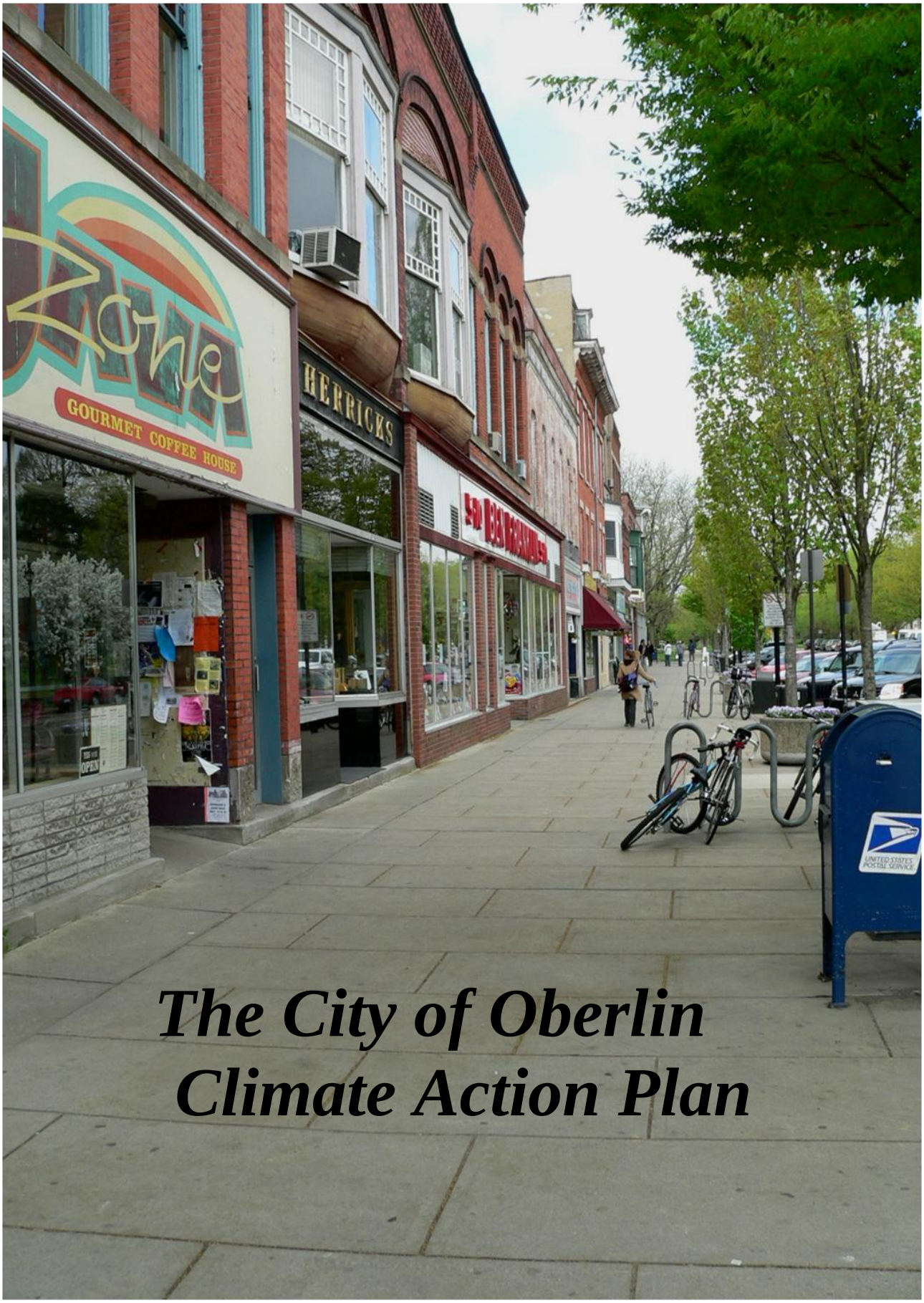

The City of Oberlin Climate Action Plan

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Executive Summary

Background

In 2007, Oberlin City Council initiated and authorized membership in the International Council on Local Environmental Initiatives (ICLEI). Membership in ICLEI committed the City to carry out five milestones in ICLEI's focal program, Cities for Climate Protection (CCP). This program is designed to educate and empower local governments worldwide to take action on climate change and provide resources, tools, and technical assistance to help local governments measure and reduce greenhouse gas emissions in their communities and their internal municipal operations.

The five milestone process includes:

Milestone 1 **Conduct a baseline greenhouse gas emissions inventory**
Milestone 2 **Adopt an emissions reduction target**
Milestone 3 **Develop a Local Climate Action Plan**
Milestone 4 **Implement policies and measures**
Milestone 5 **Monitor and verify results**

Milestone 1 was completed as an honors project by Nathaniel Meyer, an Oberlin College student, in partnership with Oberlin Municipal Light and Power, the City of Oberlin, and Oberlin College Department of Environmental Studies staff in 2009. The inventory was compiled and calculated using ICLEI's Clean Air and Climate Protection Software. The 2007 baseline emissions inventory took into account all sectors of Oberlin – municipal, commercial, residential and separated out Oberlin College emissions due its large presence in the community.

The inventory determined that as a whole, the community (within city limits) emitted 174,391 tons of carbon dioxide equivalents (CO2e) in 2007. The community's per capita (2007 population was 8,344 persons) annual emissions were 20.9 tons CO2e per resident. The commercial sector, including all businesses, Oberlin College properties, and municipal facilities made up 67% of total community-wide emissions. The commercial sector, excluding College and municipal facilities, emitted 38% of total community-wide emissions. The residential and transportation sectors each emitted 16% and 15% of total community-wide emissions respectively.

With the baseline inventory complete, the City proceeded with Milestone 2 (adopting an emissions target) and Milestone 3 (developing a local climate action plan). This document has been prepared to address these two Milestones simultaneously and will allow the City to take into account existing ongoing actions thereby ensuring realistic and attainable goals.

Overview

It is recommended that the City of Oberlin set goals of reducing greenhouse gas emissions below 2007 emission levels by 50% beginning in 2015, 75% by 2030 and 100% by 2050. These

proposed short and mid-term goals are based on what the City believed to be feasible reductions given monetary, infrastructural and institutional constraints. While the Intergovernmental Panel on Climate Change (IPCC) recommends an 80% reduction from 1990 greenhouse emissions levels by 2050, the long term goal of 100% is based on the City joining the Clinton Climate Positive Development Program in 2010.

To achieve these goals, the City must eliminate 87,195 tons of CO2e by 2015, 130,793 tons CO2e by 2030 and 174,391 CO2e by 2050. For some of the proposed measures and policies it was not possible to accurately predict emissions reduction—in these cases social, environmental, and economic benefits are emphasized.

This Climate Action Plan outlines existing and proposed measures which will enable the City to significantly reduce its greenhouse emissions through 2050. Topics and emission reduction sectors included in this document are:

Climate Change	***Oberlin's Emission Inventory***
Energy Efficiency	***Renewable Energy***
Green Building	***Solid Waste Management***
Transportation	***Education***

Each of the emission reduction sectors describes the recommended strategies, provides the implementation year, lists the responsible entity and quantifies the projected greenhouse gas reduction.

The majority of the strategies in this climate action plan are recommendations for municipal actions over which the City has control. For the most part these actions will affect municipal operations and emissions. A continuing emphasis on the purchase of green power by the City during the last 12 years will have the effect of greatly reducing greenhouse gas emissions for the entire community. These concerted efforts to obtain renewable power supply for its municipal power portfolio will result in 90% renewable power by 2015. These decisions alone will result in greenhouse gas emissions in Oberlin being reduced by 87,440 tons of CO2e by 2015.

Conclusion

This plan was created under the premise that the local government and the community it represents are uniquely capable of addressing many of the major sources of the emissions within their jurisdictions that contribute to global warming. This plan discusses how Oberlin can mitigate causes of climate change by addressing the areas of energy efficiency, renewable energy, green building, waste management, transportation, and education. The policies and measures discussed in this plan are those that are within the City's direct sphere of influence, including municipal energy use, community utility consumption, and city-wide program infrastructure and community education.

Introduction

About This Report

The City of Oberlin became a member of the International Council on Local Environmental Initiatives (ICLEI) in 2007, and committed to carry out the five milestones on ICLEI's focal program, Cities for Climate Protection (CCP), which assists municipal officials as they pursue greenhouse gas reductions for their municipal operations and their community as a whole. The ICLEI CCP program, an international initiative, has five areas of development which are:

Milestone 1 ***Conduct a baseline emissions inventory***. Based on energy consumption and waste generation, the city calculates greenhouse gas emissions for a base year. The inventory provides a benchmark against which the city can measure progress.

Milestone 2 ***Adopt an emissions reduction target.*** The city establishes an emission reduction target and target year for the city. The target both fosters political will and creates a framework to guide the planning and implementation of measures.

Milestone 3 ***Develop a Local Climate Action Plan***. Through a multi-stakeholder process, the city develops a Local Action Plan that describes the policies and measures that the local government will take to reduce greenhouse gas emissions and achieve its emissions reduction target. Most plans include a timeline and an assignment of responsibility to departments and staff. In addition to direct greenhouse gas reduction measures, some plans incorporate public awareness and an education component.

Milestone 4 ***Implement policies and measures.*** The city implements the policies and measures contained in their Local Climate Action Plan. Typical policies and measures implemented by participants include energy efficiency improvements to municipal buildings and water treatment facilities, streetlight retrofits, public transit improvements, renewable power applications, and methane recovery from waste management.

Milestone 5 ***Monitor and verify results.*** Monitoring and verifying progress on the implementation of measures to reduce or avoid greenhouse gas emissions is an ongoing process. Monitoring begins once measures are implemented and continues for the life of the measures, providing important feedback which can be used to improve the measures over time.

Having completed the first milestone of conducting the baseline inventory in 2009, the City of Oberlin has developed this Climate Action Plan as step two on the journey and planning to reduce carbon emissions. This document includes both the policies and measures that have already been undertaken by the City of Oberlin, Oberlin College, and community organizations to reduce greenhouse gas emissions and future recommendations for Oberlin to further reduce carbon emissions. It is Oberlin's goal to not only continue on this journey but to become an example for other cities who wish to follow this same path.

This plan was created within the premise that the local government and the community it represents are uniquely capable of addressing many of the major sources of the emissions within their jurisdictions that contribute to global warming. This plan discusses how Oberlin can mitigate causes of climate change by addressing renewable energy, energy efficiency, waste management, transportation, education, and green building. The policies and measures discussed in this plan are those that are within the City's direct sphere of influence, including municipal energy use, community utility consumption, and city-wide program infrastructure and community education.

Further information about Oberlin's continued progress toward this goal will be available at the City of Oberlin website at www.cityofoberlin.com.

ICLEI and the Cities for Climate Protection Campaign

ICLEI's mission is to improve the global environment through local action. The Cities for Climate Protection® (CCP) campaign is ICLEI's flagship campaign designed to educate and empower local governments worldwide to take action on climate change. ICLEI provides resources, tools, and technical assistance to help local governments measure and reduce greenhouse gas emissions in their communities and their internal municipal operations.

ICLEI's CCP campaign was launched in 1993 when municipal leaders, invited by ICLEI, met at the United Nations in New York and adopted a declaration that called for the establishment of a worldwide movement of local governments to reduce greenhouse gas emissions, improve air quality, and enhance urban sustainability. The CCP campaign achieves these results by linking climate change mitigation with actions that improve local air quality, reduce local government operating costs, and improve quality of life by addressing other local concerns. The CCP campaign seeks to achieve significant reductions in U.S. greenhouse gas emissions by assisting local governments in taking action to reduce emissions.

ICLEI uses the performance-oriented framework and methodology of the CCP campaign's 5-Milestones to assist U.S. local governments in developing and implementing harmonized local approaches for reducing global warming and air pollution emissions, with the additional benefit of improving community livability.

Development of This Report

The City of Oberlin made the decision to develop the Climate Action Plan in house. The endeavor was led by Oberlin Municipal Light and Power System's Energy Services and Sustainability Initiatives Manager and a sustainability intern from Oberlin College. Funding for the sustainability intern was provided through a DEED grant from the American Public Power Association. The American Public Power Association's Demonstration of Energy-Efficient Developments (DEED) Program is the only research and development program funded by and for public power utilities. Established in 1980, DEED encourages activities that promote energy innovation, improve efficiencies and lower costs of energy to public power customers. Further assistance in calculating GHG emissions was provided by an intern with the Clinton Climate Initiative.

The plan's process began with researching existing climate action plans from similar communities. Plans were evaluated for content, structure and suitability to Oberlin. A climate action plan template provided in ICLEI's toolkit was used as a formational outline in the process. Peer reviewed sustainability and climate action literature was also reviewed in the acquisition of data in the development of the plan. Integrating the current status of climate science and policy was included in the report. A first draft was created, submitted to upper levels of the City management and after review was edited based on the input from these managers. Following this edit the plan was shared with citizen groups for review. Once these reviews and edits were completed the plan was finalized as it stands. As changes occur within the community and actions are completed, this will remain a living document flexible to the needs and desires of the community.

The Oberlin Community

The Oberlin community has demonstrated its capacity for leadership in the social justice arena from its inception with John Shipherd and Philo Stewart, who founded Oberlin in 1833 with high values for its future citizens and fledgling college. Oberlin's central role in the US civil rights movement is the foremost historical example of Oberlin's social courage and leadership. When the City was founded in 1833, Oberlin College was created as a co-educational institution, a rare occurrence during that time period, which led to the first four Bachelor's degrees awarded to US women in 1841. Furthermore, in 1835, the College became the first institution of higher learning in the US to accept students without considering race.

Oberlin has also been at times credited with being the spark that started the Civil War. In 1858, a group of Oberlin citizens participated in the Oberlin-Wellington rescue. Defying the Fugitive Slave Law, they traveled to neighboring Wellington and freed John Price, an escaped slave who was being held in the local jail there while waiting to be returned to his master. This event earned Oberlin, already a prominent stop on the Underground Railroad, widespread publicity. It is evident that Oberlin has been a powerful force for societal change in the past.

Oberlin is governed under the Council-Manager form of government. The seven-member city council is elected every two years through at-large seats. Council members are part-time civil servants who do not maintain offices at City Hall but, rather, serve their constituency through personal contact. Under this system of local government, the elected officials are the community leaders and policy makers who establish a vision for Oberlin. The city council hires a City Manager to carry out policy, oversee operations and ensure that all residents are being equitably served. The City Manager coordinates the work of department heads and other employees, who help ensure the smooth and efficient delivery of services. By building public/private partnerships, intergovernmental agreements, and other collaborative relationships, the City Manager works to use all of the community's resources to solve current problems and provide municipal services to residents.

From this rich history of civil rights leadership, the Oberlin community's identity as a leader has re-emerged in the context of another generation-defining challenge: climate change. The City and Oberlin College made these commitments consistent with their history of courageous and

morally sensitive leadership on issues of race, gender and labor. Following in its rich heritage, the City of Oberlin has been developing pertinent actions which demonstrate its commitment to the goal of reducing greenhouse gas emissions.

In 2001, a Sustainability Resolution was passed by Oberlin City Council. This resolution adopted the definition of sustainability from the United Nations Commission of Environment and Development which is: "meets current needs without compromising the ability of future generations to meet their needs".

Further the resolution commits the City of Oberlin to promoting a sustainable future by accepting the responsibilities to:

- Support a stable, diverse and equitable community;
- Protect the quality of the air, water, land and other natural resources;
- Conserve where possible and enhance ecosystems; and
- Minimize adverse human impacts on local, regional and worldwide ecosystems.

In addition, the City adopted these sustainability principles:

- The concept of sustainability will guide City policy and actions.
- The City will lead by example.
- The quality of the environment and the health of the economy are interdependent.
- Community participation is fundamental to successful implementation of sustainability policies and program.

The mindset of sustainability in Oberlin was further enhanced as sustainability was subsequently deemed the central theme of the City's 2004 Comprehensive Plan.

Similarly, in 2004 Oberlin College created its own comprehensive Environmental Policy that establishes its special obligation as an institution of higher learning to educate its students, manage its internal affairs, and interact with the broader community in ways that serve as examples that others might follow.

In February of 2007, Oberlin City Council voted to become one of the first municipalities in Ohio to join the International Council on Leadership in Environmental Initiatives (ICLEI) Cities for Climate Protection (CCP) program. Additionally, Oberlin College became one of the first in the nation to accept the goal of carbon neutrality by signing the American College and University Presidents Climate Commitment (ACUPCC).

In a controversial decision during the spring of 2008, City Council voted 4-3 to opt out of a 50-year contract to purchase power from a proposed coal-fired power plant to be built in southern Ohio. This decision led the city to search for more renewable resources for the electrical power supply in Oberlin. Performing due diligence through professional consultant studies and vendor proposals the City entered into a long- term power supply contract in two Ohio based landfill projects. This contract will supply over half of Oberlin's power supply needs with renewable landfill gas generated power for the foreseeable future.

Two years later in 2010, Oberlin became the 18th city in the world to join the Clinton Climate

Positive Development Program. The Climate Positive Development Program was created to meet the dual challenge of rapid urban growth and climate change by setting a new global benchmark for leadership in large-scale urban development. Launched in May 2009 by the Clinton Climate Initiative (CCI) in partnership with the U.S. Green Building Council (USGBC), the program supports the development of large-scale urban projects that will demonstrate that cities can grow in ways that are "climate positive," striving to reduce the amount of on-site CO2 emissions to below zero. Specific program initiatives include the creation of a 'Climate Positive' greenhouse gas metric and measurement standard as well as project technical support, business and financial analysis, and partnership facilitation.

With the creation of this Climate Action Plan, Oberlin continues to be a leader in seeking and developing solutions to the environmental issues facing the nation today.

Oberlin Municipal Light and Power System

Oberlin Municipal Light and Power System (OMLPS) is a community-owned, not-for-profit electric utility created by the community in 1934 to provide high quality, affordable services tailored to the unique needs of the Oberlin Area. OMLPS generates, purchases, transmits and distributes electric power to over three thousand residential and commercial customers. Owned by the community, OMLPS is governed by the residents it serves. The municipally-owned and operated electrical system provides local, reliable electric service and its priorities are directed by the community. OMLPS is overseen by an Electric Director who is governed by the Oberlin city council.

OMLPS owns and operates 20 megawatts of diesel/natural gas generation capacity that is used for peak-shaving for 42 municipally-owned electric utilities in the northern Ohio area. Its power supply portfolio includes power produced from the renewable resources of hydro, wind and landfill gas.

OMLPS procures its power supply for the community through its membership in American Municipal Power (AMP) a nonprofit wholesale power provider. Owned and governed by its members, AMP was developed in 1971 by 10 municipals, including Oberlin, to reduce power supply costs for its members. AMP has grown to serve 129 public power communities in Ohio, Pennsylvania, Michigan, Virginia, Kentucky, West Virginia and Delaware. This growth and the needs of the many communities have provided AMP the ability to expand into a wide range of other services on a cooperative, nonprofit basis for the mutual benefit of all member communities. These services include energy efficiency, engineering, training and community public relations.

AMP purchases and generates electric power dispatched through its control center in Columbus, Ohio on behalf of its members. Understanding the demand of future renewable power from its members' resources AMP is continuously working to develop renewable power resources to best meet members' needs. Within their managed power resources, AMP oversees hydro, wind and solar projects on behalf of it members.

