

### Potential Greenhouse Gas Benefits of Natural Gas Franchise Fee

*“Natural gas demand side management programs reduce natural gas consumption by improving the efficiency of buildings, space heating systems, water heating and other gas appliances. This lowers the bills of consumers and businesses that adopt these measures and also provides broader societal benefits such as reducing natural gas imports, reducing the risk of gas shortages and putting downward pressure on natural gas prices”.<sup>1</sup>*

The 2008 draft Climate Action Plan includes a measure called “Natural Gas Energy Conservation”. This measure proposes to replace the \$445,000/year Gas Company Occupation Tax the City levies on Xcel Energy for the right to provide natural gas with a franchise fee agreement where the City would charge Xcel an annual fee equal to 3% of gas sales revenue in Fort Collins. This would result in an approximate 1.5% increase in natural gas rates to Fort Collins customers and approximately \$555,000/.year increased revenue to the City General Fund.

The greenhouse gas benefit is estimated at 5,000 – 10,000 tons CO<sub>2</sub>e avoided per year in 2012. A question arose at the October 28, 2008 City Council work session about how greenhouse gas benefits were calculated.

A review of natural gas efficiency programs published by SWEEP in 2006<sup>1</sup> showed that of the ten natural gas demand side management (DSM) programs studied, the annual natural gas savings ranged from 0.2% to 1.0% of usage, with the average reduction being 0.5% of usage. The annual investments made, as a percent of gas retail sales revenue, ranged from 0.5% to 1.6%, with the average investment being 0.8% of retail sales. The average of the ten natural gas DSM programs studied suggest that investing 0.8% of revenue could lead to reducing 0.5% of natural gas usage.

The analysis of the “Natural Gas Energy Conservation” strategy in the draft 2008 Climate Action Plan uses slightly more conservative assumptions. First, the natural gas savings estimated for the existing measure “State-Mandated Natural Gas Efficiency Programs under HB1037” was subtracted from the projected base natural gas usage numbers. The low-end estimate of natural gas saving for the “Natural Gas Energy Conservation” measure (5,000 tons CO<sub>2</sub> avoided) was then calculated based on achieving 0.3% annual reduction in natural gas use in 2010, 2011 and 2012. The high-end estimate (10,000 tons CO<sub>2</sub> avoided) is based on achieving 0.3% reduction in 2010, 0.7% reduction in 2011 and 1.0% reduction in 2012.

The percent of natural gas savings estimated savings from both the “Existing HB1037 and the new Natural Gas Energy Efficiency (franchise fee) measures are shown in Table 1 below.

<sup>1</sup> *Natural Gas Demand Side Management Programs: A National Survey* by Suzanne Tegan and Howard Gellar, SWEEP, January 2006, see [http://www.swenergy.org/pubs/Natural\\_Gas\\_DSM\\_Programs\\_A\\_National\\_Survey.pdf](http://www.swenergy.org/pubs/Natural_Gas_DSM_Programs_A_National_Survey.pdf)

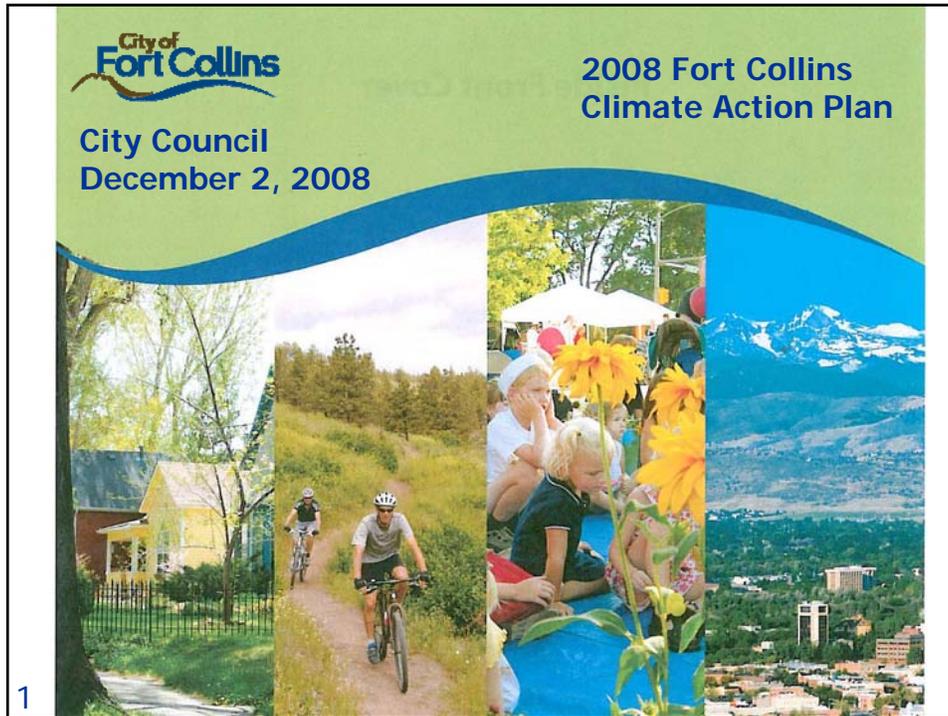
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Table 1. Estimated Percent Reduction in Fort Collins Natural Gas Usage as a Result of Natural Gas Measures in the Climate Action Plan

Year	EXISTING MEASURE State-Mandated Natural Gas Efficiency Programs HB1037	NEW MEASURE Natural Gas Energy Conservation - Franchise Fee	Total Reductions in Natural Gas Usage
2009	0.50%	0.30%	0.80%
2010	0.50%	0.30%	0.80%
2011	--	0.3% - 0.7%	0.3% - 0.7%
2012	--	0.3% - 1.0%	0.3% - 1.0%

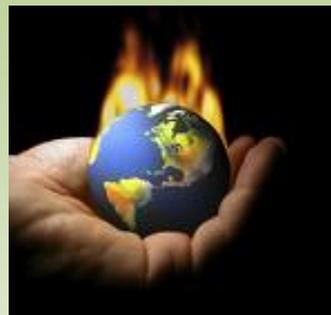
The new measure benefits assume that the majority of additional revenue provided to the City is used to fund natural gas efficiency programs. There may be a small reduction in natural gas use that results directly from the price increase, but natural gas demand has been proven to be relatively inelastic to price signal. However, a slight increase in the price of natural gas may further motivate natural gas customers to take advantage of efficiency programs.

The vast majority of local governments in Colorado have a franchise fee agreement with their natural gas utility providers. These include the following local governments which have a 3% fee unless otherwise noted: Ault (5%), Boulder, Breckenridge, Broomfield, Denver, Dacono (2.35%), **Estes Park**, Glendale, Gunnison, Littleton, **Longmont**, Louisville, **Loveland**, Mead (\$0.02/CCF), Platteville (5%), Thornton, Steamboat Springs, and Wiggins.



## The Challenge

Widespread consensus exists that human emissions of greenhouse gases are impacting the Earth's climate systems, causing the potential for unprecedented large-scale adverse health, social, and ecological effects.



Communities can and should play an important role in mitigating this issue.

## Multiple Goals Addressed Through Climate Protection

- ✓ Economic development - job creation, attraction and retention
- ✓ Environmental protection goals - air pollution reduction, reduce filling of landfills, water conservation
- ✓ Cost savings
- ✓ Diversify energy sources; decrease reliance on fossil fuels

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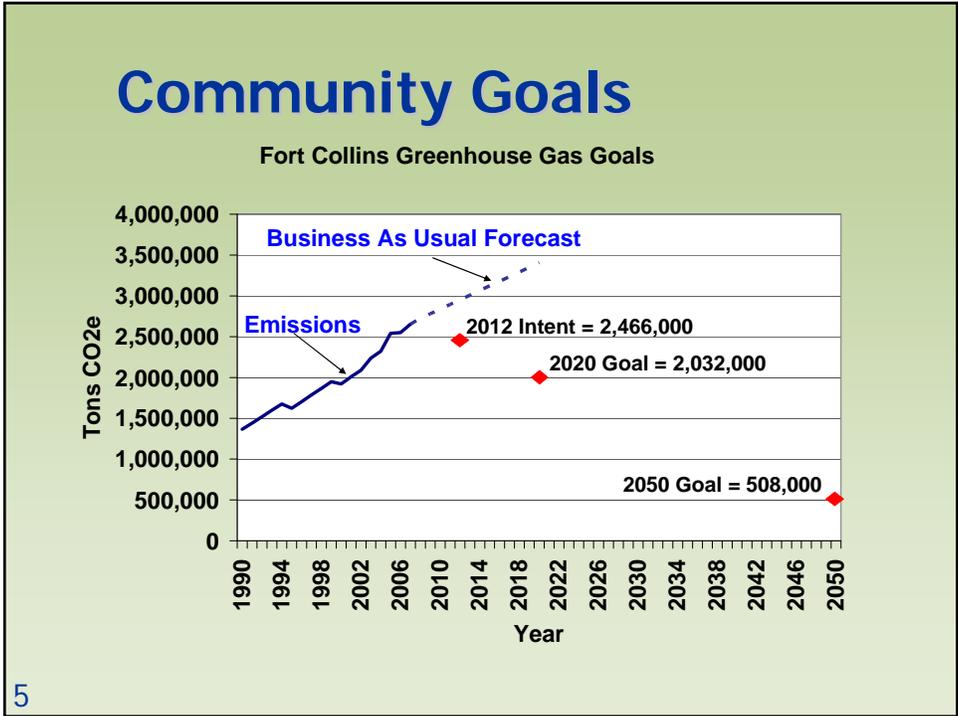
## Community Greenhouse Gas Reduction Goals

Adopted by Council - May 2008

- 20% reduction below 2005 levels, by 2020
- 80% reduction below 2005 levels, by 2050
- "intent to reduce current community-wide emissions by the end of 2012 to a level not to exceed 2.466 million tons."

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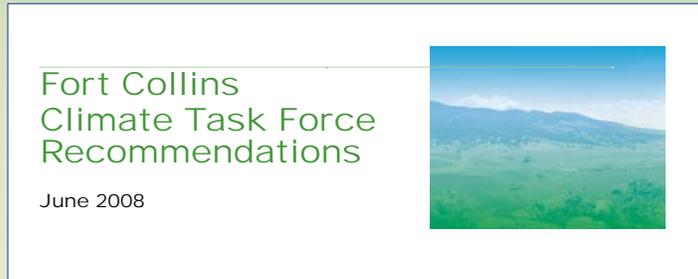
## To get from here to there...

