



AGENDA

Sustainability Commission Meeting

7:00 PM - Monday, August 12, 2019
City Hall

Page

- I. CALL TO ORDER
- II. ROLL CALL
 - Commissioner Heine
 - Commissioner Drennen
 - Commissioner Bayha
 - Commissioner Foley
 - Commissioner Greenwald
 - Commissioner Cannon
 - Commissioner Gibbons
 - Commissioner Collins
 - Commissioner Michalowski
- III. AGENDA APPROVAL
- IV. INTRODUCTIONS
- V. PRESENTATIONS
 - A. Creating opportunity and affordability in Ypsilanti with solar energy - Dave Strenski, SolarYpsi
 - B. Non-Motorized Advisory Committee report and discussion - Bob Krzewinski, Chair
 - C. A discussion on Opportunity Zones - Bonnie Wessler, City Planner
- VI. PUBLIC COMMENT (3 MINUTES)
- VII. CONSENT AGENDA
 - A. Approve the minutes of July 8, 2019 3 - 10
[Sustainability 7-8-19 Reg Minutes](#)
- VIII. WORK SESSION 11 - 189
 - A. Sustainability Plan Work Session
 - University Town Plans**
 - [Bloomington Indiana Plan](#)
 - [Holland Sustainability Report](#)
 - [Washtenaw County 2019 Energy and Sustainability Plan](#)
 - [Eau Claire Wi Sustainability Plan](#)
 - [Eau Claire Wi Other Sustainability Provisions](#)
 - [Oberlin 2013 Sustainability Plan](#)
 - [Oberlin 2015 Sustainability Plan Update](#)
- IX. RESOLUTIONS/MOTIONS/DISCUSSIONS

A.	WCRC roadside herbicide spraying discussion Termination of Herbicide Spraying Program Roadside-Herbicide-Spraying-Flyer Washtenaw County Road Commission and herbicides rev2 Certified Resolution R-19-327 - Washtenaw County Road Commission	191 - 204
B.	Open Meetings Act discussion Open Meetings Act—Email Quorum Violation	205
C.	Curbside Recycling Update Discussion August 7, 2019 News Flash	207 - 208
X.	COMMISSIONER REPORTS	
XI.	PUBLIC COMMENT (3 MINUTES)	
XII.	PROPOSED BUSINESS	
XIII.	ADJOURNMENT	



MINUTES

City of Ypsilanti SUSTAINABILITY COMMISSION MEETING One South Huron Street Ypsilanti, Michigan 48197

Monday, July 8, 2019
7:00 P.M.

I. CALL TO ORDER: 7:00 p.m.

II. ROLL CALL

Keith Michalowski	Present	Nancy Heine	Present
Emily Drennen	Present	Julia Bayha	Present
Bryan Foley	Absent	Katy Greenwald	Present
Christian Cannon	Present	Beth Gibbons	Absent
Takunia Collins	Present		

Also Present: Council Liaison Steve Wilcoxon
City Planner Bonnie Wessler
Commission Recording Secretary Nancy Hare-Dickerson

III. INTRODUCTION

IV. AGENDA APPROVAL

Heine (Second: Drennen) moved to approve the Agenda as submitted.

Voice Vote: Unanimous

Motion: Carried

V. PRESENTATIONS

A. Zero Waste Presentation with Lauren Koloski, Washtenaw County Environmental Supervisor
Washtenaw County Public Works--Solid Waste Division, Environmental Supervisor Lauren Koloski, provided a Zero Waste Events presentation, touching on the following topics:

1. What is Zero Waste
2. Understanding what is involved before starting a Zero Waste Journey
3. Purchasing the correct materials
4. Support factors; i.e., materials, volunteers, clear signage
5. Reducing, reusing, recycling, recovery and disposal
6. Considerations in planning the Zero Waste event

Query/discussion followed as to the purchase/cost of Clear Stream containers, compostable bags; the set-up of washing stations to wash recycling to avoid contamination; the shortest planning time needed for small events; recycled polyester; how the issue of outside containers brought into an Event vs inside containers going into the receptacle are addressed; laminated signage; proper disposal for latex gloves used for cleaning or by medical/police professionals; how to better address industries re: the proper disposal of bottles, glass beverage/wine/alcohol containers and large amounts of oil from restaurants;

Styrofoam disposal; the background of how Zero Waste Events was first initiated; and Zero Waste events which have taken place in other areas.

Ms. Koloski indicated that the goal of her office is to help reduce the amount of waste that goes into our landfills. She asked that the Commission provide a couple of month's notice if they wish to do a Zero Waste Event so she can attend meetings and discuss the details.

Commissioner Greenwald indicated that she runs the Environmental Science program at Eastern and that they have students who are looking for internships or volunteer experiences. Ms. Koloski acknowledged appreciation.

B. Non-Motorized Advisory Committee with Bob Krzewinski, Chair – Not Present [To be heard August 2nd]

VI. AUDIENCE PARTICIPATION- none

VII. CONSENT AGENDA

A. Approval of June 10, 2019 minutes

Heine (Second: Greenwald) moved to approve the Minutes as submitted.

Voice Vote: Unanimous

Motion: Carried

VIII. WORKING SESSION

A. Sustainability Plan Framework

1. ICLEI membership Resolution and ClearPath

Commissioner Michalowski: Updated the Commission with the following information – that the Sustainability Plan is being viewed as a chapter of the Master Plan; that the meetings that will be held for the public will be Master Plan meetings with the Sustainability Plan as well. Stated that in regards to the Greenhouse Gas Inventory, that the Commission can become a member of a group called ICLEI. Stated that ICLEI has a software tool available for its members called ClearPath which will allow easier tracking of the data. The cost of the membership is \$600 a year. *[Discussion re: budget considerations/availability of funds]*

City Planner Wessler: Stated that a great deal of technical assistance also comes with the ICLEI membership, both in educational and promotional materials. Stated that with the ICLEI membership, once the Greenhouse Gas Inventory is completed, that modeling can also be done.

[In answer to query, explained and discussed examples of what can done with the models]

[Discussion re: budget considerations/availability of funds for Sustainability oriented memberships]

Commissioner Michalowski: Asked why was this not included in the original agreement, the \$12,000 that is being paid.

City Planner Wessler: Stated that they probably were not aware that we were not a member.

Commissioner Collins: Asked if, looking at \$600/year for three years, it would be wise to ask for an increase in the budget in order to have funds for other activities.

Commissioner Heine: Stated that with the current budget being for membership/subscriptions, asked if a new budget plan could be created.

City Planner Wessler: Stated that budget items can change over time at the discretion of Council and that the next budget process is coming up at the beginning of next year. Stated that if the Commission determines that the ICLEI membership is valuable, the \$600 line item can be maintained and then a different \$1,000 line item could be requested for other activities.

Responding to query, stated that staff recommends that, at least for this year, the Commission approve the expenditure of \$600 for the ICLEI membership.

Commissioner Collins: Asked if that calendar year would be considered a year out from today or just for five months.

City Planner Wessler: Stated that she expects that it is a rolling twelve months. Stated that the budget year runs from July to June.

[Discussion continued re: fiscal year vs calendar year as to funds availability and membership duration]

Commissioner Collins: Asked if the data would be in real time.

City Planner Wessler: Stated that the data would not be in real time. Stated that work is done with DTE in order to get the data for both the City's use and for looking for aggregate use and with vendors for things like fuel use, for example. Stated that in order to get data or update it, the data would have to be pulled and put into the tool. Stated that these are long term bar scale changes that we are aiming for. Stated that a year-over-year comparison is probably relatively useful but probably not even going to be as useful as a five-year-to-five-year comparison.

Commissioner Michalowski: Asked if there is a specified plan of maintaining for the software that the Sustainability Commission would be paying for.

City Planner Wessler: Stated that there is not a current plan to maintain. Stated that she will look into trying to get a lot of this data more clear.

Commissioner Drennen: Expressed a concern about previous difficulties getting good community data from DTE.

Commissioner Collins: Asked if this will be a continuous software that will stay in business in the next three years.

City Planner Wessler: Stated that it is actually software that is completely run by ICLEI. Stated that ICLEI created ClearPath and that they are the ones offering it and selling it. Stated that all of the data that goes into ClearPath, we can get back out, so that if we do need to go with something other than ClearPath in the future, we will still have the raw data.

Commissioner Collins: Asked if the City will be selling the data to a third party.

City Planner Wessler: Stated that to the best of her knowledge, no. Stated that a lot of it is not our data.

Commissioner Cannon: Asked if the data is obtained from a commercial standpoint, a residential standpoint or from a mixture of both.

City Planner Wessler: Stated that it will probably vary by the data type and will probably be a mix of both.

Commissioner Michalowski: Asked if the Commission will have access to the software.

City Planner Wessler: Stated that she would hope so, to at least view.

Commissioner Michalowski: Stated that he will get more clarifying information re: the time frame of the membership from date of purchase.

Commissioner Collins: Asked if there is a plan B for a second option.

City Planner Wessler: Stated yes, that the consultant would use Excel, which can be challenging in creating spreadsheets to work with and in generating reports.

Commissioner Cannon: Asked what other cities have adopted this software.

City Planner Wessler: Stated, a lot. Stated that the software is pretty popular.

Commissioner Collins: Asked if they don't allow the option to buy the whole year and if it is prorated, do we take the prorated rate and then deal with it next year.

Commissioner Michalowski: Stated, yes. Stated that the software is needed now for the contractors to do the Greenhouse Gas emissions portion of the Sustainability Plan.

Council Liaison Wilcoxon: Asked if we still have the STAR subscription for three years.

Commissioner Drennen: Stated that it was \$1000/year. Explained that we paid for a year and then, within that year, STAR Communities ceased to exist and merged with LEED. Stated that LEED for Cities is somewhat similar to what STAR Communities used to be. Stated that LEED is different from ClearPath, in that it is a reporting platform whereas ClearPath is more of a reporting for greenhouse gas inventory. Indicated that she wrote an email to LEED asking what do we still have. Indicated that she will update the Commission when that information is received.

Commissioner Michalowski: Read Resolution No. 2019 - 07- 001, dated July 8, 2019 into the record:

"RESOLVED BY THE SUSTAINABILITY COMMISSION OF THE CITY OF YPSILANTI:

Whereas, the City is proceeding with a Greenhouse Gas Inventory, and; Whereas, the ICLEI makes available a software for use in creating such inventories to its membership, amongst other benefits; and

Now therefore be it resolved that the Sustainability Commission authorizes \$600 to be expended from account 101-7-7290-958-00 (General Fund: Sustainability Commission: Memberships and Dues) for ICLEI membership."

Drennen (Second: Cannon) moved to approve Resolution No. 2019 - 07- 001 for the authorization of \$600 to be expended for ICLEI membership.

Discussion: [Consensus to add the following language "*membership for the first year*"]

Greenwald (Second: Cannon) moved to approve Resolution No. 2019 - 07- 001, as amended, for the authorization of \$600 to be expended for ICLEI membership for the first year.

Discussion: Commissioner Michalowski: Indicated that although he is disappointed that it worked itself out in the way it did, that it is still an overall benefit.

Commissioner Cannon: Indicated agreement with Commissioner Michalowski and stated that it is a step forward to becoming a greener city. Asked who would be essentially managing the software.

City Planner Wessler: Stated that she would probably be the main staff contact, at least until there is a chance to talk things out with the DPS director. Stated that the consultant will have access to it in order to upload the data and to generate the reports that are needed. Stated that she will see if she can get at least "View Only" access for the Commission so we can all be on the same page.

Commissioner Michalowski: Asked if how the data was obtained will be documented so that it can be replicated in the future.

City Planner Wessler: Stated, yes.

Voice Vote: Unanimous

Motion: Carried

Commissioner Michalowski: [*Reference the folder of plans provided by Commissioner Drennen*] Stated that we have a contractor who is going to work with us but, with budget considerations, we have to find some middle ground and have to establish what is important to us and have to make sure those things are in there.

City Planner Wessler: Indicated tweaking the draft goals and visions as needed. Stated her desire to schedule a separate meeting, such as an open house or a town hall to which the public can be invited and hash out what the public also wants to see. Encouraged commissioners to attend the visioning session on Thursday, July 11th and/or email thoughts/questions/comments to her.

Commissioner Michalowski: Expressed opinion that the process is moving faster than it should for what is being done. Encouraged commissioners to get any info into the visioning session and make sure that there is engagement with the Plan approach.

B. 2019-2020 Commission Goals

Commissioner Michalowski: Explained that based on discussion from the June meeting and a review of the previous goals list, he created a draft Goals Resolution. In answer to query, explained that when we are thinking about what should we be doing, we look to our goals.

Commissioner Drennen: Asked about the MGC silver level.

Commissioner Heine: Stated that two more were answered than we needed for the bronze level.

Commissioner Michalowski: Stated that the silver level is the one that requires the greenhouse data that Commissioner Heine was working on. Stated that he will look over where we are at and quantify it. Stated that silver may still be something we may be able to get ourselves towards and, if we cannot, we should be able to have a list of things that says "this is why we don't have and this is what we should do to get there".

Commissioner Greenwald: Suggested making the goals more specific/quantifiable. *[Discussion ensued as to possible language to achieve more specificity and ideas for ways to accomplish goals]*

Greenwald (Second: Cannon) moved to approve Resolution No. 2019 - 07- 002 Defining the 2019-2020 Goals of the Sustainability Commission.

Voice Vote: Unanimous

Motion: Carried

IX. RESOLUTIONS/MOTIONS/DISCUSSIONS

A. WCRC Roadside Herbicide Spraying Discussion

Commissioner Michalowski: Stated that he was contacted by people with concerns about the roadside herbicide spraying. Stated that he reached out to the Road Commission, who indicated that they do not spray the City of Ypsilanti. Stated that the Road Commission indicated not being able to attend the Commission meeting to discuss it. Stated that the Road Commission indicated there is an opt-out process. Stated that he is bringing the issue before the Commission to garner thoughts, concerns and to see if there is a desire to put anything together to pass on to Council that the Commission disagrees with the spraying and would like it not to continue. Stated that Ypsilanti is still affected even if the Road Commission indicates they do not spray within the City limits.

Commissioner Greenwald: *[Initiated discussion re: WCRC opt-out language]*

Commissioner Drennen: *[Initiated discussion re: "City of Ann Arbor Council Resolution R-19-327 to Reduce Herbicide Use"]*

Commissioner Collins: Indicated that it should be discussed further, in addition to a plan of action because of the long-term effects.

Commissioner Michalowski: Stated that he is all for putting together something to move forward on this.

[Discussion ensued re: best way to proceed]

Commissioner Heine: Asked if it can be confirmed whether it is Ypsilanti Township or Ypsilanti City.

Commissioner Michalowski: Stated that he will look into that confirmation.

City Planner Wessler: *[Initiated discussion re: different road jurisdictions]*

Commissioner Collins: Stated that we have to lead by example. Stated that if we are working for sustainability to improve Ypsilanti, we have to make a stand.

Commissioner Drennen: Stated that we can even extend it further and say that as a member of this county, we do not want spraying in our county. Stated that we are not just standing up for the citizens of Ypsilanti – we are saying Washtenaw County Road Commission should not be doing this spraying anywhere, in our opinion.

Commissioner Bayha: Stated that it would help if we started by declaring our own city exempt from it, so that we would have a more legitimate voice to the whole county.

Commissioner Cannon: Indicated agreement.

Commissioner Greenwald: *[Initiated discussion re: the chemicals used in the herbicide spraying]*

Commissioner Michalowski: Asked for a volunteer to do some research and put together a resolution on the subject to be discussed at the next meeting. *[Commissioner Heine volunteered]*

X. COMMUNICATIONS- none

XI. LIAISON REPORTS

A. Housing Affordability & Accessibility Committee Report

[Commissioner Foley Absent]

B. EMU Sustainability Commission Report

Commissioner Greenwald: Indicated no new updates.

C. MGC Challenge Report

Commissioner Michalowski: Indicated no new updates.

D. Plan Steering Committee Report

[Discussed during Working Session – A. Sustainability Plan Framework]

E. Perry School Solar Power Project Report

Commissioner Cannon: Updated the Commission regarding having met with a Board of Education Trustee and an upcoming meeting scheduled with the Perry School Director of Facilities to discuss the project in more detail. Indicated that he continues to work on the grant funding to support the project.

Also indicated that he was informed of the possibility of solar installation at the new Ypsilanti Library being built in Superior Township.

XII. COMMISSIONER REPORTS

A. Commission Heine- none

B. Commissioner Drennen- none

C. Commissioner Bayha

Indicated that she was asked to attend and provide recycling at the Rutherford Pool Ice Cream Social on Thursday, July 25th and asked for a volunteer that would be available to assist. *[Discussion as to time and availability of commissioners]*

D. Commissioner Foley- absent

E. Commissioner Greenwald- none

F. Commissioner Cannon- none

G. Commissioner Gibbons- absent

H. Commissioner Collins

Presented the idea of the Commission teaching people about sustainability by promoting the carrying of canvas bags, and offering the bags for sale as a fundraiser for the sustainability program. *[Discussion re: cost/the integrity of materials used in the product]*

Commissioner Michalowski indicated he would look deeper into allowances and restrictions of the Commission.

Commissioner Drennen indicated that Legals would need to weigh-in as well.

I. Commissioner Michalowski-none

Council Liaison Wilcoxon: Stated that he received an email from Bob Krzewinski, Chair of the Non-Motorized Advisory Committee, who indicated that he had the presentation listed on his calendar for tomorrow but now has put August 2nd on his calendar to present for the Commission.

[See V. Presentations – B.]

XIII. AUDIENCE PARTICIPATION

XIV. PROPOSED BUSINESS

XV. NEXT MEETING DATE

Monday, August 12, 2019

XVI. ADJOURNMENT: 9:21 p.m.

Heine (Second: Bayha) moved to adjourn the meeting of the Sustainability Commission.

Voice Vote: Unanimous

Motion: Carried

WASHTENAW COUNTY

Office of Infrastructure Management

Energy and Sustainability Plan



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Executive Summary

Why are we doing this and what are our goals – below is the outline on how we plan to get there.

Sustainable – adjective – Definition: relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged.

Net-Zero – adjective – Definition: resulting in neither a surplus nor a deficit of something specified when gains and losses are added together.

The goal of the energy and sustainability plan is to create a net-zero infrastructure portfolio by 2035. We must ensure our organization is managing the resources we use each day in a sustainable method so that resources are not depleted or permanently damaged. Protecting the environment from overconsumption or wasteful behavior will drastically help as our population grows. This is important for the future generations to thrive in a healthy environment. Many of the Earth's resources are vulnerable because of human activity. It will require everyone in our organization to participate to be successful. Our culture needs to change in order for us to accomplish our goal by 2035. OIM believes that we can reduce our environmental impact without sacrificing safety or comfort.

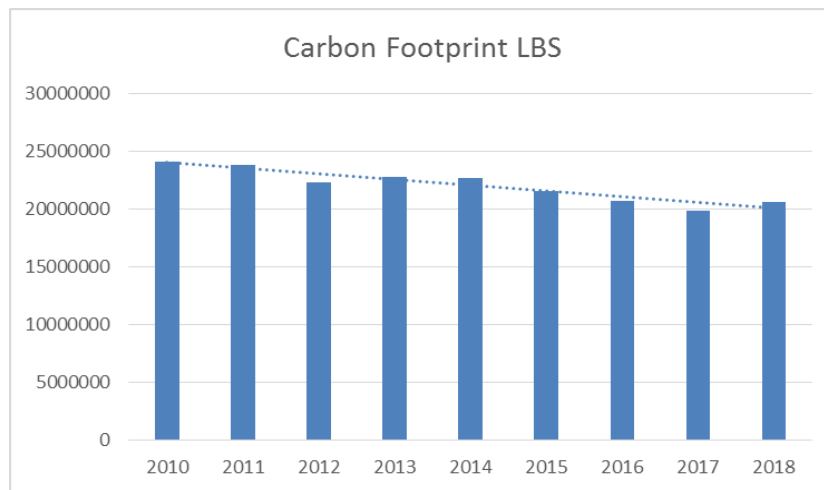
There is a monetary value associated with reducing the amount of resources used by large organizations such as ours. When we reduce the need for resources required to do business we lower our cost of doing business. There are also environmental benefits to practicing sustainability. Reducing our carbon footprint and our landfill waste are just a few ways we can save money and the environment at the same time. New technology is making it possible to reduce energy needs while at the same time creating a more comfortable and productive environment for our staff and the citizens we serve.

The information below reflects what OIM can accomplish with our existing resources. It also explores how we can achieve our goal of net-zero operations if we had additional resources and revenue to support energy and infrastructure projects.

Carbon Footprint

Existing budget:

Staying within OIM's current budget we can achieve a 40% county wide carbon footprint reduction by 2035 using 2010 as a baseline. In 2010 OIM created 24,048,137 lbs of carbon. By 2018 we reduced our carbon footprint by 17%. This was accomplished by educating building occupants, strategic energy management, energy projects, space plan projects, implementing HVAC and lighting standards, and optimizing building management systems. OIM also took advantage of the DTE rebate program and rolled all the rebates awarded into the Energy Coordinators energy fund. These additional rebate dollars have helped OIM with LED lighting upgrades that wouldn't have been possible without the additional funding.



Washtenaw County can easily reduce our carbon footprint by 5-10% over the next 15 years by implementing easy low-cost, no-cost methods. First steps to achieving net-zero operations is to identify energy waste. Leaving energy consuming items “on” while the item or building is not in use is a huge waste of energy. The best watt saved is the watt that wasn’t used. When computers, printers, coffee makers, TV’s, computer & monitors, lights & lamps aren’t turned off at the end of each day it adds to our carbon footprint and our energy bill. Developing a culture where employees share electric devices such as: printers, scanners, coffee makers, microwaves and refrigerators can also greatly reduce energy use. Banning personal employee appliances like space heaters, mini-fridge, coffee makers, microwaves, humidifiers, dehumidifiers, air fresheners, lamps, toasters, toaster ovens, decorative lights, hot plates, oversized fans, popcorn makers also reduces energy loads. There has been no limit or restrictions on what type of electrical devices employees or building occupants can bring from home and utilize while working within county facilities. There is an overwhelming number of devices in county facilities that pose a risk to the building. Implementing a policy that limits such devices would create a safer and less energy intense environment.

Electricity

Existing budget:

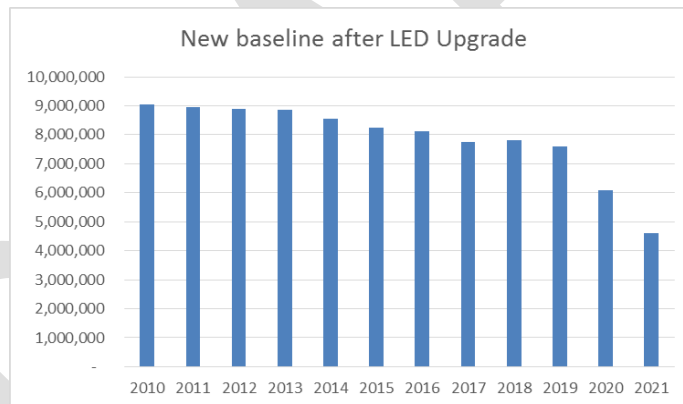
Reduction goals – OIM can achieve a 45% county wide reduction in electric use by 2035 using 2010 as a baseline. In 2010 OIM operated buildings used 9,909,461 KWH of electricity. By 2018 we achieved a 24% reduction in energy use while staying within the parameters of our existing budget. We strategically layered in energy efficient technology during planned projects and renovations. Dynamic energy projects and strategic energy management helped the county reduce our electric cost by 35%.

Phase 1 – Proposed Lighting Project:

Goal - Achieve net-zero operations by 2035. This goal is not achievable under our existing budget.

Lighting:

Once we have eliminated as much energy waste as possible, the next steps to getting our existing facilities to net-zero is to update all of our interior lighting to LED. We also need to add lighting controls such as daylight, dimming and occupancy sensors for additional efficiency. All of our existing exterior lights has been converted to LED. Approximately 25% of our existing interior lights have been converted. The cost to replace all light fixtures for our remaining space is around \$730,000 for fixtures. At our current staffing level it would take OIM 20 years to complete the upgrade county wide. Hiring a contractor to do the work would cost approximately 1,200,000. OIM would need an additional \$500,000 to add lighting controls to areas that don't currently have dimming, occupancy or daylight sensors. The cost savings would exceed \$350,000 annually. The project would pay for itself in 6.5 years. This payback doesn't include the cost of deferred labor, consumables or disposal of old fluorescent light bulbs and ballasts. Based on customer feedback the new LED lights help the building occupants perform their daily tasks more efficiently. The results of this lighting project would be a 54% county wide reduction in energy use by the end of 2021 when compared to 2010.



Phase 2 – Proposed Renewable Energy

Photovoltaic – Goal of generating 100% of OIM electric need using renewable energy such as solar, wind, geothermal or biomass generation.

The next steps on our journey to net-zero is to add solar arrays to our infrastructure. Solar panels require land to install arrays. The chart below outlines our solar ground mounted potential at each location that has enough acreage for solar.

Building Address	Building KWH Use 2018	KW Solar Needed	Production (KWH/Yr)	Cost to Install	Cost of KWH Generated	Payback Years	Acreage needed
4101 Washtenaw Ave, Community Corrections, Ann Arbor	103,360	52	67,092	\$ 104,000.00	\$ 8,051.04	12.92	0.080
4125 Washtenaw Ave, Children's Services, Ann Arbor	540,048	270	348,360	\$ 540,000.00	\$ 34,836.00	15.50	0.413
4135 Washtenaw Ave, LRC, Ann Arbor	126,080	105	135,473	\$ 210,000.00	\$ 16,256.76	12.92	0.161
2201 Hogback Rd, + 4133 Correctional Facility, Ann Arbor	3,022,520	1360	1,806,279	\$ 2,720,000.00	\$ 144,502.32	18.82	2.081
2155 Hogback Rd, Veteran Affairs, Ann Arbor	91,280	45	59,767	\$ 90,000.00	\$ 7,172.04	12.55	0.069
705 North Zeeb, Western Service Center, Ann Arbor	392,704	195	258,988	\$ 390,000.00	\$ 31,078.56	12.55	0.298
2140 East Ellsworth Rd, CSTS, Ann Arbor	399,570	200	265,629	\$ 400,000.00	\$ 31,875.48	12.55	0.306
1000 North Maple, 14A-4 District Court, Saline	68,560	35	46,485	\$ 70,000.00	\$ 5,578.20	12.55	0.054
TOTAL	4,744,122	2,262	2,988,073	\$ 4,524,000.00	\$ 279,350.40	16.19	3.462

The KW solar needed at each location is based on a 40% decrease in electricity needs after the lighting project is complete. The proposed solar arrays would be net-metered with DTE. Our strategy is to create enough solar power during the day to offset the electrical needs at night or when the sun isn't shining. When a net-metered building produces more power than it consumes it pushes the extra green power back into the grid for others to use. The power sent to the grid then becomes a credit. These credits are sold back to us at a rate of .747 cents per KWH.

We also have the potential to install solar panels on roofs. Since solar panels can last up to 25+ years it's a good strategy to install solar after a roof has been replaced. The chart below outlines the size, solar potential and age of each roof under OIM management. Payback for roof top is 22+ years.

Building Address	Roof Sq Ft	Solar Array Potential	Roof Top Production (KWH/Yr)	Roof Top Revue	Cost to Install (\$3 Watt)	Carbon Footprint Reduction LBS	NOTES
110 N Fourth County Annex	5,683	-	-	-	-	-	No room for solar on this roof.
200 North Main	8,220	15	19,116	\$ 2,293.92	\$ 45,000.00	38,232	6-8 years of roof life, 10kw existing - could add 5kw more
220 North Main Administration	13,073	7	8,921	\$ 1,070.52	\$ 21,000.00	17,842	6-8 years on roof - solar hot water on roof - has skylights
101 East Huron, Downtown Courthouse	41,226	7	8,921	\$ 1,070.52	\$ 21,000.00	17,842	Cooling tower and solar hot water - 7-10 years on roof
312 West Huron, Delonis Center	6,704	25	31,860	\$ 3,823.20	\$ 75,000.00	63,720	10+ years of roof life, based on 1/4 of roof size,
4101 Washtenaw Ave, Community Corrections	8,250	41	52,250	\$ 6,270.00	\$ 123,000.00	104,500	3-4 years of roof life, based on 1/3 roof size,
4125 Washtenaw Ave, Children's Services	35,394	132	168,218	\$ 16,821.80	\$ 396,000.00	336,436	6-8 years of roof life, existing solar hot water, based on 1/4 roof size
4133 Washtenaw Ave, 14-A1 District Court	28,697	108	137,633	\$ 16,515.96	\$ 324,000.00	275,266	6-8 years of roof life, based on 1/4 roof size
4135 Washtenaw Ave, LRC	8,581	32	40,780	\$ 4,893.60	\$ 96,000.00	81,560	6-8 years of roof life, skylight, based on 1/4 roof size
2201 Hogback Rd, Correctional Facility	123,291	462	588,764	\$ 47,101.12	\$ 1,386,000.00	1,177,528	0-8 years of roof life, solar hot water on roof, based on 1/4 roof size
2155 Hogback Rd, Veteran Affairs	22,225	116	147,828	\$ 17,739.36	\$ 348,000.00	295,656	3-5 years on metal roof, 50% of metal roofing used for calculation
4100 Clark, Safe House	-	-	-	-	-	-	No room for solar on this roof.
415 West Michigan Ave, 14A-2 District Court	17,783	66	85,830	\$ 10,299.60	\$ 198,000.00	171,660	6-8 years of roof life, has skylight, based on 1/4 of roof
555 Townner Street, Human Services	28,500	120	156,055	\$ 18,726.60	\$ 360,000.00	312,110	2-8 years of roof life, skylights, based on 8000 sq ft,
22 Center Street, State Human Services	24,369	91	118,341	\$ 14,200.92	\$ 273,000.00	236,682	3-5 years of roof life, skylights, based on 1/4 roof
750 Townner Street, Community Support & Treatment	9,772	-	-	-	-	-	0-6 years of roof life, lots of skylights - no room for solar
705 North Zeeb, Western Service Center	14,152	52	67,624	\$ 8,114.88	\$ 156,000.00	135,248	6-8 years of roof life, has skylight, based on 1/4 of roof
122 South Main Street, 14A-3 District Court	2,452	7	8,921	\$ 1,070.52	\$ 21,000.00	17,842	3-5 years of roof life, skylights, based on 1/4 roof section 1
2140 East Ellsworth Rd, CSTS	31,791	119	154,361	\$ 18,523.32	\$ 357,000.00	308,722	10+ years of roof life, based on 1/4 of roof size,
1000 North Maple, 14A-4 District Court	8,044	30	38,982	\$ 4,677.84	\$ 90,000.00	77,964	6-8 years of roof life, based on 1/4 roof size
TOTAL	438,207	1,430	1,834,405	\$ 193,213.68	\$ 4,290,000.00	3,668,810	

Alternate DTE options:

DTE is offering a Voluntary Green Purchase program. The cost to participate is 7.2 cents per KWH. If we were to purchase our electricity on this program it would create an additional 60% increase in electric cost.

Natural Gas

Existing Budget:

Reduction goals – 2% per year – weather based normalization.

Phase 3 – Future Renewable Energy Proposal

If the goal is to be true net zero we would need to convert all our existing HVAC that runs on natural gas to electricity. The estimated KWH use increase is 9,241,276 KWH – which would require 3,700 acres of land to install 9.241 MW of solar. The cost to power the electric grid at the VGP rate would be an additional \$1,755,842.44. It is our hope that over the next few years technology will provide more options for natural gas to electric conversions.

Cost To Convert HV/AC Equipment to All Electric					
Building Address	Year Constructed	Assigned Sq Ft	Whats done	Whats left to do (sq/ft)	Cost to upgrade
110 N Fourth County Annex	1904	32,852		32,852	\$ 1,314,080.00
200 North Main	2000	43,515		43,515	\$ 1,740,600.00
220 North Main Administration	1907	26,303		26,303	\$ 1,052,120.00
220 East Huron, City Center Building (Lease space)	1965	11,800		11,800	\$ 472,000.00
101 East Huron, Downtown Courthouse	1954	118,130		118,130	\$ 4,725,200.00
312 West Huron, Delonis Center	2003	22,751		22,751	\$ 910,040.00
4101 Washtenaw Ave, Community Corrections	1975	16,863		16,863	\$ 674,520.00
4125 Washtenaw Ave, Children's Services	2002	35,313		35,313	\$ 1,412,520.00
4135 Washtenaw Ave, LRC	1974	7,983	Done	-	\$ -
2201 Hogback Rd + 4133 14A-1 Court/Correctional	1978 / 2010	164,012		164,012	\$ 6,560,480.00
2155 Hogback Rd, Veteran Affairs	1982	18,635		18,635	\$ 745,400.00
4100 Clark, Safe House	1994	30,308		30,308	\$ 1,212,320.00
415 West Michigan Ave, 14A-2 District Court	1970	28,486		28,486	\$ 1,139,440.00
555 Towner Street, Human Services	1985 / 1991	64,636		64,636	\$ 2,585,440.00
22 Center Street, State Human Services	1990	44,682		44,682	\$ 1,787,280.00
750 Towner Street, Community Support & Treatment	1968	14,953		14,953	\$ 598,120.00
705 North Zeeb, Western Service Center	2001	42,225		42,225	\$ 1,689,000.00
122 South Main Street, 14A-3 District Court	1901	12,065		12,065	\$ 482,600.00
2140 East Ellsworth Rd, CSTS	1968	30,284		30,284	\$ 1,211,360.00
1000 North Maple, 14A-4 District Court	2009	7,295		7,295	\$ 291,800.00
		773,091		765,108	\$29,290,240.00

Water

Reduction Goals – Water reduction goal of 5% per year or 25% reduction by 2023.

The cost of water and sewer continues to grow each year although we are surrounded by water. The best way we can reduce cost is to reduce use. We do have technology in place that alerts OIM to water leaks or water running during non-business hours.

Sustainability Efforts:

Stormwater and Landscaping

In 2013 OIM installed our first rain garden at the LRC. This garden filters stormwater runoff before it makes its way into our rivers and streams. It also added curb appeal and a place for beneficial insects. We also worked with the Huron River Water Shed Council to install a large rain garden at the county service center using grant funding. Our latest rain garden was installed using employee volunteers at 415. West Michigan Ave. OIM is working closely with Water Resources to audit and develop a maintenance program for our stormwater infrastructure.

Fleet

There is a plan currently in place to baseline the current fleet emissions and environmental impact. Once we have the data collected we will develop a plan and set goals.

City of Eau Claire Comprehensive Plan Sustainability Chapter



City of Eau Claire

COMPREHENSIVE PLAN

Sustainability Chapter

2005 – 2025

Adopted April 14, 2009 (Amended September 22, 2015)

Eau Claire City Council

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David Duax, District 1

David Klinkhammer, District 2

Thomas Kemp, District 3

Bob Von Haden, District 4

Berlye Middleton, District 5

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Eau Claire Comprehensive Plan

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Sustainability

"Sustainability takes forever and that's the point."
~William McDonough, Architect



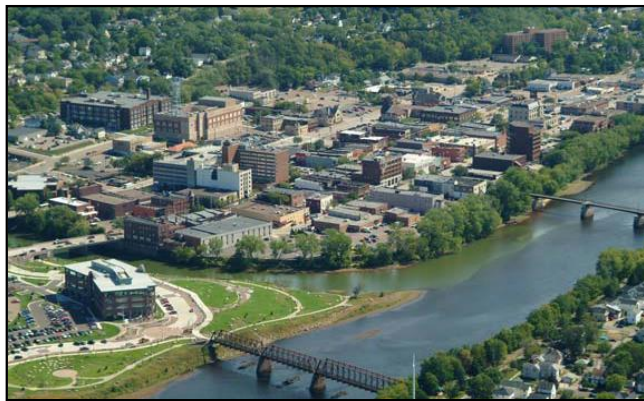
Sustainability has been defined most commonly as, "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987). The goal of this chapter is to "make certain that principles of sustainability in the Eau Claire area are followed to improve our quality of life by meeting present environmental, economic, and social needs without compromising the ability of future generations to do the same". This concept of sustainability not only speaks to meeting these needs locally but how our actions also affect the greater world. It is not difficult today to see how individual actions that are held collectively are affecting the earth in different ways. Take for instance the developing world; as more nations undergo urbanization, industrialization and improvements in infrastructure, these highly energy intensive phases emit tremendous amounts of greenhouse gases. In combination with the emissions already produced from developed nations, the planet's average temperature continues to warm gradually. The effects of this global warming can be experienced at varying places in forms of biome alteration, loss of glaciers, drought, heat waves, wild fires, floods, ocean acidification, or dangerous storms.

Human civilization is at a crossroads and Climate Change is only one converging factor driving the sustainability movement. This chapter will address sustainability factors as they relate to how Eau Claire sees its responsibility in protecting the environment, improving the human condition and continuing to enhance economic prosperity. It will advance local awareness of the interdependence between humans and nature and will serve us better to help end heedless behaviors that undermine Eau Claire reaching its goal.

In September of 2008 the City Council determined a supplement chapter on sustainability should be added to the 2005 *Comprehensive Plan*. Notification of the amendment was provided to media outlets and to various interest groups including all City commissions. A series of public workshops were held which drove the community input process. The Plan Commission reviewed this chapter as it was being developed and held public hearings once the workshops concluded. The City Council adopted the chapter on April 14, 2009. This chapter is unique because it also offers some educational background on key concepts that may be unfamiliar. The information contained herein builds upon and coincides with State Smart Growth Planning legislation, the *Plan's* overall Future Growth Strategy (Page 1-6, refer to the 2005 *Plan*) and other sustainable development approaches listed in earlier chapters of the *Plan*. Objectives and policies were developed from the major issues identified by the public participation process and form the greater part of this chapter. During the 10-year update of the Comprehensive Plan in 2015, this chapter was amended with several new considerations. In 2014, the City created an Advisory Commission on Sustainability which carries out many of the goals and policies of this chapter. At the end of the chapter, a Plan Implementation Work Program, similar to the 2005 *Plan*, is provided in order to guide the ongoing realization of sustainability in Eau Claire for the next decade.

Key Issues

1. **Energy:** What should the City do to foster local energy production, conservation, and efficiency, while increasing the use of renewable power?
2. **Local Food:** What should the City do to promote area food production, sales, and consumption while reducing food related waste?
3. **Environmental Conservation:** What should the City do to safeguard our eco-systems, trees, soil, and water resources?
4. **Atmosphere:** What should the City do to reduce our contribution to global warming and minimize air pollution?
5. **Managing Waste:** What should the City do to promote consumer product awareness, increase recycling rates, and reduce the amount of substances entering into landfills?
6. **Strong and Healthy Community:** How should the City continue to protect its citizens from disease, promote healthy living, civic engagement, cultural and ethnic diversity, while partnering with others to provide these activities?
7. **Sustainable Development:** How should the City guide and promote development so that buildings and neighborhoods incorporate sustainable features?
8. **Balanced Transportation:** How should the City increase mobility choices by enhancing other forms of transportation besides that for automobiles? How can transportation infrastructure be designed efficiently, safely, with the environment in mind, and be connected to other local and regional networks?
9. **Greener Economy:** How should the City bolster the local economy by attracting Green-collar jobs and encouraging businesses to become more sustainable?
10. **Sustainable Government:** What should the City do to provide good government and cost-effective services, meet the needs of our citizens, protect the environment, and cooperate with other governments?



Goal and Objectives

Goal: Make certain that principles of sustainability in the Eau Claire area are followed to improve our quality of life by meeting present environmental, economic, and social needs without compromising the ability of future generations to do the same.

Objective 1 – Energy: Foster local energy production, conservation, and efficiency, while increasing the use of renewable power.

Objective 2 – Local Food: Promote area food production, sales, and consumption while reducing food related waste.

Objective 3 – Environmental Conservation: Safeguard our eco-systems, trees, soil, and water resources.

Objective 4 – Atmosphere: Reduce our contribution to global warming and minimize air pollution.

Objective 5 – Managing Waste: Promote consumer product awareness, increase recycling rates, and reduce the amount of substances entering into landfills.

Objective 6 – Strong and Healthy Community: Continue to protect citizens from disease, promote healthy living, civic engagement, cultural and ethnic diversity, while partnering with others to provide these activities.

Objective 7 – Sustainable Development: Guide and promote development so that buildings and neighborhoods incorporate sustainable features.

Objective 8 – Balanced Transportation: Increase mobility choices by enhancing other forms of transportation besides that for automobiles. Design transportation infrastructure efficiently, safely, with the environment in mind, and connect to other local and regional networks.

Objective 9 – Greener Economy: Bolster the local economy by attracting Green-collar jobs and encouraging businesses to become more sustainable.

Objective 10 – Sustainable Government: Provide good government and cost-effective services, meet the needs of our citizens, protect the environment, and cooperate with other governments.

Sustainability Policies

Objective 1 – Energy

Foster local energy production, conservation, and efficiency, while increasing the use of renewable power.

Energy comes in various forms from freely-given sources such as the wind or sun to forms such as fossil fuels that need to be extracted from the earth. Every day the citizens of this community rely on energy for lighting, heating and cooling, travel, entertainment, and so on. As demand continues to rise due to an ever growing world consumption rate so does the price of energy and associated environmental issues. Air pollution is just one environmental distress linked with power plants burning fuel to make energy. Thus, with these and other factors, greater emphasis has developed around conservation and the use of alternative forms of energy.

Policies:

1. **Energy Conservation:** Partner with other organizations to offer conservation education so the community can learn how to reduce energy use in the most immediate and cost effective way. Demonstrations and tours of projects will help residents and businesses learn about successful strategies.
2. **Energy Efficiency:** Encourage the wider use of Energy Star labeled building envelope improvements, appliances and electronics. Products such as programmable thermostats, lighting fixtures, low-emittance glazed windows, heating and cooling equipment, computers, and printers are all good examples.

Encourage, coordinate, and collaborate with the business community about energy savings via guaranteed performance contracts, life-cycle payback options, and other programs which lead to greater efficient use of energy.

Consider enacting a property assessed clean energy (PACE) program in conjunction with stakeholders. PACE can make energy improvements more financially feasible for commercial, industrial, multifamily, and non-profit building owners. Upfront project costs can be spread over a longer term by utilizing the property assessment collection process.

Explore collaborative arrangements which may provide mutual opportunities to use energy in more efficient ways. District heating and cooling plants, fuel bulk-buying, and industries that can reuse an energy by-product such as steam produced by another industry, are all examples of shared approaches.

3. **Outdoor Lighting:** To reduce energy consumption, consider an outdoor lighting efficiency ordinance for all new construction and existing building lighting retrofits. Consider requiring all new and existing streetlights to use cut-off fixtures to preserve the dark night sky. Consider a pilot project to convert a portion of lights on a street to light emitting diodes. See Objective 11 in the Physical Character Chapter which addresses outdoor lighting regulations.

