

The Climate Action Plan

A Plan to Save Energy
and Reduce Greenhouse Gas
Emissions

Household Opportunities

PUBLIC REVIEW DRAFT

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Who Developed this Plan, and Why

The Task Force's Objectives

In working on this Climate Action Plan, the task force was guided by three primary objectives:

1. To develop baseline emissions estimates and reduction strategies.
2. To give decision makers a clear understanding of the efforts that are needed to achieve a 10 percent, community-wide reduction in emissions.
3. And, to raise public awareness—to educate and motivate local citizens to take and support effective actions.

This Climate Action Plan has two purposes:

- to raise awareness about individual and business actions that reduce the threat of global climate change, and
- to guide decision makers of the City of Burlington toward policies, strategies and actions that can reduce CO₂ emissions in the city and the region.

In pursuing these goals, the developers of this plan hope to contribute to Burlington's broader vision of becoming the most *sustainable* city in the United States—becoming, that is, a city where economic, environmental and social conditions contribute to the well-being of all.

This plan was developed by the Burlington Climate Protection Task Force. The primary authors are David Hill of Vermont Energy Investment Corporation (Climate Protection Opportunities, Appendices B, C, and D) and Debra Sachs of the Chittenden County Regional Planning Commission (Executive Summary, Introduction, Moving Forward). They received much technical assistance from Melissa Royael of the Climate Protection Task Force (BCPTF), and Tom Buckley of the Burlington Electric Department (BED), along with editorial support from the other members of the task force.

Gioia Thompson, of the University of Vermont Environmental Council designed and formatted this report with assistance from Karen Bresnahan of Chittenden County Regional Planning Commission. Acting as partners throughout the plan's development were the Metropolitan Planning Organization (MPO), Fletcher Allen Health Care, the University of Vermont and the Vermont Department of Public Service, all of which provided significant guidance and technical assistance.

The Climate Protection Task Force guided the 18-month analysis and planning process that led to this plan, strategies and actions that are suggested here. The task force is committed to nurturing a process that will lead to this plan's successful implementation, so that the CO₂ reductions targeted by the city can be achieved by 2005.

A.



1. Household Energy Use and Greenhouse Gases

2. Ten Things One Person Can Do

3. Making a Household Action Plan

4. The Challenge

Household Opportunities

Many daily household activities are directly related to the emissions of greenhouse gases and therefore to the threat of global climate change. The most direct link between household activities and the emissions of greenhouse gases is energy use. Investments in energy efficiency, which often save money and improve comfort, offer a powerful means for combating global climate change and other environmental impacts.

Often, however, the steps individuals can take to help protect the environment are not clear. This section provides a basic overview of the important connections between household energy use and the emissions of greenhouse gases. It also provides direction for taking steps that can significantly reduce your household's emissions. The good news is that there are many options to select from, and good resources are available to help you make the right choices.

