

# TOWN OF WELLESLEY SUSTAINABLE ENERGY PLAN

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Prepared by the Town of Wellesley Green Ribbon Study Committee:

Katy Gibson, Chair

Scott Bender

Chris Chan

Robert Cooper

Kevin Counihan

Molly Fairchild

Robert Rooks

## **Acknowledgements:**

Heather Sawitsky and Margaret Metzger, Town Moderators

Hans Larsen, Executive Director

Richard Joyce and Debra Healey, Wellesley Municipal Light Plant

Meghan Jop and Ethan Parsons, Town Planning Department

Gordon Martin, Recycling and Disposal Facility

David Cohen, Department of Public Works

Caren Parker, Advisory Committee

Mary Anne Cluggish, Christine DuVivier, Ellen Watts, and John Zaehring, Former Green Ribbon Study Committee members

# Sustainable Energy Plan Summary

## 10 Percent by 2013

Recognizing the importance of developing and adopting locally sustainable practices to reduce energy use and the impacts of greenhouse gas (GHG) emissions, the 2008 Town Meeting commissioned the Green Ribbon Study Committee to develop a Sustainable Energy Plan for the Town that identifies policies and actions that will increase energy conservation and efficiency, reduce reliance on fossil fuels, and reduce GHG emissions, at both the public and private levels.

Based on the preliminary work of the Committee, the 2009 Town Meeting set a goal to reduce emissions to 10 percent below 2007 levels by 2013. In order to reach this target, at least 44,500 tons of eCO<sub>2</sub><sup>1</sup> have to be eliminated from our annual emissions over the next four years. This goal may appear to be relatively modest, but in the context of increasing energy usage and emissions, it will require the concerted efforts of the Town's residents, businesses, institutions, and municipal government to attain.

The Town of Wellesley Green Ribbon Study Committee has prepared a Sustainable Energy Plan (Plan) and this summary. The Plan outlines measures the Town has already undertaken, and measures the Town is encouraged to take, in order to achieve the 10 percent GHG reduction target by 2013. Measures in the Plan outline actions related to increasing energy efficiency and conservation in buildings and infrastructure, reducing vehicle miles travelled and increasing vehicle fuel efficiency, improving management of solid waste, and purchasing electricity from renewable resources.

To lay the ground work for success of the Sustainable Energy Plan, the Committee recommends the Town take two essential initial steps towards its implementation:

- Create a Sustainable Energy Committee that will be responsible for achieving the Town's sustainable energy goals; implementing and revising this Plan; coordinating actions among municipal departments and community organizations; reporting annually to Town Meeting on achievements, trends, and planned activities; and proposing future sustainable energy goals and plans;<sup>2</sup> and
- Create a Sustainable Energy Coordinator position,<sup>3</sup> to lead the day-to-day implementation efforts, including developing and administering energy efficiency initiatives for the Municipal Light Plant (MLP) and municipal departments; consulting and coordinating with community and regional organizations and groups; serving as a liaison between the Town and the public; monitoring new developments, initiatives, and technologies relating to sustainability and energy efficiency; keeping current with potential opportunities for funding and writing grant proposals; updating and preparing

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<sup>1</sup> Greenhouse gas includes emissions from carbon dioxide, methane, and nitrous oxide. We report greenhouse gas in terms of carbon dioxide equivalent emissions (eCO<sub>2</sub>).

<sup>2</sup> The Sustainable Energy Committee would consist of seven members, with three members appointed by the Board of Selectmen, the School Committee and the Municipal Light Plant Board respectively, and four residents of the Town, appointed by the Board of Selectmen, who are active in the Town's volunteer sustainable energy initiatives or who bring relevant expertise, such as knowledge about sustainable energy practices, marketing, or community engagement. Members would serve three-year terms. Brookline, Concord, Lexington, Newton, Sudbury, Wayland, and Winchester are peer communities with similar committee structures that include members from both Town government and civic organizations.

