar savings from City energy challenge from \$49,226 to \$9,226 on Executive Summary page 2 and in Report page 30.*

Fort Collins Climate Action Plan 2008 Status Report

Executive Summary – July 2009

We Are Making Progress

A decade 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.

Today, 10 years later, thanks to the efforts of the entire community, we have changed the trajectory of the emission growth curve.

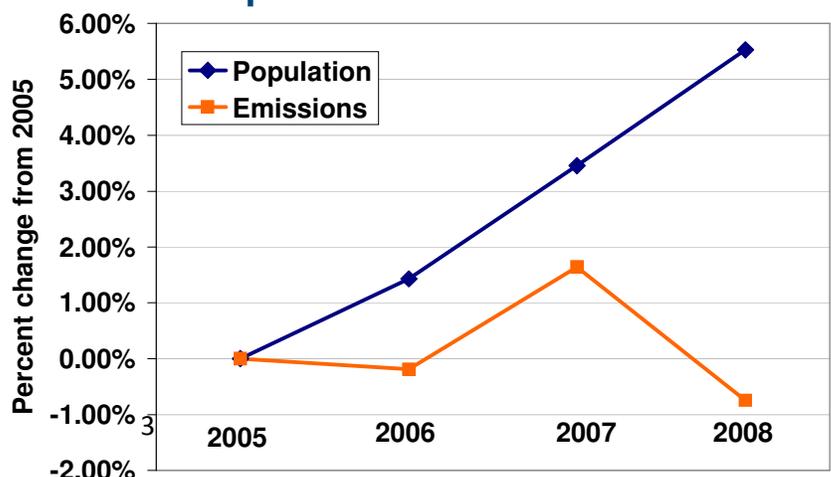
- Despite a 5% growth in population, our community emissions have not grown since 2005.
- Together, we avoided over 236,000 metric tons CO₂e (carbon dioxide equivalent) in 2008.
- Climate Wise partners avoided over 100,000 tons CO₂e and saved over \$7.2 million in 2008 alone.
- Citizens and businesses participating in City energy efficiency programs avoided almost 29,000 metric tons CO₂e in 2008.
- 6.3% of our electricity from is generated by clean, renewable energy.



- Tons of waste sent to the landfill dropped by 21% since 2006.
- Community waste diversion rates increased by 28% since 2006.
- Transfort ridership grew by 27% since 2005.
- The number of VanGo vans increased by 65% since 2005.

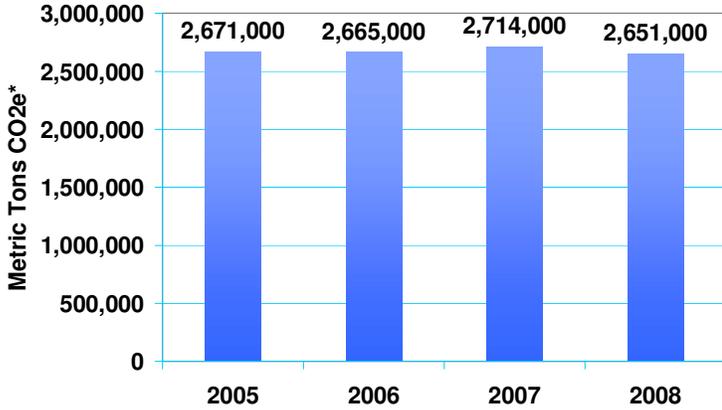


Population and Emissions



2008 Emissions Are Essentially Level With 2005 Emissions

Fort Collins Greenhouse Gas Emissions



* Total net emissions with the benefit of metered wind energy from Medicine Bow factored in.

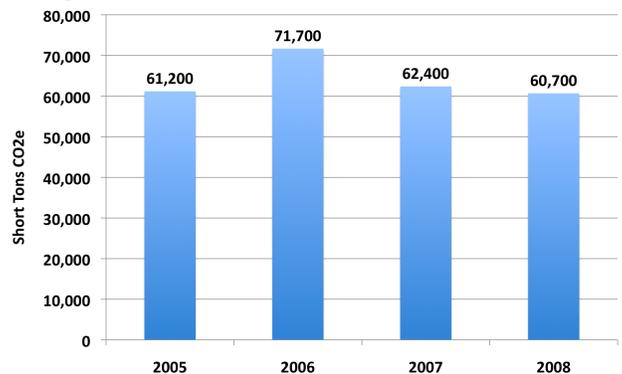
Despite a 5% growth in population, our community emissions have not grown since 2005.

- Energy efficiency savings from 2008 programs saved over 11,400 megawatt-hours (MWh) in annual electricity use, or 0.8% of the community's electricity use;
- The *Green Energy Program* has over 1,650 residential customers and over 120 commercial customers, comprising 39% of overall renewable energy purchases.
- Climate Wise partners avoid over 100,000 tons CO₂e in 2008, and saved over \$7M in 2008 alone.
- Tons of waste sent to the landfill dropped by 21% since 2006.
- Transfort ridership has increased 27% from 2005 levels.

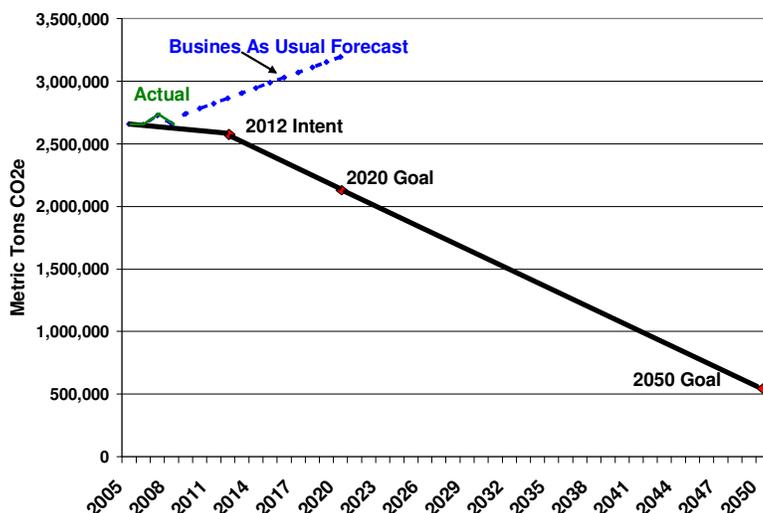
City of Fort Collins municipal emissions dropped by 0.7% from 2005 levels, despite 1.4% growth in number of employees.

- An employee Energy Challenge saved 164,753 kWh and an estimated financial savings of \$9,226.
- Lighting retrofits were completed for 22 municipal buildings.
- Office recycling increased by 56 tons from 2005 levels; City office diversion rates were calculated to be 18%.
- Scrap metal recycling earned the City approximately \$70,000 in rebates.
- City self-hauled deliveries to the landfill were reduced 20% in volume.
- The City began purchasing only ENERGY STAR qualified desktop computers, desktop derived servers and laptop computers.
- 11,638 alternative mode trips were logged in the GO GREEN pilot program from July to November 2008.

City Government GHG Emissions



Our Goals



In recognition of the significant potential disruption that climate change could cause at the local as well as global level and the multiple benefits that come from taking proactive action, in 2008 City Council adopted new carbon reduction goals for the Fort Collins community:

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

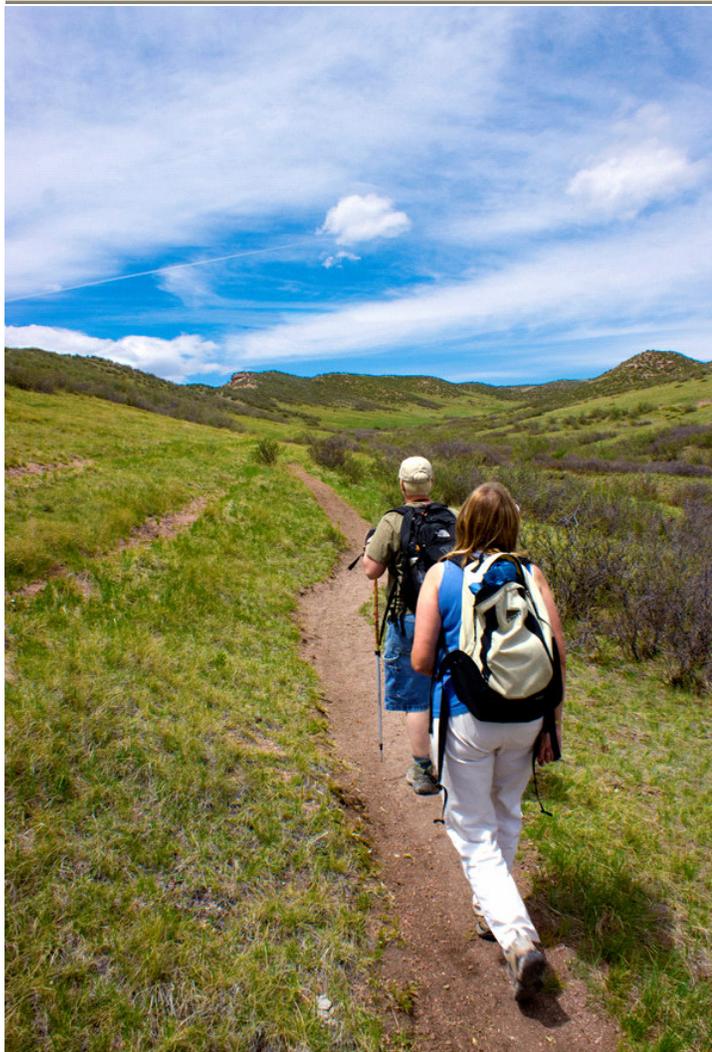
How We'll Get There

In 2008, City Council adopted the 2008 Fort Collins Climate Action Plan to guide community progress towards the adopted reduction goals.

FUTURE ACTIONS

High priority actions in 2009 through 2011 include:

- Community Climate Challenge to reduce 1% of residential emission by 2012. Pilot program will be conducted in 2009.
- Implementation of 2009 Fort Collins Energy Policy.
- Continuation of the Climate Wise program growth.
- Anticipated passage of Transit Strategic Plan in 2009.
- Council direction to staff to prepare amendments to Pay-as-you-Throw trash ordinance and further evaluate pilot trash services "district".
- Implementation of ICC Green Building Code.

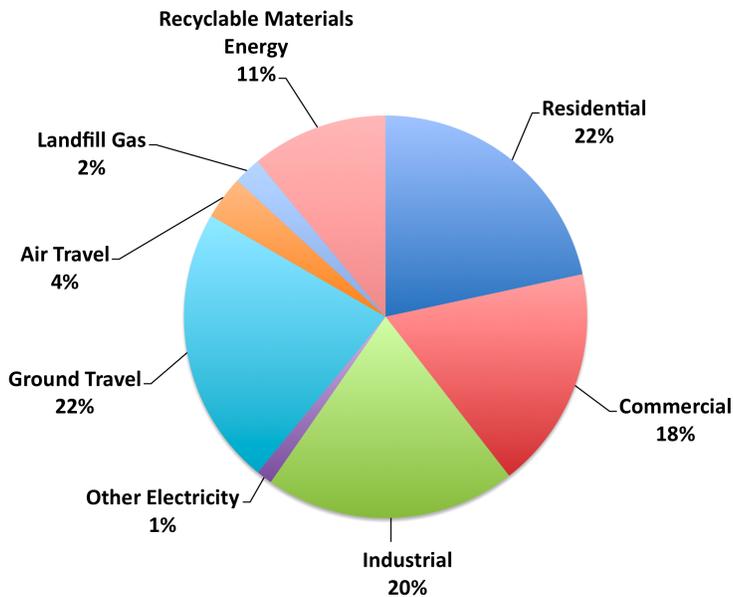


FUNDING OPPORTUNITIES

- The City of Fort Collins will receive \$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.
- Fort Collins will also receive federal stimulus funding to convert six Transfort buses to compressed natural gas. Fort Collins is also joining with other Front Range communities on a grant request to upgrade several fleet vehicles to plug-in-hybrids.
- Fort Collins may receive a portion of the \$49 million Colorado State Energy Program funding; local residents and business could benefit from another \$80 million earmarked for the state to offer building weatherization programs.
- Fort Collins will apply for other grant funding opportunities to help implement the CAP.
- Funding for CAP-related items will be requested through the 2010/2011 BFO process.