Year	Future Projection (Business As Usual) Tons CO <sub>2</sub>	Goal Tons CO <sub>2</sub>	Reduction Needed Tons CO <sub>2</sub>
2012	2,951,000	2,466,000	485,000 tons/yr in 2012
2020	3,407,000	2,032,000	1,375,000 tons/yr in 2020
2050	Not calculated	508,000	1,524,000/year below 2020 goal level

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## Climate Task Force

- ✓ Compiled, evaluated and filtered cost-effective strategies to reduce emissions.
- ✓ Completed recommendations in June 2008 ([fcgov.com/ctf](http://fcgov.com/ctf))



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## Draft Climate Action Plan

- ✓ Focus on LOCAL action
- ✓ Provides a range of approaches (education, incentives, regulation)
- ✓ Engages all stakeholders (citizens, businesses, schools, other organizations)
- ✓ Addresses all sources of emissions
- ✓ Builds on existing successes
- ✓ Contains cost-effective strategies
- ✓ Supports the local economy
- ✓ Brings multiple other benefits



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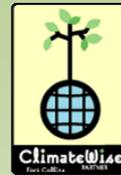
## Builds On Existing Successes

Measure Name	Estimated Tons CO2e Reduced in 2012 Above 2007 Levels
Energy Efficiency Programs	40,000
Climate Wise Program	37,000
Single Stream Recycling	14,000
Business and Residential Recycling	7,000
Electronics Waste Ban	6,000
State-mandated Natural Gas Efficiency Programs (HB1037)	5,000
2005 Residential Energy Code	4,000
FortZED Jumpstart	3,000
Others	4,000
<b>TOTAL</b>	<b>104,000</b>
(After double-counting removed)	

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## Supports the local economy

- ❑ **Climate Wise -**  
 Improve business bottom lines, increase employee attraction and retention
- ❑ **Colorado Carbon Fund –**  
 Local purchase of carbon offset return reinvestment funds to Fort Collins for implementing more clean energy projects
- ❑ **Energy efficiency and green building**  
 New jobs associated with increased demand for building energy audits and upgrades



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### Reduction Measures in Draft Plan (Oct '08)

Measure name	2012 Estimated Benefit (Tons CO2e)	2020 Estimated Benefit (Tons CO2e)
<b>EXISTING MEASURES</b>	<b>104,000</b>	
Expand Climate Wise	73,000 – 94,000	143,000
Government Organizations Set GHG Goals	42,000	217,000
Community-wide Climate Challenge	28,000	34,000
Colorado Carbon Fund	5,000	8,000
Push Toward 50% Diversion Goal	73,000 – 137,000	253,000
<b>2008 Energy Policy</b>		
Efficiency Programs	20,000 – 30,000	214,000
SmartGrid, Advanced Metering Infrastructure, Pricing, Conservation	10,000 – 20,000	246,000
Renewable energy (Colorado RPS and voluntary programs)	0	190,000
Natural Gas Energy Conservation	5,000 – 10,000	52,000
Update Residential Building Code	1,000	4,000
Reduce Vehicle Miles of Travel	2,000 – 12,000	14,000
Modern Roundabouts	1,000	2,000
TOTAL (before double-counting removed)	<b>366,000 -486,000</b>	<b>1,481,000</b>
<b>TOTAL (after double-counting removed)</b>	<b>268,000 – 378,000</b>	<b>1,212,000</b>
Needed to meet objectives	485,000	1,375,000

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- ### City Council Work Session Input from October 28, 2008
- Develop an alternative plan for Council consideration that fully meets 2012 and 2020 reduction objectives
  - Revisit assumptions in Community Climate Challenge
  - Concerns about long-term "Time of Sale Energy Conservation Ordinance"
  - Integrate whole-systems thinking as much as possible
- 
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## Proposed Addendum

### Quantified Measures

	2012 Tons CO2e	2020 Tons CO2e
<b>ADDITIONAL BENEFIT of Potential Additional Strategies</b>		
Purchase Carbon Offsets	77,000	81,000
Construction & Demolition Debris Deposit	20,000	44,000
Long-term VMT Reduction		28,000
Increase participation targets for Community Climate Challenge	3000	3,000
Increase participation targets for Colorado Carbon Fund	7,000	7,000
<b>Sub-total Additional Strategies</b>	<b>107,000</b>	<b>163,000</b>
Existing and New Measures in draft Plan	268,000 - 378,000	1,212,000
<b>TOTAL (After double-counting)</b>	<b>375,000 - 485,000</b>	<b>1,375,000</b>

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## Proposed Addendum

### Qualitative changes

- Replace long-term "Time of Sale Ordinance" with "Explore Additional Opportunities to Increase Efficiency of Existing Buildings"
- Add: Explore Integrated Waste Optimization
- Add: Promote Fort Collins as Green Community
- Minor text revision to Acknowledgements, add brief description of global warming.

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## Costs

- ❑ There will be costs associated with implementing actions in the plan.
- ❑ Cost estimates are provided where possible.
- ❑ Adopting the Plan by resolution does not commit budget resources at this time.
- ❑ Costs estimates will be fully developed before Council considers individual actions using the most up-to-date information.
- ❑ Significant savings can be realized over time.

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## Multiple Benefits

- ✓ Actions support many other City policy goals
- ✓ Reduce energy costs for heating, cooling and lighting
- ✓ Reduce motor vehicle fuel costs
- ✓ Support local businesses and the economy
- ✓ Redirect investments back into local economy
- ✓ Reduce vulnerability to energy price increases and volatility
- ✓ Reduce peak demand and need for new base load capacity
- ✓ Reduce air pollution emissions (incl. ozone precursors)
- ✓ Reduce waste and increase landfill diversion rates

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## Requires Monitoring and Reporting

Year	Annual Progress Report	Milestone Tons Co2	Biennial Review	Budget Recommendations
2009	X			Fall 2009 for 2010/2011
2010	X			
2011	X		Spring 2011 for 2010	Fall 2011 for 2012/2013
2012	X	2,466,000		
2013	X		Spring 2013 for 2012	Fall 2013 for 2014/2015
2014	X			
2015	X		Spring 2015 for 2014	Fall 2015 for 2016/2017
2016	X	2,263,000		
2017	X		Spring 2017 for 2016	Fall 2017 for 2018/2019
2018	X			
2019	X		Spring 2019 for 2018	Fall 2019 for 2020/2021
2020	X	2,032,000		

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## Action Being Considered Tonight, by Council Resolution

- Accept the Plan as a blueprint for achieving the 2020 reduction goal, without committing budget resources to any specific action at this time.
- Grant the City Manager flexibility to select specific actions from the Plan, to be advanced in budget recommendations and staff work plans.

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## Action Being Considered Tonight, by Council Resolution (cont'd)

- Require preparation of an annual status report and biennial progress report that evaluates progress and recommends future climate protection actions.
- Authorizes continued evaluation of emerging best practices and cost-effective strategies for inclusion in biennial report.

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## Resolution Options Tonight

- ✓ Resolution A – Adopts draft 2008 Climate Action Plan plus Proposed Addendum – meets 2012 and 2020 reduction objectives
- ✓ Resolution B – Adopts draft 2008 Climate Action Plan without Proposed Addendum – Achieves 55-80% of 2012 reduction objective and 90% of 2020 reduction objective

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**Questions?**

**Thank you.**



EXHIBIT EE

OPTION A (with Addendum)

RESOLUTION 2008-122  
OF THE COUNCIL OF THE CITY OF FORT COLLINS  
APPROVING AND ADOPTING  
THE 2008 FORT COLLINS CLIMATE ACTION PLAN

WHEREAS, there is widespread 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; and

WHEREAS, climate disruption is likely to cause, and may already be causing, damage to the environmental and economic health of Colorado communities, risks associated with reduced snow pack that could affect both water supply and tourism, and secondary impacts such as changes in agriculture economics; and

WHEREAS, local governments can greatly influence their communities' greenhouse gas emissions by exercising key powers over land use, transportation, building construction, waste management, and, in many cases, energy and water supplies and management; and

WHEREAS, it is appropriate for local governments to take responsibility for emissions occurring within their jurisdictions since local community actions can speed the development of technology-based solutions and more rapidly promote market transformation that will help drive reductions in global emission levels; and

WHEREAS, by the adoption of Resolution 1999-137, the City Council established a policy that the City shall proactively identify and implement actions to reduce greenhouse gas emissions within the City by at least 30% below predicted 2010 levels by 2010 while achieving cost-effectiveness in each program, and

WHEREAS, despite progress in efforts to reduce greenhouse gas emissions through implementation of Climate Wise, the Electric Energy Supply Policy, recycling initiatives and other programs to reduce emissions, Fort Collins is not on track to meet the greenhouse gas emissions goal established by Resolution 1999-137 to reduce carbon dioxide emissions to an inventory level of 2.466 million tons in the year 2010; and

WHEREAS, by the adoption of Resolution 2008-051, the City Council established the goals of reducing Fort Collins' community-wide greenhouse gas emissions 20% below 2005 levels by 2020 and 80% below 2005 levels by 2050, and further expressed its intent to reduce community-wide greenhouse gas emissions by the end of 2012 to a level not to exceed 2.466 million tons pending attainment of such goals; and

WHEREAS, in accordance with Resolution 2008-051, the City Manager has prepared for Council consideration the *2008 Fort Collins Climate Action Plan* (the "Plan") to reduce greenhouse

## EXHIBIT EE

gas emissions within the Fort Collins community that identifies interim milestones needed to put Fort Collins on a trajectory to meet the 2020 goal, including a milestone for the year 2012 as referenced above, a copy of which is attached hereto, marked as Exhibit "A" and incorporated herein by reference; and

WHEREAS, the Plan includes a list of strategies that consider relevant technical, economic, political, and social factors; promote economic vitality and prioritize investments in the Fort Collins community; address all emissions sectors; and promote involvement by all segments of the community (local businesses, governments, utilities, schools, universities, non-profit organizations, homeowners, and other individuals); and

WHEREAS, the City Council has directed City staff to prepare an addendum to the Plan to take steps beyond those identified in the Plan to meet the 2020 and 2012 objectives (the "Addendum"), a copy of which is attached hereto as Exhibit "B" and incorporated herein by reference; and

WHEREAS, on November 19, 2008, the Electric Board considered the Plan and the Addendum and recommended that the City Council approve and adopt the Plan incorporating the Addendum; and

WHEREAS, on November 19, 2008, the Air Quality Advisory Board considered the Plan and the Addendum and recommended that the City Council approve and adopt the Plan incorporating the Addendum; and

WHEREAS, on November 19, 2008, the Natural Resources Advisory Board considered the Plan incorporating the Addendum and recommended that the City Council approve and adopt the Plan incorporating the Addendum.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FORT COLLINS as follows:

Section 1. That the 2008 Fort Collins Climate Action Plan and the Proposed Addendum are hereby approved and adopted and shall supersede the 1999 Local Action Plan to Reduce Greenhouse Gas Emissions. The City Manager is hereby directed to incorporate the provisions of the Addendum into the Climate Action Plan to create a final 2008 Climate Action Plan (December 2008).

Section 2. That the City Manager is hereby directed to:

- a) prepare an annual status report tracking progress toward attainment of the goals established herein, including a community-wide greenhouse gas emissions inventory and a list of quantified emission reductions actions for the preceding calendar year,

EXHIBIT EE

- b) biennially, at least six months in advance of the City's biennial budget adoption, prepare a report evaluating progress on greenhouse gas reduction relative to established interim milestones and recommending actions for consideration in the upcoming budget cycle (the "Biennial Report"), and
- c) consider greenhouse gas reduction actions identified in the Plan and future biennial progress reports in annual staff work plan development.

Section 3. That the City Council hereby recognizes that new data, scientific findings, mitigation technologies, and quantification methodologies may emerge over time and that future Councils may choose to eliminate, modify or add specific action items contained in the 2008 Fort Collins Climate Action Plan to take into account evolving science, technology or other opportunities.

Section 4. That the City Manager is hereby authorized to continue to examine and evaluate emerging best practices and new cost-effective strategies to identify local emissions reductions opportunities for inclusion in future Biennial Reports.

Section 5. That it is the intent of the City Council that Fort Collins city government lead by example in this area by minimizing greenhouse gas emissions in its own operations through the establishment of policies and directions that will lead the community to a sustainable future, and by inspiring community involvement in the effort to reduce greenhouse gas emissions.

Passed and adopted at a regular meeting of the City Council held this 2nd day of December, A.D. 2008.