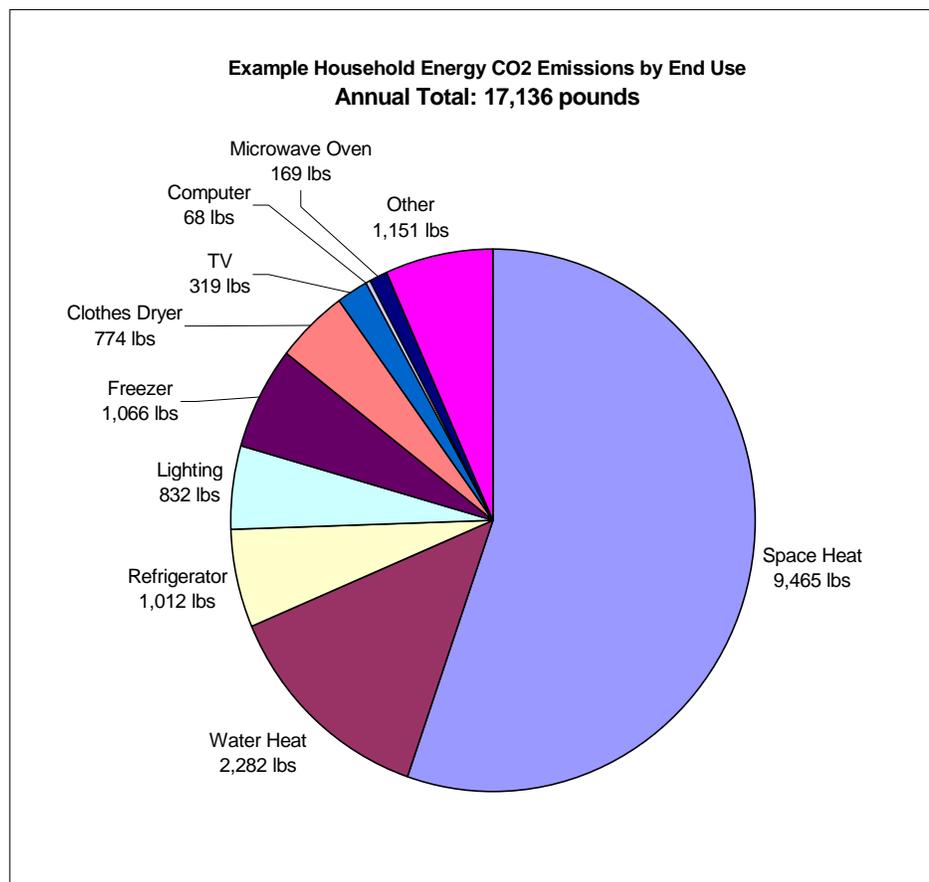
Ten Ways to Reduce Household Emissions

1. Look for the *ENERGY STAR* label.
2. Drive less.
3. Buy a fuel-efficient vehicle.
4. Reduce, reuse, recycle.
5. Improve your home's energy efficiency.
6. Invest in renewable energy.
7. Turn off unused lights and appliances. Set back your water temperature and thermostat.
8. Support climate-friendly products and services.
9. Support local agriculture.
10. Participate in climate-protection projects.

1. Household Energy Use and Greenhouse Gases

The major household energy users and emitters of greenhouse gases are space heating, water heating, lighting and appliances. In Vermont, space heating is generally the largest user, water heating the second-largest. The following graphic shows the annual greenhouse gas emissions from a typical Burlington home.

Many technologies and services on the market today can help reduce your energy consumption, save money, and reduce greenhouse gas emissions. So can some simple changes in your daily practices.



2. Ten Things You Can Do

You can help to reduce global warming by taking some simple steps to reduce the greenhouse gas emissions for which you, personally, are responsible. The following ten actions are examples of what you can do.

The Ten Things You Can Do...



1. Look for the Energy Star label when buying new home appliances, lighting products, electronic and home office equipment. The Energy Star label helps you to easily identify the most energy-efficient models available.

2. Drive less. With every gallon of gas it burns, a car's engine emits *20 pounds* of carbon dioxide (see sidebar for how this works). Share rides, ride the bus, bike or walk.

3. Buy a fuel-efficient vehicle. Use a vehicle that gets 30-plus miles per gallon, especially for your most frequent driving tasks, such as the daily commute.

4. Reduce, reuse, recycle. Managing your household consumption patterns can significantly save on resources and energy. Most of the materials in our lives take energy to produce. You can reduce your consumption of them by using canvas shopping bags, recycling and looking for creative ways to reuse items.

5. Improve your home's energy efficiency. Efficiency measures can be major—involving your heating system, insulation, windows, appliances and water heaters—or more modest, with electricity-saving lamps, lighting fixtures and low-flow faucets. The benefits include improved comfort, lower energy bills *and* fewer emissions.

6. Invest in renewable energy. You can use the sun's free energy to produce electricity, or to help reduce your household's fossil fuel consumption. By reducing your consumption of conventional fuels, solar electric and solar hot water systems can reduce your emissions of greenhouse gases and other air pollutants. (See next page for ideas.)

7. Turn off and set back. Keep a sharp eye out for chances to turn off unused lights, TVs, stereos and home office equipment. Turn back the temperature on your water heater to 120 degrees, and set back your thermostats as much as comfort allows.

8. Support climate-friendly products and services. When shopping look for recycled content, minimized packaging, and "climate neutral" products.