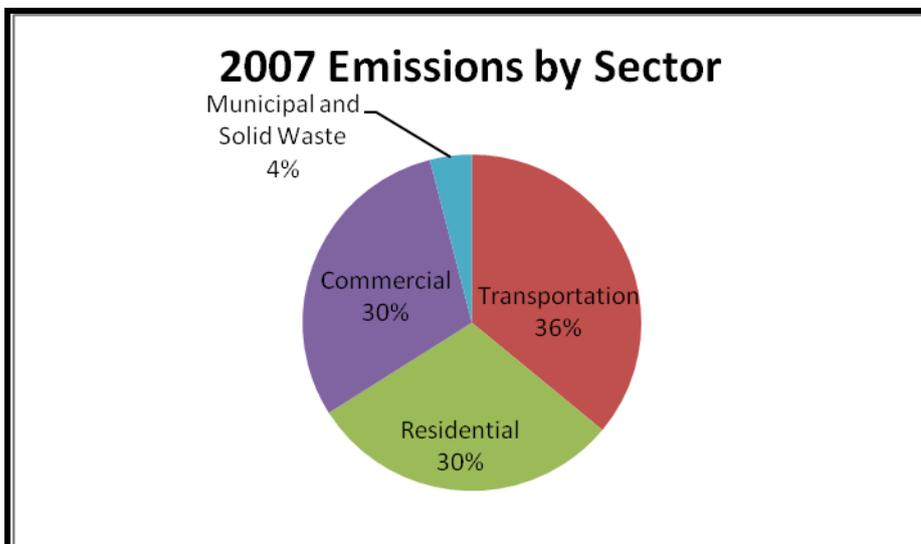
<sup>3</sup> Funding for this coordinator position (half-time, no benefits) is included in the FY2011 budget request, with funding split equally between the Sustainable Energy Committee budget (included within the Selectmen's budget) and the MLP's non-tax impact budget.

the annual emissions inventory; and preparing annual reports on the behalf of the Sustainable Energy Committee.

The next step will involve the evaluation and prioritization of the measures proposed in the Plan. The Town's Sustainability Energy Committee, working together with Town boards and departments, will be charged with the task of determining which measures are most appropriate for the Town to implement and gaining approval from Town Meeting or other governing body as necessary. Table 1 highlights several measures proposed in the Plan that will achieve promising eCO<sub>2</sub> savings. Such actions to reduce greenhouse gas emissions will not only contribute to the overall regional and global mitigation of climate change and dependence on foreign oil and gas, but also will provide the Town with many local benefits – increased financial savings through energy efficiency (both decreased utility costs and deferral of costly improvements to the Town's electrical infrastructure) and improved air quality and quality of life (more comfortable buildings, safer walking and biking routes)

The Sustainable Energy Plan begins with a look at where we stand. The Green Ribbon Study Committee completed an inventory of the Town's GHG emissions. This inventory indicated that in 2007, 445,000 tons of eCO<sub>2</sub> were released from sources in Wellesley. The main findings of this inventory are:

- The greatest energy consumption and GHG emissions result from transportation, representing 36 percent of total emissions;
- Residential and commercial/institutional buildings (each with about 30 percent of total GHG emissions) are the next most significant energy users;
- Municipal emissions, at 2 percent, are relatively small, and emissions associated with residential solid waste management are less than 1 percent. However, together these two items contribute significantly to the cost of Town operations; and



- Total emissions in Wellesley decreased 1.5 percent from 2007 to 2008. The residential and commercial/institutional sectors decreased between 2.0 percent and 2.5 percent each; however, transportation decreased by only 0.5 percent. Factors contributing to the decline include conversion of home heating source from fuel oil to natural gas, improvement in average emissions per vehicle, improvements in energy efficiency and insulation, and milder temperatures in the winter and summer of 2008.

The Sustainable Energy Plan is organized into four broad areas: 1) efficient buildings and infrastructure, 2) efficient transportation, 3) effective waste management, and 4) clean and renewable energy. The Plan discusses in detail each of these four categories. The Plan concludes with a discussion on community outreach, and recommends strategies to build awareness and encourage meaningful reductions in energy use across the commercial, institutional, residential, and municipal sectors. Based on the analysis of existing and readily foreseeable opportunities for emission reductions, we propose initiatives that are projected to reduce eCO<sub>2</sub> 33,650 tons by 2013 through 1) increased energy efficiency and conservation in buildings (11,000 tons), 2) reduced vehicle miles travelled and increased vehicle fuel efficiency (16,000 tons), 3) increased recycling (1,000 tons), 4) increased electricity from renewable resources (4,600 tons), and 5) small actions made by every household (1,150 tons). These initiatives, together with the continuation of trends in energy reductions by the commercial sector (6,900 tons) and conversion from fuel oil heat to natural gas, a cleaner fuel (4,000 tons), are projected to achieve the 10 percent target reduction of 44,500 tons of eCO<sub>2</sub> by 2013.