4. **Renewable Energy:** Develop a plan to use renewable energy sources which could supplement non-renewable sources. The City is an Energy Independent Community and has adopted the State's goal of 25% renewable energy by the year 2025. The Office of Energy Independence is the state office committed to supporting Wisconsin's goal of generating 25% of its electric power and transportation fuels from renewable resources by 2025, capturing 10% of the emerging bioindustry and renewable energy market by 2030, and leading the nation in groundbreaking research that will make clean energy more affordable and will create good paying Wisconsin jobs. A combination of hydro-electric, biogas from waste, biomass, corned-based ethanol with transition to 'second-generation'/ non-edible cellulosic blends, geothermal, photovoltaics (solar), and wind energy conversion systems may all serve in this local capacity to meet or exceed the targeted goal. As of 2014, the City was at 24% renewable electricity and 2% renewable liquid fuels.
5. **Clean Energy:** Provide website materials that inform residents and businesses about carbon-neutral energy types. Provide information on example payback times, location assessment, installation and related regulations. Power generated from wind and solar is emission-free. Biomass fuels such as wood pellets though not emission-free are cleaner than burning fossil fuels.

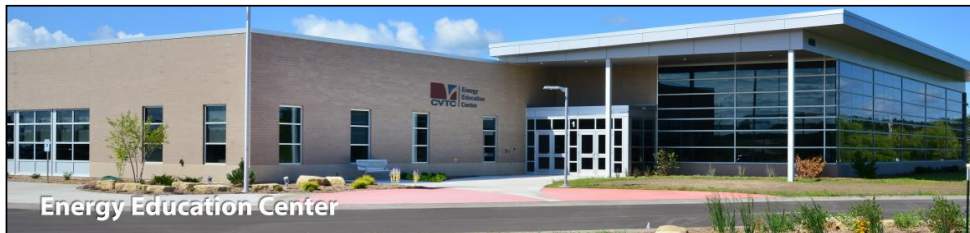
As a community partner in the Midwest Renewable Association's (MREA) Federal SunShot award, obtain technical assistance on solar training for electrical inspectors, property assessed clean energy programming, and education on affordable solar solutions such as group-buys and community solar. Both electric power companies in Eau Claire are developing community solar programs and the City can support these efforts. Further, through MREA's guidance, consider developing a clean energy access ordinance to address factors such as site orientation, setbacks, height, and public water stipulations.

6. **Pilot Projects:** Conduct a feasibility study for a solar, wind, geothermal or hybrid vehicle pilot project. A project of this magnitude will not only serve the City in reducing its own dependence on non-renewable power but also serve as an educational piece for students and the general public. The City is one of the largest consumers of power in the community. Therefore, it should take the lead and encourage businesses to implement renewable energy projects.



Solar hot water heating at Badger State Inc.

7. **Incentives:** Provide a list of energy tax credits or other forms of assistance available from the Federal, State, local government, power companies and non-profits. This will help the community be aware of and leverage these incentives to offset initial purchase and start-up costs.
8. **Explore other Opportunities:** Work with area power companies to encourage more renewable energy options such as consumers being able to purchase ‘wind-kilowatt-blocks’, community solar offerings, and work with citizens and businesses who are able to put power back onto the electrical grid. Partner for educational purposes with the Chippewa Valley Technical College’s Energy Educational Center, the UWEC Office of Sustainability, groups such as Focus on Energy, RENEW Wisconsin, Energy Center of Wisconsin, and others.



Chippewa Valley Technical College’s Energy Education Center Photos

Objective 2 – Local Food

Promote area food production, sales, and consumption while reducing food related waste.

A meal travels an average of 1,500 miles in order to reach the American consumer. Shipping adds to the price of food and expends more energy and emissions. This section deals with the growing and selling of food in and around the Eau Claire area.

Policies:

1. **Agricultural Preservation:** Minimize the loss of prime farmland from premature conversion to non-agricultural uses. Preserving prime agricultural lands around the City of Eau Claire is a central theme in many of the previous chapters of the *Plan*. The goal translates into many policies, from those that deal with infill and compact urban growth to limiting via regulation and cooperative agreements large lot non-sewered subdivisions. Refer to the Land Use, Natural Resources, Public Utilities, and Intergovernmental Cooperation chapters for more specific policies and background.
2. **Farmer's Markets:** Continue to support the Farmer's Market at Phoenix Park and at other locations. Farmer's markets not only give the community a venue to purchase area food, but offer valuable social opportunities from meeting farmers to learning about how the food was grown.
3. **Temporary Food Stands:** Continue to allow agricultural food stands per State Statute, City/County Health Department code and zoning provisions. They provide similar opportunities as Farmer Markets.
4. **Increase Community Food Development:** Work with citizens to convert vacant City-owned lots to community food plots and gardens. Not only does this beautify an unused or blighted property, but it provides a place for neighbors to interact and take ownership of their neighborhood. Advertising a pilot project may be a good way to get started.



Encourage more private gardens and food plots on residential, business, and institutional properties. Prepare brochures in partnership with the UW-Extension, local food experts, community organizations and schools, to provide proper education. Discuss how to set up an urban food plot, the array of food options in keeping with our climate and soil, cultivation techniques, food care, harvesting and canning information, along with any applicable City/County regulations.

Businesses and institutions such as schools could directly benefit by lowering their food costs by providing their own garden food to their employees or

students. It may also be advantageous for them to buy local food in bulk partnership at wholesale grower auctions which support area farmers.

The City and schools could make minimally used areas available for food and flower gardens. McDonough and North Riverfront parks already have neighborhood gardens and other parks could provide future spots. One example worth studying is Forest Street Park. Since the 16 acre park is undeveloped and underused by virtue of being located in the Chippewa River Floodplain, it may be a good location for a larger type community garden. The park is also adjacent to the Downtown Farmer's Market, so transporting produce to market would be convenient.

Greenhouses and Botanical Gardens are another option. City Zoning Code provides for greenhouses mostly as accessory uses in residential districts. In commercial and industrial districts there are more zoning opportunities to develop larger for-profit operations. These climate controlled structures provide the ability to grow food year-round.

5. Central Grocery:

Continue to support efforts to attract a grocery store to the core area. As part of the recent North Barstow Street redevelopment, the City sought aggressively to attract a grocery store to the downtown. A grocery near the Farmer's Market would give local food producers another venue to sell their food. Other potential sites such as the West Bank Redevelopment District or along Water Street could also be suitable locations for a grocer.

6. Local Food as Identity: Encourage community promotion of local food. It provides a healthy alternative to processed food, deepens appreciation for food in particular, and creates a natural tie to the land and environment. Dairy products and other notable foods from our area should be sold/promoted more in local retailing to leverage tourism and economic return for the Chippewa Valley.

7. Reduce Food Waste: Consider projects that could decrease the amount of waste associated with the food industry. Locally grown food substantially reduces the food industry's processing, storing, shipping, and retailing requirements. This translates to a reduction in water and pesticides use, shipping material and packaging waste, fuel usage, emissions, and a strengthening of the local economy.

One option would be to educate the public on how unused food can easily and naturally biodegrade in compost bins. Composting is discussed further in Objective – 5 Managing Waste section.

8. Food Education: Provide more opportunities for citizens to learn about the importance of growing, preserving and buying local and organic food. Consider research that has been conducted by institutions such as the University of Wisconsin Eau Claire and the UW-Extension to promote more local food opportunities and programs.

Objective 3 – Environmental Conservation

Safeguard our ecosystems, trees, soil and water resources.

The natural environment is inheritably sustainable and provides insight on how humanity can become more sustainable. Thanks to the awareness, foresight, and previous efforts of this community, Eau Claire's 'green infrastructure' remains a valuable asset. The community's ecological components perform a variety of necessary functions. Forests, open spaces and parks provide places for ground water recharge and purification of non-point pollutants such as leaked vehicle fluids and chemical lawn fertilizers. Eau Claire's trees remove by absorption other pollutants such as carbon and sulfur dioxide, ozone, nitrogen oxides, and fine particulates from the burning of fossil fuels in buildings and vehicles. These are just two examples of the life-sustaining benefits environmental forces have on cities and why it is important to safeguard these resources. Additional policies concerning the environment in this *Plan* can be found in the Land Use, Natural Resources (refer to Figure 3-1 for the major resource protection map), Parks System, and Economic Development chapters.



Half Moon Lake—a natural sanctuary amidst the city

Policies:

1. **Ecosystems:** Review and consider strengthening existing development codes. In addition the City should provide educational materials to help engineers, architects and other design professionals plan with more nature in mind. See Objective 7 – Sustainable Development for more information. In designing any project—whether a redevelopment or new site—a greater value should be placed on working with the natural environment (soil, water, vegetation, solar radiation, wind current, climate, etc.).
2. **Water Conservation:** Update current policies for Grading and Erosion Control or Stormwater Pollution Plans for sites over one acre as per the State of Wisconsin's stormwater and erosion control NR 151 requirements. Continue to enforce

requirements in Floodplain and Shoreland overlay districts and add more private lands that contain unique natural functions into the Conservancy Zoning District. Continue programs that clean up water quality (i.e. Half Moon Lake). Refer to the Natural Resources Chapter for additional policies.

Offer education on how to reduce water usage by installing low-flow shower heads, toilets, faucets, and appliances. Explain how to capture rain, shower and sink water for reuse as gray water.

3. **Rain Gardens/Barrels:** Work with the County's Land Conservation Commission, Master Gardeners, and UW-Extension, to promote water conservation practices in the City. Rain gardens are swales or low depressions planted with native vegetation. They are designed to absorb rainwater runoff from impervious urban roofs, driveways, walkways, streets and compacted areas. Help start a program that encourages rain barrels or cisterns to capture water for use in watering lawns and plants.
4. **Impervious Surfaces:** The City has maximum impervious surface thresholds for residential zoning districts based on total building coverage and total hard surface coverage on lots. Consideration should be given to expanding a requirement to all zoning districts. Develop a program that offers City stormwater utility rebates/credits to those businesses that exceed requirements by providing exceptional on-site stormwater management. Promote the use of permeable pavers, pervious pavement, subsurface drainage chambers and green roofs. Pervious surfaces in cities are important because they reduce urban heat island effect and allow water to pass through soil. They provide aquifer recharge, nutrients, surface vegetation growth, filter pollutants, and lessen the need for City stormwater infrastructure/maintenance.
5. **Pollutants:** Consider adopting a municipal ordinance which restricts the use of herbicides, pesticides, and fertilizers containing phosphates or other harmful chemicals which pollute water sources. Require natural versions instead.
6. **Native Landscaping:** Restore and encourage the use of more native and drought tolerant plantings on sites to reduce irrigation, protect shorelines, and provide natural beautification. Work with State departments and others to plant more native species and remove invasive species in right of ways, parks and other open spaces. Phoenix Park is a prime example of how a busy urban park can incorporate native plants in an effective manner.
7. **Trees as an Asset:** The City should consider passing a tree preservation ordinance for new development. Continue City ordinances that require developers to plant street trees and provide rebate programs for homeowners who plant a tree on their lot. Consider the adoption of an ordinance requiring approval prior to the clear-cutting of major wooded areas (refer to the Public Utilities Chapter). Trees provide numerous

A 1998 study indicated trees added \$9,500, or more than 18 percent, to the average sale price of a home in a suburb of Rochester, New York.

Nowak, David J., "Benefits of Community Trees", (Brooklyn Trees, USDA Forest Service General Technical Report)

benefits that far outweigh their initial purchase and life-cycle costs. Trees absorb greenhouse gases and pollutants. Trees provide shade relief for people, buildings and parking lots reducing energy consumption and extending infrastructure life. They decrease dehydration and the potential of heat stroke by soaking up urban heat given off from the built environment, vehicles, and construction operations. Trees clean water and reduce the flow of stormwater. They have sociological benefits like beautification, relaxation and noise buffering. Economic benefits also result from trees increasing real estate values. Trees result in an increase in worker productivity and a reduction in absenteeism. Plus, a green city is often an attractive place tourists want to visit. Thus, trees are an intrinsic natural component of a successful community. Eau Claire values this resource and has demonstrated so by obtaining Tree City USA® status for the last 30 years.

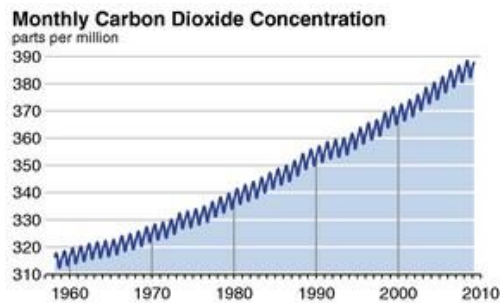
8. **Grading Permit:** Consider an ordinance that requires developers to obtain a grading permit before disturbing site soil. Continue enforcement of erosion control of topsoil at construction sites. Refer to the Natural Resources Chapter Objective 3 for more information about soil protective measures.
9. **Steep Slopes:** Consider strengthening provisions of on-site disturbance or removal of terrain that contains over 20% slope. Eau Claire's ridges and hills are a valuable scenic amenity.

Objective 4 – Atmosphere

Reduce our contribution to global warming causing climate change and minimize air pollution.

Global warming is an issue at home and abroad. The earth's various ecosystems are so precisely balanced with each other and the atmosphere that an increase in air temperature by only a few degrees can result in significant changes to the way these systems function. One of the most noticeable changes is the melting of glaciers. From the poles to mid-latitudes, major coastal cities stand to face flooding with sea levels rising. People who depend on mountain top

glaciers to supply their fresh water needs will face water shortages. While the Green House Effect is natural and necessary for life, the planet has experienced a dramatic increase in the effect. Carbon dioxide—the most prevalent greenhouse heat trapping gas—can remain in the atmosphere for as long as 200 years. Since the atmosphere warms more quickly than the earth's surface, the full effect has not been experienced. Before the Industrial Revolution the level of carbon dioxide was rarely above 300 parts per million. As human population and industrialization have rapidly increased so have greenhouse gas (GHG) emissions. The Keeling Curve above indicates this marked rise



(c) 2008 Scripts CO2 Program

since the late 1950s. The burning of fossil fuels in power plants, buildings, transportation systems, industrial facilities and construction operations are the main contributors.

Policies:

- 1. Towards Carbon Neutral:** The ultimate goal of reducing emissions is to become carbon neutral (those who have a carbon footprint equal to zero). Consider setting time targets for greenhouse gas reductions. In order to achieve this, the City would first have to measure the community's greenhouse gas index and then set realistic targets. Targets have been set and are continually being researched by climatologists, governments, and other organizations so they can be used as trustworthy benchmarks. In Wisconsin, most large cities have already signed onto the U.S. Conference of Mayors Climate Protection Agreement, which is a commitment to reduce city emissions to 7% below 1990 levels by 2012 (equivalent of meeting the Kyoto Protocol). However, reaching this level may prove difficult because of time constraints. A more comprehensive approach could be adopting the Governor's Global Warming Task Force 2008 policy recommendations, which says the State should return to 2005 emission levels by 2014, reduce the 2005 level by 22% by 2022 (approximately equaling the 1990 level), and reduce 2005 level by 75% by 2050. Future United Nations or Federal legislation may also require that cities adopt standards. The City's Health Chapter of the Comprehensive Plan states a Climate Action Plan should be developed and these factors could be considered therein.
- 2. Mitigation Measures:** If goals and time targets are set, the City should develop a strategy to reduce greenhouse gas emissions and include possible adaptation recommendations. Policies that work towards mitigation include:
 - Purchase and invest in cleaner and renewable forms of energy
 - Enhance energy efficiencies in buildings such as envelope improvements, high performance heating, ventilation, and cooling systems, and lighting retrofits
 - Build more green buildings and remodel existing structures per green building standards
 - Salvage construction debris like concrete, steel, and old buildings materials for new uses
 - Develop land using Smart Growth principles which promote compact urban form, mixed-uses, and transportation choices
 - Increase use of fuel efficient vehicles and alternative transportation forms (e.g. bus routes and bicycle lanes)
 - Reduce the amount of vehicle idling within the City
 - Buy more Energy Star labeled consumer products
 - Grow and buy more local food to reduce food transportation miles
 - Educate corporations and others toward implementing sustainability within their businesses operations
 - Attract green-collar jobs, research and development, and cutting edge technology focused on lowering emissions and
 - Offset carbon emissions by increasing 'carbon-sinks' (e.g. planting more trees, preserving forests, and rural lands).



**UW-Eau Claire's Coal-fired
Power Plant**

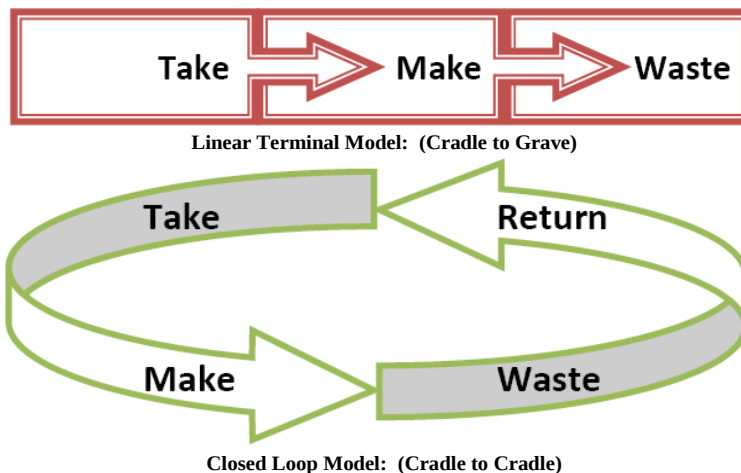
All of these options are feasible near-term possibilities and many are addressed in other sections of this Chapter. These policies not only reduce greenhouse gases directly but they also reduce local air pollution.

3. Raise Public Awareness: Inform the community more about global warming, its effects, and what can be done to reduce it. Partner with other organizations or corporations committed to reducing their own greenhouse gas emissions (i.e. the University of Wisconsin – Eau Claire has pledged to reach carbon neutrality by adopting The American College & University Presidents Climate Commitment).

Objective 5 – Managing Waste

Promote consumer product awareness, increase recycling rates, and reduce the amount of substances entering into landfills.

The traditional method for waste management has been to dump unwanted materials someplace away from people and then cover them over with earth. Landfills eventually become contaminated places because of toxic materials. The resultant polluted soil, ground water, and air have the greatest effect on those who live nearby the landfill. These factors along with ever growing consumption rates make it difficult to zone for new landfills as older ones become obsolete. Recycling has helped but other strategies must be advocated to reduce the amount of waste going into landfills. One solution is to design a product to biodegrade naturally or be recycled at the end of its useful life. This means ideally there could be zero waste by ‘closing the loop’. This change in thinking contrasts with the traditional model which does not complete the loop.



When thinking about significant waste reduction strategies, there needs to be new market and technological advances in the manufacturing and recycling industry’s ability to make use of recovered materials. Thus, in order to achieve waste reductions in Eau Claire this section lays out several policy approaches which are achievable within present day realities. It is also important to partner and work with Eau Claire County and others since recycling and waste management programs fall under their administration.

Policies:

1. **Education:** Partner and work with the community, Eau Claire County Recycling Program, and the Department of Natural Resources West Central Region Waste and Materials Management Program to achieve better citizen and business waste reduction rates. Educate and promote on how to reduce, reuse, recycle, and recover waste materials. Provide information to increase consumer product awareness and environmentally preferable purchasing. Identify how cutting waste not only helps the environment but also saves on associated costs (e.g. lower disposal costs, lower waste treatment costs, lower energy costs, lower storage costs, savings on materials and supplies; reduction in regulatory compliance costs, and cost recovery through the sale of recyclable materials).
2. **Towards Zero Waste:** Partner with Eau Claire County Recycling Program to achieve a greater rate of waste reduction within City Limits with a vision towards the ultimate goal of zero waste (closing the loop). Consider percentage goals over specified time periods in the elimination of waste the community produces. This will result in significant reduction totals. The Department of Natural Resources Waste and Materials Management Program has a State 2015 goal of increasing waste material reuse, recycling, and maximizing the environmental and economic benefits of waste as raw materials by 30%.
3. **Waste Reduction:** Evaluate if a 'Pay-As-You-Throw' ordinance (which requires garbage haulers to charge individuals based on the weight of their garbage instead of the size of their container) could work in the community. This type of ordinance is a better reflection of the actual waste generated by the individual and reduces costs for those who are acting more sustainably.
4. **Recycling:** Work with area garbage haulers and recycling companies to determine if the City should switch to 'Single-Stream' recycling. Single-Stream supposedly increases recycling rates because separation of recyclables is not required. However, the composition of new products produced from the recycling industry can be of lesser quality because of other recyclable materials found in the product.



Recycling at Boyd Park

Promote better institutional and business waste reduction and recycling programs. The Wisconsin DNR reports; office buildings can generate almost three pounds of trash per person per day and 75% of this is paper. Implementing programs will achieve significant waste reductions for a community. Businesses are required by Wisconsin law to recycle paper, magazines, cardboard, aluminum and steel cans, plastic bottles (#1, #2), major appliances, tires, lead acid batteries, yard wastes, and used motor oil.

5. **Composting:** Work with Eau Claire County Recycling Program to educate on how to set up/maintain compost bins at home and the workplace for organic waste (e.g. proper food left-overs and yard wastes). Work with Eau Claire County to develop a site for community composting of leaves and other organic materials.

The City's Management of Waste and Recyclables code 8.32.050 allows for the hauling of compostable materials as part of regular curbside refuse and recycling service. Alternatively, by obtaining an Eau Claire City-County Health Department special collection permit, these materials may be collected on a non-regular basis (e.g., during special events) and transported to appropriate composting operations. Both options must not compromise the health, safety and wellness of the community.

The EPA estimates yard trimmings and food residuals constitute 24 percent of the U.S. municipal solid waste stream. By keeping these materials out of landfills it reduces greenhouse gas emissions, the need for expansion and treating more leachate. Among other uses, finished compost can be a useful soil amendment in landscaping, garden beds and farm fields. Thus, encourage residents, businesses, special event organizers, haulers, landfill operators, farmers and others to further composting efforts whereby their combined efforts will create a local system that better recovers this waste stream.

6. **Construction Waste:** Consider an ordinance that requires mandatory recovery, reuse, and recycling of demolition debris and building scraps at construction sites. Materials such as recovered steel can be reused for new buildings and recovered concrete aggregate can be reused for a new parking lot base. See the Sustainable Development section for more information.
7. **Non-biodegradables:** Consider passing an ordinance that bans plastic bags and styro-foam community wide or in certain circumstances (e.g. restaurants, groceries, and retail stores, etc.). China has banned free plastic bags. Materials or substances that have chemical properties that do not break down in nature, cause human and wildlife harm, and pollute ecosystems, should be phased out.

In 2013, the City Council created the Sustainable Bag Committee, which offered recommendations on how to reduce, reuse and recycle point-of-sale disposable paper and plastic shopping bags. As of 2015, the Advisory Commission on Sustainability is working on a sustainable community bag educational campaign with area businesses and retailers. One of their goals is to create a reusable bag that contains educational facts about the impact non-biodegradables bags have on the environment.

Continue to support efforts by Eau Claire County to recycle plastic shopping bags and film going into landfills. A larger percentage of plastic film (e.g., pallet wrap) ends up in landfills compared to plastic bags. This material is recyclable and valuable for new products such as composite lumber.

8. **Electronics:** Consider passing an ordinance that mandates businesses which sell consumer electronics must take-back a certain percentage amount for recycling, material recovery, and remanufacturing purposes.
9. **Prescription Drugs:** Consider an ordinance that encourages or facilitates the collection and disposal of unwanted/excess prescription drugs.

- 10. Waste Transport:** Work with haulers to evaluate if passing an ordinance that geographically assigns garbage haulers to 'pickup zones' for greater transportation efficiency, less wasted fuel, and fewer emissions, would make sense in the community.
- 11. Special Events:** Consider a pilot project to make special community event(s) zero-waste by using products that are bio-based or recyclable (replacing plastic cups, plates, and cutlery instead with glass, bio-plastics and paper products).
- 12. Littering:** Continue to enforce littering laws. Encourage citizens/volunteers to pick up litter in public places, parks, along waterways, during special events, and in the general community.
- 13. Urban Wood Reuse:** Support efforts with reusing local urban wood waste. The City's Forestry Division has been developing a program to assist wood workers and artisans with the reutilization of City owned trees after they have been cut down, either due to disease, pre-emption practice, or other reason. This cost avoidance strategy saves the City money on grinding services and helps the private sector reuse a valuable, local, and renewable resource for higher purposes than mulch or fuel.

Objective 6 – Strong and Healthy Community

Continue to protect citizens from disease, promote healthy living, civic engagement, cultural and ethnic diversity, while partnering with others to provide these activities.

Human society, like the environment and economy, is a component of sustainability. A strong and healthy community is a place where physical and psychological needs are met. Manfred Max-Neef, an economist and environmentalist, won the Alternative Nobel Prize based on his work identifying these fundamental human needs; which are:

- Subsistence: to survive, to have food, water, and shelter
- Protection: to feel safe and secure
- Affection: to experience emotion and human relationships
- Understanding: to encourage curiosity and acquire knowledge
- Participation: to assemble, take action and express opinions
- Leisure: to relax, reflect, play, and enjoy life
- Creation: to imagine, invent, design, and work
- Identity: to belong, have self-esteem, share values, and culture and
- Freedom: to have open-mindedness, equal rights, and autonomy.

A community that promotes and strives to meet these basic human needs, both collectively and individually, will undoubtedly be successful.

Sustainability

Eau Claire has a history of being successful. The Eau Claire Metropolitan area, which includes Eau Claire and Chippewa counties, consistently ranks high nationally as a safe community having a low crime rate. The low cost of living compared to other midwestern peer and larger cities, attracts economic development to the area. Eau Claire County is one of the healthiest counties in the State (*The 2008 Wisconsin Health Rankings*). Eau Claire has two large medical centers and a free clinic. The Chippewa Valley Free Clinic, a volunteer organization which provides medical services to low income individuals without insurance, has served over 21,000 patient visits since opening in July 1997. Eau Claire Area School District and higher learning institutions have strong reputations. All of these factors reassure citizens that Eau Claire will continue to strive to meet basic human needs well into the future. See the Parks Systems, Physical Character, and Housing chapters for more information.



Parents teaching their children to swim at Fairfax Pool

Policies:

1. **Existing Programs:** Continue Police, Fire, Ambulance, and National Incident Management System public safety programs. Continue human services programs provided by the City. The City/County of Eau Claire Health Department, City Housing Department, and the Parks and Recreation Department administer multiple programs, from health care access, to housing for low-income individuals, to youth/adult recreational sports.

Continue providing support to organizations such as the Eau Claire Public Access Center, the L.E. Phillips Senior Center, the Community Beautification Association, local museums, economic development and tourism groups, the arts, and others.

2. **Health Plan:** Continue to support efforts for a local Health Improvement Plan to improve the health of Eau Claire citizens. The next State Health Plan, Healthiest Wisconsin 2020, will focus on the social and economic determinants of health. The list of determinants include equity, social justice, societal resources, standard

of living, culture and history, social institutions, built environments, political structures, economic systems, technology, and the natural environment.

3. Health and Urban Land Use

Consider the direct and indirect impacts on human health for existing situations or new developments. The built environment can positively or negatively affect public health. The location, size, layout, and density of new housing, can hamper active living if residents have to drive to accomplish their daily routines. Additionally, if new and existing neighborhoods do not include a variety of socio-economic backgrounds, polarization of communities can result. An example of this is when older neighborhoods are left to decay. Property values drop and the concentration of lower incomes rise making it difficult for the neighborhood to experience renewal. Research confirms the polarization of communities can have profound human physical and mental effects, from commuting problems to pockets of poverty.

- 4. Active Lifestyles:** Continue to support and participate in programs that promote active lifestyles. The relationship between physical activity and health status is abundantly clear. Programs like Energize Eau Claire County improve our community's well-being by promoting and supporting regular physical activity, good nutrition, and healthier weights for people of all ages.

- 5. Safe Routes to School:** Continue to build safe route infrastructure for Kindergarten through 8th grade students to bike or walk more to school. Apply for more State grant funding if new funds become available. Work with Eau Claire Area School District and Safe STEPS to connect all middle schools as well as high schools with safe routes.

- 6. Festivals and Attractions:** Support Downtown Eau Claire Inc. and other entities which put on community festivals. Events such as Taste of Eau Claire, Open Air Festival of the Arts, Summer Fest, Festival in the Pines, bring people together from within and outside our community. Additionally, support should continue for places like Phoenix Park, Barstow Street, Water Street, L.E. Phillips Memorial Public Library, Eau Claire Regional Art Center, State Theater, the Children's Museum, etc.



Live Music in the Park

Objective 7 – Sustainable Development

Guide and promote development so that buildings and neighborhoods incorporate sustainable features.

“Nature is more than a bank of resources to draw on: it is the best model we have for all the design problems we face”. Sim Van der Ryn and Stuart Cowan wrote so in their landmark book entitled, *Ecological Design*. The book, which details ecological architecture, buildings, city and regional planning, puts forth the concept that sustainable development should keep with these five principles:

- Solutions Grow from Place: or that a development takes cues from its unique surrounding physical, natural, and cultural characteristics
- Ecological Accounting: or that a development accounts for its full environmental and social impacts
- Design with Nature: or that a development uses nature as design metaphor, model, and measure
- Everyone is a Designer: or that a development design process collaborates with all stakeholders (e.g. including the eventual building users, neighbors, and general community) and
- Make Nature Visible: or that a development features nature for adults and young to learn and experience natural living systems.

An example of how to build with nature in mind is the U.S. Green Building Council’s Leadership in Energy and Environmental Design or LEED Green Building Rating System™. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. LEED programs are transforming the U.S. built environment and have proved to be a reliable benchmarking tool to standardize the language and realization of ‘green buildings’. This section addresses not only the micro view of sustainable sites and buildings, but a macro view of planning for whole neighborhoods. Many of these larger urban context policies however have already been noted in the Land Use Chapter. Refer there for more information on sustainable neighborhood, city, and regional planning.



First Certified LEED Green Building in Eau Claire

Policies:

1. **Life-Cycle Cost Analysis:** Promote life-cycle assessing as a necessary component of designing a sustainable development. Provide educational materials to help developers and builders know how to assess the full range of social and environmental impacts of their project so better choices can be made.

Life-Cycle Costs are those which take into account the full life of a building product or development. In other words, from its raw material production, manufacture, transport, actual use, to its disposal. Approaches like the LEED Green Building Rating System™ or the International Organization for Standardization 14000 Environmental Management Standards are already proven methods to account for Life-Cycle Cost Analysis.

2. **Green Buildings:** Consider offering incentives for green buildings or requiring green buildings in City Tax Increment Financing Districts. Consider also requiring green building for all new City buildings and remodeling projects. The principles in LEED can be adopted or used to create similar standards. Other programs exist also such as the International Code Council's 2008 National Green Building Standard. LEED has rating systems developed for new construction, major renovations, existing buildings and operation/maintenance, commercial interiors, core and shell construction, schools, retail, healthcare, and homes. The table on the right identifies how green buildings' initial per square footage investment can return significant savings over a twenty year period. Studies have also shown that green buildings have a greater market ability to attract willing buyers and renters because of the direct emphasis placed on meeting fundamental social and environmental issues.

Financial Benefits of Green Buildings (per ft ²)	
Category	20-year Net Present Value
Energy Savings	\$5.80
Emissions Savings	\$1.20
Water Savings	\$0.50
Operations and Maintenance Savings	\$8.50
Productivity and Health Benefits	\$36.90 to \$55.30
Subtotal	\$52.90 to \$71.30
Average Extra Cost of Building Green	(\$-3.00 to \$5.00)
Total 20-year Net Benefit	\$50 to \$65
Source: Capital E Analysis	

3. **Buildings and Energy:** Partner with utility companies to offer energy efficiency education programs or incentives for residents and businesses to improve energy use in buildings. Buildings consume 40% of the energy consumed in the U.S. Several strategies to reduce energy consumption are listed below:
 - Conserve, turnoff, and eliminate power that is being wasted. (e.g. left on room lights, computers, non-essential peripheral electronics such as printers, monitors, and cell-phone chargers)
 - Conduct home and business energy audits
 - Design Net-Zero Energy buildings to take advantage of natural free forms of energy (e.g. wind can be used to cool the inside of buildings during the summer, sunlight can heat a building with southern window exposure during the winter, or the thermal energy stored inside the ground can be tapped by geothermal wells, coils or loops to heat or cool the building year-round)
 - Weatherize buildings to retain and prevent energy loss (e.g. install proper insulation, caulk windows, eliminate air drafts)
 - Commission Heating, Ventilating, Air Conditioning equipment to operate more optimally during the course of a day
 - Automate electrical systems with integrated computer management programs. (i.e. software that enables a control operator to remotely

manage all of the building's security, lighting, heating, cooling and ventilation systems

- Replace inefficient building lighting with high performance T8 blubs, compact fluorescence lights or light emitting diodes. Install occupancy/photo sensors to further eliminate wasted artificial lighting
- Install a raised in-floor ventilation system for personal heating and cooling control
- Enter into energy performance contracts which guarantee dollar and energy savings within a given period and
- Harness renewable energy when appropriate (e.g. install photovoltaic's, geothermal and wind conversion systems).



Eau Claire home utilizing both passive and active solar energy

4. **Cool Roofs:** Consider a green roof pilot project on a City building to promote conservation. Green Roofs or Living Roofs are rooftops which typically have native grasses, flowers, shrubs and vegetation planted into a layer of soil, over a waterproof membrane. Other common features include gravel paths, patios, irrigation systems and photovoltaic arrays. Another option is white roofs, or those which have a white rooftop membrane that reflects solar radiation off the roof thereby reducing the building's thermal load.
5. **Material Recovery:** Consider passing an ordinance which requires all recyclable building materials be recovered. This could mean not only construction waste from the new building project but also what exists on site. A significant amount of waste comes from the razing of sites and construction of buildings and most of this material gets land-filled. In demolition there may be salvageable materials that could be reused. Intact structures or portions of buildings could be preserved. Many older buildings were made out of stone and brick which are long-lasting, have a good fire rating, and thermal retention properties. If the building's shell cannot be reused and these types of materials exist in good condition, they should be recovered. Refer to the Waste Managing section for additional examples. Structures and materials recovered reduce environmental impacts such as emissions from the manufacture and transportation of new products. The City values older properties and

neighborhoods and encourages their reuse and renovation. See the Historic Preservation Chapter for more policies on preservation practices.



Recovered Gypsum Board at an Eau Claire construction site

6. **Local Materials:** Promote the use of building materials and products that can be found in the immediate area and surrounding region (i.e. sandstone). Buying and using quality area building materials strengthens the area economy, creates local identity, and decreases out of the region transportation costs.
7. **Sustainable Neighborhoods:** Consider strengthening existing ordinances or adopting a similar ordinance to LEED's Neighborhood Design Rating System to encourage more sustainable development. LEED-ND will be the first national program for sustainable neighborhood design and will integrate principles of Smart Growth, New Urbanism and green building into its rating system. Green buildings are just one piece to the sustainable development puzzle; also needed are sustainable neighborhoods and automobile alternative travel options.
8. **Smart Growth Zoning:** Continue to encourage developers to use the City's Planned Development Zoning Ordinance to achieve the objectives of Smart Growth. The City's Traditional Neighborhood District Zoning Ordinance also provides Smart Growth zoning standards. The Smart Growth's overall vision is to make metropolitan settlement patterns denser on the average while providing mixed-uses, open space and transportation choice. It is considered the antithesis to sprawl (scattered, separated, and excessive land use consumption on the fringe of cities). Smart Growth is sustainable development because it fosters development patterns that are economically sound, environmentally responsible and socially just. For a fuller discussion on Smart Growth refer to the Introduction Chapter on pages 1-2 and 1-3 and the many policies found in the Land Use Chapter.
9. **Mixed-Use Corridors:** Consider a more defined mixed-use ordinance for commercial districts especially along Community Commercial and Highway Overlay Districts. There is potential in some areas to transform land along Eau Claire's major thoroughfares to be of higher use. Significant infrastructure investments such as highways are capable of serving a lot of automobile and bus traffic as well as bike and pedestrian traffic if there are safe sidewalks and trails available. Underutilized commercial buildings, strip centers, and parking lots could be redeveloped to take advantage of these traffic volumes. Attractive

transit-oriented, mixed-income housing could be built over new or alongside existing retail and office developments to reduce travel to work and shopping trip lengths. Transportation corridors are good locations for denser developments because most often they represent a boundary between two lower density neighborhoods. Transitions up to higher densities are more easily made on the edges instead of in the middle of a single family detached home neighborhood. See the Physical Character Chapter Objective 5 – Mixed- and Multi-use Development for more information.



Mixed use building along Phoenix Park

Objective 8 – Balanced Transportation

Increase mobility choices by enhancing other forms of transportation besides that for automobiles. Design transportation infrastructure efficiently, safely, with the environment in mind, and connect to other local and regional networks.

Transportation is the second largest contributor of greenhouse gas emissions in the United States. Much of these emissions come from the use of gasoline-powered automobiles. These vehicles have made Americans heavily dependent on foreign oil. James Flink, who wrote the book, *The Automobile Age*, notes the impact of the car and the road on American society and that the car culture will never be as great as it was in the last half century. Personal automobile travel will remain the dominant mode of transportation for some time to come, but greater emphasis is being placed on cities to upgrade and diversify their transportation infrastructure. Multi-modal land based transportation systems (e.g. intercity and commuter rail lines, light rail transit, dedicated bus rapid transit lanes, commuter bike ways and improved pedestrian connections) are quickly being developed around the country with the support of increased Federal and State funding. Simultaneously, improvements in vehicle fuel-economy, electric hybrid technologies and alternative fuels are changing the face of the auto-maker's industry. Transportation will remain an important issue for growing cities/regions and the City of Eau Claire recognizes its role in facilitating more efficient forms of travel. The Transportation Chapter covers the following policies more in depth and should be referred to for more information.

Policies:

1. **Midwest Regional Rail System:** Continue to support the efforts of the West Central Wisconsin Rail Coalition so an intercity passenger rail line travels through Eau Claire. On the current proposed Midwest Regional Rail System, Eau Claire is listed as a 'Feeder Bus Route' down to Tomah to connect with the rail system. The designated route from St. Paul to Chicago is through La Crosse. An 'Eau Claire plus' route has been put forth in the past as a possible option to serve both La Crosse and Eau Claire. See Objective 12 – Passenger Rail in the Transportation Chapter for more information.

Work with Wisconsin Department of Transportation in 2009 to include an Eau Claire route in their *Draft Connections 2030 Plan*, the State's transportation plan. Promote that the final plan should initiate feasibility, environmental studies, and preliminary engineering sooner than currently proposed.

2. **Regional Transit Authorities:** Continue support and campaign for the State to authorize transit agencies to create their own funding authorities to improve mass transit options. RTA Legislation is expected to pass in 2009 and the City's future/updated Transit Development Plan (expected to be completed in 2010) will include a blueprint on how to create a regional transit authority for the Chippewa Valley.
3. **Bus Transit:** The City should continue to provide and support bus transit service looking at ways to improve and grow this benefit. From 1997 to 2007 Eau Claire Transit had over 9,900,000 riders. In the same period, ridership doubled from 557,676 in 1997 to 1,067,303 in 2007. With the price of gasoline continuing to rise, city bus transportation is being used more and more. See Objective 8 – Local Bus Transit System in the Transportation Chapter for specific policies promoting bus transit.

The Eau Claire Bus Station downtown is due for replacement. Federal funds are still lacking but when they are made available, sustainable features should be incorporated into the station design. The Transit Commission is already committed to investigating green technology options for the station. The actual site and design of the station may need future study. The study should include the feasibility of incorporating renewable energy systems in the facility. Eau Claire Transit is studying the replacement of eight old Flyer Buses in 2010. Electric-hybrid or alternative burning fuel bus options are currently being considered.



Eau Claire Bus Station located downtown

4. **Complete Streets:** Continue to promote and build infrastructure that accommodates a variety of travel options including bus, automobile, bicycle, and pedestrian. Address pedestrian and bike safety concerns such as at street crossings. Complete the draft Bicycle and Pedestrian Master Plan in 2009. The plan will lay out various options to ‘complete streets’ for all transportation options or provide safe off-street dedicated routes for certain modes of travel such as a bicycle trail. See Objectives 6, 7, 10 in the Transportation Chapter.
5. **Transit Oriented Development:** Development projects should include transit-ready options for the site and building. Denser mixed-use developments support mass transit and may provide bicycle racks as another modal choice. See Objective 3 in the Transportation Chapter for more information and principles on transit oriented development.

Objective 9 – Greener Economy

Bolster the local economy by attracting Green-collar jobs and encouraging businesses to become more sustainable.

Eau Claire’s economy continues to adapt. Originally founded upon the logging industry, then manufacturing, Eau Claire now has a diverse economy which includes retail, health care and educational professions. The Economic Development Chapter already covers a number of policies from providing incentives to creating jobs in specific industries. This section targets the objective to attract more green-collar jobs to Eau Claire and to promote corporate responsibility to society and the environment.

Policies:

1. **Green-Collar Jobs:** Promote, expand, and offer business incentives to attract green-collar companies. While many jobs either directly or indirectly contribute to sustainability, green-collar jobs are defined as those that work with the environment or involve products and services that are environmental friendly. There are many job opportunities that fit into this category; such as for ecologists, environmentalists, sustainable farmers, renewable energy manufacturers, recyclers, green builders, researchers, paleoclimatologists (scientists who deal with past climate records), and biomimetic engineers (designers who produce products from observation of natural or living things). In 2006 energy efficiency technologies and renewable energy alone created 8.5 million new jobs, and nearly \$970 billion in revenue, with more than \$100 billion in company profits. The 2007 Green Jobs Act, authorized \$125 million to help train workers for Green-collar fields. It is expected that additional Federal Government funding will be authorized in the years to come to continue the momentum in the green-collar job sector. As this industry grows larger, sustainability will continue to advance by their new innovations.
2. **Green Job Education:** Work with higher learning institutions such as Chippewa Valley Technical College and University of Wisconsin Eau Claire, to ramp up education and training for fields in sustainability.

3. **Buy Local:** Promote the buying of local and regional products to help strengthen our economy. Studies have shown successful locally owned businesses significantly recirculate money back into their base economies. This fact is found to be true in spent laborer wages, business net profits, procurement of local goods and services, and charitable giving.
4. **Travel Green Wisconsin:** Help the Chippewa Valley Convention and Visitors Bureau to increase more eco-tourism businesses. Examples of such businesses include local attractions, lodging, convention centers, restaurants, and golf courses.
5. **Triple Bottom Line:** Promote and educate institutions and businesses to measure their success not only by financial profit, but by environmental and social performance as well. For years European corporations, and now an increasing number of American corporations, have been keeping records of how they are being sustainable or meeting their Triple Bottom Line (i.e. the Planet or Natural Capital, People or Social Capital, and Profit or Economic Capital). This holistic accounting approach has been ratified by the United Nations and the International Council for Local Environmental Initiatives- Local Governments for Sustainability, as a bona fide technique to measure corporate and governmental sustainability.

In Wisconsin, one program that helps companies to run their operations in a more sustainable manner is the DNR's Green Tier. This program gives environmentally innovative companies—who go beyond compliance with minimum regulatory standards—support for their efforts while improving their bottom line. The goals of the program include environmental improvement beyond that which is achieved through mere compliance, community development and economic gain. The Phillips Plastics Multi-Shot facility in Eau Claire is a Green Tier participant. The company focuses on the education of their people, reduction of emissions and waste, recycling and energy use. For example, an energy efficient lighting upgrade led to a 448,000 kilowatt per year reduction in electrical power consumption. Phillips Plastics staff is also strongly encouraged to be environmental stewards outside the work place.



**Phillips Plastics Corporation Multi-Shot—
Eau Claire's first Green Tier business**

Objective 10 – Sustainable Government

Provide good government and cost-effective services, meet the needs of our citizens, protect the environment, and cooperate with other governments.