\_\_\_\_\_  
Mayor

ATTEST:

\_\_\_\_\_  
City Clerk



2008

# Fort Collins Climate Action Plan

Interim Strategic Plan Towards 2020 Goal



*Draft October 2008*

EXHIBIT EE

# Climate Action Plan Outline

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### Acknowledgements

Our gratitude goes out to members of the 2007/2008 Fort Collins Climate Task Force for their significant contribution to the content of this Plan. Thanks are also due to citizens and Board and Commission members for sharing their insights and suggestions along the way, and to the City Manager and City staff who worked in many capacities to support the process.

# Executive Summary



## The Challenge

Widespread consensus exists that human emissions of greenhouse gases are impacting Earth’s climate system, causing the potential for unprecedented large-scale adverse health, social, economic and ecological effects. Coloradans may not be surprised by predictions such as these because we are already seeing the changes. Observations in recent decades show that Colorado is already experiencing shorter and warmer winters, with thinner snow pack and earlier spring runoff, less precipitation overall, longer periods of drought, more wildfires and other ecological effects potentially related to climate change.

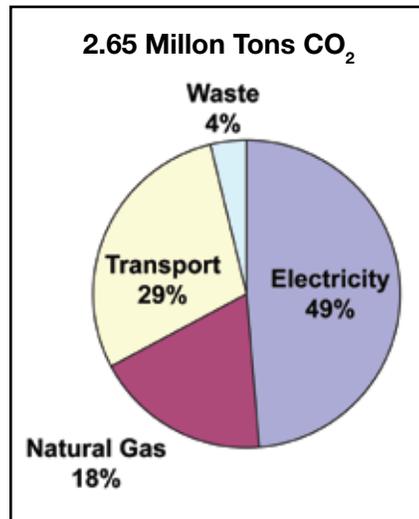
## Our Responsibility

Local communities are vulnerable to the many risks posed by a changing climate. Likewise, cities can make a difference in avoiding climate instability by exercising key powers over land use, transportation, building construction, waste management and energy and water supplies and management. It is fitting for local governments to take responsibility for emissions occurring within their jurisdictions. Local actions not only bring local benefits, they can speed the development of technology-based solutions and promote more rapid market transformation that will help drive reductions in global emission levels.

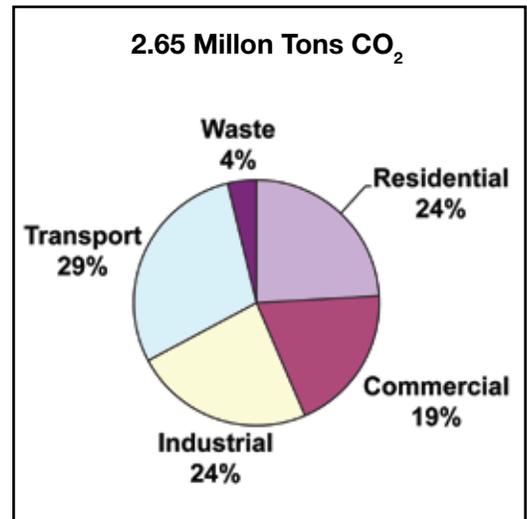
## Fort Collins Greenhouse Gas Emissions

About half of Fort Collins’ greenhouse gas emissions come from electricity use, primarily to light and cool buildings. The second largest source is emissions from combustion of fossil fuels for transportation (30%). The third largest source is natural gas use, primarily for heating buildings (~20%) and a small portion of emissions result from organic matter decay in the landfill.

**Fort Collins 2007 Greenhouse Gas Emissions by Source**



**Fort Collins 2007 Greenhouse Emissions Sources by Use Sectors**



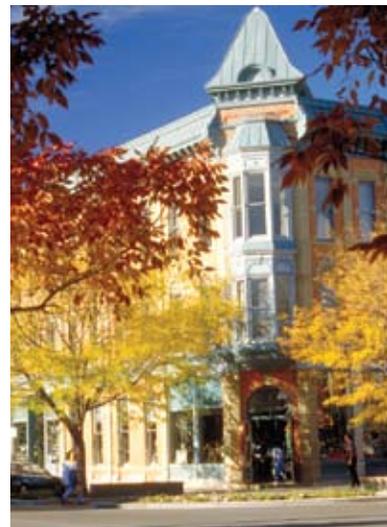
## Fort Collins Greenhouse Reduction Goals and Efforts

In 1999 Fort Collins was among the first wave of communities in the nation to commit to reducing local 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, by 2007, innovative businesses avoided emitting more than 82,000 tons of carbon dioxide equivalent (CO<sub>2</sub>e), while saving over \$12 million since 2000. As a result of foresight in leadership, Fort Collins established the first renewable energy standard in the state of Colorado. And our participatory community tells us through recent surveys that they not only support but also expect further greening efforts.

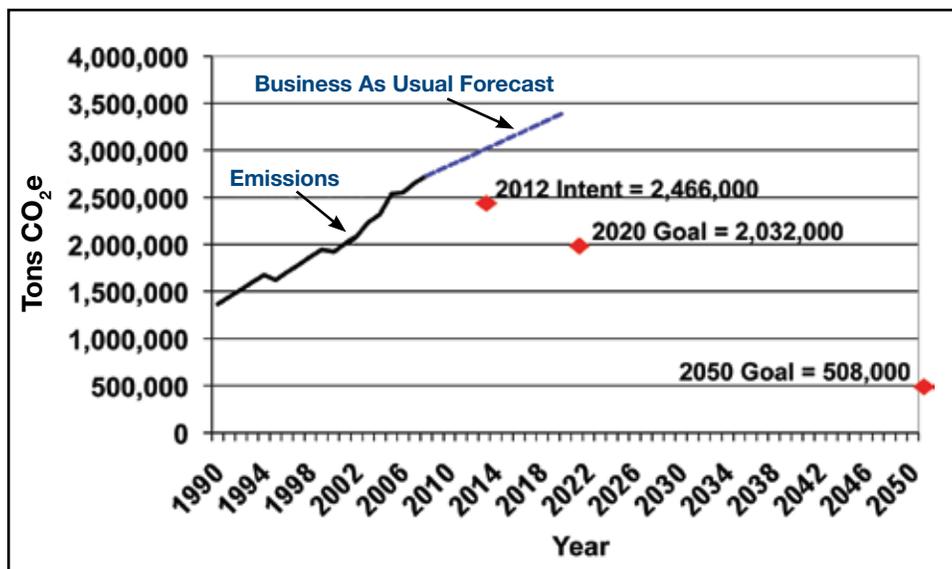
In 2008 City Council renewed its commitment to climate protection by adopting Colorado's statewide goals to reduce emissions.

- Reduce emissions 20% below 2005 levels by 2020
- Reduce emissions 80% below 2005 levels by 2080

During 2007 and 2008, a dedicated citizen task force worked to recommend actions that will help Fort Collins make progress on climate protection. Their report can be found at: <http://fcgov.com/ctf>



### Fort Collins Greenhouse Reduction Goals



### Climate Action Plan

This Climate Action Plan offers a well-considered list of strategies that will help Fort Collins advance our progress towards future carbon reduction goals, while affording the community other economic and environmental benefits. The Plan is based largely on the recommendations of the Climate Task Force. It builds upon existing successes and encompasses a range of strategies such as expanding the enormously successful Climate Wise program, increasing residential and business recycling, reducing vehicle miles traveled, providing various incentives for reducing CO<sub>2</sub> and increasing energy efficiency. It offers cost-effective strategies that will also support our local economy, reduce risks for energy and fuel price increases and volatility and bring a wide range of other environmental, social and economic benefits. Actions that reduce greenhouse emissions also support other local community goals and contribute to sustaining Fort Collins as a vibrant, world class community.

## EXHIBIT EE

### New Measures

MEASURE NAME	2012 Estimated Benefit (Tons CO <sub>2</sub> e)	2020 Estimated Benefit (Tons CO <sub>2</sub> e)
<b>EXISTING MEASURES</b>	<b>104,000</b>	104,000
<b>MENU OF OPTIONS</b>		
<b>COMMUNITY LEADERSHIP</b>		
Expand Climate Wise	73,000 – 94,000	143,000
Government Organizations Set GHG Goals	42,000	217,000
Community-wide Climate Challenge	28,000	34,000
Colorado Carbon Fund	5,000	8,000
<b>Community Leadership Sub-total</b>	<b>148,000 – 169,000</b>	<b>402,000</b>
<b>RECYCLING — Push Toward 50% Diversion Goal</b>		
Ban cardboard from waste stream	46,000 – 58,000	68,000
Private paper/glass drop-off	5,000- 6,000	8,000
Increase residential education	4,000 – 5,000	15,000
Larger residential recycling containers	3,000 – 4,000	5,000
Require haulers to provide residential yard waste collection for added cost	1,000	1,000
Enhance residential PAYT (2nd can costs more)	11,000 – 17,000	21,000
Commercial recycling co-ops	1,000 – 7,000	8,000
Residential yard waste drop-off and ban yard waste	0 – 4,000	5,000
C&D Drop-off	0 – 34,000	39,000
C&D contract preferences for City contracts	1,000	1,000
Commercial recycling fee embedded in rates (Additional benefit above cardboard ban)		81,000
<b>Recycling Sub-total</b>	<b>73,000 – 137,000</b>	<b>253,000</b>
<b>ENERGY</b>		
<b>2008 Energy Policy</b>		
Efficiency Programs	20,000 – 30,000	214,000
SmartGrid, Advanced Metering Infrastructure, Pricing, Conservation	10,000 – 20,000	246,000
Renewable Energy (Colorado Renewable Portfolio Standard and voluntary programs)	0	190,000
Natural Gas Energy Conservation	5,000 – 10,000	52,000
<b>Energy Sub-total</b>	<b>35,000 – 60,000</b>	<b>703,000</b>
<b>GREEN BUILDING</b>		
Update Residential Building Code	1,000	4,000
<b>Green Building Sub-total</b>	<b>1,000</b>	<b>4,000</b>
<b>TRANSPORTATION</b>		
Reduce Vehicle Miles of Travel	2,000 – 12,000	14,000
Modern Roundabouts	1,000	2,000
<b>Transportation Sub-total</b>	<b>3,000 – 13,000</b>	<b>16,000</b>
<b>TOTAL (before double-counting removed)</b>	<b>366,000 – 486,000</b>	<b>1,481,000</b>
<b>TOTAL (after double-counting removed)*</b>	<b>268,000 – 378,000</b>	<b>1,212,000</b>

\*Double-counting between measures with overlapping benefits was addressed as follows:

- Climate Wise — 50% overlap with other measures
- Gov. Orgs Set GHG Goals — 75 % overlap
- Community Climate Challenge — 90% overlap
- Local Carbon Offset Program — 62% overlap

If fully implemented, the Plan will bring Fort Collins to nearly 80% of the 2012 reduction objective and 90% of the 2020 goal. Annual progress reports and biennial reviews will allow the plan to evolve along with City budget priorities, carbon markets and technology opportunities.

<b>Year</b>	<b>Future Projection (Business As Usual) Tons CO<sub>2</sub></b>	<b>Goal Tons CO<sub>2</sub></b>	<b>Reduction Needed Tons CO<sub>2</sub></b>	<b>Estimated Reductions from Climate Action Plan</b>
2012	2,951,000	2,466,000	485,000 tons/yr in 2012	268,000 – 378,000 tons/yr in 2012
2020	3,407,000	2,032,000	1,375,000 tons/yr in 2020	1,212,000 tons/yr in 2020
2050	Not calculated	508,000	1,524,000/year below 2020 goal level	Not estimated



Fort Collins’ 2020 goal allows the opportunity to embrace strategies that have a long-term benefit yet take more time to develop and implement. The Plan also includes measures that have not been quantified but that can play an important role in making progress towards the 2020 goal. These strategies are listed in the table below and described in this Climate Action plan.