Climate Change

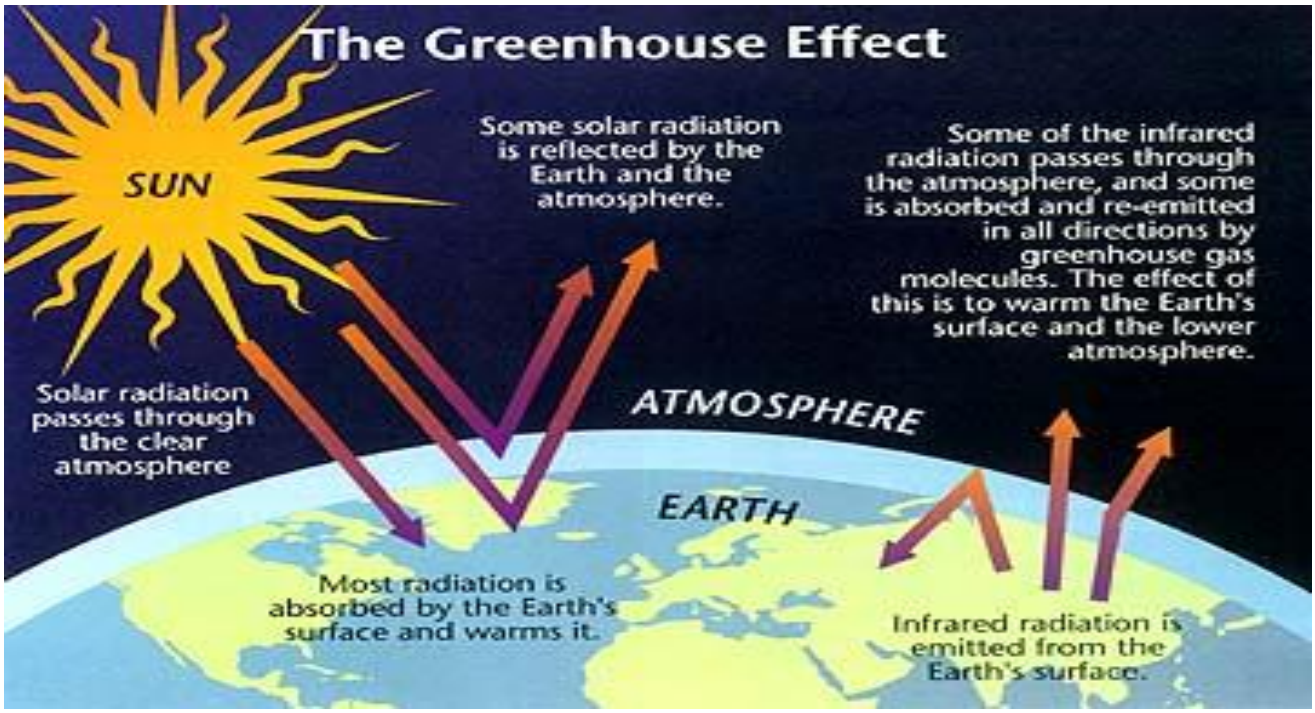
The leading theory of climate change is anthropogenic change brought about by human activity. The theory is based on the premise that the Earth's atmosphere is naturally composed of a number of gases which act like the glass panes of a greenhouse and their ability to trap the energy from the sun in the Earth's atmosphere. These gases retain heat to keep the temperature of the Earth stable and hospitable for life at an average temperature of 60ºF. Carbon dioxide (CO2) is the most prolific of these gases. Other contributing gases include methane (CH4), nitrous oxide (NO2), ozone (03) and halo carbons. Without the natural warming effect of these gases the average surface temperature of the Earth would be around 14ºF. Together these gases in the atmosphere are labeled greenhouse gases.

Elevated concentrations of these gases in the atmosphere have had a de-stabilizing effect on the global climate, fueling the phenomenon commonly referred to as global warming. Some potential impacts of greenhouse gases could be irreversible and accelerate the process of global warming, such as the melting of permafrost, which could release huge quantities of methane gas into the atmosphere. The global average surface temperature increased during the 20th century by about 1°F. According to NASA scientists, the 1990s were the warmest decade of the century, and the first decade of the 21st century is well on track to be another record-breaker. The years 2002, 2003, 2004 and 2005, along with 1998, were the warmest five years since the 1890s, with 2005 being the warmest year in over a century.

Facts and Projections:

- The atmospheric concentration of carbon dioxide (CO2) during the last two decades has increased at the rate of 0.4% every year.
- Current CO2 concentrations are higher than they have been in the last 420,000 years, and according to some research, the last 20 million years.
- About three-quarters of the CO2 emissions produced by human activity during the past 20 years are due to the burning of fossil fuels.

A further concern is that the climate and the atmosphere do not react in a linear fashion to increased greenhouse gases. That is to say specific degrees of warming cannot be predicted for each ton of carbon dioxide emitted from human activities. The Earth's climate has a number of feedback loops and tipping points that scientists fear will accelerate global warming beyond the rate at which it is currently occurring. For example, as CO2 emissions have increased in recent human history, the oceans have been absorbing a significant portion of these gases. As the oceans become more saturated with CO2 scientists anticipate that oceans will reach a saturation point, after which each ton of anthropogenically emitted CO2 will have a more substantial impact.[1] Another example of this compounding can be found in the polar ice caps. Ice is highly reflective and acts effectively like a giant mirror, reflecting the sun's rays back into space. As the planet warms and some of this ice melts away, a darker land or ocean surface is revealed. This darker surface tends to absorb more heat, accelerating the speed at which the planet warms with each ton of greenhouse gas emitted. As these examples illustrate, the stakes are high, and there is no time to lose in the fight against global warming.



Effects & Impacts of Climate Change

Global Impacts

In addition to causing an increase in average global surface temperature, rising levels of greenhouse gases have a destabilizing effect on a number of different micro-climates, conditions and systems. According to the Intergovernmental Panel on Climate Change, surface temperatures are on course to increase by between 2.5 and 10.5ºF by the year 2100, with regions in the northern parts of North America and Asia heating by 40% above the mean increase.[2] The increase in the temperature of the oceans is projected to accelerate the water cycle, thereby increasing the severity and rate of both storms and drought, which, along with decreased snow pack, could disrupt ecosystems, agricultural systems and water supplies.
Snow cover has decreased by 10% in the last forty years. Average sea levels have raised between 1/3 and 2/3 of a foot over the course of the 20th century and are projected to rise by at least another 1/3 of a foot and up to almost three feet by the year 2100. These coastal infringements on such a large scale could lead to not only significant environmental and ecosystem disturbances, but also major population displacement and economic upheaval.[3]

CLIMATE CHANGE IN OHIO

In the last century, Ohio has experienced rising temperatures, increased precipitation including more extreme weather events, and decreased water resources. Average annual temperatures for the Southern Great Lakes region increased by 1.3° F (.7° C) since 1895 while the average annual

temperature in Columbus, Ohio has increased by 0.3° F (.2 ° C) over the same period (EPA 1998). Since 1900, precipitation has increased by 10 percent in Northern Ohio and decreased by 10 percent in Southern Ohio. Heavy precipitation events have increased during the summer months in the Southern Great Lakes region and winter snowfall has decreased in response to warmer winter temperatures. Between 1970 and 1990 evaporation on the Great Lakes increased by an average of 9mm/year, the spring thaw is occurring earlier in the season, and less precipitation has been falling as snowfall (Great Lakes 2003). Since 1997, unusually warm years have resulted in a 3.5 feet drop in Lake Erie's water level and similar decreases are occurring throughout Ohio's surface water resources (Lake Erie 2006).

These trends are predicted to continue or worsen if climate change progresses unchecked. Average yearly temperatures are expected to increase by 3-4° F (1.6-2.2° C) with winter and spring temperatures increasing the most (IPCC 2001). Precipitation is expected to increase in every season with the largest increase of 25 percent predicted to occur during the fall months (US EPA 1997). As climate change increases rates of surface water evaporation, decreases snow fall, and expedites the spring thaw, there will be significant changes in Ohio's surface water levels over the next century. Lake Erie is likely to be severely affected by a predicted 34 inch drop in water level over the next 60 years, reducing the total surface area of the lake by 15 percent (Lake Erie 2006). Similar reductions in water level will likely occur for all of the state's streams, rivers, and lakes.

MAJOR ECONOMIC IMPACTS

Shipping and Manufacturing

Shipping and manufacturing constitute one of the major industries in Ohio. Manufacturing alone accounted for nearly 20 percent of Ohio's GDP in 2006 (BEA 2006). Ohio's industries rely on the shipping routes through Lake Erie to receive their raw materials as well as export them to Canada and elsewhere. The Ohio Department of Development reports that the top eight export items in 2006 had a combined value of $27.8 billion dollars. Ohio's exports to Canada totaled about 18.8 billion dollars, 48 percent of its total exports, in 2006. A majority of these exports were sent through Lake Erie ports (Office of Strategic Research 2006).

The projected fall in the water level in Lake Erie would substantially affect the shipping industry as the carrier vessels lose their capacity. According to the Great Lakes Carriers' Association, a 305 meter long vessel (of the type that is used for intra-lake transportation) loses 270 tons of capacity for each inch of draft loss. Each carrier will have to carry lighter loads, losing nearly $30,000 per vessel (Moore 2002).

Even if there were only a 2 percent decrease in shipping activity each year, this will result in a direct economic impact on water transportation worth $556 million in 2007 and an almost equally large multiplicative impact on the rest of the economy, due to the shipping industry's importance to the rest of the state's economic sectors, worth approximately $452 million in 2007 (RESI 2008). Should that decrease continue, then direct economic impacts just ten years later would be $5.54 billion and indirect economic impact of in excess of $4.49 billion. By 2017, a combined direct and indirect 49,000 jobs would be at peril (RESI 2008).

Water Supply

Ohio's water supply will also be heavily affected as a drier climate, high rates of evaporation and reduced contributions from snow pack lead to decreased availability of surface water. Ohioans will turn to ground water to satisfy demand. The Ground Water Protection Council reported that 97 percent of all cities, villages, school, business, and industries in Ohio relied on ground water in 1996. Ohio farmers use about 2 billion gallons of ground water per year to irrigate their crops (Ground Water Protection Council 1996). Reliance on water for irrigation will increase in response to rising temperatures over the next century. As surface water supplies are strained through reduced levels or pollution concentration, look to see more water being extracted from ground reserves.

After the droughts of 1988 and 1991- 1992, it was observed that there was an increased use of wells, which drew down water from a larger underground area, which concentrates pollutants and increases the risks of contamination. Some public ground water supplies dried up, and there was a scarcity of clean potable water (Rogers 1992).

Tourism, Recreation and Natural Resources

Lake Erie, forests, and natural locations throughout Ohio support a wide variety of tourism and recreational activities such as fishing and hunting. These activities are a major source of revenue for Ohio. A study conducted by Longwoods International for the Ohio Department of Development reports that visitors spent more than $33.8 billion in the year 2005 alone (Ohio Travel 2008b), which constituted nearly eight percent of Ohio's state GDP that year (BEA 2005). More than 560,000 people are employed in Ohio's travel and tourism industry. Tourism brings in $10.2 billion in wages for Ohio and direct taxes from tourism spending generate more than $2 billion (Ohio Travel 2008a). The Ohio Department of Natural Resources reported over two million hunting and fishing licenses and permits sold statewide in 2006 (Ohio Dept. of Natural Resources 2006). At an average price of $19, revenue from fishing and hunting licenses sale exceeded forty million dollars. Fishing, hunting and wildlife recreation also promote a range of other industries like restaurants, souvenir shops, fishing and hunting equipments. A survey by the United States Fish and Wildlife Services reported that about $2.96 billion was spent through fishing, hunting and wildlife recreation activities in Ohio in 2006 (US Fish and Wildlife Service 2006).

Increasing temperature in Ohio would result in range shifts and altered habitat for fish, which could significantly affect the recreational and commercial fishing in the state. Large changes in distribution and productivity of fisheries would indirectly impact industries closely associated with fishing. A report by the Union of Concerned Scientists states that Lake Erie's world famous walleye fisheries could be affected by projected climate changes in the region. In one study of the walleye population in Lake Erie it was concluded that "in general, warmer lake temperatures led to increased habitat area and volume, particularly in the central and eastern basins, but reduced lake levels tended to offset these increases and lead to net declines in habitat area and volume in the western basin and in volume in the central basin" (Jones et al. 2006). Although many other factors need to be taken into account to derive the effects of such climate-related changes, a combined effect of summer stratification (a process by which oxygen supply is

depleted in lower lake levels as warmer water rises to top) and possible accumulation of pollutants due to the lower water levels suggest significant impacts on fish populations and related industries. Furthermore, when rising water temperatures couple with other ecosystem changes, invasive species thrive and native fisheries are threatened. The Great Lakes and Lake Erie in particular, are notorious for their ability to draw in and harbor invasive species from around the world. Lake Erie has 34 non-native invasive fish species and a growing number of fish-damaging pathogens; these species vie for limited resources and deteriorate the native fish populations that are so vital to the local culture and economy of Ohio's Erie shoreline (Lake Erie 2006).

Forests cover 30 percent of Ohio and support many different forestry related industries like logging, furniture and paper pulp. Ohio's forest products industry contributes $15.9 billion to Ohio's economy and employs over 119,000 people with payrolls of $4.2 billion. The forest industry contributes over $426 million in sales and excise taxes annually and approximately $143 million in payroll taxes (Department of Natural Resources 2006). Climate change will stress forests with drier conditions, reductions in soil moisture and increased rates of evapotranspiration. Changes in species composition, geographic range of forests, and overall forest health and productivity will likely be the outcome of climate change. Ohio's forest areas could change little or decline by 30 to 50 percent, depending on how climate change and human management of forests plays out. Regardless of overall decline of forest density, the types of trees dominating forests and woodlands will likely change. In a warmer climate, forested areas could come to be dominated by pine and scrub oaks, replacing many of the economically valuable eastern hardwoods common throughout Ohio. In combination with Ohio's poor soils, an increase in temperature will expand the range of scrub oaks of little commercial value (e.g., post oak and blackjack oak). A decline of 50 percent in existing forest cover would amount to $8 billion in economic costs, and the loss of tens of thousands of jobs.

OTHER ECONOMIC IMPACTS

Agriculture

Agriculture will also be heavily affected by the climate changes projected in Ohio. The total market value of all agricultural products sold in 2002 was $4.9 billion, or about 1.25 percent of the total state GDP (NASS 2002). The main crops for Ohio include winter wheat, soybeans and corn; grains, oilseeds, and beans topped all agriculture products with sales of $1.5 billion. Dairy and livestock industries, which totaled $1.3 billion in sales (not including poultry), will also be affected by changes in temperature, precipitation cycles and severe weather (Census of Agriculture 2002).

While warmer weather, increased carbon dioxide and nitrogen may increase yield for some crops, higher ozone and severe weather, especially during the planting and harvest seasons, could decrease productivity (USEPA, Climate Change and Ohio, 1998) . Drier conditions may also lead to shortage of water for irrigation adding to production costs. Studies have shown that increases in temperature decreases milk production in cows. A study by St. Pierre et al (2003) on the effect of heat stress on livestock in the United States found that without abatement measures,

320 Kg per cow per year of milk was lost due to increasing and prolonged exposure to temperature and humidity above a threshold level (St. Pierre et al. 2003).

Longer periods of drought may decrease agricultural yields, particularly in the southern portion of the state. This happened in 1999 after a late-season dry spell which decreased corn yields by over 11 percent. Farmers' incomes went down by nearly the same amount that year (Ohio State Extension and Purdue Extension Partnership 1999). A more severe yield loss was underway in 2007 when a drought caused some corn ears to become stunted, causing a 50-60 percent yield decrease (Pollock 2007). The same drought caused damages to hay harvests, as well, which are used for cattle feed. First-harvest yields were reported to be down by 20-70 percent in 2007 (Hay and Forage Grower 2007).

The effect of climate change on agriculture is dependent upon a host of other factors like adaptation strategies by farmers, technology and market demand. Additionally, increases in soil erosion from more precipitation and runoff and invasion from warm-climate pests will certainly have an impact on the people and industries in the Ohio agriculture sector.

Infrastructure

More frequent heavy rainstorms, flooding and high temperatures would add to the costs through infrastructure damage. With high temperatures the ground hardens and becomes less permeable to rainfall. Under these conditions precipitation and especially heavy rainstorms lead to more flooding. The Ohio valley has been subjected to a great deal of costly flooding as of recently. For example, the March flood of 1997 cost nearly $232.5 million and resulted in the evacuation of 20,000 people (Jackson 1998). Heavy rainstorms and flooding not only damages properties but also adds to the costs for emergency management, rebuilding costs and negatively affects the quality of water.

Health Impacts

Various studies have also shown the negative health impacts of increasing temperature on human mortality and morbidity. A study released by Physicians for Social Responsibility in 2000 reported that increasing temperature and ground level ozone in Ohio would result in more heat related illness and deaths. Also increased flooding due to more frequent heavy rainstorms could cause water borne diseases like the Norwalk Virus to be more common (Physicians 2000). Although increased use of air conditioning and other measures will help people adapt to the increasing temperatures, the consumption of more energy causes more pollutants to be released by power plants, increasing health risks for the region (Physicians 2000). Lastly, increased winter temperatures will result in fewer cold-related deaths, but a rise in summer temperatures will increase the occurrence of heat stroke and heat-related deaths.

Missing Information and Data Gaps

This study is subject to the uncertainties inherent in measuring global climate change and climate change itself and attempts to reflect this as best as possible through use of scenarios and ranges of confidence. Further, data gaps exist between the effects of climate change in one particular

sector and the ripple effects that manifest in interconnected sectors. Analysis of this sort would be useful to policy-makers and businesses at all levels and sizes.

CONCLUSIONS

The State of Ohio's greatest challenge is likely to be in adapting to climate change along its waterways and on Lake Erie, as this is where the most significant economic and ecological impacts will occur. Building and maintaining an alternative transportation infrastructure would allow Ohio to maintain its vibrant manufacturing industry amidst sea-shipping uncertainty, but the costs of the sort of adaptation needs to first be researched. Natural areas such as forests and lakes will suffer from climate change. The ecological integrity of Ohio's natural landscape will be threatened in the coming century and it is recommended that management of resources be carefully monitored to ensure the wellbeing of the economic and cultural functions that depend on them. Lastly, because flooding events are likely to occur more often, preparations to prevent and mitigate floods and flood related disasters could be made ahead of time.

(The above information on climate change in Ohio was excerpted from the report *Economic Impacts of Climate Change on Ohio* prepared by the Center for Integrative Environmental Research at the University of Maryland.)

CLIMATE POLICY

At this point in time here is no congressional mandate for greenhouse gas emission reporting or reduction in the United States. However, in April 2007, the U.S. Supreme Court ruled that the U.S. EPA has not only the authority, but also the obligation, to regulate greenhouse gases as "serious and well recognized" pollutants. In April 2009, the EPA released a 133-page finding that stated, "...Greenhouse gases that are responsible for [climate change] endanger public health and welfare in the meaning of the Clean Air Act." The eventual judgment from the EPA may open the door for regulation of greenhouse gas emissions via the provisions of the Clean Air Act.

In May 2007, the State of Ohio joined with 30 other states to help found The Climate Registry. This ground-breaking organization will help Ohio industries play an important leadership role, at both the national and state level, in recognizing and addressing the impact of GHG emissions on climate change. The Registry is developing a uniform way of calculating and verifying GHG emissions and will serve as a "one-stop shop" for reporting and tracking businesses' GHG emissions. The Climate Registry will provide Ohio businesses and other entities with a uniformly accepted means of calculating and tracking GHG emissions and enhance their ability to anticipate the impacts of impending GHG laws on their operations.