The City should work in partnership with other governmental entities when practical to provide shared vision, operations, and planning, while delivering cost-effective services at a level the community deems appropriate. The Intergovernmental Cooperation Chapter should be referred to for a more complete picture of how the City should follow policies which promote sustainable government.

Policies:

- 1. Municipal Sustainability:** The City of Eau Claire should continue its efforts to engage in more sustainable practices. The City's internal Green Team's mission is to help promote more environmental and social gains in the workplace. For example, in September 2008 the City entered into an energy performance contract with Honeywell International to eventually recoup a \$500,000 investment. The investment will go towards energy efficient upgrades such as traffic signal and building lighting retrofits, building envelopment improvements, ventilation control, and other repairs for a guaranteed annual savings of approximately \$75,500 in utility and operational expense over the next 10 years. It is estimated that 500,000 Kilowatts per hour and 20,000 Gas Therms will be saved per year by these energy efficient improvements. The City should continue to build upon these efforts such as conducting annual sustainability audits, purchasing a greater amount of environmentally preferable supplies, applying for renewable energy grants, implementing renewable energy projects, and other initiatives.



City Council of Eau Claire

The City should take a lead role in promoting sustainability within the metropolitan region. It can do so by working together with others, providing direction, educating, giving presentations, and creating a website so that governments, businesses, and citizens can have a common understanding of sustainable practices. See also the Sustainable Development Policy in Objective 2 – Smart Growth Cooperation, Intergovernmental Cooperation Chapter.

2. **Shared Services and Facilities:** See the Intergovernmental Cooperation Chapter Objective 3 – Shared Services and the Community Facilities Chapter Objective 1 – Cost Effective and High Quality Facilities for information.
3. **Chippewa Valley Environmental Defense:** The City should continue to implement the policies of the Natural Resources Chapter and other applicable local laws that pertain to Eau Claire proper. However, because natural resources are often found traveling through, under or beyond a given jurisdiction, it will remain important to work with adjacent municipalities, counties, and other agencies to protect the environment. Resources such as clean air and fresh water are shared by all in this metropolitan region. See again Objective 2 – Smart Growth Cooperation in the Intergovernmental Cooperation Chapter (Sustainable Development, Protection of Rural Lands, Premature Development, and Area-wide Planning policies) for more information.
4. **Joint Committee on Sustainability:** Consider initiating the creation of an area-wide or metropolitan task force charged with bringing governments, businesses, special interest groups, citizens, and others together to promote sustainability. A joint committee would provide improved stakeholder representation, communication, information and the shared visions of a sustainable Chippewa Valley. The joint committee could also prepare annual reports, keep annual accountability measures, and facilitate guest lecturer appearances, all the while helping to transform sustainability in this area.

Chapter Implementation Plan

The goal statement “**make certain that principles of sustainability in the Eau Claire area are followed to improve our quality of life by meeting present environmental, economic, and social needs without compromising the ability of future generations to do the same**”, is only mere words without any action. A work program provides a schedule for implementing the various policies the community identified as priorities. This chapter’s Plan Implementation Work Program is an amendment to the Comprehensive Plan’s Work Program found on pages 14-5 through 14-9. Taken together, the City will address each proposed policy while being cognizant of our ability, financial capacity, and commitment to carry out existing services. The Work Program table on the next page has been organized around the following categories of implementation actions:

- Public Information
- Continuous Planning Program
- Plans and Studies
- Codes and Ordinances
- Joint Efforts
- Capital Improvements

The Work Program covers a five year period. When the City’s Comprehensive Plan is completely updated again in 2015, the concept of sustainability will be incorporated seamlessly into its future chapters. Since this chapter was completed in 2009, it is an official supplement chapter to the 2005 *Comprehensive Plan*.

Plan Implementation Work Program

Sustainability Chapter of Eau Claire's Comprehensive Plan Plan Implementation Work Program (2009-2025) Updated 2015

Public Information

1.1	Provide information/a webpage that describes carbon-neutral energy types and what forms of financial assistance are available.	Planning	2009
1.2	Partner with energy companies to provide education programs and incentives.	Planning	2010
1.3	Prepare informational brochures to provide proper education on growing local food and institutional bulk-buying at wholesale grower auctions.	Planning	2010
1.4	Provide information to increase consumer product awareness and environmentally preferable purchasing along with education on how to reduce, reuse, recycle, and recover waste materials.	City & County	2010
1.5	Continue to encourage developers to use the Planned Development or Traditional Neighborhood District ordinances to achieve objectives of Smart Growth.	Planning	Ongoing

Continuous Planning Program

2.1	Continue to support efforts to attract a grocery store to the downtown area.	Economic Development	Ongoing
2.2	Encourage the use and restoration of native species and drought tolerant plantings.	Parks & Recreation	Ongoing
2.3	Continue enforcement of erosion control of topsoil on slopes, at construction sites, and in general.	Public Works	Ongoing
2.4	Continue to support City ordinances that require developers to plant street trees and rebate programs for homeowners who plant a tree on their lot.	Parks & Recreation	Ongoing
2.5	Continue volunteer programs to pick up litter in public places, parks, along waterways, during special events, and in the general community.	Parks & Recreation	Ongoing
2.6	Continue to promote and build infrastructure that accommodates a variety of travel options from bus, automobile, bicycle and pedestrian.	Public Works	Ongoing
2.7	Promote, expand, and offer business incentives to attract Green-collar jobs.	Economic Development	2010
2.8	Implement the Green Team's Report recommendations for City sustainability.	Green Team	Ongoing

Plans and Studies

3.1	Consider becoming an Energy Independent Community by conducting an energy baseline audit and then develop a plan to increase renewable energy by 25% by the year 2025.	Planning	2009
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Sustainability

Plans and Studies			
3.2	Consider developing a strategy to reduce green house gas emissions. See the City's Health Chapter regarding a Climate Action Plan.	Planning	2010
3.3	Consider strengthen existing ordinances or adopt a similar ordinance to LEED's Neighborhood Design Rating System.	Planning	2012
3.4	Complete a Bicycle and Pedestrian Master Plan.	Planning/ Public Works	2009
Codes and Ordinances			
4.1	Consider adopting an outdoor lighting ordinance for all new construction and existing lighting retrofits.	Planning	2009
4.2	Consider expanding impervious surface requirements to all zoning districts while promoting the use of innovative pervious technologies.	Planning	2011
4.3	Develop a program that offers stormwater utility rebates/credits to businesses that exceed on-site requirements by providing exceptional stormwater management.	Public Works	2011
4.4	Consider adopting a municipal ordinance which restricts the use of herbicides, pesticides, and fertilizers containing phosphates or other harmful chemicals. Require natural versions instead.	Parks & Recreation	2010
4.5	Consider adopting a tree preservation ordinance that prevents clear-cutting of major wooded areas before development approvals.	Planning	2010
4.6	Update ordinances for Grading and Erosion Control and Stormwater Pollution Plans as per the State of Wisconsin's stormwater permit requirements.	Public Works	2009
4.7	Consider an ordinance that requires developers to obtain a grading permit before disturbance of site soil.	Public Works	2009
4.8	Consider enhancing provisions of on-site land disturbance and removal of terrain that contains over 20% slope.	Public Works	2009
4.9	Consider passing an ordinance that bans plastic bags and styro-foam City wide or in certain circumstances.	Planning	2010
4.10	Consider an ordinance collection and disposal of unwanted/excess prescription drugs.	Health	2010
4.11	Consider adopting an ordinance which requires demolition debris and building materials to be recovered for reuse.	Planning	2010
4.12	Consider requiring/offering incentives for certified green buildings (i.e. Tax Increment Financing Districts).	Planning	2010

Sustainability

Codes and Ordinances			
4.13	Consider requiring green building certification or an equivalent for all new City buildings and major remodeling projects.	Planning / Green Team	2010
4.14	Consider amending commercial zoning districts to allow for mixed-uses.	Planning	2009
4.15	Consider enacting legislation that facilitates a property assessed clean energy program.	Planning	2015-2016
Joint Efforts			
5.1	Work with area power companies so they offer more renewable energy options.	City/Xcel	2010
5.2	Work with citizens to convert vacant City-owned lots to food and garden plots.	Parks & Neighborhood Associations	2011
5.3	Work with State departments and others to plant more native species and remove invasive species in right of ways, parks or other open spaces.	Public Works & Parks	Ongoing
5.4	Start a program that encourages rain barrels or cisterns to capture water for rainwater reuse at homes and businesses.	Public Works & County Planning	2009
5.5	Partner with Eau Claire County Recycling Program to achieve a greater rate of waste reduction within City Limits with a vision towards the ultimate goal of zero waste.	City & County Planning	2010-2013
5.6	Consider percentage goals in the elimination of total waste the community produces to reach significant reduction totals.	City & County Planning	2010
5.7	Work with the County to evaluate if a 'Pay-As-You-Throw' and/or 'Single-Stream' recycling ordinance should be adopted.	City & County Planning	2010
5.8	Work with Eau Claire County to research the feasibility of opening a community wide composting site.	City & County Planning	2011
5.9	Consider passing an ordinance that mandates businesses which sell consumer electronics must take-back electronics for reuse.	City & County Planning	2011
5.10	Work with local garbage haulers to evaluate if an ordinance should be enacted that geographically assigns haulers to pickup zones.	City & County Planning	2012
5.11	Consider a pilot project to run a community festival at zero-waste.	DECI & County	2009
5.12	Continue support of community events and other festivals.	DECI	Ongoing
5.13	Work with Eau Claire Area School District and Safe STEPS to reach with safe routes all middle schools as well as high schools.	Public Works	Ongoing
5.14	Continue to advocate/campaign with West Central Wisconsin Rail Coalition, St Croix, and Dunn Counties for intercity passenger rail.	Planning	Ongoing

Sustainability

Joint Efforts			
5.15	Continue to advocate and campaign for the State to authorization regional transit agencies.	Transit	2009
5.16	Consider creating an area-wide or metropolitan task force charged with bringing governments, businesses, special interest groups, citizens, and others together to promote sustainability.	Planning	2009
5.17	Work with the Midwest Renewable Energy Association to receive solar technical assistance under the U.S. Dept. of Energy's SunShot grant.	Planning	2015
5.18	Work with Eau Claire County, waste haulers, and other stakeholders to develop a more efficient means to collect and compost organic materials.	Public Works, Planning & Health Dept.	Ongoing
5.19	Work with area businesses and retailers to create a community reusable bag campaign.	Planning	2015-2016
5.20	Continue to support Eau Claire County to increase plastic bags and film recycling totals.	Planning	Ongoing
5.21	Seek to reuse urban wood waste from City boulevards and other spaces to supply private sector businesses for high-value products.	Parks	Ongoing
Capital Improvements			
6.1	Consider a pilot street project to convert a portion streetlamps to light emitting diodes.	Public Works	2010
6.2	Consider a pilot solar, wind, geothermal, or hybrid vehicle project.	Public Works	2010
6.3	Consider converting Forest Street into a larger community garden site.	Parks & Recreation	2010
6.4	Consider a Green Roof pilot project on a City building.	Public Works	2012
6.5	Incorporate green technologies into the new transit station.	Transit	2011
6.6	Replace the eight old Flyer Buses with electric-hybrids or alternative burning fuel buses.	Transit	2010



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

Comprehensive Plan

Outside of the sustainability chapter, the following is a list of the Plan's other chapters containing sustainability strategies. The chapters' goal, set objectives and underlining policies are noted. Refer to the Comprehensive Plan document for complete text of each policy statement.

❖ **Land Use Chapter**

Goal: Establish and maintain a land use pattern that achieves a desirable balance among quality of life, economic growth, protection of natural resources, and efficient delivery of public services.

- **Objective: Sustainable Growth:** Grow by investing in established areas, carefully planning new neighborhoods, providing attractive public amenities, and protecting environmental resources.

Policies:

- *Compact and Contiguous Growth.*
- *Complete New Neighborhoods.*
- *Infill and Reinvestment.*
- *Maintain Older Neighborhoods.*
- *Intensify Activity Centers.*
- *Annexation.*

- **Objective: Perimeter and Regional Growth:** Achieve compact and cost-effective perimeter growth for the long-term future.

Policies:

- *Growth Management.*
- *Limit Non-sewered Development.*
- *Environmental Protection.*
- *Protection of Prime Farmland.*
- *Encouraging Smart Growth.*
- *Infrastructure Investments.*

- **Objective: Residential Neighborhoods:** Reinforce or create neighborhoods with a diversity of housing, attractive public spaces, compatible land uses, and a sense of identity.

Policies:

- *Compact Growth.*
- *Variety within Each New Neighborhood.*
- *Context-sensitive Redevelopment and Infill.*
- *Multiple Land Uses in Neighborhoods.*
- *Mixed- and Multiple-use Development.*

- **Objective: Riverfronts and Stream Corridors:** Guide waterfront land use to parks, open spaces, housing, offices, and similar land uses that are compatible with the rivers. The pattern and design of land development or open space along



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

waterfronts is an important objective in Eau Claire because of the great number of miles of river or creek edge in the community.

- **Objective: Major Roadway Corridors:** Plan land use along the major road corridors in a manner supportive of the functional classification of the road.

Policies:

- *Road Corridor more intensive Land Use Planning.*

- **Objective: Environmental Resources:** Safeguard and improve environmental features as a means of promoting sustainable urban development, revitalization, and quality of life.

Policies:

- *Protect Wetlands.*
- *Protect Flood Plains.*
- *Steep or and extend greenways.*
- *Parks.*
- *Non-metallic Mineral Resources.*
- *Wooded Slope regulation.*
- *Minimize the loss of Prime Agricultural Lands.*

- **Objective: Redevelopment:** Restore underutilized urban and waterfront properties to viable commercial, residential, or recreational opportunities.
- **Objective: Public Infrastructure Investments Redevelopment:** Encourage state and local investments in public facilities and infrastructure that are consistent with the principles of Smart Growth and the objectives of the *Comprehensive Plan*.
- **Objective: Regional Planning:** Build land use planning relationships in the greater Chippewa Valley region that support the principles of Smart Growth and that help accomplish the *Comprehensive Plan*.

Policies:

- *Shared Metropolitan Vision of Smart Growth.*
- *Sustainable Development.*

❖ **Natural Resources Chapter**

Goal: Protect or improve steep slopes, wetlands, and streams in Eau Claire to promote sustainable development, ecological responsibility, quality of life, and economic development.

- **Objective: Water Resources:** Protect and improve the quality of surface water and ground water in and near Eau Claire.

Policies:

- *Storm Water Plan Implementation.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

- *Storm Water Plan Updates.*
- *Regional Surface Water Management Plan.*
- *River and Stream Shoreline Protection.*
- *Greenway Design.*
- *Wetland Restoration.*
- *River Flood Plain Management.*
- *River Flood Plain Property Acquisition.*
- *Reduce Groundwater Contamination.*
- *Infiltration Standards.*
- *Lawn Fertilizers.*

- **Objective: Wildlife Habitat:** Protect the key remaining small tracts of wildlife habitat and restore or improve the quality of other locations. Wildlife habitat is limited in this urban area, but key locations, such as around Half Moon Lake and along river and stream corridors, can be protected.

Policies:

- *Native Species of Vegetation.*
- *Greenways.*
- *Urban Forest.*

- **Objective: Soil Resources:** Safeguard soils by reducing soil erosion, especially near streams and wetlands, and by promoting compact urban growth. Reducing soil erosion supports the objective of protecting water quality.

Policies:

- *Regulate Steep Slopes.*
- *Prevent Erodible Slopes.*
- *Enforce Other Erodible Sites.*
- *Minimizing the loss of Prime Farmlands.*

❖ Transportation Chapter

Goal: Improve the City transportation system to ensure the safe and efficient movement of people and goods, and provide a variety of mode choices, while enhancing neighborhood livability and resident quality of life.

- **Objective: Balanced and Efficient Transportation System:** Provide a balanced and efficient transportation network that offers viable alternatives to driving and maximizes use of existing investments.

Policies:

- *Evaluate Projects for Multi-Modal Needs.*
- *Mode Connectivity.*
- *Alternative Mode Choices.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

- **Objective: Transportation Smart Growth and Land Use:** Coordinate the provision and improvement of transportation infrastructure with revitalization projects and compact, directed growth.

Policies:

- *Compact and Contiguous Growth.*
- *New Neighborhoods with mix of land uses.*
- *Infill and Redevelopment.*
- *Invest in Older Neighborhoods.*
- *Activity Centers.*

- **Objective: Transit-oriented Development:** Promote development in corridors and districts that encourage transit ridership

Policies:

- *Transit-oriented Development (TOD) Site Plan Guidelines.*

- **Objective: Neighborhood Streets:** Design neighborhood streets with features for automobile, bicycle, and pedestrian travel while limiting the impacts of traffic.

Policies:

- *Local Street Design.*
- *ADA-compliant Streets.*
- *Traffic Calming.*

- **Objective: Pedestrian Environment:** Improve pedestrian connections to create a continuous and seamless pedestrian system, and enhance the pedestrian environment to create a more walkable community.

Policies:

- *Build Sidewalks.*
- *Pedestrian System Plan.*
- *Pedestrian Crossings.*
- *Multi-jurisdictional Cooperation.*
- *Urban Design.*
- *Traffic Calming.*
- *Downtown Pedestrian Connections.*

- **Objective: Local Bus Transit System:** Sustain and improve the local bus transit system to serve both transit dependent and discretionary riders.

Policies:

- *Capital Investments (The Eau Claire Transit Station and new buses).*
- *Ensure High Quality Paratransit Service.*
- *Transportation Demand Management (carpooling/flexible/work times/telecommute).*

- **Objective: Intercity Bus Service:** Coordinate local and intercity transit service.



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

Policies:

- *Encourage Greyhound to relocate its present inter-city stop to the transit station.*

- **Objective: Bicycle Network:** Continue to build a connected bicycle route and trail network that is viable, convenient, safe, and secure and which will encourage both utilitarian and recreational riding.

Policies:

- *Bicycle Plan Implementation.*
- *Trails Network.*
- *Bike Route System.*
- *On-road Striped Bicycle Lanes.*
- *Future Local and Collector Streets.*
- *Accessibility and Parking.*

- **Objective: Parking Management:** Require only the amount of parking necessary to avoid problems and maintain viable businesses, considering transit and on-street spaces.

Policies:

- *Downtown Parking Management Plan.*
- *Balanced Neighborhood Parking.*
- *Minimum Parking Requirements.*

- **Objective: Passenger Rail:** Work with the Midwest Rail Initiative, WisDOT, and other agencies to link Eau Claire to the proposed high-speed passenger rail service.

Policies:

- *Midwest Regional Rail Initiative.*

❖ **Parks System Chapter**

Goal: Expand the park system into new neighborhoods while improving the conditions in the older parks.

- **Objective: Role of Parks in Urban Design:** Locate and design parks, greenways, and parkways to enhance the quality of residential neighborhoods and commercial districts, reflect Eau Claire's cultural heritage, and honor civic life.

Policies:

- *A Network of Green Spaces.*
- *A System of Civic Spaces.*
- *Neighborhood Quality.*
- *Waterfront Public Open Space.*
- *Quiet Spaces.*
- *Civic Pride and Local Heritage.*
- *Park Buildings follow a consistent architectural theme.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

- *Development of Adjacent Park and Greenway Areas.*

- **Objective: Ecology and Environment:** Plan and design parks and greenways to protect environmentally sensitive features, reduce negative environmental effects and serve as models of land stewardship.

Policies:

- *Natural Preservation and Stewardship.*
- *Half Moon Lake Watershed.*
- *Otter Creek.*
- *Manage Drainageways Naturally.*
- *Use Sustainable Plantings.*
- *Link Open Spaces.*
- *Retain Unmanaged Places.*
- *Stewardship Example.*
- *Provide Educational Opportunities.*
- *Work with Other Organizations.*

❖ Physical Character Chapter

Goal: Improve the aesthetics and enhance the identity of the City as a whole, and its neighborhoods, major road corridors, and waterfronts by building on its traditional urban character, natural amenities, and history.

- **Objective: Overall Urban Character:** Design Eau Claire to incorporate the best aspects of both a small town and a major city.

Policies:

- *Nodes of Urbanity in a Small Town.*
- *Promote Downtown and the River.*
- *Greening the City.*
- *Improve the appearance of the Major Commercial Corridors.*
- *De-emphasize the Automobile.*
- *Preserve and accentuate Urban vs. Rural Distinctions.*

- **Objective: Regional Setting:** Use public improvements, public art, and land development regulations to preserve, highlight, and interpret the major elements and special places that evoke the regional environmental and cultural history of Eau Claire.

Policies:

- *Paper Milling and Logging Economies.*
- *Early Ethnic and Religious Heritage.*
- *Special Places.*
- *Entrance Corridors and Major Intersections.*
- *Views and Landmarks.*
- *Wayfinding Sign System.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

- **Objective: New Neighborhoods:** Design new neighborhoods to reflect the best qualities of the traditional neighborhoods of Eau Claire.

Policies:

- *Minor Residential Streets.*
- *Continue to allow Alleys.*
- *Collector Streets with subarea plans.*
- *Require Sidewalks on both sides of each new local and collector street.*
- *Street Trees.*
- *Garage Setbacks.*

- **Objective: Established Neighborhoods:** Maintain or revive the traditional urban character of the older neighborhoods so that they remain attractive places to live.

Policies:

- *Neighborhood Protection.*
- *Context-sensitive Redevelopment and Infill.*
- *Mixed Use in Neighborhoods.*
- *Historic Preservation.*

- **Objective: Mixed- and Multi-use Development:** Encourage a mix of compatible land uses in a variety of locations and scales in order to create more vital and walkable activity centers.

Policies:

- *Neighborhood Center Scale.*
- *Commercial District Scale.*
- *Downtown Scale.*
- *New Neighborhoods and Centers.*

- **Objective: Site Design:** Improve standards for site planning and design, including building and parking placement, pedestrian connections, signage, and landscaping.

Policies:

- *Connections.*
- *Efficiency in shared uses.*
- *Landscaping.*
- *Sensitivity to Context.*
- *Parking Design.*
- *Environmental Protection.*
- *Open Space.*
- *Coordinated Signage.*
- *Transit-oriented Design.*
- *Incentives.*

- **Objective: Waterfronts:** Improve the visual quality and connections to the Chippewa and Eau Claire Rivers to support appropriate development and enhance the community's quality of life.



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

Policies:

- *Public Open Space and Walkways.*
- *Relationships of Buildings to the Open Space Edge.*
- *Edge Treatments to stabilize shorelines.*

- **Objective: Major Road Corridors:** Improve the appearance of the major road corridors in Eau Claire through landscaping, site planning, sign regulation, and access management.

Policies:

- *Commercial Site Landscaping.*
- *Corridor Landscaping and Lighting Improvements.*
- *Housing Abutting High-volume Roads.*
- *Street Trees.*

- **Objective: Parkways:** Build an interconnected parkway system to help improve community appearances, property values, and quality of life.

Policies:

- *Parkways System Plan.*

- **Objective: Outdoor Lighting:** Regulate outdoor lighting so as to reduce off-site glare and nuisances.

Policies:

- *Control exterior lighting so it is not a nuisance.*

❖ **Economic Development Chapter**

Goal: Seek to maintain a diverse economic base, high-quality workforce, and key quality of life assets necessary for attracting business investment and creating a sustainable tax base.

- **Objective: Dynamic Global Economy:** Periodically review and update economic development strategies, policies, investments, and programs to respond to changing economic conditions and opportunities.

Policies:

- *Development Areas.*
- *Incentive Programs.*
- *Organization.*

- **Objective: Sustainable Development:** Foster development that balances the benefits and burdens of economic growth by seeking to meet current community economic needs without reducing the capacity to meet the needs of the future.

Policies:

- *Conserve Land and Natural Resources.*
- *Leverage Previous Infrastructure Investments.*
- *Connectivity.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

- *Infrastructure Systems.*
- *Infrastructure Design.*
- *Preservation of Natural Systems.*
- *Infill.*
- *Diverse Neighborhoods.*
- *Building Footprint.*
- *Building Design.*

- **Objective: Redevelopment:** Support redevelopment of contaminated, blighted, and underused properties with strong potential for reuse as business and industrial development sites.
- **Objective: Revitalization Efforts:** Foster economic revitalization of Downtown, the riverfront and other commercial areas by encouraging diverse economic activity, including public and private offices, retail, services, medical, hospitality businesses, higher density housing, and civic, cultural, and entertainment uses.

Policies:

- *Retain and attract major employers Downtown.*
- *Work to retain and attract Entertainment, Civic, Recreational and Cultural Resources.*
- *Seek to attract higher density housing in and around Downtown*
- *Improve Business Improvement Districts (BIDs).*
- *Riverfront Redevelopment.*
- *Water Street: Support continued revitalization.*
- *Hastings Way: improve aesthetics and business investment.*
- *Oakwood Mall Area.*

- **Objective: Workforce:** Foster the competitive workforce needed for a high technology economy by working with community organizations and institutions to update existing workforce skills and to invest in the outdoor, recreational, lifestyle, entertainment and neighborhood amenities.

Policies:

- *Retain Students.*
- *Link Employers and Workforce Development Resources.*
- *Support Quality of Life.*

- **Objective: Transportation and Telecommunications Infrastructure:** Support and facilitate strong telecommunications and transportation infrastructure to all local business, industrial and office centers of economic activity, as well as to regional economic/transportation hubs such as Minneapolis, Chicago, Milwaukee and Duluth/Superior.

Policies:

- *Telecommunications Lines, Antennae, and Wireless Devices.*
- *High Speed Rail.*
- *Chippewa Valley Regional Airport.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

- **Objective: Organization and Coordination:** Work with public and private economic development partners to efficiently and effectively address economic development issues and opportunities and minimize duplication of effort.

Policies:

- Provide water, sewer, and storm utilities to industrial parks.

- **Objective: Tourism:** Support regional strategies to attract visitors to the area in ways that balance the economic benefits from tourism with the economic costs of expanded traffic and use of public facilities and services.

❖ Public Utilities Chapter

Goal: Maintain the existing public utility system and extend urban services to fringe areas in a planned, staged manner, while minimizing the impacts to the natural environment.

- **Objective: New Public Water and Sewer System Infrastructure:** Ensure that water and sewer systems are extended to annexed properties in a planned and staged manner with minimal disruption to the natural environment.

Policies:

- *Utilities Staging Plan: approve and extend according to priority.*

- **Objective: Natural Environment:** Maintain the existing public utility system and construct new utility infrastructure in a manner that minimizes harm to the natural environment. Sewer and water services allow and promote intensive urban growth in undisturbed locations. Eau Claire is committed to regulating such growth so that it respects sensitive natural features.

Policies:

- *Minimize Disturbance to Environmentally Sensitive Area (ESAs).*
- *Improve protection of Steep Slopes.*
- *Regulating clear cutting of Major Wooded areas.*
- *Discourage Private On-site Wastewater Treatment.*

- **Objective: Surface Water Management.**

Policies:

- *Continue to refer to the recommendations of Storm Water Plan Implementation.*
- *Update Storm Water Plan.*
- *Continue to safeguard and improve Water Quality Protection.*
- *Expand the City's present requirements for erosion control.*
- *Regional Surface Water Management Plan.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

❖ Community Facilities Chapter

Goal: Locate and maintain public facilities and services so as to support the goals of compact growth, neighborhood revitalization, and sustainable new neighborhood design.

- **Objective: Cost-effective and High-quality Facilities:** Provide public facilities in a cost-effective manner and build them to a high standard of quality.
- **Objective: Continue a high level of police and fire services.**
- **Objective: Coordinate urban growth, particularly new parks, with Schools.**
- **Objective: Other Facilities and Services.**

Policies:

- *Solid Waste Recycling collection and Disposal.*
- *Power Generation and Transmission.*

❖ Housing Chapter

Goal: Stabilize and improve established neighborhoods, while promoting affordable and decent housing for all residents of Eau Claire.

- **Objective: Housing Affordability:** Use regulations and assistance programs to help make housing affordable for all.

Policies:

- *Rent Assistance.*
- *Homeownership Assistance for First-time Buyers.*
- *Homeownership Assistance for Low-income Families*
- *Maintain Public Housing.*
- *Housing for the Homeless.*
- *Habitat for Humanity.*
- *State Housing Assistance.*
- *Local Housing Assistance.*
- *Promote Private Housing.*

- **Objective: Housing Rehabilitation, Maintenance, and Infill Development:** Continue to support and require maintenance of all types of housing.

Policies:

- *Housing Code Enforcement.*
- *Housing Rehabilitation Loans.*
- *Lead Paint Reduction Program.*
- *Weatherization Program.*
- *Infill Lots.*
- *Adaptive Reuse.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

- **Objective: Housing Diversity:** Promote, through plans and regulations, a broad range of housing types and price levels in each major district or neighborhood.

Policies:

- *Variety of Housing Types.*
- *Reduce the cost of Housing for the most needy in the community.*
- *Address the needs of the Homeless.*

- **Objective: Multiple-Family Housing Design:** Improve the appearance of multiple-family housing so that it becomes a more acceptable and compatible alternative.

Policies:

- *Strengthened Design Requirements.*
- *Integration with Single-family Housing.*

❖ Historic Preservation Chapter

Goal: Identify, protect, and preserve Eau Claire's resources, which reflect distinctive elements of the City's cultural, social, economic, political, historical, and architectural heritage in order to enhance the quality of life and foster pride and knowledge about Eau Claire's past.

- **Objective: Evaluation and Designation:** Continue to survey and evaluate historic and potentially historic resources for designation, recognition and protection.

Policies:

- *Intensive Historic and Architectural Resource Survey.*
- *Certified Local Government Program.*
- *National Register Nominations.*
- *Local Historic Designation.*

- **Objective: Role of Eau Claire Landmarks Commission:** Work to expand the role of the ECLC to utilize its expertise in assisting in the implementation of other elements of the *Comprehensive Plan*.

Policies:

- *Neighborhood and Area Planning.*
- *Design Standards and Guidelines.*
- *Conservation Districts.*
- *Heritage Recognition.*

- **Objective: Education:** Continue to provide and expand upon programs and activities that will instill an appreciation and pride in Eau Claire's past.



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

❖ Downtown Chapter

Goal: Re-establish the Downtown as a regional mixed-use activity center integrating civic and government uses, professional and corporate offices, health care, meeting and entertainment facilities, arts and culture, housing, and specialty retail.

- **Objective: *Downtown Action Agenda*:** Ensure an effective and ongoing public-private partnership to continue implementation of the *Downtown Action Agenda 2001*.
- **Objective: Business Development and Marketing:** Provide business development and marketing support to encourage diverse economic activity in the Downtown.

Policies:

- *Work to retain and attract Downtown Employers.*
- *Retain and attract Entertainment, Civic, Recreational & Cultural Resources.*
- *Incentives & Downtown Loan Funds.*
- *Retail Support.*
- *Increase Pedestrian Activity.*
- *Create large Community Spaces.*

- **Objective: Redevelopment:** Support redevelopment of blighted, vacant, or underutilized properties and sites in the Downtown.

Policies:

- *Redevelopment Authority carry out redevelopment projects in Downtown.*
- *Redevelopment Tools (TIDs, etc.).*
- *Master Planning for Redevelopment:*

- **Objective: Riverfront Development:** Encourage the use of the riverfront and adjacent open spaces as a key organizing feature for the design and orientation of both public facilities and private development.

Policies:

- *Establishing an interconnected Open Space system.*
- *Complete development of Phoenix Park.*
- *Neighborhood Connections.*
- *Create a continuous and connected river pathway system.*
- *Riverfront Access, Overlooks & Vistas.*

- **Objective: Pedestrian Orientation:** Enhance the walkability of the Downtown by ensuring safe, attractive, and pleasant pedestrian routes and connections within the Downtown area and between the Downtown and adjacent neighborhoods, public parks, and major activity centers.

Policies:

- *Increase Walkability and Complete key Pedestrian Connections.*



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

- **Objective: Downtown Design:** Encourage the consistent use of Downtown design standards and principles for buildings and public spaces to guide all public and private developments in the Downtown.

Policies:

- *Follow Downtown Design Principles.*
- *Downtown Land Use Pattern.*
- *Encourage incorporation of special decorative features and Public Art.*
- *Ensure that street edges in the Downtown are improved.*
- *Special Gateway Entry Features.*
- *Encourage well-designed exterior improvements Buildings.*
- *Wayfinding Sign System.*
- *Encourage improvements to interior building structures*

- **Objective: Circulation:** Provide a safe internal circulation system that is interconnected among districts with pedestrian and vehicular, and multi-modal access from the peripheral highway system.

Policies:

- *Loop System.*
- *Street Design.*
- *Encourage the construction of a new multi-use, multimodal Transportation Center.*
- *Explore the feasibility of implementing a small bus or trolley route.*
- *Traffic Circulation Study.*

- **Objective: Parking:** Provide a well-integrated system of surface and ramp parking consistent with Downtown design principles to meet mixed-use parking needs of Downtown.

Policies:

- *Ensure that bicycle parking loops are provided in key locations.*

- **Objective: Housing:** Encourage a mix of housing styles and opportunities within and surrounding the Downtown to meet the diverse economic needs of the community.

Policies:

- *Historic Homes, Loft Apartments & Empty Nester Housing.*
- *Mixed-use & Adaptive Re-use.*

❖ Intergovernmental Cooperation Chapter

Goal: Work jointly with other governments to achieve an orderly, compact, and cost-effective urban development pattern in the Eau Claire-Chippewa Falls metropolitan area.

- **Objective: Smart Growth Cooperation:** Encourage government jurisdictions in the metropolitan area to work together in implementing policies consistent with



City of Eau Claire's Comprehensive Plan Sustainable Development Policies

the *Comprehensive Plan* recommendations for the Urban Sewer Service Area and the principles of Smart Growth.

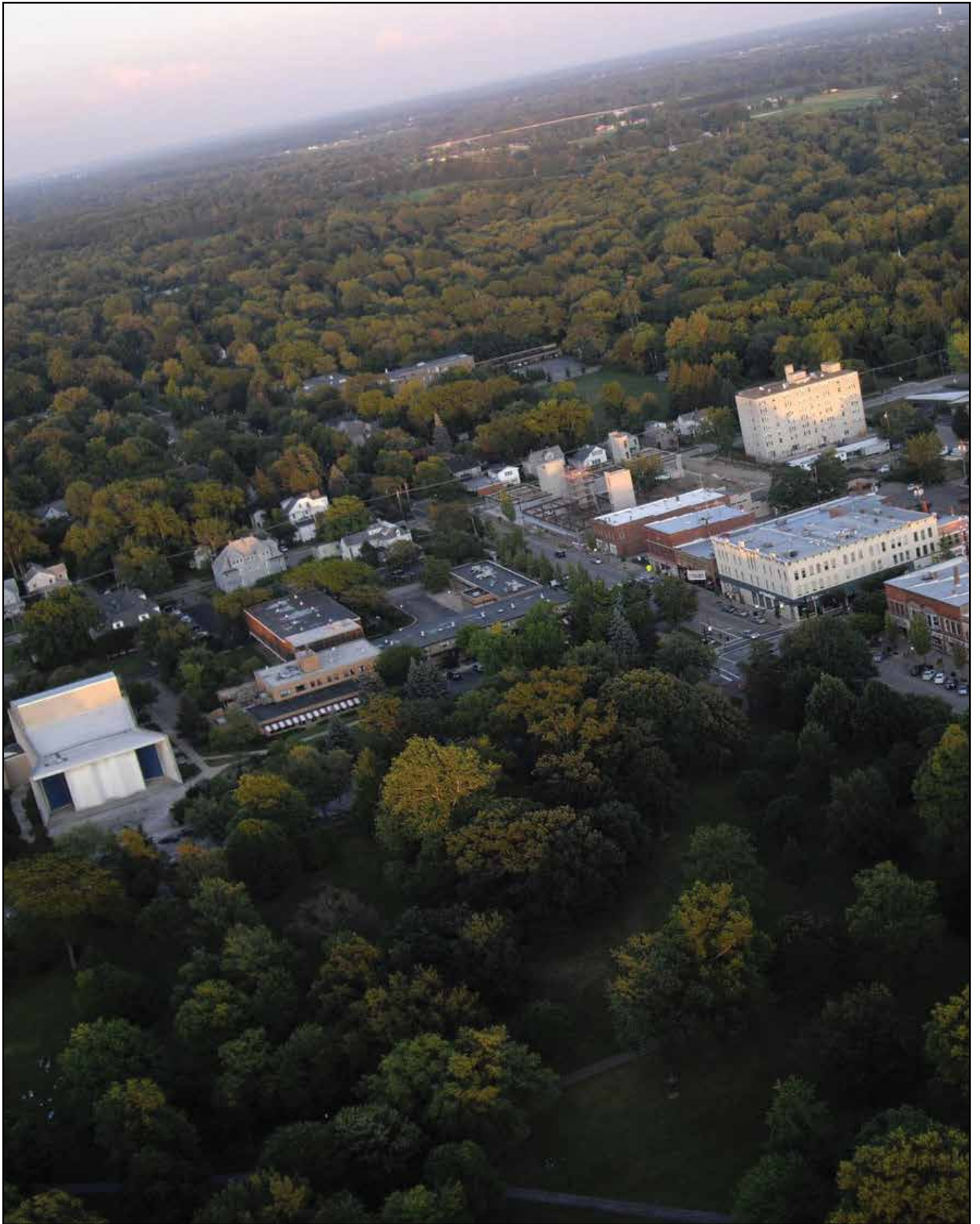
Policies:

- *Encourage multi-jurisdictional alliances to promote Smart Growth principles.*
 - *Update the City's Zoning Ordinance incorporate Smart Growth principles.*
 - *Shared Metropolitan Vision consistent with principles of Smart Growth.*
 - *Sustainable Development, interdependent relationship between economic vitality and environmental quality.*
 - *Protection of Rural Lands.*
 - *Regional Transit.*
 - *Actively prevent Premature Development.*
 - *Encourage design/ location of interim development in Extraterritorial Review Area.*
 - *Support County comprehensive plans encompassing the principles of Smart Growth.*
 - *Support and participate in Area-wide Planning.*
 - *Execute Intergovernmental Memorandum of Understanding.*
-
- **Objective: Shared Services:** Pursue expanded collaboration among government jurisdictions and agencies to share services and facilities more cost-effectively when providing public services in the metropolitan area.
 - **Objective: Consistent Development Standards:** Encourage government agencies in the metropolitan area to adopt and implement consistent land development policies, standards, and review procedures.
 - **Objective: Boundary Change:** Encourage an orderly boundary change process consistent with the *Comprehensive Plan* recommendations for the Urban Sewer Service Area.
 - **Objective: Shared Services:** Pursue expanded collaboration among government jurisdictions and agencies to share services and facilities more cost-effectively when providing public services in the metropolitan area.
 - **Objective: Consistent Development Standards:** Encourage government agencies in the metropolitan area to adopt and implement consistent land development policies, standards, and review procedures.
 - **Objective: Boundary Change:** Encourage an orderly boundary change process consistent with the *Comprehensive Plan* recommendations for the Urban Sewer Service Area.



Oberlin Climate Action Plan





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Oberlin's Vision

With a rich history of social and civil rights leadership beginning with its founding, the Oberlin community's identity as a leader has emerged again in the context of another generation-defining challenge: climate change. The City of Oberlin is committed to reducing community-wide greenhouse gas emissions below zero, while striving to balance the environmental, social, and economic interests of the Oberlin community.

With the adoption of a Sustainability Resolution by City Council in 2001, the City committed to uphold sustainability principles in carrying out their duties. In 2006, Oberlin College signed the American College and University Presidents' Climate Commitment, committing the College to become climate neutral by 2025. In 2007, the City became one of the first Ohio members of an international organization known as ICLEI—Local Governments for Sustainability, initiating a greenhouse gas inventory and developing a local climate action plan.

In 2010, the City and the College each signed an agreement with the Clinton Foundation and the United States Green Building Council to participate in the Climate Positive Development Program. Oberlin will become a community that will not just

neutralize its emissions but improve the environment by offsetting emissions. This goal of "reducing the City of Oberlin's GHG (greenhouse gas) emissions below zero through the implementation of economically viable innovations" committed the City and the College to becoming a climate positive community.

In accordance with membership in ICLEI and the Climate Positive Development Program agreement, the City developed and adopted a Climate Action Plan in 2011. The 2011 plan set systematic goals of reducing 2007 GHG inventory emissions by 50% in 2015, 75% by 2030 and below 100% by 2050.

The Climate Action Committee, a community-based group created by City Council, developed this 2013 Climate Action Plan as a roadmap for transitioning to a climate positive community. Work by the City and the College through the use of the recommended strategies and community outreach will create not only a climate positive community but also a community in which its residents live, learn, and lead.

This document serves as the 2013 Climate Action Plan for the City of Oberlin. For further information including background information, reports and more details of the strategies visit www.cityofoberlin.com.



A nighttime shot of downtown Oberlin. Photo by Greg Pendolino for Oberlin College.

A Message from Council President Ron Rimbart and City Manager Eric Norenberg

Dear Oberlinians:

We are pleased to present the City of Oberlin's 2013 Climate Action Plan which describes how the City and its residents can work together to address the challenges of climate change and forge a better tomorrow for Oberlin and the nation.

Oberlin has always been at the forefront of important issues of the day. The challenge of climate change is no different. We are proud of the leadership role Oberlin has played in our country since its founding in 1833. Now, we are in the vanguard demonstrating that environmental sustainability will not only foster a healthy environment, but also result in a prosperous community.

This plan demonstrates municipal government's commitment to addressing climate change and calls on all residents and businesses to be partners in this effort. Each of us can help by driving less and walking more, by weatherizing and increasing efficiency of homes and businesses, and by decreasing our use of fossil fuels. Cooperation among the City and community-based partners can help make such efforts easier as well as affordable.

We are grateful for the work of the Climate Action Committee, City staff and the Oberlin Project for helping to provide leadership and guidance in developing the 2013 Climate Action Plan. For it is only through collaboration, teamwork and the combined efforts of our entire community that we can achieve our goal of a climate positive community by 2050.

With your participation we can together address the challenge of climate change and in the process provide leadership for other communities and the nation as Oberlin has done before.

Sincerely,



Ronnie Rimbart
City Council President



Eric Norenberg
City Manager



Ronnie Rimbart and Eric Norenberg at Oberlin City Hall on Main Street.

Cover photos, from top left to bottom right: Sunset over Oberlin's Main Street, photo by Greg Pendolino; Family Fun Day, photo by John Seyfried; Solar panel rendition, photo by Rob Lamppa; the Bertram and Judith Kohl Building, photo by Kevin Reeves; OMLPS replacing traffic lights with LED bulbs; downtown Oberlin, photo by Yvonne Gay Fowler; West College Street shops, photo by Laura Blake.

Table of Contents photo: aerial photo of Oberlin's downtown by John Petersen for Oberlin College.



A scene of Oberlin's Main Street. Photo by Matthew Lester for Oberlin College.

Oberlin's Past Commitments to Sustainability

2001: The City adopted a Sustainability Resolution (Resolution No. R01-06 CMS) embracing the 1987 United Nations Commission on Environment and Development definition of sustainability: Policies, decisions, and actions will meet "current needs without compromising the ability of future generations to meet their needs."

2004: The College created a comprehensive Environmental Policy establishing 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 consistent with the best environmental practices.

2004: The City embraced sustainability as a central theme in its 2004 Comprehensive Plan.

2005: The Board of Trustees of Oberlin College unanimously adopted "Move toward Environmental Sustainability" as one of the College's strategic directions in its Strategic Plan.