### **Efficient Buildings and Infrastructure**

A significant opportunity for savings lies in Wellesley buildings and infrastructure, which account for more than 60 percent of Wellesley's total energy use and production of GHG emissions. Energy efficiency is often the most cost-effective means of achieving emissions reductions. In addition, taking advantage of modern efficient technologies and practices not only results in economic savings but also creates healthier and more productive living, work, and study environments.

#### **Existing Measures**

The Town already has accomplished much in recent years to reduce emissions, particularly in the municipal sector. In the Summer of 2009, the Town established the Municipal Energy Efficiency Committee, which is made up of representatives from various Town departments, to develop and evaluate municipal policies to reduce energy use. The Town through this committee established a target reduction in municipal energy use of 20 percent by 2013 -- even more aggressive than the target reduction of 10 percent established for the entire Town.

The MLP has been at the forefront in promoting and implementing programs to improve energy efficiency. In 2006, the MLP established a fund to support municipal initiatives such as lighting retrofit projects in municipal buildings, which to date has resulted in a reduction of almost 390,000 kWh, or about 150 tons of eCO<sub>2</sub>. In 2008, MLP decreased its line losses resulting in an annual savings of 5 million kWh or about 1,900 tons eCO<sub>2</sub>. Other programs include replacing streetlights with more efficient sodium or LED lights, using a hybrid car for meter reading, and conducting a time-of-use pilot program.

#### **Key Recommendations**

- Adopt the Massachusetts stretch building code to ensure that new and remodeled residential and commercial buildings will be at least 20 percent more efficient than current state building standards.
- Explore and develop a program that encourages and motivates homeowners to conduct energy audits to improve the energy efficiency of their homes (e.g., identify opportunities to replace inefficient equipment, add insulation, and seal air leaks) on a periodic and regular basis (e.g., upon sale or purchase of a home).
- Conduct expanded time-of-use/smart meter pilot program to evaluate whether smart metering technology coupled with a time-of-use utility rate scheme could become a

viable, permanent approach to engage, motivate, and empower consumers to achieve deeper, more persistent, and verifiable energy savings.

- Engage a company to audit municipal buildings and implement meaningful energy efficiency improvements.
- Continue program to replace ornamental street lights with more energy-efficient LED technology.
- Develop and promote uniform municipal policies regarding computer purchase and use, thermostat setting, and lighting use.

### **Efficient Transportation**

Transportation is a major contributor (36 percent) to the total amount of GHG emissions released in Wellesley each year, creating an estimated 160,000 tons of eCO<sub>2</sub> annually. The goal to reduce transportation emissions 10 percent below 2007 levels by 2013 can be met by simultaneously reducing the number of miles driven by all motorized vehicles, and reducing the emissions for each mile traveled.

One can reduce miles driven by leaving a car at home for some trips and, instead, walking, bicycling, carpooling or taking public transport, provided the infrastructure and systems are in place to do so in a safe, efficient manner. Reducing vehicle miles traveled (VMT) benefits everyone. Money, time and effort spent on improving public transport and walking and biking options benefits those who remain in their cars, through decreased congestion on the roads, as well as those who choose to walk, bike or use public transit.

Improving vehicle efficiency is something that everyone who owns or operates a vehicle in Wellesley can do. When it is time to purchase a replacement vehicle, choose the most fuel efficient vehicle appropriate to planned use. When given a choice, one should replace the highest consuming vehicle with a more efficient one. For both existing and new vehicles, an immediate improvement in efficiency can be achieved by regularly maintaining the vehicle, properly inflating tires, using fuel-saving driving techniques, and choosing the most fuel-efficient vehicle in the family for most trips.

### **Existing Measures**

Wellesley benefits from convenient public transportation options to and from Boston, with three commuter rail stations in Town (which also serve points west to Worcester), "T" trolley stops at the Woodland and Riverside stations in neighboring Newton, and bus service at Riverside. However, public transportation within the Town, and to and from neighboring towns, is limited. The MetroWest Regional Transit Authority (MWRTA) bus service from Newton to Framingham has just two stops in Wellesley, on Cedar Street and on Route 9 at Overbrook Drive. Additional services are provided for seniors and those with disabilities through "The Ride" shuttle bus service operated by the MBTA and the Wellesley Council on Aging minibus. Local colleges also operate shuttle buses for their students and staff.