**Summary of New Qualitative Measures**

- Community Engagement**
  - City of Fort Collins Government Leadership
- Transportation**
  - Seek Adequate Funding to Implement Transportation Plans, with Funding for Transit as a Priority to Achieve Best Practices
  - Develop Partnerships to Reduce Vehicle Travel
  - Parking Management
- Land Use**
  - Implement Land Use Code Changes that Support Greenhouse Gas Emissions Reductions
  - Promote and Pursue Infill and Refill Development
  - Promote Transit-Oriented Development
  - Consider Requirements for New Developments to Have Less Travel Demand than Comparable Existing Developments
- Green Building**
  - Regular Updates of Building Energy Codes
  - Continued Support for Above Code Green building Initiatives
  - Time of Sale Energy Conservation Ordinance
  - Require Green Building as a Prerequisite for Public Financing
  - Explore Net Zero Ready Homes
  - Explore LEED for Neighborhoods
- Urban Forestry**
  - Promote Tree Planting
- Support State and Federal Climate Protection Actions**



## Conclusion

Reducing our community's carbon footprint will be a major challenge. Implementing some of these strategies will not be easy; nor will it be cost free. However, because these strategies are cost-effective, the future payback is expected to be large. It is far more costly to ignore global warming than to take action to avert the worst of its impacts. An increasing number of studies show that, in addition to being less costly overall, taking action to avert global warming can be immediately profitable.

Fortunately, Fort Collins abounds with innovators and technical expertise that can be harnessed to help address this challenge. Organizations leading sustainability efforts locally include Poudre School District, Colorado State University and the wide array of Climate Wise partners who have publicly committed to voluntarily reduce their organization's greenhouse gas emissions. The groundbreaking work of the Clean Energy Cluster and the vision of FortZED position Fort Collins well for success in reducing emissions while maintaining a robust economy.

The benefits to our community from increased efforts to reduce carbon emissions will be significant. Not only will our CO<sub>2</sub> footprint be reduced, but the City will introduce leading edge practices and technologies that will save consumers and businesses money, create new business opportunities and cement Fort Collins' reputation and reality as a high performing, vibrant and attractive place to live and conduct business.

## Introduction

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### Need For Climate Protection

Widespread consensus exists that human emissions of greenhouse gases (GHG) are impacting Earth's climate system, causing the potential for unprecedented large-scale adverse health, social, economic and ecological effects. In the past two decades, the science connecting global warming to human augmentation of the greenhouse effect has progressed dramatically. Many changes that had been predicted are now occurring, and the observed pattern of change points to the enhanced greenhouse effect. Climate disruption is likely to cause, and may already be causing, damage to the environmental and economic health of Colorado communities, introducing risks associated with reduced snow pack and earlier snowmelt that could affect both water supply and tourism and secondary impacts such as changes in agriculture economics.

Two summary reports of the International Panel on Climate Change (IPCC) released in 2007 find that global warming is real and will have significant impacts. Approximately 600 authors from 40 countries produced the IPCC reports. Over 620 expert reviewers and a large number of government reviewers also participated. Representatives from 113 governments reviewed and revised the summaries before adopting them.

In February 2007 Working Group I of the IPCC released a summary for policy makers on the science of climate change. They concluded that:

- Warming of the climate system is unequivocal.
- Most of the warming that our climate system has experienced in the last 50 years is very likely (meaning over 90% likely) due to human caused greenhouse gas emissions.
- It is very likely (meaning over 90% likely) that heat extremes, heat waves and heavy precipitation will become more frequent.

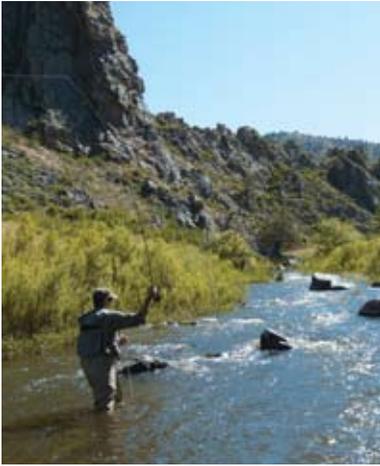
In April 2007 Working Group II of the IPCC released a summary of expected global warming impacts. Their conclusions about impacts in North America include:

- Tens of millions of Americans are likely to be exposed to greater risk for injury, disease and mortality due to higher pollution levels, more frequent and more intense heat waves, more intense storms and more favorable conditions for the spread of water and insect-borne diseases, in the absence of effective counter-measures.
- Western regions are already facing increased water scarcity and are expected to experience inadequate water supplies and reliability losses as snow pack diminishes and evaporation increases.
- North American forests face escalating destruction from increasing outbreaks of wildfire, insect infestation and disease.
- Between 15% and 40% of North American plant and animal species are likely to become extinct by 2050.

Coloradoans may not be surprised by predictions such as these. Observations in recent decades show that Colorado is already seeing the following:

- Shorter and warmer winters, with thinner snow pack and earlier spring runoff.
- Less precipitation overall, and more falling as rain than snow.
- Longer periods of drought.
- More wildfires, burning twice as many acres each year than before 1980.
- Rapid spread of West Nile Virus due to higher summer temperatures.





The European Union considers that a temperature rise of 2 degrees Celsius (3.6° Fahrenheit) over pre-industrial times is the threshold for “dangerous change” that must be avoided. The Center for International Climate and Environmental Research in Oslo found that, in order to have a 50% chance of avoiding this 2 degree Celsius threshold, we would have to reduce global emissions of greenhouse gases 80% by the year 2050, at the latest.

The cost of inaction may exceed the cost of taking action by an order of magnitude. Sir Nicholas Stern, head of the UK Government Economic Service and former Chief Economist of the World Bank, stated in October 2006:

*There is still time to avoid the worst impacts of climate change, if we take action now... If we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP per year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more... In contrast, the cost of action — reducing greenhouse gas emissions to avoid the worst impacts of climate change — can be limited to around 1% of GDP per year.*

The evidence of climate change is overwhelming and undeniable. The vast majority of scientists agree that global warming is real, it's already happening and that it is the result of human activities and not a natural occurrence. We are already seeing changes. It is far more costly to ignore global warming than to take action to avert the worst of its impacts.

### Benefits of Climate Protection

An increasing number of studies show that, in addition to being less costly overall, taking action to avert global warming can be immediately profitable.

Nations and corporations that take action to reduce greenhouse gases end up saving money. David Northrop, director of Sustainable Development for the Rockefeller Brothers Fund, reported in July 2006, “Every company and city taking action to reduce greenhouse gas emissions has saved money doing so.” Examples include:

**Table 1 — Example Economic Benefits**

Entity	Greenhouse Gas Reductions	Economic Benefits
DuPont	72% since 1990	\$2 Billion Savings
Alcoa	26% since 1990	\$100 Million Savings through 2006
British Petroleum	10% below 1990	\$650 Million Net Present Value Savings
IBM	38%	\$791 Million
Germany	19% since 1990	450,000 New Jobs in Renewable Energy

Urban regions can thrive while also reducing greenhouse gases, as demonstrated by Portland/Multnomah County. While net greenhouse gas emissions in Multnomah County are about at 1990 levels, and per capita CO<sub>2</sub> emissions have dropped over 12%, the inflation-adjusted payroll has increased 29% and employment has increased about 12%.

Finally, to demonstrate local benefits we need look no further than Fort Collins' own Climate Wise program. In 2007 Climate Wise reported a cumulative cost savings of over \$12 million from projects completed by partners through 2007, the same year the partners collectively reduced over 82,000 tons of carbon dioxide equivalent (CO<sub>2</sub>e).

The Fort Collins community could realize tremendous ancillary economic, environmental and social benefits by undertaking responsible steps to combat climate change, including:

- Support local businesses and stimulate economic development.
- Provide economic stimulation of research and development activities.
- Reduce home and business energy costs for heating, cooling and lighting.
- Reduce home and business motor vehicle fuel costs.
- Reduce dependence on foreign fuel sources.
- Reduce vulnerability to energy price increases and volatility.
- Reduce peak energy demand and improve utilization of the electricity system.
- Diversify energy supply and reduce loads on transmission system.
- Reduce air pollution emissions including ozone precursors and fine particles.
- Improve public health.
- Improve local visibility.
- Reduce waste and increase landfill diversion rates.
- Reduce vehicle miles of travel and road congestion.
- Reduce water consumption in the community.
- Increase Fort Collins' ability to adapt to a changing climate.
- Provide opportunities for regional, state and national leadership and recognition.

Local governments have strong financial incentives to address climate change. Reducing local carbon emissions means pursuing a variety of programs and practices that are energy prudent, and thus ultimately fiscally responsible.

### Role of Local Governments

Local governments can greatly influence their communities' greenhouse gas emissions by exercising key powers over land use, transportation, building construction, waste management and, in many cases, energy and water supplies and management.

Cities can make a difference in avoiding climate instability. The U.S. is among the largest emitters of human-caused greenhouse gas emissions. Across the country, more and more local governments are committing to reduce emissions and developing plans to achieve their pledges. Over 160 cities and counties, including Fort Collins, have joined the Cities for Climate Protection Campaign of the International Council for Local Environmental Initiatives (ICLEI). These cities represent about 20% of the U.S. population, have reduced 23 million tons CO<sub>2</sub> annually and have eliminated over 43,000 tons of local air pollutants.

As of June 2008, 850 mayors across the country signed the Seattle "Mayor's Agreement," pledging their community to:

- Strive to meet or beat the Kyoto Protocol targets in their own communities, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects and public information campaigns;
- Urge their state governments and federal government to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol — 7% reduction from 1990 levels by 2012; and,





- Urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation, which would also establish a national emissions trading system.

It is appropriate for Fort Collins to reduce greenhouse gas emissions even if some neighboring communities do not. City Council in 1999 adopted the policy that “The city shall proactively identify and implement actions that reduce Fort Collins’ contribution to total global greenhouse gas emissions.” Numerous benefits accrue from climate protection activities including pollution reduction, human health benefits, cost savings, economic development, reduced vulnerability to peak oil, reduced dependence on foreign oil, increased opportunity to attract grant funding and leadership. Collectively, climate protection activities will enhance the sustainability of our community.

It is equally appropriate for local governments to take responsibility for their emissions, even if they are overshadowed by rapidly increasing emissions elsewhere in the world. Despite this size disparity, it should be recognized that the U.S. still leads the world in per capita greenhouse gas emissions. By acting to reduce emissions, Fort Collins joins other communities in sending a signal that will speed the development of technology-based solutions and more rapidly promote the transformations needed to drive change in global emission levels.

Cities need not wait for state or national programs to begin. It may take a few to several years before carbon emission legislation, programs and regulations are developed. The sooner local communities begin to take action, the sooner they will reap the benefits.

These are some examples of Colorado cities taking action:

- Denver has committed to reduce per capita greenhouse gas emissions 10% below 1990 levels by 2011 in their Greenprint plan.
- Boulder recently passed a carbon tax that will enable their community to reduce emissions 7% below 1990 levels by 2012 through home energy efficiency, switching to renewable energy and alternative fuels and reducing vehicle miles of travel.
- Recognizing special vulnerability to disruptions in water supply from climate change, Aspen launched the Canary Initiative in 2005 to reduce global warming pollution, inform the public about impacts and solutions and advocate for actions at all levels of government.
- Carbondale has committed to reduce greenhouse gas emissions 25% below 2004 levels by 2012, and voters passed a \$1.8 million Clean Energy Bond to fund a town-owned renewable energy facility.
- Telluride has committed to decrease emissions from 2004 levels by no less than 15% by December 2010, and by no less than another 15% of 2004 levels by December 2015.