2007: The City joined ICLEI-Local Governments for Sustainability, committing the City to address climate change.

2006: The College signed the American College and University Presidents' Climate Commitment (ACUPCC) committing the college to become climate neutral with the current target date of 2025.

Introduction

Oberlin Community and Leadership

Oberlin has demonstrated its capacity for leadership in social justice from its inception with the high standards of John Shipherd and Philo Stewart, who together founded Oberlin in 1833—Shipherd, the town; Stewart, the school. Oberlin's central role in civil rights is the foremost historical example of its social courage and vision. Oberlin College at its founding “embraced the joint education of the sexes” which led in 1841 to the first bachelor's degrees in the nation awarded to women. Furthermore, in 1835, the College became the first institution of higher learning in the United States to accept students regardless of race.

Oberlin has also been credited with being the spark that ignited the Civil War.¹ In 1858, a group of Oberlin citizens traveled to neighboring Wellington and freed John Price, an escaped slave, in defiance of the Fugitive Slave Law. Their prosecution in the federal court in Cleveland brought widespread attention to the injustices of slavery. The 20th century saw Oberlin continue its leadership in civil rights through actions to end segregation and discrimination based on race, gender, and sexual orientation.

Prophetically, soon after Oberlin's

founding, Shipherd observed, “Oberlin is peculiar in that which is good.”

Climate Change and Commitments to Sustainability

Oberlin has again emerged at the beginning of the 21st century as a leader in another generation-defining challenge: climate change (See Sidebar: Climate Change). Accepting the scientific consensus that climate change is here, the City of Oberlin and the College have made significant progress and new commitments to address climate change consistent with their history of courageous and morally sensitive leadership.

City Governance

Oberlin has a council-manager form of government. A seven-member City Council is elected at large every two years, and the City Council appoints the City Manager. The part-time Council members do not have physical offices but rather interact with citizens through personal contact. The City Manager is responsible for the daily operation of City departments and coordination of department heads and City staff. The City Manager, Finance Director, Law Director, and Council Clerk report directly to City Council and provide independent management, operational supervision, and expert

How to read this document:

There are links within this document, noted by an underline, included to provide you with additional information. Also, throughout the document there will be helpful definitions in this sidebar.

DEFINE IT:

Sustainability: Policies, decisions, and actions that meet current needs without compromising the ability of future generations to meet their needs.

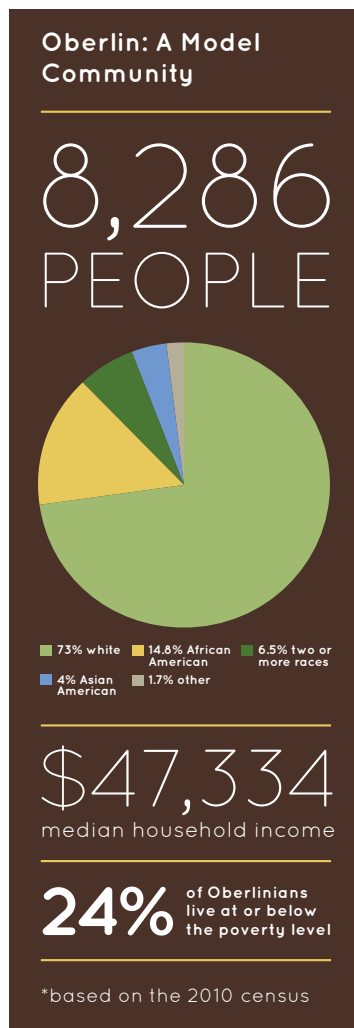
2008: The City continued efforts to reduce the carbon intensive sources in its electricity portfolio by withdrawing from participation in a 50-year contract to purchase power from a proposed coal-fired power plant.

2010: The City and College both joined the Clinton Foundation's Climate Positive Development Program (CPDP) thereby committing each to become climate positive by reducing community-wide greenhouse gas (GHG) emissions below zero.

2011: The City completed the first version of its Climate Action Plan (the 2011 CAP) that commits the City to reducing its GHG emissions below 2007 emission levels 50% by 2015, 75% by 2030, and 100% by 2050.

2009: The City hired the energy consulting firm Black & Veatch to investigate viable low-carbon energy sources to replace the City's traditional fossil-fuel-based electricity portfolio.

2011: The City completed its 2025 Strategic Plan in which environmental and economic sustainability were two of its top strategic priorities.



advice. More than 20 boards and commissions composed of Oberlin residents are appointed by City Council to provide advice and recommendations to city officials and City Council concerning various matters including planning, development, utility infrastructure, and quality of life issues.

City Utilities

The City's Public Works Department has six divisions: Engineering, Administration, General Maintenance, Building and Grounds, Water, and Wastewater. Public Works operates the City's refuse and recycling collection program as a self-supporting Enterprise Fund. In addition to water and wastewater utilities, the City has a community-owned, not-for-profit electric utility, Oberlin Municipal Light and Power System (OMLPS). Created in 1934, OMLPS generates, purchases, transmits, and distributes electric power to more than three thousand residential and commercial customers. An Electric Director who reports to the City Manager oversees OMLPS.

Oberlin College

Oberlin College is the largest employer in the City, and its student body comprises approximately one third of the population of the city. Oberlin College uses about 25% of the city's electricity and is responsible for about the same percentage of the city's carbon emissions. A significant percentage of these emissions come from its coal-fired power plant, which produces steam to heat College buildings. Sustainability planning at the College is led by the Office of Environmental Sustainability (OES) and the Committee on Environmental Sustainability (CES), a committee of the General Faculty.

Since their beginning in 1833, Oberlin College and the City of Oberlin have nurtured and challenged each other to advance human well-being locally and beyond. Testimony to this relationship is provided above with the list of sustainability resolutions and commitments each has made in the past decade. By signing in 2010 individual memoranda of understanding with the CPDP to become climate positive,

the College and City created an even stronger interdependent relationship. At the signing ceremony, Bob Berkebile, an internationally renowned Kansas City architect speaking for the United States Green Building Council (USGBC), foreshadowed the future this way: "This alignment of common purpose, of having to work together, will change this community in ways unimaginable and for the better."

The Oberlin Project

The Oberlin Project, a local collaborative venture that can trace its origins to 2007 and became a staffed operating initiative in 2011, provides an interface among the City, College, Oberlin City Schools, and the many institutions and groups within the Oberlin area, as well as its citizens. The Oberlin Project is the scaffolding in the Oberlin community to facilitate the development of full spectrum sustainability (FSS) in which sustainability becomes the default setting for all policies, decisions, and actions. The Project serves as the catalyzing agent for many of the GHG reduction strategies and the sustainability work in and around the City and College, and serves as the lead contact and coordinator for the CPDP. Funded by grants and individual donors independent of both the City and College, the Oberlin Project staff has been tasked with assisting in moving forward the many parts that encompass FSS. In addition to bringing in resources for assisting with implementation of the CAP and the CPDP's Climate Positive Credits, the Oberlin Project has tasked itself with facilitating a radical lowering of carbon emissions while building a stronger local economy, increasing local food supply and agriculture resources, and working to further FSS with all four local educational institutions: Oberlin City Schools, Oberlin College, Lorain County Joint Vocational School, and Lorain County Community College.

A Model Community

As of the 2010 census, Oberlin was a city of 8,286 people. Population growth was essentially flat with 1% growth between 2000 and 2010. Oberlin's population is 73% white, 14.8% African

American, 6.5% two or more races, and 4% Asian American.² Oberlin also includes a broad range of socioeconomic backgrounds; the median household income is \$47,334, and 24% of the individuals in Oberlin live at or below the poverty level.³ This plan was created with the premise that Oberlin is a representative community within the United States, that it is large and diverse enough to serve as a proxy for larger cities, but small enough that the community as a whole is capable of addressing many of the major sources of emissions that contribute to global warming. Oberlin strives to serve as a model that can be learned from and replicated nationally and worldwide.

About This Report

Climate Action Plan for ICLEI Cities for Climate Protection Program

In 2007, the City of Oberlin became a member of ICLEI–Local Governments for Sustainability and committed to carry out the five milestones in ICLEI’s program, Cities for Climate Protection (CCP) (see Figure 1). ICLEI’s CCP program assists municipal officials as they pursue GHG reductions for their municipal operations and their community as a whole. Having completed the first milestone of conducting the baseline inventory in 2009, the City of Oberlin completed milestones two and three

with the adoption of the 2011 CAP and establishing GHG reduction targets.

Climate Positive Roadmap for Climate Positive Development Program

In 2010 the City and Oberlin College individually signed memoranda of understandings with the Clinton Foundation and the USGBC to be the 18th city in their Climate Positive Development Program (CPDP); this committed both City and College to establishing programs in consultation with the CPDP that would result in both becoming climate positive. Currently, the City and College are Climate Positive Candidates within this program. This document will meet the requirements necessary to achieve the second level of recognition within the CPDP, Climate Positive Participant, by serving as the Climate Positive Roadmap (see [Sidebar: Achieving Climate Positive Participant Status](#)).

Development and Revision of this Report

The City of Oberlin developed the 2011 Climate Action Plan led by OMLPS’ Energy Services and Sustainability Initiatives Manager and a sustainability intern from Oberlin College. City Council adopted the 2011 CAP and formed a Climate Action Committee to provide an update to the Plan, which resulted in this 2013 CAP. The major

DEFINE IT:

Climate positive: Operation of a building or an entity (college, city, defined area, etc.) resulting in net removal of greenhouse gases from the atmosphere.

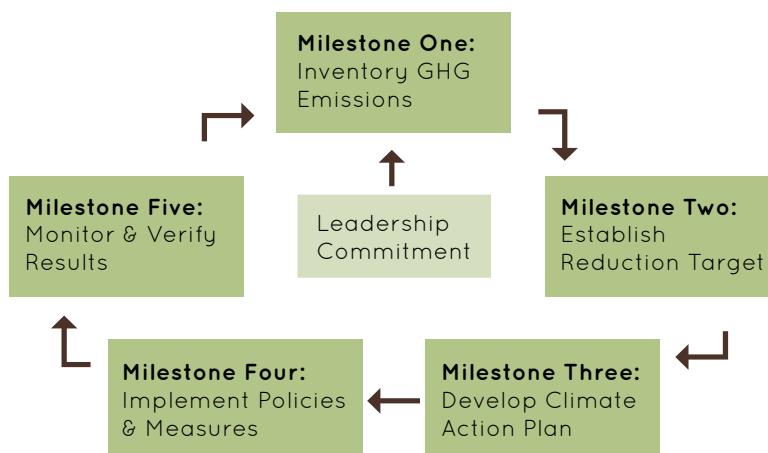
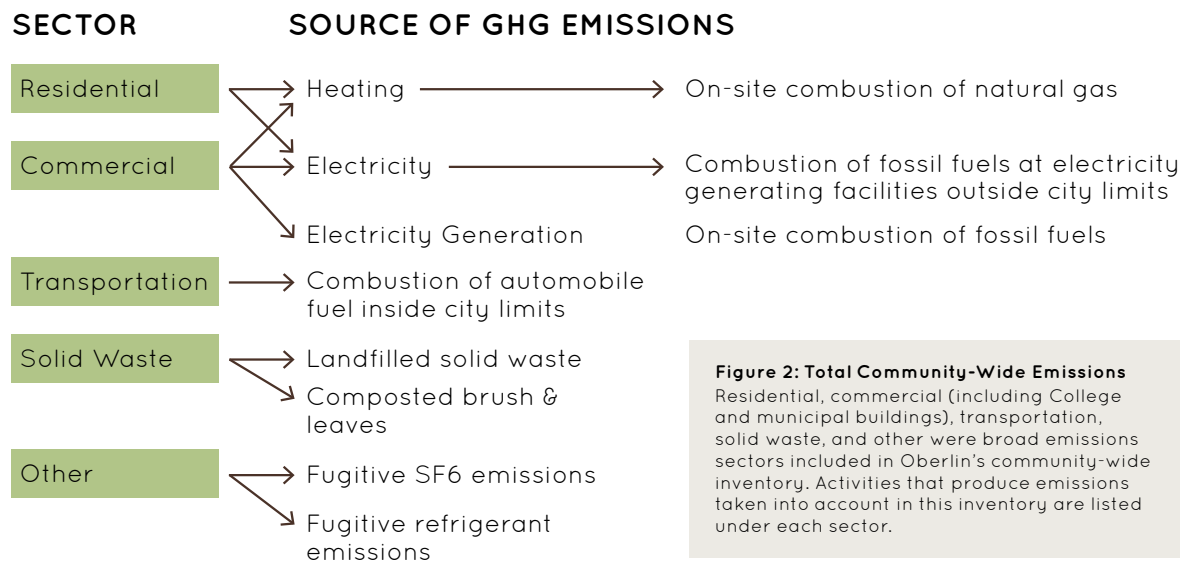


Figure 1: ICLEI CCP’s five milestones. Oberlin completed an emissions inventory in 2009 and established reduction targets and adopted a Climate Action Plan in 2011.

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 GHG 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. GHG emissions by assisting local governments in taking action to reduce emissions.

For more information on ICLEI and the five milestones, see www.icleiusa.org.



changes in the 2013 CAP reflect the work of the Climate Action Committee and take into account the roles of Oberlin College, local non-profits, and others to identify further potential strategies to chart the path toward a climate positive community. The 2013 CAP includes both recommended strategies under and outside of the City's direct control. See the [Acknowledgements](#) section of this report for more information on the participants involved in drafting the 2013 CAP.

Oberlin's Emissions Inventory

The purpose of a baseline emissions inventory is to understand current patterns of GHG emissions, to prioritize strategies to reduce emissions, and to establish measurable reduction targets. Breaking out emissions by sector (e.g. commercial, residential) and energy use (e.g. heating, vehicle fuel, electricity) allows Oberlin to identify the best opportunities for significantly reducing emissions. An inventory is also useful for comparing emissions with other communities and for tracking progress over time.

The City's GHG inventory was conducted through a partnership of OMLPS, the City, and the College's Environmental Studies Program. The

inventory was compiled and calculated using ICLEI's [Clean Air and Climate Protection](#) (CACP) software. Both a municipal and community-wide inventory were completed for the years 2001 and 2007. For the purposes of setting Oberlin's emissions reductions targets, 2007 was chosen as the baseline because of the availability of more complete data than 2001. The emissions inventory will be updated every five years, allowing Oberlin to track its progress toward emission reduction targets over time. See the Measurement and Verification section of this plan for detail and a discussion of GHG emissions protocol and software.

Community-wide Inventory Results

The community-wide inventory included GHG emitted within the municipal boundary of the City of Oberlin. Figure 2 outlines emissions sources included in the inventory. The inventory determined that as a whole, the community emitted 174,391 tons of carbon dioxide equivalent (CO₂e) in 2007. The community's per capita annual emissions (using population of 8,286) were 21.0 tons CO₂e. According to the US Energy Information Administration, per capita energy-related CO₂e emissions in the US were 19.8 tons per person in 2007.

Municipal Inventory Results

An inventory of emissions from municipal operations was also completed for 2007 and is summarized in [Appendix II](#).

Vision, Goals, and Strategic Direction

The City of Oberlin is committed to reducing community-wide GHG emissions below zero, while striving to balance the environmental, social, and economic interests of the Oberlin community. The 2013 CAP serves as a roadmap for transitioning to a climate positive community by charting specific emissions reduction strategies and establishing a plan for measurement and verification of emissions reductions. This plan is a living document that will be reviewed on an ongoing basis and updated periodically. Annual updates on the progress of goals and strategies will be prepared for City Council.

Using 2007 as a baseline, the City of Oberlin has set goals of reducing GHG emissions at least 50% by 2015, at least 75% by 2030, and below zero by 2050. The City will strive to achieve measurable GHG emissions reductions each year in order to ensure incremental progress toward reduction targets. To bring this into perspective it will be necessary to reduce emissions by at least 1.5% annually. Reductions will be

calculated every 5 years with an updated GHG emissions inventory.

This document was created with some important guiding principles in mind. First, in order to achieve a climate positive outcome in an environmentally and economically responsible way, the City and community must strive to reduce its own emissions as much as possible across sectors and energy uses highlighted in the GHG emissions inventory. However, it will be necessary to offset remaining GHG emissions and reduce emissions below zero through the creation of Climate Positive credits, which can be generated by carbon sequestration projects (such as tree planting) or extending emissions reductions to the surrounding community (such as through implementing large scale renewable energy infrastructure).

Second, the GHG emissions inventory highlights the sectors and energy uses that are responsible for the majority of emissions, allowing us to identify and pursue strategies that will achieve the greatest emissions reductions first. The 2007 inventory identified electricity as the largest contributor to community-wide emissions. The City has addressed these emissions through its locally owned electric utility, OMLPS, by entering into long-term contracts for landfill gas, hydro, and

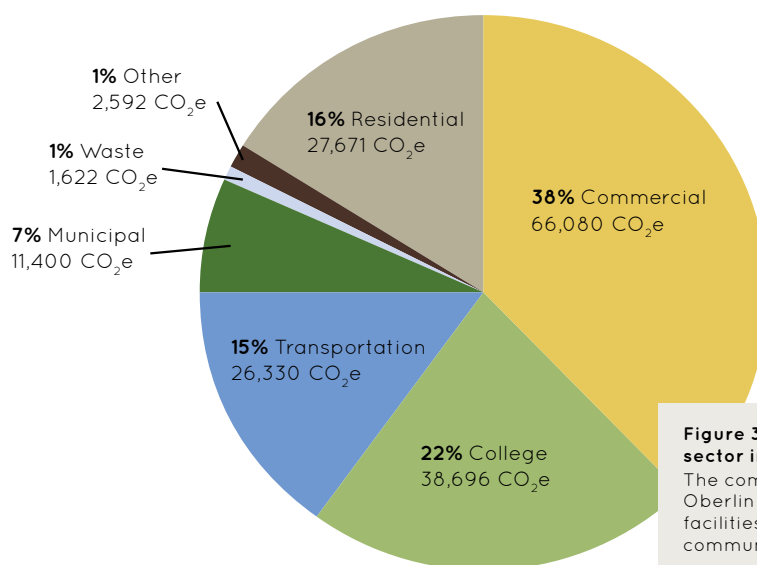
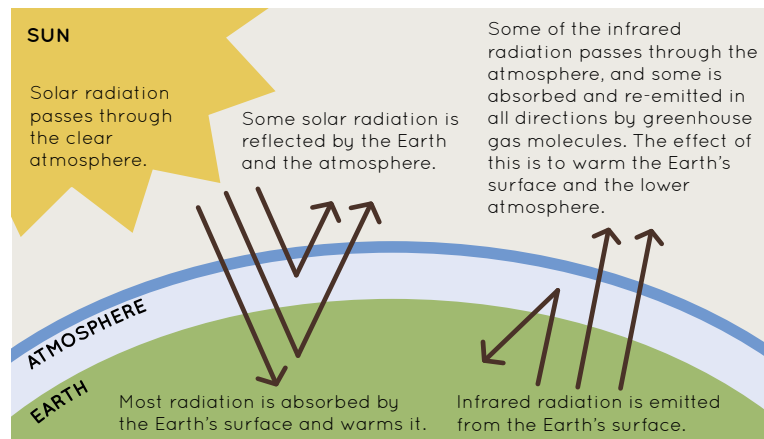


Figure 3. Percentage of CO₂ tons emitted by sector in 2007.

The commercial sector, including all businesses, Oberlin College properties, and municipal facilities within city limits, made up 67% of total community-wide emissions.



Climate Change

Life on earth is possible because earth's warm surface temperature allows water to exist in liquid form. Earth has a warm temperature because our atmosphere is composed of greenhouse gases (GHG) that act as a blanket; these GHG adsorb infrared radiation, meaning they trap heat and thereby warm the earth's surface. Without GHG the earth's temperature would be about 60° F cooler or -3° F. Water (H₂O), carbon dioxide (CO₂), methane (CH₄), and chlorofluorocarbons are all greenhouse gases affecting climate change, but water and carbon dioxide have a greater influence than the others. Climate science has established a positive correlation between atmospheric CO₂ concentration and surface temperature. That is, in the past when CO₂ went up, temperature rose and when CO₂ went down, temperature decreased. Simply put, carbon dioxide acts like a blanket that retains infrared radiation thereby making the planet warmer.

Over the past 65 million years earth's average temperature ranged from 50° F to 81° F while over the past 10,000 years the range was 51° F to 58° F with present-day average temperature being 57° F. Over the last 10,000 years agriculture and civilization arose during a period of relatively stable temperatures to which we are acclimated. Over the last 100 years human activities have increased CO₂ concentration from 310 parts per million (ppm) to 390 ppm, and the temperature has risen 1.4° F, with a 0.9 ° F rise since 1980. Climate scientists predict that on our present course the temperature will increase from 4° F to 11° F over the next 100 years.⁴

Although the average temperature rise of 1.4° F appears to be small, we are seeing its effects. Spring comes a week or two earlier while fall is a week or two later and the ranges of many northern hemisphere species are moving north and to higher altitudes.⁵ The result is the unraveling of ecosystems and life support. Glaciers are melting almost everywhere. Greenland glaciers lost 36 to 60 cubic miles annually between 2002 and 2006 while Antarctica glaciers lost 36 cubic miles between 2002 and 2005, causing sea level rise and threatening low land populations.⁶ Oceans are more acidic from CO₂ adsorption causing coral reefs to die.

The hottest 10 years based on actual recorded temperatures have occurred since 1997.⁷ Extreme weather events are increasing: intense rainfalls, extremely high temperatures, droughts, tornados, and class 4 and 5 hurricanes. If the climate were stable, then record-setting low and high temperatures would be about equal. This was the case before 1980, but since then high records have occurred twice as often as low records. The climate dice are now set for extremes that will become the new norms if we persist in pumping heat trapping GHGs into the atmosphere. The thicker we make the heat-trapping blanket, the warmer the planet.

SEE [CLIMATE CHANGE APPENDIX I](#) FOR MORE INFORMATION.

solar power supply. See the [Renewable Energy Section](#) for more information on these renewable/carbon neutral resources, which will provide Oberlin with 90% renewable/carbon-neutral electricity in 2015.

This plan outlines the GHG emissions reductions needed to achieve our goal of becoming climate positive. However, it does not chart how we will achieve the reduction goals while balancing, and indeed improving, the environmental, social, and economic interests of the Oberlin community. With concern for achieving economic resilience and social and environmental justice, we will need to measure success using social, physical, and economic indicators of sustainability. These metrics and financial tools, which speak to economic and social aspects, are currently being developed in partnership with The Oberlin Project and Oberlin College.

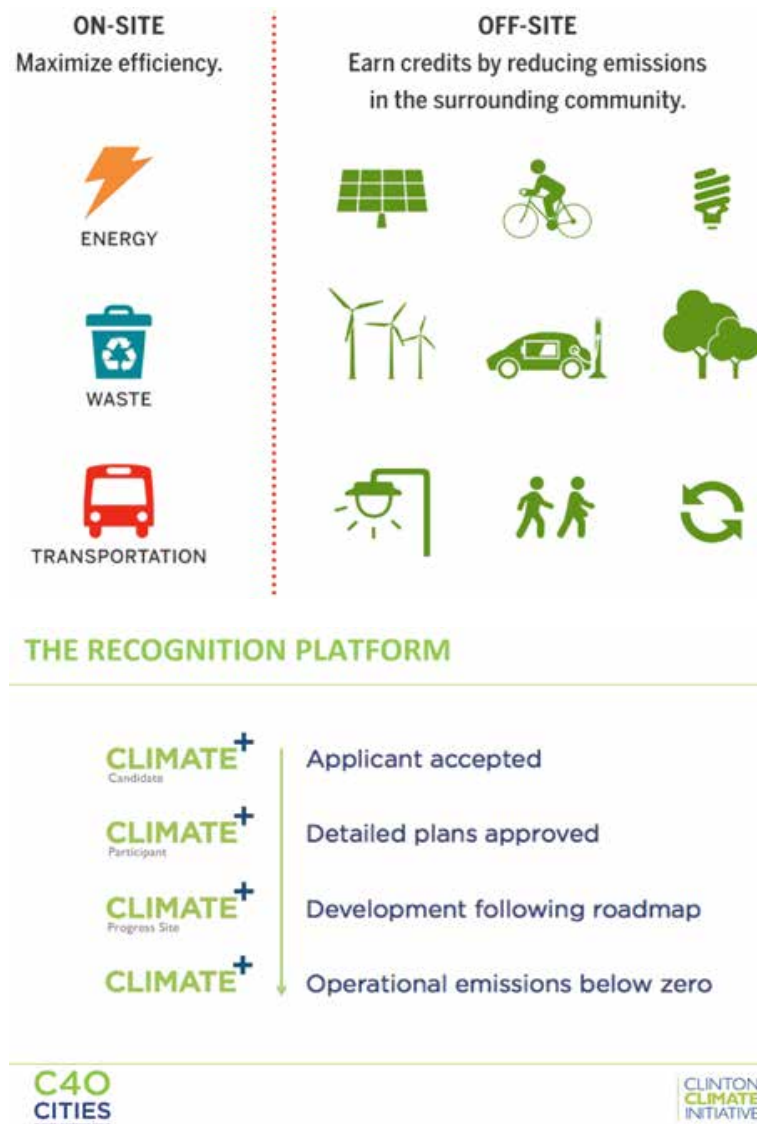
Reader's Guide

The remainder of the plan is organized into six main sections addressing GHG emission reduction strategies. We have ordered the sections from greatest to least percentage of GHG emissions based on the 2007 inventory and presented relevant material in each section with an associated appendix of more detailed information and data. Each section includes potential strategies that are recommended for consideration and/or implementation by the City and partner organizations within the next five years.

Achieving Climate Positive Participant Status

In order to qualify for Climate Positive Participant Status with the Climate Positive Development Program (CPDP), partners must adopt a Climate Positive Roadmap that:

- Outlines planned strategies that will achieve a net-negative emissions outcome in the areas of waste management, transportation, and energy, meaning that greenhouse gas emissions are reduced below zero
- Details the emissions profile through net-negative project completion
- Identifies and quantifies Climate Positive Credits, which allow a project to achieve a climate positive outcome (see [Climate Positive Credit section](#))
- Includes an ongoing measurement and verification plan, including identification of protocol used to calculate emissions
- Identifies important stakeholders and partners in the project
- Specifies milestones when progress will be assessed.



Graphics courtesy of the Climate Positive Development Program



Rendition of the 2.27 MW solar array constructed on Oberlin College property in 2012. Photo by Rob Lamma for Oberlin College.

Renewable Energy

Introduction

Energy accounts for about two-thirds of global GHG emissions and includes energy used for electricity, space heating, and transportation. Drastically reducing emissions requires steep reductions

in the use of carbon-intensive fossil fuels. The carbon intensity of Oberlin's energy portfolio can be reduced by replacing fossil fuels with renewable energy sources such as photovoltaic systems, low-carbon energy sources such

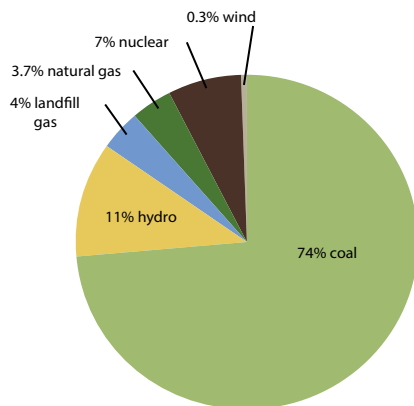


Figure 4: Oberlin Fuel Resources for 2007.
2007 chart does not reflect associated environmental attributes sold by City.

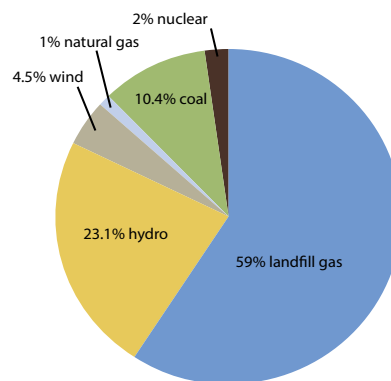


Figure 5: Oberlin Fuel Resources for 2015.
2015 chart reflects associated environmental attributes retained by City.

as nuclear energy, or carbon neutral sources such as landfill gas. In contrast to other sources of energy, renewable energy resources are constantly replenished and will never run out.

Background: Oberlin Energy Portfolio

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, an opportunity that most cities in the United States do not have. Furthermore, as a member of [American Municipal Power \(AMP\)](#), Oberlin is involved in renewable/carbon neutral joint power supply projects that the City would not be able to manage or afford on its own.

Oberlin's 2007 baseline renewable/carbon-neutral power supply includes a mix of landfill gas (LFG), hydro, wind, and solar. Because of the high percentage of coal in Oberlin's electricity portfolio, electricity accounted for 55% of community-wide GHG emissions in 2007.

Energy used for space heating and transportation presents a different challenge because the fossil fuel-based sources for these sectors are outside of the direct control of the City. Natural gas is the major energy source for space heating and is supplied to the majority of customers through an investor-owned utility. Transportation is heavily reliant on gasoline and diesel, which are sold commercially. Reducing CO₂e in these sectors can be accomplished by transitioning from equipment dependent on fossil fuels to efficient renewable, low-carbon, or carbon neutral alternatives.

Renewable Energy Goals

The City of Oberlin is committed to developing and maintaining a portfolio of renewable resources that will provide the city with reliable power at a stable and reasonable cost to its residents. Specifically, Oberlin will strive to:

- Eliminate fossil fuel use for electricity generation no later than 2050.
- Transition away from fossil fuel use to carbon neutral energy for sectors such as space heating and transportation as efficient technologies allow (see [Sidebar on Fuel Switching](#)).

About Renewable Energy

What is Renewable Energy?

Renewable energy resources are constantly replenished and will never run out. According to the National Renewable Energy Laboratory (NREL), renewable energy sources include solar, wind, biomass, geothermal, ocean, and hydropower.

Benefits of Renewable Energy

Renewable energy creates many public benefits for the city and the region including environmental improvement, increased fuel diversity and security, regional economic development benefits, and local revenue:

- **Environmental Improvement** – Emissions of CO₂, mercury, NO_x, SO_x, and particulate matter are significantly reduced. Damage associated with fuel extraction/processing/transport is almost eliminated.
- **Fuel Diversity and Security** – Multiple energy assets mitigate risk from under-performance or loss of any one source. Energy sources spread across two regional transmission organizations (RTOs) and multiple transmission networks minimize risk of reliability problems. Energy sources sited within Oberlin are effectively insulated from regional grid outage.
- **Economic Benefits** – Rates will be immune to the volatile market swings of fossil fuels. Utility revenues paid to Ohio-based companies provide local jobs and continue to circulate the money through the local economy. Oberlin-based energy sources avoid transmission fees and garner capacity credits, both of which lower electric rates. Reliable electricity with stable rates is attractive to new and existing businesses that provide jobs for the community and a healthy tax base.
- **Local Revenue** – A Renewable Energy Credit (REC) encapsulates the positive environmental attributes of electricity from a renewable source and can be sold as a separate commodity from the associated electricity to another entity wishing to offset the negative environmental attributes of its power source. For example, the [City has in the past sold RECs to Oberlin College](#) and created the Sustainable Reserve Fund. [Senate Bill 221](#), signed by Gov. Strickland in 2008, requires that investor-owned utilities in Ohio obtain 12.5% of their electricity from renewable resources by the year 2025. While SB221 requirements do not apply to Oberlin's municipal utility, they do have long-term implications for the market value of in-state RECs held and sold by Oberlin. With further acquisition of Ohio-based renewable energy resources, Oberlin has the opportunity to expand its REC sale program by selling in-state RECs and replacing them with out-of-state RECs to realize significant revenue for future local environmental initiatives.

Challenges of Transitioning to Renewable Energy

The wind does not always blow and the sun does not always shine, but we have become accustomed to electricity – anytime – at the flip of a switch. Replacing fossil fuel generators running 24/7 with highly intermittent renewable energy is not a satisfactory solution. Until the technology is available to efficiently store and utilize renewable energy with low capacity factors such as solar and wind power (10%-40% capacity factors), interim sources of low-carbon or carbon neutral power must be relied upon. The most promising of these energy sources is landfill gas (LFG), which is derived from the decomposition of organic matter in municipal solid waste and is widely considered a carbon neutral energy resource. However, because LFG is a by-product of landfills, and landfills are only replenished so long as we continue to generate and dispose of waste in the same way, LFG is not considered renewable. It is also important to note that there are GHG emissions resultant from the initial construction and continuing operations and maintenance of renewable energy infrastructure also known as embodied carbon or carbon footprint.

DEFINE IT:

Power Purchase Agreement

(PPA): A contract in which the seller retains ownership of the generation facility and the buyer agrees to purchase electricity at prescribed terms over time.

Present Strategies

Based on present power supply commitments, our municipal electric utility will have a 90% carbon neutral portfolio of energy sources by 2015, reducing community-wide emissions by approximately 50%. (See table below)

Spotlight: Spear point Solar Energy 2.27 MW PV Field

In 2012, Oberlin College and the City of Oberlin collaborated on the development of a 2.27 megawatt solar photovoltaic facility located on 11 acres of college-owned property in New Russia Township. The College entered into a power purchase agreement (PPA) with Spear Point Energy of Aspen, Colorado to purchase the renewable solar energy for a 25-year period. The solar photovoltaic project was designed and constructed by SPG Solar of Novato, California and incorporates a single-axis tracking system for solar production enhancement. The project is estimated to produce 3,000 megawatt-hours of renewable energy annually serving 12% of the College's power supply requirements.

"Renewable energy resources are constantly replenished and will
NEVER RUN OUT."

Present Strategies for Renewable Energy

Strategy	Lead Entity	Timeline	Reduction CO ₂ e tons - annual	Benefits
Belleville Hydro Project	OMLPS	1999–2050	8,182	Owned asset, baseload resource, renewable
New York Power Authority - Niagara and St. Lawrence Hydro	OMLPS	1999–2030	1,986	Low cost, baseload resource, renewable
Ohio Renewable Energy Services, LLC - Erie County LFG	OMLPS	2010–2022	3,615	Contract capacity and 1/2 RECs, baseload resource, carbon-neutral
AMP JV6 - Bowling Green Wind Project	OMLPS	1999–2030	360	Owned asset, renewable
Iberdrola Renewables Blue Creek Wind Project	OMLPS	2012–2022	1,440	Contract capacity/RECs, renewable
Spear Point Solar One, LLC Oberlin College Solar Field	Oberlin College	2012–2036	2,270	Customer-owned generation, peaking resource, renewable
Purchasing Natural Gas Blended with Methane for City Buildings	OMLPS	2009–ongoing	25	Reduced carbon-footprint of space heating
Customer-Owned Solar Generation	Utility customers	1999–ongoing	183	Local assets, peaking resource, renewable
Waste Management Renewable Energy, LLC - Mahoning and Geneva County LFG	OMLPS	2013–2027	44,365	Contract capacity/RECs, baseload resource, carbon-neutral
AMP Hydro Phase I - Cannelton, Smithland, and Willow Island	OMLPS	2013–2080	9,319	Owned asset, baseload resource, renewable
AMP Hydro Phase II - Meldahl and Green-up	OMLPS	2014–2080	2,815	Owned asset, baseload resource, renewable
Sustainable Reserve Fund	OMLPS	2007–ongoing	TBD	Provides funding for GHG reduction efforts
Electric Vehicle Charging Stations	OMLPS	2013–ongoing	TBD	Reduction of vehicle emissions, available to the public in downtown parking

The College and the City entered into an Interconnection Agreement to permit the photovoltaic solar facility to tie into Oberlin's electric grid and virtually deliver the solar generation output to College facilities. The project offers significant benefits to the City as a renewable fuel based resource within its power supply and through wholesale power cost savings associated with transmission-shaving and installed capacity obligations.

Potential Strategies

Given the goal of eliminating fossil fuel use, Oberlin will continue to acquire generation assets of renewable energy to supply our community's electricity needs as technology and opportunity allows, to promote transitioning to carbon neutral electricity for sectors that are currently heavily reliant on fossil fuel, and to utilize existing opportunities in the renewable energy market to finance additional GHG reduction efforts.

AMP Hydro Phase III – R.C. Byrd and Pike Island Hydro Projects

In 2010, the City authorized AMP to apply on its behalf for the Federal Energy Regulatory Commission (FERC) license to develop a 49.5 MW hydro-electric project at the Pike Island Locks and Dam on the Ohio River. Previously, the City of Orrville, OH had held the development license for twenty years. AMP's evaluation of potential hydro-electric projects identified Pike Island as being sixth in terms of megawatt capacity. The R.C. Byrd Locks and Dam is a 48 MW hydro project being developed jointly by AMP and the City of Wadsworth, OH. The City should consider participation in these projects if they are developed by AMP.

Replace Natural Gas for Heating

Natural gas is widely used in Oberlin for space heating, domestic hot water (DHW), and cooking. While combustion of natural gas produces fewer emissions than coal or oil, there is debate over whether the life cycle CO₂e emissions are significantly less than those of coal.⁸ Replacement of all natural gas use with electricity or carbon neutral energy sources should be encouraged if Oberlin is to become climate positive. Both

super-insulated tank and newer on-demand water heaters can be purchased as electric models and are an efficient, proven method of providing hot water. Electric air-source and ground-source heat pumps have been successfully proven for over twenty years and their prices have continued to fall as their efficiency has improved. Even though these costs have decreased, the installation cost of ground-source heat pump systems is significantly higher than conventional heating systems. Oberlin should consider future financing and rebate programs to encourage the replacement of fossil fuel heating equipment with high efficiency electric water and space heating equipment with electricity supplied from the City's renewable/carbon neutral portfolio as cost-effective equipment and installation is available.

Replace Gasoline and Diesel Fuel

Gasoline and diesel are the common fuels utilized for motorized transport. While extensively covered in the [Transportation](#) section of this plan, it is important to note the impacts of fuel switching expected in the electricity sector. While rather new to the market, it is expected that electric vehicles will have an increasing presence on Oberlin's streets in the coming years. The City should consider adoption of policies that encourage electrified transport such as targeted rates for charging electric vehicles during off-peak hours or other mechanisms that ensure cost-effective and carbon neutral vehicle charging.

Capitalize on the REC Market

RECs are commonly sold to create a separate revenue stream to fund renewable energy projects and may be used as a regulatory compliance tool to meet mandatory renewable portfolio standards. Once a REC is sold, the environmental attributes associated with the renewable energy production can no longer be claimed. The State of Ohio's [Alternative Energy Portfolio Standard](#) (AEPS) has the potential to create enhanced value for renewable energy projects located within the state's borders. The City has a number of renewable energy sources located

Oberlin's Renewable Electricity Portfolio

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

The impending closure of AMP's Gorsuch coal-fired power plant in 2011 provided the impetus for the City's quest to find a better source of affordable and reliable electricity. Oberlin recognized that the hazards of fossil fuels were disproportionately borne by others such as families in the coal counties of Appalachia or families living atop the Marcellus shale formations of Ohio and Pennsylvania. Unwilling to perpetuate that legacy, Oberlin commissioned a power supply study by the consulting firm Black & Veatch in 2009 specifically tasked with identifying energy sources with an appropriate balance of cost, long-term reliability, and sustainability.

The results of that study and subsequent diligence in procurement have transformed Oberlin's energy portfolio from one heavily reliant on fossil fuels to a portfolio comprised of renewable and low-carbon energy sources that will provide 90% of the community's electricity by 2015.

DEFINE IT:

Renewable Energy Credit (REC):
A tradable commodity that represents the environmental benefits associated with renewable energy production.



Landfill gas to energy generators at the Lorain County Landfill.

Greenhouse Gas Considerations When Switching from Fossil Fuel to Electricity Use for Heating

In the very near future the City of Oberlin will have an electric supply that is largely carbon neutral. Thereafter, most of the City's GHG emissions will be associated with other non-electric uses of energy including natural gas used for heating and gasoline/diesel used for transportation.

One option to reduce natural gas usage could be to switch to carbon neutral electric technologies for heating; however, an important GHG implication must be considered. Electric generating plants, on average, use three units of natural gas (or coal) energy to produce one unit of electric energy. Therefore, on average, every unit of natural gas heating energy in Oberlin that is replaced with one unit of carbon-neutral electric energy will result in the burning of three units of natural gas (or coal) at some power plant connected to the grid. As a result, total GHG emissions (in and outside of Oberlin) are three times greater than would have been the case had natural gas been used for heating in the first place. In general, shifting from natural gas to electricity for heating results in increased greenhouse gas emissions unless the switch to electricity uses 1/3 of the energy as compared to the amount of energy used heating with natural gas. Some, but not all, air-to-air and ground-source heat pump systems can deliver such savings. An electric on-demand domestic hot water system may also deliver such savings (owing to the fact that it does not have the standby losses of the typical hot water storage tank), but this depends on the details of the usage.

The City of Oberlin should encourage fuel switching from natural gas to electric energy whenever the technology employed is cost-effective and that such switching will result in the overall reduction in primary energy use or GHG emissions (both inside and outside of Oberlin). As fuel switching increases demand, OMLPS will have to increase its carbon neutral power portfolio or increase energy efficiency initiatives to meet the energy requirements.

These same criteria apply to switching from gasoline to electric energy for transportation.

within the state. To that end, the City should explore selling in-state RECs and purchasing out-of-state RECs using the resulting revenues to benefit Oberlin electric consumers. Examples of how revenues could be used include:

1. Returning a portion of the value to electric customers through credits on the City's wholesale power bill.
2. Significantly expanding funding capacity and scope of projects of the Sustainable Reserve Fund to assist environmentally positive endeavors that demonstrate a purpose related to the municipal electric system operation and with community-wide benefit.
3. Providing a funding mechanism to achieve higher targets of energy efficiency than mandated in the current Efficiency Smart program from AMP.

Conclusion

Oberlin has made a lasting commitment to renewable energy and will strive to eliminate fossil fuel use for electricity generation no later than 2050. Based on present power supply commitments, our municipal electric utility will have an approximately 90% carbon neutral portfolio of energy sources by 2015. Reduction of CO₂e emissions from other sectors relying on gasoline, diesel, or natural gas can be accomplished by transitioning to carbon neutral electricity and will be promoted by the City. As technology and opportunity allow, Oberlin will continue to acquire generation assets of renewable energy to supply our community's electricity needs.



OMLPS replacing traffic lights with LED leading to a two-thirds reduction in energy use.

Energy Efficiency

Introduction

Energy efficiency means accomplishing the same tasks and functions as before with less energy. Because the least expensive means of providing energy is not to use that energy in the first place, energy efficiency is one of the most cost-effective ways to reduce GHG emissions. Energy efficiency can result from improvements in technology, better management of existing technology, or better organization of existing systems.

Background: Impact of Energy Efficiency on Oberlin's GHG Emissions

Efficient use of electricity and natural gas are both important to pursue as energy efficiency remains the best way to reduce GHG emissions. In fact, you may be surprised to know that this remains true even when Oberlin's electricity portfolio is mostly carbon neutral because of Oberlin's interconnectivity to the nation's electric grid, which

remains inefficient and carbon-intensive. One kilowatt-hour of electricity saved in Oberlin results in one less kilowatt-hour purchased from the grid. If in the future Oberlin's carbon neutral electric supply exceeds its load requirement, one kilowatt-hour of saved energy in Oberlin means that Oberlin exports one more kilowatt-hour of carbon neutral electricity to the grid. In either case, somewhere on the nation's electric grid, our energy efficiency will displace a fossil-fuel plant that is only 33% efficient, burning three units less of natural gas or coal and therefore reduce its GHG emissions. Natural gas, the major energy source for space heating, accounts for about 18% of Oberlin's GHG emissions. Therefore, increasing the space heating efficiency of Oberlin's building stock is an important short-term strategy for reducing GHG emissions.