On May 1, 2008, Governor Ted Strickland signed substitute Senate Bill 221 into law, establishing an alternative energy portfolio standard (AEPS) for the state of Ohio investor-owned electric utilities. The law mandates that by 2025, at least 25 percent of all electricity sold in the state come from alternative energy resources. At least half of the standard, or 12.5 percent of electricity sold, must be generated by renewable sources such as wind, hydropower, geothermal, biomass and solar (solar must account for at least 0.5 percent of electricity use by 2025). At least half of this renewable energy must be generated in-state.

SB 221 also requires the Public Utilities Commission of Ohio (PUCO) to adopt rules establishing greenhouse-gas reporting requirements, including participation in the Climate Registry, which aims to develop a common system for tracking GHG emissions across states within North America.

Oberlin's Emissions Inventory

The City of Oberlin greenhouse gas inventory was conducted by Nathaniel Flaschner Meyer (OC '09) in partnership with Oberlin Municipal Light and Power, the City of Oberlin, and Oberlin College Department of Environmental Studies staff. The inventory was compiled and calculated using ICLEI's Clean Air and Climate Protection Software. The purpose of the baseline emissions inventory is to determine the levels of greenhouse gas emissions of the City of Oberlin. While GHG inventory data was compiled for both 2001 and 2007, 2007 was chosen as the baseline year rather than 2001 because of more complete data in 2007.

ICLEI's Cities for Climate Protection inventory methodology allowed Oberlin to systematically estimate and track greenhouse gas emissions from energy and waste related activities at the community-wide scale and those resulting directly from municipal operations. The municipal operations inventory is a subset of the community-scale inventory. Once completed, these inventories provided the basis for creating an emissions forecast and reduction target, and enabled the quantification of emissions reductions associated with implemented and proposed measures.

ICLEI's Climate and Air Pollution Planning Assistant Software

To facilitate local government efforts to identify and reduce greenhouse gas emissions, ICLEI developed the Climate and Air Pollution Planning Assistant (CAPPA) with the assistance of hundreds of local governments. This software estimates emissions derived from energy consumption and waste generation within a community. The CAPPA software determines emissions using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of carbon dioxide equivalent units, or CO2e. Converting all emissions to carbon dioxide equivalent units allows for the consideration of different greenhouse gases in comparable terms. For example, methane is twenty-one times more powerful than carbon dioxide in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of CO2 equivalent.

The emissions coefficients and methodology employed by the software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change, the U.S. Voluntary Greenhouse Gas Reporting Guidelines, and, for emissions generated from solid waste, the U.S. EPA's Waste Reduction Model (WARM).

CAPPA is the a decision support tool designed to help U.S. local governments explore, identify, and analyze potential climate and air pollution emissions reduction opportunities. Calculating emissions from energy use with precision is difficult—the carbon emissions model depends upon numerous assumptions, and it is limited by the quantity and quality of available data. Any specific number generated by the model as an approximation rather than an exact value.

Inventory Results

Community Scale Emissions Inventory

GHG Emissions Community Inventory Oberlin, OH	Total CO2e tons/year (2007)	Percentage of city emissions
Residential	27,671	16%
Commercial	66,080	38%
College	38,696	22%
Transportation	26,330	15%
Municipal	11,400	7%
Waste	1,622	1%
Other	2,592	1%
TOTAL	174,391	

Table 1. Tons of CO2 emitted by sector

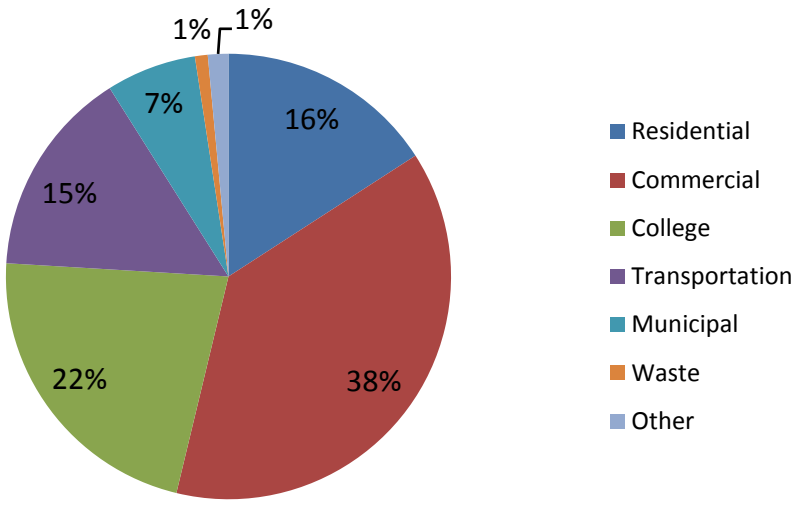


Figure 1. Percentage of CO2 tons emitted by sector

The inventory determined that as a whole, the community (within city limits) emitted 174,391 tons of carbon dioxide equivalent (CO2e) in 2007. The community's per capita (2007 population was 8,344 persons) annual emissions were 20.9 tons CO2e per resident. The commercial sector, including all businesses, Oberlin College properties, and municipal facilities within city limits, made up 67% of total community-wide emissions. The commercial sector, excluding College and municipal facilities, emitted 38% of total community-wide emissions. Emissions from the College made up approximately 22% of total community-wide emissions, with coal burned at the College's heat plant making up 10% of this total in 2007. The residential and transportation sectors each emitted 16% and 15% of total community-wide emissions respectively.

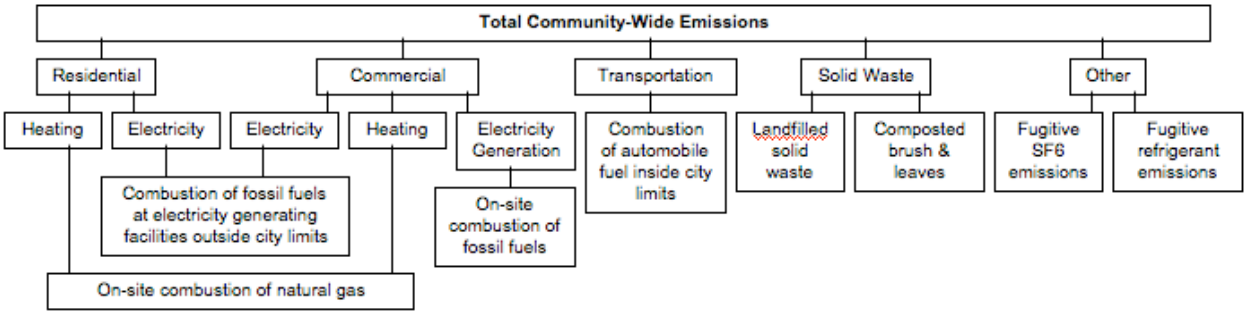


Figure 1: Constituent components of emissions attributable to activities within Oberlin's city limits and thus included in Oberlin's community-wide inventory.

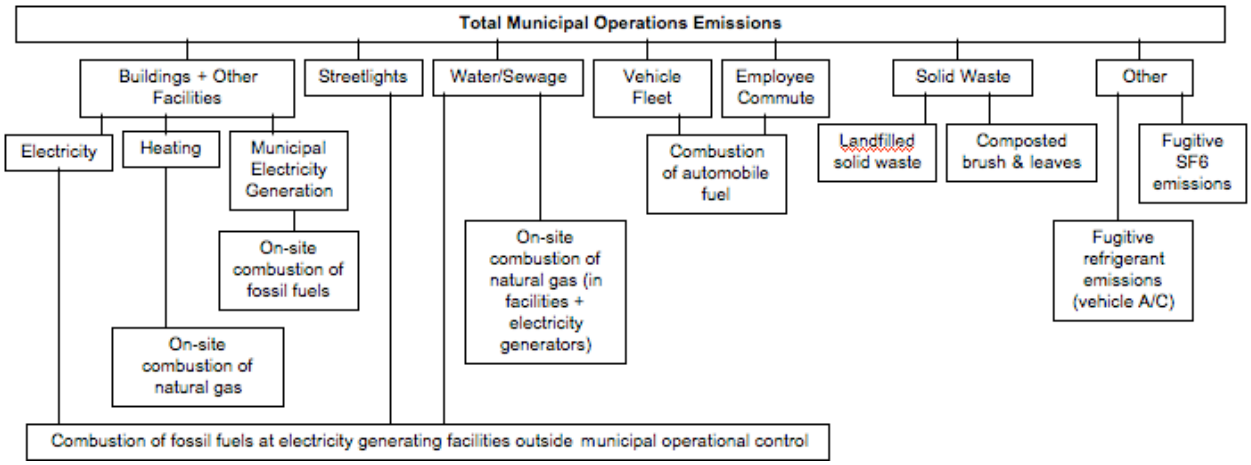
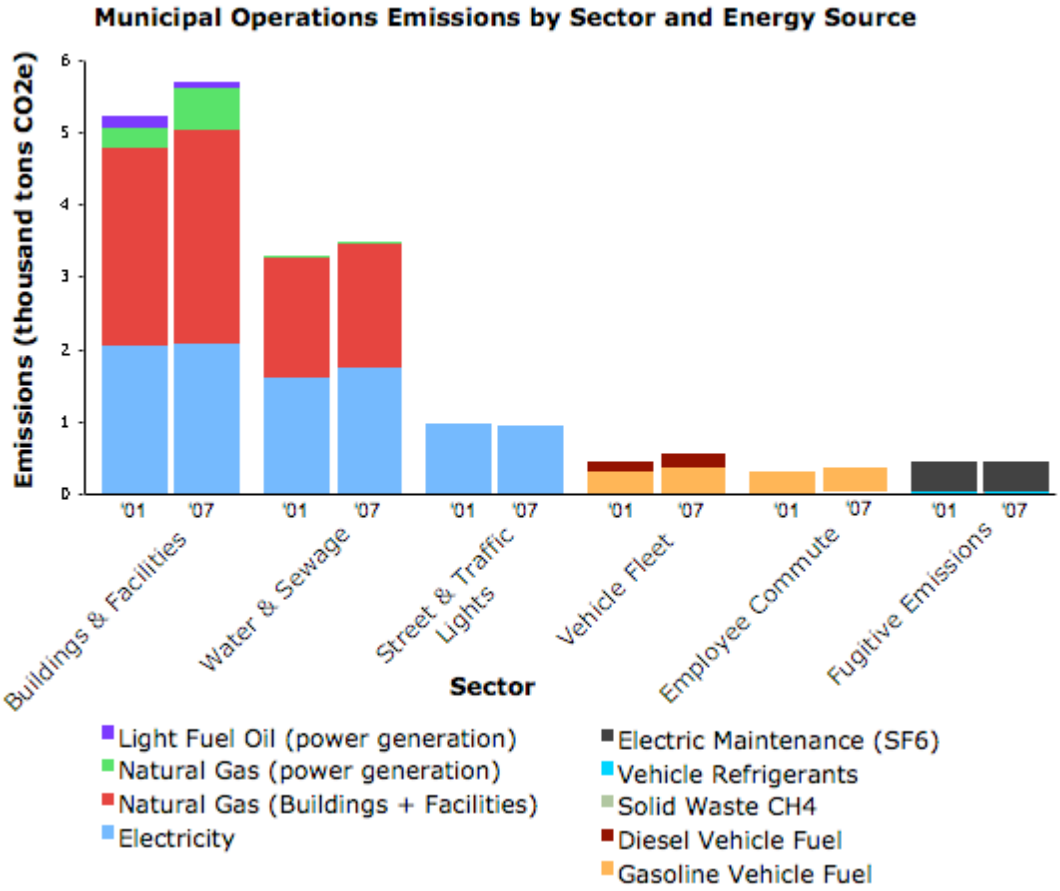


Figure 2: Constituent components of emissions attributable to activities under the control of Oberlin's municipal government and thus included in Oberlin's municipal operations inventory.

The municipal operations were responsible for emitting 11,400 tons CO2 in 2007. Emissions associated with electricity and natural gas consumption each made up approximately 40% of municipal emissions. Buildings and facilities, excluding those associated with water and wastewater departments, were responsible for roughly half of the municipal emissions. Water and wastewater buildings and facilities were responsible for approximately 30% of the municipal emissions, and street and traffic lights were 9%. Emissions from the municipal vehicle fleet and

employee commuting were each responsible for less than 5% of the municipal emissions.



In 2007, emissions from electricity use made up 41.4% of the City's overall emissions, followed closely by natural gas consumption for heating (41.0%). The remaining 15-20% came from natural gas and light fuel oil burned, primarily at the OMLPS plant, to produce electricity (6.0%), gasoline (6.1%) and diesel (1.6%) fuel from the City fleet and employee commuting, and fugitive emissions (3.8%).

Greenhouse Gas Emissions Reduction Target

The City of Oberlin's objective is to develop an implementable climate change action plan that allows the community to reduce greenhouse gas emissions while balancing the environmental, social and economic interests of the Oberlin community. Developed through the lens of sustainability, the plan aims to reduce greenhouse gas emissions and measure progress. The plan sets the following greenhouse gas emissions reduction goals for the short-, mid- and long-term time frames.

It is recommended that the City of Oberlin set goals of reducing greenhouse gas emissions below 2007 emission levels by 50% beginning in 2015, 75% by 2030 and 100% by 2050. These proposed short and mid-term goals are based on what the City believed to be feasible reductions

given monetary, infrastructural and institutional constraints. While the Intergovernmental Panel on Climate Change (IPCC) recommends an 80% reduction from 1990 greenhouse emissions levels by 2050, the long term goal of 100% is based on the City joining the Clinton Climate Positive Development Program in 2010.

To achieve these goals, the City must eliminate 87,195 tons of CO2e by 2015 and 110,543 tons CO2e by 2030. For some of the proposed measures and policies it was not possible to accurately predict emissions reduction—in these cases social, environmental, and economic benefits are emphasized.

Energy Efficiency

> ***"Energy Efficiency** (EE) encompasses all changes that result in a reduction in the energy used for a given energy service (heating, lighting...) or level of activity. This reduction in the energy consumption is not necessarily associated to technical changes, since it can also result from a better organization and management or improved economic efficiency in the sector (e.g. overall gains of productivity)."*
>
> -World Energy Council (2009)

The use of fossil fuels, including coal, oil, and gas, for energy production contributes significantly to greenhouse gas emissions. Reductions in the emissions from energy production and consumption can be achieved by increasing the efficiency of traditional energy sources. Oberlin recognizes that energy efficiency is one of the most cost-effective ways to reduce our GHG emissions while at the same time reducing citizen's energy costs. The City of Oberlin initiated its community influence of energy efficiency with the creation of the OMLPS Energy Services Division OMLPS in 1998. This department began by coordinating electrical utility services to Oberlin's commercial customers and now includes promoting and providing energy efficiency programs and education for all its customers.

Oberlin realizes that investing in a sustained EE strategy provides the following benefits to the City and its customers:

- Significant end-use customer reductions in energy use
- Low end use cost of utilities
- Additional income to the local economy
- Creation of local jobs in selling and installing energy efficiency measures
- Continued energy savings over the life of the measures
- Decreased need of building future generation resources
- Curtailed environmental impacts through reduced generation
- Reduced vulnerability to future environmental costs that may be imposed through new regulations.

"The least expensive means of providing a unit of energy is to not use that unit at all."

Goal: Energy Conservation

Strategy: Efficiency Smart Power Plant
Implementation year(s): 2011 - 2013
Department: OMLPS
Projected GHG reduction: 1035 tons CO2e

In 2010, the City of Oberlin voted to join with forty-six other members of American Municipal Power (AMP) to become part of Efficiency Smart Power Plant (ESPP) developed by AMP and Vermont Energy Investment Corporation (VEIC).

"The Vermont Energy Investment Corporation (VEIC) is a mission-driven nonprofit organization, founded in 1986, that is dedicated to reducing the economic, social, and environmental costs of energy consumption through cost-effective energy efficiency and renewable energy technologies."

The ESPP will offer an opportunity for all customers in the Oberlin Municipal Light and Power territory to reduce electrical consumption through energy efficiency. VEIC, who has managed and overseen energy efficiency for the entire state of Vermont for the past 10 years, will provide the same oversight in managing the ESPP for AMP communities who are enrolled in the program. VEIC, a leading energy efficiency provider in the country has both the experience and knowledge to run a successful energy efficiency program. Providing successful energy efficiency through ESPP will be provided through building relationships, providing incentives and monitoring the results within each community. The projected goal is to reduce MWh use by 1407 MWhs annually by the end of 2013.

Strategy: Heat loss inspections
Implementation year: 2000 - ongoing
Department: OMLPS
Projected GHG reduction: 657 tons CO2e since inception

OMLPS offers free heat loss inspections for residential and small commercial customers. Over 550 inspections have been completed over 10 years. This inspection includes a blower door test and thermal scan of the building or home with an infrared camera. Heat loss areas are identified and recommendations to address problem areas are provided to the customer. This service provides customers the opportunity to identify and make energy efficiency upgrades to their homes. It further develops a growing awareness of energy inefficiencies in the community.

Strategy: Promote use of compact fluorescent light (CFL) bulbs
Implementation year: 2007 - ongoing
Department: OMLPS
Projected GHG reduction: 83 tons CO2e additional reduction annually

CFLs use 75% less electricity than an incandescent bulb. OMLPS offers a no-cost CFL bulb to each customer on an annual basis. On the average OMLPS, hands out 950 CFL bulbs to its customers each year. Based on a usage of four hours per day per bulb this annual offering reduces the electrical usage in Oberlin by an additional 106,800 kWh every year, an equivalent of twelve households per year.

Strategy: Department of Energy Industrial Assessment Grants
Implementation year(s): 2005 - 2010
Department: OMLPS
Projected GHG reduction: 42 tons CO2e

Through its Key Account "Direct Connections" Program, OMLPS and AMP secured four industrial energy audits for Oberlin's largest manufacturing customers. These audits inspected the mechanicals, HVAC, building egresses and processes for each company. The opportunity for

an average of twelve percent energy savings for these large commercial customers was identified through the audits. OMLPS and AMP continue to work to find methods of helping large commercial customers reduce their energy costs.

Strategy: Replacement of Incandescent Traffic Signals with Light Emitting Diodes (LEDs)
Implementation year(s): 2009 - 2010
Department: OMLPS
Projected GHG reduction: 59 tons CO2e

Oberlin began converting its traffic signals from incandescent bulbs to LEDs in 2009. LEDs in traffic signals consume 70% less energy than incandescent bulbs, last up to ten times longer and require less maintenance. In the case of traffic signals, the conversion pays for itself in three to four years depending on whether the conversion involves upgrading the present signal with LEDs or is a complete replacement of the signal. Furthermore, the greatly increased lifetime of the lights reduces maintenance and the run time of trucks performing re-lamping work. Upgrading to LED traffic signals in Oberlin has reduced the electrical consumption for traffic signal control by two thirds.

Strategy: Replacement of Downtown Incandescent Christmas lights to LED
Implementation year(s): 2010
Department: OMLPS
Projected GHG reduction: 90 tons of CO2e

Oberlin replaced 8,500 incandescent Christmas bulbs with the same number of LED bulbs for its downtown holiday lighting. The use of these bulbs reduced the total annual usage for holiday lighting from 124,740 kWh to 2,566 kWh, a reduction of 122,174 kWh in holiday lighting energy use for the City.