### **Opportunities**

The Fort Collins community offers a unique combination of innovation and technical expertise that can be leveraged to develop long-term sustainable solutions and facilitate action by community sectors and organizations to reduce emissions.

Market opportunities and technologies are evolving rapidly to support carbon reduction activities. Technology-based advancements are occurring in the areas of biofuels, including algae-based biofuels; electricity grid distribution improvements; and bio-refineries that integrate biomass conversion processes and equipment to produce fuels, power and chemicals from biomass. A dramatic increase in cleaner and more efficient energy technology and sources has occurred in recent years. New industries and programs bring with them strong economic growth opportunities.

Northern Colorado has become a leader in many aspects of clean energy technology development and application. The Northern Colorado Clean Energy cluster, a public/private sector partnership, aims to provide “clean” energy by using renewable energy (e.g., solar and wind), efficient energy technology, green building and energy utilization. Sixty businesses in the cluster employ more than 450 people locally. Colorado State University is recognized internationally for pioneering clean and renewable energy technologies. Additionally, FortZED, a zero-energy district in the historic downtown, will begin to model what policy makers and scientists deem to be the living situation of the future: balanced energy use and renewable energy sourcing. Action on climate change supports the local economy by increasing demand for the services and products that companies in the Clean Energy Cluster provide.

Markets are being created to make greenhouse gas reduction economically efficient. Carbon markets are thriving in Europe, and although the U.S. does not have a national carbon registry and trading policy, voluntary markets are emerging here as well. Examples include the Regional Greenhouse Gas Initiative (RGGI), a greenhouse gas cap-and-trade system being developed by seven northeast states; California’s cap-and-trade system to meet its strict greenhouse gas emission targets; and the Chicago Climate Exchange (CCX), a voluntary mechanism for trading carbon; and the Colorado Carbon Fund, a voluntary carbon offset program.

In light of all these financial and business development initiatives, the Fort Collins community has the opportunity to create a thriving future based on practical energy use.



## Fort Collins Evolving Commitment to Greenhouse Gas Reduction



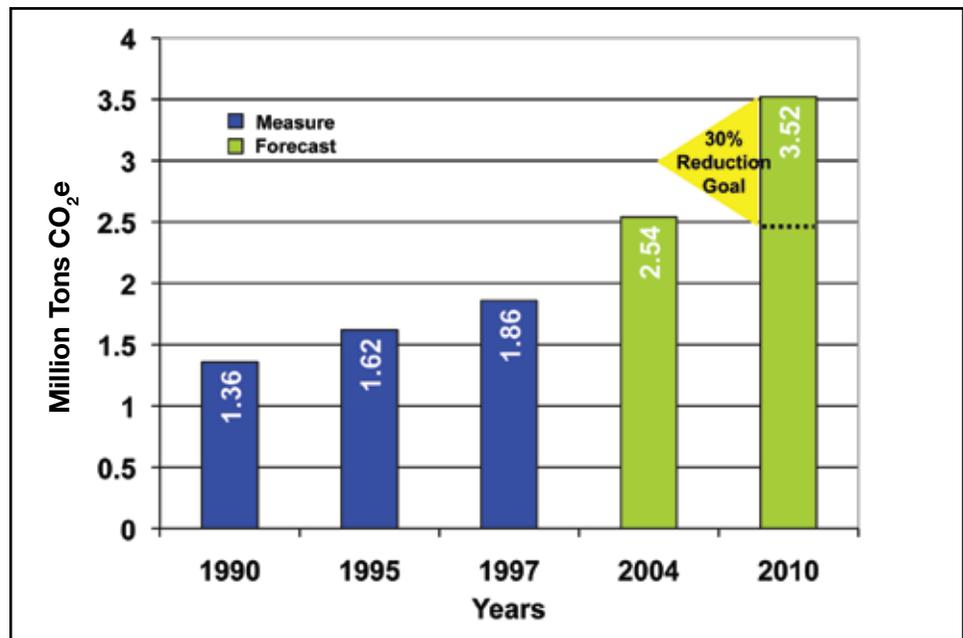
### Original Greenhouse Gas Goal and Plan

In 1997 the City of Fort Collins joined ICLEI's Cities for Climate Protection (CCP) Campaign. In doing so, Fort Collins committed to:

- Develop a 1990 baseline greenhouse gas inventory and forecast for 2010.
- Set a greenhouse gas reduction goal.
- Develop a plan to meet the goal.

The community-wide 1990 emissions inventory showed emissions at 1.36 million tons of CO<sub>2</sub>e, which includes both carbon dioxide and methane emissions. The majority of emissions were produced by electricity use. The 2010 forecast was developed by applying a business as usual projection from 1997 out to the year 2010. This included a 7% annual increase in vehicle miles traveled, causing the transportation sector to increase significantly. The original 2010 forecast, often referred to as the worst case forecast, shows a 160% increase in emissions above 1990 levels. Figure 1 illustrates the 1990 emissions inventory and the 2010 forecast prepared in 1998.

**Figure 1 — Fort Collins Original Emission Inventory, Forecast and Goal (1999)**



Following completion of the emissions inventory and forecast, a Staff Technical Team and a Citizen Advisory Committee met for over a year to identify and recommend a prioritized list of cost-effective actions to reduce local greenhouse gas emissions. In 1999 City Council adopted Resolution 99-137, setting a goal to **“Reduce (community-wide) greenhouse gas emissions 30% below predicted 2010 levels by 2010.”** The 1999 *Fort Collins Local Action Plan to Reduce Greenhouse Gas Emissions (LAP)* was also adopted by Council Resolution 99-137. The plan outlined how to accomplish that goal and called for biennial progress reporting.

### Success to Date

Benefits to the City from implementing the 1999 LAP have been wide-ranging and include air pollution reduction, reduced waste disposal in the landfill, increased

support for local businesses and the economy and generally improved quality of life. The highlights from several specific measures identified in the 1999 LAP that have now been implemented are discussed below.

### **Conversion of Traffic Signals to Energy Efficient Light-Emitting Diodes**

This action was ranked the highest priority for implementation in the LAP. The conversion of red and green signals to LEDs in 2001 saves over \$110,000/year in electricity and maintenance costs, with an initial capital cost of \$370,000, for a 3+ year payback.

### **Climate Wise Business Outreach**

The Fort Collins Climate Wise program, a voluntary business outreach program, was initiated in 2000 and has been growing ever since. As of 2007, the 75 partners collectively avoided over 82,000 tons CO<sub>2</sub>e in that year alone, and reported over \$12.5 million in cumulative cost savings since 2001. The program has now grown to over 115 partners, and the greenhouse gas reduction and cost savings are increasing as well.

### **2004 Update to Residential Building Code**

The 2004 energy code update for Fort Collins' residential buildings requires energy efficiency improvements (R-18 walls, low-e windows, more effective furnaces, duct work, right-sized AC systems). These upgrades will save homeowners \$90 - \$150 a year per home in utility costs and will avoid 1.2-1.5 tons CO<sub>2</sub>e per home per year.

### **Wind Energy Program**

Fort Collins Utilities has offered renewable energy to customers through the wind program since 1998. The wind program went through a rebranding in 2007 to the Green Energy program. By 2007, there were over 1,700 residential and over 110 commercial subscribers, purchasing over 35,000 megawatt-hours of renewable energy.

### **Electric Energy Supply Policy**

In addition to measures included in the 1999 LAP, the passage of the Fort Collins Electric Energy Supply Policy in 2003 has led to significant greenhouse gas reductions. The targets of the supply policy are:

- Reduce per capita electric consumption 10% from 2002 levels by 2012.
- Reduce per capita peak demand 15%.
- Achieve 15% renewable energy by 2017.

A 2% fee on utility bills funds the energy efficiency and renewable energy programs. The Policy has supported a rapid expansion of energy efficiency programs and the addition of renewable energy to the rate-based electricity sources.

### **Addition of a Centralized Recycling Drop-Off Site**

A City recycling drop-off facility opened at Rivendell School in March 2002. Approximately 1,400 tons of materials are recycled annually. This results in approximately 1,800 tons CO<sub>2</sub>e avoided and provides added convenience to citizens for recycling.

## **Reporting & Progress**

Council Resolution 99-137 which established the original greenhouse gas goal also called for a biennial report to track progress and identify additional greenhouse gas-reducing activities that merit consideration, in recognition of changing scenarios and advances in technology. Several biennial climate status reports have been completed and are posted at: <http://fcgov.com/climateprotection/policy.php>

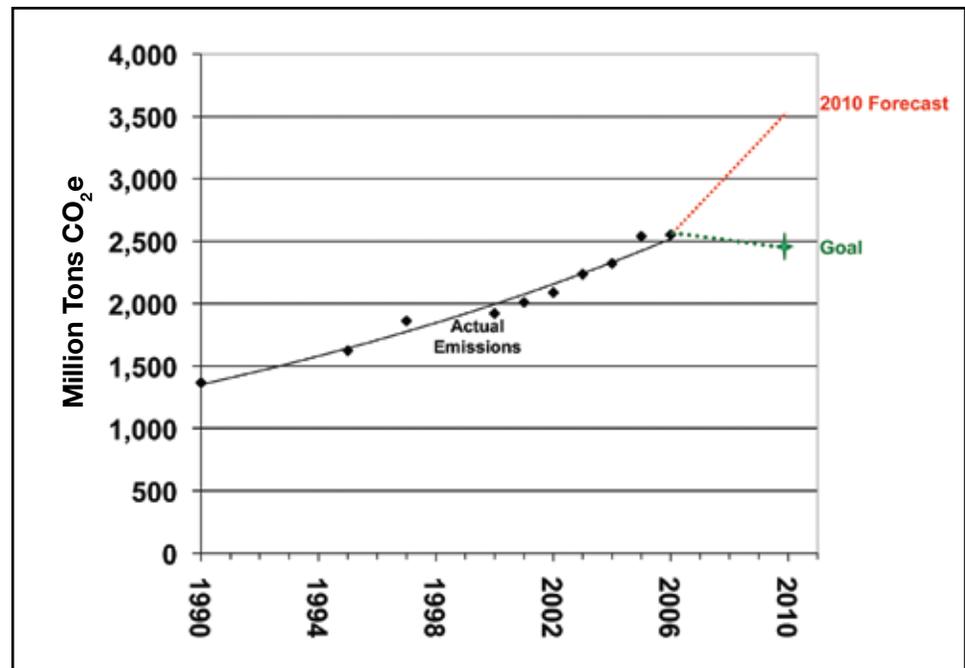


Table 2 shows that the quantified tons of avoided CO<sub>2</sub>e have grown steadily since 2000. However, Figure 2 shows that the reductions have not been able to keep pace with emissions growth, and net emissions have continued to grow.

**Table 2 — Biennial Climate Protection Status Reports**

<i>Report</i>	<i>Tons CO<sub>2</sub>e Avoided in Year</i>	<i>% Reduction</i>
2000 Climate Protection Status Report	190,000 tons CO <sub>2</sub> e avoided in 2000	9%
2001/2002 Climate Protection Status Report	237,000 tons CO <sub>2</sub> e avoided in 2001	10%
2003/2004 Climate Protection Status Report	241,000 tons CO <sub>2</sub> e avoided in 2004	9%
2005/2006 Climate Protection Status Report	244,000 tons CO <sub>2</sub> e avoided in 2006	9%

**Figure 2 — Fort Collins Greenhouse Gas Emissions**



Following the completion of the 2005 emissions inventory, it became apparent that Fort Collins was not on track to meet the 2010 goal, as 2005 emissions exceeded the 2010 goal threshold. One of the reasons Fort Collins is not on track to meet the 2010 goal is that the 1999 LAP included a few large strategies that were directly within local control (Denver Commuter Rail, More Stringent Vehicle Fuel Efficiency Standards and Landfill Methane Capture), and one strategy was not met (VMT Growth Rate Not Exceed Population Growth Rate). Together, these four strategies represented over 50% of the total reduction strategies contained in the original LAP. Additionally, the original LAP did not establish interim milestones by which to assess progress on the 2010 goal.