Our Carbon Footprints

Fort Collins Communitywide 2008 Greenhouse Gas Emissions



COMMUNITY CARBON FOOTPRINT

In 2008, Fort Collins emitted 2,650,000 metric tons of CO₂e after taking into account the benefit of wind energy from Medicine Bow. This includes:

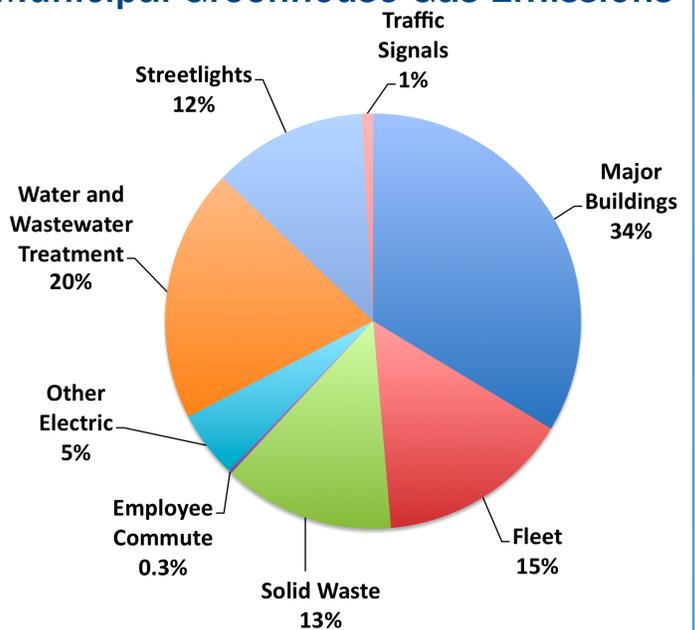
- Combustion of fossil fuel that occurred inside the community boundary; specifically, fuel for ground transportation and building heating (defined as Scope 1 emissions).
- Indirect emissions from electricity purchased by Fort Collins Utilities for use in the community but generated outside the community boundary (Scope 2 emissions). Electricity represents 45% of total emissions.
- Indirect emissions that result from Fort Collins' activities which physically 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).

MUNICIPAL GOVERNMENT CARBON FOOTPRINT

The City of Fort Collins emitted 61,000 short tons CO₂e in 2008. This includes emissions from internal government operations such as building operations, fleets including Transfort, trash and employee commuting. It also includes emission associated with the provision of public utilities for the community including water treatment and wastewater reclamation, streetlights and traffic signals.

In 2008, 62 percent of total municipal emissions came from electricity use, followed by 15 percent from transportation.

2008 City of Fort Collins Municipal Greenhouse Gas Emissions



INTRODUCTION

Widespread 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.

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 success of the voluntary Climate Wise Program, for example, in 2008, innovative businesses avoided emitting more than 100,000 tons of CO₂e, while saving over \$7.2 million.

In 2007 a citizen task force was convened to develop an updated plan and recommend a future direction. In May 2008, via Resolution 2008-051, City Council set new community-wide goals that align with state goals:

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

At the same time, City Council also expressed their intent to reduce community-wide emissions to a level not to exceed 2.466 million tons of CO₂ by the end of 21012.

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 .)

Climate Protection Timeline

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

1997 – City joins ICLEI's Cities for Climate Protection Campaign

1998 – Fort Collins is first community in Colorado to offer voluntary wind subscription

1999 – Community carbon reduction goals and Local Action Plan adopted

1999 – Goals adopted for diverting 50% of the community's waste stream from landfill disposal

2000 – Climate Wise program for business initiated

2003 – Energy Policy adopted, making Fort Collins the first entity in Colorado to set renewable portfolio standard

2004 -- Residential energy code updated

2006 – Fort Collins 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

June 2009 – First progress report for the 2008 Climate Action Plan.

January 2009 – Revised Energy Policy adopted by Council, with carbon metrics and new goals

City Council Resolution 2008-051 also calls for an annual report tracking progress toward attainment of the goals. The Resolution directs the annual report to include an evaluation of community-wide greenhouse gas emissions and a list of quantified reduction activities for the prior year. This report will

be prepared by the City's Energy Management Team and presented to the City Manager no later than June for the prior year. Annual reporting will commence in 2009 for the year of 2008.

This report is the first annual report on community-wide greenhouse gas emissions and progress toward reductions. The report contains:

- Baseline emissions in 2005 according to recently updated greenhouse gas accounting protocols
- Community emissions in 2008
- City government emissions in 2005 and 2008
- List of key community progress indicators
- Summary of major greenhouse gas reduction highlights in 2008
- List of actions completed in 2008
- Revised 2020 "Business as Usual Forecast" that reflects updated growth projections
- List of additional climate protection actions.

The completion of this report marks an important juncture in the City of Fort Collins' climate protection campaign. After 10 years of planning and implementing comprehensive strategies, and considerable investment by private and public entities alike to voluntarily develop new practices that drive down GHG emissions, the results of the City's efforts show progress.

Citizens of Fort Collins and their elected officials have exemplified conviction and a tireless commitment to "thinking globally and acting locally" to reduce the damaging effects of climate change. By doing so, we have demonstrated leadership in our community, with benefits to our community, to other communities and at all levels of government.

II. WHERE WE ARE NOW

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

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

The main purposes of the community 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 emission 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. Following a review of GHG accounting Best Practices in early 2009, the City revised the components that are included in the community GHG inventory by adding airline miles attributed to Fort Collins, and embodied energy in recyclable materials. This approach brings the accounting into better alignment with reductions defined in the 2008 Climate Action Plan. Other minor adjustments were made to the GHG accounting practices as well. See Appendix A for more information about the community emissions inventory.

In 2005, a total of 2,647,000 metric tons (MT) of carbon dioxide equivalent¹, or CO₂e, were emitted by the Fort Collins community, after accounting for the benefits of metered wind energy from the 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 physically 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).

¹ Carbon dioxide equivalent or CO₂e: Each GHG has a "global warming potential" which refers to its heat-trapping ability relative to carbon dioxide. Methane is 21 times more potent than CO₂ and nitrous oxide is 310 times more potent. CO₂e refers to the summed impact of gases quantified, in terms of carbon dioxide.

Table 1 identifies Fort Collins’ baseline emission in metric tons of CO₂e.

Table 1. Fort Collins 2005 Baseline Greenhouse Gas Emissions

Source	MT CO ₂ e	Type
Electricity (Gross)	1,177,867	Indirect (Scope 2)
Natural Gas	412,409	Direct (Scope 1)
Ground Transport	573,199	Direct (Scope 1)
Air Travel	86,933	Indirect (Scope 3)
Landfill Gas	62,731	Indirect (Scope 3)
Recyclable Materials Energy	368,440	Indirect (Scope 3)
Total (Gross)	2,681,579	
Benefit of Metered Wind	-10,494	
Total (NET)	2,671,085	
Benefit of RECs	-12,047	
Benefit of Known Offsets	0	
Revised Total	2,659,038	

Metered Wind = wind energy provided to Fort Collins from Medicine Bow wind site.

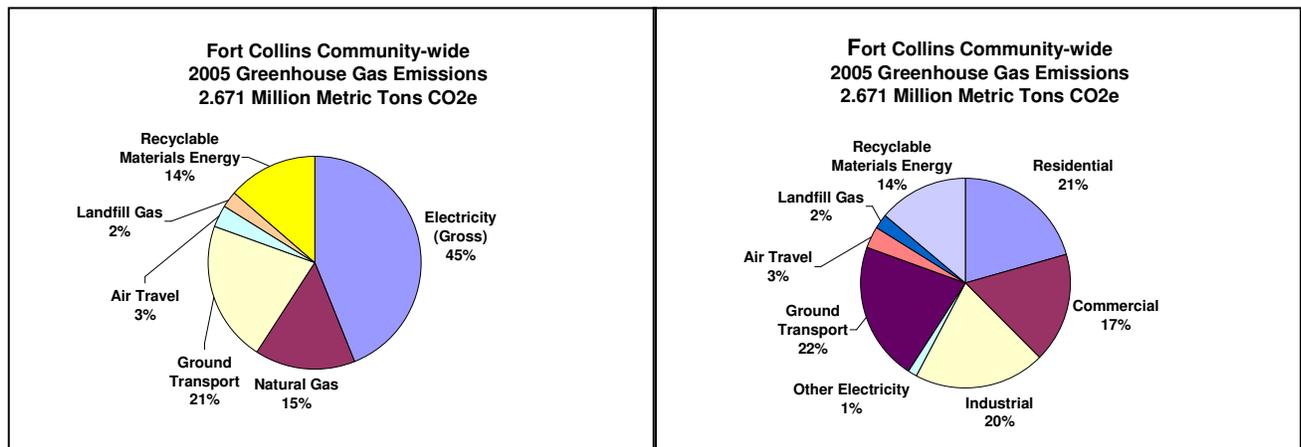
RECs = Renewable Energy Certificates

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

The graphs in Figures 1 and 2 show the 2005 baseline emissions according to source and end user categories.

Figure 1. 2005 Baseline Emissions by Source

Figure 2. 2005 Baseline Emissions by End User



2008 Community Inventory

The 2008 community GHG inventory was calculated using the same approach as the 2005 baseline. Results are shown below in Table 2.

Table 2. Fort Collins 2008 Greenhouse Gas Emissions

Source	MT CO ₂ e	Type
Electricity (Gross)	1,185,846	Indirect (Scope 2)
Natural Gas	440,461	Direct (Scope 1)
Ground Travel	594,552	Direct (Scope 1)
Air Travel	92,082	Indirect (Scope 3)
Landfill Gas	58,367	Indirect (Scope 3)
Recyclable Materials Energy	290,587	Indirect (Scope 3)
Total (Gross)	2,661,895	
Benefit of Metered Wind	-11,467	
Total (NET)	2,650,428	
Benefit of RECs	-54,191	
Benefit of Known Offsets	-231	
Revised Total	2,596,006	

Figure 3. 2008 Emissions by Source

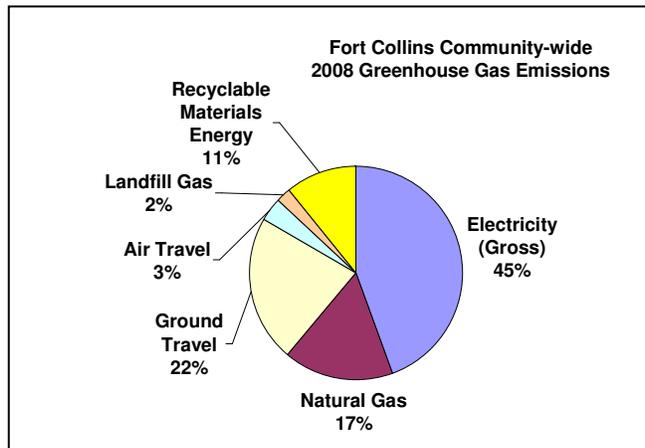
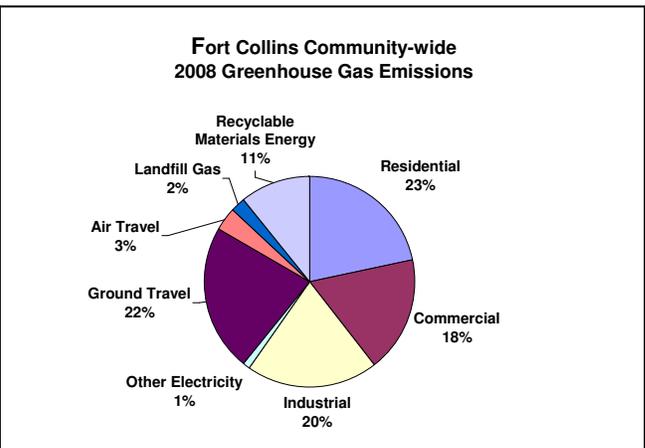