Strategy: Lighting Upgrades in City Buildings
Implementation year(s): 2010
Department: Building and Grounds
Projected GHG reduction: 9 tons of CO2e

Advances in lighting technology in recent years have made the upgrading of lighting an obvious and cost-effective means of reducing energy use and GHG emissions. The City of Oberlin has budgeted $5,000 in 2011 for lighting upgrades at Oberlin City Hall which includes the court and police department. The first of these projects, replacing 100W mercury vapor lights with 15W LED flood light bulbs reduced the electrical use by 11,589 kWh annually. Continued upgrades are in the planning stages and will significantly reduce the lighting power consumption at City Hall over time.

Strategy: Purchase Efficient Office Equipment
Implementation year(s): ongoing
Department: Administration
Projected GHG reduction: 2 tons CO2e per 10 computer and monitor replacements, additional reductions over time as more equipment is upgraded

The City of Oberlin will purchase ENERGY STAR® approved office equipment as equipment needs replaced wherever possible. Additionally, the City will publicize this ENERGY STAR® recommendation to residential community members and encourage the purchase of efficient home appliances.

Strategy: Energy Efficiency at OMLPS Power Plant
Implementation year(s): 2007-2010
Department: OMLPS
Projected GHG reduction: 444 tons CO2e

Lighting upgrades in the plant included replacing high pressure sodium (HPS) high bay fixtures with induction and fluorescent lighting. Replacing the HPS fixtures not only increased efficiency of the fixtures but provided the ability to turn fixtures off in areas where lighting was not needed at certain times. Jacket water electrical consumption was reduced dramatically through the use of programmable logic controllers (PLC's) and variable frequency drives (VFD's) on the jacket water pumps. VFD's were also installed on cooling system pump motors reducing the consumption of electricity. The power consumption in the plant was reduced from 1,298,400 kWh in 2007 to 694,000 kWh in 2010 resulting in an annual power reduction of 604,000 kWh.

Strategy: Energy Efficiency at OMLPS Technical Services Office
Implementation year(s): 2007-2010
Department: OMLPS
Projected GHG reduction: 24 tons CO2e

The OMLPS technical services department has been very successful in reducing its annual electrical consumption since 2007. Electric resistance heating was replaced with mini-split heat pumps which use a third of the electricity to heat the office area and break room. These units are also more efficient than the air conditioning units that had been in use thus reducing cooling costs as well. Additional cellulose insulation was added to the attic area above the garage area and foam insulation was applied to the roof sheeting in the second floor storage area above the office. Lighting controls were also installed in the technical service work area. These controls use both infrared and motion sensors as they control the lighting in different work areas to provide light when needed and automatically turn them off when they are not. A 3.8 KW solar array was added to the roof in 2008 producing 9% of the annual consumption of the building, reducing power needed from the grid and purchased by Oberlin ratepayers. These upgrades have reduced the annual power consumption from 76,040 kWh to 43,000 kWh, a reduction of 33,040 kWh annually.

Strategy: Energy Efficiency at Oberlin's Water Environment Protection Facility
Implementation year(s): 2007-2010
Department: Water Environment Protection Facility
Projected GHG reduction: 176 tons CO2e

The energy efficiency work at the Water Environment Protection Facility has included installing VFDs on various pumps, changing incandescent to fluorescent lighting, upgrading heating and cooling systems to mini-split heat pumps and improving mechanical systems. In 2007 the annual consumption of the plant was 1,124,080 kWh. After the efficiency upgrades, the consumption in 2010 was 885,440 kWh resulting in a 21% decrease in annual electrical consumption.

Strategy: Energy Efficiency at Oberlin's Water Treatment Plant
Implementation year(s): 2008 - 2010
Department: Water Dept.
Projected GHG reduction: 48 tons CO2e

Approximately $4.2 million in upgrades at the Water Treatment Plant and the Raw Water Pump Station to replace obsolete equipment including pumps, motors, control systems, process equipment, compressors, HVAC and mechanical systems. From 2006 to 2009, the annual electrical consumption averaged 607,113 kWh. In 2010, after the improvement project was substantially complete, electrical consumption was 541,320 kWh, a 12.15% decrease.

Strategy: Energy Efficiency at Oberlin's Cemetery and Parks Building
Implementation year(s): 2007 - 2010
Department: Cemetery and Parks Dept.
Projected GHG reduction: 14 tons CO2e

Dryvit system was installed on the exterior walls of building increasing R-value from R-3 to R-13. Cellulose insulation was added to the attic of the building bringing the R-value to R-38. Steel frame windows were replaced with triple-pane, low-e argon filled vinyl replacement windows reducing air leakage and thermal losses. More efficient mini-split heat pumps were installed to supplement gas furnace.

Strategy: Efficiency Upgrades in City Buildings
Implementation year(s): 2009 – Ongoing
Department: Public Works
Projected GHG reduction: 7 tons CO2e in 2010 additional reduction annually

Additional monitoring of GHG emission reductions from city building upgrades will be accomplished with the Planet Footprint Environmental Scorekeeper subscription which tracks municipal buildings utility use.

Recent work includes:

Flat roof over the POD area of city was upgraded with 360 sq. ft. of white reflective roof reducing heating costs. An older rooftop HVAC unit in the Police Department was replaced with a new higher efficiency HVAC reducing heating and cooling costs.

Sub-division of office, work and break room space at the Water Distribution metal storage/shop building will allow separate conditioning of occupied spaces. Split system equipment for heating and air conditioning will provide efficient space heating and cooling. The existing 75 gallon gas-

fired hot water heater will be replaced by a tankless hot water heater. New T8 and CFL fixtures in occupied areas combined with (5) DayLight Solar Skylights in parts, garage, and mezzanine areas will improve lighting levels while decreasing electricity consumption.

Future City Projects:

As work was being planned for this rooftop HVAC upgrade in 2010 it was determined with ducting and control modification a third HVAC for the police department will be eliminated in the future. Further lighting system upgrades are in the plans for City Hall. Surveying and planning in the areas that are lit 24/7 are being implemented first.

Staff will continue to evaluate opportunities to improve the energy efficiency of building shells, lighting systems and mechanical equipment both as existing systems near the end of their useful life and as other opportunities arise that would result in decreased energy consumption.

Strategy: Tree planting on City Tree Lawns and Parks
Implementation year(s): 2000 - ongoing
Department: Parks and Cemetery
Projected GHG reduction: 13 tons CO2e additional reduction annually

Oberlin budgets $25,000 per year to plant trees within the City. While some of these trees are replacements they are replacements for dead or dying trees. The City averages planting fifty trees each year. Besides absorbing CO2, trees reduce the urban heat island effect. Each tree is therefore estimated to reduce CO2e by 250 lbs annually.

Spotlight on POWER (Providing Oberlin with Efficiency Responsibly)

Strategy: POWER
Implementation year(s): 2008 – Ongoing
Local non-profit agency
Projected GHG reduction: 8 tons CO2e additional reduction annually

The mission of POWER is to improve and increase awareness of the energy efficiency of homes in Oberlin with a particular focus on Oberlin's most vulnerable low-income residents. POWER currently achieves this mission by providing energy efficiency retrofits, specifically insulation and weatherization, at no cost to low-income homeowners in Oberlin. POWER is a non-profit organization governed by a Board of Trustees and administered by a part-time Program Coordinator.

POWER was originally conceived when a group of concerned citizens and city staff were motivated to address the initial increase in cost of renewable power and the effect it would have on the low income. One of POWER's founding principles is that change comes from within, and as such the organization was established by and for the community members it is designed to serve. Participants in this process have included: local pastors; low-income homeowners; citizen activists; city staff; local non-profit organizations staff; Oberlin College staff and students; and Oberlin City Council members.

Funded entirely by grants and donations from individuals, organizations, businesses, and institutions POWER insulates and weatherizes seven to nine homes a year. This organization not only reduces costs for homeowners in Oberlin it also improves the livability of the home. An example of what a can be done, POWER has demonstrated how members of a community can work for solutions to improve the wellbeing of the community and the environment.

Buildings account for a large percent of all the city emissions and are a primary target for emission reductions. Efficiency changes can be large scale—building renovations—or small—individuals dialing down the thermostat at night. The City of Oberlin's goal is to become an example to the community members and businesses to take small and large steps towards being more energy efficient. Oberlin will continue to devote resources to improving the energy efficiency in the City and believes these efforts will continue to produce significant energy and GHG reductions through reduced energy use now and in the future.

* It should be noted that the 2015 90% renewable energy resources in Oberlin's power supply greatly reduces the impact of GHG emission reductions from electricity related energy efficiency measures.

Renewable Energy

> ***"Renewable Energy** is derived from natural processes that are replenished constantly. In its various forms, it derives directly from the sun, or from heat generated deep within the earth. Included in the definition is electricity and heat generated from solar, wind, ocean, hydropower, biomass, geothermal resources, and biofuels and hydrogen derived from renewable resources."*
>
> *-International Energy Agency (2010)*

Energy accounts for about two-thirds of global greenhouse gas emissions. Reduction in energy emissions depends on lessening global dependency on carbon intensive fossil fuels. The carbon intensity of energy can be reduced by substituting renewable energy sources for fossil fuels (and by substituting lower-carbon natural gas for coal). Renewable energy flows involve natural phenomena such as sunlight, wind, tides, decomposition of organic materials and geothermal heat.

Benefits of Renewable Energy

The use of renewable energy sources in place of fossil fuels substantially reduces greenhouse gas emissions.

It has been projected that if 20 percent of the total energy use in the United States were provided by renewable energy it could:

- Save consumers a least $4.5 billion by 2020 by stabilizing market prices;
- Increase the potential for local job creation as renewable energy can more often be generated at a local scale compared to traditional energy sources;
- Generate more than 1 billion dollars of revenue for farmers, landowners, and others previously left out of the energy profit loop, and;
- Reduce global warming pollution from power plants by nearly one-fifth.

(Wagner et al, 2004)

Hydroelectric, landfill gas (methane), wind and solar energy are all renewable options, and are excellent ways of producing energy without creating waste, or wasting resources.

Hydroelectric power is the largest renewable resource in the world. Hydroelectric power is produced by harnessing the force of moving water. The most common method of producing hydroelectric power is by damming a river and controlling the flow of the water from the reservoir behind the dam to run generators. Along the Ohio River, "run of the river" hydro plants are used to produce electricity. These plants have no reservoir of water and the output of power is dependent on the flow of the river. Plants may not run when the water levels in the river are too high or too low.

Landfill gas or methane is naturally produced by the decomposition of the organic refuse buried in landfills across the United States. Previously, either escaping to the atmosphere or flared off, the methane is now collected through piping interwoven through the landfill and pumped to generators designed to run on methane. . With the rising cost of power, demand for renewable

resources and increased regulations governing landfills, the development of landfill gas projects is rapidly increasing in Ohio and across the country.

Solar energy is harnessed directly from the sun's energy and can be used for heat and electricity production. Electricity is generated by photovoltaic (PV) panels commonly known as "solar cells", which convert solar energy from the sunlight into electricity. Wind power, the fastest growing segment of the energy market, generates electricity through the mechanical propulsion of wind turbines powered by the wind current.

Renewable energy can provide important benefits to the State of Ohio as well as local communities. These benefits include:

- Environmental – Most renewable-energy technologies are clean sources of energy that have a much lower environmental impact than conventional-energy technologies.
- Sustainability – Renewable energy by definition is replenishable. Renewable energy will be available for our children's children. Other sources of energy are finite and will someday be depleted or become too expensive to use.
- Economic – Ohio farmers may find additional benefits to renewable energy in the form of production of crops for processing into biomass fuels and land leases for the production of wind energy. Renewable energy investments often support local businesses who supply the manufacturing, installation and service of renewable energy resources.
- Security – Our national dependence on foreign oil supplies leaves us vulnerable to supply disruptions and price fluctuations and complicates our foreign relations.
- Price Stability - Smart investors typically acquire a portfolio of stocks and bonds to reduce risk. Including renewable energy as part of Ohio's power supply portfolio would do the same by protecting consumers from fossil fuel price shocks and supply shortages. The 2001 California energy crisis occurred in part because of a sharp rise in the cost of natural gas, which in turn led to spikes in wholesale electricity prices. During the 2002-2003 winter, natural gas prices surged to record highs across the country – in some places tripling.

RENEWABLE ENERGY IN OBERLIN

The City of Oberlin is committed to developing a portfolio of renewable resources that will provide the city with reliable power at a stable and reasonable cost to its residents. Oberlin is in the enviable position of owning its own municipally-operated electric system. This allows Oberlin to make local decisions on the composition of its power supply that most cities in the United States do not have. Furthermore, as a member of American Municipal Power (AMP), Oberlin has taken the opportunity of being involved in joint power supply projects which the City would not be able to manage or afford on its own. AMP is a full service wholesale power supplier, providing generation, power purchasing, distribution and other electrical utility services for Oberlin and 127 other member municipals in Ohio, Michigan, Pennsylvania, Kentucky, Virginia and West Virginia.

Renewable energy became a key component of the City of Oberlin's power supply beginning in 1994 when the Oberlin City Council voted to join with forty-one other member communities of

AMP to develop the Belleville Hydro Plant, a 42 megawatt run-of-the-river hydro project on the Ohio River. This first renewable project completed in 1999 now provides Oberlin with 7.1% of its annual power supply. This effort has continued with further investments in hydro, wind and landfill gas resources for Oberlin's power supply.

Oberlin's present renewable power supply includes a mix of landfill gas, hydro and wind. Currently, 14.9% of the City of Oberlin's annual power requirements are supplied from renewable resources. Oberlin has accomplished this level of renewable power supply through the joint action efforts of Oberlin and the other municipalities through membership in AMP. The combined efforts of AMP members continue to develop renewable resource opportunities and make greater renewable energy resources available for Oberlin and other AMP members.

In February, 2011 Oberlin City Council approved a long-term purchase power agreement (PPA) through AMP for landfill gas power supply from two Ohio-based landfill projects. These projects are owned and operated by Waste Management, Inc. These projects will replace 56% of the City's fossil-fuel based power supply with clean, renewable energy beginning in 2013.

Following are a list of existing and planned strategies to meet a goal of 100% renewable electric power supply for the City. It should be noted that this amount of renewable energy resources in Oberlin's power supply greatly reduces the impact of GHG emission reductions from electricity related energy efficiency measures.

Strategies to meet the goal of 100% renewable electric power supply:

Strategy: Existing hydroelectric power (JV5 Bellville)
Implementation year(s): 1999 - 2050
Department: OMLPS
Projected GHG reduction: 8182 tons CO2e

The City is a joint owner of the Belleville Hydro Plant, a 42 megawatt hydro facility located on the Ohio River in Belleville, West Virginia. The City owns 1.3 megawatts of generation in this plant supplying approximately 7.1% of the community's annual power requirements.

Strategy: Existing hydroelectric power (NYPA Hydro)
Implementation year(s): 1999-2030
Department: OMLPS
Projected GHG reduction: 1986 tons CO2e

The City receives an allocation of .455 megawatts of Federal preferential hydro power from the New York Power Authority. This hydroelectric power supplies 2.4% of the City's annual power requirements.

Strategy: Future hydroelectric power (AMP Hydro – Phase I)
Implementation year(s): 2013 - 2080
Department: OMLPS
Projected GHG reduction: 9319 tons CO2e

In 2007, the City contracted to purchase 2.6 megawatts of capacity from three new hydroelectric projects under development on the Ohio River by AMP. These plants are located at the Cannelton Locks and Dam, the Smithland Locks and Dam and the Willow Island Locks and Dam. It is estimated that these projects will supply 12% of the City's annual energy requirements.

Strategy: Future hydroelectric power (AMP – Hydro – Phase II)
Implementation year(s): 2014 - 2080
Department: OMLPS
Projected GHG reduction: 2815 tons CO2e

In 2009, the City contracted to purchase .84 megawatts of of capacity from two hydroelectric plants including an existing facility and a new facility presently under construction. The existing facility is located at the Green-up Locks and Dam and the new facility under construction is located at the Meldahl Locks and Dam. It is estimated that these projects will supply 4% of the City's annual power requirements.

Strategy: Existing Landfill Gas Generated power
Implementation year(s): 2010 - 2022
Department: OMLPS
Projected GHG reduction: 3615 tons CO2e

In 2010, the City contracted to purchase .66 megawatts of capacity through AMP from the Erie County landfill gas generation project located near Milan, Ohio. Three cities including Oberlin purchase power from this landfill gas generation project rated at 1.6 megawatts.. This landfill gas generation supplies approximately 4% of the City's annual power requirements.

Strategy: Future Landfill Gas Generated Power
Implementation year(s): 2013 - 2027
Department: OMLPS
Projected GHG reduction: 44,356 tons CO2e

In 2011, the City contracted for 8.1 megawatts of capacity through AMP from Waste Management Renewable Energy, LLC (WMRE) for power supply beginning in 2013. WMRE will develop and construct two landfill gas projects at Ohio-based landfills in Geneva and New Springfield. These two landfill gas projects will supply approximately 56% of the City's annual power requirements.

Strategy: Existing Wind Generation
Implementation year(s): 1999 - 2030
Department: OMLPS
Projected GHG reduction: 360 tons CO2e

The City is a joint owner with nine other communities in a four-turbine wind generation project located in Bowling Green, Ohio. The four wind turbines are rated at an aggregate capacity of 7.2 megawatts. The City's ownership share of the project is .25 megawatts supplying approximately

0.4% of the City's annual power requirements. It is important to note that this joint project developed through AMP was the first utility scale wind farm to be developed and constructed in Ohio.

Strategy: Purchasing Natural Gas Blended With Methane for City Buildings
Implementation year(s): 2009 - ongoing
Department: OMLPS
Projected GHG reduction: 25 CO2e tons

In 2009, the City contracted to purchase its natural gas supply from Integrys Energy Services. Intregrys has a voluntary program, Ecovations™ Renewable Gas which provides 8% renewable gas to be included in a customer's gas supply. This program provides for carbon reduction by using renewable gas and purchasing carbon offsets. In 2010, the City consumed 5,893 MBtu of natural gas which would have had GHG emissions of 314 CO2e tons. The blending of methane reduced the GHG emissions by 25 CO2e tons.

Customer-Owned Solar Generation
Implementation year(s): ongoing
Department: OMLPS
Projected GHG reduction: 183 tons CO2e will increase as customers add solar generation

At the present time there are eight solar array installations in Oberlin. Four of these are on residential homes and four are on commercial buildings. These provide a combined total of 185 kW installed solar. Oberlin developed a net metering ordinance in 2000 to allow customers to tie into the grid. This net metering agreement allows customers to feed power back to the grid when the solar system produces more electricity than what is being used at a given time. Customers who have up to 10 kW of solar receive full credit for the power produced by offsetting usage up to their total annual usage. Customers who install more than10 kW must sign a net metering agreement with the City to install and receive credit for any excess electricity produced. In this case full credit is given for kW hours produced but the standard monthly distribution charge is based on the peak demand of the facility.