9. Support local agriculture. Take advantage of farmers' markets, community-supported agriculture and other ways of buying from local farmers. The closer your food is grown, the less fuel is burned in getting it to you. There are also the advantages of freshness, fun, and strengthening your community.

10. Participate! Encourage your friends and associates to support climate protection activities. Schools, faith-based groups and other community-based organizations can help to motivate broader community involvement. Support national, state and local groups that are working for climate protection. Participate in local utility and community efforts to protect the climate.

A Multiplier Effect

How, you might ask, when a gallon of gasoline weighs somewhat less than 8.3 pounds (the weight of a gallon of water), can burning this gasoline create 20 pounds of CO₂?

The answer is that much of the carbon dioxide's molecular weight comes from the atmosphere in the form of oxygen. More specifically, carbon has a molecular weight of 12, and oxygen a molecular weight of 16. Therefore, when a gallon of gasoline, which is mostly made up of carbon molecules, is burned it is possible to generate an amount of carbon dioxide that is roughly 3 times greater (on a mass basis) than the original unit of fuel.

3. Making a Household Action Plan

The Burlington Climate Protection Task Force is encouraging households, businesses and institutions throughout the city to develop individual climate protection action plans. There are three basic steps to creating such a plan:

1. Use energy bills and other information on household activities to estimate your annual emissions of greenhouse gases.
2. Identify changes or investments that you can make over the next year to reduce emissions.
3. Track your progress.

If you have access to the Worldwide Web (one computer is available at the Fletcher Free Library for public use), you can use the personal CO₂ calculator provided by the International Council for Local Environmental Initiatives at www.iclei.org/iclei/co2calc.htm.

The calculator is easy to use, but to answer its questions you will need to have information ready about your utility bills and your yearly gasoline consumption.

After calculating your household's current emissions, you can set a greenhouse gas reduction target. The city's goal is to reduce emissions by 10 percent by 2005, but you may decide to choose a higher or lower figure. To help you get started, Appendix D contains information on a range of household energy efficiency measures and the reductions they can bring in CO₂ emissions.

4. Resources

You are the most important resource for personal action to combat climate change. There are many local, state and national programs that can help you take action. Some offer technical advice, consumer education and assistance, while others can provide qualified households with direct incentives, financing and other financial assistance.

The Burlington Electric Department and Vermont Gas Systems both offer energy efficiency programs for residential customers. Through the SunWise program, Burlington Electric is offering technical assistance, incentives and contract management to promote the installation of solar hot water and photovoltaic systems.

Income-eligible households in Burlington and surrounding communities can also participate in the Weatherization Assistance Program. For more information, contact the sources listed at the end of this chapter.

Alternative Energy Supplies for Homeowners

Solar energy reaches your rooftop every day, and you can take advantage of it. In Burlington, solar hot water and photovoltaic (PV) technologies are usually the most feasible options for home renewable energy systems. Investing in a renewable system will provide you with clean, reliable, affordable energy for years to come.

PV Systems

Photovoltaic systems produce electricity directly from sunlight. They can be tied directly to the utility grid, and they can power regular home appliances. They can also be used to charge battery banks or directly power your household in case of a utility power outage.

By reducing consumption of conventionally produced electric power, each kilowatt of PV power installed in Burlington will prevent roughly 24 tons of greenhouse gas emissions over 20 years.

Solar Hot Water

Water heating is typically the second-largest household energy cost. These systems also use a conventional fuel for backup—so you'll always have hot water, even when the sun isn't shining. In Burlington, a new solar hot water heater will typically provide between 60 and 70 percent of a household's needs.