Figure 4. 2008 Emissions by End User



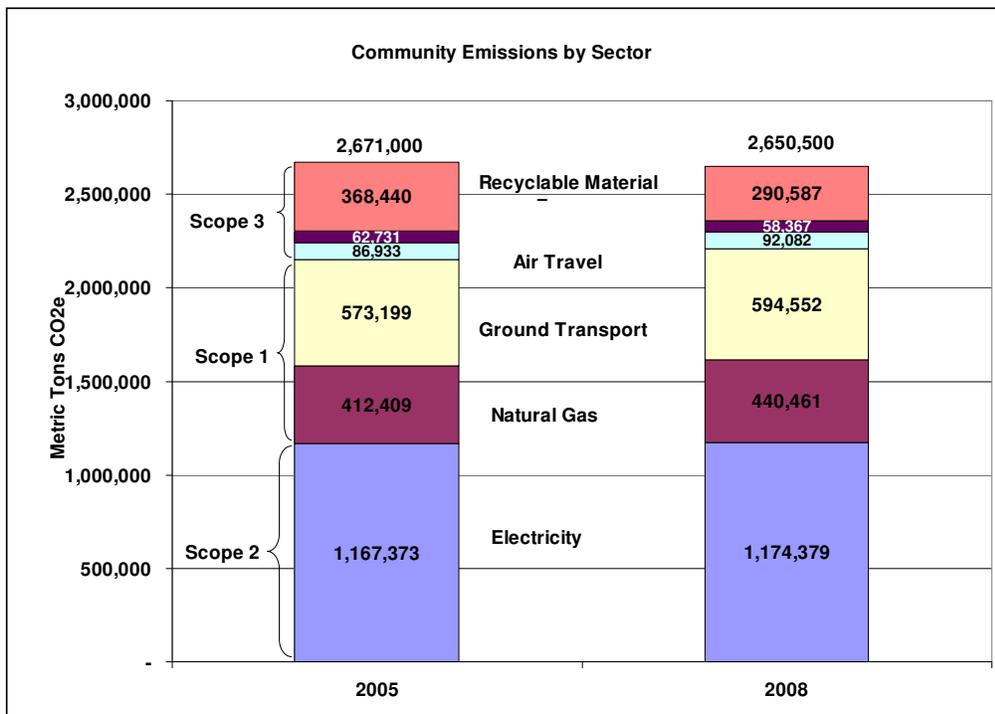
III. COMMUNITY PROGRESS

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 2008, net community greenhouse gas emissions grew by only 0.1% while population grew by 5.5%. This has resulted in a 5.1% reduction in per capita emissions between 2005 and 2008. Furthermore, when the benefits of RECs and offsets are also factored in, community emissions were documented to drop by 1.5% from 2005 to 2008. The tables and charts below illustrate emissions levels in various sectors.

Table 3. Fort Collins Greenhouse Gas Emissions; 2005 and 2008

GREENHOUSE GAS EMISSIONS	2005	2008	Percent Change
Population	127,686	134,743	5.5%
	Metric tons CO2e	Metric tons CO2e	
Electricity (Gross)	1,177,867	1,185,846	0.7%
Natural Gas	412,409	440,461	6.8%
Ground Transportation	573,199	594,552	3.7%
Jet Fuel	86,933	92,082	5.9%
Landfill Emissions	62,731	58,367	-7.0%
Energy in Recyclable Materials	368,440	290,587	-21.1%
TOTAL (Gross)	2,681,579	2,661,895	-0.7%
Benefits of Metered Wind	-10,494	-11,467	9.3%
TOTAL Net With Metered Wind	2,671,085	2,650,428	-0.8%
Per Capita Net GHG Emissions	20.9	19.67	-6.0%
Benefits of RECs and Offsets	-12,047	-54,422	351.8%
Revised Total Emissions	2,659,038	2,596,006	-2.4%

Figure 5. Community Emissions by Sector



Key Community Indicators

Table 4. Key Community Indicators

	2005	2008	Percent change
Fort Collins population	127,686	134,743	5.5%
RESIDENTIAL			
Residential Electricity (MWh)*	454,070	472,871	4.1%
Per Capita Electricity (MWh/person)	3.6	3.5	-1.3%
Residential Natural Gas (DTH)	3,254,870	3,610,428	10.9%
Per Capita Natural Gas (DTH)	25.5	26.8	5.1%
Per Capita Residential Buildings- Tons CO2/person	4.3	4.2	-0.7%
TOTAL ENERGY			
Electricity (MWh)*	1,433,063	1,472,844	2.8%
Per Capita MWh	11.2	10.9	-2.6%
Natural Gas (DecaTherms)	7,619,775	8,137,860	6.8%
Per Capita DecaTherms	59.7	60.4	1.2%
TRANSPORTATION			
Estimated Vehicle Miles Traveled	997,420,380	1,034,576,424	3.7%
VMT/person/yr	7,811.5	7,678.1	-1.7%
VMT/person/Day	23.7	23.3	-1.7%
Transit Ridership/year	1,481,000	1,885,000	27.3%
WASTE and RECYCLING			
Short Tons Waste generated	237,747	187,510	-21.1%
Short Tons Recycled Material (excluding asphalt) ('06-'08)	60,245	69,510	15.4%
Percent waste diversion ('06-'08)	21.1%	27.0%	28.2%

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

Summary of Progress Highlights: 2005 to 2008

- Total net community-wide emission dropped by 0.8%; population grew by over 5%.
- Net per capita emissions dropped by 6%.
- Per capita electricity use dropped by 2.6%.
- Tons of waste sent to the landfill dropped by 21% from 2006 to 2008.
- Tons of recycling increased by over 15% from 2006 to 2008.
- Community waste diversion rates increased by from 21% in 2006 to 27% in 2008, a 28% increase in community waste diversion rates.

IV. 2008 COMMUNITY ACTION HIGHLIGHTS

Quantified Community-wide Greenhouse Gas Reductions

In 2008, Fort Collins avoided nearly 182,000 metric tons of CO₂e from specific, quantified community-wide projects before the benefits of green energy are factored in. The tons avoided rise to over 236,000 when green energy is factored in. Although countless other projects may have occurred during 2008, 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. 2008 Estimated Community-wide GHG Reductions

Community-wide Reductions Project name	2008	2008
	Short Tons CO ₂ e/yr	Metric tons CO ₂ e/yr
Climate Wise		
Electric Energy Efficiency projects	36,670	33,267
Renewable Energy Projects**	11,464	10,400
Natural Gas Projects	12,921	11,722
Recycling/Waste Diversion	33,594	30,476
Transportation	756	686
Water	829	752
Other	4,277	3,880
Climate Wise Total	100,511	91,184
ENERGY		
Electric Efficiency Program Savings (2002 - 2008)	31,679	28,739
Metered Renewable Energy	12,640	11,467
Renewable Energy Certificates**	59,734	54,191
RFR Program CFC-11 Destruction	4,583	4,158
Building Codes Changes Since 2005	1,558	1,413
Energy Sub-Total	110,194	99,968
WASTE REDUCTION		
Residential Recycling	53,356	48,404
Commercial Recycling	98,072	88,971
Waste Reduction Sub-Total	151,428	137,375
TRANSPORTATION		
Transfort Bus	3,796	3,444
Van Go vanpool	341	309
BioDiesel (CSU and City of Fort Collins)	139	127
Bike To Work Day	12	11
Transportation Sub-total	4,276	3,879
TOTAL QUANTIFIED REDUCTIONS without RECs	253,850	230,293
TOTAL QUANTIFIED REDUCTIONS with RECs	313,585	284,484

*Reductions TOTAL corrected for double-counting.

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

Fort Collins Energy Policy

Energy Efficiency and Load Management 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). Many of the programs are a collaborative effort between Fort Collins Utilities and Platte River Power Authority.

Energy efficiency and load management results for 2008 include:

- Electricity savings from 2008 efficiency programs saved over 11,400 megawatt-hours in annual electricity use, or 0.8% of the community’s electricity use;
- Efficiency programs in 2008 saved energy at a cost of 1.3 cents per kilowatt-hour (kWh), compared with a 3.9 cents per kWh total wholesale cost from Platte River;
- Cumulative annual electricity savings in 2009 from efficiency programs (2002 through 2008) will be over 39,000 megawatt-hours;
- Cumulative annual peak demand savings in 2009 from efficiency programs (2002 through 2008) will be over 7.3 megawatts;
- Load management programs for residential air conditioning, residential hot water heaters and commercial/industrial customers expanded, avoiding over 3.5 megawatts of summer peak demand; and
- 2008 per capita electric consumption was 0.9% lower than the 2002 baseline; per capita peak electric demand was 2.9% higher than the 2002 baseline.

The electricity savings from energy efficiency programs implemented under the Energy Supply Policy are shown below. Energy savings are tracked here from 2006 forward, recognizing that 2005 is the baseline year for the community inventory. However, these efficiency programs have provided over 39,000 MWh savings since 2002. For more details, see Fort Collins “Electric Energy Supply Policy: 2008 Annual Update” report.

Table 6. Energy Efficiency Program Energy Savings 2006 - 2008 (MWh and Tons CO₂e)

Program	2006 MWh	2007 MWh	2008 MWh	Total MWh	06-'08 Cumulative Short tons CO ₂ e	06-'08 Cumulative Metric tons CO ₂ e
Clothes Washer Rebate	110	132	135	377	305	277
Cooling Rebate	11	10	170	191	155	140
Refrigerator & Freezer Recycling	415	303	271	989	800	726
RFR Program - CFC-11 Destruction					4,583	4,158
Residential Lighten Up	1,429	1,501	861	3,791	3,067	2,782
LightenUP Program		3,391	6,232	9,623	7,785	7,063
Electric Efficiency Program	3,190	2,450	3,630	9,270	7,499	6,803
Integrated Design Assistance Program	190	247	82	519	420	381
Total	5,345	8,034	11,381	24,760	24,614	22,330

Renewable Energy Program

Fort Collins Utilities renewable energy strategy targets meeting policy initiatives to increase use of renewable energy and customers who volunteer to subscribe for additional renewable energy.