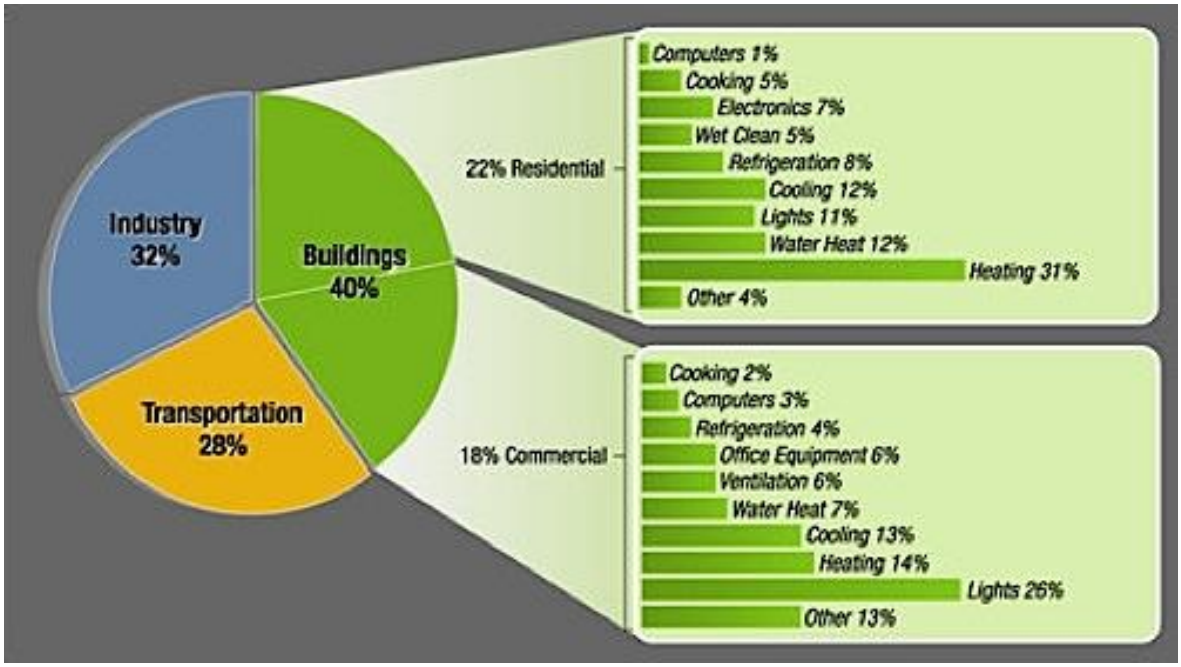
> Codified Ordinances of the City of Oberlin 903.04 (b)(3) Net Metering. *Net metering (an interactive interconnection between the City's utility system and the consumer's electric service panel using a standard kilowatt hour meter capable of registering the flow of electricity in both directions) is allowed when on-site generating capacity does not exceed 10 KW (kilowatts) and is derived from solar power. In cases where capacity exceeds 10 KW, both the customer and utility must sign a net metering agreement before connecting to the utility.*

Spotlight: Sustainable Reserve Fund

The Sustainable Reserve Fund (SRF) was created in 2007 to provide funding opportunities for community-based, utility related, environmentally-friendly initiatives demonstrating energy efficiency, energy conservation, green house gas reductions and/or development of green power generation resources. The SRF was first funded by selling energy attributes to Oberlin College. This fund has continued to grow with selling energy attributes from the landfill gas generated power. Grants from the SRF have been used to insulate low income homes, perform a local wind study, assist in developing a biodiesel fuel station to Oberlin, and purchase solar units from a local manufacturer. This purchase was used as leverage to receive other public and private funding for the manufacturer. The SRF provides the opportunity for further sustainability work including energy efficiency, renewable energy and CO2 reduction to be funded in Oberlin.

Green Building

Buildings are the largest users of energy in the U.S. Building related greenhouse gas emissions are largely attributed to indoor heating, ventilation and air conditioning (HVAC) as well as the efficiency of appliances and other mechanical systems. This includes hot water heaters, dishwashers, washers and dryers, and plumbing fixtures. According to the Department of Energy (DOE) buildings consumed almost 40% of U.S. primary energy in 2006. Electricity made up 74% of all energy used in the building sector and the demand for electricity is expected to increase by 33% by 2030. While the energy usage is divided into various areas within the buildings as shown in the following chart, it provides the opportunity for energy reduction throughout building use. This subdivision of energy use provides the means to identify where efficiency measures can be addressed in both new and retrofit construction.



http://www.jetsongreen.com/2009/08/breaking-down-building-energy-use.html

From the building perspective, it is usually best to approach energy efficiency measures according to the appropriate site or building system. In addition, the greatest savings and performance are obtained through an integrated design process (particularly for new construction). Common areas of focus include:

- Site planning, landscaping & hardscaping
- Building envelope/shell
- Mechanical: HVAC
- Electrical
- Lighting
- Appliances
- Office equipment & plug loads

Further, for those projects that are considering the use of self-generation to cover all or a portion of the thermal and/or electrical loads of the home or business, it is always advised that the facility be made as efficient as possible prior to sizing and procurement of the self-generation system.

Projects should not only "meet" all applicable energy codes, but "exceed" them by using higher efficient systems or incorporate additional measures. Likewise, the owner and design team should consider related green building techniques and sustainable best practices to optimize the total energy and environmental life-cycle impacts of the project. Of particular importance is the opportunity to "do it right the first time" where it is difficult or economically prohibitive to alter the structure after it is constructed and occupied.

Developing and implementing actions to achieve these goals entails continuous improvement in building energy use services offered to the community. This means that minimum standards for energy efficiency in the residential and commercial sectors should continuously be ratcheted up and become more effective at saving energy and money over time.

The green building movement is about building better buildings and more livable communities, not just protecting the environment. Green buildings conserve resources, save money on energy and water bills, provide a more comfortable and healthy environment for building occupants, and are proving to be more valuable than conventional buildings. The City of Oberlin intends on fostering an environment for green construction. Promoting and demonstrating green building practices for new and existing structures are important strategies to reduce greenhouse gas emissions.

Strategy: Standards for future City building
Implementation year(s): 2007
Department: City Council
Projected GHG reduction: public policy and promotion of green building

A policy on green building standards for municipal buildings in Oberlin was proposed and unanimously passed for municipal buildings in 2007.

City of Oberlin Green Building Policy

The City of Oberlin shall incorporate green building principles and practices into the design, construction, and operations of all City facilities, City funded projects and infrastructure projects to the fullest extent possible.

All new construction exceeding 5,000 sq. ft. and major renovations exceeding 1,000 sq. ft. of municipally owned and operated facilities shall be required to meet minimally the U.S. Green Building Council's latest version of LEED Silver Certification.

In addition, the City shall evaluate all land purchases for future development on the basis of reducing environmental impacts that include but are not limited to transit and bicycle

accessibility, urban and brownfields redevelopment, solar access, on-site storm water mitigation capacity and vegetation and habitat restoration.

Furthermore, the City will provide the leadership and guidance to encourage the application of green building practices in private sector development. To this end, the City shall endeavor to resolve any code or other regulatory conflicts with green building practices.

This Policy is expected to yield long-term cost savings to the City's taxpayers due to the substantial improvements in life-cycle performance and reduced lifecycle costs.

Strategy: Track energy consumption in municipal buildings
Implementation year(s): 2011
Department: OMLPS
Projected GHG reduction: continual monitoring and verification

OMLPS contracted with Planet Footprint to collect and manage the utility data usage for the City of Oberlin facilities. Planet Footprint will provide energy use and environmental score keeping through its services by collecting, tracking and reporting on the usage of electric, gas and water for city buildings. Data is collected monthly and reports are available at anytime through their website. Reports are generated and sent to the City when anomalies in usage occur. Planet Footprint also provides a comparison of the usage and best practices of other municipalities. This service will provide the City the means to monitor where municipal energy is being used, how Oberlin compares to other cities and where to focus attention for improvements.

Strategy: Develop a Residential Green Building Program
Implementation year(s): 2012
Department: Planning and Development
Projected GHG reduction: 8 tons CO2e per 2500 sq. ft. building

The State of Ohio building codes limit the ability of cities to set more stringent building codes than what is required by the State of Ohio. This restriction however can be overcome by developing a Green Building Criteria for buildings within the City of Oberlin to be certified green. This certification process would set a standard for green buildings to qualify as green and provide as guideline and protection for buyers in seeking and purchasing green residences.

The code would set minimum standards for the following areas:

Building envelope infiltration
Mechanical systems
Appliances
Lighting
Foundation
Structural Frame
Windows
Doors
Exterior Walls
Roofing
Flooring
Air Quality
Land Use
Material Reduction, Reuse, and Recycling
Water Conservation

Oberlin Fire Station Expansion
Implementation year(s): 2009
Department: Fire Department
Projected GHG reduction: 12 tons CO2e due to 11kW solar array

The Oberlin Fire Department took a leadership role in the design and construction of the recent expansion of the fire department building. This expansion increased the size of the fire station from 7,623 sq. ft. to 19,903 sq. ft. The building expansion and renovation lead to a gold LEED rating. The new building contains the following building components for the LEED certification:

-Solar array – 10.8 kW
-Water runoff collection and pump system for collecting and filtering gray water to flush toilets
-Pervious pavement in any additional paving reducing runoff into nearby stream
-Air to air heat pumps for reduced heating and cooling costs
-Modular green roof system reducing water runoff from the roof and reducing A/C requirements
-Bio swale which collects and slowly drains storm water runoff into soil
-Low VOC paints, floor coverings, ceiling, and adhesives throughout the building

Spotlight: The Oberlin Project

"A collaborative venture among Oberlin College, the City of Oberlin, Oberlin City Schools, and private sector organizations to build a prosperous post-fossil fuel economy."

Oberlin College has initiated an ambitious development named "The Oberlin Project." The project will address many aspects of sustainability including urban revitalization, green development, advanced energy technology, sustainable agriculture and forestry, green jobs and education. Its foundation will include participation with the City of Oberlin, Oberlin City Schools, and private sector organizations to build a prosperous post-fossil fuel economy.

The Oberlin Project has three goals:

- Development of a 13-acre block as a LEED platinum-rated arts district and regional educational catalyst;
- Transition rapidly to a carbon-free energy system including both college and city; and
- Establishing a 20,000 acre greenbelt for agriculture, forestry, biofuels and carbon sequestration.

The center piece of the project is the revitalization of the 13-acre block near the city center which will include the development or renovation of a dozen buildings during the next five to seven years. The investment in construction, renovation, and energy technology will stimulate the expansion of existing businesses and create new enterprises including green technology and agriculture.

Spotlight: Oberlin College Kohl Building Jazz Center

The architectural firm of Westlake, Reed, Leskosky (WRL) designed the $24 million building that includes flexible rehearsal and performance spaces, teaching studios, practice rooms, music archive and exhibits, instrument storage, a lobby, a world-class recording studio, and the largest privately held jazz recording collection in the United States; the latter is a gift from James and Susan Neumann of Chicago, Illinois. Mr. Neumann is a 1958 graduate of Oberlin College.

The firm aspires to achieve the gold Leadership in Energy and Environmental Design (LEED) rating from the U.S. Green Building Council for the Kohl Building. Buildings with LEED certification are determined to be environmentally responsible, profitable, and a healthy place to live and work. The Kohl Building promotes green building practices and sustainable strategies and planning opportunities. Its design intention—to achieve the first LEED gold rating for a facility exclusively dedicated to music—is remarkable given the engineering innovation required to attain such an appellation while meeting the exacting acoustical standards of a music building. The Kohl Building will serve as a pioneering model for sustainability and energy efficiency for music facilities of its type with stringent acoustical requirements.

The following LEED measures have been selected to reinforce and support the programmatic, functional, and operational requirements of the project and the overall environmental goals of the college:

- Energy modeling to significantly improve the building envelope, and identifying the need for increased insulation and high performance glazing systems.
- Use of a geothermal system to meet building heating and cooling needs.
- Building management systems to measure and account for energy consumption over time.
- Design strategies addressing daylighting and thermal comfort with individual controls and provisions for system controllability in multi-occupant spaces to suit group need and preferences
- Upgrading of existing transformer vaults.
- Low flow and sensor activated plumbing fixtures resulting in almost 50% (47.9%) reduction in potable water use below the code minimum baseline.
- Construction administration activities addressing indoor air quality management; construction waste management; use of low emitting sealants, paints, and other coatings; purchasing local/regional materials and materials with high recycled content; and hazardous material abatement at existing building connection.
- Sustainable landscaping features including collected and filtered rain water, rooftop gardens which provide insulation and storm water mitigation.

Solid Waste Management

Waste management is defined as the landfill disposal, recycling, or composting of municipal solid waste. Waste is a non-energy source of greenhouse gas emissions, and municipal solid waste management can contribute to or help mitigate greenhouse gas emissions, depending on how particular types of waste are handled. Because of the anaerobic decomposition that takes place when microorganisms in the waste are not exposed to oxygen, large amounts of carbon dioxide are emitted from landfills. Additionally, as solid waste decomposes in landfills, methane is released into the atmosphere. Methane has a global warming potential 21 times that of carbon dioxide.

Oberlin currently has programs for trash removal, recycling, composting, and brush/leaf removal. The majority of solid waste is collected by the City and transported to the nearby Republic landfill (outside city limits). Estimates of Oberlin's waste composition, adjusted from Lorain County Solid Waste Management District's waste characterization are: 30% paper products, 6% food waste, 3% plant debris, 12% wood/textiles, and 49% other. Seasonal leaves and brush collection are collected by the city and hauled to Oberlin's composting facility near the City's wastewater treatment plant.

Goal: Increase recycling in the residential and commercial sectors

Strategy: Increase Recycling
Implementation year(s): 1994 - Ongoing
Department: Public Works
Projected GHG reduction: 39 tons CO2e

The City of Oberlin has had a residential curbside source-separated recycling program since 1994. Over the last 17 years, this program has been expanded to include transfer services for Oberlin College's co-mingled recycling collection program; commercial corrugated cardboard collection at 30+ sites and limited commercial recycling in the downtown business district. A report prepared in spring, 2010 indicates that approximately 50% - 60% of residents participate in the recycling program; approximately 25% to 33% of participants consistently follow sorting guidelines. In 2010, the City generated nearly $20,000 in revenue from re-sale of cardboard, mixed paper, steel and aluminum. An additional $17,500 is generated from the hauling service provided to Oberlin College. The economics strongly favor the continuation of the City's source-separated program even though evidence from other programs indicates that single-stream recycling would be expected to increase participation and probably quantity of recycled material.

The report targets various actions that would be expected to improve participation in the source-separated recycling collection system. Filling the vacant, part-time Recycling Coordinator position would be expected to improve education/awareness and increase participation by targeting certain audiences that are currently not actively participating. Staff would work to

increase the range of materials collected and expand collection opportunities at apartment buildings (for example). These educational efforts should be coupled with making source-separation mandatory, followed by implementation of mandatory recycling.

***Comparative Data**: The 2008 national average for the percent of waste recovered through recycling and composting was 33.2 percent (MSW 2008 report). Oberlin's average documented recycling rate is about 23 percent, 10 percent lower than the national average.*
Single source recycling has demonstrated great strides in increasing the amount of recycled materials collected and reduced the amount of trash dumped into landfills. Lorain County's largest private hauler introduced single source recycling in 2009. The results have been very encouraging with overall recycled material collected in Lorain County increasing by 100% with single source collection.

Strategy: Reduce Solid Waste Disposal
Implementation year(s): Ongoing
Department: Public Works
Projected GHG reduction: additional research needs to be done to determine feasibility and reduction

The City of Oberlin should consider developing and adopting a Zero Waste Plan. "Zero Waste" describes a closed loop system used primarily in industry in which the byproducts of production and consumption are designed to provide the feedstocks for the fabrication of new products. The zero waste philosophy is increasingly adapted by public sector agencies as a framework to expand public understanding of waste as a misplaced resource.

Transportation

Transportation emissions comprise 15% of Oberlin's greenhouse gas emissions. As the Oberlin population expands and current vehicle ownership and use trends continue, transportation emissions will become a larger proportion of Oberlin's emissions unless action is taken. Oberlin promotes alternative modes of transportation, such as public transit, walking and bicycling. Improving the convenience of these modes of transportation will decrease the use of automobiles and help reduce the carbon footprint in Oberlin due to transportation.

In addition to greenhouse gas emissions, vehicle use has localized effects such as increasing smog, ozone, and particulate matter. Thus, reducing vehicle use is intimately related to the reduction of greenhouse gases as well as the livability and health of a community. Tracking transportation related emissions at a local level is challenging. Sources are widely distributed and determined by numerous transportation decisions made by community residents. Additionally, many transportation policies, such as fuel efficiency and vehicle emissions standards are enacted at the federal, state, and regional levels. Shifting the balance toward sustainable transportation at the local level requires a combination of policies, consumer education initiatives, sustained sources of revenue, and effective incentives. In essence, it requires assembling policies and programs that together will aggressively reduce vehicle miles traveled (VMT) and the associated GHG emissions, while also improving community mobility and quality of life.

Strategy: Anti-idling policy
Implementation year(s): 2010
Department: Public Works
Projected GHG reduction: 113 tons CO2e

The City consumed almost 50,000 gallons of diesel and gasoline in 2009. As a response to both the cost of fuel and the resulting emissions an anti idling policy was implemented for City-owned vehicles and equipment in 2010. The policy limits idling gasoline engines to no more than a 30 second warm-up period and diesel vehicles to a maximum of a 3 minute warm-up period. While some situations and vehicles are exempted from this policy, employees are expected to take responsibly to minimize fleet operating costs and reduce vehicle emissions.

Strategy: Increasing residential and commuter bicycle use
Implementation year(s): 2015
Department: Public Works
Projected GHG reduction: 5 tons CO2e

The North Coast Inland Trail extends over 13 miles linking Kipton and Elyria Through Oberlin.. Passing diagonally through town, the trail provides 3.1 miles of paved, multi-purpose pathway on a separated right-of-way. This pathway has been extended to include a link to the City's Recreation Complex. Additional opportunities for future connections throughout the City remain to be conceptualized, planned and constructed.
One idea was developed in 1997 by a group associated with the Oberlin Historical and Improvement Organization (OHIO). They worked with an architectural firm and developed a

plan which would use part of the North Coast Inland Trail to interconnect the city. The plan composed of three bike loops which would include an outer loop around the fringe of the city, a town loop which would encompass the core of the city including Tappan Square and a Plum Creek loop which would make a recreational trail along Plum Creek. These proposed routes would provide a bicycling or pedestrian means of connecting the residential, downtown, commercial and industrial areas of Oberlin.

Strategy: Fleet Management
Implementation year(s): Ongoing
Department: Public Works
Projected GHG reduction: 2 tons CO2e

Using the E3 Fleet Rating System model developed in Canada, staff will pursue a variety of fleet efficiency improvements expected to include: driver training and awareness; idling reduction, procurement, fueling system management, operations and maintenance, trip/route planning, etc. The goals will be reduced fuel consumption, reduced cost and reduced CO emissions.

Strategy: Alternative Fueling for Vehicles
Implementation year(s): 2015
Department: Public Works
Projected GHG reduction: 27 tons

Research the potential opportunity of re-purposing an existing 2,500 above-ground storage tank for bulk purchase and dispensing of biodiesel fuel for municipal vehicles. Biodiesel fuel consists of vegetable-based oils combined with petroleum based diesel fuel. This mixture reduces emissions compared to straight diesel.

Strategy: Encourage Increase of Electric Vehicles
Implementation year(s): 2011
Department: OMLPS
Projected GHG reduction: 4 tons of CO2e

Included in the upgrade of the street lighting circuit on South Main St. will be two electric vehicle charging stations. These stations will encourage the use of not only local electric vehicles but also those from out of town by providing the means to recharge while in Oberlin.

Strategy: Active Transportation
Implementation year(s): Ongoing
Department: Public Works
Projected GHG reduction: 1 ton CO2e

The City will continue implementation of pedestrian and accessibility improvements in the public rights-of-way and on municipal property. These are often constructed in conjunction with street improvement projects but could include stand-alone projects. These projects provide the necessary infrastructure to improve safe active transportation opportunities. Future

improvements include a pedestrian walk across Park St. Park, accessibility and safety improvements in the North Campus Paving Improvement Project and enhancements for bicyclists.