While early biennial climate status reports identified strategies for implementation in the next budget cycle, projections of these strategies to 2010 were not done. Some of the additional strategies were only partially implemented or were not implemented. Consequently, Fort Collins could not meet the 2010 goal, despite successful implementation of a number of measures.

## Climate Task Force

When it became apparent that Fort Collins was not on track to meet its 2010 emissions target, a local community group, the Fort Collins Sustainability Group, approached City Council in the Fall of 2006, asking that efforts be undertaken by the City to update the Plan. In March 2007 Fort Collins City Council passed Resolution 2007-015, approving the formation of a task force to address the issue. (See Appendix X for Resolution 2007-015.)

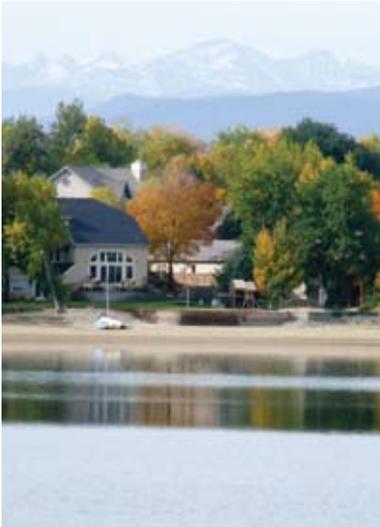
The Climate Task Force (CTF) was convened in May 2007, consisting of 12 members representing key community organizations and stakeholders in local climate protection efforts.

## CTF Findings

Through its investigation into climate protection in Fort Collins, the CTF made the following findings:

- The Fort Collins community has demonstrated its leadership on the issue of climate protection and should continue to act from a position of leadership and focused intent so as to inspire other communities across the region, state and globe to likewise step up to share in the solution.
- The community will realize tremendous ancillary economic, environmental and social benefits when taking responsible steps to combat climate change. Accordingly the goal and plan should actively pursue and manage these benefits including but not limited to economic vitality, community cohesion, societal and individual health, improved air quality and state and national recognition.
- The City of Fort Collins government should play a special role in energizing the community by first leading by example in greening its own operations, then by establishing policy directions that will lead the community to a sustainable future, and most importantly by inspiring community involvement.
- Fort Collins is fortunate to have a number of organizations leading sustainability efforts including Poudre School District, Colorado State University and the wide array of Climate Wise partners that have publicly committed to voluntarily reduce their organizations' greenhouse gas emissions. For perspective, the Climate Wise program represents the city's top employers (representing more than 20,000 employees) and the city's top energy users (representing approximately one third of Fort Collins Utilities' total annual electricity delivered). Collaborating and sharing experiences with other leaders in the community and region will be integral to achieving success.
- Based on scientific evidence, forecasts and models under different scenarios of action, the CTF believes that the local goal should target an 80% or greater reduction in our greenhouse gas emissions inventory by mid-century in order for Fort Collins to perform at a level consistent with global requirements for reversing the effects of climate change.
- In the end, we must come together as a community, a state, a nation and a globe to dedicate ourselves to the serious task of addressing climate change while not losing sight of the fact that we can make a difference and leave the world a better place for future generations.





**CTF Process**

The CTF met 17 times between May 2007 and May 2008, working primarily to develop strategies to meet the 2010 goal. During this process, citizen input was gathered from several City advisory boards, two public open houses were held, and input was received via a Web comment form. In February 2008 a preliminary list of strategies was presented at a City Council work session, along with estimated costs and benefits. At that time, Council decided to revisit the appropriateness of the 2010 goal. Based in part upon recommendations from the CTF, the City Council adopted new community-wide carbon reduction goals in May 2008. These goals are discussed below.

The CTF revisited its recommendations in light of the new goals. The CTF final recommendations address how a 2012 milestone could be met and how significant progress towards the 2020 goal could be achieved. The CTF final recommendations were presented to the City Manager in June 2008. The full report of the CTF recommendations can be found at: <http://fcgov.com/ctf>

**New Greenhouse Gas Goals**

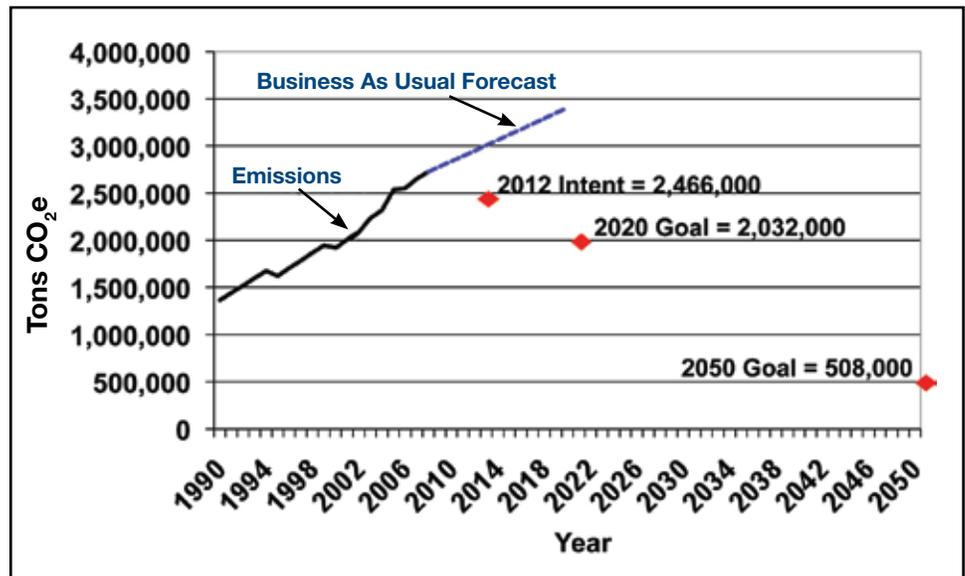
In May 2008 Fort Collins City Council set visionary new community-wide greenhouse gas goals for 2020 and 2050 that align with goals for the State of Colorado:

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

Council also expressed interest in continuing short-term progress and stated the intent to reduce 2012 emissions to 2.466 million tons of CO<sub>2</sub>e (comparable to the original 2010 goal).

Figure 3 below illustrates these goals.

**Figure 3 — Fort Collins Greenhouse Reduction Goals**

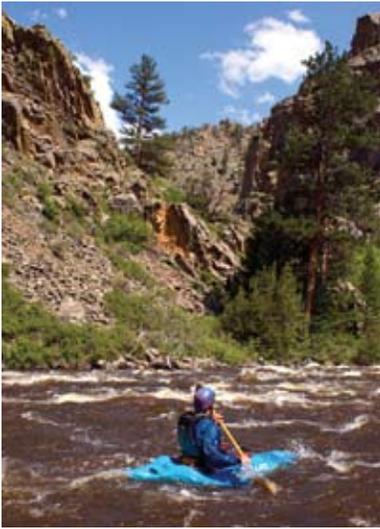


Achieving the 2020 goal will mean reducing community emissions to 2.032 million tons of CO<sub>2</sub>e, a 40% drop below predicted 2020 business as usual levels. This 40% drop equates to 1.375 million tons of CO<sub>2</sub>e reduction that are needed by the year 2020, compared to business as usual levels, to achieve the goal. In order to meet the 2012 reduction intent, 485,000 tons of CO<sub>2</sub> per year will be needed by 2012, compared to predicted business as usual emission of that year.

### **Development of Fort Collins Climate Action Plan**

Following completion of the CTF recommendations, City staff evaluated the strategies, updated the assumptions and made adjustments, where necessary. This Climate Action Plan presents a list of strategies that current and future City Councils can select in order to continue making progress towards the 2020 goal. These flexible, innovative strategies will benefit Fort Collins' citizens and businesses in many ways, now and into the future, regardless of changes in carbon regulation or advancements in technology.

# Fort Collins Greenhouse Gas Inventory and Projections

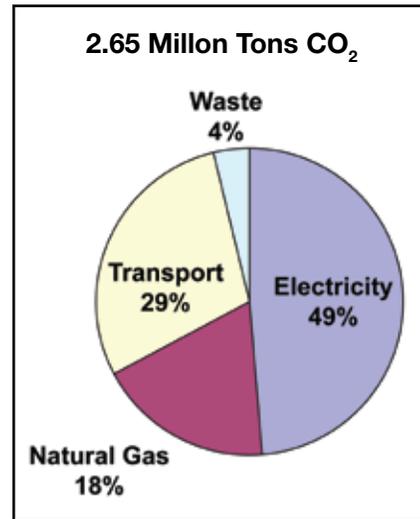


An important first step in developing a plan to reduce greenhouse gas emissions is to understand current sources and estimate future emissions. Understanding emissions sources can help guide the selection of reduction strategies. This inventory reflects the two most common human-caused greenhouse gases; carbon dioxide and methane.

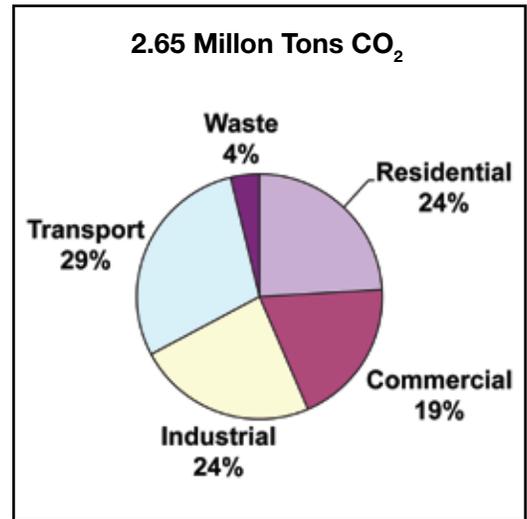
Fort Collins' inventory looks at total gross emissions; it does not subtract carbon sequestration by vegetation or soils. It considers consumption-based emissions within the energy sector by evaluating community usage of electricity and natural gas. The emissions inventory does not factor in the energy needed to manufacture materials, products and food that is transported into and used in Fort Collins. The inventory methodology follows currently generally accepted principles and guidelines established by ICLEI and represented in the Clean Air Climate Protection Software. As inventory methodologies evolve, Fort Collins will continue to evaluate and, when appropriate, update its inventory methods.

In 2007 Fort Collins generated approximately 2,653,000 tons of carbon dioxide equivalent (CO<sub>2</sub>e)<sup>1</sup>. The largest source is electricity consumption, followed by the transportation sector and then natural gas consumption. Below, Figures 4 and 5 show 2007 emissions by emissions source and user category.

**Figure 4 — Fort Collins 2007 Greenhouse Gas Emissions by Source**



**Figure 5 — Fort Collins 2007 Greenhouse Emissions Sources by Use Sectors**



Emissions in Fort Collins have grown by 94% since 1990, when community-wide emissions were 1,366,000 tons CO<sub>2</sub>e. Figures 6 and 7 compare 1990 and 2007 greenhouse gas emissions by source. The electricity sector contribution grew from 42% in 1990 to 48% in 2007, while the natural gas percentage dropped from 25% to 19% of citywide GHG emissions for the same period. The relative increase in electricity generation's contribution to emissions can be attributed to reduced availability of federal hydroelectric power to Platte River Power Authority, increased use of electronics in homes and a dramatic increase in the use of residential air conditioning. The transportation sector decreased slightly in relative contribution of total GHG emissions from 1990 to 2007.