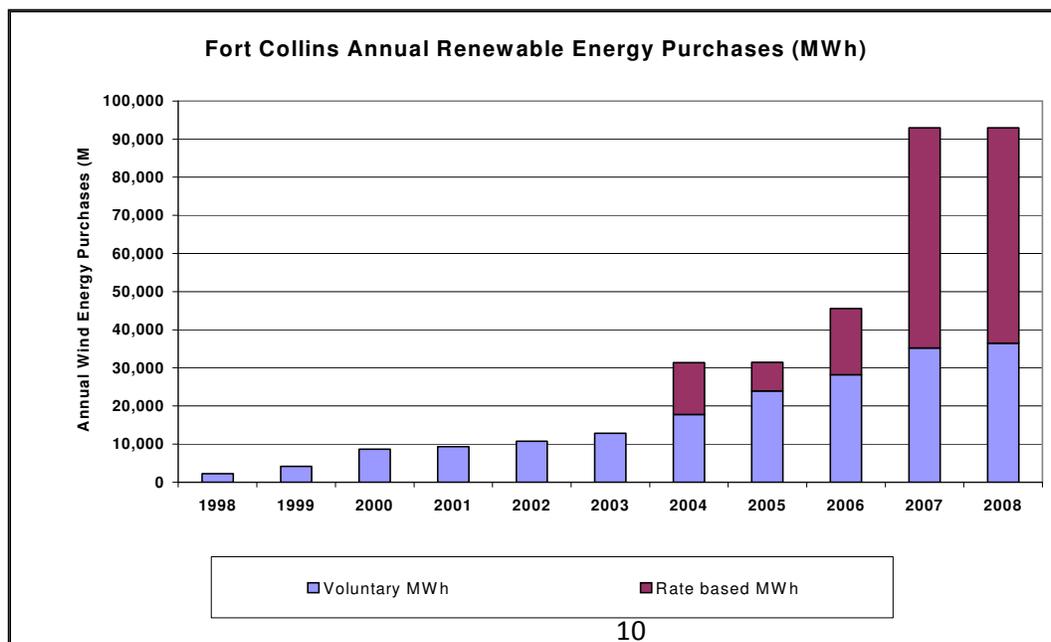
The *Energy Supply Policy* set a goal of a minimum of 2% renewable energy, increasing to 15% in 2017. The State of Colorado also has a Renewable Energy Standard (RES) that covers Fort Collins. The Colorado RES requires Fort Collins to have a minimum of 1% renewable energy through 2009, increasing to 3% in 2011, 6% in 2015 and 10% in 2020.

Utilities has offered renewable energy to customers since 1998. In 2007, the *Wind Power Program* went through a re-branding to the *Green Energy Program*. This program is a premium-priced rate option for customers who wish to have all or a portion of their electricity generated from renewable sources. The amount of energy purchased through the Green Energy Program varies from year to year, but has been approximately 2.5% of community electricity use.

Fort Collins Utilities purchases all renewable energy from Platte River Power Authority under their Tariff 7, sufficient to meet the requirements of both policy and the Green Energy Program. In 2008, the City’s renewable program was supplied from two types of sources. Wind turbines at Platte River’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. RECs in the Tariff 7 portfolio are certified by Green-e, as is Fort Collins Utilities’ Green Energy Program.

Platte River plans to reduce the fraction of their renewable energy portfolio supplied by RECs over time by increasing investment directly in wind energy projects. The most recent addition to the portfolio, in April 2009, was 12 megawatts of wind in southern Wyoming.

Figure 6. Total renewable energy purchases from 1998 – 2008.

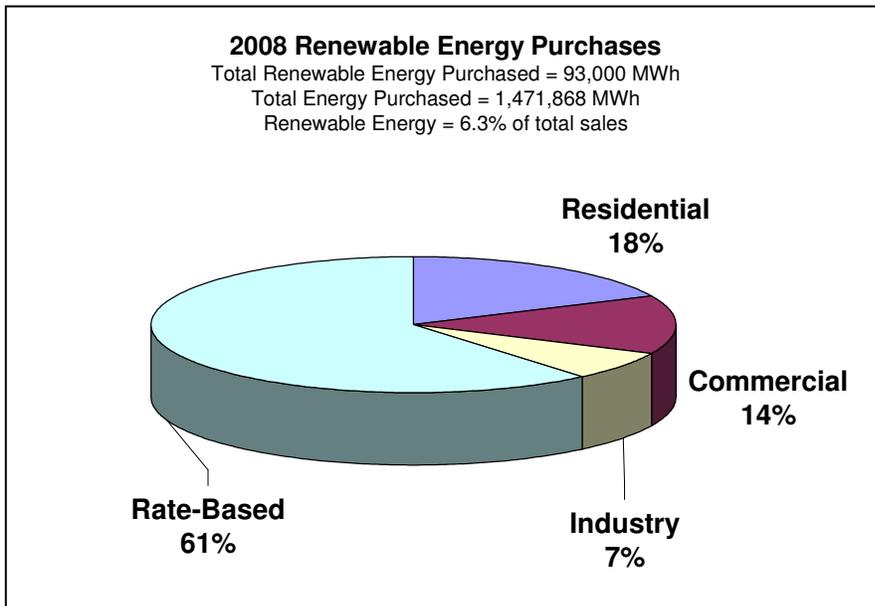


2008 Renewable Energy Results

- Renewable energy comprised 6.3 percent of total electrical energy purchases in 2008. Renewable energy purchases were 93,000 megawatt-hours (Figure 5.1);
- The Green Energy Program facilitated the purchase of over 36,000 megawatt-hours of electricity, comprising 39 percent of overall renewable energy purchases;
- The Green Energy Program has over 1,650 residential customers and approximately 120 commercial customers; and
- Rate based purchases of renewable energy totaled over 56,000 megawatt-hours of electricity, comprising 61% of overall renewable energy purchases.

Figure 7 below shows the distribution of renewable energy acquired in 2008.

Figure 7. Fort Collins Renewable Energy Purchases



Climate Wise

During 2008 the Climate Wise program grew by 52 organizations to include 124 business partners. With 87% of partners reporting, the number of Climate Wise partners' GHG reduction projects grew from nearly 400 in 2007 to more than 600 hundred in 2008. In 2008, Climate Wise partners avoided over 100,000 tons of CO₂e. The projects saved the partners \$7.2 million in 2008 alone, and over \$24 million cumulatively since the program began in 2000.

Figure 8 shows the growth in Climate Wise partners and projects over the years. Figure 9 shows the breakdown of projects by type. For more information, see the 2008 Climate Wise Annual Report at <http://www.fcgov.com/climatewise/reports.php>

Figure 8. Climate Wise Program Growth, in Numbers of Partners and Projects

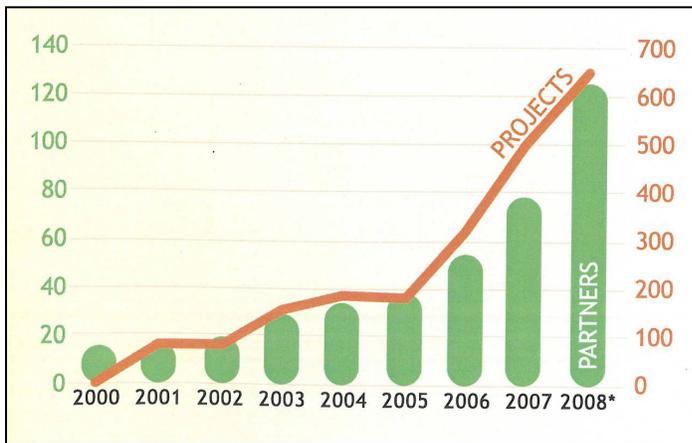
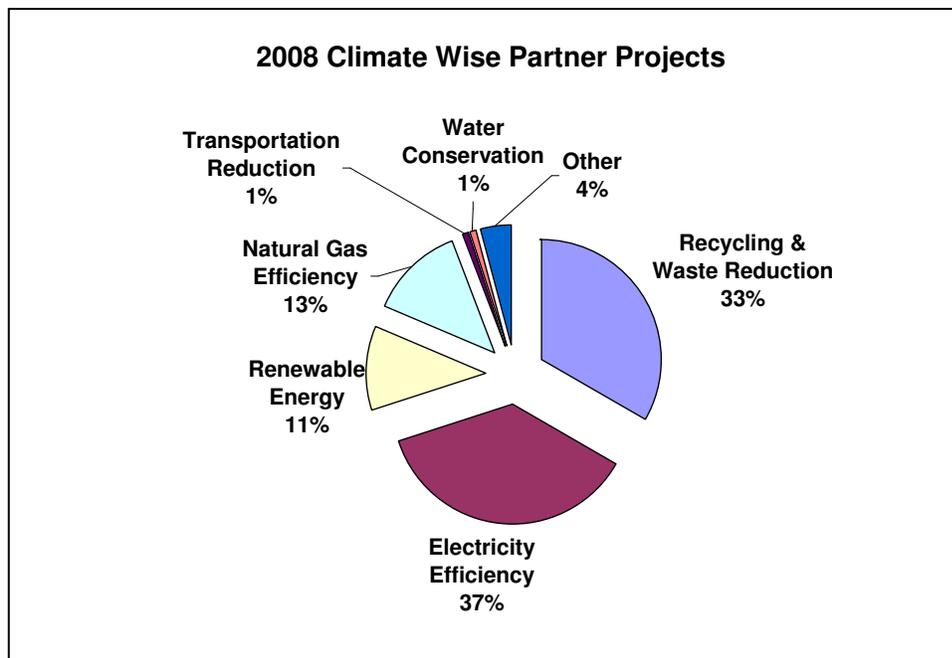


Figure 9. 2008 Climate Wise Partners' GHG Reductions by Percent of Tons CO₂e Avoided



Climate Wise Measures That Matter

Water Conservation: Cumulative savings since 2000: saved almost 4 billion gallons of water (equivalent to filling City Park Pool 18,600 times annually).

Electrical Energy: Cumulative savings since 2000: 280,000,600 kWh (equivalent to the annual energy use of 25,400 homes).

Natural Gas: Cumulative savings since 2000: 6,590,000 therms (equivalent to the annual natural gas usage of 9,300 homes).

Reduce, Reuse, Recycle: Cumulative savings since 2000: 83,200 tons of materials diverted (equivalent to the weight of 6,000 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.

Poudre School District

As a Climate Wise partner and in accordance with their 2006 Sustainability Management System (SMS), Poudre School District is committed to conducting an updated greenhouse gas (GHG) inventory each fiscal year to assess progress toward the District’s established, long-term goal to reduce GHG emissions:

Reduce the utility (energy and water) portion of the GHG percentage by 1.5% per year until the year 2016 for a total reduction of fifteen percent in 10 years. Measure this by GHG tons per square foot.

As of 2008, Poudre School District achieved an 11.6% reduction over 2005 baseline emissions from the utility component (electricity and natural gas) of the inventory on a per square foot basis. This progress puts the District ahead of its goal of achieving 1.5% reduction per year. Preliminary estimates of net reductions indicate a 15% decrease in overall emissions between 2005 and 2008. Final results will be published in the District’s 2009 SMS Report.

Waste Diversion

The City of Fort Collins has established a goal to divert 50% of the community waste stream by the year 2010. As of 2008, Fort Collins' community diversion rate-- including a 6% factor¹ for waste reduction that is attributed to the City's Pay-As-You-Throw trash ordinance-- was calculated at 33%. If the benefit of recycling 158,500 tons of asphalt from street paving activities was also factored in, the diversion rate would jump to 52% (the City uses the US Environmental Protection Agency's waste diversion methodology, which excludes industrial waste materials).

2008 afforded Fort Collins citizens and businesses increased opportunities to recycle and divert waste from the landfill. Some highlights are discussed below.

[Expansion of Materials Accepted for Recycling](#)

In 2008 local trash haulers began accepting an expanded list of materials and voluntarily switched to collecting curbside recycling in a single-stream system, instead of using a dual-stream approach. Newly added were plastic containers and lids, including most plastics numbered 1 through 7.

The City of Fort Collins joined with Loveland and Larimer County to launch a strategic pilot project to offer area residents five locations for glass-only recycling, thereby ensuring that nearly all glass actually gets recycled. This 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.

[Vegetable Oil Recycling Opportunities for Residents](#)

In 2008 Fort Collins resident gained a way to recycle their waste vegetable oil (WVO) through a pilot project. Starting in December, the City helped support WVO drop-off services for residents at two local businesses, Habitat Home Supply and Eco-Thrift. The WVO collected at these two stores is used to manufacture biodiesel for their delivery trucks.