Strategy: Expansion of Oberlin Connector Shuttle
Implementation year: 2010
Department: City Hall
Projected GHG reduction: 9 tons of CO2e

The City of Oberlin, Lorain Metropolitan Housing and OCS collectively contracted with Lorain County Transit to provide a Community Connector service two days a week, which began in 2010. This service allows Oberlin residents to schedule rides to area medical and social-service appointments and to continue shopping in the area. This service reduces the use of individual automobile trips through friends or taxi services.

Strategy: Safe Routes to Schools
Implementation year: 2011 - ongoing
Department: Public Works
Projected GHG reduction: 77 tons CO2e

The City has received notification that its first ODOT Safe Routes to School grant funding application has been successful. This will fund approximately 7,000' of extension and fill-in of the City's sidewalk infrastructure. The funding will also include traffic signal upgrades and pedestrian accessibility improvements at select intersections.

Spotlight: Biofuel in Oberlin: Full Circle Fuels

Implementation year: 2005
Department: Private business
Projected GHG reduction: 5 tons CO2e per vehicle. Projections based on 5 vehicles per year being converted.

Using vegetable oil in place of diesel fuel reduces greenhouse gases and particulate pollutants, promotes energy independence, supports domestic industry, and can stimulate the economy by saving money and keeping more revenue in local community. In addition vegetable oil is a renewable resource meaning that it comes from plants that were grown last season, not 350 million years ago like oil. By replacing diesel fuel with vegetable oil we can reduce the negative impacts of oil combustion because vegetable oil is a safe, clean and renewable fuel.

In 2005 a recent Oberlin College graduate whose studies were in biodiesel opened Full Circle Fuels in Oberlin. This former gas station now converts diesel vehicles into vehicles that also burn vegetable oil as an alternative fuel source. This oil may be new vegetable oil or it may be used vegetable oil from restaurant and food processing facilities that have been filtered. Full Circle Fuels also sells biodiesel and ethanol from this local facility.

Education

No action is complete without an effective communications program. Simply making information available has limited impact. Oberlin must create an engaging, multifaceted communications program that motivates residents to energy efficiency, sustainability and reducing their carbon footprint. The program must include education on how it can be done, building commitment to the goals, encouraging long term participation, and inviting residents to create and share new solutions. This requires understanding residents' motivations and constraints and designing a program to make climate-friendly choices as attractive as possible. For some residents, saving money is of the greatest concern. For others it is convenience. For others it is concern about the environment or climate change. The City believes that climate action will address all three of these concerns.

The actions and new programs proposed in this section largely build on existing outreach, education, and empowerment efforts in the community. Their goal is to contribute to building a critical mass of Oberlin citizens and businesses engaged in a achieving a community-wide goal.

Strategy: Increase Awareness of Energy Issues in Public Schools
Implementation year(s): 2002
Department: OMLPS
Projected GHG reduction: educational awareness leading to environmental behavioral change

OMLPS purchased an Energy Bike in 2002 to educate students about electricity in the local schools. The bike has a variety of experiments, which teach about energy production and energy efficiency. The Energy Services Division provides demonstrations with the bike in local schools and at various community events throughout the year.

OMLPS also worked with Prospect Elementary School in 2002 to obtain no cost photovoltaic panels and a grant to purchase the mounting equipment for installing a 1 kW photovoltaic solar array at the school. OMLPS provided the design and installation service at no cost to the school. The installation serves the purposes of raising energy awareness of renewable energy and providing a mechanism to help the public school system reduce their energy costs.

Strategy: POWER organization
Implementation year(s): 2008
Department: Public sector
Projected GHG reduction: educational awareness leading to environmental behavioral change

POWER (Providing Oberlin With Efficiency Responsibly) was conceived when a group of concerned citizens realized the cost of moving to green power would initially increase the utility bills in Oberlin and low income residents would be disproportionally affected by this increase in energy costs. POWER's goals are to help reduce the energy consumption of the low income population leading to reduced energy costs and reduced carbon emissions. POWER has raised funds to insulate 21 homes in the first three years of its existence and continues in its mission. The City of Oberlin has awarded the group a total of $37,750 from its Sustainable Reserve Fund,

which is financed by selling renewable energy credits in Oberlin's power portfolio. As POWER's mission expands to reach all population sectors in the community they will be a strong and important resource for sustainable education in the community.

Strategy: Collaboration with Oberlin College
Implementation year(s): ongoing
Department: Various
Projected GHG reduction: educational awareness leading to environmental behavioral change

Oberlin College through various programs and grants brings speakers and programs to the College and community. Speakers have included Amory Lovins from the Rocky Mountain Institute, Doug McKenzie-Mohr, a leader in community-based social marketing, and Christine Todd Whitman, former head of the EPA. A regional Midwest conference of ICLEI, Local Governments for Sustainability, was held at Oberlin College with the promotion, support and funding of the City and College. Working with the College to promote and encourage the community to take advantage of such knowledgeable speakers and organizations provides the community with the knowledge to set goals and further the means of building a sustainable community.

Conclusion

It is recommended that the City of Oberlin set goals of reducing greenhouse gas emissions below 2007 emission levels by 50% beginning in 2015, 75% by 2030 and 100% by 2050. These proposed short and mid-term goals are based on what the City believed to be feasible reductions given monetary, infrastructural and institutional constraints. While the Intergovernmental Panel on Climate Change (IPCC) recommends an 80% reduction from 1990 greenhouse emissions levels by 2050, the long term goal of 100% is based on the City joining the Clinton Climate Positive Development Program in 2010. The long term goal of 100% in 2050 will require diligent research, planning, outreach and execution to reach carbon neutrality.

The vast majority of the GHG emissions reductions in Oberlin for 2015 will be brought about through renewable energy acquisition for the city's electric power supply requirements. This will reduce the entire city GHG emissions by 50% alone. Future reductions in emissions will be attained in much smaller increments. The City does not have direct influence over all sources of GHG emissions and therefore this effort will require action by all stakeholders to attain these goals. Reaching the 100% goal by 2050 will require a concerted effort by the entire city and need methodologies that are on the drawing board, in infancy or yet to be created.

The effort to stabilize man-made greenhouse gases in the atmosphere will require a long-term commitment. The emissions reduction goals that are currently being set on local, national and international levels are the starting point for an unprecedented global effort to lessen the potentially devastating impacts of an environmental problem that can affect every person on this planet. The City of Oberlin believes that this Climate Action Plan is the beginning of one small – but potentially important – demonstration of that capacity. Much of what happens next, and for the next few decades, will depend on the willingness of all the stakeholders to make a commitment to climate protection. Creative ideas and solutions are always welcome.

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Appendices

Climate Action Plan Strategies Reductions by tons CO2e

	Projected 2010 GHG Reduction	Additional Annual Reduction	Reduction by 2015*	Reduction by 2030*	Reduction by 2050*
Energy Efficiency					
Efficiency Smart Power Plant	**1,035**	**-**	**207**	**207**	**207**
OMLPS Heat loss inspections	**275**	**18**	**365**	**635**	**995**
CFL bulb annual give-away promotion	**83**	**83**	**17**	**332**	**332**
DOE Industrial assessment grants	**42**	**-**	**42**	**42**	**42**
Upgrade traffic signals with LEDs	**59**	**-**	**12**	**12**	**12**
Upgrade Christmas lighting with LEDs	**90**	**-**	**18**	**18**	**18**
Lighting upgrades in city buildings	**9**	**9**	**2**	**36**	**36**
Purchase ENERGY STAR office equipment	**2**	**2**	**0.4**	**4**	**4**
OMLPS Power Plant	**444**	**-**	**89**	**89**	**89**
OMLPS Technical Services Building	**24**	**-**	**5**	**5**	**5**
Water Environment Treatment Plant	**176**	**-**	**35**	**35**	**35**
Water Treatment Plant	**48**	**-**	**10**	**10**	**48**
Cemetery and Parks building	**14**	**-**	**14**	**14**	**14**
Efficiency upgrades in city buildings	**7**	**7**	**1**	**28**	**28**
Tree planting on City property	**13**	**13**	**65**	**260**	**520**
POWER	**21**	**8**	**61**	**181**	**341**

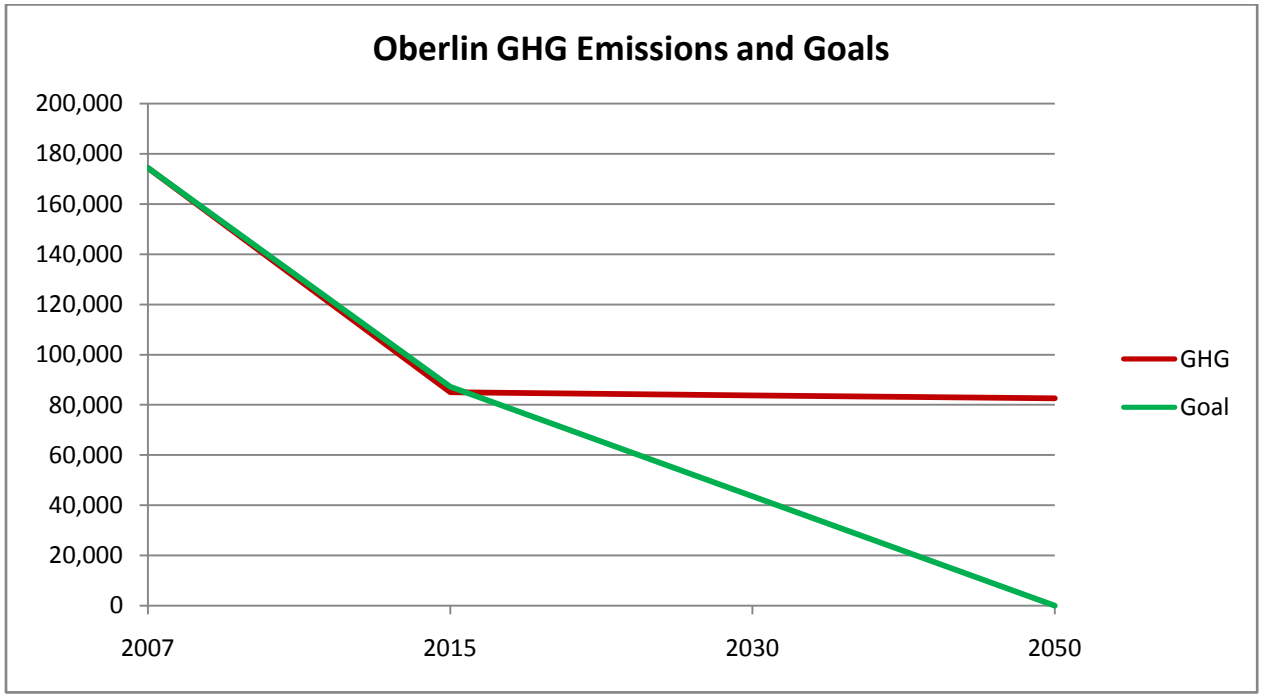
Renewable energy generation					
OMLPS Energy Portfolio	**0**	**-**	**87,440**	**87,440**	**87,440**
City gas supply blended with methane	**25**	**-**	**25**	**25**	**25**
Customer-owned solar generation	**183**	**1**	**188**	**204**	**225**
Green Building					
Standards for future City building					
Residential green building program	**8**	**8**	**40**	**160**	**320**
Oberlin Fire Station Expansion	**12**	**-**	**12**	**12**	**12**
Solid waste management					
Increase recycling	**39**	**-**	**39**	**39**	**39**
Reduce solid waste disposal					
Transportation					
Anti-idling policy	**113**	**-**	**113**	**113**	**113**
Increase residential bicycle use	**5**	**-**	**5**	**5**	**5**
Fleet Management	**2**	**-**	**2**	**2**	**2**
Alternative fueling for municipal vehicles	**27**	**-**	**27**	**27**	**27**
Increase electric vehicles	**4**	**-**	**4**	**4**	**4**
Encourage active transportation	**1**	**-**	**1**	**1**	**1**
Expansion of connector shuttle	**9**	**-**	**9**	**9**	**9**
Biofuel use: Full Circle Fuels	**27**	**-**	**135**	**540**	**1,080**
Safe Route to Schools	**77**	**-**	**77**	**77**	**77**
Education					

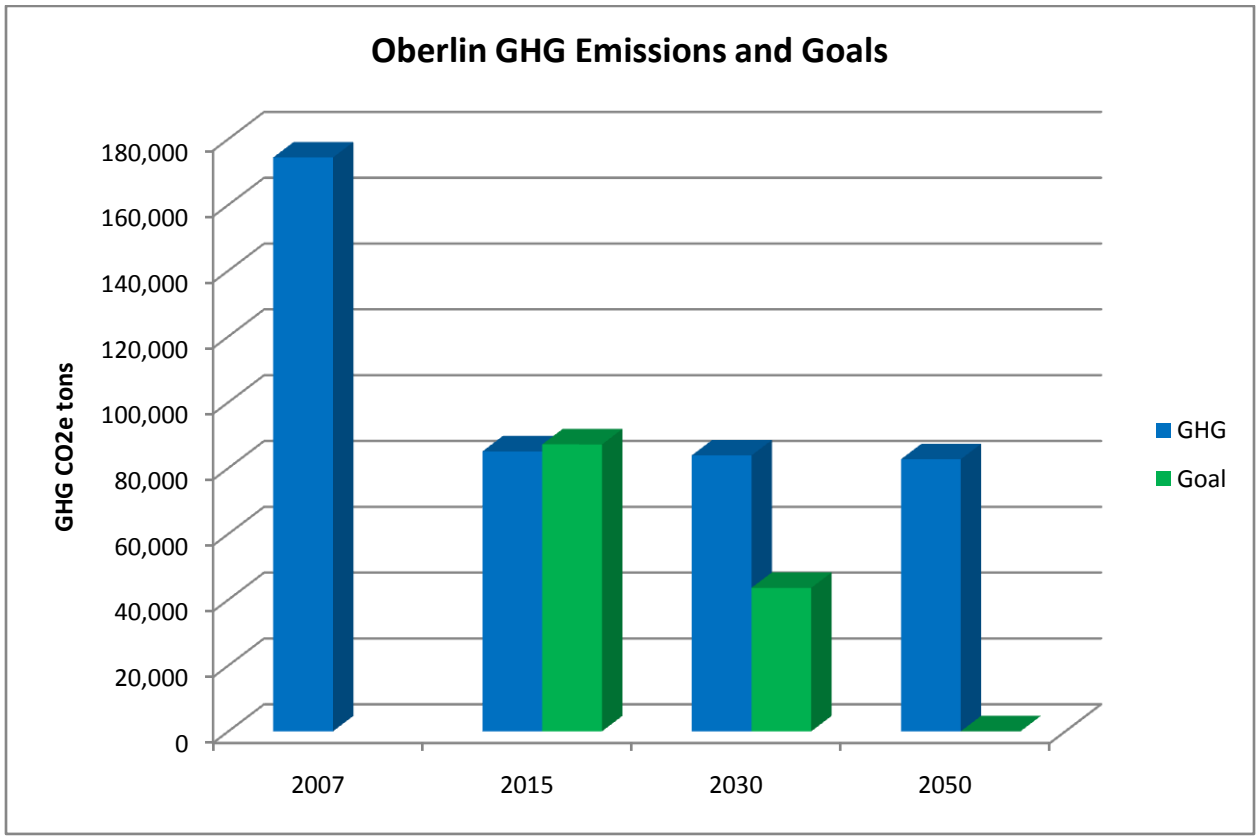
Energy awareness in schools	**Increased environmental awareness leading to behavior change**				
POWER	**Increased environmental awareness leading to behavior change**				
Collaboration with Oberlin College	**Increased environmental awareness leading to behavior change**				
Reduction Totals		**149**	**89,059**	**90,566**	**92,105**
Greenhouse Gas Emissions	**174,391**		**85,332**	**83,825**	**82,286**
Percent reduction			**51.07%**	**51.93%**	**52.82%**

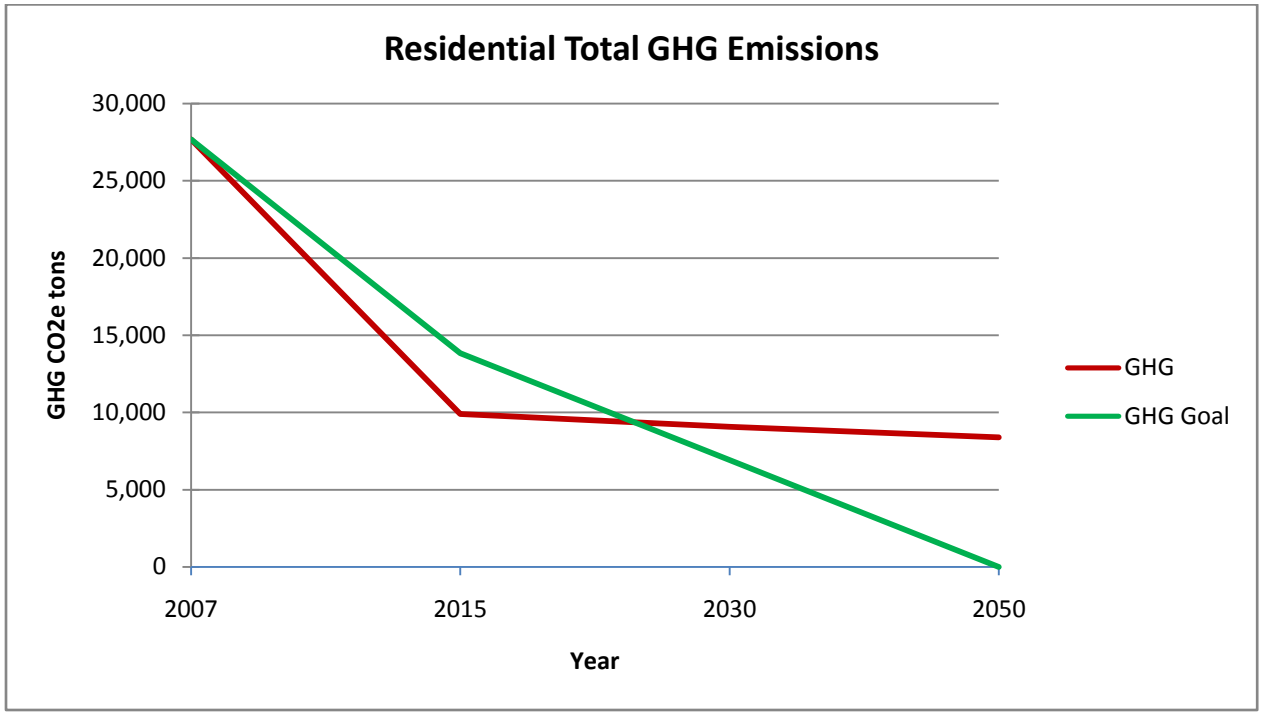
***2015 and beyond assume a power portfolio of 90.5% renewables**

