



# **ENERGY SMART SMART GROWTH A CASE STUDY**



## **BURLINGTON, VERMONT**

A case study of a city making efforts to incorporate energy efficiency and renewable energy technologies and practices into the city-wide planning process

### **VERMONT:**

The State of Vermont set precedent in energy efficiency with their 1999 Efficiency Vermont program. The seeds of the program took root in 1996 and 1997 during restructuring deliberations for electric utilities. These deliberations occurred in conjunction with a report written by the Vermont Department of Public Service that reported on utility energy efficiency efforts since 1990.

Vermont has also engaged in a longstanding fight against urban sprawl. In 1969 Governor Deane C. Davis appointed a commission to study the effects of urban sprawl. In 1970 the findings helped the Vermont legislature pass Act 250, the Land Use and Development Act. This act discusses how to monitor development projects by outlining ten specific criteria. Some important criteria hold that the development will not result in or cause such things as water pollution, air pollution, or traffic congestion, it will conform to local or regional plans, and will use best available technology for energy efficiency. Because the Act stipulates smart urban planning it has undoubtedly saved energy throughout the state of Vermont.

Vermont is protective of its environmental health because it has many industries tied to natural resources. A few of the direct economic impacts that have impacted Vermont's industry include:

- Impacts of warmer, wetter winters, reduced snow pack, and shorter ski and foliage seasons on tourism, which is a \$4.2 billion per year industry.
- Increased strain on storm water management systems caused by precipitation increases of 5 percent -25 percent.
- Impact on Vermont maple syrup, which is a \$226 million per year industry.
- Impact on fishing and hunting, which is a \$383 million per year industry.<sup>1</sup>

### **BURLINGTON:**

Burlington, Vermont is the largest city in Vermont with a population of just under 40,000 residents. It is home to the University of Vermont as well as Burlington College, Champlain College, and a Community College of Vermont campus.

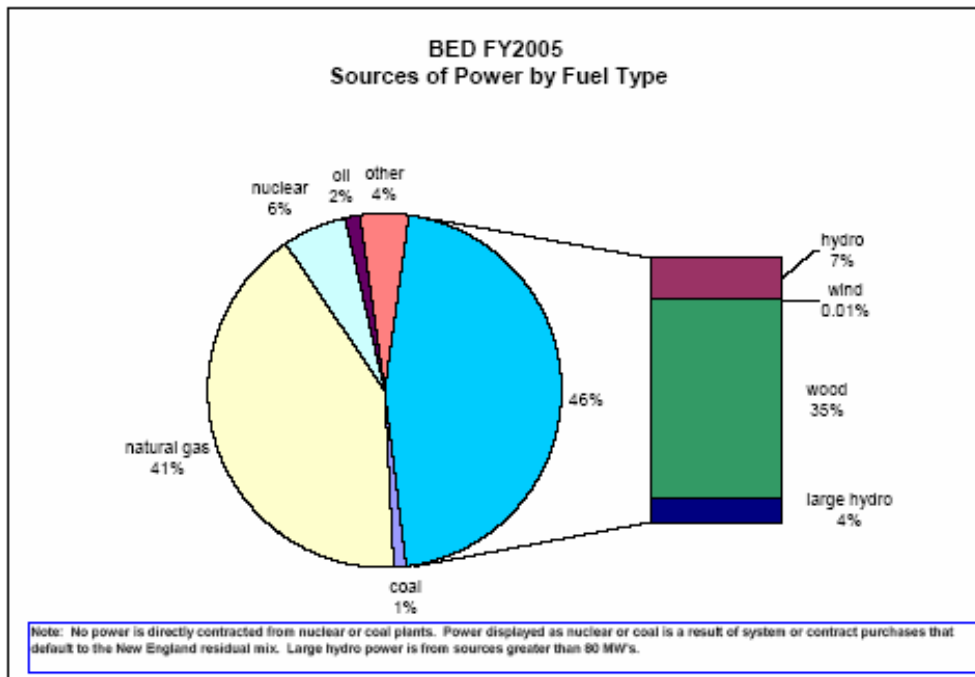
Burlington became integrated in the climate change community in 1996 when the City Council voted to join the International Council for Local Environmental Initiatives' (ICLEI) "Cities for Climate

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<sup>1</sup> Taken from US DOE article Burlington, Vermont Forms Alliance to Reduce Greenhouse Gas Emissions.