Driving children to and from school is a significant contributor to traffic in Wellesley. More-frequent high school bus service was provided at reduced cost for 2009-2010, but rescinded for the following year. Grass roots initiatives to reduce car trips (such as the walking school bus at several elementary schools) also deserve support.

Wellesley already has many of the physical attributes necessary to develop and integrate a walkable/bikable infrastructure. Most Wellesley main streets are wide and have sidewalks; most side streets are relatively quiet and many of them have sidewalks. The trail system, a Wellesley gem, interconnects many areas of the town. However several problem areas remain with respect to the connectivity and condition of existing walkways that lead to and from the Town's commercial areas, schools, and public transit stations.

The MassHighway Development and Design Guide is a nationally recognized, award-winning approach to street design that includes many elements to improve the safety of pedestrian and cyclists. The Wellesley Planning Department has incorporated the guide in its development standards and uses it "when and where appropriate" in street design and reconstruction.

## **Key Recommendations**

### ***Increase use of public transport and ridesharing***

- Develop a sustainable transportation vision for the Town which considers the health, safety, and sustainability impact of transportation choices, develops the synergies within the existing infrastructure and identifies and fills in the missing elements. This vision could encompass initiatives such as the following.
  - Add more bus stops within Wellesley to the MWRTA bus route from Newton to Framingham.
  - Improve school bus ridership by re-examining bus rate structure and schedule, and high school parking policy.
  - Continue and expand planning initiatives that promote use of public transportation (e.g., smart growth zoning).
  - Investigate an in-town bus to serve employees, students, and residents traveling within Wellesley and to and from the Town and its neighboring communities.
  - Promote ridesharing (carpooling) and encourage local employers and colleges to offer alternatives to driving (e.g., "emergency ride home," covered bicycle racks, preferential parking for carpools).

### ***Increase walking and biking***

- Complete the work of the Walkways Task Force and create a bicycle task force to document bicycling needs and recommend improvements to promote bicycle ridership.
- Recognize and encourage efforts by school communities to increase and improve conditions for walking and biking.
- Formally adopt a "Complete Streets" policy to integrate good practices in street design and build upon the MassHighway design guide.

### ***Improve motor vehicle efficiency***

- Encourage residents and businesses to purchase more efficient vehicles and to use vehicles more efficiently.

- Advocate for gasoline or excise tax changes to encourage the purchase and use of more efficient vehicles.
- Establish a policy that considers fuel efficiency in decisions on the replacement and use of municipal vehicles.
- Expand the anti-idling educational campaign.

In addition, Wellesley should participate more actively in regional transportation planning organizations (e.g., Metropolitan Area Planning Council, Boston Area Metropolitan Planning Organization, MassHighway, MBTA) to represent its interests and cooperate and coordinate with other municipal and state governments on regional transport issues affecting the Town.

### **Effective Waste Management**

The Wellesley Recycling and Disposal Facility (RDF) received more than 24,000 tons of waste materials in FY2008. Of this amount, about a third was managed as recyclables, another third was composted as yard waste, and the remaining third was hauled for disposal at a managed landfill.

Wellesley's solid waste sent for disposal at the landfill, which recovers about 75 percent of the methane gas generated in decomposition, produced about 2,000 tons of eCO<sub>2</sub> from the unrecovered emissions. Recycling and composting operations at the RDF avert about 20,000 tons of eCO<sub>2</sub> emissions that would have been produced if this material had been disposed of as solid waste at the landfill.

### **Existing Measures**

Sound waste management is based on the 3R's; reduce first, reuse second, and finally recycle. The *Step Up!* program at the RDF challenges residents to increase the amounts they recycle, and has become a model for the cost-effective diversion of waste. Town residents recycle about 38 percent of household waste, which provides \$400,000 in annual revenue to the Town. It is estimated that 95 percent of residents recycle; however, far fewer routinely recycle all the materials that can be recycled at the RDF.