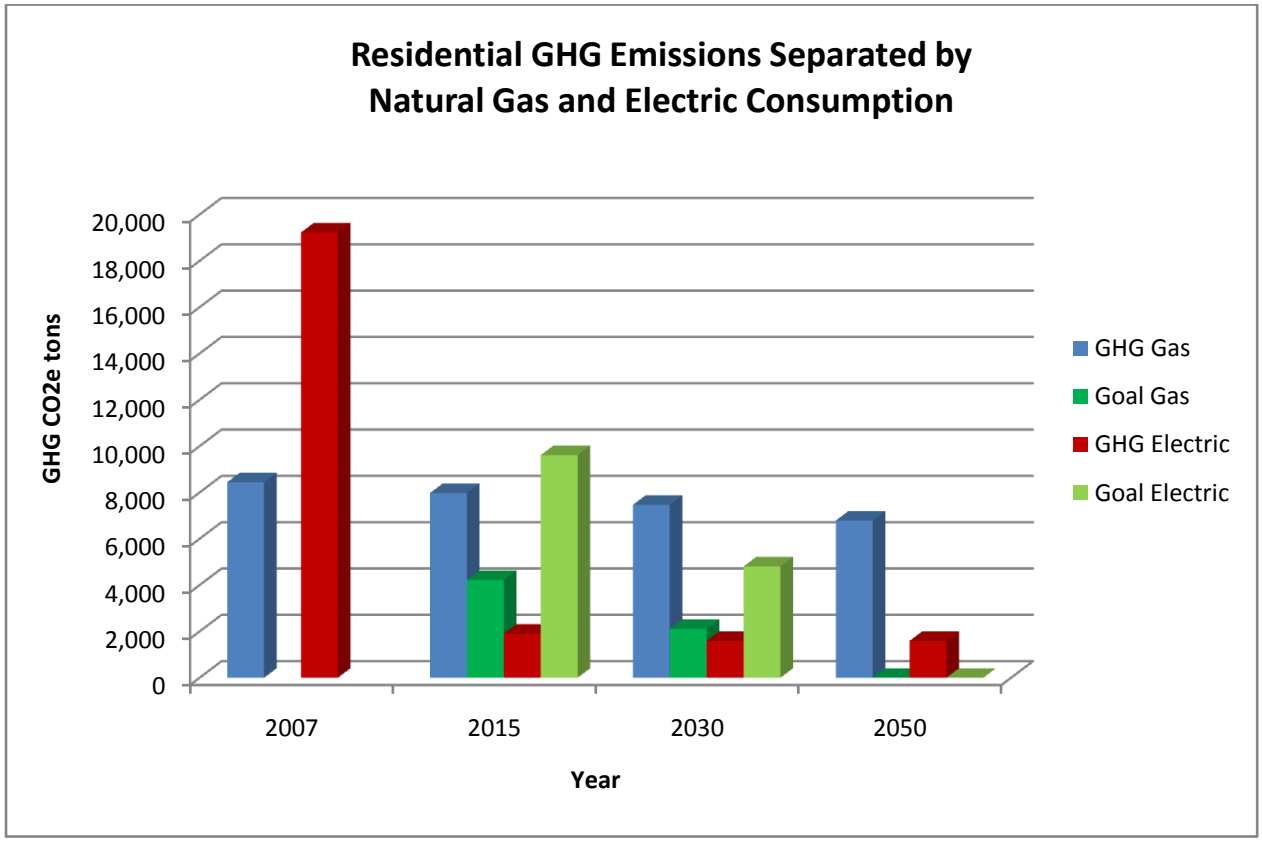
This reduces the impact of the reduction of GHG on electricity energy efficiency measures

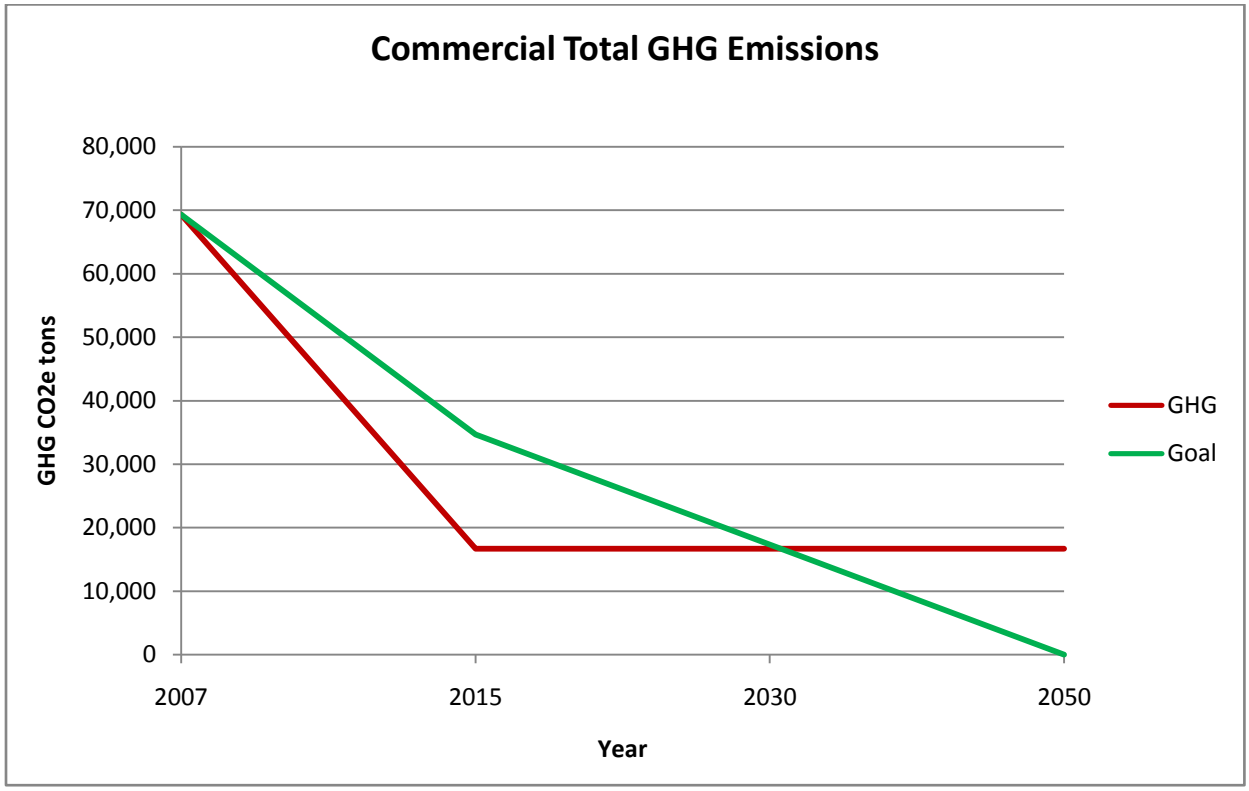
**** This number includes reduced kWh sold in 2015 by 14,000 MWh**

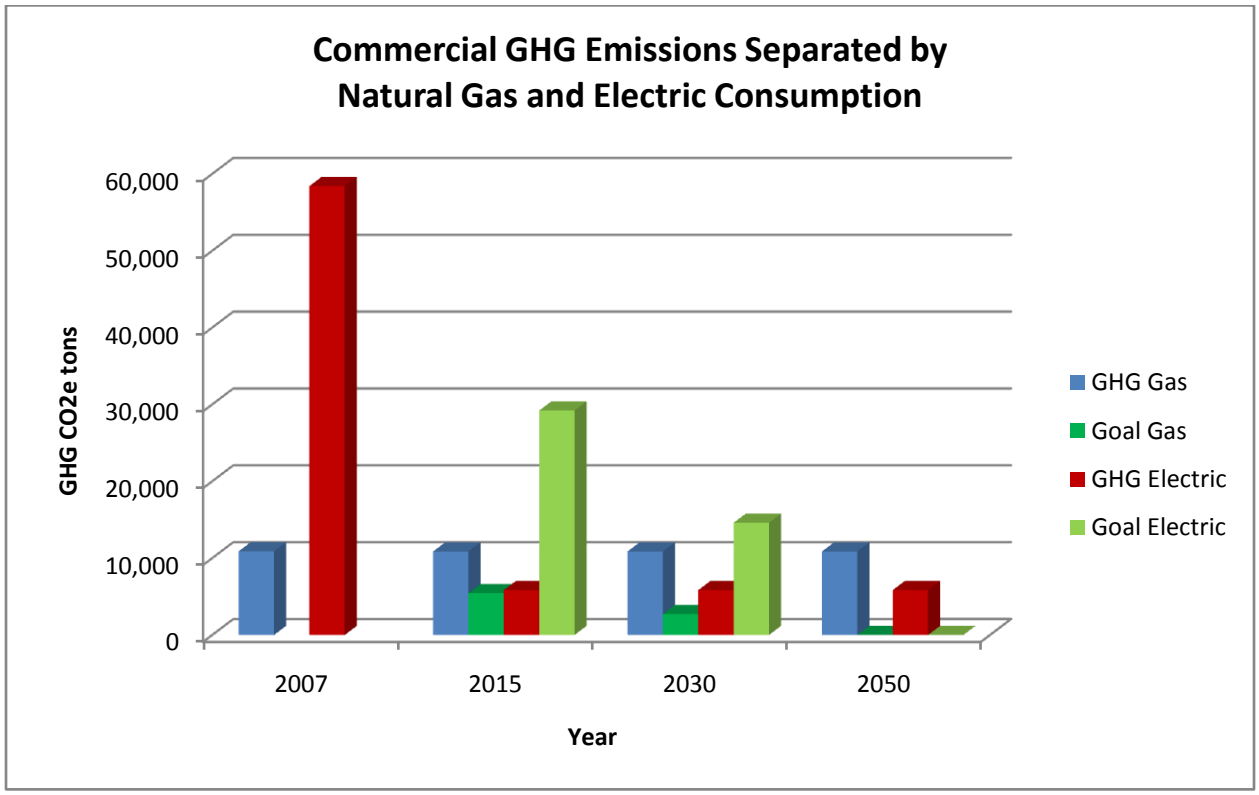

Oberlin GHG Emissions and Goals
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
2007
2015
2030
2050
GHG
Goal

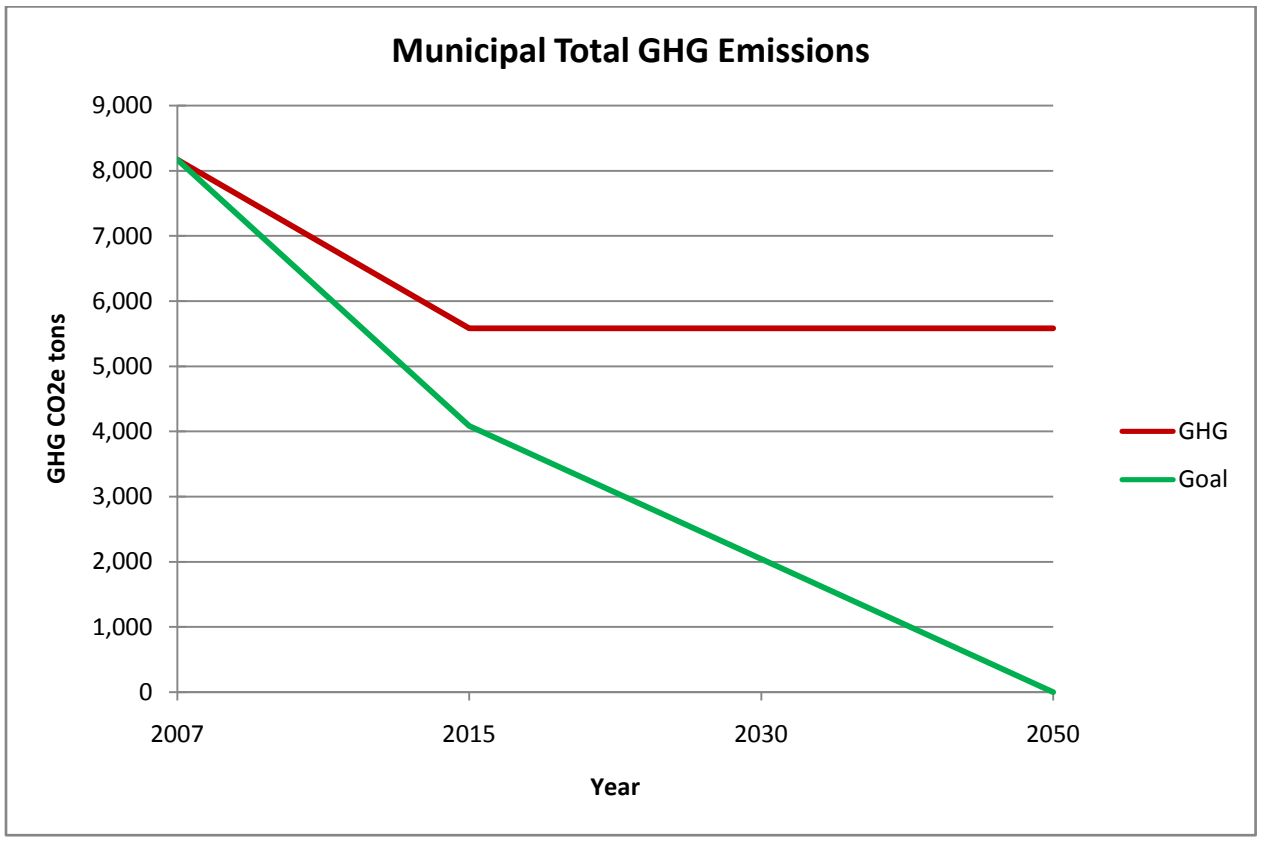

Oberlin GHG Emissions and Goals
GHG CO2e tons
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
2007
2015
2030
2050
GHG
Goal

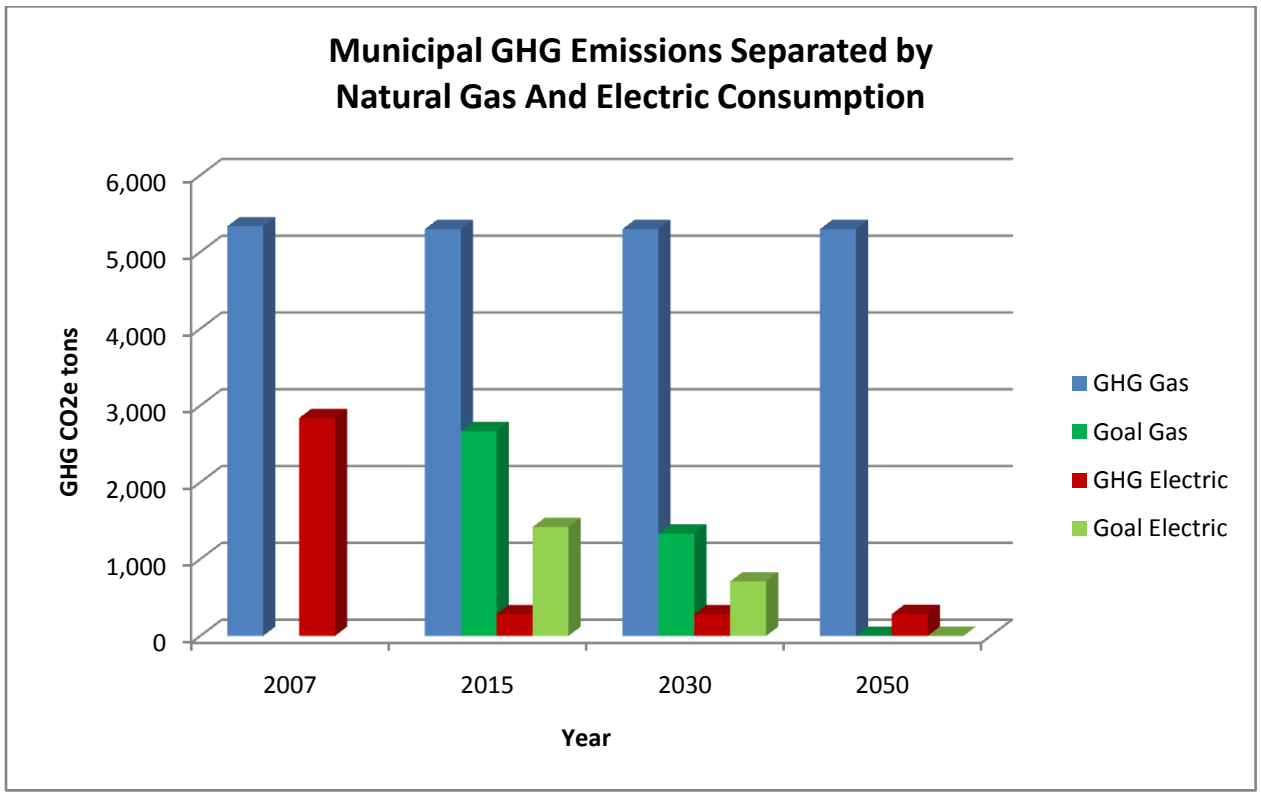

Residential Total GHG Emissions
GHG CO2e tons
30,000
25,000
20,000
15,000
10,000
5,000
0
2007
2015
2030
2050
Year
GHG
GHG Goal

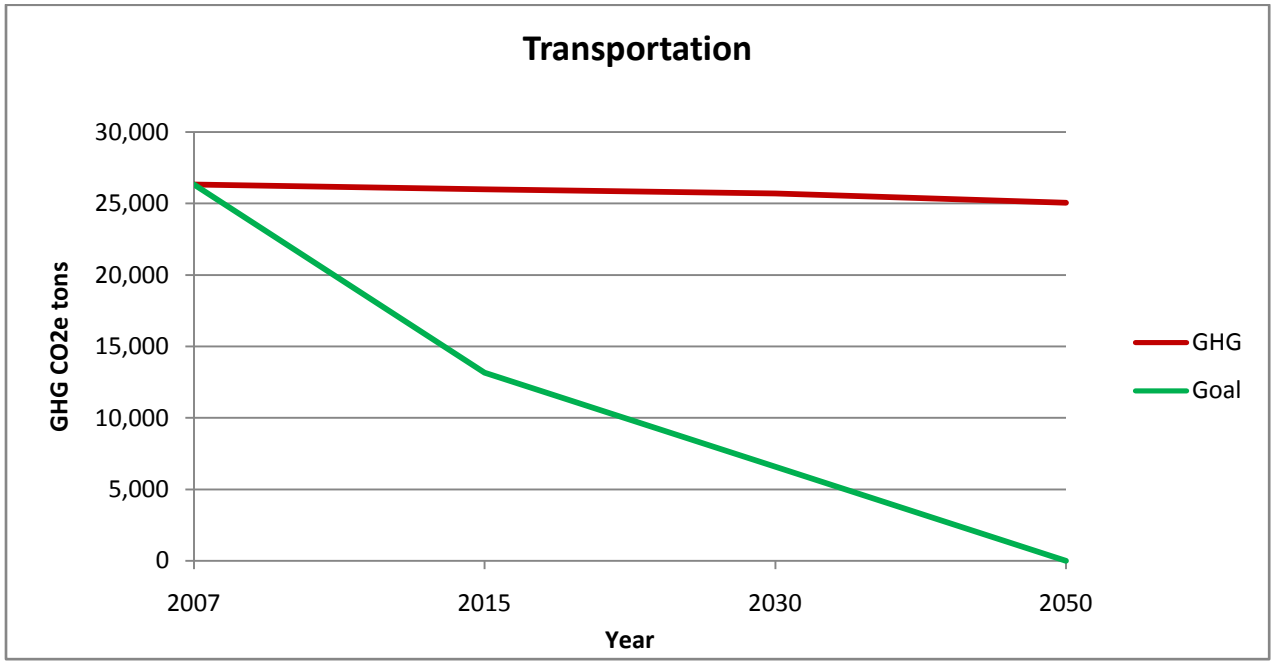

Residential GHG Emissions Separated by Natural Gas and Electric Consumption
GHG CO2e tons
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2007
2015
2030
2050
Year
GHG Gas
Goal Gas
GHG Electric
Goal Electric