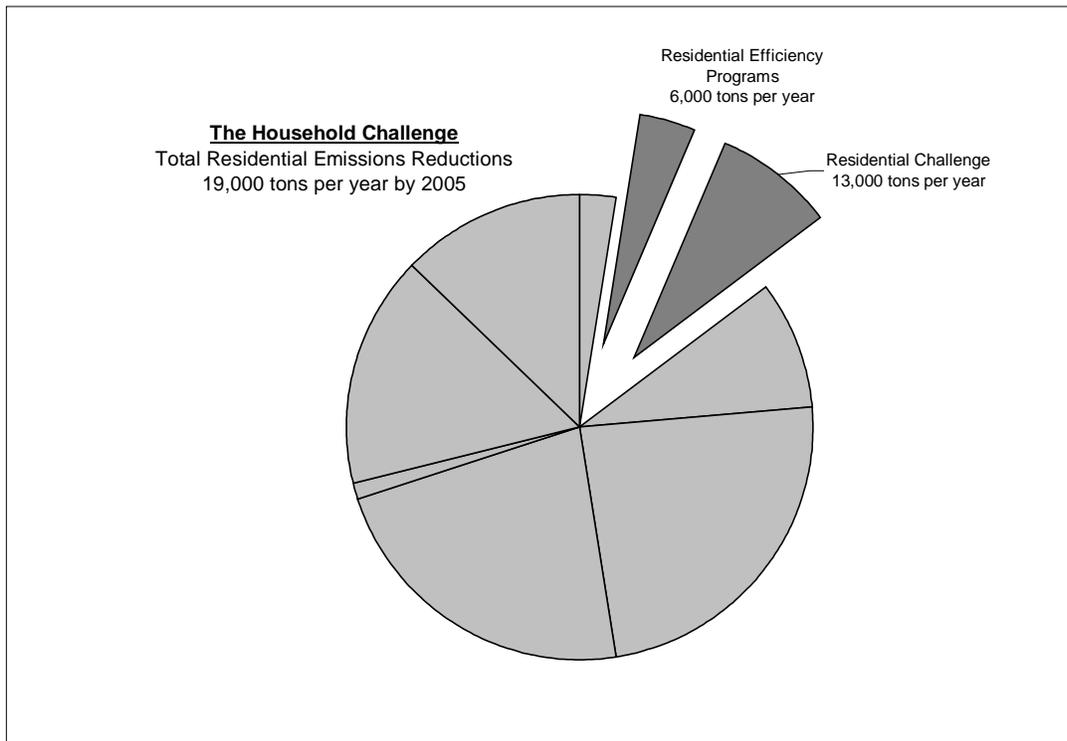
By installing a solar water heater, a family of four, using an average of 80 gallons of hot water per day, can prevent 3,700 pounds of greenhouse gas emissions each year. Over 20 years, that adds up to 37 tons of emissions prevented!

5. The Household Challenge

Household energy use in Burlington is responsible for roughly 20 percent of total greenhouse gas emissions (not including emissions from personal cars). Planned energy efficiency programs are expected to reduce greenhouse gas emissions by roughly 6,000 tons per year. These impacts are significant—but more steps are necessary to help the city reach its climate protection goal of 156,000 tons annual emissions reductions by 2005.

The following chart illustrates the role of households in helping Burlington reach its climate protection goals. The combined contribution from the household sector is about 12 percent of the total emissions reductions target. Reductions from households are expected from both the planned energy efficiency programs and additional independent actions that households adopt through the Challenge program.

Appendix tables C-6 and D-1 present additional actions that could help the residential sector reach a target of 19,000 tons of annual reductions.



Resources for Households

Organization	Services	Phone	Email / Web Site
Burlington Electric Department	Residential energy efficiency programs, information and incentives, incentives for renewable energy systems.	(802) 658-0300	www.burlingtonelectric.com
Vermont Gas Systems	Residential energy efficiency programs, information and incentives.	(802) 863-8899 ext. 372	jgrevatt@vermontgas.com
Vermont Energy Investment Corporation	Utility residential energy efficiency programs; information on available resources, technology and techniques, custom audits.	(802) 658-6060	energy@veic.org
Vermont Star Homes Program	Residential new construction utility incentives.	(800) 893-1997	www.vtstar@together.net
The Renewable Energy Resource Center	Residential solar energy system technical and financial assistance	(877) 888-7372	www.vt-rerc.org
Champlain Valley Weatherization	Residential energy efficiency improvements for qualifying low-income households	(802) 660-3452	cvoeo_wx@together.net
Energy Rated Homes of Vermont	Home energy rating system recognized by mortgage community	(800) 639-6069	erh@veic.org
ENERGY STAR	Ratings of high-efficiency products	(888) STAR-Yes	www.energystar.gov
Chittenden County Solid Waste District	Provides proper disposal and recycling of refrigerators, air conditioners and other household goods containing harmful chemicals	(802) 872-8111	cswd.net