[Planning](#)

In 2008 a Trash Services Study was conducted, with assistance from a consulting firm (R3) that researched and wrote a comprehensive report² recommending ways to reduce the impact of trash collection services in Fort Collins, and to improve diversion rates for recyclable materials. City Council considered a number of recommendations from this report at four work sessions in 2008, and asked for PAYT ordinance changes and a pilot trash collection district to be further developed in 2009.

Awards

[Award](#)

The City received the 2008 3CMA Savvy President's Award for its "Electronic Waste, Not for Landfills" public awareness campaign in the category of Marketing Plans with Tools; Community Issue.

¹ See Fort Collins' 2006 draft Strategic Plan for 50% Waste Diversion, by Skumatz Economic Research Associates (http://www.fcgov.com/recycling/pdf/ftcollins_5yr_sw_plan_2006-0208_v15.pdf)

² Report available at http://www.fcgov.com/trashstudy/pdf/trash_svcs_study_final_2008-0701.pdf

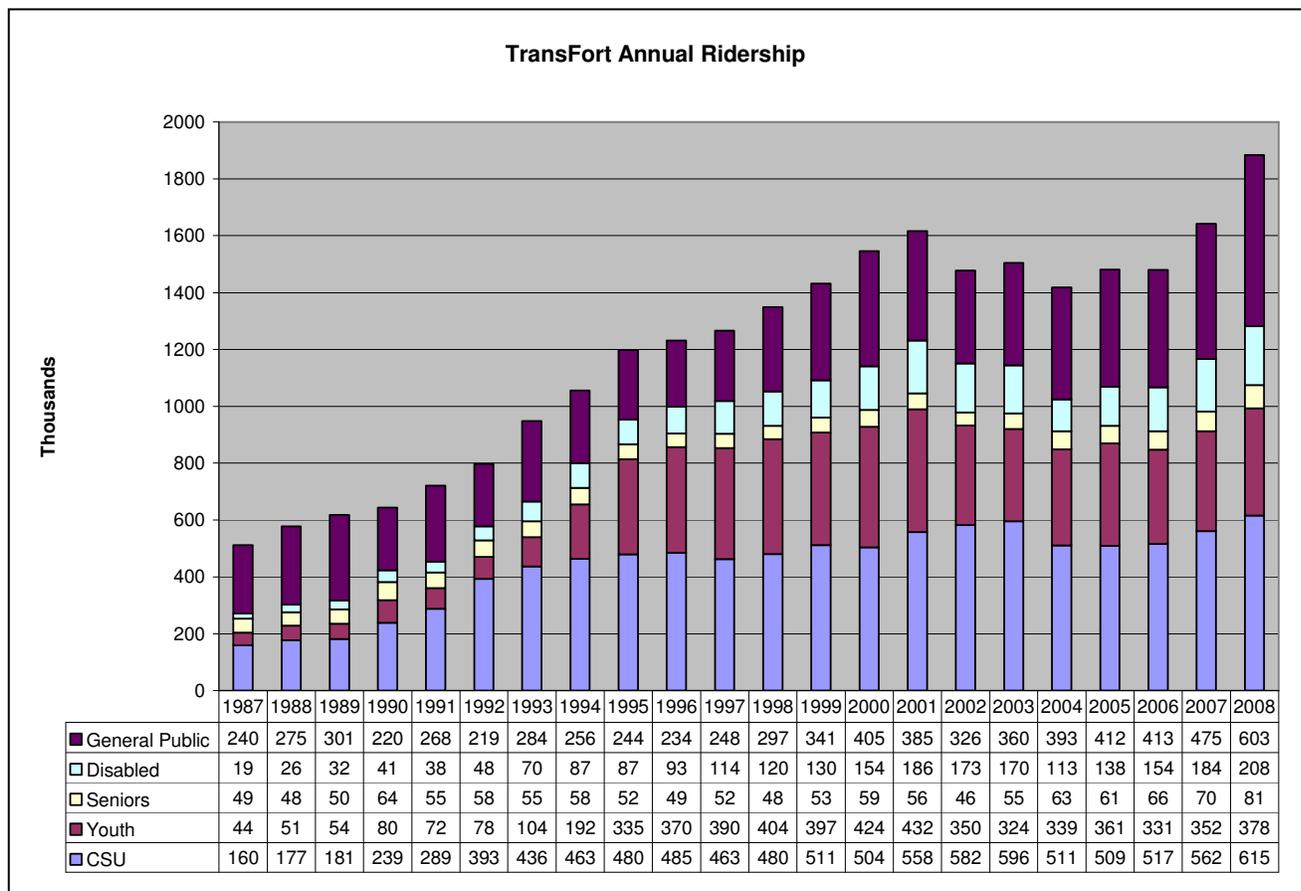
Transportation

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 2008 reached 1,884,191 trips, a 14.8% increase from 2007. At 3.9 miles/trip on average, Transfort avoided 7.3 million miles of vehicular travel in Fort Collins in 2008.

Transfort ridership levels have increased 27% from 2005 levels. Ridership in the “General Public” sector grew by nearly 50% in the same period.

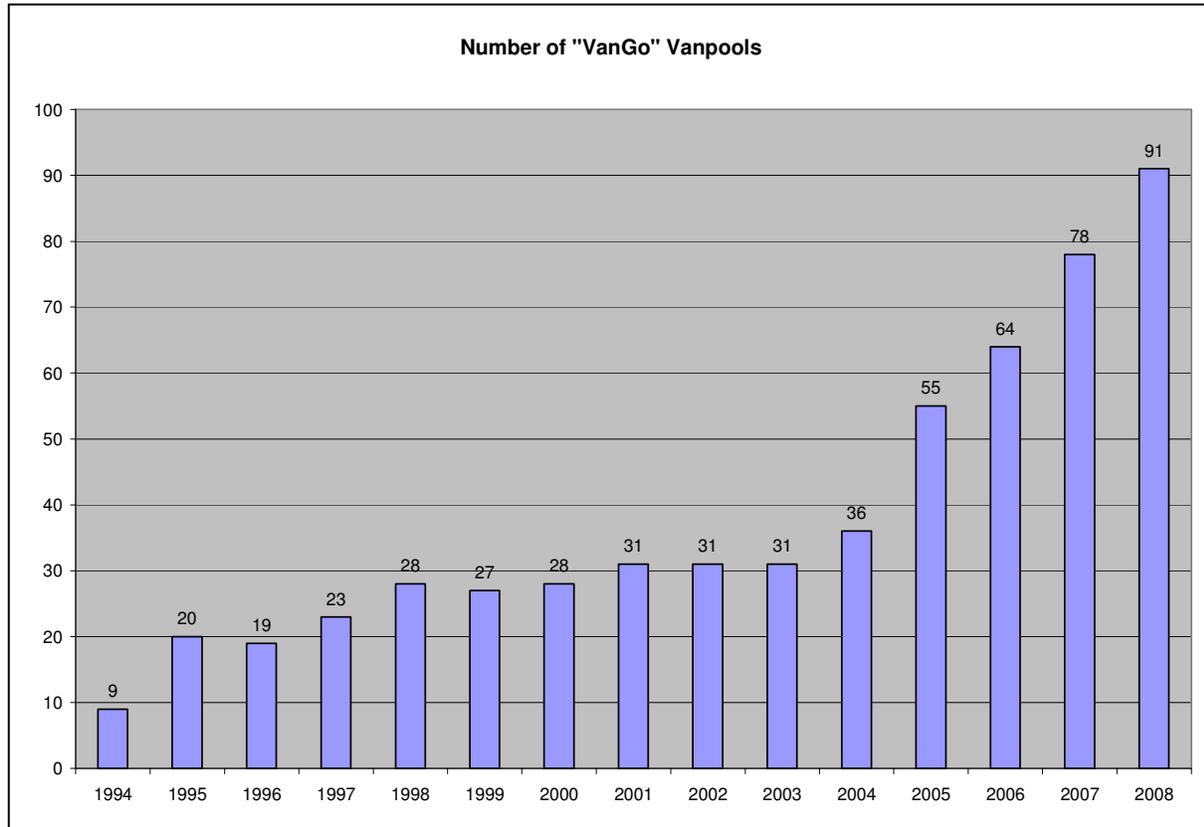
Figure 10. Transfort Ridership Trends



VanGo Vanpool Program

In 2008, the North Front Range Metropolitan Planning Organization’s “VanGo” program saved approximately 660,000 vehicle miles traveled (VMT) based on 55 vans originating from, or traveling into, Fort Collins city limits. The VanGo fleet saved a total of 12,952,924 miles in 2008. There were 91 vans in daily operation at the end of December 2008. Figure 10 shows the rapid increase in VanGo ridership since the program’s inception in 1994.

Figure 11. Growth in VanGo Ridership



Biodiesel

In 2005 the City of Fort Collins piloted the use of biodiesel (B20) in all fleet vehicles and equipment. Since in 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 2008 the City used 343,476 gallons of biodiesel. Colorado State University is also now using B20 and used 40,197 gallons in 2008.

Progress on “Anticipated Next Steps”

When City Council adopted the 2008 Climate Action Plan, a series of “next steps” were identified in the supporting agenda materials. The table below summarizes progress on those anticipated next steps.

Table 7. Anticipated Climate Action Plan: Next Steps and Status

Anticipated Action (per CAP AIS, 12/2/08)	Anticipated Timing (per CAP AIS, 12/2/08)	Status as of June 30, 2009
Budget request to expand Climate Wise resources	2009 exceptions request, or request in 2010/2011 Budgeting for Outcomes (BFO).	Three “enhancement” offers were submitted for Climate Wise in the 2010/2011 budget cycle.
Community Climate Challenge (CCC)	Pilot challenge in 2009	Stakeholder CCC Café held in May. Local marketing firm retained in June. Pilot roll-out planned for August 2009.
Colorado Carbon Fund	Formalize relationship via small outreach grant	CCF promoted at Climate Wise events. Contractual relationship with GEO not established yet; may occur later 2009 in conjunction with CCC.
Council work session to review alternative trash services strategies	December 9, 2008	Work session occurred; direction to staff to prepare amendments to Pay-as-you-Throw trash ordinance and further evaluate pilot trash services “district”.
Potential trash services strategies to be implemented: <ul style="list-style-type: none"> • Increase education and outreach • Larger recycling containers • Revise the Pay-As-You-Throw ordinance • Curbside Yard waste/compost options • 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. A pilot project will be considered in July 2009 for awarding a competitively bid contract to one hauler for trash and recycling collection services, in a sub-area or “district” of the community.
Develop Implementation Plans for 2009 Energy Policy	First quarter 2009	A consultant-supported study for energy efficiency was completed. Implementation plans for Advanced Metering Infrastructure (AMI), Energy