Protection” program. This move signaled Burlington’s recognition of a need for action on climate change. In 1998 the City Council “set a target for the year 2005 of reducing greenhouse gas emissions in Burlington by 10 percent below 1990 levels.”<sup>2</sup>

In order to find a feasible way to meet these goals, the mayor of Burlington created a Climate Protection Task Force. The task force was spearheaded by the Burlington Electric Department (BED). BED currently serves more than 19,600 customers (roughly half of Burlington’s total population). According to the city’s Municipal Development Plan, “in 2004, Burlington as a whole used the same amount of electricity it used in 1989 – about 435,000 megawatts.” This fact signifies Burlington’s emphasis on energy conservation. As of June, 2006, 67 percent of the BED’s energy portfolio came from renewable power.<sup>3</sup>



**Figure1:** Burlington’s Energy Portfolio

Burlington’s main renewable energy source is a wood-burning facility known as the McNeil Wood-Fired Generating Facility. BED owns half of the facility, which was built in 1997 as “part of an experimental biomass gasification demonstration project.”<sup>4</sup> The facility is located in Vermont. The city also utilizes waste to energy transfer by trapping methane at the former landfill and collects wind energy from its wind turbine facility in Norwich, Vermont. Other renewable energy comes from the cities purchase of power from the New England Power Grid, 46percent of which comes from renewable sources.

<sup>2</sup> Burlington Climate Action Plan p3D

<sup>3</sup> Aug. 31, 2006 BED Website Press Release

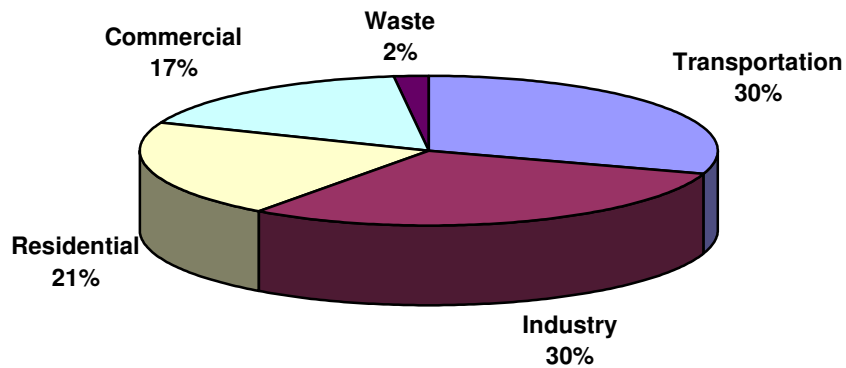
<sup>4</sup> 2006 Burlington Municipal Development Plan, Page VIII-3

## CLIMATE ACTION PLAN:

The task force's goal was to develop an action plan and provide suggestions for effectively meeting the 10 percent reduction goal. After studying emission trends they quickly realized that to lower emissions by 10 percent of 1990 levels meant annual emissions reductions of 257,000 tons, an unfeasible figure. Thus, their first recommendation was to make an annual reduction of 156,000 tons, which would result in a 10 percent reduction from 1997 emissions levels.

In 1997, Burlington's CO<sub>2</sub> emissions were broken up as follows:

- Transportation- 30 percent
- Industry - 30 percent
- Residential -21 percent
- Commercial 17 percent
- Waste 2 percent.



**Figure 2:** Carbon dioxide emissions by sector in Burlington

In order to make the largest reductions the Task Force decided Climate Action needed to be a community effort. The Action Plan uses this community effort approach by proposing five strategies to lower emissions. They are as follows:

<b>Strategy:</b>	<b>Annual CO<sub>2</sub> Reductions Goals:</b>
1. Implement climate action plans for municipal buildings and operations See <b>Error! Reference source not found.</b>	<b>6,000 tons</b> <i>Energy Efficiency: 4,000 tons</i> <i>Solid Waste: 2,000 tons</i>
2. Support the full implementation of planned (2000-2005) efficiency programs to maximize the capture of lost opportunity efficiency potentials.	<b>20,000 tons</b> <i>Residential: 6,000 tons</i> <i>Commercial and Industrial: 14,000 tons</i>
3. Develop and lead a public education campaign, demonstrate civic commitment to climate protection activities and implement a TEN PERCENT CHALLENGE CAMPAIGN.	<b>70,000 tons</b> <i>Transportation: 20,000+ tons</i> <i>Buildings: 50,000+ tons</i>

4. Support biomass district energy and other alternative fuel supply options.	<b>35,000 tons for Phase 1</b> <i>50,000 tons at full build-out</i>
5. Implement transportation demand management (TDM) projects and support climate friendly transportation policy at the local, state, and federal levels.	<b>25,000 tons</b> <i>TDM Projects: 9,000-15,000 tons</i> <i>Policies: 10,000 tons</i>
<b>TOTAL:</b>	<b>156,000 tons</b>

Strategy number 2 stipulates the full implementation of planned efficiency programs. These programs came out of a project started by BED in 1990. They include but are not limited to:

- **Smartlight:** leases compact florescent energy saving light bulbs to consumers.
- **Neighbor\$ave:** offers household energy audits of all energy consumed, compact florescent light bulbs, and installs water and energy savings measures for electric water heater customers.
- **Top 10:** offers a customized menu of energy savings opportunities to the City’s largest electrical customers to provide “positive cash flow” financing of demand-side management measures.

Strategies from the Climate Action Plan were also carried over into Burlington’s Municipal Development plan.