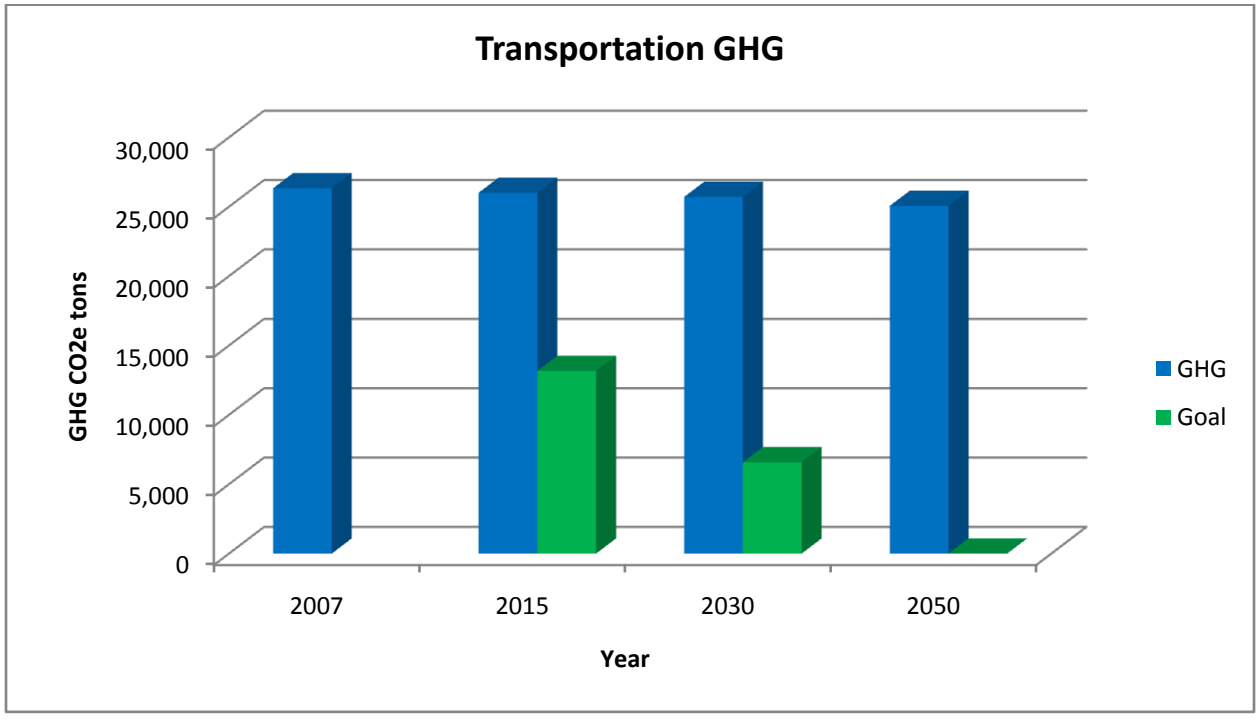

Commercial Total GHG Emissions
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
GHG CO2e tons
2007
2015
2030
2050
Year
GHG
Goal

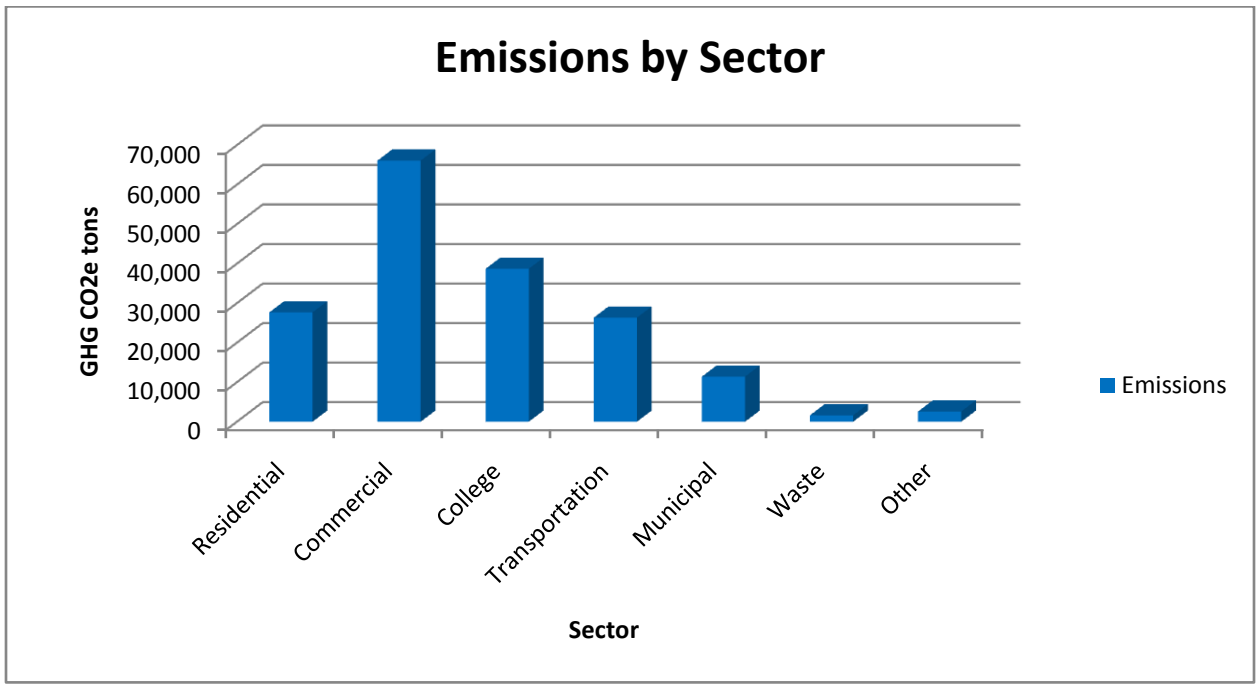

Commercial GHG Emissions Separated by Natural Gas and Electric Consumption
60,000
50,000
40,000
30,000
20,000
10,000
0
GHG CO2e tons
2007
2015
2030
2050
Year
GHG Gas
Goal Gas
GHG Electric
Goal Electric


Municipal Total GHG Emissions
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
GHG CO2e tons
2007
2015
2030
2050
Year
GHG
Goal


Municipal GHG Emissions Separated by
Natural Gas And Electric Consumption
6,000
5,000
4,000
3,000
2,000
1,000
0
GHG CO2e tons
2007
2015
2030
2050
Year
GHG Gas
Goal Gas
GHG Electric
Goal Electric


Transportation
30,000
25,000
20,000
15,000
10,000
5,000
0
GHG CO2e tons
2007
2015
2030
2050
Year
GHG
Goal


Transportation GHG
30,000
25,000
20,000
15,000
10,000
5,000
0
GHG CO2e tons
2007
2015
2030
2050
Year
GHG
Goal


Emissions by Sector
GHG CO2e tons
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Residential
Commercial
College
Transportation
Municipal
Waste
Other
Sector
Emissions

Community Greenhouse Gas Emissions in 2007
Detailed Report

	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential			
Oberlin, Ohio			
Scope 1 - Building Heating			
Natural Gas	8,444	4.8	136,666
Subtotal Scope 1 - Building Heating	8,444	4.8	136,666
Scope 2 - Residential Electricity			
2007 Oberlin Community I	19,227	11.0	62,757
Subtotal Scope 2 - Residential Electricity	19,227	11.0	62,757
Subtotal Residential	27,671	15.9	199,423
Commercial			
Oberlin, Ohio			
Scope 1 - Buildings/Facilities (Non-College, Non-Municipal)			
Natural Gas	10,893	6.2	176,318
Subtotal Scope 1 - Buildings/Facilities (Non-College, Non-Municipal)		6.2	176,318
Scope 1 - Municipal Buildings/Facilities			
Natural Gas	4,653	2.7	75,321
Subtotal Scope 1 - Municipal Buildings/Facilities	4,653	2.7	75,321
Scope 1 - Municipal Water & Wastewater Dept Generators			
Natural Gas	19	0.0	304
Subtotal Scope 1 - Municipal Water & Wastewater Dept Generators		0.0	304
Scope 1 - Oberlin College CHP Plant			
Coal	16,645	9.5	153,363
Natural Gas	827	0.5	13,384
Subtotal Scope 1 - Oberlin College CHP Plant	17,472	10.0	166,747

This report has been generated for Oberlin, Ohio using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

Community Greenhouse Gas Emissions in 2007
Detailed Report

	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Scope 1 - Oberlin College Non-CHP Heating			
Natural Gas	5,464	3.1	88,438
Subtotal Scope 1 - Oberlin College Non-CHP Heating		3.1	88,438
Scope 1 - OMLPS Power Plant			
Light Fuel Oil	81	0.0	980
Natural Gas	582	0.3	9,423
Subtotal Scope 1 - OMLPS Power Plant	663	0.4	10,402
Scope 2 - Electricity (Non-College, Non-Municipal)			
2007 Oberlin Community I	58,415	33.5	190,665
Subtotal Scope 2 - Electricity (Non-College, Non-Municipal)		33.5	190,665
Scope 2 - Municipal Electricity			
2007 Oberlin Community I	2,837	1.6	9,260
Subtotal Scope 2 - Municipal Electricity	2,837	1.6	9,260
Scope 2 - Oberlin College Non-CHP Electricity			
Solar	0	0.0	496
2007 Oberlin College Elec	15,761	9.0	83,944
Subtotal Scope 2 - Oberlin College Non-CHP Electricity		9.0	84,440
Subtotal Commercial	116,177	66.6	801,895
Transportation			
Oberlin, Ohio			
Scope 1 - Transportation			
Gasoline	21,727	12.5	254,178
Diesel	4,604	2.6	53,038
Subtotal Scope 1 - Transportation	26,330	15.1	307,216
Subtotal Transportation	26,330	15.1	307,216

This report has been generated for Oberlin, Ohio using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

Community Greenhouse Gas Emissions in 2007
Detailed Report

	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Waste			
Oberlin, Ohio			
Scope 3 - Leaves & Brush Collection			*Disposal Method - Compost*
Plant Debris	-76	0.0	
Subtotal Scope 3 - Leaves & Brush Collection	-76	0.0	
Scope 3 - Solid Waste			*Disposal Method - Managed Landfill*
Paper Products	1,553	0.9	
Food Waste	290	0.2	
Plant Debris	-21	0.0	
Wood/Textiles	-124	-0.1	
Subtotal Scope 3 - Solid Waste	1,698	1.0	
Subtotal Waste	1,622	0.9	
Other			
Oberlin, Ohio			
Scope 1 - Fugitive Emissions: Community Refrigeration			
Carbon Dioxide	1,360	0.8	
Subtotal Scope 1 - Fugitive Emissions: Community Refrigeration		0.8	
Scope 1 - Fugitive Emissions: Electric Maintenance			
Sulphur Hexafluoride	418	0.2	
Subtotal Scope 1 - Fugitive Emissions: Electric Maintenance		0.2	
Scope 1 - Fugitive Emissions: Vehicle A/C			
HFC-134a	814	0.5	
Subtotal Scope 1 - Fugitive Emissions: Vehicle A/C	4	0.5	
Subtotal Other	2,592	1.5	
Total	174,391	100.0	1,308,534

This report has been generated for Oberlin, Ohio using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

RESOLUTION NO. R01-08 CMS

A RESOLUTION ADOPTING A SUSTAINABILITY POLICY FOR THE CITY OF OBERLIN, OHIO

WHEREAS, in April 1997 the City of Oberlin and the Environmental Studies Program of Oberlin College with the generous support of the Nord Family Foundation co-sponsored a Symposium on Sustainable Development; and

WHEREAS, a recommendation emerged that the City of Oberlin adopt a policy of sustainability; and

WHEREAS, on January 8, 2000, at a Council retreat, vision statements for the City were agreed upon; and

WHEREAS, these included that the city strive "to be unsurpassed in its environmental/sustainable viability" and to encourage a "sustainable economic and physical environment"; and

WHEREAS, issues related to community sustainability cut across jurisdictional borders and political boundaries; and

WHEREAS, sustainable development accounts for the needs of present and future generations, encourages energy conservation, local economic development, and works towards a greater quality of life for the community; and

WHEREAS, sustainable development policy will enable Oberlin to build on and protect its unique historical character, quality of life, and vital downtown economy through promoting, local economic development, environmental quality and community participation; and

WHEREAS, sustainable development practices can provide positive alternatives to many issues that threaten the economic stability, environmental quality and community vitality of Oberlin and Lorain County.

NOW THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF OBERLIN, County of Lorain, State of Ohio, a majority of all members elected thereto concurring:

SECTION 1. Sustainability as defined by the United Nations Commission of Environment and Development "meets current needs without compromising the ability of future generations to meet their needs". The City of Oberlin is committed to promoting a sustainable future by accepting the responsibility to:

- Support a stable, diverse and equitable economy;
- Protect the quality of the air, water, land and other natural resources;
- Conserve, where possible, and enhance ecosystems; and
- Minimize adverse human impacts on local, regional and worldwide ecosystems.

SECTION 2. Sustainability Principles: City elected officials and City staff will, to the best of their ability, uphold the following principles in carrying out their duties:

2.1 *The concept of sustainability will guide City policy and actions.* The City of Oberlin is committed to meeting its current needs without compromising the ability of future generations to meet their own needs. The City will endeavor to ensure that each of its policy decisions and programs are interconnected through the common bond of sustainability as expressed in these principles. The long term impact of policy choices will be considered as we work to promote a sustainable legacy.

2.2 *The City will lead by example.* The City of Oberlin has an opportunity and responsibility to set an example for others by operating its facilities and services in a sustainable manner. The City is committed to evaluating its current practices and programs with respect to sustainability. The City is committed to developing strategies and seeking community partnerships for implementing sustainable practices.

2.3 *The quality of the environment and the health of the economy are interdependent.* A healthy environment is integral to the long-term economic interest of the City. The City will encourage individuals, businesses, government, and community-based groups to consider the potential impacts of their activities within the context of this policy on sustainability.

a) The City will be responsive to the maintenance and protection of the visually appealing historic character of Oberlin while supporting public spaces that protect the natural environment.
b) The City will encourage the local production and use of goods and services.
c) The City will support minimizing the production and disposal of materials which degrade the quality of the atmosphere, the soil and water.
d) The City will promote and continue to maintain quality housing for all citizens (that is compatible with its infrastructure) and is sensitive to resource and energy efficiency.
e) The City will support land-use and transportation designs that support pedestrian or non-motorized modes of travel.
f) The City will promote energy efficiency and resource conservation.
g) As we protect the health of the environment and provide for the expansion of the local economy, we will ensure that inequitable burdens are not placed on any one geographic area or socio-economic sector of our community.

a) Citizen interaction is critical to community and to a sense of belonging.

b) The City will continue to facilitate citizen participation in the development of solutions to problems and to develop land use patterns that support the relationship among residential, agricultural, institutional, commercial, industrial and open space.

2.5 *Local actions have regional, national and global implications.* Oberlin does not exist in isolation; it is part of a larger community of interests. The City will support model environmental programs and innovative approaches to economic development that demonstrate our linkages to the regional, national and global communities and ecosystems.

SECTION 3. It is hereby found and determined that all formal actions of this Council concerning or relating to the adoption of this Resolution were adopted in an open meeting of this Council, and that all deliberations of this Council and of any of its committees that resulted in such formal action, were in meetings open to the public in compliance with all legal requirements, including Section 121.22 of the Ohio Revised Code.

SECTION 4. That this Resolution shall take effect at the earliest date allowed by law.

PASSED: 1st Reading - April 2, 2001
2nd Reading - April 16, 2001 (Amended)
3rd Reading - May 7, 2001 (Effective in 30 days)

ATTEST: Eugene F. Simon
CLERK OF COUNCIL

Francis M. Baumann
CHAIR OF COUNCIL

POSTED: May 8, 2001

EFFECTIVE DATE: June 30, 2001

City of Oberlin, Ohio

RESOLUTION No. R11- 09 CMS

A RESOLUTION ADOPTING THE 2011 CITY OF OBERLIN CLIMATE ACTION PLAN

WHEREAS, in 2001, the Oberlin City Council adopted Resolution R01-08 CMS adopting a Sustainability Policy for the City of Oberlin that adopted the following principles to guide elected officials and City staff in carrying out their duties:

First, the concept of sustainability will guide City policies and actions,
Second, the City will lead by example,
Third, the quality of the environment and the health of the economy are interdependent,
Fourth, community participation is fundamental to successful implementation of sustainability policies and programs, and
Fifth, local actions have regional, national and global implications; and

WHEREAS, in 2007 the City of Oberlin joined ICLEI, the International Council for Local Environmental Initiatives, and committed itself to achieving five milestones for climate protection:

Milestone 1 - Conduct a baseline greenhouse gas emissions inventory
Milestone 2 - Adopt an emissions reduction target
Milestone 3 - Develop a Local Climate Action Plan
Milestone 4 - Implement policies and measures
Milestone 5 - Monitor and verify results, and

WHEREAS, in 2009, Milestone 1 was achieved as the City's greenhouse gas inventory was completed and staff of the Oberlin Municipal Light and Power System, under the direction of the City Manager and with the concurrence of the City Council, proceeded with Milestone 2 and 3 through the development of a Climate Action Plan for the City of Oberlin; and

WHEREAS, in 2010, the City of Oberlin signed a Memorandum of Understanding with the Clinton Climate Initiative committing the City to "work with urgency to achieve the goal of reducing the City of Oberlin's GHG Emissions below zero through the implementation of economically viable innovations in a combination of strategies" and to co-develop a collaborative work plan to achieve climate positive goals; and

WHEREAS, adoption of this Plan will guide the City of Oberlin's efforts to reduce greenhouse gas emissions in the short and long-term; and

WHEREAS, the 2011 Climate Action Plan demonstrates the City's commitment to effective planning and to reducing greenhouse gas emissions by 2050.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Oberlin, County of Lorain, State of Ohio, a majority of all members elected thereto concurring:

SECTION 1. That the Council of the City of Oberlin hereby adopts the 2011 City of Oberlin Climate Action Plan.

SECTION 2. That the Council of the City of Oberlin hereby adopts the following Greenhouse Gas Reduction Targets based on 2007 Greenhouse Gas Emission inventory levels:

50% Reduction of Greenhouse Gas Emissions by 2015
75% Reduction of Greenhouse Gas Emissions by 2030
100% Reduction of Greenhouse Gas Emissions by 2050

SECTION 3. That the Council of the City of Oberlin hereby establishes the Oberlin Climate Action Committee for the purpose of preparing an annual update to the City's Climate Action Plan. The Chair of the committee will be appointed by City Council. The Oberlin Climate Action Committee shall strive to include representatives from facets of the community and city government in its membership to foster broad-based support. The committee will meet at least once per quarter beginning in the first quarter of 2012.

SECTION 4. The City Manager shall report to the City Council on a periodic basis, but no less frequently than once during each year on the progress made to achieve the goals of the Climate Action Plan.

SECTION 5. It is found and determined that all formal actions of this Council concerning or relating to the adoption of this Resolution were adopted in an open meeting of this Council and that all deliberations of this Council and of any of its committees that resulted in such formal action, were in meetings open to the public in compliance with all legal requirements, including Section 121.22 of the Ohio Revised Code.

SECTION 6. That this Resolution shall be in full force and effect from and after the earliest period allowed by law.

PASSED: 1st Reading – October 3, 2011
2nd Reading – October 17, 2011 (Tabled)
2nd Reading – November 21, 2011(Amended)
3rd Reading – December 5, 2011 (A)(E)(F)

To enable implementation of the Climate Action Plan before the end the year.

ATTEST:

BELINDA B. ANDERSON,CMC
CLERK OF COUNCIL

SHARON F. SOUCY
ACTING PRESIDENT OF COUNCIL

POSTED: 12/06/2011

EFFECTIVE DATE: 12/05/2011