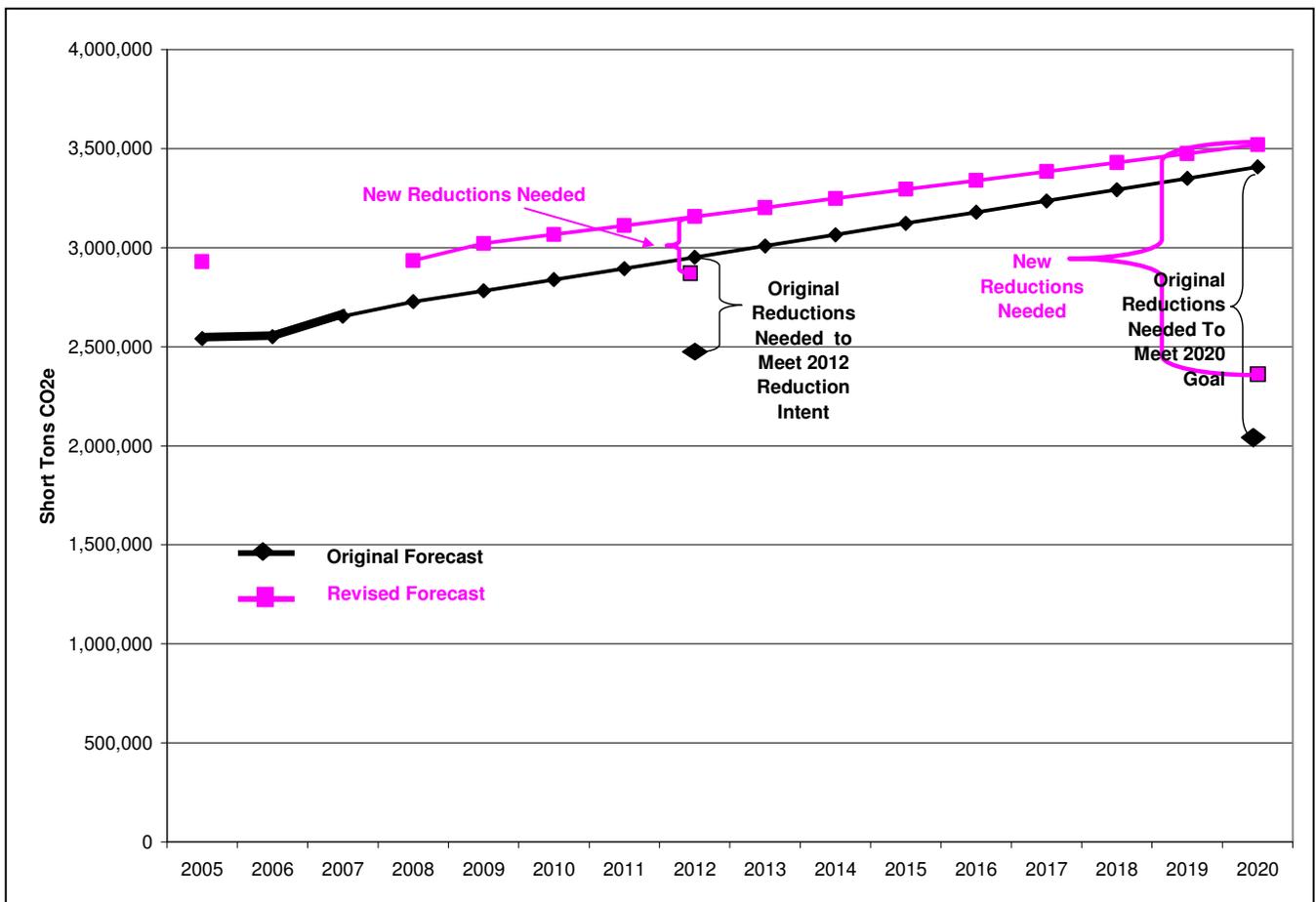
		Efficiency and Load Management presented to Electric Board March - May 2009. BFO offers submitted for Energy Services and Community Renewable Energy.
Begin implementing strategies for 2009 Energy Policy	2009	Continue implementation of energy efficiency, load management and community renewable energy programs. Started new public engagement initiatives, including community benchmarking and “Fort Collins Conserves” campaign.
Update Residential Building Code	2009	Codes Adopted by Council in 2008: <ul style="list-style-type: none"> ▪ International Building Code (commercial and multi-family) ▪ 2006 International Energy Conservation Code (multi-family) ▪ ASHRAE 90.1-2007 energy code (commercial and multi-family over three stories) City codes forthcoming: <ul style="list-style-type: none"> ▪ 2009 International Residential Code (mid-2010) ▪ 2009 International Energy Conservation Code (mid-2010) ▪ ASHRAE 90.1-2010 Energy Code (mid-2010)
Transit Strategic Plan	2009	Plan drafted; advisory boards and public outreach in April and May with Council consideration scheduled for August 18, 2009.
BFO requests to implement action in CAP, including consideration of Natural Gas Franchise Fee starting in 2010, with resources to monitor and track progress, etc.	November 2009	BFO requests submitted to support CAP actions including Climate Wise and Advanced Meter Infrastructure. Stimulus funding being sought for GHG tracking and reporting.

V. WHERE WE'RE GOING

Revised 2020 Forecast

During 2008, local, national and global economies experienced significant downturns. This and other factors resulted in revisions to growth forecasts in many sectors. Updated projections were obtained for the population growth rate in Fort Collins, and electricity and natural gas usage in the City. These new growth assumptions alter the anticipated growth in community-wide greenhouse gas emissions as well. Figure 11 illustrates the revised forecast that incorporates these new assumptions. Modifications to the 2020 GHG forecast are discussed in more detail in Appendix A.

Figure 12. Revised Forecast for Fort Collins Greenhouse Gas Emissions



Role of Climate Action Plan in Meeting Reduction Goals

The community’s 2005 baseline emissions have been revised due to recent decisions to include airline travel by Fort Collins residents and the embodied energy in recyclable materials that are currently put into the landfill. At the same time, the predicted growth rates for population and other activities has dropped. As a result of the revised forecast, the reduction needed between predicted “Business as

Usual” emissions levels and the City’s GHG reduction objectives has gotten smaller. According to the revised forecast, strategies contained in the 2008 Climate Action Plan, if fully implemented, would meet the 2020 GHG goal. However, strategies in the 2008 Climate Action Plan, if fully implemented, still leave a gap of 58,000 tons CO₂e necessary to meet the 2012 GHG reduction intent.

Tables 8 through 10 show emissions projections goals, Climate Action Plan (CAP) benefits, the remaining gap under the original baseline emissions and forecast, and the revised forecast. Under the revised forecast, additional reductions are needed to reduce 58,000 short tons in 2012.

Table 8. GHG Reductions Needed Under Old Forecast and Accounting Methodology

Year	Future Projection (Business As Usual) (Short Tons CO ₂ e)	Goal (Short Tons CO ₂ e)	Reductions Needed (Short Tons CO ₂ e)	Estimated Reductions From CAP (Short Tons CO ₂ e)	Remaining Gap (Short Tons CO ₂ e)
2005	2,539,830				
2012	2,951,000	2,466,000	485,000	268,000 - 378,000	107,000 - 217,000
2020	3,407,000	2,032,000	1,375,000	1,212,000	163,000

Table 9. GHG Reductions Needed with New Forecast and Accounting Methodology

Year	Future Projection (Business As Usual) (Short Tons CO ₂ e)	Goal (Short Tons CO ₂ e)	Reductions Needed (Short Tons CO ₂ e)	Estimated Reductions From CAP (Short Tons CO ₂ e)	Remaining Gap (Short Tons CO ₂ e)
2005	2,917,000				
2012	3,156,000	2,830,000	326,000	268,000 - 378,000	58,000
2020	3,520,000	2,334,000	1,186,000	1,212,000	-26,000

Table 10. GHG Reductions Needed with New Forecast and Accounting Methodology

Year	Future Projection (Business As Usual) (Metric Tons CO ₂ e)	Goal (Metric Tons CO ₂ e)	Reductions Needed (Metric Tons CO ₂ e)	Estimated Reductions From CAP (Metric Tons CO ₂ e)	Remaining Gap (Metric Tons CO ₂ e)
2005	2,646,802				
2012	2,863,323	2,567,398	295,924	243,000 - 343,000	53,000
2020	3,192,914	2,117,442	1,075,472	1,100,000	-24,000

Additional Future Strategies

This section lists additional strategies to further advance climate protection in Fort Collins. If fully implemented, these strategies, in combination with the measures identified in the 2008 Climate Action Plan, would help the community achieve both the 2012 reduction goal and the 2020 reduction goal.

Additional Benefits from the Adopted 2009 Energy Policy

The 2009 Energy Policy, adopted by City Council in January 2009, will result in greater carbon reduction than estimated in the 2008 Climate Action Plan because the new Energy Policy contains a more aggressive efficiency goal. The efficiency goal adopted in 2009 was to achieve 1.5% annual reduction in electricity use. The efficiency goal assumed when the Climate Action Plan was adopted in 2008 was to achieve 1.0% efficiency. The increased carbon reduction from more aggressive efficiency goal is listed below.

2012 Additional GHG Benefit: 20,000 short tons CO₂e

2020 Additional GHG Benefit: 80,000 short tons CO₂e

However, because the benefits of the energy efficiency in the CAP were estimated previously, the added carbon reduction benefit from Energy Policy efficiency goals is 46,00 tons in 2012 and 43,00 tons in 2020. This difference is explained in Table 11 below.

Table 11. Additional GHG Benefits of 1.5% Energy Efficiency Goal

Option	Tons CO ₂ e avoided	
	2012	2020
1% Energy Efficiency/year goal	55,074	175,568
1.5% Energy Efficiency/year goal	75,880	256,621
Difference	20,806	81,053
Energy Efficiency Benefits Estimated in CAP	20000 - 30000	214,000
1.5% Energy Efficiency/year goal	75,880	256,621
Difference between CAP and 1.5% EE	45,880	42,621

Table 12 below identifies the additional carbon benefit of the adopted new Energy Policy as well as the carbon benefit of several potential new strategies, discussed in more detail below.

Table 12. Estimated GHG Reduction Benefits of Implementing Strategies not Identified in the CAP

Strategy	2012 (Short tons CO2e)	2012 (Metric tons CO2e)	2020 (Short tons CO2e)	2020 (Metric tons CO2e)	Status
WASTE REDUCTION					
Construction & Demolition Debris Deposit	20,000	18,000	44,000	40,000	Potential
ENERGY					
2009 Energy Policy (above what is estimated in CAP)	46,000	42,000	43,000	39,000	Adopted
Green Building / Codes	4,000	4,000	50,000	45,000	Potential
Streetlight Upgrades	1,000	1,000	2,000	2,000	Potential
TRANSPORTATION					
Incentives for Low Emitting Vehicles	3,000	3,000	3,000	3,000	Potential
TOTAL	74,000	68,000	142,000	129,000	

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 total 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 as a key opportunity for improvement in waste diversion rates.

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). Updates will generally occur every two to three years through 2020, and they’re expected to continue to require increased energy efficiency for new buildings over time.

In addition to the residential code update scheduled for 2009, an interdepartmental team will evaluate a newly available green-building standard (ANSI ICC-700-2008) for adoption by 2010. The evaluation will include reviewing the standard for impacts on the development-review and 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 will 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 CO₂e in 2012 and 50,000 tons in 2020 for commercial and residential properties.

Streetlights

Slowly but surely, manufacturers are starting to develop better streetlights with light emitting diodes (LEDs) as the illumination source. Cities across the USA are exploring the benefits and limits of the new technologies, and finding that LEDs reduce electrical consumption to produce the same lighting levels as existing technologies, which promises a greener future for area and street lighting. Costs for LED lighting is 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 lifespans are extended far enough beyond that of 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 (HPS) lights, primarily because they represent the largest proportion of our streetlights. 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 lights, over 1,000 tons of CO₂e 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.

Incentives for Low Emissions Vehicles (LEV)

This strategy, originally proposed by the Climate Task Force (CTF), was removed from the 2008 CAP because it was deemed that high fuel prices in the recent past provided enough incentive for purchasing of LEVs. However, it remains on the list for additional consideration because the CTF assessed it to be among the most cost-effective strategies.

If implemented simultaneously, these four strategies are estimated to avoid 73,000 tons CO₂e in 2012 and 140,000 tons in 2020.

UNQUANTIFIED ADDITIONAL STRATEGIES

Nighttime Outdoor Lighting

Some local governments have established outdoor night lighting requirements to help preserve the night sky and to reduce energy consumption. For example, Boulder County requires that all outdoor lights must be fully shielded and downlit. In 2006, the City of Boulder passed a more stringent ordinance that establishes a maximum allowable lighting level based on zoning districts. Private property owners are given 15 years to comply. Dallas, TX is considering an ordinance to darken thousands of City lights for four hours each night. Madison, WI regulates exterior residential lighting to improve the nighttime environment and avoid conflicts between neighbors caused by poor lighting.