As discussed in the [Renewable Energy section](#), a longer-term goal for

Benefits of Energy Efficiency

Using energy more efficiently is about as close as one can come to getting something for nothing. It has a number of benefits:

- Long-term decreased costs for energy consumers
- Long-term decreased environmental impacts
- Additional revenue available for diffusion into the local economy
- Creation of local jobs in selling and installing energy efficiency measures
- Reduced vulnerability to rising energy prices or economic costs that may be imposed through new regulations

achieving climate positive will be to shift space heating from natural gas to renewable resources. Because natural gas use is widely distributed among individual businesses and households, maximizing GHG emission reduction through fuel switching will be labor-intensive and expensive. Creating a culture in which people value using less energy, and providing homeowners and businesses with the resources they need to make informed decisions, will be crucial to maximizing efficiency.

Energy Efficiency Goals

The City's recent electric power supply commitments create a near-term base-load energy surplus, meaning the City needs to seek an appropriate balance between energy efficiency reductions and managing its load profile. Therefore, the City aims to:

- Reduce electricity demand by 1% per year (from 2010 levels) over 5 years, beginning in 2011.
- Reduce natural gas use by 1.5% per year (from 2010 levels) over 10 years, beginning in 2011.

Present Strategies in Energy Efficiency

Strategy	Lead Entity	Timeline	Reduction CO₂e tons - annual	Benefits
Heat Loss Inspections	OMLPS	2000–ongoing	18	Energy efficiency awareness on an individual basis
Industrial Audits	OMLPS	2005–ongoing	42	Potential energy reductions on a larger scale
Promotion of Compact Fluorescent Light Bulbs	OMLPS	2007–ongoing	83	Lowest cost electrical energy efficiency measure
Energy Efficiency at OMLPS Power Plant	OMLPS	2007–2010	444	Reduced energy usage and reduced cost to ratepayers
Energy Efficiency at OMLPS Technical Services Office	OMLPS	2007–2010	24	Reduced energy usage and reduced cost to ratepayers
Energy Efficiency at Water Environment Protection Facility	Public Works	2007–2010	176	Reduced energy usage and reduced cost to ratepayers
Energy Efficiency Upgrades at Water Treatment Plant	Public Works	2008–2010	48	Reduced energy usage and reduced cost to ratepayers
Traffic Light Upgrades to Light Emitting Diodes (LEDs)	OMLPS	2009–2010	59	Reduced energy usage and reduced cost to ratepayers
Building Efficiency Upgrades to Parks and Cemetery Building	Public Works	2009–ongoing	14	Reduced energy usage and reduced cost to ratepayers
Building Efficiency Upgrades to City Facilities	Public Works	2009–ongoing	7	Reduced energy usage and reduced cost to ratepayers
Downtown Christmas Lighting Upgrade to LEDs	OMLPS	2010	90	Reduced energy usage and reduced cost to ratepayers
Lighting Upgrades to City Buildings	Public Works	2010	9	Reduced energy usage and reduced cost to ratepayers
<u>Efficiency Smart</u>	OMLPS	2011–2013	1035	Energy efficiency promoted on a community wide scale
Oberlin Super Rebate Program	OMLPS	2012–2013	TBD	Energy efficiency promoted on a community wide scale
Efficiency Upgrades to City Office Equipment	Engineering & Administration	Ongoing	2	Reduced energy usage and reduced cost to ratepayers
Develop One-Stop Shop for Residential Energy Efficiency Information and Assistance	POWER	2007–ongoing	1.5	Energy efficiency completed and promoted on a community-wide scale

Spotlight: Providing Oberlin with Efficiency Responsibly (POWER)



POWER was founded in 2008 in collaboration with Zion Community

Development Corporation and Oberlin Community Services. The purpose of this non-profit, grassroots, environmental justice organization is to increase the energy efficiency of Oberlin housing with an emphasis on those homes whose residents may not be able to afford the upfront cost of energy efficiency upgrades. Since 2008, POWER has insulated and weatherized 28 houses, resulting in reduced emissions of CO₂e of more than 8 tons. POWER estimates that 50% of the housing stock (approximately 1,000 homes) still requires efficiency upgrades. By setting a goal of working with 100 households per year, POWER aims to facilitate efficiency retrofits of 100% of the inefficient housing stock in Oberlin by 2025.

Present Strategies

See table on opposite page.

Potential Strategies

The strategies recommended below are expected to set Oberlin on the path to achieving its energy efficiency goals and are based on best practices and policies in other cities. Adoption of new technology and policies will depend on research, feasibility of implementation, and cost/benefit analysis.

Building Performance Disclosures for Residential and Commercial Properties

Consumers need better information about the amount and cost of energy used in buildings when they consider buying, renting or leasing them. A growing practice across the country is to require sellers and landlords to share this information with prospective buyers and tenants. The City should research building energy performance disclosure programs and evaluate benefits.

Develop One-Stop Shop for Commercial Energy Efficiency Information and Assistance

Develop a One-Stop shop to gather and disseminate information on

energy efficiency services and programs available to the commercial sector. The one-stop shop would make it easier for commercial customers to navigate available services and programs as well as encourage adoption of energy efficient measures to reduce energy costs.

Evaluate and Consider Adoption of Smart Grid Technologies for Future Real-Time Monitoring of Energy Consumption and Load Control Opportunities

Advanced Metering Infrastructure (AMI), which allows for two-way communication between the customer's meter and the utility through software and hardware upgrades, can offer opportunities for a utility to better manage its peak load requirements and help customers understand and better manage their energy consumption. In consideration of future upgrades to its metering infrastructure, OMLPS will research the benefits and costs of advanced metering infrastructure (AMI) including real-time monitoring, load control, and other enhanced customer services.

Conclusion

With the creation of the Energy Services Division of OMLPS in 1998, Oberlin has taken a proactive role in promoting and offering a number of energy efficiency services and programs to residents and businesses, culminating with the deployment of the Efficiency Smart program in 2011. Through rebates and technical assistance through this program, it is expected that Oberlin will reduce its electrical consumption by 1% per year over the next three-year period, the equivalent of powering 388 homes. The non-profit organization POWER has weatherized 28 homes (over 1% of the residential building stock) and continues to increase its weatherization and energy education efforts. Projects, programs, education, and incentives by the City, the College, and the community have brought energy efficiency to the forefront in our mission to reduce energy usage and GHG emissions. It will be important to emphasize the benefits of energy efficiency in order for all stakeholders to fully embrace and practice efficient use of energy as the norm.

Setting the Bar for Efficiency Goals

According to research conducted by the American Council for an Energy Efficient Economy (ACEEE) and cited in *State Energy Efficiency Scorecard 2011*, p. 17, the best state-wide electric energy efficiency programs typically achieve annual reductions in electricity demand of .74% - 1.64% (Comparable data was not available for natural gas energy efficiency programs). ACEEE also researched electricity and gas standards set by state governments around the country. Goals set by the top 10 states for electricity reduction started at 1% initial reductions, ramping up to 2.5% reductions over several years. Natural gas reduction goals started as low as .2%, and increased to 1.9% over several years.

DEFINE IT:

Advanced Metering Infrastructure (AMI): Systems that measure, collect, and analyze energy use and communicate with metering devices such as electricity meters, gas meters, heat meters, and water meters, either on request or on a schedule.



Lightbulbs collected throughout the community to be replaced by energy-saving ones. Photo by Dale Preston for Oberlin College.



Oberlin Bike Festival features safety demonstration, equipment giveaways, bike raffle, maintenance and free food. Photo by Gary Cohen '11 for Oberlin College.

Transportation

Introduction

The City of Oberlin will promote a more sustainable transportation system that serves the needs of the Oberlin community. Since transportation networks cross political boundaries, the City's goals will be pursued in partnership with local, county, regional, and state entities and stakeholders. Envisioning and ultimately re-creating local and regional transportation systems will not only reduce GHG emissions but will have numerous positive additional environmental, social, and economic benefits.

Background: Transportation Profile of Oberlin

Nationally, the transportation sector accounts for approximately 27% of GHG emissions. By contrast, in 2007 Oberlin's transportation sector accounted for 15% of community-wide emissions (23,887 metric tons). As the City transitions to

a lower-carbon electrical power supply however, GHG emissions associated with the transportation sector will make up an increasingly larger percentage of the City's CO₂e emissions profile.

Many residents work in Oberlin; 53% of commuters travel less than 10 minutes to work. Average commutes of Oberlin residents differ considerably from national averages: 53% of Oberlin residents drive to work (12% of whom carpool) compared with 86% nationally; 32% walk; and 6% bike. Fifty-one percent of Oberlin households own one car, 32% own two cars, and 13% have none. This equates to an average of 1.5 vehicles per household, slightly less than the national average of 1.7 vehicles per household.⁹

Almost all motor vehicles on Oberlin's roads are powered by fossil fuels, approximately 82% gasoline and 18% diesel. Both the College and the City have hybrid-electric cars in their fleets. At the moment, plug-in electric vehicles

DEFINE IT:

Hybrid vehicle: A vehicle that uses more than one power source (such as an internal combustion engine and electric power sources).

DEFINE IT:

Biofuel: Fuel derived from biomass conversion, including bioethanol (made from fermented sugar or corn crops) and biodiesel (made from vegetable oils or animal fats).

are rare, but the College has a charging station and the City is evaluating installation for others. Finally, Oberlin has a biofuel station, [Full Circle Fuels](#), that provides up to 100% bio-diesel for sale to the public. Full Circle Fuels has also converted 300 cars, trucks and tractors to run on straight vegetable oil (SVO).

In order to reduce Oberlin's transportation-related GHG emissions, it will be necessary to address the diverse transportation needs of various constituencies on multiple fronts.

Transportation Goals

Our goal is to reduce our transportation-related carbon emissions by 1.5% annually with aggregate goals of 5% by 2015, 30% by 2030, and 60% by 2050. The City of Oberlin will strive to achieve these goals by implementing programs and policies to:

- **Lower the amount of fuel consumed:** Work with local and regional partners toward a more complete network of affordable, environmentally friendly transportation choices.
- **Reduce the carbon content of the fuel:** Increase electric and alternative fuel adoption for fleets and residents. Electric-powered vehicles "filling up" in Oberlin will use renewable/carbon neutral energy resources, and energy dollars will stay in the region.
- **Reduce vehicle miles traveled (VMT):** Comprehensive and integrated land use planning reduces dependence on carbon-based fuels for transportation by providing the structure to encourage the community to travel, commute, and shop using low carbon methods of transportation such as transit, biking, walking, ride sharing, and car sharing.

Present Strategies

Oberlin already promotes alternative modes of transportation, such as public transit, walking, and bicycling. Improving the convenience and safety of these modes of transportation will decrease the use of automobiles and help reduce the City's carbon footprint.

The strategies outlined in this

section are based on the "Oberlin Transportation Profile" by the Center for Neighborhood Technology (CNT) completed on May 27, 2011. CNT is an award winning innovations laboratory for urban sustainability.

See table on following page.

Spotlight: Rethink Your Ride

More than half of Oberlin's residents live within a 10-minute walk of the town center. In recognition of this demographic, the Transportation Working Group of the Oberlin Project developed a mode-shift competition called "[Rethink your Ride](#)" to encourage residents to use active transportation and alternative transportation modes. This challenge encouraged those who live, learn, work, and play in Oberlin to replace at least one single vehicle trip per week with a low-carbon mode of transportation. More than half of the activity was walking and biking. In addition, local businesses sponsored the weekly participation prizes and were highlighted online as part of a shop local campaign. Participants avoided over 3,762 single-occupancy vehicle miles during the 6-week competition.

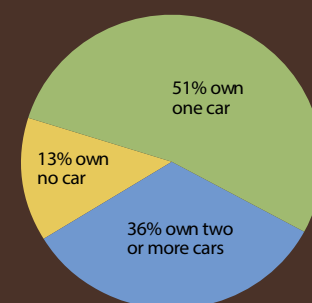
Potential Strategies

Continued cooperation between the City, local institutions, and regional, state, and federal entities will be necessary to rethink the nature of our built environment to provide a more comprehensive network of no- and low-carbon transportation options. Note, however, that success in reducing emissions is largely dependent on changing driving

Transportation Profile of Oberlin

53% of commuters travel less than ten minutes

12% commuters CARPOOL



1.5
cars per household in the city of Oberlin
(0.2 less than the national average)

Vehicle Miles Traveled (VMT) in Oberlin

Total VMT for the City of Oberlin in 2006 was 40.6 million miles, a 2.5% increase from 2000; if this trend were to continue, Oberlin VMT would increase 20% by 2050. In comparison, VMT grew 10% nationally during the same 2000-2006 time period. National VMT has been on the rise for decades and is expected to grow until 2035.

Generally, transportation-related emissions can be described as the product of the carbon content of the fuel, vehicle miles traveled, and fuel consumption of the vehicle.

$$\text{Emissions}_{[\text{Carbon}]} = [\text{Gallons/Mile}] \times [\text{Miles Traveled/Vehicle}] \times [\text{Carbon/gallon}]$$

$$\text{or } [\text{Fuel Consumption}] \times [\text{Activity}] \times [\text{Carbon Content}^2]$$

Present Strategies in Transportation

Strategy	Lead Entity	Timeline	Reduction CO ₂ e tons - annual	Benefits
Strategies: Increase active transportation – walking and biking				
Wayfinding Signage	City, Non-profit, Commercial	Ongoing	TBD	Improved ease and efficiency for all modes of transportation
Safe Routes to School	City, Non-profit	Present–2014	TBD	Expanded, safe active transportation options promote healthy lifestyles
Expand Bicycle and Pedestrian Infrastructure	City	Present–2014	TBD	Promotes active lifestyles
Bicycle Parking at Events	City, College, Commercial	Ongoing	TBD	Health, lower transportation costs
Bicycle Giveaway	Commercial	Ongoing	TBD	Free bicycle, improved health
Bicycle Tourism Program	City, County, Non-profit	Ongoing	TBD	Increased health benefits, economic development potential
Bicycle and Pedestrian Education and Safety	City, Non-profit	Ongoing	TBD	Promoting public health, safety, and sustainable transportation
Strategies: Transit				
Oberlin Connector Transit Service	City, Non-profit, Commercial	Present–2015	TBD	Available, affordable option for those who do not drive, eliminating a 2 nd vehicle saves money
Regional Transit Coordination	City	Ongoing	TBD	Personal mobility. For every \$1 invested in public transportation, \$4 in economic returns is generated
WestShore Corridor Transportation Project	City	2015–2030	TBD	Encourages compact, walkable communities
Strategies: Increase Use of Alternative, Efficient Fuels and Vehicles				
Biofuel Pumping Station	Commercial	Present–2014	TBD	Environmental and economic benefits. Potentially lower fuel costs, may offer convenience of home refueling.
Electric Vehicle Charging Stations	City, College	2013–2015	TBD	
Alternative Fuel Station for Consumers	City, College, Commercial	2015–2030	TBD	
Alternative-Fueled and Hybrid Vehicles	City, College, Commercial	Present–2014	TBD	
Efficient Fleet Standards	City, College	Present–2014	TBD	Environmental and economic benefits
Anti-Idling Training	City, College	Present–2014	TBD	Improved health benefits, Diesel particulate pollution has been linked to asthma, heart disease, cancer, and premature death
Eco-Driving Training	City, Non-profit, Commercial	Present–2014	TBD	Improved road safety, reduced fuel costs
Strategies: Reduced Vehicle Ownership				
Increase Carpooling/Car-Sharing	City, College, Commercial	Ongoing	TBD	Reduced vehicle miles traveled
Strategies: Trip Reduction				
Rethink Your Ride – Mode Shift Competition	Community	Ongoing	TBD	Improved health, reduces traffic congestion, monetary savings

behaviors. See [Appendix V](#) for additional potential strategies.

Adopt Complete Streets Policy

Develop and adopt a Complete Streets Policy intended to ensure that the City's streetscapes are consistently designed with all users in mind including cars and trucks, emergency and safety-service vehicles, bicyclists and pedestrians of all ages and abilities, and where applicable, public transit.

Explore Changes to Parking Infrastructure and Policies

Considerable research demonstrates that restructuring parking design and cost can have a big impact on driving patterns. Currently, permit parking for College students is \$100 per year (recently raised from \$75); College employees receive two free permits to park in faculty/staff spaces. Parking in the City of Oberlin is free though restricted. Consideration should be given to infrastructure and policy changes that discourage driving/parking and encourage alternative forms of transportation. Options could include: charging for parking and offering employees payment to opt out of parking, as well as increasing student parking fees while providing more transportation alternatives so students will have less need for a car on campus. Parking revenue could be used to fund the City's GHG reduction efforts.

Explore Low-Carbon Solutions for Cargo Transport

This strategy involves encouraging businesses to change their logistics to combine shipments and use lower-carbon shipping methods. For example, green procurement standards can require suppliers to reveal the carbon intensity of their supply chain and allow purchasers to select goods with lower-carbon lifecycles.

Explore Options for Low-Carbon Long Distance Travel

Long distance travel is not included in the 2007 GHG inventory for Oberlin because most emissions from long-distance trips occur elsewhere. Because Oberlin's community GHG inventory does not include air travel, efforts to reduce it will not help toward meeting any emissions

reduction targets. However, CNT estimates that long distance travel accounts equates to 31% of Oberlin's total transportation inventory. Providing low-emission long distance travel options, such as high-speed rail and airplanes powered by sustainable biofuels, is obviously not something that Oberlin can undertake alone. However, in addition to collaborating regionally to promote long-distance transportation alternatives, it may be able to initiate some alternatives. For example, Oberlin's Wilder Lines, a charter bus to New York City and other cities runs during Oberlin College breaks, is considered a "best practice" for reducing single-occupancy vehicle miles traveled.

Conclusion

Reaching the goal of reducing carbon emissions as a result of transportation changes will require a multi-faceted approach. This includes increasing the safety, convenience and social acceptability of biking and walking, improving the availability and reliability of no- and low-carbon fuel sources, and reducing travel demand. These approaches must be considered in the context of the widely divergent transportation needs of the community. Oberlin has many assets in place that provide the foundation for achieving these goals. To meet the goal of reducing transportation-related GHG emissions, existing infrastructure and policies must be re-evaluated and new programs and policies established to provide the necessary framework for progress to meet – and possibly exceed – the incremental goals.

" Improving the
CONVENIENCE & SAFETY
of these modes of transportation
will decrease the use of
automobiles and help
REDUCE THE CITY'S
CARBON FOOTPRINT."



Oberlin's East College Street Project is expected to receive LEED Neighborhood Certification. Photo by Kevin Reeves for Oberlin College.

Green Building

Introduction

The green building movement is about creating better buildings and communities in which people want to live as well as ones that are compatible with ecological principles. In addition, green buildings and communities can conserve resources, save money on energy and water bills and provide a comfortable and healthy environment. Green buildings are proving to be cost effective and more desirable and valuable than conventional buildings. Both new and existing structures benefit from the best green building practices that can result in climate positive buildings, especially when being high-performance and climate positive are the primary goals (see [Appendix VI: Green Building, A and D 2](#)).

DEFINE IT:

High-performance building: A building operating on 40% or less of the average energy used by a similar type of building in the same region of the county.

Background: Energy Use and GHG Emissions in Buildings

The operation of buildings takes about 40% of the energy used in the US with residential energy accounting for 22% while commercial buildings use around 18%. In the residential sector, the four biggest uses account for 66% of the energy used: heating, 31%; cooling and hot water, 12% each; and lighting, 11%. In commercial buildings, the three largest uses account for 53% of the energy used: lighting, 26%, heating, 14%, and cooling, 13%. Electricity represents about 75% of the primary energy used in buildings. In Oberlin's 2007 GHG-emissions inventory, residential buildings accounted for 16% of emissions while commercial buildings were 38%. (See Figure 5)

Green Building Goals

These energy use data indicate that increased efficiencies in heating, cooling, and lighting provide the best opportunities for substantial energy and monetary savings, thereby meriting early attention.

Present Strategies

See table below.

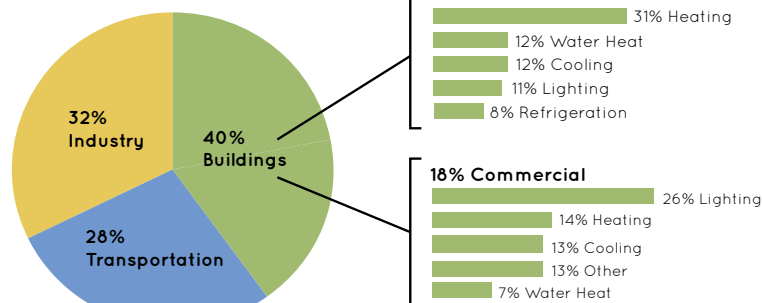
Spotlight: Green Buildings in Oberlin

Commercial Building: The Adam Joseph Lewis Center for Environmental Studies (AJLC)

The AJLC, a classroom-office building, is an early example of ecological design that provides a healthy and comfortable place of learning while minimizing negative impacts of the built environment. Building systems clean and recycle wastewater with a “living machine” that employs natural processes. Daylighting with passive and active solar reduce energy demand and provide operating energy. The landscape restores native habitats and produces food. These attributes create a building that teaches. Showcasing a variety of energy efficient strategies and technologies, the 13,600 square foot building is the winner of numerous architecture awards and was named the most important green building constructed since 1980 in a poll of green building experts and advocates.¹¹

Residence: Trail Magic

Trail Magic is a passive-active solar home built in 2008 that is climate positive, running on site-produced solar and renewable energy and having the capacity to run entirely on solar



energy. It provides an excellent design and example of a sustainable residential building. Based on metered electricity use, homeowner data, and calculations the passive solar design provides a substantial fraction of the home's operating energy. A 5.2 kilowatt photovoltaic system generates 40% more electricity than used. Trail Magic's primary energy use is less than 10% of the average two-person US home. Water saving technologies and appliances combined with resident behavior reduce indoor and hot water use to 20% and 40%, respectively, of that used by the average two-person US home.

Figure 5: National energy use and GHG emissions in residential and commercial buildings.¹⁰



Adam Joseph Lewis Center for Environmental Studies (AJLC). Courtesy of Oberlin College.



Trail Magic.

Potential Strategies

Facilitate Development of City-Owned Green Acres Property

The City intends to facilitate the development of the City-owned Green Acres property to create a model neighborhood with all houses built to high performance standards, which are expected to include both passive and active solar features with the goal of acquiring most if not all operating energy from the sun. Creative design of the property will

Present Strategies in Green Building

Strategy	Lead Entity	Timeline	Benefits
Oberlin College Green Building Policy	College	2006–ongoing	New construction/major renovations LEED Silver or equivalent
City Green Building Policy	City	2007–ongoing	New construction/major renovations LEED Silver or better
Planet Footprint to Monitor Municipal Gas and Electric Energy Use	OMLPS	2011–ongoing	Inform City staff on energy use, provide comparative data over time and in relation to other cities
Rehabilitation of LMHA Housing in Oberlin	<u>Lorain Metropolitan Housing Authority</u>		Reduce energy costs of tenants, reduce GHG emissions

Best Practices for Building Envelope and Lighting Efficiency

A building's envelope – the slab, walls, and ceiling or roof – defines the movement of heat and light into and out of a building which in turn determines the energy required to light, heat, and cool a building.

For existing structures, eliminating air leaks is the least expensive change for the greatest savings in heating and cooling energy with payback times of 3 to 6 years in residential buildings.

Daylighting followed by lighting with compact fluorescent light bulbs (CFLs), linear fluorescent lamps, and light-emitting diode (LED) bulbs provides the most energy efficient lighting.

SEE APPENDIX VI, GREEN BUILDING, B



A view of the roof of the AJLC. Photo by John Petersen for Oberlin College.

DEFINE IT:

Positive energy: A building or entity (college, city, defined area, etc.) that produces more solar energy than it uses.

provide the City with the opportunity not only to have a climate positive neighborhood, but also one that has common open space and vegetable gardens, aesthetically pleasing locations and relationships among houses, and attractive landscaping created to complement neighboring properties.

Develop Commercial and Residential Green Building Certification Programs

Ohio law limits the ability of cities to establish more stringent building codes than those required by the State. This restriction, however, can be overcome in at least two ways. First, the City could certify buildings as "Green" if they meet specified green building standards established by the City, with separate criteria for commercial and residential buildings. Second, the City could develop a residential building standard in which homes could be rated based on high performance and ecological criteria.

In establishing green building certification programs, criteria could come from one of the established certification programs including LEED, Passive House, Living Building Challenge, Energy Star Certified New Homes, and National Association of Home Builders. Criteria would ensure that all certified houses would be high performance and potentially climate positive or positive energy (see Appendix VI, Green Building, E).

Establish Procedures and Policies that Encourage Green Building

The City should consider establishing procedures and policies that encourage builders and homeowners to build high-performance, climate positive, or positive-energy homes. Positive-energy homes generate more energy than they use, meaning they can export electricity back to the grid. These procedures and policies could include favorable publicity such as opinion articles and editorials in local newspapers, City Council proclamations, "Green House" plaques, reduced permit fees, or other actions that will be of minimal cost to the City. (See Appendix VI, Green Building F for effective incentives)

Conclusion

The City and College have made notable strides in embracing green building standards. As we strive to follow best green building practices, we can learn from what has been accomplished. It is important for the City and College to use not only green building certification programs and other best-practice standards for new construction and renovations, but also to develop policies and mechanisms to reduce costs for similar quality construction and to assess performance over several years. Such policies can correct missteps and in other ways improve and guide future projects.

The Architecture 2030 Challenge

Architecture 2030, a non-profit formed to address climate change by focusing on eliminating fossil fuel energy use in buildings, issued the following guidelines to global architects and builders as The 2030 Challenge:

All new buildings, developments and major renovations shall be designed to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 60% below the regional (or country) average for that building type.

At a minimum, an equal amount of existing building area shall be renovated annually to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 60% of the regional (or country) average for that building type.

The fossil fuel reduction standard for all new buildings and major renovations shall be increased to:

- 70% in 2015
- 80% in 2020
- 90% in 2025
- Carbon-neutral in 2030 (using no fossil fuel GHG-emitting energy to operate)

These targets may be accomplished by implementing innovative sustainable design strategies, generating on-site renewable power, and/or purchasing (20% maximum) renewable energy.

[HTTP://ARCHITECTURE2030.ORG/2030_CHALLENGE/THE_2030_CHALLENGE](http://architecture2030.org/2030_challenge/the_2030_challenge)

LEED Buildings in Oberlin

Oberlin Fire Department

In 2011 Oberlin's fire station was expanded from 7,623 square feet to 19,903 square feet and achieved LEED Gold certification. The new and renovated building contains the following "green" building features:

- Solar array – 10.8 kW
- Water runoff collection and pump system for collecting and filtering gray water to flush toilets
- Pervious concrete reduces runoff into a nearby stream
- Air to air heat pumps reduce heating and cooling costs
- Modular green roof system reduces water runoff from the roof and the need for air conditioning
- Bioswale collects and slowly drains storm water runoff into soil
- Low volatile organic compound (VOC) paints, floor coverings, ceiling, and adhesives throughout the building

East College Street Project

The East College Street Project, the first major commercial development project in downtown Oberlin in 50 years, is on track for LEED Neighborhood Development certification.

Oberlin College LEED Certified Buildings

New Buildings:

- Bertram and Judith Kohl Building (jazz building)
- Williams Field House
- Kahn Dormitory

Renovations:

- Allen Memorial Art Museum
- Apollo Theater renovations.

DEFINE IT:

Volatile Organic Compounds

(VOCs): Human-made or naturally occurring organic compounds, some of which are hazardous to human health or the environment.



Williams Field House. Photo by Harmony Pringle '11 for Oberlin College.



Oberlin Fire Department. Photo courtesy of the Oberlin Fire Department.



Oberlin College's Kahn Dormitory. Photo by John Seyfried for Oberlin College.



Oberlin College's Kohl Building. Photo by Kevin Reeves for Oberlin College.

Design, Cost, and Performance

When designing a new building, it is important to keep front and center, from the beginning, the critical design decisions that will dictate the building's lifecycle energy performance. The three most important decisions in making a high performance building for the 21st Century are:

- **Size:** Make it as small as possible for the functions to be served
 - **Envelope:** Make it super insulated and very tight (about one air exchange per hour at minus 50 Pascals)
 - **Orientation:** Design it with the long axis east-west to accommodate passive and active solar strategies
- In rehabilitation of existing

buildings, size and envelope decisions can often be addressed but orientation is more problematic. Passive and active solar, however, should be on the table and employed to the extent possible. (See Green Building Appendix H for references on green building in general and passive solar in particular)

In the construction of new buildings, doing things differently appears to incur extra costs, and currently priorities of initial cost outweigh not only life cycle cost, but also operation and maintenance expenses. This is considered "normal" for the building industry and becomes the default choice because builders and developers know how to construct conventional buildings, and occupants expect them. Green

building certification programs have gained recognition and are challenging the norm. Their programs have begun to change the building industry by promoting practices and measures that can significantly increase building quality, efficiency, habitability, and community structure, as well as lower initial and lifecycle building costs. To date only one of these innovative programs, the Living Building Challenge, has placed weight on performance, and none have addressed cost effectiveness in their building certification programs. Clearly performance and the performance-per-dollar-spent ratio are important criteria by which to evaluate the "greenness" of a building.



Food waste collected for composting.

Waste Management

Introduction

Effective waste management to minimize CO₂e emissions includes reducing solid and industrial waste and diverting remaining waste from landfills. The present and future strategies addressed in this plan encompass residential, commercial, institutional, and industrial solid wastes as well as residual waste products from wastewater treatment. Strategies to minimize emissions include recycling, composting, and methane recapture.

Background: Measurement of GHG Emissions from Waste Management

Reduction in CO₂e emissions from waste management strategies is measured in emissions from terminal waste management (landfilling, recycling, composting, etc.). Anaerobic decomposition of organic wastes in landfills or compost facilities can release significant

carbon dioxide and methane. Methane production is the major concern because its heat trapping potential is approximately 21 times that of carbon dioxide. According to the City's 2007 emissions inventory, the Waste Management sector accounted for 1,622 tons CO₂e, equal to 0.9% of the community's GHG emissions. Note that CO₂e emissions associated with collection, transport, and processing of wastes are measured in the [Transportation](#) and [Energy](#) sectors and are not included as part of the 1,622 tons attributed to Waste Management.

Solid Waste Management

Measuring reductions in CO₂e emissions for the solid waste sector is linked to waste disposal by landfilling. Reductions in the disposal quantity will most likely be attributed to reduced consumption, improved re-use, and/or increases in recycling and composting.

DEFINE IT:

Anaerobic decomposition: A process in which organic wastes are broken down in the absence of oxygen.

Measurable goals can be set to reduce solid waste disposal. These reductions can be modeled to project corresponding reductions in CO₂e emissions.

To meet or exceed the goal of becoming climate positive by 2050, the City would have to reduce solid waste disposal by 10% each and every year throughout the planning cycle. Even then, a small amount of residual waste (63.32 tons or 1.62% of the current waste stream) would still be landfilled. This is not considered a realistic scenario. However, more modest annual reductions do net significant results over the planning period. The table below shows the net impact of reducing solid waste disposal at 1%, 2%, and 3% per year.

It seems highly unlikely that reductions in waste disposal will be achieved in consistent and regular increments. Rather, reductions in waste disposal are more likely to be tied to programs and policies that are put into place to help achieve such reductions as well as such external factors as local, regional, and global economic conditions; technological improvements; etc.

Nevertheless it appears reasonable to set an annual reduction target of at least 2% per year. Although meeting this goal will achieve a significant reduction

in corresponding CO₂e emissions, the City's CAP will need to include the necessary CO₂e offsets for the remaining emissions associated with solid waste disposal by 2050.

Present Strategies – Solid Waste

The City of Oberlin provides residential and commercial solid waste and recycling services for its residents, businesses, and institutions. All solid waste is delivered to the Republic Services Inc. sanitary landfill just east of Oberlin for disposal. Recyclable materials are delivered to Republic and other processors to be reclaimed. The City supports the efforts of the [Abitibi-Bowater Paper Retriever](#) program that provides drop-off paper recycling facilities throughout the community. The City provides seasonal [leaf, brush, and yard waste collection](#) for its residents. Organic wastes are transported to the City's Class IV compost facility where they are composted using the static pile method. See [Waste Management Appendix](#) for additional details. See table below for present strategies.

Spotlight: Debris Diversion for Green Acres

Public Works staff have been charged with preparing plans and

DEFINE IT:

Embodied energy: The energy used to make something or used to provide the end use energy for a task.

Projected Reductions from 2008–2011 Average Disposal Baseline of 3,855.42 tons/year

Year	Cumulative reduction at 1%/year	Residual Quantity tons/year	Cumulative reduction at 2%/year	Residual Quantity tons/year	Cumulative reduction at 3%/year	Residual Quantity tons/year
2015	3.94%	2,703.51	7.76%	3,556.12	11.47%	3,412.18
2030	17.38%	3,185.23	31.88%	2,626.44	43.94%	2,161.40
2050	32.43%	2,605.22	54.52%	1,753.43	69.51%	1,175.36

Present Strategies in Solid Waste Disposal

Strategy	Lead Entity	Timeline	Benefits
Residential Curbside Recycling	City	Ongoing	Reduction in landfill disposal decreases CO ₂ e emissions; recaptures embodied energy in waste materials; enhances consumer awareness of resource issues; adds reuse/resale value of materials.
Commercial and Institutional Recycling	City	Ongoing	
Composting	City	Ongoing	

29.4%
OBERLIN'S
average recycling rate

33.2%
NATIONAL
average recycling rate

specifications for the demolition and site restoration of "Green Acres," the former children's home at the intersection of Oberlin Rd. and East College St. Project specifications set a minimum goal of diverting 65% of demolition debris from the landfill. As of this writing, the contractor has achieved a 79% diversion rate that includes the recovery for re-use of 1,721.25 tons of masonry products, 110.39 tons of ferrous metals, 23.26 tons of organic materials, and 4.86 tons of non-ferrous metals. A total of 1,859.76 tons of demolition debris have been recovered while 498.67 tons of materials have been sent to the Lorain County Landfill.

Potential Strategies – Solid Waste

In order to minimize solid waste disposal and to maximize recycling and composting, the City intends to develop and adopt a Zero Waste Policy that will provide the framework for comprehensive efforts to improve source reduction, re-use, recycling, and composting to significantly decrease the amount of solid waste sent to the landfill. Based on that policy and industry best management practices the City will develop and implement a Zero Waste Plan.

Develop and Implement a Zero Waste Plan

Key elements of a Zero Waste Plan are expected to include:

- Waste audit(s)
- Ongoing evaluation of programs and services including consideration of best management practices within the waste management sector
- Improved residential, commercial,

and institutional recycling opportunities

- More comprehensive organics recycling
- Coordination with Oberlin College, the Lorain County Solid Waste Management District, Republic Services, and other key stakeholders
- Comprehensive, targeted, and incremental educational programs and services
- Adoption and implementation of policies, regulations, and/or ordinances in support of the Zero Waste goals.

See [Waste Management Appendix VII](#) for additional information on each of the 'key elements' of Zero Waste.

Wastewater Management

The City of Oberlin owns, operates, and maintains a Class IV Water Environment Protection Facility (WEPF) that provides comprehensive wastewater treatment services to the community in compliance with the City's National Pollutant Discharge Elimination System (NPDES) permit. The rated capacity at the WEPF is 1.5 million gallons per day (mgd); the average daily flow is just under 1 mgd.

Reductions in CO₂e emissions associated with wastewater are linked to biological decomposition of organic materials through treatment processes. Improving methane production, capture, and beneficial re-use may be considered a climate positive function that will help to offset CO₂e emissions in other sectors. The manner in which such a credit would be calculated remains to be determined. Staff will,

DEFINE IT:

Bio-solids: Treated human sewage, the byproduct of domestic and commercial sewage and wastewater treatment. The two types of bio-solids include:

Class A bio-solids: Treated to reduce bacteria prior to land application.

Class B bio-solids: Not treated to reduce bacteria prior to land application.

Present Strategies in Wastewater Treatment

Strategy	Lead Entity	Timeline	Benefits
Anaerobic Digestion	City	Ongoing	Approved wastewater treatment process. Recaptured methane is used to heat the digester off-setting the purchase of natural gas.
Land Application of Class B Bio-Solids	City	Ongoing	Beneficial re-use of bio-solids in local (non-human) crop production.
Co-Generation from Anaerobic Digestion	City	2012	Increased electrical production on site will result in decreased use of other forms of electricity.

however, continue to track natural gas and electricity consumption as well as methane production from the WEPF for ongoing evaluation of environmental and economic benefits.

Present Strategies – Wastewater

As described above, CO₂e emissions associated with sanitary sewer collection and the wastewater treatment processes are primarily measured in the Transportation and Energy sectors. There may, however, be CO₂e emissions associated with the biological decomposition of bio-solids. Solids from the primary and final settling tanks must be further treated prior to disposal. The WEPF can use both aerobic and anaerobic digestion processes. Current treatment methodology is anaerobic. Sludge is heated in the anaerobic digester to between 90° to 100° F. The methane by-product of anaerobic digestion is captured in the digester and combusted to heat the boiler that maintains digester temperature. Digested solids are sent to the sand drying beds or stored in the sludge holding lagoons. Class B bio-solids are sampled and analyzed prior to land application at agronomic rates in accordance with all applicable Ohio Environmental Protection Agency (OEPA) regulations. See table on previous page.

Spotlight: WEPF Generator

WEPF staff developed plans to use methane created through anaerobic digestion to power an engine generator. A 30kW generator has been purchased and installed just outside the digester. Once in operation, methane from the digester will produce electricity that will be used on-site to power plant equipment and processes. The waste heat from the generator will be transferred back into the digester via heat exchange equipment to maintain digester operating temperatures.

Potential Strategies – Wastewater

Although the primary mission of the WEPF must be compliance with NPDES permit requirements, the Public Works Department will continue to support the efforts of WEPF staff to operate the plant as efficiently as possible. This will

include continuing efforts to maximize energy conservation through efficiency measures and to continually examine opportunities to enhance resource recovery (energy and organic matter) associated with the treatment of wastewater.

Landfill Gas (LFG) Generator Waste Heat Recovery Feasibility Study

Cost effective reuse of waste heat could improve WEPF treatment processes. Significant quantities of waste heat available have economic development potential for appropriate industries (such as greenhouses) with high heat demand.

Evaluate Additional Anaerobic Digestion Opportunities to Maximize Methane Production for Re-Use in the Co-Generation System

Managing organic inputs to the anaerobic digester could lead to increased methane production that in turn will further reduce the need to purchase natural gas and when the co-generation system comes on-line, will decrease use of electricity from the municipal utility.

Evaluate Costs and Benefits Associated with the Production of Class A Bio-Solids

Unlike Class B bio-solids, Class A bio-solids may be applied without restriction to farmlands, gardens, and landscapes. As a more desirable soil amendment, Class A bio-solids could reduce the City's transportation costs associated with land application of Class B bio-solids.

Conclusion

Although Waste Management currently accounts for a small percentage of the City's GHG emissions (0.9%), this relative percentage will increase as the City makes progress towards reducing its CO₂e emissions portfolio in all sectors. Ongoing tabulation of Waste Management GHG emissions will be necessary to evaluate progress in decreasing related emissions from the 2007 emissions inventory level of 1,622 tons CO₂e. Continuous evaluation and improvement of solid waste and wastewater management practices will also result in important related climate-positive benefits that will accrue in every other sector of the Climate Action Plan.

History of Oberlin's Recycling Program

As one of only two remaining "self-haul" communities in Lorain County, the City of Oberlin enjoys a great deal of local control over its solid waste management programs. This has allowed staff to frequently analyze revenues and expenses as well as opportunities and challenges to maximize service to the community. In 2010, the Public Works Department published a "Recycling Program Status Report". This report reviewed program history and current operations and analyzed the pros and cons of the existing source-separated recycling program as well as the pros and cons of implementing co-mingled recycling. A key finding is that the City has an economic incentive to continue to operate its source-separated recycling program.

The report states that the 2008 national average recycling rate is 33.2% while Oberlin's 4-year average rate is 29.4%. To improve the recovery rate, the report recommends: 1) improve public education; 2) consider regulatory changes to make source-separation mandatory, followed by making recycling mandatory; and 3) develop and adopt a 'Zero Waste' policy.

Following the report, it was determined that operational changes could achieve significant savings that would alleviate the need to raise rates in the short term and provide funding to fill the vacant Recycling Coordinator position. In April 2012, a part-time recycling coordinator was hired. In the first several months, the coordinator started a pilot recycling program at one of the largest apartment complexes in town, implemented recycling at the City's recreation complex, and worked closely with the Oberlin College staff to improve recycling on campus.



A camper at George Jones Farm, Oberlin, Ohio. Photo by John Seyfried for Oberlin College.

Education & Awareness

Introduction

No action is complete without an effective education and awareness program. Simply making information available has limited impact. The educational strategies employed in Oberlin seek to embrace the age-old, educational adage: “Tell me and I will forget; show me and I will know; have me do and I will understand.”

Effecting behavioral changes that will foster the creation of a climate positive community, with sustainability as the default setting, is a monumental opportunity. The educational challenge is to employ those aspects of human behavior that enable persons and groups to embrace new norms of behavior consistent with the principles of ecosystems that undergird full spectrum sustainability. The actions and programs

proposed in this section build largely on existing outreach, education, and empowerment efforts in the community. Their goal is to contribute to building a critical mass of Oberlin citizens, City and College employees, and business people engaged in achieving a climate positive community.

City departments and community organizations can use community-based social marketing (CBSM) tools to ensure that programs are as effective as possible at encouraging behavior change. CBSM builds on research and expertise from the fields of social psychology and marketing and lays out a systematic approach for identifying the most effective strategies to promote positive behavior change that supports sustainability. A thorough how-to guide is available free for download at www.cbsm.com.

Background: Accomplishments to Date

In 2002, OMLPS began employing an “energy bike” for use in the Oberlin City School District to provide instruction for students on electricity generation and energy efficiency. In the same year, a 1 kilowatt (kW) photovoltaic (PV) system was installed at Prospect Elementary School to illustrate and promote solar energy as well as to provide no-cost electricity to the school.

In 2012, the school district and Michigan-based Creative Change Educational Solutions announced a partnership to develop a comprehensive K-12 Educational for Sustainability curriculum under the Oberlin Project. The initiative is designed to enhance the district’s International Baccalaureate (IB) programs currently in place. The integration of sustainability will go beyond environmental education to serve as a mechanism for meeting core standards, as well as supporting equity and deepening connections between the school and the community. Teacher training began in July 2012 and implementation in classrooms was scheduled to begin in January 2013.

In early 2012, the Oberlin Project Community Engagement Team was formed to ensure community engagement in all aspects of sustainability projects through the Oberlin Project and CAP. The Team works with the larger community to define and achieve collective goals and develop open and transparent communications, create wide and ongoing opportunities for discussion and feedback, identify and build on existing community assets and projects, and ensure that projects create tangible benefit for all members of our community.