#### **MUNICIPAL DEVLOPMENT PLAN:**

Both the 2001 and the 2006 Burlington Municipal Development Plan’s contain sections for energy. These sections highlight Burlington’s goal to optimize energy efficiency, use more renewable energy, reduce transportation energy use, educate its citizens, and reduce greenhouse gases. One way the plan hopes to do this is by amending and enforcing municipal codes and ordinances. According to the EPA, “Burlington has residential new construction codes and a minimum rental housing time-of-sale standards. The former helps prevent lost opportunities for energy efficiencies in new construction, while the latter addresses the split incentive that often exists between renter and landlord for energy efficiency improvements in rental housing.”

The plan discusses the climate change action plan and also introduces its own Energy Action Plan which includes action items and who the lead and secondary agencies will be. The plan’s vision statement explains these goals by stating the following.

<p><i>This Plan envisions Burlington as a city where...</i></p> <p>...Burlington is the leader in the development and implementation of energy efficiency and renewable energy measures that reduce energy costs, enhance environmental quality, improve security and sustainability, and enhance economic vitality. Key elements of this success are a broad range of energy efficiency programs, public education in resource conservation, publicly-owned alternatively-fueled electric generation, biomass-fueled district energy technologies, energy-efficient green building technologies, and climate-friendly transportation solutions, which includes support for alternative fueled vehicles.</p> <p style="text-align: right;"><a href="#">Click here to see the complete Municipal Plan</a></p>
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## CONCLUSION:

Since Burlington's goal was to achieve a 10 percent reduction from 1997 emissions levels by 2005 it is possible to see if the city reached its goal. According to Mary Sullivan, communications director for the Burlington Electricity Department, they did not. She states, "We unfortunately did not make our goal, and we will not until we really start doing something about the transportation sector. We continue to do very well with energy efficiency, but it is not enough." The state of Vermont is trying to lower its emissions in the transportation sector modeled along the lines of California's plan to reduce emissions which requires a nearly 30 percent cut in greenhouse gas emissions on all passenger vehicles, including light trucks and SUVs, sold in the state starting in 2016. However, Vermont along with other states is embroiled in a legal battle with auto manufacturers over jurisdiction so it remains to be how successful they will be in limiting emissions from the transportation sector.

Although the Climate Action Plan failed to meet its goal, it exceeded some of its individual requirements. The 10 Percent Challenge (strategy 3) took on a life of its own. In April of 2002 the Alliance for Climate Action started the program and in March of 2003, 81 Vermont communities passed resolutions to promote the use of renewable energy. By December 2003, 245 households (some outside Vermont) and 60 businesses had joined the campaign.<sup>5</sup> Two particular successes stemming from the campaign are the No-Idling Initiative and the Vermont High Performance Schools Initiative. The Vermont High Performance Schools Initiative provides information to help build more green-friendly school buildings. It was modeled after the California High Performance Schools, a program that has been extremely successful.

The state of Vermont also played a role in helping Burlington with incentives for renewable energy. According to the Database of State Incentives for Renewables and Efficiency, Vermont has many state incentives, including:

- A Renewable Portfolio Standard that requires utilities in the state to meet any new load growth by 2012 with renewable energy resources. The total amount of renewable energy that each utility must supply is capped at 10 percent of its 2005 sales.
- A State Rebate Program supported by Efficiency Vermont and Cool Choice that offers a rebate to businesses that purchases high-efficiency HVAC equipment and controls.
- A State Rebate Program supported by Efficiency Vermont that provides financial incentives for its residential customers to install energy efficient equipment in their homes. Eligible technologies include washers, dryers, lighting, and furnaces.

The Climate Action Plan also helped Burlington improve their energy codes. On November 12, 2000 the city amended their energy codes from 1991. Now they meet the standards of the 2000 International Energy Conservation Code.

Burlington's inclusion of energy in their Municipal Development plan also demonstrates the city's drive to meet their climate change goals. Incorporating energy use at such a base level forces planners and other city officials to think wisely about how and why they build. It also prevents greenhouse gas emissions from the start because it emphasizes smart building.

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<sup>5</sup> Taken from US DOE article Burlington, Vermont Forms Alliance to Reduce Greenhouse Gas Emissions

Overall, Burlington provides a good example of why it is necessary to outline exactly where your reductions are coming from and how exactly you will meet your stated goals when forming a Climate Action Plan. The projects that were successful demonstrate how important it is to include the public in your energy saving and emissions reducing strategies.

#### **FOR FURTHER INFORMATION:**

- Burlington Climate Action Plan - <http://www.burlingtonelectric.com/SpecialTopics/Reportmain.htm>
- 2006 Burlington Municipal Development Plan- <http://www.ci.burlington.vt.us/planning/mdp/2006/index.html>
- Burlington Electric Department - <http://www.burlingtonelectric.com/>
- 10 percent Challenge - <http://www.10percentchallenge.org/>
- Database of State Incentives for Renewables & Efficiency (DSIRE) - <http://www.dsireusa.org/>
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