Education, incentives, or regulations to safely address night lighting could be considered in Fort Collins and would reduce greenhouse gas emissions.

Full FortZED Implementation

A project proposal that would be eligible for federal stimulus bill funding (American Recovery and Redevelopment Act of 2008) was drafted to accelerate achievement of a zero energy district, in a designated area of Fort Collins called FortZED. The FortZED District uses about 16% of all electricity in Fort Collins (236,059,000 kWh in 2007). While the project holds great promise for the future, though the likelihood of receiving full funding and achieving significant levels of implementation by 2012 is not high.

New Initiative - Architecture 2030

The Architecture 2030 Challenge is a bold initiative that also helps calculate the potential for green-building to impact the long-term emissions of the community. The Challenge asks the global architecture and building community to adopt the following targets:

- All new buildings, developments and major renovations shall be designed to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 50% of the regional (or country) average for that building type.
- At a minimum, an equal amount of existing building area shall be renovated annually to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 50% of the regional (or country) average for that building type.
- The fossil fuel reduction standard for all new buildings and major renovations shall be increased to 60% in 2010, 70% in 2015, 80% in 2020, 90% in 2025, and carbon-neutral in 2030 (using no fossil fuel GHG emitting energy to operate).

Targets may be accomplished by implementing innovative sustainable design strategies, generating on-site renewable power and/or purchasing (20% maximum) renewable energy and/or certified renewable energy credits. Preliminary estimates suggest that implementing an Architecture 2030 program in Fort Collins could help the community avoid 7,000 tons CO₂e in 2012 and 80,000 tons in 2020.

Integrated Waste Optimization / Recovery Goal

The City could take a role of greater leadership to help shape the direction of local/regional solid waste management policies. In partnership with the County, the City could manage and control the waste stream so that: 1) the maximum amount of commodities are recovered for appropriate reuse and recycling opportunities; 2) the remainder of the waste stream (residuals) is harvested as feedstock for generating energy using conversion technology. This approach reduces the direct methane emissions of the landfill by diverting trash through reuse and recycling and then converting the embodied energy in the residual waste stream into useable energy through non-combustion “conversion technologies”.

The term conversion technology (CT) is used here to describe all technologies that convert waste that are not landfills or incinerators. CT includes gasification, pyrolysis and plasma arc systems. These

processes are rapidly being developed and piloted. Over the next five years, the City could research the best options so that within 10 years, it would be positioned to invest efforts and resources into building new infrastructure using CT technology for, at minimum, waste that is generated in the City. Conceivably, a local CT waste system would be designed and built to accept waste from an even broader geographic area, such as Larimer County or Northern Colorado. Ultimately, the Larimer County landfill would no longer be used as a disposal site, although it would likely be kept in use as a waste transfer facility.

Funding Opportunities to Support Climate Protection Activities

Federal Stimulus Funding

The City of Fort Collins received \$1.3 million in federal stimulus funding through the Energy Efficiency and Conservation Block Grant Program to be used to implement carbon reduction projects within City government and in the community. The final list of selected projects may include matching funds for solar thermal system installations, assistance for Climate Wise, high priority bicycle and pedestrian path improvements along key sections of trail, support for green building codes, virtualization of City computer servers and other City facility upgrades.

Fort Collins will also receive \$3.6 million to convert five Transfort buses to compressed natural gas. Fort Collins is also joining with other Front Range communities on a grant request to upgrade several fleet vehicles to plug-in-hybrids.

Fort Collins may receive a portion of the \$49 million Colorado State Energy Program funding; local residents and business could benefit from another \$80 million earmarked for the state to offer building weatherization programs

Funding for Mason Corridor

By 2009 Fort Collins had secured \$8.5 million from the Colorado Department of Transportation (CDOT) and \$11 million from the Federal Transit Administration to construct the Mason Corridor, which will introduce fixed route bus rapid transit (BRT) for a major north-south route through the City of Fort Collins. These contributions will allow for the first phase of BRT construction between Downtown Fort Collins and Colorado State University, a new South Transit Center located off of Fairway Lane, and the Final Design and right-of-way acquisition for the entire project.

Relationship of Local, State and Federal Actions

While Fort Collins' climate protection efforts should not be unduly reliant on actions at other levels of government to reach its stated goals, local progress could be greatly advanced by passage of climate protection programs at the state and federal levels. Several actions have been initiated at higher levels of government that would support Fort Collins efforts, if implemented.

The Colorado Climate Action Plan (November 2007) calls for the enactment of "bridge" strategies that reduce greenhouse gas emissions now while pursuing clean energy technologies, providing leadership, and preparing to adapt to climate change that cannot be avoided. The Colorado Climate Action Plan

also sets a goal for major electric utilities in Colorado to reduce their greenhouse gas emission 20% by 2020.

In response to this objective, in June 2009, Platte River Power Authority submitted a report to the Governor's Energy Office indicating how the utility could reduce its greenhouse gas (GHG) emissions to 20 percent below 2005 levels by 2020. This report identifies the three most cost-effective options for reaching the emissions goal: reducing reserve energy sales, increasing funding for customer energy efficiency projects and generation of additional wind power.

Several bills were passed by the Colorado State Legislature in 2009 that will provide added incentives for or remove barriers to energy efficiency and clean energy. These include HB1331 that provides incentives to buy fuel efficient vehicles, HB1126 that allows local governments more latitude in providing incentives for solar thermal installations, and SB051 that takes numerous steps to make solar energy systems more affordable for homeowners and improve market conditions for solar energy companies doing business in Colorado.

Fort Collins is a member of the newly formed “Colorado Climate Action Network”, an initiative of the Rocky Mountain Climate Organization. The mission of the Network is to support efforts by local governments and allied organizations in Colorado to reduce greenhouse gases and to adapt to climate change – whether those efforts are styled as climate, sustainability, energy, or adaptation programs. Sharing of information, successes and barriers, and possible collaboration on regional initiatives is likely to support Fort Collins’ efforts to reduce emissions. (See <http://www.coclimatenetwork.org/>.)

At the federal level, recent announcements by the Obama Administration may pave the way for changes that support carbon reduction. On May 19, 2009 President Obama announced that the U.S will adopt new vehicle emission rules that are as tough as California’s standards, a move that establishes the first-ever national limits on greenhouse gas emissions from cars and trucks while also increasing fuel economy. The new standards raise the national average mileage requirement for vehicles to 35.5 miles per gallon, up 40% from the current 25 MPG.

In April 2009, after a thorough scientific review ordered in 2007 by the U.S. Supreme Court, the Environmental Protection Agency issued a proposed finding that greenhouse gases contribute to air pollution that may endanger public health or welfare. The proposed endangerment finding states, “In both magnitude and probability, climate change is an enormous problem. The greenhouse gases that are responsible for it endanger public health and welfare within the meaning of the Clean Air Act.”

In May 2009, the U.S. Senate passed H.R. 2454, the American Clean Energy and Security Act of 2009, otherwise known as the Waxman-Markey bill. As passed by the Senate, this bill establishes a national renewable energy standard and develops a national greenhouse gas cap-and-trade program. Ultimately, passage of any federal cap-and-trade legislation will result in major revisions to the nation’s energy economy. Associated carbon reduction benefits will be realized at state and local levels as well.

VI. CITY GOVERNMENT EMISSIONS AND REDUCTIONS

City of Fort Collins 2005 Baseline Emissions

The City of Fort Collins has tracked its own internal 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 off early efforts and gains, 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 the following goal for City operations:

Reduce greenhouse gas emissions (carbon dioxide and methane) from municipal operations at least 2 % per year, starting in 2009, in order to achieve a reduction of 20% below 2005 levels by December 31, 2020; and, to ultimately achieve carbon neutrality for the municipal organization.

In addition, the City developed specific goals for GHG reductions from City activities, including transportation, energy use, solid waste reduction and purchasing. As with the community reduction goals, the year 2005 serves as our municipal “baseline” or benchmark against which progress will be measured. Progress will be measured toward lowering total GHG emissions, regardless of the rate of growth for the organization or the community’s population.

Figure 13. 2005 Baseline Municipal Greenhouse Gas Inventory by Source

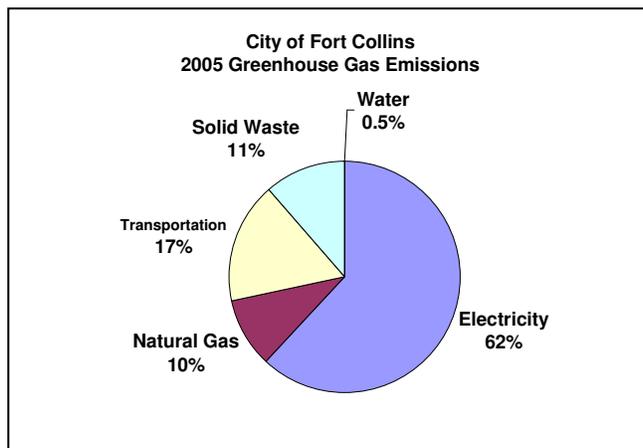
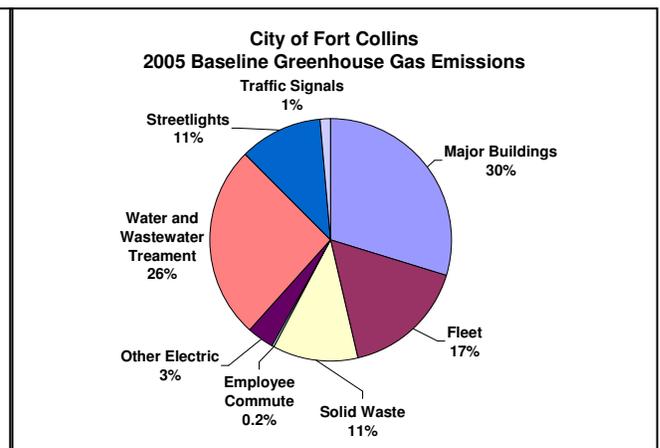


Figure 14. 2005 Baseline Municipal Greenhouse Gas Inventory by End User



City of Fort Collins Progress on Greenhouse Gas Reductions

Carbon emissions from the municipal government dropped by 0.7% percent between 2005 and 2008, despite employee growth of 1.4% in the same timeframe and a net 13% increase in square footage of municipal buildings tracked in the City’s *Utility Manager* database.