### **Recommendations**

- Continue incremental improvements in waste diversion through the *Step Up!* program. In particular, paper products and food waste, which are the primary sources of methane emissions, should be given priority by encouraging home composting and recycling of all paper products.
- Resume annual reporting by all private haulers (currently 13) of monthly tonnage of both recyclables and refuse, and the number of residential and commercial accounts they serve, as stated in the annual rubbish haulers permit from the Department of Health, to gain a better understanding of the waste stream managed by private haulers.
- Increase the rate of commercial recycling by requiring recycling through the RDF as a condition in permits issued to new commercial developments or buildings.
- Evaluate the benefit of adopting a pay-as-you-throw (PAYT) policy; the logistics of implementing and monitoring a PAYT system should be considered as well as the potential for improvement in waste diversion.

- Explore opportunities for diverting commercial and institutional food waste to composting and energy production, as supported by the Massachusetts Department of Environmental Protection.

### **Clean and Renewable Energy**

Renewable energy is an integral part of GHG emissions reduction, along with energy efficiency and conservation measures. By increasing our use of naturally replenished sources of energy (e.g., solar, wind, biomass, hydropower, and tidal) in place of fossil fuels, the Town will reduce its emissions and also contribute toward the State's goal for renewable energy<sup>4</sup>.

Wellesley residents and businesses have a great opportunity to shift the Town's electricity from reliance on fossil fuels to renewable sources, through their participation in the voluntary renewable energy purchase program (VREP) offered by the MLP. Because Wellesley's electric rates are substantially less than those of the investor-owned utilities, its customers can pay the premium for renewable energy and still pay a lower total rate for electricity than the "standard" rate paid by residents in neighboring towns that do not have a municipal light plant. Achieving the Town's 10 percent GHG emissions reduction target and the Green Communities Act 20 percent renewable target will require significantly higher levels of participation by residents and businesses in the VREP.

### **Existing Measures**

A 2008 survey of residential and business customers conducted by the MLP showed a high degree of Town support for energy conservation and renewable energy initiatives by the Light Plant. In response, the MLP introduced the VREP program in 2009, which allows customers to purchase a percentage (10%, 25%, 50% or 100%) of their electricity from renewable sources. By February 2010, this program had 600 household subscribers, or about 6 percent of all accounts. This participation level places the program among the top 10 nationwide for voluntary participation. The MLP has a goal to increase the participation rate to 10 percent in 2010.

Because VREP participants generally purchase only some of their electricity from renewable resources and large commercial customers have not yet participated, VREP commitments affect only about 1 percent of the Town's total electricity consumption. To meet the current demand for renewable energy, the MLP is now purchasing electricity from the Miller Falls Hydro plant and the Granby Landfill<sup>5</sup>. MLP also is in the process of purchasing power from the planned wind project in Savoy, Massachusetts to further increase the town's renewable portfolio.

A few small-scale initiatives to generate renewable energy have been implemented within the Town. The Town has just been awarded a federal stimulus grant in the amount of \$150,000, which will be applied towards the installation of a 50kW solar photovoltaic (PV) panel system at the MLP garage, which will generate sufficient electricity to meet the building's demand. A handful of residences in Town are generating electricity from solar PV, supported by net-metering from the MLP<sup>6</sup>, or are using solar thermal to heat the house. For educational purposes, Babson College has a demonstration-scale wind turbine and Wellesley High School has a demonstration-scale solar PV system. The Town also has an opportunity to include solar panels in the construction of its new high school.

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<sup>4</sup> Under the Green Communities Act (2008), Massachusetts has a goal to supply 20% of its electric load through new, renewable and alternative energy sources by 2020.

<sup>5</sup> The Granby Landfill uses methane gas captured from the decomposition of waste to generate electricity.

<sup>6</sup> Net metering allows the residence to both sell electricity to the grid and buy electricity from the grid.

## **Key Recommendations**

- Continue to promote and expand the MLP Voluntary Renewable Energy Program.
- Develop a municipal solar PV program to increase the amount of installed PV on municipal buildings.
- Evaluate the potential impact of encouraging commercial and residential solar PV installations through rebates and/or paying a net-meter rate on energy sold to the grid that is comparable to the cost of commercial renewable energy purchases.