Education and Awareness Goals

- Motivate Oberlin residents and businesses to change their behavior in ways that reduce carbon emissions and enable the City to reach its Climate Positive goal by 2050.
- Empower K-12 educational institutions to enhance curricula to create learning environments that support sustainability, leadership, health, creativity and social justice through place-based learning, which is

focused on understanding and solving problems within the local community.

- Support sustainability and environmental studies majors at higher education intuitions to identify long-term technology and career opportunities to prepare students for careers in developing and maintaining a sustainable future.
- Provide ongoing sustainability-related learning opportunities for all interested community members, institutions, and students through service learning, community events, workshops, and other educational programs.

Present Strategies

To effect real change, it is vital that the community hears and sees frequent and consistent messaging about initiatives, particularly about how they can play a part in the process. See table on next page.

Spotlight: Bioregional Dashboard

The Bioregional Dashboard is a technology that monitors and displays the total flows of electricity and water and environmental conditions in the entire city of Oberlin. It provides an animated and narrated depiction of the city that is designed to help the community better understand how the decisions each person makes affect Oberlin’s ecological and social community. The overarching goal is to use information on these resource flows to engage, educate, motivate and empower the community to value and conserve environmental resources. Bioregional dashboard displays are currently located at the Oberlin Public Library, Prospect Elementary School, Slow Train Café, and Adam Joseph Lewis Center for Environmental Studies on the Oberlin College campus. View the Oberlin Bioregional Dashboard online at: www.oberlindashboard.org.

Potential Strategies

The following provide a highlight of future strategies to achieve the education and awareness goals outlined above. Additional potential strategies can be found in Appendix VIII.

DEFINE IT:

Education for Sustainability: A life-long learning process that leads to an informed citizenry having the creative problem-solving skills, scientific and social literacy, and commitment to engage in responsible individual and cooperative actions.

“ The educational challenge is to employ those aspects of human behavior that enable persons and groups to EMBRACE NEW NORMS of behavior consistent with the principles of ecosystems that undergird full spectrum sustainability. ”



The website for the Oberlin's Bioregional Dashboard (<http://oberlindashboard.org/brd/>).



A child at Prospect Elementary School with an Oberlin college student envisioning a sustainable future.

Create a Community and/or Business Environmental Award

Recognize and celebrate the environmental leadership of local businesses, business associations, and community groups.

Promote Green Business and Green Restaurant Membership

For businesses interested in third party certification, green restaurant and/or business membership can offer a host of benefits including cost savings, publicity, new customer attraction, improved employee morale, and a healthier work environment.

Develop Support of a Buy Local Campaign

Encouraging local purchasing decreases carbon emissions associated with travel outside of the community and increases the vibrancy of downtown Oberlin. One example of a buy local campaign is a "cash mob" in which consumers are encouraged to visit local businesses using social media and peer-to-peer outreach.

Annual Speaker and Film Series

Both an annual speaker series and an annual film series on a broad range of subjects will empower an informed,

engaged public.

Hold Community Workshops to Educate the Community

Workshops could include home energy conservation, home composting, water conservation and storm water management, home gardening/farming, etc.

Conclusion

Oberlin will create an engaging, multifaceted education program that motivates residents to reduce their carbon footprint and make sustainability their default choice. It builds commitment to these goals through long-term participation and invites residents to create and share new solutions. This requires an understanding of citizen motivations and constraints and requires designing a program to make climate-friendly choices as attractive as possible. For some, saving money is of the greatest concern. For others it is convenience. For others still it is concern about the environment or climate change. The educational initiatives in this section and throughout the CAP strive to lower the barriers and enhance the incentives for making choices consistent with a climate positive community.

Present Strategies in Education and Awareness

Strategy	Lead Entity	Timeline	Benefits
Media Marketing of Sustainability Opportunities and Benefits	City, Non-profit	2012–ongoing	To effect real change, it is vital the community hears/sees frequent and consistent messaging about CAP initiatives, particularly about how they can play a part.
Develop New/Enhanced Sustainability Curricula at Oberlin City Schools and Other Institutions of Learning	City Schools, Non-profit	2012–2014	The integration of sustainability serves as a mechanism for meeting core standards, as well as supporting equity and deepening connections between the school and the community.
Install Bioregional Dashboard at Various Locations in the Community	City Schools, College	2012–2013	Dashboards provide real-time information on energy and resource consumption
Complete Sustainability Tracking Assessment and Rating System (STARS) Assessment at All Partner Schools	College, Lorain County Community College, Lorain Conty Join Vocational School, City Schools	2012–2014	Allows schools to calculate and track progress towards sustainability at institutional, physical, and academic levels.
Partner with POWER to Raise Awareness of Residential Energy Opportunities	City, Non-profit	2012–ongoing	Promote the "one-stop shop" for information and assistance in navigating available efficiency programs to all Oberlin residents.



Peters Hall, Oberlin College. Photo by Greg Pendolino for Oberlin College.

Oberlin College

Oberlin College uses about 25% of the City's electricity, and is responsible for about the same percentage of the City's carbon emissions. Prior to embracing the goal of becoming climate positive in conjunction with the City, the College signed in 2006 The American College and University President's Climate Commitment (ACUPCC) with a similar goal to become climate neutral. Over the past dozen years, significant administrative infrastructure has been put in place to champion and facilitate this goal.

Oberlin College has a long history of progressive leadership on social justice issues and a shorter, but equally impressive, history in environmental stewardship. The pursuit of carbon neutrality in many ways represents the ultimate liberal art and as such is fundamentally important to a liberal arts college. For the College to pursue its mission of

education requires meeting the needs of the present without compromising the ability of future generations of students to meet their needs. That is to say it requires sustainability and a stable climate in order to educate generation after generation of students. A community that understands the dynamic interactions of species and communities over time and during changing ecological conditions is one that recognizes the interconnections between the environment, economics, equity and education. A college that embraces carbon neutrality commits itself to instilling a consciousness of these interrelationships and to developing the skills necessary to create new possibilities and extend our ecological imaginations through any discipline, field, endeavor or area of study.

For a summary of the Oberlin College CAP see Appendix IX.

Timeline of Oberlin College's Commitment to Sustainability

2001: Environmental Policy Advisory Committee (EPAC) established.

2002: EnviroAlums, an Alumni Affiliate Group, formed to advocate for environmental education and sustainability.

2004: EPAC drafted an Environmental Policy Statement for environmental sustainability that has guided the College since.

2006: EPAC morphed into the Committee on Environmental Sustainability (CES), a committee of the General Faculty.

2006: Office Environmental Sustainability (OES) established.

2008: David Orr became Special Assistant to the President for Sustainability.

2009: The Green Edge Fund, administered by students and funded by a student fee, established to support activities and projects that foster environmental sustainability.

2011: OES initiated an in-depth, systemic analysis of energy use across the campus in order to assess where energy efficiency can reduce substantially energy use and cost.

2012: Oberlin College revised its Climate Action Plan.



Trees being planted in Tappan Square as a part of the Carbon Offsetting Initiative, 2012. Photo by Janine Bentivegna for Oberlin College.

Achieving Climate Positive

Becoming a climate positive community means that Oberlin is striving not just to minimize harm caused by energy use, transportation, waste management, and environmental degradation, but to actually have a net positive impact that will improve our local and global community. The 2013 CAP addresses ways in which we can reduce our negative impact by pursuing strategies that reduce greenhouse gas emissions.

This section will address the requirements for achieving a climate positive outcome, including Climate Positive Credits, land use and local food systems, financing solutions, policy recommendations, and measurement and verification of emissions reductions.

The CPDP is not rigidly prescriptive as there is no single path for Oberlin to achieve a Climate Positive outcome. A project of this size can take decades to

complete. The framework encourages the community to set realistic plans for achieving the emissions target by project completion, demonstrate that implementation conforms to those plans at important milestones, and adjust implementation as circumstances and technologies change over time.

Climate Positive Credits

The Climate Positive Development Program stipulates that members should strive to reduce their on-site emission impacts first, but they will also have to create Climate Positive credits in order to reduce operational GHG emissions below zero. Emission credits are measured by metric ton (CO₂e) in the same manner as GHG emissions. Reducing or abating emissions in the surrounding community or capturing carbon on-site can create Climate Positive Credits. These avoided emissions must be quantifiable.

Creating Credits: Local Carbon Offset Pilot

The student body of Oberlin College has long demonstrated leadership on environmental issues and serves as a catalyst for local sustainability projects through the Green EDGE Fund, a student-run sustainability grant and efficiency loan fund. The Green EDGE Fund in collaboration with the Student Finance Committee, the College Grounds and Athletics Departments, the City, and the Oberlin Rotary Club organized three events to plant 102 trees in fall 2012. The first tree was planted in the common green space in the center of town, Tappan Square, on September 29, and an additional 26 trees were planted in November. As part of its 75th anniversary, Rotary set a goal of purchasing 75 trees to donate to the City for planting in curb lawns. The EDGE Fund supported 30 of these trees. Rotary and the student body are both interested in calculating carbon sequestration associated with these trees to count as offsets.

In spring 2012, the student body voted in favor of creating a student-funded local carbon offset program to offset emissions associated with student travel to and from Oberlin. This could generate

approximately \$50,000 per year for use toward the purchase of carbon offsets. Demonstrating the viability of a local carbon offset program will support the creation of a dedicated funding stream to support local carbon reduction and sequestration projects that create Climate Positive Credits.

In collaboration with the Oberlin Project and many other community partners, Oberlin College is applying for seed grant funding to provide proof of concept for a local carbon offset market based in Oberlin, Ohio as a viable option for sequestering and reducing carbon emissions. College students, faculty, staff, and community partners will engage in project planning, implementation, and verification. Students working alongside faculty advisors will be responsible for calculating carbon emissions associated with activities to be offset and setting a price for carbon offsets. Projects include pilots in energy efficiency, reforestation, and soil sequestration through sustainable agricultural and land use practices. These pilot projects will also offset specific sources of emissions for the College and partner organizations, including the city school bus fleet and the City's Police and Fire Departments vehicles.

" The long-term goal is to
INCREASE LOCAL FOOD
ACCESS WITHIN THE
COMMUNITY
to provide residents and businesses
with convenient and affordable
choices to **meet a majority of their
food needs** through local farms,
grocers, and other sources by
2030."

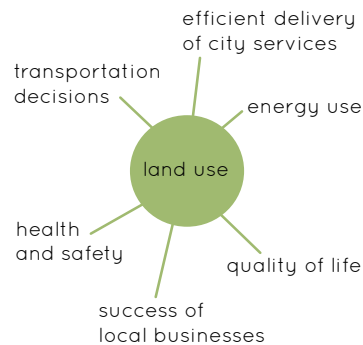


Figure 6: A diagram of what overall land use can influence.

Creating Credits: Greenhouse Pilot

The Oberlin Project is researching the viability of a greenhouse operation that would be located outside of the city limits of Oberlin and heated by the waste heat released by landfill gas-to-energy generators operating at the nearby landfill. Greenhouses would extend the growing season for local food, provide a new business opportunity for a local entrepreneur, and have a guaranteed market through institutional partners such as Oberlin College. This project could generate climate positive credits by avoiding natural gas use for heating outside city limits and providing a replicable model for regional food production; if food is sold to partners outside of Oberlin, the reduction in emissions associated with the transportation of food from national or international sources would also count as a climate positive credit.

Creating Credits: Next Steps

The success of early projects in creating offsets for credits will provide the basis for researching future sequestration projects and determining the types of credits appropriate for Oberlin to achieve its goal of becoming climate positive. Additional credits may be explored via reduction of emissions through strategies that impact communities outside of Oberlin's boundaries, such as production and sale of excess renewable energy and leadership in a regional transportation system that reduces emissions elsewhere.

Land Use and Local Food Systems

Planning surrounding land use and local food systems, while outside of the scope of the 2013 CAP, are important to the long-term health, resilience, and GHG emissions reductions. This section outlines components of land use and local food systems that will be expanded upon in a revised version of this plan.

Land Use Planning

Land use planning involves decisions that shape the entire community, including setting priorities for new and existing development, making zoning recommendations, guiding new commercial and neighborhood development,

and defining boundaries or connections between different parts of the city.

Overall land use plans can have ripple effects on transportation decisions, energy use, efficient delivery of city services, health and safety, success of local businesses, and quality of life, to name a few (figure 6). These factors are important to the climate impacts of a community's activities as well as to its long-term resiliency and prosperity.

The City updated its [Comprehensive Plan in 2004](#) and the Planning Commission completed a "5 Year Review" of the Plan in 2011 and found its policy direction to continue to be relevant. The update includes sections on general policies, land use, transportation, utilities, annexation, and special areas such as downtown and Oberlin College. General policies for land use outlined in the plan are to encourage infill and density, connect neighbors and neighborhoods, and to become a more sustainable community. The Comprehensive Plan and the 2013 CAP can be used to complement each other ensuring future sustainable development.

Green Space

Green space is part of overall land use planning, but it deserves special mention as green spaces serve a number of important roles in a community for recreation, congregation, and connection with each other. The Open Space and Visual Environment Commission of the City provides recommendations on green space to City Council. Recently the Public Works and Planning Departments participated in the development of the [2011 Parks and Recreation Strategic Plan](#). Integration of existing planning with green space planning is included in the City's Comprehensive Plan and should be considered in revisions to the CAP.

Local Food and Agriculture

Local food and agriculture are a vital part of the innovative vision for a post-fossil fuel community. As part of the Oberlin Project, partner entities are working with local landowners to identify a 20,000-acre patchwork of land, within a 6-county area, that might

be put into productive use to support food, energy, and carbon sequestration projects.

Growing and processing food locally supports local farmers and small businesses and reduces transportation distances. The long-term goal is to increase local food access within the community to provide residents and businesses with convenient and affordable choices to meet a majority of their food needs through local farms, grocers, and other sources by 2030.

Financing

This section describes potential financing strategies that Oberlin could pursue toward implementation of the CAP, and primarily focuses around energy efficiency and renewable energy projects at the residential, commercial, industrial, institutional, and municipal levels.

Background

Most of the energy efficiency investments that impact GHG emissions will be made by individual residents and business owners as they improve the efficiency of their homes and buildings. While implementing this plan will be aided by a sustained and strategic public investment by the state and federal governments, the City and other regional players can serve as catalyzing agents by actively advocating for and participating in the financial mechanisms and

policies that support the goals of this document. The City stands to benefit from a more resilient local economy with increased economic development through job creation.

Investing in energy efficiency and renewable energy systems can make sound fiscal, social, and environmental sense, be it a family home, a local business, a school or municipal building. Energy financing eases the cost burden of installing energy efficiency upgrades and installing renewable energy by eliminating the large up-front costs. With the right financing these projects in homes and businesses should pay for themselves due to the reduced energy costs.

Potential Strategies

These are highlighted potential strategies. For more strategies see [Appendix X](#).

Efficiency Smart Residential Rebate Enhancements

OMLPS working with POWER will promote and enhance the residential appliance rebates available through Efficiency Smart to further encourage the community in upgrading to more energy efficient appliances.

Energy Special Improvement District (ESID)

An ESID is a way to access capital, which allows a property owner to

Present Strategies in Achieving Climate Positive

Strategy	Lead Entity	Timeline	Benefits
Energy Efficient Mortgages (EEM)	Federal Government	Ongoing	Allows borrowers the opportunity to finance cost-effective, energy-saving measures through the home mortgage
Bonds	Ohio Air Quality Development Authority (OAQDA)	Ongoing	Financing for local governments and businesses to support renewable energy projects
State/Federal Tax Incentives and Loans	Ohio and Federal	Ongoing	Loans and tax incentives are available for residents and businesses
Community Housing Improvement Program (CHIP)	City	Ongoing – dependent on state and federal distribution of funds	Grants and deferred loans to households for rehabilitation including weatherization of homes

Financing Benefits for EE and RE Projects

Key financing benefits for energy efficiency and renewable energy projects include:

- Leverage existing energy efficiency programs and their funding sources
- Minimize the amount of public dollars used
- Bring local private capital into local market
- Generate opportunities for local businesses
- Help to conduct “deep” retrofits

install alternative energy and perform energy efficiency work by financing the work without upfront costs. The financing is then paid for through a special assessment on the property tax bill. This program is being evaluated on a county-wide basis, which would include Oberlin.

Local Energy Capital Fund

Develop a local revolving loan fund that would provide funds at competitive rates to finance energy efficiency improvements and alternative energy. The fund would be created with local investment dollars keeping the financing in the community while improving the environment and the economy.

Residential PACE

Property Assessed Clean Energy (PACE) financing supports energy efficiency and alternative energy projects by providing upfront capital through a special assessment on the participant's property tax bill. PACE financing allows property owners to benefit from immediate energy savings while spreading the cost of improvements over a number of years.

For more information on understanding the needs for alternate types of financing see “[Barriers to Efficiency and Renewable Energy Projects](#)” in Appendix X.

Conclusion

Financing of energy efficiency and renewable energy projects can make these projects happen when they otherwise would not have moved past the proposal stage. Numerous [federal, state, and regional incentives](#) are available to assist with funding some of the more expensive strategies related to renewable energy. Further, there is potential to leverage financing opportunities by partnering with other jurisdictions in the county to administer joint programs as in the possibility of an Energy Special Improvement District. With properly designed energy financing available, businesses, residents, and government can invest in energy efficiency and renewable energy projects that are self-sustaining.

Policy

Policy legislation serves an important role in the strategic rollout and implementation of the goals of the 2013 CAP. Policy decisions, including the decisions by City Council to join ICLEI and the Climate Positive Development Program have been crucial in developing the direction and goals of carbon neutrality while improving the local economy. Policy actions are the tools that will be used to both guide and direct the City in implementing the 2013 CAP and serve as a roadmap for best practices and prioritization. Policy Matters Ohio has been working with the City, the College, and the Oberlin Project to develop a set of tools or policy platform to guide our efforts in developing priorities for achieving our goal of a more sustainable community.

Potential Strategies

Policy strategies currently being researched for implementation over the coming two years include (see [Appendix X](#) for complete list):

Local Living / Live Near Your Work Policy Initiative

This program, which is working well in other college towns, provides direct financial assistance for eligible employees to encourage homeownership near the place of employment, serving to benefit employees, employers, and the community. For the community as a whole, this program works by improving air quality, reducing urban sprawl and traffic congestion, rehabilitating neighborhood housing stock, supporting area businesses, diversifying the economy, contributing to the tax base, and by helping to achieve a greater balance between homeowners and renters in targeted neighborhoods.

Enabling employees to live closer to their workplaces minimizes the daily commute, encourages alternate means of travel including walking and biking, and reduces household energy costs all which improve the quality of living. Further, the financial benefit of this program helps to ensure the family's ability to purchase a home.

For the employer, this program improves employee morale and

productivity, and encourages staff to plant long-term roots in the community, resulting in reduced turnover and reduced training costs. It also serves to revitalize the community the employer resides in, making it more attractive to customers, clients, and future staff recruits.

Existing structures within Oberlin, including the City's Oberlin Community Improvement Corporation (OCIC) could potentially be a strong conduit for this type of program.

Residential Energy Disclosure Policy

This practice already successful in Austin, TX, requires home sellers and landlords to disclose energy bills to potential homebuyers and renters. This policy increases market awareness of EE and promotes the message that a home's energy use is an important factor that home-buyers can consider as part of their purchasing or renting decision. This in turn drives demand for more efficient housing stock while positively impacting job and business growth in the efficiency sector. It is suggested that this begin as a voluntary program in Oberlin.

Measurement and Verification

Measurement and verification is required by both ICLEI and by the CPDP in order to achieve Climate Positive Participant status. To meet the criteria set out in the CPDP, the CAP must "clearly identify measurement protocol or calculation methodology Development Partners plan to employ in order to calculate and verify actual emissions." Measurement and verification of actual emissions reductions will assure that the City is making progress toward the short- and long-term goals adopted by City Council in 2011.

Goals and Measurement/Verification Schedule

Using 2007 as baseline GHG emissions, the City set goals of reducing greenhouse gas emissions at least 50% below baseline by 2015, at least 75% below baseline by 2030, and below zero by 2050 at the latest. To achieve these goals, the City must eliminate 87,195 tons of CO₂e by 2015, at least 130,793 tons CO₂e by 2030 and at least 174,391

CO₂e by 2050.

To bring clarity in achieving the adopted GHG emission reduction goals, the City is looking at incremental goals of at least 1.5% emissions reductions each year. This equates to 2,616 tons annually or 13,079 tons CO₂e every five years. A revised GHG inventory is planned every five years.

Emissions Reductions Estimates in this Plan

Throughout this document, many strategies are accompanied by estimated reduction in greenhouse gas emissions, expressed as carbon dioxide equivalent (CO₂e). The estimates in this plan were primarily generated using the ICLEI Climate and Air Pollution Planning Assistant (CAPPA), a tool developed with the assistance of hundreds of local governments. In the transportation section, estimates were provided by the Center for Neighborhood Technology as part of the *Energy Efficient Transportation Plan for Oberlin and Northern Ohio*. The emissions coefficients and methodology employed by these tools 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).

Future Greenhouse Gas Emissions Inventory

The City will be responsible for conducting future greenhouse gas emissions inventories. In conducting future emissions inventory, the City expects to adopt the Global Protocol for Community-Scale GHG Emissions (GPC) developed jointly in 2011-12 by the C40 Cities Climate Leadership Group and ICLEI Local Governments for Sustainability.

It is recommended that the City update its baseline emissions inventory using this newly developed protocol in order to both better capture baseline emissions and identify or develop tools that will be used for future inventories. The next emissions inventory to measure and verify progress will be compiled and calculated in 2013 using

emissions for the year 2012.

Measurement and Verification of Climate Positive Credits

Climate Positive Credits must also be measured and verified in order to count as an emissions reduction for the City. The most appropriate methodology should be selected to quantify Climate Positive Credits, and the process of verifying credits should also establish that the credits are connected to the City or its partners (relevant) and would not have been accomplished without the work of the City or its partners (additional). In the case of Climate Positive Credits associated with projects such as energy efficiency improvements, reforestation, and agricultural or land use changes, relevant carbon offset protocols should be used such as the ACUPCC Voluntary Carbon Offset Protocol, Verified Carbon Standard, or subsets of these protocols.

Additional Considerations

To the greatest extent possible future decisions in planning and development within the City should be take GHG emission impacts into consideration. This includes changes in land use and new construction. New large-scale development projects should utilize tools such as the Climate Positive Modeling Tool developed by the consulting firm Arup to fully account for emissions associated with land use changes, construction, transportation, energy use, water and storm water, and waste. This will better enable the City to aim proactively for climate positive developments at the beginning of any development process.



Downtown Oberlin stores. Photo by Matthew Lester for Oberlin College.

Conclusion

The City of Oberlin and Oberlin College have made substantial progress in moving toward creating a climate positive community. Power supply commitments for wind, photovoltaic, hydro, and landfill gas will make the City's electricity over 90% carbon neutral by 2015, thereby reducing the City's GHG emissions by almost 50%. Strategies in energy efficiency and green building have made and will continue to make impacts in reducing GHG emissions in Oberlin. Education and awareness are increasing in the community with the development of the local non-profit POWER (Providing Oberlin With Efficiency Responsibly) and the Oberlin Project.

Oberlin College, the largest stakeholder in the community, has made significant strides in developing its 2013 Climate Action Plan. This plan demonstrates how it will attain climate neutrality by 2025. The largest GHG reduction impact is the plan to convert its coal-fired central heating plant to natural gas. At the same time it is creating a seven-zone heating and cooling distribution system allowing for greater efficiency and the option of using more sustainable systems in each zone as they are developed. The early steps in the conversion of the central heating system and other actions will reduce the College's GHG emissions by almost 50% by 2016.

As described in this plan, the City and Oberlin College have initiated numerous strategies, and identified others that will reduce further GHG emissions in all sectors by emphasizing energy efficiency and transitioning to less carbon intensive and carbon neutral primary energy sources. The City and College consider their CAPs to be works in progress and will continue to evaluate strategies and actions to attain the ultimate goal of being climate positive.

Looking Ahead: Adaptation and Resilience

Natural disasters are occurring with increasing frequency and severity: Katrina, Fukushima, Haiti, Irene, and Sandy. The discussion about sustainability has been primarily concerned with prevention of further climate change and is the major focus of this and most CAPs. It is becoming clear that adaptation is important as well because we failed to prevent the dangerous buildup of carbon dioxide in the atmosphere.

As a result, we are experiencing more extreme weather events. It is highly likely that today's extremes will become increasingly more severe in an environment where "the normal" is continually shifting. No matter what we do, Oberlin and the rest of the planet will experience significant warming and its multiple consequences. We recognize that adaptation needs to be fully addressed as we move forward.

The standard for adaptive strategies – behavioral, technological, and infrastructural changes – is resilience, which is the capacity of ecosystems, the built environment, communities, and people to absorb varied changes without significant change in core functions and values. Creating resilient patterns of habitation that can absorb the expected variances of climate change and adaptive strategies for when resilience is overcome are concerns that will need to be addressed.

Adaptation and resilience are topics of concern even as we move toward becoming climate positive. ICLEI has recognized this need and developed the next generation of sustainability planning tools including the [STAR Community Index](#) and the

[Sustainability Planning Toolkit](#) to assist governments in preparing for adaptation and resiliency in their communities. The City of Oberlin and Oberlin College will continue in leadership roles as they strive to transform Oberlin into an even more sustainable and livable community.

"The City and College consider their Climate Action Plans to be **works in progress** and will continue to evaluate strategies and actions to ATTAIN THE ULTIMATE GOAL OF BEING CLIMATE POSITIVE."



Oberlin's Farmers' Market in summer, 2009. Photo by John Seyfried for Oberlin College.



Oberlin College student Kobi Shevin taking a water quality sample at Plum Creek. Photo by Chris Canning '12.

Table of Greenhouse Gas Reductions

Renewable Energy Generation

Present Strategies	CO ₂ e tons reduction
Belleville Hydro Project	
New York Power Authority - Niagara and St. Lawrence Hydro Projects	
Ohio Renewable Energy Services, LLC – Erie County Landfill Gas (LFG)	
AMP JV6 – Bowling Green Wind Project	
Iberdrola Renewables Blue Creek Wind Project	
Spear Point Solar One, LLC Oberlin College Solar Field	
Purchasing Natural Gas Blended with Methane for City Buildings	
Customer-Owned Solar Generation	
Waste Management Renewable Energy, LLC – Mahoning and Geneva County LFG	
AMP Hydro Phase I – Cannelton, Smithland, and Willow Island	
AMP Hydro Phase II – Meldahl and Green-up	
Sustainable Reserve Fund	
Electric Vehicle Charging Stations	
Potential Strategies	
AMP Hydro Phase III – R.C. Byrd and Pike Island Projects	
Replace Natural Gas for Heating	
Replace Gasoline and Diesel Fuel	
Capitalize on the REC Market	

Energy Efficiency

Present Strategies	CO ₂ e tons reduction
Heat Loss Inspections	
Industrial Audits	
Promotion of Compact Fluorescent Light Bulbs	
Energy Efficiency at OMLPS Power Plant	
Energy Efficiency at OMLPS Technical Services Office	
Energy Efficiency at Water Environment Protection Facility	
Energy Efficiency at Water Treatment Plant	
Traffic Light Upgrades to Light Emitting Diodes (LEDs)	
Building Efficiency Upgrades to Parks and Cemetery Building	
Building Efficiency Upgrades to City Facilities	
Downtown Christmas Lighting Upgrade to LEDs	
Lighting Upgrades to City Buildings	
Efficiency Smart	
Oberlin Super Rebate Program	
Efficiency Upgrades to City Office Equipment	
Develop One-Stop Shop for Residential Energy Efficiency Information and Assistance - POWER	

Potential Strategies

Building Performance Disclosures for Residential and Commercial Properties	
Develop One-Stop Shop for Commercial Energy Efficiency and Assistance	
Evaluate and Consider Adoption of Smart Grid Technologies for Future Real-Time Monitoring of Energy Consumption and Load Control Opportunities	

Transportation

Present Strategies	CO ₂ e tons reduction
Wayfinding Signage	
Safe Route to Schools	
Expand Bicycle and Pedestrian Infrastructure	
Bicycle Parking at Events	
Bicycle Giveaway	
Bicycle Tourism Program	
Bicycle and Pedestrian Education and Safety	
Oberlin Connector Transit Service	
Regional Transit Coordination	
WestShore Corridor Transportation Project	
Biofuel Pumping Station	
Electric Vehicle Charging Stations	
Alternative Fuel Station for Consumers	
Alternative-Fueled and Hybrid Vehicles	
Efficient Fleet Standards	
Anti-Idling training	
Eco-Driving training	
Increase Carpooling/Car-Sharing	
Rethink Your Ride – Mode Shift Competition	
Potential Strategies	
Adopt Complete Streets Policy	
Explore Changes to Parking Infrastructure and Policies	
Explore Low-Carbon Solutions for Cargo Transport	
Explore Option for Low-Carbon Long Distance Travel	

Green Building

Present Strategies	CO ₂ e tons reduction
Oberlin College Green Building Policy	
City Green Building Policy	
Planet Footprint to Monitor Municipal Gas and Electric Use	
Rehabilitation of Lorain Metropolitan Housing Authority (LMHA) Housing in Oberlin	
Potential Strategies	
Facilitate Development of City-Owned Green Acres Property	
Develop Commercial and Residential Green Building Certification Programs	
Establish Procedures and Policies that Encourage Green Building	

Waste Management

Present Strategies	CO ₂ e tons reduction
Residential Curbside Recycling	
Commercial and Institutional Recycling	
Composting	
Anaerobic Digestion	
Land Application of Class B Bio-Solids	
Co-Generation from Anaerobic Digestion	
Potential Strategies	
Develop and Implement a Zero Waste Plan	
LFG Generator Waste Heat Recovery Feasibility Study	
Evaluate Additional Anaerobic Digestion Opportunities to Maximize Methane Production for Re-Use in the Co-Generation System	
Evaluate Costs and Benefits Associated with the Production of Class A Bio-Solids	

Education

Present Strategies	CO ₂ e tons reduction
Media Marketing of Sustainability Opportunities and Benefits	
Develop New/Enhanced Sustainability Curricula at Oberlin City Schools and Other Institutions of Learning	
Install Bioregional Dashboard at Various Locations in the Community	
Complete STARS Assessment at All Partner Schools	
Partner with POWER to Raise Awareness of Residential Energy Opportunities	
Potential Strategies	
Create a Community and/or Business Environmental Award	
Promote Green Business and Green Restaurant Membership	
Develop Support of a Buy Local Campaign	
Annual Speaker and Film Series	
Hold Community Workshops to Educate the Community	

Achieving Climate Positive

Present Strategies	CO ₂ e tons reduction
Climate Positive Credits: Local Carbon Offset Pilot	
Climate Positive Credits: Greenhouse Pilot	
Community Housing Improvement Program (CHIP)	
Potential Strategies	
Energy Special Improvement District (ESID)	
Local Energy Capital Fund	
Residential PACE	
Local Living / Live Near Your Work Policy Initiative	
Residential Energy Disclosure Policy	

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2007 GHG Emissions Inventory

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2011 Climate Action Plan

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Abbreviations

AJLC – Adam Joseph Lewis Center for Environmental Studies
CAP - Climate Action Plan
CFL – Compact Fluorescent Light
CHIP – Community Housing Improvement Program
CNT - Center for Neighborhood Technology
CPDP – Climate Positive Development Program
EV – Electric Vehicle
GHG - Greenhouse Gas
HTG – Heat Trapping Gas
kW – Kilowatt
kWh – Kilowatt hour
LCCC - Lorain County Community College
LCJVS - Lorain County Joint Vocational School
LED – Light Emitting Diode
LEED – Leadership in Energy and Environmental Design
LGIF – Local Government Innovation Fund
NEOSCC – Northeast Ohio Sustainable Communities Consortium
NOACA – Northeast Ohio Areawide Coordinating Agency
OAQDA – Ohio Air Quality Development Authority
OC - Oberlin College
OCSD - Oberlin City School District
ODOT – Ohio Department of Transportation
OMLPS - Oberlin Municipal Light and Power System
POWER - Providing Oberlin with Efficiency Responsibly
PV – Photovoltaic
RCRC - Resource Conservation and Recovery Commission
REC – Renewable Energy Credit
STARS - Sustainability Tracking, Assessment and Rating System
SVO – Straight Vegetable Oil
TLCI – Transportation for Livable Communities Initiative
USGBC – United States Green Building Council.
VMT – Vehicle Miles Traveled
VOC – Volatile Organic Compound

Appendix I: Climate Change

The scientific consensus on the basic scientific conclusions that climate warming is happening and human activities are a major cause is supported by numerous analyses of the climate science literature. A recent analysis by the National Academy of Sciences affirms that, using a database of 1,372 climate scientists, “(i) 97–98% of the climate researchers most actively publishing in the field support the tenets of anthropocentric climate change [ACC] outlined by the Intergovernmental Panel on Climate Change, and (ii) the relative climate expertise and scientific prominence of the researchers unconvinced of ACC are substantially below that of the convinced researchers.” (William R. L. Anderegg, James W. Prall, Jacob Harold, and Stephen H. Schneider, *Expert credibility in climate*, [http://www.pnas.org/content/early/2010/06/04/1003187107.full.pdf+html]).

Numerous books have been written on climate change over the past three decades. The following are among the best general audience books.

Richard Alley, *The Two-Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future* (Princeton: Princeton University Press, 2011)

Climate Central, *Global Weirdness: Severe Storms, Deadly Heat Waves, Relentless Drought, Rising Seas and the Weather of the Future* (New York: Pantheon, 2012)

Tim Flannery, *The Weather Makers: How Man Is Changing the Climate and What It Means for Life on Earth* (New York: Atlantic Monthly Press, 2005)

Ross Gelbspan, *The Heat is ON: The High Stakes Battle over Earth's Threatened Climate* (Reading, MA: Addison-Wesley, 1997)

James Hanson, *Storms of My Grandchildren: The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity* (New York: Bloomsbury USA, 2009)

Bill McKibben, *The End of Nature* (New York: Random House, 1987)

Bill McKibben, *Eaarth: Making a Life on a Tough New Planet* (New York: Times Books, 2010)

National Research Council, *Abrupt Climate Change: Inevitable Surprises* (Washington, DC: National Academies Press, 2002)

Naomi Oreskes and Erik M. Conway, *Merchants of Death: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (New York: Bloomsbury Press, 2010)

James Powell, *The Inquisition of Climate Science* (New York: Columbia University Press, 2011)

Stephen H. Schneider, *Global Warming: Are We Entering the Greenhouse Century?* (San Francisco: Sierra Club Books, 1989)

Spencer R. Weart, *The Discovery of Global Warming* (Cambridge: Harvard University Press, 2003)

Three websites that are useful for understanding climate science

Global Warming entry on Wikipedia provides a detailed discussion and references (http://en.wikipedia.org/wiki/Global_Warming).

Science Daily is an excellent source of the latest, scientific-based articles on climate change (www.sciencedaily.com).

Climate Central is an excellent website for the latest information on climate change (www.climatecentral.org).

Two recent articles that together succinctly present the challenge before us

Bill McKibben, *Global Warning's Terrifying New Math: Three simple numbers that add up to global catastrophe and that make clear who the real enemy is* (*Rolling Stone*, August 2, 2012) (<http://www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719>)

Dan Satterfield, NASA *Climate Expert James Hansen & An Amazing Forecast* (<http://blogs.agu.org/wildwildscience/2012/08/10/nasa-climate-expert-james-hansen-an-amazing-forecast/>). [This is a general audience discussion of Hansen, J., Mki. Sato, and R. Ruedy, 2012: Perception of climate change. *Proc. Natl. Acad. Sci.*, 109, 14726-14727, E2415-E2423, doi:10.1073/pnas.1205276109 {http://pubs.giss.nasa.gov/docs/2012/2012_Hansen_et_al_1.pdf}]

Appendix II: Municipal Inventory Results

The municipal emissions inventory includes emissions from municipal operations outside of the city limits of Oberlin and thus is not entirely a subset of the community-wide inventory (see Figure 7). Municipal operations were responsible for emitting 11,400 tons CO₂ in 2007.

TOTAL MUNICIPAL OPERATIONS EMISSIONS

SOURCE OF GHG EMISSIONS

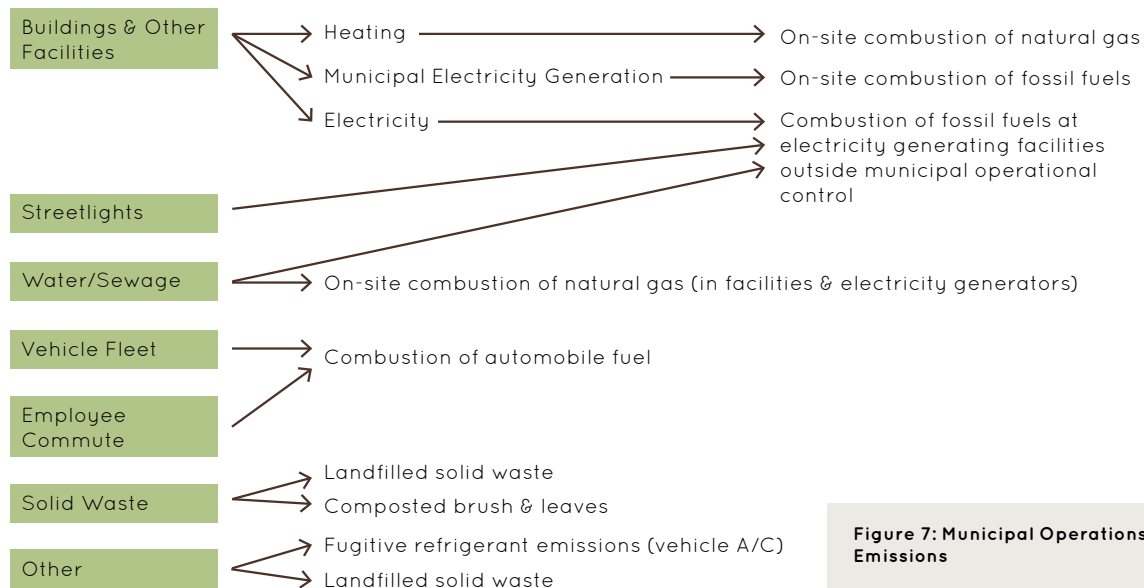


Figure 7: Municipal Operations Emissions

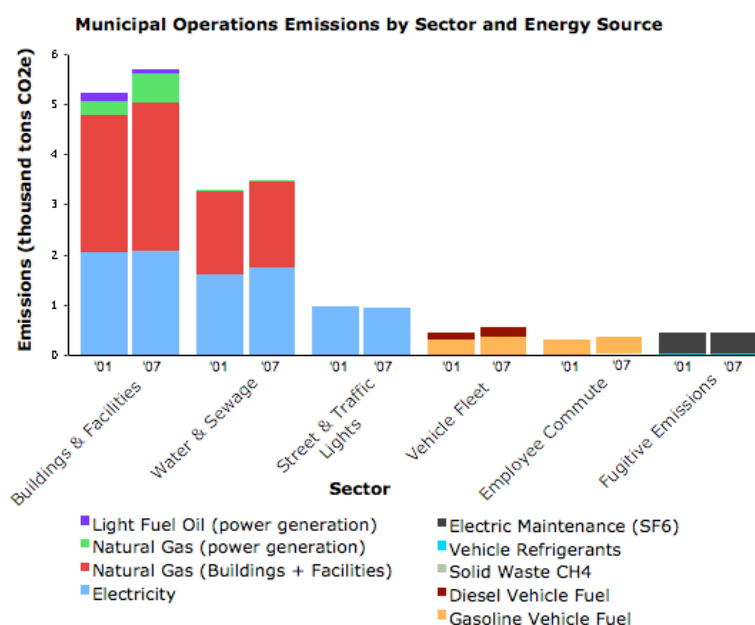


Figure 8: Municipal Operations Emissions by Sector and Energy Source

Appendix III: Renewable Energy

Present Strategies

AMP Joint Venture 5 – Belleville Hydro Project

Implementation year(s): 1999 – 2050

Lead entity: OMLPS

Projected GHG reduction: 8,182 tons CO₂e

Forty-two AMP member communities, including Oberlin, own the Belleville Hydro Plant located on the Ohio River in Belleville, West Virginia. The City owns 1.3 MW of generation from this 42 megawatt plant supplying approximately 7.1% of the community's annual power requirements.

New York Power Authority (NYPA) – Niagara and St. Lawrence Hydro Projects

Implementation year(s): 1999-2030

Lead entity: OMLPS

Projected GHG reduction: 1,986 tons CO₂e

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

Ohio Renewable Energy Services, LLC – Erie County Landfill Gas

Implementation year(s): 2010 – 2022

Lead entity: OMLPS

Projected GHG reduction: 3,615 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 MW. This landfill gas generation supplies approximately 4% of the City's annual power requirements.

AMP Joint Venture 6 – Bowling Green Wind Project

Implementation year(s): 1999 - 2030

Lead entity: 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 MW 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.

Iberdrola Renewables - Blue Creek Wind Project

Implementation years: 2012-2022

Lead entity: OMLPS

Projected GHG reduction: 1,440 tons CO₂e

In 2012, the City contracted to purchase 1 MW of capacity through AMP from the 350 MW Blue Creek Wind project located in Van Wert, OH.

Spear Point Solar One, LLC – Oberlin College Solar Field

Implementation year(s): 2011 – 2036

Lead entity: Oberlin College

Projected GHG reduction: 2270 CO₂e tons

In 2012, Oberlin College contracted to purchase power from a 2.27 MW single axis tracking photovoltaic generation project owned by Oberlin Spear Point Solar One, LLC and constructed on Oberlin College Property located in New Russia Township, OH. The project is interconnected to the City's electric distribution system and energy is credited to the College's monthly retail generation costs.

Strategy: Purchasing Natural Gas Blended With Methane for City Buildings

Implementation year(s): 2009 - ongoing

Lead entity: OMLPS

Projected GHG reduction: 25 CO₂e tons

In 2009, the City contracted to purchase its natural gas supply from Integrys Energy Services. Integrys has a voluntary program, Ecovations™ Renewable Gas which provides 8% carbon-neutral gas to be included in a customer's gas supply. This program provides for carbon reduction by using carbon-neutral 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

Lead entity: Private interests and OMLPS

Projected GHG reduction: 183 tons CO₂e will increase as customers add solar generation

Oberlin passed a net metering ordinance in 2000 to allow customers interconnection to the City's electric distribution grid. This net metering agreement allows customers to feed power back to the grid when the PV system produces more electricity than what is being used at a given time. Customers who have up to 10 kW of PV receive full credit for the power produced by offsetting usage up to their total annual usage. Customers who install more than 10 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. At the present time there are nine photovoltaic (PV) installations in Oberlin. Four of these are on residential homes and five are on commercial buildings. These provide a combined total of 200 kW installed solar.

Waste Management Renewable Energy, LLC – Mahoning and Geneva County Landfill Gas

Implementation year(s): 2013 – 2027

Projected GHG reduction: 44,365 tons CO₂e

In 2011, the City contracted to purchase 8.1 MW of capacity through AMP from the Mahoning County and Geneva County landfill gas generation projects owned and operated by Waste Management Renewable Energy. The City of Oberlin is the sole purchaser of power from these projects. This landfill gas generation will supply approximately 56% of the City's annual power requirements.

AMP Hydro Phase I – Cannelton, Smithland, and Willow Island Hydro Projects

Implementation year(s): 2013 - 2080

Lead entity: OMLPS

Projected GHG reduction: 9,319 tons CO₂e

In 2007, the City contracted to purchase 2.6 MW 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 power requirements.