<sup>1</sup>CO<sub>2</sub>e = Carbon dioxide equivalent. Since methane is at least 21 times more potent a greenhouse gas than carbon dioxide, the relative global warming potential of CO<sub>2</sub> = 1 and of methane = 21. When methane and carbon dioxide emissions are summed, they are referred to as CO<sub>2</sub>e, indicating methane has been converted to CO<sub>2</sub> equivalent.

Figure 6 — Fort Collins 1990 Emissions

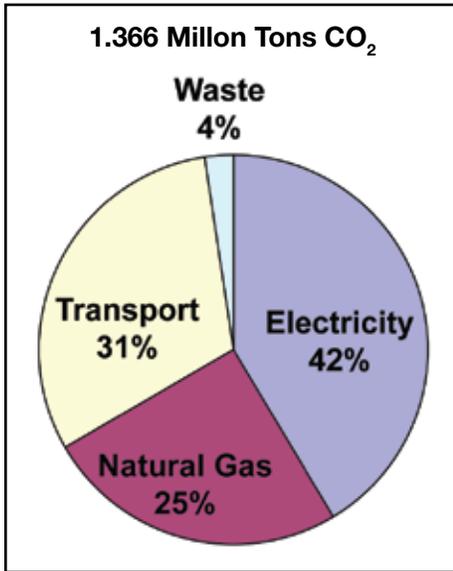


Figure 7 — Fort Collins 2007 Emissions

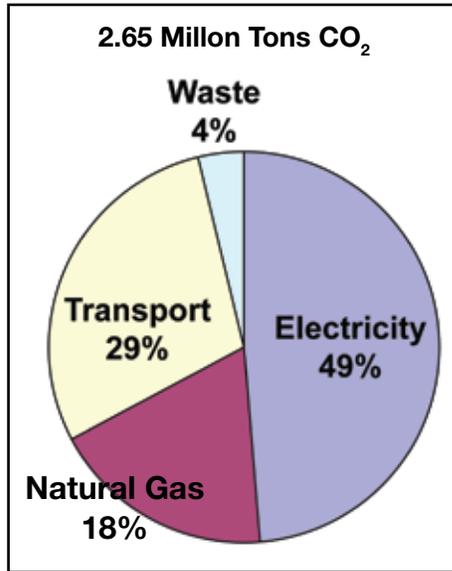
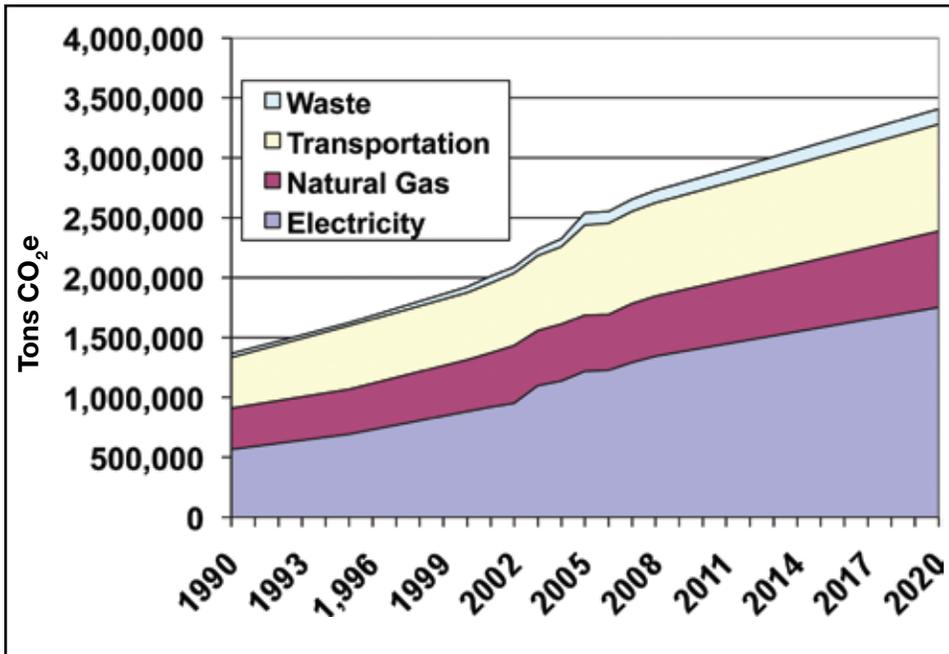


Figure 8 — Fort Collins Greenhouse Gas Emissions and Projections to 2020



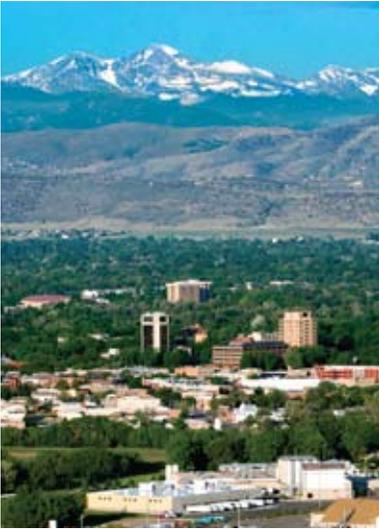
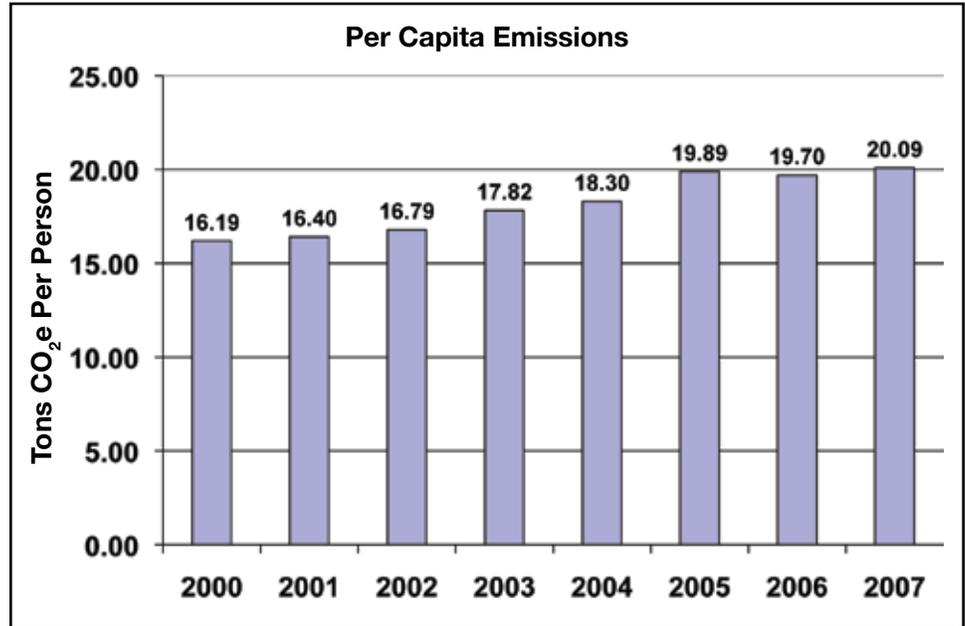


Figure 9 illustrates that Fort Collins' emissions growth is not solely attributable to population growth, as there has been a steady growth in per capita emission as well. The exception is 2006. The 2006 per capita emissions drop slightly below 2005 levels. This can be attributed to reductions in natural gas usage and the amount of solid waste generated.

**Figure 9 — Fort Collins Per Capita Greenhouse Gas Emissions**

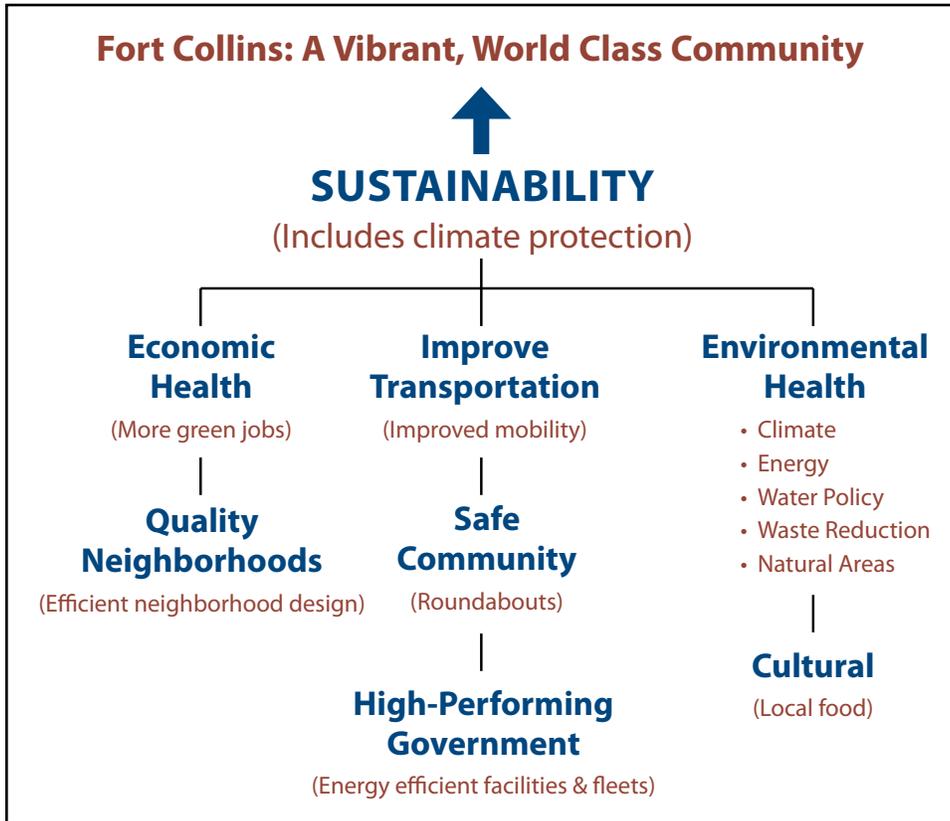


# Climate Protection Strategies

## Support for Multiple Goals

The majority of actions that reduce emissions also support other local community goals and contribute to sustaining Fort Collins as a vibrant, world class community. In fact, many existing actions that benefit the climate were initiated to meet other priority goals, such as supporting the economy, reducing environmental impacts, exercising fiscal responsibility and increasing mobility. However, carbon reduction adds one more important reason for implementing these strategies. See Figure 10.

**Figure 10 — Fort Collins: A Vibrant, World Class Community**



## Existing Measures

Efforts to identify new emissions reduction strategies should start with an analysis of existing actions to reduce emissions. Fort Collins has been working to reduce its greenhouse gas emissions since 1999, when the original reduction goal was adopted. This Plan recognizes the role that existing efforts, if continued, will have on reducing future emissions. It considers only the benefit of these actions above 2007 levels, as projected out to the year 2012 under current plans and anticipated growth rates.