## **Education and Outreach Campaign**

The successful implementation of Wellesley's Sustainable Energy Plan is dependent upon support from the community. Launching a campaign to raise awareness and encourage residents, businesses, and municipal departments to reduce their GHG emissions through a combination of the energy efficiency, renewable energy, and transportation initiatives outlined in the Plan is paramount to create and sustain momentum in communicating and meeting specific goals for energy reduction. Education and outreach efforts are essential components of influencing sustainable behavior.

## **Key Recommendations**

- Build general awareness and sustained program support by identifying a "face" or spokesperson for the campaign, using traditional media tools (Wellesley Cable Channel, Wellesley Townsman, signage at the RDF), using digital and social networking outreach tools including a dedicated web site, and forming an advisory committee or council to promote awareness.
- Garner the support of Town committees and volunteer groups at schools, businesses, institutions, religious organizations, and municipal facilities. Meet with each Town committee and volunteer group focused on energy conservation to highlight Sustainable Energy Plan and make the goal of quantifiable energy reduction a cornerstone of their agenda.
- Monitor the awareness and effectiveness of the campaign through analytical tools to effectively focus and target efforts to yield the best results.

## **Conclusion**

The Committee believes the Town's commitment to sustainable energy is a long-term one which will continue past 2013 and ultimately achieve GHG emissions reductions far greater than the 2013 goal. We view the Sustainable Energy Plan as a living document, which will be adapted to incorporate the lessons learned from the implementation experience as well as the evolving options available as technologies improve and costs decline. We believe this Plan can benefit the Town in multiple ways, providing well-lit comfortable homes and other desired energy services at a lower cost, doing our share to reduce the emissions which contribute to climate change, and fostering the sustainable energy sources that our children will need so they can continue to enjoy comfortable and healthy lifestyles.

With this Plan<sup>7</sup>, the Green Ribbon Study Committee completes its assignment from Town Meeting. We thank you for the opportunity to contribute to Town action on this important issue and request Town Meeting approval of our recommendations under Article 33.

Green Ribbon Study Committee  
Scott Bender  
Chris Chan  
Robert Cooper  
Kevin Counihan  
Molly Fairchild  
Katy Gibson  
Robert Rooks

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<sup>7</sup>A link to the full Sustainable Energy Plan is available on the front page of the Town website at <http://www.wellesleyma.gov>

**Table 1 Key GHG emission reduction measures outlined in the Sustainable Energy Plan**

Proposed Measure	Key Assumptions	Estimated Annual Reduction in eCO <sub>2</sub> Emissions in 2013
<b><i>Efficient Buildings and Infrastructure</i></b>		
Adopt stretch building code	250 larger replacement homes 1,700 residential additions 370,000 sq ft new commercial space 400 new housing units	7,000 tons
Conduct home energy audits (at time of purchase)	2% - 4% of homes are sold 15% reduction/home	400 - 800 tons
Conduct home energy audits (at other times)	5% of homes 10% reduction/home	700 tons
Expand smart meters program	5% of homes participate 20% reduction/home	400 tons
Street light replacement program	Install more efficient lights	200 tons
Audit and improve municipal buildings	15% reduction in energy use	1,500 tons
Develop and promote municipal policies	5% reduction in energy use	500 tons
<b><i>Efficient Transportation</i></b>		
Increase average auto fuel efficiency	Replace 13% of autos each year with vehicles 15% more fuel efficient	8,000 tons
Eliminate 5% of single person trips	Use carpool, walk, bike, public transit, telecommute options	8,000 tons
<b><i>Effective Waste Management</i></b>		
Increase recycling	10% increase in recycling	1,000 tons
<b><i>Community Outreach</i></b>		
All residents take small action	Every house replaces 1 light with CFL	250 tons
	Every house lowers winter thermostat 1 degree for 8 hours/day	900 tons
<b><i>Renewable/Cleaner Energy</i></b>		
Increase renewable energy to 4% of MLP portfolio	Continued growth of Voluntary Renewable Energy Purchase program	3,700 tons
Increase local renewable sources 1%	New solar installations	900 tons
<b><i>Continuing Trends</i></b>		
Business Reductions	Businesses reduce 5%	6,900 tons
Convert from fuel oil to natural gas	Continue trend of 300 houses/year	4,000 tons
<b>TOTAL</b>		<b>44,550 tons</b>

<b>Target Reduction</b>	<b>44,500 tons</b>
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