AMP Hydro Phase II - Meldahl and Green-up Hydro Projects

Implementation year(s): 2014 - 2080

Lead entity: OMLPS

Projected GHG reduction: 2,815 tons CO₂e

In 2009, the City contracted to purchase .84 MW 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. The projects are owned and developed jointly as a partnership between AMP and the City of Hamilton, OH. It is estimated that these projects will supply 4% of Oberlin's annual power requirements.

Sustainable Reserve Fund

Implementation year(s): 2007 - Ongoing

Lead entity: OMLPS

Projected GHG reduction: TBD

In 2007, Oberlin City Council established a Sustainable Reserve Fund (SRF) to provide grants and leverage other funding sources for community-based, utility related, environmentally-friendly initiatives demonstrating energy efficiency, energy conservation, greenhouse gas reductions, and/or development of green power generation resources. The SRF is funded through the sale of energy attributes to Oberlin College. Grants from the SRF have been used to insulate low income homes, perform a local wind study, assist in developing a local biodiesel fuel station, procure and install concentrated solar arrays from a local manufacturer, and create an energy auditing and efficiency advocacy program.

Appendix IV: Energy Efficiency

Present Strategies

Heat Loss Inspections

Implementation year: 2000 - ongoing

Lead entity: OMLPS

Projected GHG reduction: 18 tons CO₂e

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.

Industrial Audits – Department of Energy Industrial Assessment Grants

Implementation year(s): 2005 - ongoing

Lead entity: 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 12% 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.

Promotion of Compact Fluorescent Light (CFL) Bulbs

Implementation year: 2007 - ongoing

Lead entity: 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.

Energy Efficiency at OMLPS Power Plant

Implementation year(s): 2007-2010

Lead entity: 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.

Energy Efficiency at OMLPS Technical Services Office

Implementation year(s): 2007-2010

Lead entity: 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. These upgrades have reduced the annual power consumption from 76,040 kWh to 43,000 kWh, a reduction of 33,040 kWh annually.

Energy Efficiency at Water Environment Protection Facility

Implementation year(s): 2007-2010

Lead entity: 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.

Energy Efficiency at Water Treatment Plant

Implementation year(s): 2008 - 2010

Lead entity: 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.

Traffic Light Upgrades to Light Emitting Diodes (LEDs)

Implementation year(s): 2009 - 2010

Lead entity: 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.

DEFINE IT:

R-value: A measure of the flow of energy (heat) through a material. The higher the number the slower the flow of energy.

Building Efficiency Upgrades to Parks and Cemetery Building

Implementation year(s): 2007 - 2010

Lead entity: 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 the gas furnace.

Building Efficiency Upgrades in City Facilities

Implementation year(s): 2009 – Ongoing

Lead entity: Public Works

Projected GHG reduction: 7 tons CO₂e in 2010

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 administrative area of city hall was upgraded with 360 sq. ft. of white reflective roofing, 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 that 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 lighted 24/7 are being implemented first.

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

Downtown Christmas Lighting Upgrade to LED

Implementation year(s): 2010

Lead entity: 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.

Lighting Upgrades in City Buildings

Implementation year(s): 2010

Lead entity: OMLPS

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 has budgeted \$5,000 in 2011 for lighting upgrades at 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.

Efficiency Smart

Implementation year(s): 2011 - 2013

Lead entity: OMLPS

Projected GHG reduction: 1035 tons CO₂e

In 2010, the City voted to join with forty-six other members of American Municipal Power (AMP) to become part of Efficiency Smart developed by AMP and Vermont Energy Investment Corporation (VEIC). Efficiency Smart will offer an opportunity for all customers in the Oberlin Municipal Light and Power territory to reduce electrical consumption through energy efficiency. VEIC, which has managed and overseen energy efficiency for the entire state of Vermont for the past 10 years, will provide the same oversight in managing Efficiency Smart for AMP communities 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. Energy efficiency services through Efficiency Smart 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.

Oberlin Super Rebate Program

Implementation year: 2012-2013

Lead entity: OMLPS

Projected GHG reduction: TBD

The City of Oberlin increased the energy efficiency rebates available by Efficiency Smart starting the last quarter of 2012 through 2013. Efficiency Smart provides rebates on six types of electrical appliances. The City tripled the amounts on three of the appliances and doubled the rebate on the other three. Sustainable Reserve Funds are being used to provide the additional rebates. OMLPS oversees the program and POWER is providing administrative support.

Efficiency Upgrades to City Office Equipment

Implementation year(s): ongoing

Lead entity: City

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 to be replaced wherever possible. Additionally, the City will publicize this ENERGY STAR® recommendation to residential community members and encourage the purchase of efficient home appliances.

Develop One-Stop Shop for Residential Energy Efficiency Information and Assistance –Providing Oberlin With Efficiency Responsibly (POWER)

Implementation year(s): 2008 – Ongoing

Lead entity: 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 low income residents. 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. As an example of what can be done, POWER has demonstrated how members of a community can work for solutions to improve the well-being of the community and the environment.

Appendix V: Transportation

Present Strategies

Wayfinding Signage

Implementation year(s): Completed

Lead Entity: City, commercial, nonprofit

Projected GHG reduction: TBD

Install pedestrian signage pointing to major destinations. Directional signage, maps, and identification signs help passengers plan and execute their transit journeys more easily and efficiently.

Safe Routes to Schools

Implementation year(s): Present - 2014

Lead Entity: City, nonprofit

Projected GHG reduction: TBD

Provide bicycle and pedestrian amenities and safety improvements to enable walking and biking by students. Walking and biking are two of the easiest ways to be active. Active transportation encourages healthier lifestyles for children.

Expand Bicycle and Pedestrian Infrastructure

Implementation year(s): Ongoing

Lead Entity: City

Projected GHG reduction: TBD

Improve existing active transportation infrastructure to encourage walking and bicycling to local destinations for work and shopping. More bicycle infrastructure is needed in the downtown area as is apparent by all the bicycles near the East College Street project. Making use of resources from the Northeast Ohio Sustainable Communities Consortium (NEOSCC) and funding through Northeast Ohio Areawide Coordinating Agency (NOACA) Transportation for Livable Communities Initiative (TLCI) grant helps promote more active lifestyles within the community while also lowering carbon emissions.

Bicycle Parking at Events

Implementation year(s): Ongoing

Lead Entity: City, College, Commercial

Projected GHG reduction: TBD

Use vegetated open space or turf pavement for bicycle parking, such as at Oberlin College's commencement. All community event organizers should be encouraged to provide bicycle parking. Providing more locations for bicycle parking encourages people to consider biking over driving alone. Bicycling is part of a healthier lifestyle regiment, lowers transportation costs while also reducing carbon emissions.

Bicycle Giveaway

Implementation year(s): Ongoing

Lead Entity: Commercial

Projected GHG reduction: TBD

Bicycle giveaway or raffle at least once a year at a community event to encourage people to bike over driving alone. Residents have the opportunity to obtain a free bicycle that may improve health if used while emitting zero carbon emissions.

Bicycle Tourism Program

Implementation year(s): Ongoing

Lead Entity: City, nonprofit

Projected GHG reduction: TBD

Encourage visitors to Oberlin to ride bicycles through outreach including maps, tour groups, and wayfinders. Bicycling increases health benefits and economic development growth within a community.

Bicycle and Pedestrian Education and Safety

Implementation year(s): Ongoing

Lead Entity: City, nonprofit

Projected GHG reduction: TBD

Promote public health, safety, and sustainable transportation through making walking and bicycling use safe and accessible. The rights of bicycle and pedestrians on City streets must be strictly enforced as well. This can be achieved through legislation, planning, and education.

Oberlin Connector Transit Service

Implementation year(s): Ongoing

Lead Entity: City, nonprofit

Projected GHG reduction: TBD

Continue and extend current transit services to Oberlin residents seeking travel throughout the county. A single commuter switching his or her commute to public transportation can reduce a household's carbon emissions by 10%, or up to 30% if he or she eliminates a second car.

Regional Transit Coordination

Implementation year(s): Ongoing

Lead Entity: City

Projected GHG reduction: TBD

Coordinate with other communities in the region to increase transit options. Coordinate with NOACA, NEOSCC, Lorain County Administrators and Commissioners, and other local non-profit organizations. Public transportation provides personal mobility and freedom for people from every walk of life. For every \$1 invested in public transportation, \$4 in economic returns is generated. In addition, people who use transit more often are more active because of walking to and from the transit locations.

WestShore Corridor Transportation Project

Implementation year(s): Ongoing

Lead Entity: City, nonprofit

Projected GHG reduction: TBD

Construct a commuter rail line from Lorain that serves downtown Cleveland and Sandusky. Increased bus transit services and ridership within the county can lead to the development of this project. High quality rail systems encourage compact, walkable communities, and provide sustainable, comfortable transportation while greatly reducing oil use and carbon emissions. Walkable communities support rail systems by providing high ridership.

Biofuel Pumping Station

Implementation year(s): Present - 2014

Lead Entity: Commercial

Projected GHG reduction: TBD

Expand present biofuel station that would operate long hours and accepts credit cards, like a conventional gas station. Using biodiesel as a vehicle fuel increases energy security improves public health and reduces carbon emissions.

Electric Vehicle Charging Stations

Implementation year(s): 2013 - 2015

Lead Entity: City, College

Projected GHG reduction: TBD

Alternative fuels are generally cleaner-burning so they put less relative strain on the environment. Consumers can see lower fuel costs when they use some alternative fuels, although the initial cost of a vehicle can be higher. Home refueling of electric cars can save time and be cost effective.

Alternative Fuel Station for Consumers

Implementation year(s): 2014

Lead Entity: Commercial

Projected GHG reduction: TBD

In addition to biofuels, alternative vehicle fuels include Compressed Natural Gas (CNG), Liquefied Natural Gas (LNG), and Propane. See Electric Vehicle Charging Station description above.

Alternative-Fueled and Hybrid Vehicles

Implementation year(s): Ongoing

Lead Entity: City, College

Projected GHG reduction: TBD

Hybrid vehicles that can operate on both fossil fuels and electricity use regenerative braking to capture wasted energy. If just 25% of corporate fleets converted to green vehicles, there would be a substantial reduction in carbon emissions. Greening fleets is an opportunity to be the catalyst for economic and environmental benefits.

Efficient Fleet Standards

Implementation year(s): 2014

Lead Entity: City, College

Projected GHG reduction: TBD

Fleet requirements that set minimum standards for vehicle fuel use efficiency provide environmental and economic benefits for the City and College.

Anti- Idling Training

Implementation year(s): Ongoing

Lead Entity: City, College

Projected GHG reduction: TBD

Anti-idling habits will reduce carbon emissions and may assist with improving health benefits of the residents. Diesel particulate pollution has been linked to asthma, heart disease, cancer, and premature death.

Eco-Driving Training

Implementation year(s): Ongoing

Lead Entity: City, College

Projected GHG reduction: TBD

Train drivers to improve vehicle efficiency through driving behavior. Eco-driving improves road safety as well as the quality of the local and global environment and reduces fuel costs.

Increase Carpooling/Car-Sharing

Implementation year(s): 2014

Lead Entity: City, College, Community

Projected GHG reduction: TBD

Carpooling participants save money by sharing the cost of all travel related expenses. By sharing a vehicle, it reduces the number of vehicles on the road, which reduces pollution and carbon emissions. Also those who use car-sharing services tend to sell their own cars, which results in active transportation modes such as biking and walking.

Rethink Your Ride – Mode Shift Competition

Implementation year(s): Ongoing

Lead Entity: Community

Projected GHG reduction: TBD

This challenge encouraged those who live, learn, work, and play in Oberlin to replace at least one-single vehicle trip per week with a low-carbon mode of transportation. Added benefits include improved health, reduced traffic congestion, and saving money.

Additional Potential Strategies***Car-Sharing for Fleets***

Implementation year(s): 2015 - ongoing

Lead Entity: City, College

Projected GHG reduction: TBD

Sharing vehicles among multiple institutional entities lowers the operation costs of a fleet while enhancing personal and business travel program. It also helps to reduce carbon footprint.

Peer-to-Peer Car-Sharing

Implementation year(s): 2015 - ongoing

Lead Entity: Community

Projected GHG reduction: TBD

A peer-to-peer car-sharing program, in which individuals share their personal vehicles with others, will better address the issues that threaten urban livability, sustainability, and air quality.

Low-Carbon Shopping

Implementation year(s): 2015 - ongoing

Lead Entity: Commercial, Community

Projected GHG reduction: TBD

Local merchants provide perks to encourage shoppers who bike and walk. Residents can reduce their carbon footprint by purchasing locally produced goods and services. Anchor institutions can be the catalyst of such change, leading by example. Such a lifestyle change promotes economic development, reduces carbon emissions, and saves money on transportation expenses.

Car-Free Visitor Program

Implementation year(s): 2015 - ongoing

Lead Entity: City, College, Commercial, non-profit

Projected GHG reduction: TBD

Car-free planning, which is focused on enabling Oberlin visitors to enjoy their visit without a car, reduces carbon emissions and traffic congestions, and increases consumer savings.

Appendix VI: Green Building

A. Energy Basics: Primary Energy, End Use Energy, and Embodied Energy.

Primary and End Use Energy:

Energy is a complex topic for several reasons including the units used—kilowatt hour, barrels of oil, ton of coal, joule, British Thermal Unit, therm, cord—and differences among primary energy, end use energy, and embodied energy.

The complexity of units makes it useful in comparative assessments to select a single unit and convert the energy under consideration to this unit. The British Thermal Unit, the amount of heat energy needed to raise the temperature of one pound of water by one degree F, is often selected because it is the standard unit used to state the amount of energy in a fuel. For example, to compare the energy used to heat house A with electricity and house B with natural gas, we convert kWhs and therms used in each to BTUs where 1 kWh = 3412 BTUs and 1 therm = 100,000 BTUs.

In the above example, electricity is the end use energy source but not the primary energy source for heating house A while natural gas is both for house B. The primary energy source in house A is the energy used by the power company to generate the electricity used. Coal, natural gas, nuclear reaction, and other heat sources are generally used to make steam that powers a turbine that generates electricity. Let us assume that coal is the primary energy source for heating house A. In generating electricity about three BTUs of primary energy (coal) are required to generate one BTU of electricity. This conforms to a general law in physics: when coal is converted to electricity, useful energy is lost. In this conversion 3 BTUs of coal become 1 BTU of electricity.

In house A, 3 BTUs of primary energy are used to provide each BTU of electricity used for heating. The conversion of electrical energy to heat energy is very efficient so almost all of the energy in electricity becomes heat. However, in the whole process only one third of the primary energy in coal ends up as heat energy in the house. In house B, conversion of natural gas to heat can be 97% efficient in modern furnaces. Thus, the primary energy to heat house B is about one third of the primary energy to heat house A.

Embodied Energy

In our example above it took other energy inputs than the end use energy of electricity and natural gas to heat the houses. This other energy is all the energy necessary in the processes and systems required to get the end use energy to where it is used. For house A this would include the components of the electrical transmission system, the coal, all the components of the electrical generation process, all the components of the coal mining system, and so on. Needless to say, it is very difficult to calculate embodied energy with any precision; however, it is a convenient way to talk about energy inputs that are real but difficult to measure precisely.

To give an example let us compare the energy used by two all electric homes: house 1 with PV sourced electricity and house 2 with coal generated grid sourced electricity. House 1's primary and end use electricity is that supplied by the PV system while the embodied energy is that required to make the PV system and get it on the house. House 2's primary and end use energies are coal and electricity, respectively. The embodied energy in house 2's primary energy is all the components involved in mining, getting the coal to the power station, generating electricity, and getting electricity to House 2.

The general public when making energy use comparisons rarely distinguishes between primary and end use energy. However, energy professionals use this distinction to make valid comparisons and analyses. In the example above, the house 2 would use the same amount of electricity whether supplied by the grid or PV, but uses about 3 times the primary energy used by house 1. If house 2 used coal directly for heating, it would use less coal or primary energy.

These examples illustrate why solar generated electricity (wind, PV) and passive solar are desirable. The energy source is everywhere and free. No GHG emissions result

DEFINE IT:

Primary energy: The original source energy for a particular task.

DEFINE IT:

End use energy: The energy for accomplishing a task such as the energy to run a microwave or heat a house.

except from embodied energy in the infrastructure required to acquire the solar energy. In addition, the some fraction of the fossil fuel based embodied energy in the grid infrastructure must be accounted for when a PV system is net-metered. That is, the grid acts like a battery storing electrical energy produced during the day and then withdrawn at night or at other times when more energy is needed than being produced.

B. Basic and deep energy retrofits can have substantial benefits for home owners

Many people have renovated their houses to be more energy efficient by caulking air leaks, adding wall and ceiling insulation, installing high efficiency windows and programmable thermostats, upgrading inefficient appliances and replacing incandescent lamps with CFLs. Each of these changes can reduce energy use and GHG emissions; however, these reductions are rarely quantified.

Howard and Margaret Stoner have provided an informative example. Beginning in 2006 and through 2007 they installed CFLs, a night setback thermostat, caulked air leaks, added more insulation in attic, walls, and basement walls for a cost of \$4,821 (\$5,250 actual cost minus \$429 NY state rebates). Their annual energy use in 2005 and 2006 went from 121 to 69 million BTU in 2007 and energy cost went from \$2,278 to \$1,369, a raw savings of \$909 and actual savings of about \$1,200 because no income tax is paid on the saved money. The pay back for these improvements was 4 years with an annual dividend of \$1,200 or 25% return-on-investment for as long as they live in the house.

The Stoners began major improvements in 2008 that extended into the first two months of 2009. They installed a new boiler (mostly for hot water), a 3.3 kW photovoltaic system, and an airtight efficient wood stove for a cost of \$26,000 (\$46,200 minus \$20,000 in federal tax credit and NY state ERDA rebates). The 2009 and 2010 annual energy use was 59 million BTU including 42 million BTU from solar (wood and PV electricity) and 17 million BTU of gas for a cost of \$418 (fossil fuel; offset by 3,300 kWh of PV electricity which they used with a few dozen kWh being sent to the grid thereby making the Stoner home positive energy and climate positive).

The annual raw savings for all improvements was \$2,040, an actual savings of \$2,700; this is an 8% annual return on investment that gives a payback time of 13 years and an annual dividend thereafter of \$2,040.

The lack of data on the savings that can be realized by small and large energy use changes has hindered efforts to make houses more energy efficient. Documented energy use retrofits are critical for people to know that these changes are effective both economically and environmentally. The Stoner example and basic physics establish that significant reductions in residential fossil fuel and energy use are cost effective and that deep energy retrofits can allow residents of older housing stock to create positive-energy, climate-positive homes.

Conserving water is also relatively easy to do. Each gallon not used also saves electricity and reduces GHG emissions. Professor Rumi Shammin in Oberlin College's Environmental Studies Department has studied the energy consumed for each gallon of water used in Oberlin. His research indicated that the energy necessary to take a gallon of water from and back-to the Black River is 86 BTU or 25 watt hours resulting in the release of 0.013 lbs of carbon dioxide.

C. Envelope and lighting best practices

A building's envelope is the slab, walls, and ceiling or roof that separate inside from outside. Envelope characteristics define the movement of heat and light into and out of a building, which in turn determines the energy required to light, heat, and cool a building to meet human requirements.

For existing structures, eliminating air leaks is the least expensive change for the greatest savings in heating and cooling energy with payback times of 3 to 6 years in residential buildings. Increasing insulation in residential buildings also provides significant savings with payback times of 5 to 10 years. Because commercial buildings usually have a significantly smaller surface-to-volume ratio and often do not have the

physiological comfort requirements of homes, the payback times are a dozen or more years and envelope improvements are often not considered economical. However, to achieve climate positive status, commercial buildings in Oberlin will not only need to use energy more efficiently, but also use carbon-neutral electricity and curtail or eliminate the use of fossil fuels.

Inexpensive compact fluorescent lamps (CFL) and linear fluorescent lamps have been available for several decades, reduce electricity consumption about 70% for an equivalent amount of light and last six times longer when compared with incandescent bulbs. Many homes and businesses have already converted to fluorescent lamps.

LED (light emitting diode) lamps are now economical for many uses including traffic signals, Christmas lighting, parking lot lighting and other uses that require extended hours of lighting. With prices dropping and quality increasing, LED lamps will eventually replace incandescent and fluorescent lamps for many applications. LED lamps are more efficient than CFLs and are 85% more efficient than an incandescent bulb. They also have very long life (LED: 20,000 to 50,000 hours; CFL: 8,000 hours; incandescent: 1,000 hours).

D. A policy on green building standards for municipal buildings in Oberlin was proposed and unanimously passed for municipal buildings on September 4th, 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.

E. Spotlight: Trail Magic

Trail Magic is a passive-active solar home built in 2008 with about 2,500 square feet of conditioned space. It runs on solar energy and cost no more to build than standard custom construction. It is a positive energy home because it produces more energy than it uses and climate positive because its operation results in a reduction of GHG in the atmosphere.

The average US home purchases about 100 million BTUs of operating energy while Trail Magic purchases no energy. If energy were purchased, it would be 10 million BTUs or 10% of average US home. However, no electricity is purchased so in a primary energy comparison between Trail Magic and the standard US home, Trail Magic uses about 5% of the primary energy used by the typical two person home (10 million BTUs ÷ [100 million BTUs × 2 {factor to convert end use energy to primary energy}] = 0.05).

The total cost for building the house was \$365,000. Trail Magic has about 2,500 square feet of conditioned space thereby making the cost \$146 per square foot of conditioned space. Custom houses in NE Ohio begin around \$125 per square foot of conditioned space and go well over \$200 per square foot. Trail Magic is a modest custom house. If the upscale features that do not relate to high performance and being passive/active solar are substituted with standard materials (e.g., \$17,000 for metal roof verses \$5,500 for 25 year, asphalt shingle roof) the price drops to \$110 per square foot of conditioned space. This is similar to the cost of a quality development house in NE Ohio.

Passive solar design features (orienting the long axis of the house east-west; placing few windows on the north, east, and west sides, and most windows on the south side; and extending roof overhangs about one foot to shade-out summer sun) provides over half the home's operating energy (about 15 million BTUs for heating and 5 million for day lighting). The 5.2 kW PV system annually produces 5,200 kWh of which 4,400 kWh (15 million BTUs) provides the remaining operating energy, if the pond source heat pump is used for heating and cooling. In practice, one cord of onsite wood is used for essentially all heating and then Trail Magic runs on 10 million BTUs or just under 3,000 kWh.

Water saving technologies and appliances and resident behavior at Trail Magic reduce indoor and hot water use to 20% and 40%, respectively, of that used by the average two-person home. Other green features include very tight, super insulated envelope; high performance double and triple paned windows; passive cooling design; pond-source heat pump for cooling and heating; high performance, air tight, soap-stone wood stove; cistern to collect roof water for outside use; almost 100% permeable landscaping, swales, and pond to slow storm water runoff; site and local lumber for flooring, shelving, book case, beams, and pantry counter; raised seam metal roof; and Hardiboard siding.

For more information and details see Carl N. McDaniel (2012) *Trail Magic: Creating a Positive Energy Home* (Sigel Press, Medina, OH).

F. Green Building Rating Systems

A variety of certification programs have arisen in the past decade or so for defining in specific terms what constitutes a "green building." The most widely known nationally-based rating systems (as of 2012) are summarized below.

1. **LEED:** Leadership in Energy and Environmental Design was developed by the U.S. Green Building Council (USGBC) in 2000. The LEED rating systems are developed through an open, consensus-based process led by LEED committees. The next update of the LEED rating system, coined LEED 2012, is the next step in the continuous improvement process and on-going development cycle of LEED. LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. LEED certification provides independent, third-party verification that a building, home or community was designed and built using strategies aimed at achieving high performance in key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED rating systems apply to new construction, existing buildings, operations and maintenance, core and shell, commercial interiors, schools, retail, healthcare, homes, and neighborhood development.
2. **Passive House:** The Passive House system was developed in Europe, where some 15,000 buildings have been designed and built or remodeled to the standard. The emphasis is on creating very well-insulated, virtually air-tight buildings that are primarily heated by passive solar gain and by internal gains from people, electrical equipment, and other heat sources that normally occur in a building. Any remaining heat demand is provided by an extremely small source. Avoidance of heat gain through shading and window orientation also helps to limit any cooling load, which is similarly minimized. An energy recovery ventilator provides a constant, balanced fresh air supply. The result is a system that not only saves up to 90% of space heating costs, but also provides a uniquely high indoor air quality.
3. **Living Building Challenge:** Developed by the Cascadia Green Building Council, the Living Building Challenge seeks to go beyond LEED in building design and performance standards into the wider realm of sustainability. Initially focusing on buildings, the program now addresses development at all scales. It is comprised of seven performance areas: Site, Water, Energy, Health, Materials, Equity and Beauty. These are further subdivided into twenty Imperatives, each of which focuses on a specific sphere of influence. This standard seeks to define the most

advanced measure of sustainability in the built environment possible today, providing a framework for design, construction and the symbiotic relationship between people and all aspects of the built environment.

4. **ENERGY STAR:** Developed by the U.S. Government, ENERGY STAR certifies new homes that meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency (USEPA). These homes are independently verified to be at least 15% more energy efficient than homes built to the 2009 International Energy Conservation Code (IECC), and feature additional measures that deliver a total energy efficiency improvement of up to 30 percent compared to typical new homes and even more compared to most resale homes. ENERGY STAR also certifies buildings and manufacturing plants that earn a 75 or higher on USEPA's 1-100 energy performance scale, indicating that the facility performs better than at least 75% of similar buildings nationwide. The ENERGY STAR energy performance scale accounts for differences in operating conditions, regional weather data, and other important considerations.
5. **NAHBGreen:** Developed in 2008 by the National Association of Homebuilders, NAHBGreen ICC 700 National Green Building Standard applies to new and remodeled single and multifamily buildings as well as residential subdivisions. The system is the first and only residential green rating system to have earned the approval of the American National Standards Institute (ANSI). Similar to LEED, the system focuses on these categories: Lot Design; Preparation and Development; Resource Efficiency; Water Efficiency; Indoor Environmental Quality; and Operation, Maintenance, and Building Owner Education. To meet the highest level of rating (Emerald), a building must incorporate energy savings of 60% or more.

G. Green Building Incentive Programs

A detailed review of incentive programs for state and local green building programs is needed. Two resources are worth noting:

1. **American Institute of Architects, Local Leaders in Sustainability:** This project was developed in partnership with the National Association of Counties (NACo) to help local government officials incentivize green construction in their communities. Their survey found that state and local government green building incentives range from options that are virtually cost-free to those that involve more investment. They found that the most attractive incentives are tax incentives, density/floor area ratio bonuses, and expedited permitting. Their findings show that communities should select incentives based on their financial situation and desired impact on the construction industry. The simpler the policy, the more likely it is to be implemented successfully. The Local Leaders report focuses on five key areas of green incentives: financial costs, oversight structure, local political and cultural environment, limits to power, and industry engagement. Green Incentive Trends analyzes initiatives instituted by localities across the country in recent years to provide in-depth best practice examples and a focused analysis on strategies that work well for different communities. The report also highlights innovative green architecture and interviews with the architects and local officials who are making it possible. The report (2009) details green building policies and incentives in a number of states and municipalities.
2. **U.S. Green Building Council Green Building Incentive Strategies:** Research by this organization describes structural incentives (expedited review/permitting, density bonuses), financial incentives (tax credits and abatements, fee reductions or waivers, grants, revolving loan funds), and other incentives (technical assistance, marketing assistance) across the country.

H. General reference books on residential green building and articles on passive solar design

Many books have been written on the subject of green building and a search on the web will provide many of them. Two that provide a comprehensive overview of residential green building are:

Alex Wilson, *Your Green Home: A Guide to Planning a Healthy, Environmentally Friendly New Home* (Gabriola Island, BC, Canada: New Society Publishers 2006)

Abe Kruger and Carl Seville, *Green Building: Principles & Practices in Residential Construction* (Clifton Park, NY; Delmar, Cengage Learning 2013)

Solar Today, published nine times a year by the American Solar Energy Society, 4760 Walnut Street Suite 106, Boulder, CO 80301, routinely has articles on energy aspects of green building. The recent series of seven articles by Norbert Lechner in *Solar Today* are an excellent introduction to passive solar design. Norbert Lechner is described this way in *Solar Today*:

Norbert M. Lechner is an architect, professor emeritus in the College of Architecture, Design, and Construction at Auburn University, LEED-accredited professional and ASES Fellow. He is an expert in energy-responsive architectural design with an emphasis on solar-responsive design. Lechner's book, *Heating, Cooling, Lighting: Sustainable Design Methods for Architects*, is used by more than a third of all architecture schools in the United States and in architecture schools worldwide. His articles are as follows:

Choose the Low-Hanging Fruit. PV may be the sexy strategy, but solar-responsive design is cheaper and, by reducing a building's energy consumption, more sustainable. *November/December 2011*

For Aggressive Efficiency, Choose Passive Solar. Every south-facing window is a basic passive solar space-heating system. The challenge is minimizing heat loss while maximizing solar energy collected throughout the day. *January/February 2012*

Shading for Energy Savings. By reducing the need for air conditioning, this design technique goes a long way in saving money and energy. *March/April 2012*

Playing the Angles for Solar-Responsive Design. Solar geometry provides the tools for effective passive solar heating, shading and daylighting. *May 2012*

Daylighting Illuminated. A good design will provide ample quality daylight, saving energy and money. *June 2012*

White is the Greenest Color. Selecting light-colored roofs and walls is one of the easiest ways to save energy and money. So why don't we see more white roofs? *July/August 2012*

Think You Know Solar-Responsive Design? September 2012. List from lowest to highest hanging fruit: 1) Form and orientation, 2) Color, 3) Window size and placement, 4) Shading, 5) Passive solar, 6) Daylighting, 7) Active Solar, 8) Photovoltaics.

The URL to access these articles at *Solar Today* is: solartoday.org/lechner

Appendix VII: Waste

Solid Waste

Recycling Program Status Report. The City's most recent analysis of its recycling program is the April, 2010 'Recycling Program Status Report'. This report reviews the history of recycling in Oberlin (to 1993) including the rationale for the current source-separated collection system. Recycling program operations, including means of collection and processing/transfer, economics, participation, and the pros and cons of source-separated collection are reviewed. A section on co-mingled recycling discusses anticipated collection and transfer, economics, participation, and the pros and cons of switching from source-separated to co-mingled recycling. The report concludes with recommendations for program improvements.

Recovery Rates. Ongoing analysis of the City's refuse and recycling programs indicates that the City's most recent 4-year average recovery rate is 29.4%.

Year	Solid Waste	Recycling	Composting	Recovered Total	Percent Recovered
2008	3,997.00	642.30	351.66	993.96	24.87%
2009	3,830.13	726.68	424.83	1,151.51	30.06%
2010	3,799.28	813.81	392.75	1,206.56	31.76%
2011	3,795.29	774.82	408.82	1,183.64	31.19%

All data reported in tons. Solid waste and recycling are weighed, compost is estimated.

Zero Waste. To reduce CO₂e emissions and achieve other related environmental, economic and social benefits, the City intends to adopt a Zero Waste Policy and to implement 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 adopted by public sector agencies as a framework to expand public understanding of waste as a misplaced resource. Zero Waste is defined as diverting at least 90% of the waste stream from landfill and incineration.

The creation of a zero waste plan provides a unique opportunity to educate both the public and decision-makers, as well as to establish a meaningful dialogue within the community about the value of reusing, repairing, reselling, recycling, and composting materials rather than throwing them away. Adopting such a policy will provide guiding principles and goals regarding waste management and a continued platform for staff and leaders from which to act.

Key Elements of the Zero Waste Plan

1. **Waste Audits:** Waste audits should be used to evaluate materials placed for landfill disposal in the City's residential, commercial, institutional, and industrial sectors to more fully assess recovery potential. Waste audits should be conducted on a regular basis to provide the necessary level of detail to target increasingly comprehensive resource recovery. Initially, a baseline can be established from nationally/regionally available data for comparison with the results of local waste audits.
2. **Ongoing Evaluation:** Ongoing evaluations of programs and services should include consideration of best management practices within the waste management sector.
3. **Improved residential, commercial, and institutional recycling opportunities.**
4. **Organics recycling:** Continued promotion of home composting efforts including both backyard composting and indoor vermicomposting. Continued evaluation of the feasibility of developing a local or regional Class II compost facility capable of processing additional feedstocks, including food wastes.

5. Coordination with Oberlin College, the Lorain County Solid Waste Management District, Republic Services, Inc., and other key stakeholders to increase recycling services.
6. Comprehensive, targeted, and incremental educational programs and services
7. Adoption and implementation of policies, regulations, and/or ordinances in support of the Zero Waste goals. Possibilities include:
 - a. Local ordinance requiring managers of multi-family buildings to provide tenants with the opportunity to recycle, including the provision of the appropriate receptacles and tenant education;
 - b. Local ordinance requiring managers of commercial buildings to provide commercial tenants with the opportunity to recycle, including the provision of shared storage containers and tenant education;
 - c. City policy to mandate source separation of recyclables for those residents who choose to participate in the curbside program; and
 - d. Local ordinance(s) mandating residential recycling and, as comprehensive services become available, mandating commercial, institutional, and industrial recycling
 - e. City policy to mandate minimum construction and demolition debris recycling from construction projects.
 - f. City policy to require the purchase of products with a minimum post-consumer recycled content (ie. office supplies, park equipment, recycling and trash bins, etc).

Additional Potential Strategies

1. Reduce the amount of materials/wastes produced in the community to minimize the amount that needs management. Work with residents, businesses, institutions, the industrial park, etc. to reduce waste through smarter purchasing habits, and encouraging donation of unwanted items, repair of damaged items. Continued evaluation of recycling program structure and equipment, including consideration of a more robust Pay As You Throw (PAYT) program to further incentivize recycling.
2. Ongoing development of recycling opportunities for the business community, multi-family housing, institutions (public schools, hospital, etc.), the industrial park, and at public events.
3. The City will continue to work closely and collaborate with Oberlin College to identify, plan, develop, and implement various programs designed to achieve zero waste, minimize solid waste, and maximize recycling and composting.
4. Support efforts to hold zero waste events within the community, as well as Recycling On The Go (ROGO) programs at sporting events, along Main Street, etc.
5. Ongoing evaluation of recycling program structure and equipment.

These various strategies and programs will be supported by a robust public education program to ensure that the City's residents, businesses, and institutions have the best available information about preferred waste management options for all manner of materials.

Appendix VIII: Education

Additional Potential Strategies

The following strategies emphasize actions that will motivate and secure individual commitments to get us to our collective climate positive goal by 2050. Emphasis is placed on strategies that help answer the “what can I do” question, empower City staff and elected or appointed officials, recognize and engage the public while addressing concerns, increase the vibrancy and success of local businesses, and celebrate environmental leadership of individuals, local businesses, and community groups.

Strategy	Lead Entity	Timeline
Develop and Distribute an Oberlin Climate Action Pledge	Non-profit	2013
Develop "Individual Action Steps/What I Can Do" Document	City, Non-profit	2012–2013
Expand Energy Audit Services to Local Businesses	OMLPS, POWER	2013–2015
Create a Community and/or Business Environmental Award	Oberlin Business Partnership, Heritage Center, City	2013–Ongoing
Include CAP Goals in All New Employee Orientations (City Staff, Council, Commissions and Boards)	City	2013–Ongoing
Increase Awareness of CAP for Existing Staff and Council	City	2013–Ongoing
Promote Green Business and Green Restaurant Membership	Oberlin Business Partnership	2014–Ongoing
Increase Support of Buy Local Campaign	Oberlin Business Partnership, City	2014–Ongoing

The following strategies are aimed at the core educational institutions within our community, including Oberlin College, Oberlin City School District, Lorain County Joint Vocational School, and Lorain County Community College. Objectives include: empowering K-12 educational institutions to enhance the curriculum to create learning environments that support sustainability, leadership, health, creativity and social justice through place-based learning; and supporting sustainability and environmental studies majors at higher education institutions to prepare students for careers in developing and maintaining a sustainable future.

Strategy	Lead Entity	Timeline
Install Bioregional Dashboards at City Schools, Lorain County Joint Vocational School, and Oberlin Public Library	College, City Schools, Lorain County Joint Vocational School	2013–2016
Integrate Sustainability into Courses at Higher Educational Institutions	College, Lorain County Community College	2013–2016
Implement Recommendations from STARS Reports	College, City Schools, Joint Vocational School, Community College	2013–Ongoing

The following strategies focus on opportunities for partner educational institutions to prepare students for career opportunities and entry into the local economy, as well as identify and train new farmers to ensure the success of local food production, a particular need in the region.

Strategy	Lead Entity	Timeline
Determine Future Community Needs and Create Courses/Curriculum Accordingly	Education Committee	2013–Ongoing
Partner with Lorain County Community College and Lorain County Joint Vocational School to Develop Work Force Training Programs	Education and Economic Development Committees	2014–Ongoing
Implement a "Grow the Growers" Program for Area Farmers and Students	Education Committee, LCJVS	2014–Ongoing

The following strategies focus on activities that encourage an informed and engaged public by providing learning opportunities for all interested community members, institutions, and students through service learning projects, community events, workshops, and other educational opportunities. It is our mission to enable all interested individuals to have the opportunity for hands-on experience, increased job opportunities, and access to products and services that reduce GHG emissions.

Strategy	Lead Entity	Timeline
Provide Internships for Students to Get Engaged in CAP Initiatives and Programs	City, Oberlin Project staff	2012–Ongoing
Annual Speaker and Film Series	City, College, Education Committee	2012–Ongoing
Hold Community Workshops to Educate the Community	Education Committee, City, Oberlin Project staff	2013–Ongoing
Promote CAP Initiatives and Goals at Community Events	City	2012–Ongoing
Increase Local Food IQ – Encourage Local Food Purchasing and Expansion of the Oberlin Farmers' Market	Local Food Committee and the OFMA	2012–Ongoing

Appendix IX: Oberlin College

Summary of Oberlin College Climate Action Plan

Oberlin College uses about 25% of the City's electricity, and is responsible for about the same percentage of the City's carbon emissions. Prior to embracing the goal of becoming climate positive in conjunction with the City, the College signed in 2006 The American College and University President's Climate Commitment (ACUPCC) with a similar goal to become climate neutral. Over the past dozen years, significant administrative infrastructure has been put in place to champion and facilitate this goal.

2001: Environmental Policy Advisory Committee (EPAC) established.

2002: EnviroAlums, an Alumni Affiliate Group, formed to advocate for environmental education and sustainability.

2004: EPAC drafted an Environmental Policy Statement for environmental sustainability that has guided the College since.

2006: EPAC morphed into the Committee on Environmental Sustainability (CES), a committee of the General Faculty.

2006: Office Environmental Sustainability (OES) established.

2008: David Orr became Special Assistant to the President for Sustainability.

2009: The Green Edge Fund, administered by students and funded by a student fee, established to support activities and projects that foster environmental sustainability.

2011: OES initiated an in-depth, systemic analysis of energy use across the campus in order to assess where energy efficiency can reduce substantially energy use and cost.

Accomplishments and Strategies

Central Heating Plant

The College has heated its buildings for decades with steam from its coal-fired power plant. Replacing coal with a less carbon intensive fuel is a major hurdle to becoming climate positive. In 2011 the College initiated an in-depth analysis of the various ways to replace coal. The College is committed to replacing coal in a timely manner, but the final choice of plan is still to be made in conjunction with the Board of Trustees. The current recommendation is to install high efficiency gas boilers over the next few years in a way that foresees the campus, now essentially one heating system, as being divided in to 7 thermal zones with each zone having heating and cooling system(s) designed for its specific requirements. This plan would incorporate a shift from coal as a fuel, to natural gas and electric energy. The distributive system would be phased in over perhaps 10-15 years and is expected to lower significantly total energy use and tons of CO₂ released. Table 1 gives the GHG inventory for fiscal year 2010 and table 2 is the projected GHG inventory for 2015.

Table 1. Greenhouse gas inventory for fiscal year 2010.

Item	Quantity	Million Tons GHG (CO ₂)	% of Gross
Purchased electricity	23,913,818 kWh	20,126	47.9
Lewis Center electricity	199,625 kWh	-17	0.04
Coal burned	5,948 tons	13,906	33.1
Natural gas burned	998,095 therms	5,280	12.6
Transportation fuels	21,109 gallons	186	0.4
Commuting	1,703,000 miles	2,106	5.0
Miscellaneous	n/a	486	1.0
RECs purchased	9,781,615 kWh	-8,232	--
Total MT CO₂	--	33,791	--

Table 2. Greenhouse gas inventory for fiscal year 2015 (projected).

Item	Quantity	Million Tons GHG (CO ₂)	% of Gross
Purchased electricity with 20% reduction with 90% renewable from OMLPS	17,085,496 kWh	1,438	8.2
New PV use	3,050,000 kWh	-257	
Lewis Center electricity	164,625 kWh	-14	0.08
Coal burned	0 tons	--	--
Natural gas burned	2,458,250 therms	13,004	73.8
Transportation fuels and ground commuting	189,217 gallons	1,673	9.5
Air travel	4,542,061 miles	851	4.8
Miscellaneous	n/a	648	3.7
RECs Purchased	0	--	--
Total MT CO₂	--	17,343	57% reduction from 2012

Strategies to make energy conserving behavior the norm

In 2005 the College began a 3-week, dormitory-energy-reduction contest held each spring semester. Some dorms reduced their electricity use 55% over the 3 week contest of which some reduction persisted. Dorms now have real time displays of electricity and water use for students to see, and which appear to have led to reduced resource use through behavioral changes. Faculty research is seeking to establish the best ways to display resource use for behavior modification.

The OES has made a systemic analysis of energy use on campus, and has initiated a comprehensive program to affect behavior of students, faculty, and staff so as to embrace sustainability.

- Design student orientation materials to positively affect energy use conservation behavior.
- Have College Resident Education include energy sustainability awareness and behavior.
- Have OES staff trained to talk and discuss with staff, faculty, and others office energy and water use, recycling initiatives, and other sustainability initiatives on campus.
- Reemphasize recycling and reuse initiatives on campus to minimize solid waste.
- Develop metrics to assess “the greenness” of student rooms and staff and faculty offices on campus. On a voluntary basis designate rooms and offices as “green” based upon compliance with rubrics.
- Work with the Purchasing Department to encourage the procurement of “green” office supplies used on campus.

The underlying philosophy of these initiatives: Use what is needed, and only when needed—as, “the most energy efficient lamp or device is one that is turned off”.

Strategies to reduce GHG emissions beyond Central Heating Plant

The OES has initiated and planned the following energy efficiency programs.

1. Indoor lighting retrofit projects over two fiscal years to install high efficiency fluorescent and LED lamps with sensor controls. A 3.5 year payback is expected for this \$600,000 project.

- a. Phase one: 1.2 million square feet of College building retrofits were completed during the winter of 2011-2012.
 - b. Phase two: 0.7 million square feet of College building retrofits to be initiated in the Fall of 2012, and completed in the spring of 2013.
2. Retrofit campus outdoor area and parking lighting to LEDs. Five parking lots are currently planned for retrofits with electricity use for these lots expected to be reduced by about 50%. An 8 year payback is anticipated on this \$100,000 project.
 3. Motors for fans and pumps across campus have been inventoried. A program will be initiated to replace inefficient motors, and to make sure pump and fan motors incorporate variable frequency drives where practical.
 4. Upgrade envelopes of designated buildings with energy efficient windows and doors, and re-insulated walls and roofs.
 5. Upgrade heating/cooling systems of designated buildings for more efficient control—piping, valves, thermostats, sensors, digital controls, and monitoring.