**Table 3 — 2012 Anticipated Benefits of Existing Actions**

<i>Measure Name</i>	<i>Estimated Tons CO<sub>2</sub>e Reduced in 2012 Above 2007 Levels</i>
Energy Efficiency Programs	40,000
Climate Wise Program	37,000
Single Stream Recycling	14,000
Business and Residential Recycling	7,000
Electronics Waste Ban	6,000
State-mandated Natural Gas Efficiency Programs (HB1037)	5,000
2005 Residential Energy Code	4,000
FortZED Jumpstart	3,000
PSD Greenhouse Gas Goal	2,000
Commercial Energy Code	1,000
Mason Corridor	400
VAN GO	300
Test Ride Transit and FC Bikes	100
<b>TOTAL (After double-counting removed)*</b>	<b>104,000</b>

*\* 50% of Climate Wise program benefit is assumed to overlap with other existing measure benefits.*

### New Measures

The strategies listed in Table 4 are identified to help Fort Collins achieve progress towards the 2020 reduction goal. If fully implemented, the existing and new measures combined sum up to 1,212,000 tons of CO<sub>2</sub>e avoided in the year 2020, or approximately 90% of the reductions needed to meet the 2020 goal. The strategies listed would lead Fort Collins to achieve between 55-80% of the 2012 stated reduction intent. Through the biennial review process, the list of strategies can be updated to incorporate changes in the carbon market and technology opportunities, as well as citizen support for climate protection and City budget priorities.

Many of the strategies presented will require significant decisions about City budget priorities and trade-offs between community costs and benefits. However, the list of strategies proposed here is sound and will move Fort Collins towards its carbon reduction goals.

**Table 4 — New Measures**

MEASURE NAME	2012 Estimated Benefit (Tons CO <sub>2</sub> e)	2020 Estimated Benefit (Tons CO <sub>2</sub> e)
<b>EXISTING MEASURES</b>	<b>104,000</b>	104,000
<b>MENU OF OPTIONS</b>		
<b>COMMUNITY LEADERSHIP</b>		
Expand Climate Wise	73,000 – 94,000	143,000
Government Organizations Set GHG Goals	42,000	217,000
Community-wide Climate Challenge	28,000	34,000
Colorado Carbon Fund	5,000	8,000
<b>Community Leadership Sub-total</b>	<b>148,000 – 169,000</b>	<b>402,000</b>
<b>RECYCLING — Push Toward 50% Diversion Goal</b>		
Ban cardboard from waste stream	46,000 – 58,000	68,000
Private paper/glass drop-off	5,000- 6,000	8,000
Increase residential education	4,000 – 5,000	15,000
Larger residential recycling containers	3,000 – 4,000	5,000
Require haulers to provide residential yard waste collection for added cost	1,000	1,000
Enhance residential PAYT (2nd can costs more)	11,000 – 17,000	21,000
Commercial recycling co-ops	1,000 – 7,000	8,000
Residential yard waste drop-off and ban yard waste	0 – 4,000	5,000
C&D Drop-off	0 – 34,000	39,000
C&D contract preferences for City contracts	1,000	1,000
Commercial recycling fee embedded in rates (Additional benefit above cardboard ban)		81,000
<b>Recycling Sub-total</b>	<b>73,000 – 137,000</b>	<b>253,000</b>
<b>ENERGY</b>		
<b>2008 Energy Policy</b>		
Efficiency Programs	20,000 – 30,000	214,000
SmartGrid, Advanced Metering Infrastructure, Pricing, Conservation	10,000 – 20,000	246,000
Renewable Energy (Colorado Renewable Portfolio Standard and voluntary programs)	0	190,000
Natural Gas Energy Conservation	5,000 – 10,000	52,000
<b>Energy Sub-total</b>	<b>35,000 – 60,000</b>	<b>703,000</b>
<b>GREEN BUILDING</b>		
Update Residential Building Code	1,000	4,000
<b>Green Building Sub-total</b>	<b>1,000</b>	<b>4,000</b>
<b>TRANSPORTATION</b>		
Reduce Vehicle Miles of Travel	2,000 – 12,000	14,000
Modern Roundabouts	1,000	2,000
<b>Transportation Sub-total</b>	<b>3,000 – 13,000</b>	<b>16,000</b>
TOTAL (before double-counting removed)	366,000 – 486,000	1,481,000
<b>TOTAL (after double-counting removed)*</b>	<b>268,000 – 378,000</b>	<b>1,212,000</b>

*The quantified, “short-term” measures are discussed in more detail on the following pages.*

\*Double-counting between measures with overlapping benefits was addressed as follows:

- Climate Wise — 50% overlap with other measures
- Gov. Orgs Set GHG Goals — 75 % overlap
- Community Climate Challenge — 90% overlap
- Local Carbon Offset Program — 62% overlap



## MEASURE

### Expand Climate Wise

#### Estimated Additional CO<sub>2</sub>

##### Savings in 2012:

73,000 – 94,000 Tons CO<sub>2</sub>e

#### Estimated Additional CO<sub>2</sub>

##### Savings in 2020:

143,000 Tons CO<sub>2</sub>e

#### Double-Counting:

Considered to overlap 50% with other short-term climate strategies

#### Lead Implementing

##### Department:

Natural Resources and Utilities

#### Recommended Approach for Implementation:

Seek new FTE and funding for expanded partner outreach as soon as possible

#### Recommended Timeframe for Completion:

2010

#### Estimated Cost to the City:

\$100,000/yr

#### Potential Funding Source(s):

City General Fund; grants

#### Cost Savings:

Net \$2/ton average savings for CO<sub>2</sub> avoided by Climate Wise partners (historic average)

#### Supporting City Polices:

*Resolution 07-051* — The Fort Collins community offers a unique combination of innovation and technical expertise that can be utilized to develop long-term sustainable solutions and facilitate all sectors and organizations in Fort Collins to take action to reduce emissions.

*Budgeting for Outcomes Economic Health Result* — Support Fort Collins having a healthy economy that reflects the values of our community in a changing world.

*Budgeting for Outcomes Environmental Health* — Seek reductions in greenhouse gas emissions that puts the City on track to meet the...policy objectives.

*City Plan Policy ENV 1-13. Innovations* — The City will consider adoption of successful air quality improvement strategies in effect elsewhere, including municipal practices, public information campaigns, incentive/promotion programs and regulations.

**Measure Description:** Climate Wise is a successful voluntary business outreach program. It offers technical assistance and recognition to partners who reduce their emissions and report progress. This measure proposes to increase Climate Wise program savings from 82,000 tons CO<sub>2</sub>e avoided in 2007 to 200,000+ tons in 2010 by adding 130 new partners above 2007 levels and providing additional resources to assist existing partners implement and report more projects. This measure adds new personnel and resources to provide direct hands-on assistance for partners. As more partners and resources are added, the efficiency of the program will increase even further, due to economies of scale.

#### Other Benefits:

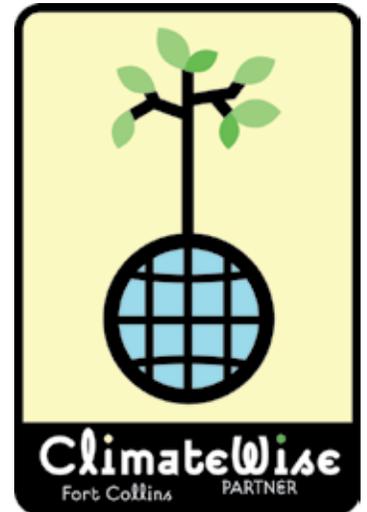
- Support local businesses and stimulate economic development
- Improve employee attraction and retention
- Increase partner customer loyalty
- Provide peer networking opportunities
- Reduce business energy costs for heating, cooling and lighting
- Reduce business motor vehicle fuel costs
- Specifically, Climate Wise partners have saved over \$12M cumulatively since 2000
- Reduce partner vulnerability to energy price increases and volatility
- Reduce peak energy demand and improve utilization of the electricity system
- Reduce air pollution emissions including ozone precursors and fine particles
- Improve public health
- Improve local visibility
- Reduce waste and increase landfill diversion rates
- Reduce vehicle miles of traveled and road congestion
- Reduce water consumption in the community
- Provide opportunities for regional, state and national leadership and recognition

**Relationship to Other Programs:** The Colorado Climate Action Panel has recommended implementation of a state-wide voluntary business program offering free technical assistance and continuous support as a means of reducing carbon emissions from energy, water, transportation and solid waste, emulating Fort Collins' successful Climate Wise program.

## CLIMATE PROTECTION STRATEGIES

### Expand Climate Wise

*“The recognition of the Climate Wise Program as one of the Top 50 innovative government programs in the country speaks volumes about the commitment by Fort Collins businesses to lead in environmental stewardship and economic vitality,”* says City of Fort Collins City Manager Darin Atteberry. *“We are proud of the close collaboration the City has forged with local organizations, as we pave the way to making Fort Collins a world-class green city through sustainable, economic and quality of life improvements.”*



*Climate Wise was selected as one of the top 50 Innovation Government Programs in the U.S., as recognized by Harvard University, from a pool of approximately 1,000 applicants.*





## MEASURE

### Local Government Organizations Establish Greenhouse Gas Goals

#### Estimated CO<sub>2</sub> Savings in 2012:

42,000 Tons CO<sub>2</sub>e

#### Estimated CO<sub>2</sub> savings in 2020:

217,000 Tons CO<sub>2</sub>e

#### Double-Counting:

Considered to overlap 75% with other short-term climate strategies

#### Lead Implementing Department for City of Fort Collins:

Operations Services

#### Recommended Timeframe for Completion:

Variable

#### Estimated Cost to the City:

Currently undetermined

#### Potential Funding Source(s):

City General Fund; grants; Utilities rebates

#### Supporting City Policies:

*Air Quality Plan Policy AQ-16.1. Lead by Example* — The City will make efforts to reduce and mitigate its own air pollution emissions before asking or requiring others to reduce and mitigate their own emissions.

*Air Quality Plan Policy AQ-16.2. Cooperation* — The City will initiate and cooperate with other efforts to improve air quality, while avoiding unproductive duplication of effort. Others include governmental entities, non-profit sector, businesses and educational institutions.

*BFO Environmental Health* — Seek reductions in greenhouse gas emissions that puts the City on track to meet the...policy objectives.

*City Plan Policy ENV 1-13. Innovations* — The City will consider adoption of successful air quality improvement strategies in effect elsewhere, including municipal practices, public information campaigns, incentive/promotion programs and regulations.

**Measure Description:** Recognizing the importance of leading by example, the measure supports large local government organizations (CSU, City of Fort Collins, Larimer County and Poudre School District) in making progress on carbon reduction goals. All four organizations are currently members of the Climate Wise program.

In their 2006 Sustainability Management System, Poudre School District set a goal to reduce their emissions from energy and water 15% between 2006 and 2016. In June 2008, Colorado State University signed the *American College and University Presidents Climate Commitment*. In July 2008, CSU President Penley announced CSU's goal to become carbon neutral by 2020. In July 2008, the City of Fort Collins drafted a municipal goal identical to the community's goal; to reduce emissions 20% below 2005 levels by 2020, by reducing municipal emissions at least 2% per year, starting in 2009. Larimer County is actively implementing carbon-reduction programs and is discussing a goal for the organization.

#### Recommended Approach for Implementation for the City:

- City of Fort Collins will develop a process to reduce, track and report municipal greenhouse gas emissions by the first quarter 2009.
- All large local government organizations (CSU, PSD, City, County) will report progress annually through Climate Wise reporting. The Climate Wise program encourages and inspires partner members to advance to the Platinum Level, which involves completing an emissions inventory, setting a reduction goal and reporting progress.

**Cost Savings:** The City of Fort Collins spends over \$1.9 million on the utilities for the majority of its buildings. Over  $\frac{3}{4}$  of this is for electricity and natural gas. As these utility costs increase, the potential for avoided costs also increases.

#### Other Benefits:

- Reduce business energy costs for heating, cooling and lighting
- Reduce business motor vehicle fuel costs
- Reduce vulnerability to energy price increases and volatility

#### CLIMATE PROTECTION STRATEGIES

#### Local Government Organizations Establish Greenhouse Gas Goals