Figure15. Municipal Government’s Emissions Trend

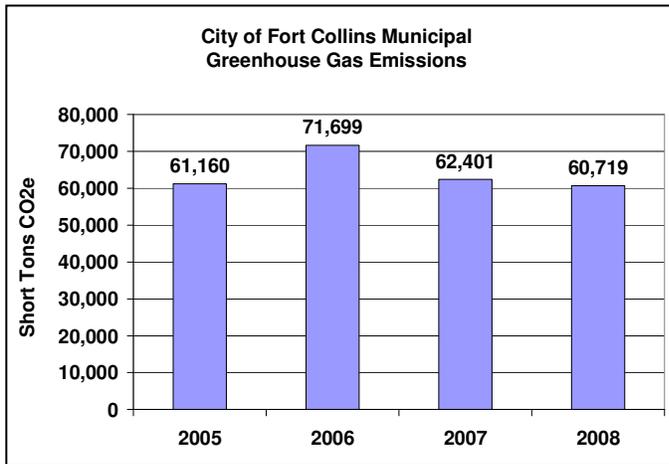


Figure 16. Municipal Government’s Emissions Trend by Sector

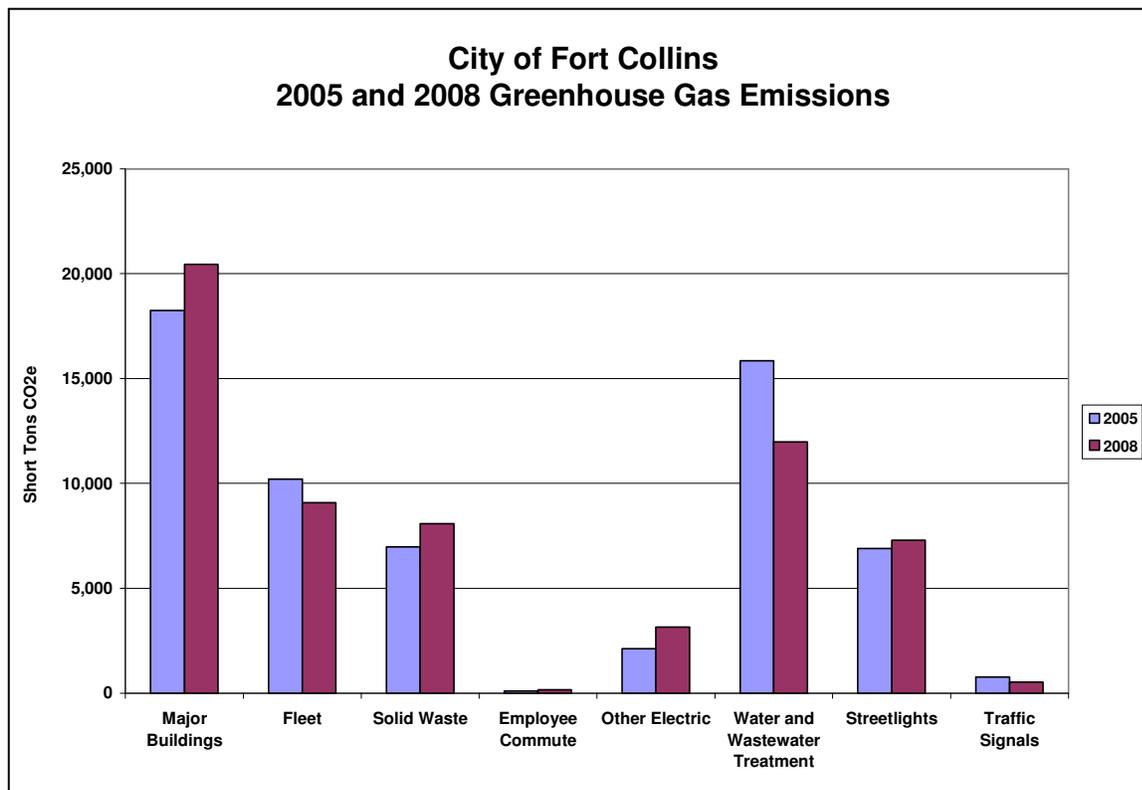


Figure 14 shows a 0.7% reduction in GHG emissions from 2005 to 2008. Among other things, the reduction reflects major energy efficiency improvements at the Water Treatment Plant and partial closure of the Mulberry Waste Water Treatment Plant in late 2008. Although total building energy usage grew, it was reduced by 1% on a per square footage basis between 2005 and 2008. This improvement is attributable to ongoing City facility upgrades, including lighting retrofits at 22 buildings and an Employee Energy Challenge. Reductions in fleet emissions may be attributable to the growing use of less carbon intensive alternative fuels

2008 Quantified Greenhouse Gas Reductions by City Government

Progress toward the City's goals is tracked by evaluating overall net emissions from municipal government activities. In addition, several individual projects implemented by the City in 2008 that were quantified for carbon reductions showed that over 6,000 tons of CO₂e were avoided. This equates to 11% of 2008 emissions.

Table 13. City of Fort Collins GHG Reductions – 2008

Project name	Short Tons CO ₂ e/yr
ENERGY	
Building Lighting Retrofits	1,257
Mulberry Pool HVAC Upgrades	21
Mulberry Pool Boiler Upgrades	69
Employee Pilot Energy Challenge	133
Green Energy Purchases = 3,263 MWh*	2,428
Energy Sub-total	3,908
WASTE REDUCTION	
Cardboard	82
Plastic	23
Newsprint	20
Mixed office paper	239
Magazines	8
Commingled	76
Wood Mulching	554
Methane Flaring/Heat Recovery at Wastewater Treatment Plant	2,429
Waste Reduction Sub-Total	3,430
TRANSPORTATION	
Employee GoGreen Campaign	34
Hybrids (compared to avg vehicle MPG)	32
Alt Fuels (compared to traditional fuel)	1,676
Transportation Sub-total	1,742
TOTAL QUANTIFIED REDUCTIONS without Green Energy	6,652
TOTAL QUANTIFIED REDUCTIONS with Green Energy	9,080

*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 2008 Environmental and Financial Highlights

Building Energy Use

- In 2008 the City started a day-time cleaning pilot project in select buildings to reduce the need for lighting and heating the buildings at night.
- Electric crews worked four 10-hour-day shifts, to reduce trips to job sites and lower fuel use and costs.
- An Energy Challenge for employees was launched, which resulted in savings of 164,753 KWh and an estimated financial savings of \$9,226.
- With help from CSU's Institute for the Built Environment, staff completed an "existing buildings" assessment using Leadership in Environment and Energy Design (LEED) EB (Existing Building) protocols for its office building at 215 N. Mason.
- Lighting retrofits were completed for 22 municipal buildings.
- In 2008 the heating and cooling systems of City buildings were set at 70 degrees for the winter season and 75 degrees for the summer, during business hours. After business hours, temperatures are lowered to 60-65 degrees during the winter and will be completely shut off during the summer.
- Energy-efficient boilers were installed at Mulberry Pool and City Park Pool.
- Energy-efficient heating units were installed at Mulberry Pool.

Recycling and Waste Diversion

- Office recycling increased by 56 tons from 2005 levels; City office diversion rates were calculated to be 18%.
- Scrap metal recycling earned the City approximately \$70,000 in rebates.
- The City's self-hauled deliveries of waste to the landfill were reduced 20% in volume.
- With renewed focus on waste reduction and recycling, the City's contracted waste services at municipal buildings was modified to down-size more dumpsters; savings in collection costs during 2008 were estimated at \$6,000.
- Offices recycled 77 tons of material, which among other resources, saved 1,301 trees.
- A new "Recycle This" campaign provided refresher courses to departments on recycling and mini-trash cans ("Starve your Trash") to employees who now generate less trash. Education and outreach to employees for all types of sustainability measures were enhanced with a small scholarship program, training at new employee orientation and a resource library.

- Thirty-six recycling containers were purchased and installed in City building public spaces.
- Pilot recycling projects were started for shrink wrap (warehouse), plastic bags (215 N. Mason) and CD/DVD cases (City Hall).
- Green Cone food digesters were installed at 215 N. Mason, Utilities and Park Services to divert biodegradable food waste from the trash.
- Inexpensive PDF writers were made available that allow staff to print any document to a PDF file and avoid paper use.
- Several City departments have purchased durable serving ware, eliminating the need for disposable paper and plastic plates and cutlery at meetings.

Green IT

- The City of Fort Collins joined the Climate Savers Computing Initiative (www.climatesaverscomputing.org) as an affiliate member.
- The City began purchasing only ENERGY STAR qualified desktop computers, desktop derived servers and laptop computers.
- The MIS Department began implementing a comprehensive server virtualization project at the City Hall data center. Approximately 50 servers are being transferred to four new blade servers as virtual units. MIS also installed a comprehensive storage area network, which works in conjunction with the new virtual platform.

Transportation

- **GO GREEN pilot program** - From July to mid-November 2008?, 183 campaign participants logged 11,638 trips using alternative modes of transportation.
- The Operations Services Division helped the City to adopt an Engine Idling Policy to limit idling to 15 minutes in most circumstances to support the Clean Cities campaign and comply with United States Environmental Protection Agency requests to help reduce emissions.

Transparency, Tracking and Reporting

- Determined the 2005 baseline in order to set measurable goals to achieve a reduction of 20% by December of 2020.
- Tracked emission levels for municipal operations for 2005-2008.
- A greenhouse gas reduction goal was set for the City government and additional supporting goals are being established.

- Fort Collins Utilities created a comprehensive report called “Utilities for the 21st Century” and in addition, reported GHG emissions and other sustainability metrics to the Global Reporting Initiative, becoming the first municipal utility registered by the GRI.
- Initiated a project to calculate baseline emissions for the Wastewater Treatment plant upgrade.

Outreach

- CityNet created a new sustainability site for employees where each week tips, facts and vendor/purchasing information are added.
- Residential environmental lecture series and High Plains landscape workshops.

APPENDIX A - Updated Greenhouse Gas Accounting

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. As a result, the 2005 baseline and subsequent inventories were upgraded in the following ways:

- Increase average on-road fuel efficiency to better reflect current national averages.
- Include airline travel by Fort Collins residents.
- Calculate landfill emissions using the IPCC and CARB First Order Decay model that accounts for “waste in place” at the landfill as well as annual additions.
- Add embodied energy from recyclable materials to align with CAP reductions.
- Remove CO₂e from combustion of methane at wastewater - a biogenic source.
- Report in metric tons CO₂e (mtCO₂e) rather than short tons.

Fort Collins joins many other communities in conducting periodic reviews and updates. As federal regulations 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.

Forecast

The following updates were made to the 2020 emission forecast to reflect current growth predictions.

Emissions Source	Old Growth Assumptions	New Growth Assumptions
Electricity (from Fort Collins Utilities)	Estimated 30% growth in MWh purchased from 2008 through 2020.	Estimates 23% growth in MWh purchased from 2009 through 2020.
Natural Gas (from Xcel Energy)	Estimated 2% annual growth	Estimates 0.1% annual growth with the benefits of their demand side management programs factored in.
Population	Estimated 2% annual growth	Estimates 1.5% annual growth
Solid Waste Airline Travel 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.

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 Inventory and 2020 Forecast**. Contact the City of Fort Collins Natural Resources Department at (970)221-6600 for a copy.

Calculating 2008 Greenhouse Gas 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 Plan will be consistent and aligned.

The basic methodology for calculating carbon 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 resource mix without renewable energy or RECs included. The 2008 factor for this mix is 1,775 pounds of CO₂ per megawatt-hour (wholesale).
- 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 2007 Environmental Protection Agency (EPA) “eGRID” non-baseload emission rate calculations for Western Electric Coordinating Council (WECC) Rockies subregion.
- Metered renewable energy, such as that delivered from the Medicine Bow wind site, is converted to carbon emissions reductions using Fort Collins fraction of Platte River’s renewable energy and a standardized conversion factor. The factor is 1,618 pounds of carbon dioxide avoided per megawatt-hour of electricity savings. It is based on 2007 Environmental Protection Agency (EPA) “eGRID” non-baseload emission rate calculations for 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 Marginal Emission Rate is based on the 2007 eGRID non-baseload emissions factors for each NERC region from which Platte River purchased RECs, weighted according to the amount purchased from each region, as follows:

NERC Region Energy Delivered to	Energy (MWh)	% Energy	Marginal CO ₂ Emission Rate (lb/MWh)
Western Electricity Coordinating Council Rockies (RMPA)	47,923	37%	1,618
Southwest Power Pool South (SPP)	70,000	53%	1,379
Midwest Reliability Organization West (MRO)	13,038	10%	2,159
TOTALS	130,961		
AVERAGE			1,544

The *Refrigerator and Freezer Recycling Program* has an additional mechanism for reducing greenhouse gas emissions by 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 (CO₂ has a GWP of 1.0).

Prepared by the City of Fort Collins Natural Resources Department
(970) 221-6600