Examples of prototype building improvement projects:

- South Hall and Mudd Library upgrades for heating distribution to provide comfort and control.
- Retro-commission Science Center, Wright Laboratory, and Chilled Water Plant for energy efficiency.
- Rehabilitation of Daub House (one of at least 20 houses owned by College that need upgrades).
- Waste heat recovery in Stevenson Hall.
- Re-commissioning of three buildings with geo-exchange heating-cooling systems.

The College has converted all grounds vehicles which are past warranty to biodiesel, and plans to convert remaining diesel-powered vehicles to biodiesel as their warranties expire. Currently grounds vehicles use annually 1,175 gallons diesel (13 tons CO₂) and 500 gallons of biodiesel (4 tons CO₂).

In 2012 College solid waste was 1654 tons of trash (612 tons of GHG emissions) and 55 tons of compost (32 tons of GHG emissions). The improved recycling and conservation activities now underway will reduce solid waste. The College is working with the City to pulp its dining hall food waste and to pilot feeding it into the City's anaerobic sludge digester which produces methane that the City uses for electricity generation at its waste water treatment plant.

The College expects that these actions could reduce GHG emissions from about 40,000 tons now to about 17,000 tons in 2015 with energy intensity decreasing from about 140,000 BTU/ ft²/year to around 117,000 BTU/ ft²/year (Table 3).

Table 3. GHG Emissions and Building Energy Intensity.

Year	Million Tons CO ₂	Square Feet	Energy Intensity (BTU/ft ² /year)	Comment
2007	39,059	2,478,289	155,477	Purchased RECs included
2010	33,791	2,510,526	132,552	Purchased RECs included
2011	40,506	2,598,513	140,276	Purchased RECs included
2012	33,551	2,598,513	122,589 (warm winter)	Purchased RECs included
2015 (Early Estimate)	17,343	2,598,513	117,043	No RECs purchased

DEFINE IT:

Building commissioning: The process of verifying, in new construction, that all the building systems and controls (e.g. HVAC, plumbing, electrical, fire/life safety, building envelopes, etc.) achieve the owner's intended project requirements.

Re-commissioning: Revisiting a commissioned building's expected performance to ensure that it is continuing to achieve expectations.

Retro-commissioning: Verifying building systems where expected performance was not certified by commissioning when it was built.

By 2016, the programs and actions summarized above are expected to reduce the College's GHG emissions to approximately 17,000 metric tons. To attain the stated goal of being climate neutral by 2025, the College would have 10 years to reduce GHG emissions to zero. Making the following assumptions, emissions could be reduced to about 6,100 metric tons in 2025; assuming:

- 10% reduction of natural gas use as a result of building efficiency improvements.
- 75% of remaining GHG emissions reduced with carbon neutral electricity.
- 80% reduction of miscellaneous category resulting from enhanced recycling and composting.
- 50% of transportation GHG emissions offset by local tree planting.

The estimated remaining GHG emissions would be 3,200 metric tons from fossil fuel use (most extreme scenario), 1,500 metric tons from transportation and commuting, and 1,400 metric tons for non-renewable electricity (assuming 1. increased electricity use for heating and 2. OMLPS's electricity is not all carbon neutral). It is the College's intention to use credits, RECs, tree planting, or some yet-to-be-identified way to eliminate or offset these tons of GHG.

Conclusion

One of the goals of Oberlin College for its students has long been "to expand their social awareness, social responsibility, and capacity for moral judgment in order to prepare them for intelligent and useful response to the present and future demands of society." The Strategic Plan for Oberlin adopted in 2005 states "Oberlin is committed to providing an education that develops scientific knowledge, global perspectives, environmental consciousness, concern for social justice, and artistic understanding" and lists "Move toward environmental sustainability" as one of the seven points under its Educational Goals.

Oberlin College has a long history of progressive leadership on social justice issues and a shorter, but equally impressive, history in environmental stewardship. The pursuit of carbon neutrality in many ways represents the ultimate liberal art and as such is fundamentally important to a liberal arts college. For the College to pursue its mission of education requires meeting the needs of the present without compromising the ability of future generations of students to meet their needs. That is to say it requires sustainability and a stable climate in order to educate generation after generation of students. A community that understands the dynamic interactions of species and communities over time and during changing ecological conditions is one that recognizes the interconnections between the environment, economics, equity and education. A college that embraces carbon neutrality commits itself to instilling a consciousness of these interrelationships and to developing the skills necessary to create new possibilities and extend our ecological imaginations through any discipline, field, endeavor, or area of study.

Appendix X: Achieving Climate Positive

Additional Potential Strategies

Financing

Strategy	Lead Entity	Benefits
Feed-in Tariffs and Clean Contracts	Individuals and OMLPS	A feed-in tariff requires utilities to pay rates set by the government for renewable power over a certain period of time. This encourages private investment into renewable projects.

Policy

Strategy	Lead Entity	Benefits
Local Purchasing Policy	City of Oberlin, Oberlin College	The City and Oberlin College could adopt, implement, and aggressively pursue local and green purchasing policies to support local and sustainable businesses.
Home Grown Power/ Sustainability Triggers	City of Oberlin, OMLPS	Sustainability Trigger: Any significant change in supply or demand for electricity that results in substantially greater demand for electricity from OMLPS than is currently projected due to factors such as economic growth, new customers outside of Oberlin, increased rates of electric vehicle adoption, or, alternatively, due to a significant reduction in supply to meet existing demand (such as a reduction in landfill gas available over time), should be met with renewable energy, CLEAN contracts, and efficiency purchases.
Eco Industrial Park	City of Oberlin, Team Lorain County	The City can foster a community of manufacturing and service businesses that comes together to enhance their environmental and economic performance through collaboration in managing environmental and resource issues, including energy, water, and materials. Requires strong Economic Development leadership.
Carbon Footprint Label/Analysis	Oberlin College	Oberlin College should require carbon footprint analyses from all large suppliers, implement green and local purchasing policies, and work with Oberlin Eco-Industrial Park Members to determine how members can serve Oberlin College needs (and then help them do so).

Invest Locally	City of Oberlin, Oberlin College	Create a national infrastructure investment bank to direct public and private funds toward infrastructure projects of national and regional significance. Create a “Green Bank” to provide seed money to support loans from private investors for various advanced clean energy technologies
Green CDFI and other financial/foundation PRI instruments	Independent banking and foundation institutions	Establishment of a local Community Development Financial Institution (CDFI), that can provide low-cost capital for energy efficiency projects. Similarly, local banks, credit unions or foundations should be asked to make program-related investment loans at below-market rates.

Barriers to Efficiency and Renewable Energy Projects

As noted in a recent Department of Energy funded report completed for Ohio’s 9th Congressional District¹², the main barrier to implementing renewable energy projects remains financing. The same can be said of energy efficiency projects, though behavioral aspects still play a role. Executing the strategies for carbon emission reductions in this plan requires significant capital investment. However, an intensive effort to reduce GHG emissions will result in cost savings over time by reducing ongoing costs associated with energy consumption resulting in radically reduced GHG while returning more disposable income into the community businesses.

While a number of programs promoting residential energy efficiency in Oberlin exist, these programs are not successfully reaching the households that need them. This is in keeping with national trends toward low uptake of efficiency programs, despite clear economic benefits, suggesting that market barriers plague the efficiency industry generally. Below we detail some of the barriers that households experience related to residential energy efficiency.¹³

Upfront Costs:

Consumers may not have the funds necessary to invest in efficiency or they may be unable to access funds through traditional mechanisms due to bad or lack of credit, reluctance to take on more debt, or other uses for the money. Incentives and rebates can reduce total costs but are often not available until after the work is done and the bills are paid. Loans provide interested consumers an option to finance via traditional methods (and low interest loans are an additional incentive) but do not avoid the debt issue. Innovative financing mechanisms such as Property Assessed Clean Energy (PACE) and on-bill financing provide a way to capture the value of efficiency and use it to pay the up-front costs over time. They also are not based on credit score, but rather bill and tax payment history.

Opportunity Cost:

Even when energy savings from an efficiency project are clearly greater than the up-front cost, efficiency project investments compete with other potential investments. In addition, energy is a regressive good – the less money a household has, the greater the percentage of disposable income that must be spent on energy bills. A median income family spends approximately 6% of income on home energy. In lower income households, the energy burden can rise to 40% or more. A household with a high-energy burden may be more motivated to invest in energy efficiency, but less able.

Lack of Knowledge/Understanding:

Many households are simply not aware of the opportunities or benefits of energy efficiency. If they are, they often have incorrect perceptions of what measures are most effective in increasing the efficiency of their home and lack understanding of the payback time of various measures. This lack of knowledge is a significant barrier to the widespread uptake of energy efficiency retrofits.

Risk:

Homeowners may be unsure that savings from energy efficiency improvements will pay for themselves over time in energy savings. Owners or occupants may be unsure they will stay in the structure long enough to recoup their costs. Structuring the payment obligation to run with the meter or the property ensures that occupants who benefit from the energy savings continue to pay the installation costs.

Split Incentives:

Landlords have little incentive to improve their properties' energy performance if tenants pay the energy bills. Aside from reductions in their utility bills, there is little incentive on behalf of the renter to fund improvements to the property that ultimately benefits the landlord. Any installed measure a renter makes will ultimately benefit the landlord through property appreciation because the majority of installed measures will stay with the property. Utility-based programs can place repayment charges on energy bills that go to tenants. With the energy savings, the tenants' net cost decreases, and the landlord benefits from an improved property at no cost other than to notify subsequent tenants of the arrangement. In addition, programs could design "cost-shares" between tenants and landlords.

Multiple Utilities:

Many households are served by multiple utilities, e.g. an electric company and a different source of heating, such as a gas company or fuel oil company. This presents a challenge for "on-bill" programs in that measures are likely to impact both heat and electrical use, and savings will thus be seen on both bills, but costs will only be charged on one of the bills. A related problem exists for PACE and signature loan programs – savings will be seen on utility bills, but will be paid as a monthly loan payment or on the property tax.

End Notes

1. For more information, see Nat Brandt, *The Town That Started the Civil War* (Syracuse, NY: Syracuse University Press, 1990)
2. "Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data," accessed February 13, 2013, http://factfinder2.census.gov/bkmk/table/1.0/en/DEC/10_DP/DPDP1/1600000US3957834
3. "SELECTED ECONOMIC CHARACTERISTICS, 2006-2010 American Community Survey 5-Year Estimates," accessed February 13, 2013, http://factfinder2.census.gov/bkmk/table/1.0/en/ACS/10_5YR/DP03/1600000US3957834
4. "Global Analysis 2012," accessed February 13, 2013, <http://www.ncdc.noaa.gov/sotc/global>
5. Daniel Grossman, "Spring Forward," *Scientific American*, January 2004, 84-91.
6. Andrew Sheperd, et. al, "A Reconciled Estimate of Ice-Sheet Mass Balance," November 2012, accessed February 13, 2013, <http://www.sciencemag.org/content/338/6111/1183>
7. Solomon, S., et.al, "Climate Change 2007: The Physical Science Basis," accessed February 13, 2013, http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm
8. Jeff Tollefson, "Methane leaks erode green credentials of natural gas," *Nature*: 493, 12, January 2, 2013, accessed February 13, 2013, <http://www.nature.com/news/methane-leaks-erode-green-credentials-of-natural-gas-1.12123>
9. "Energy Efficient Transportation Plan for Oberlin and Northern Ohio", Center for Neighborhood Technology (CNT), August 26, 2011, accessed February 13, 2013, <http://www.oberlinproject.org/images/policy-library/CNT%20Oberlin%20Transportation%20Plan.pdf>
10. Preston, Koerner, "Breaking Down Building Energy Use," accessed February 13, 2013, <http://www.jetsongreen.com/2009/08/breaking-down-building-energy-use.html>
11. Hosey, L. "The G-list," *Architect*, July 27, 2010, accessed February 13, 2013, <http://www.architectmagazine.com/green-building/web-exclusive-the-g-list-survey-of-architecture.aspx>
12. "Transforming and Embracing Innovation in Ohio's 9th Congressional District: Moving Toward Sustainable, Efficient & Reliable Energy," accessed February 13, 2013, <http://www.oberlinproject.org/images/policy-library/NETL%20Oberlin%20Report.pdf>
13. Taken from "Implementing Residential Energy Efficiency: Oberlin, OH," Ohio Environmental Council, accessed February 13, 2013, <http://www.oberlinproject.org/images/policy-library/Oberlin%20Residential%20Energy%20Efficiency.pdf>



City of Oberlin 2015 GHG Inventory Climate Action Plan Update

Oberlin Sustainability Recognition



International association of local governments and national and regional local government organizations that have made a commitment to sustainable development

Five Milestones

GHG inventory

Establish Reduction Targets

Develop Climate Action Plan

Implement Policies and Measures



Monitor and Verify Results

Oberlin Sustainability Recognition

Climate Positive Development Program



RECOGNITION SYSTEM:

PATH TO ACHIEVING CLIMATE POSITIVE



Stage 1: Applicant Accepted



Stage 2: Detailed plans approved



Stage 3: Development following Roadmap



Stage 4: Operational emissions below zero



Oberlin Sustainability Recognition



CLIMATE ACTION CHAMPIONS

AN EFFORT UNDER THE PRESIDENT'S CLIMATE ACTION PLAN



U.S. DEPARTMENT OF
ENERGY



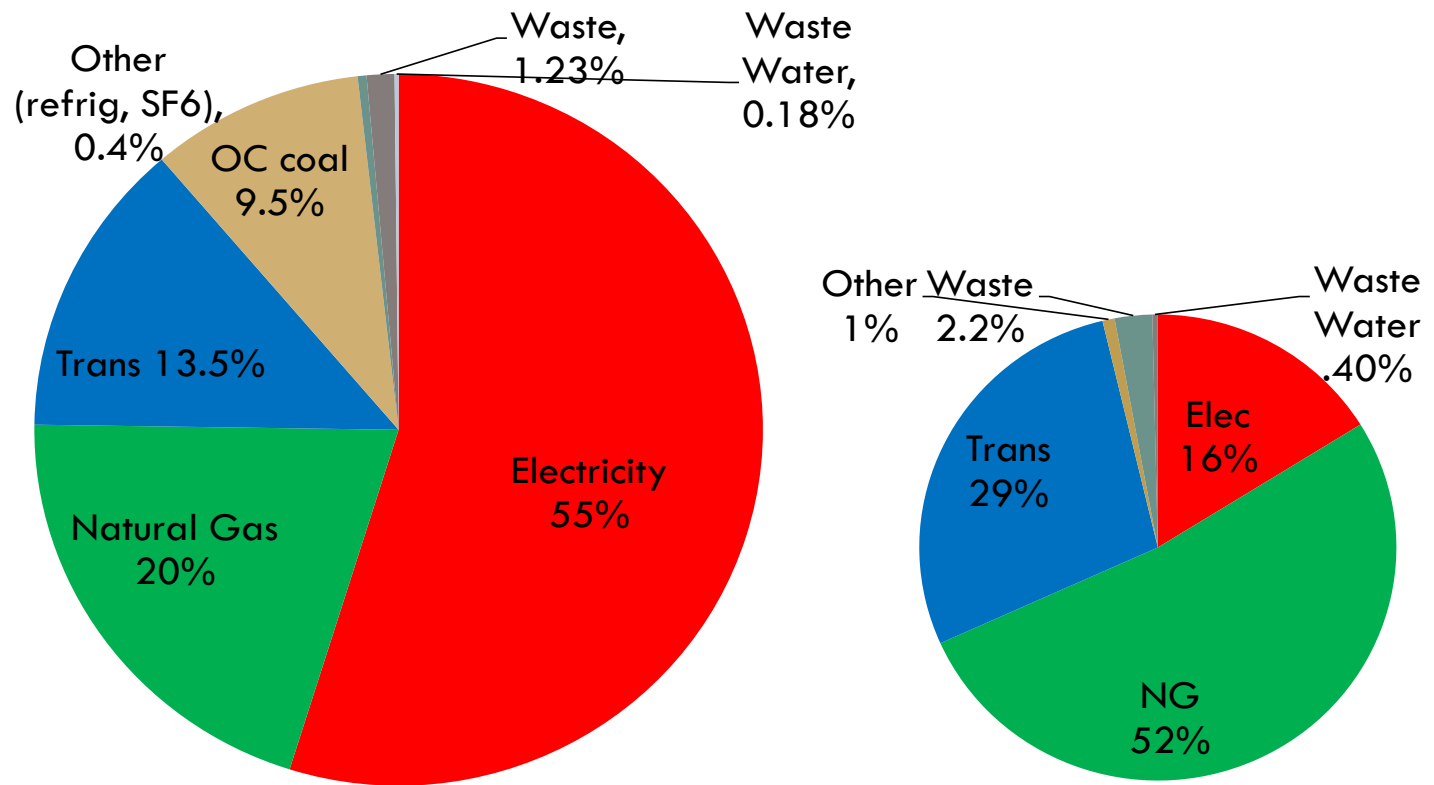


Greenhouse Gas Inventory

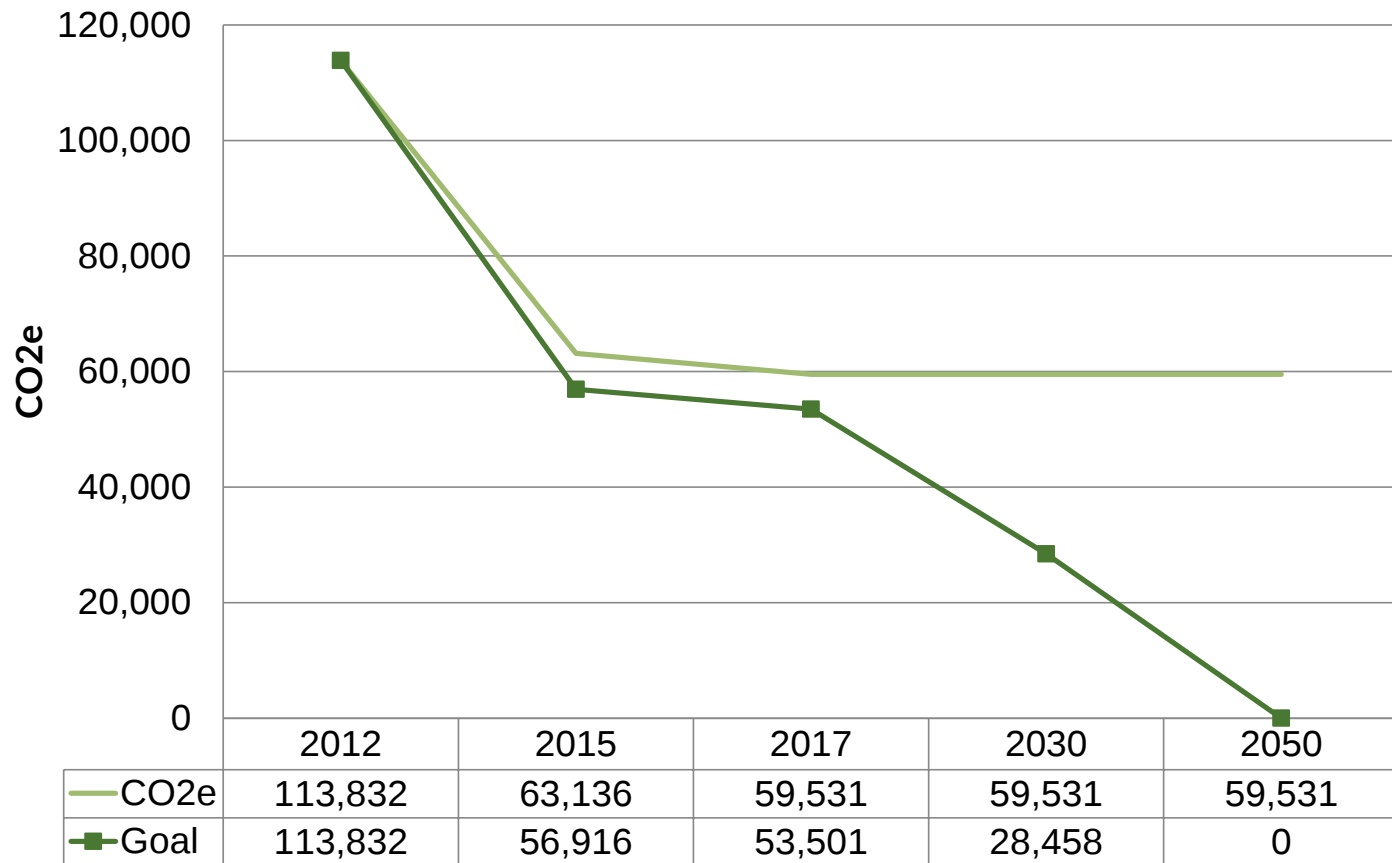
2012 - 2015 - 2017 GHG Emissions

Sector	2012	% of total	2015	% of total	2017	% of total
Electricity	62,424	54.84%	12,097	19.16%	8,492	25.91%
Natural Gas	23,211	20.39%	32,769	51.90%	32,769	55.05%
Transportation	15,371	13.50%	16,207	25.67%	16,207	27.22%
OC coal	10,778	9.47%		0.00%		0.00%
Other (refrig, SF6)	450	0.40%	521	0.83%	521	0.88%
Waste	1,395	1.23%	1341	2.12%	1,341	2.25%
Waste Water	<u>202</u>	0.18%	<u>201</u>	0.32%	<u>201</u>	0.34%
Total	113,832		63,136		59,531	
Reduction	100%		44.54%		47.70%	

2012—2017 Emissions



GHG Target and Trend: 2012 Baseline





Oberlin Climate Action Plan

Renewable Energy

Energy Efficiency

Green Building

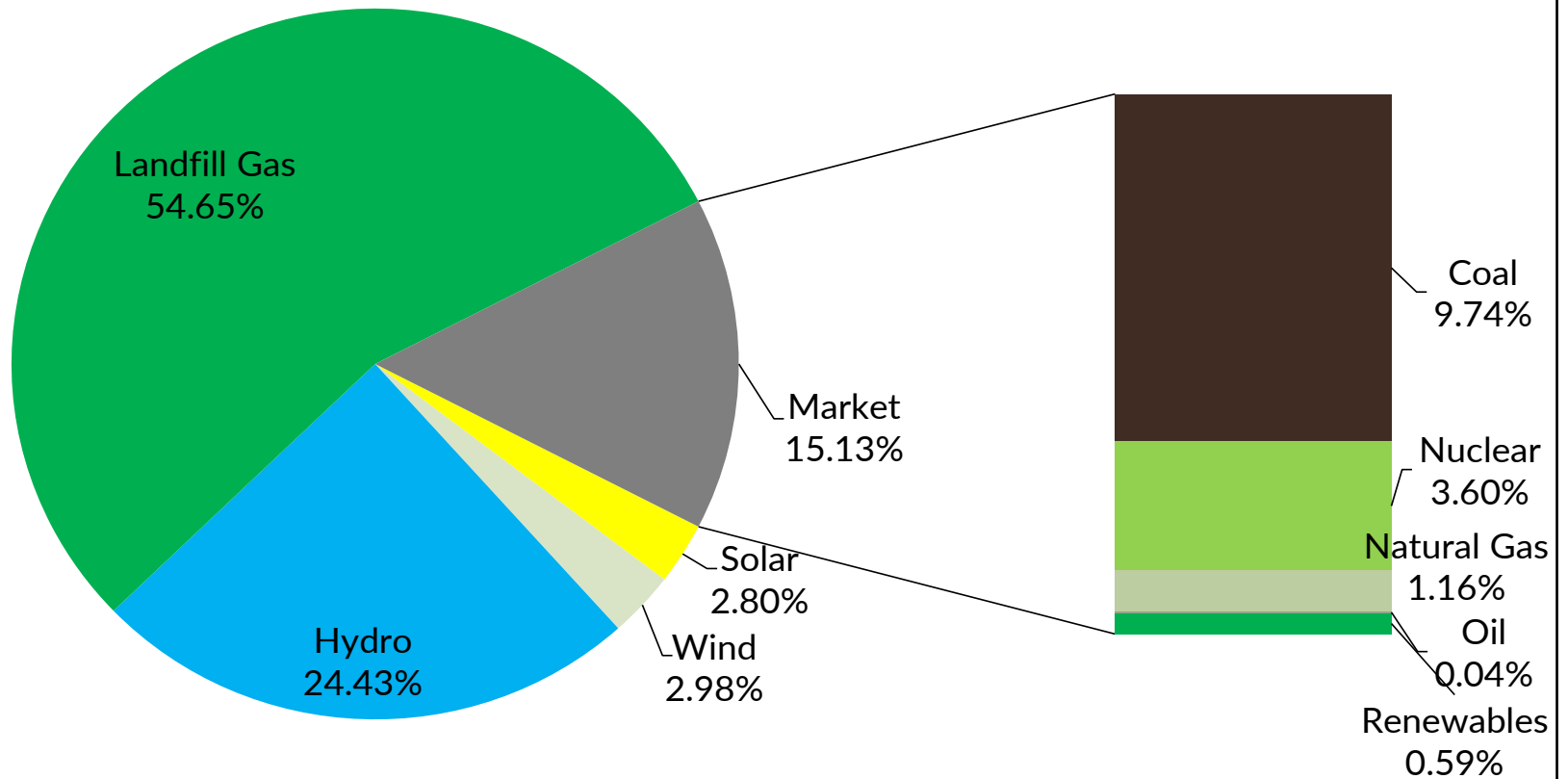
Solid Waste Management

Transportation

Education

Renewable Energy

2017 Oberlin Portfolio by Project



Renewable Energy



Landfill Gas – 55%

Geneva – Waste Management
Mahoning County – Waste Management
Erie County – BioGas Technology

Hydro – 24%

Belleville – AMP Joint Venture
Willow Island – AMP Hydro Phase 1
Smithland – AMP Hydro Phase 1
Cannelton – AMP Hydro Phase 1
Meldahl – AMP Hydro Phase 2
Greenup – AMP Hydro Phase 2
NYPA

Wind – 3%

Bowling Green – AMP Joint Venture
Blue Creek Wind – Iberdrola Renewables – Van Wert, Ohio

Solar – 3%

Spear Point Solar One - Oberlin College

Renewable Energy



Residential Solar

6 installations – 18.8 kW

Commercial Solar

5 installations – 185.8 kW

Approximate kWh per year

204,600 kWh – 23 homes

GHG emissions avoided

2015 – 23 MT CO₂e

OH SUN -

Lorain County Solar Co-op

100 + homes / 6 - 12 Oberlin

10% - 20% discount

Renewable Energy – Potential Strategy



Climate Action Champion Technical Assistance

Cold Climate Heat Pump
Evaluation

DOE

NREL

Results in August

Energy Efficiency - Residential



Creating Affordable, Comfortable & Healthy Homes



Energy Audits

316 Homes

Weatherization Work

131 Homes

Leveraged Dollars

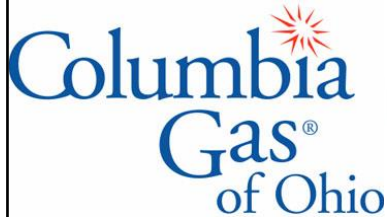
\$268,000

Energy Savings

\$633,000

CO2e reductions

98.75 CO2e



The Bill Long
Foundation

Oberlin Climate Action Plan | 7/12/2016

Energy Efficiency - Commercial



Oberlin College

NACS

FAA

Drug Mart

Kendal

Welcome Nursing Home

General Plug

AgriNomix

Allen Mercy Hospital

Lorenzo's

IGA

Certified Oil

Splash Zone

First Church

Republic Services

Subway

RR Donnelly

Herrick Jewelry

Energy Efficiency

Commercial &
Residential 2014 - 2016



kWh Reduction - annual
1,689,000

CO2e Reduction - annual
192 MT

Project Costs
\$814,474

Energy Savings - annual
\$156,111

Energy Savings - lifetime
\$2,250,463

Energy Efficiency

Commercial &
Residential 2011 - 2016



kWh Reduction - annual
7,900,000

CO₂e Reduction - annual
804 MT

Project Costs
\$2,490,000

Energy Savings - annual
\$639,027

Energy Savings - lifetime
\$7,832,704

Energy Efficiency - Municipal



Police Department

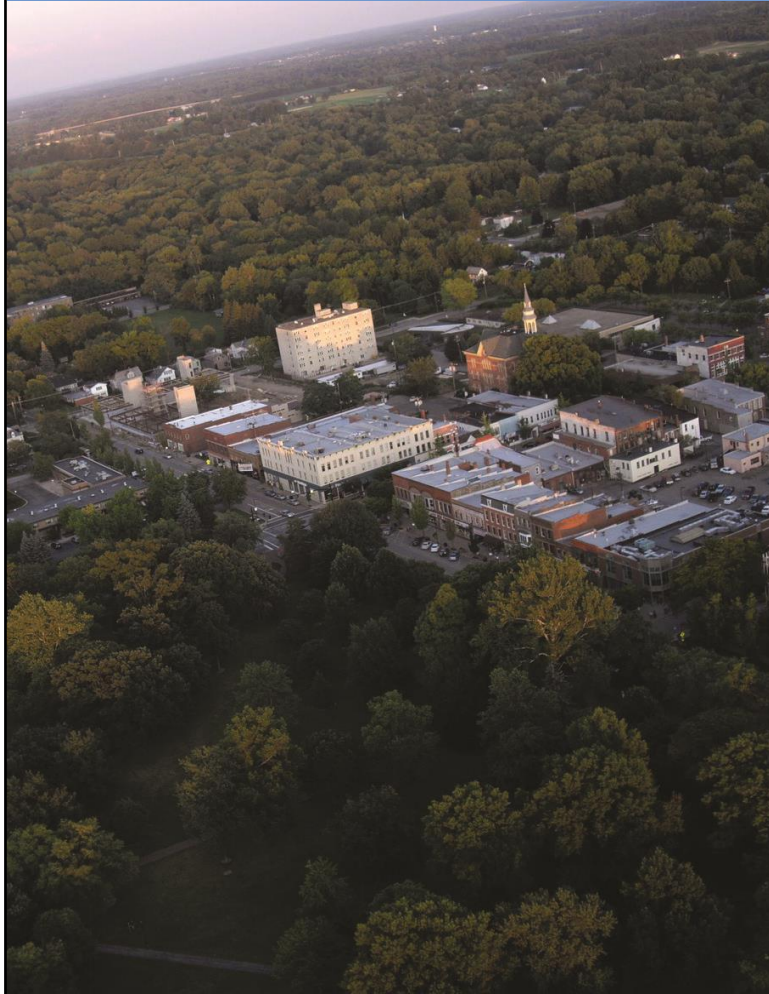
Court offices

Street light LED conversion

Power plant LED upgrade

Tech Services office LED
upgrade

Total Municipal Projects



kWh Reduction annual

245,000

CO₂e Reduction - annual

28 MT

Project Costs

\$106,799

Energy Savings - lifetime

\$331,793

kWh Reduction - lifetime

3,085,000

Energy Efficiency – 2016



LED Street Lights

City Hall - Exterior

Old City Hall - Exterior

Finance Department

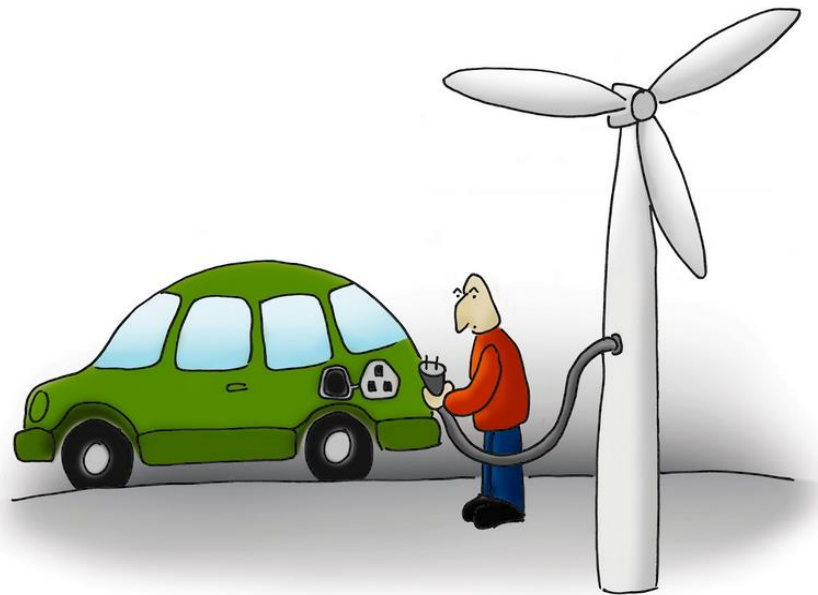
Court Lobby

GMD

Rebate program for all electric homes

Increasing rebates for small commercial

Transportation



2012

13.5% of emissions

2017

28% of emissions

Transportation



OMLPS Electric Car

- 968 kWh = 2849 miles – 1 MT CO₂e

Transportation



EV Charging Station

Safe routes to schools

Oberlin connector service

Anti-idling policy

Efficient fleet standards

Alternative-fueled & hybrid

Expanded bicycle parking

Transportation



Complete Streets Resolution

Bicycle lanes & bicycle marking

Bike Friendly Community -
bronze

CareShare by Enterprise

Shopping shuttle - OC

M.O.V.E. Lorain County

Green Building - Residential



East College St



Lincoln St



Cypress St

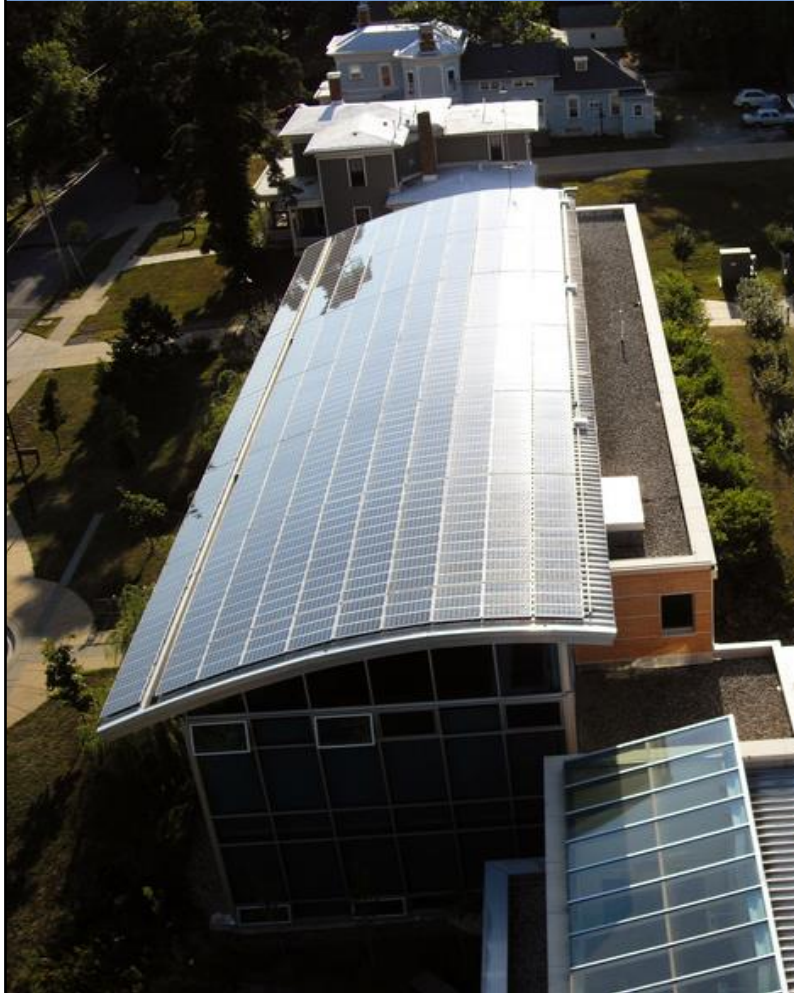
Smith St



Spruce St



Green Building - Commercial



City of Oberlin – LEED Silver or better
Oberlin Fire Station

Oberlin College – LEED Silver or better
The Hotel at Oberlin
Kohl Building
Kahn Hall
Allen Art Museum

East College St. Project
Energy Efficient
Electric Renewable Energy
Heating

Waste Management

Waste Management

ZERO WASTE PLAN

“ Zero Waste is the City’s goal to minimize the final disposal of waste materials as completely and rapidly as possible. This reduction will be achieved using a combination of environmentally sound strategies with an emphasis on education, on source reduction and reuse, and on recycling and composting. ”

Waste

- 141 ton reduction in 2015 vs. 2012

Recycling Rate

- 233 ton increase in 2015 vs. 2012
 - 30.29% recovery rate
-

ZWP Waste Management Strategies



Single-Stream Recycling

Fully automated – cart based

Residential - November 2014

Business District & College – Feb 2015

Increased recycling in commercial and multi-family

30.4% curbside pickup increase

210 MT CO₂e reduction

Education and Awareness

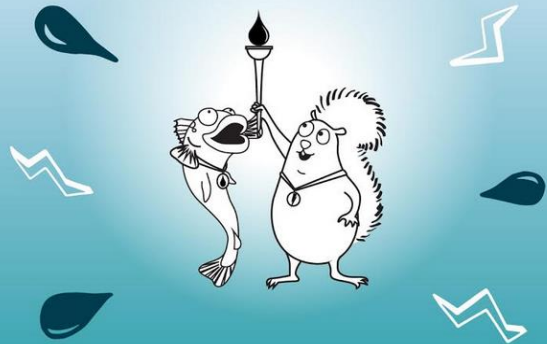


Oberlin Public Library
Slow Train Café
Public Schools – 4
Ben Franklins
Kendal
Oberlin Early
Childhood Center
Oberlin Business
Partnership
Adam Joseph
Lewis Center
Oberlin College

Education and Awareness

OBERLIN ECOLYMPICS

APRIL 8TH-22ND • 2016



Community Conservation
Competition & Event Series



environmentaldashboard.org/ecolympics

Oberlin Public Schools

Oberlin College Dorms

Oberlin College Cooperatives

Celebration Parade

Lights for Bikes

Education and Awareness



**Sustainability Tracking,
Assessment & Rating
System™**

Oberlin Public Schools

Oberlin College

Lorain County Community College

**Lorain County Joint Vocational
School**

Potential Strategies

Renewable Energy	Waste
AMP Hydro Phase III	Evaluate Methane Production for Re-Use
Customer-Owned Solar Generation	Evaluation of Producing Class A Bio-Solids
Replace Natural Gas for Heating	Education and Awareness
Energy Efficiency	Create a Community and/or Business Environmental Award
Building Performance Disclosures for Residential and Commercial Properties	Promote Green Business and Green Restaurant Membership
Develop One-Stop Shop for Commercial Energy Efficiency and Assistance	Develop Support of a Buy Local Campaign
Transportation	Annual Speaker and Film Series
Explore Changes to Parking Infrastructure and Policies	Hold Community Workshops to Educate the Community
Green Building	
Facilitate Development of City-owned Green Acres Property	
Develop Commercial and Residential Green Building Certification Programs	



City of Oberlin 2015 GHG Inventory Climate Action Plan Update

WASHTENAW COUNTY BOARD OF ROAD COMMISSIONERS

555 North Zeeb Road, Ann Arbor, MI 48103

Minutes of July 16, 2019

Board Present: Road Commissioners Doug Fuller, Barbara Fuller, Rod Green

Staff Present: S. Siddall, J. Harmon, M. MacDonell, D. Ackerman, C. Ryan, E. Kizer,

Others Present: **Citizens that Addressed the Board**

Margot Schreer, Katherine Larson, Pat Thompson, Susan Filipiak, Sue Waters, John Westman, Mark Mitshkun, John Langmore, Jason Eyster, Sheila Graziano, Cecilia Infante, Leslie Panzica-Glapa, Vincent Spade, Jan Seval, Megan Emberton, Frank Kzupala, Sheila Palkosh, Lynn Harris, Paul Wenoel, Michelle Stamboulellis, Kathy Griswold

Other Citizens in attendance

R. Jamnick, L. Moutinho, D. Paul, C. Shepard, A. Reinke, S. Dowsher, S. Ford, L. Huhman, A. Zamansky, B. Cumming, S. Cumming, J. Wallace, R. Goppold, J. Morgan, N. Jones, C. Clark, N. Stamboulellis, A. Stamboulellis, C. Heydrott, S. Bellovin, R. Jackson, J. Schreer, C. Zuccaro, D. Dues, J. Thompson, W. Field, D. Rosenblum, J. O'Donnell, C. Ballman, K. Ballman, T. Dickinson, P. Harris, A. Harris & O. Harris, E. Dickinson, K. Carpenter, S. Shepard, B. Kewir, D. Bowman, E. Borregard, D. Newman, C. O'Donnell, W. Field, M. Holland, M. Gentry, T. Tiplady, G. Dill

The meeting was called to order at 6:00 p.m. by Douglas Fuller, Chair. The Pledge of Allegiance was recited.

APPROVAL OF AGENDA

RC19-242 R. Green moved, B. Fuller seconded to approve the agenda as presented.
Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

ACCEPTANCE OF THE MINUTES

RC19-243 R. Green moved, B. Fuller seconded, the Board hereby approves the Board Meeting Minutes of July 2, 2019 as presented. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

PUBLIC COMMENT**Herbicide Spraying**

The citizens noted above addressed the Board in opposition of herbicide spraying stating concerns of toxic effects to wildlife, domestic farm animals, bees and the waterways. There was also concern raised over not enough notice provided to citizens and clarity on the opt out form. The question was raised of researching crash statistics from roadside from humans or animals running into the roadway from the roadside growth.

WRITTEN COMMUNICATIONS

RECEIVED: July 10, 2019

FROM: Chuck Tellas, York Township Supervisor

WHY: Resolution of Support for existing WCRC structure

RECEIVED: July 7-10, 2019

FROM: Several citizen communications and responses from WCRC staff

WHY: Herbicide Spraying

RECEIVED: July 8, 2019

FROM: Howard S. Lazarus, Ann Arbor City Administrator

WHY: City of Ann Arbor Resolution urging the WCRC to reduce herbicide use

RECEIVED: July 3, 2019

FROM: Sue Shink, Washtenaw County Commissioner, District 2

WHY: Letter to WCRC asking for reconsideration of herbicide spraying

ISSUED: July 2, 2019

WHERE: 5 Mile Road between Chubb Road and Napier Road

TOWNSHIP: Salem

WHY: Road construction – 5 Mile Road closed

WHEN: Monday, July 8th

CONTACT: Mark McCulloch, Senior Project Manager

ISSUED: July 2, 2019

WHERE: Stony Creek Road over Buck Creek Tributary between Carpenter Road and Sanford Road

TOWNSHIP: York

WHY: Completion of culvert replacement project – Stony Creek Road re-opened

WHEN: Monday, June 24th

CONTACT: Nate Murphy, Bridge Engineer

ISSUED: June 27, 2019
WHERE: Sylvan Road between Heim Road and Old US-12 Road
TOWNSHIP: Sylvan
WHY: Road shoulder work
WHEN: Monday, July 1, 2019
CONTACT: Mike Bernbeck, Project Manager

CONSENT AGENDA

The items approved on the Consent Agenda are as follows:

RC19-244 R. Green moved, B. Fuller seconded the approval of the Consent Agenda for July 16, 2019 as presented. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

Retirement Resolution of Public Service – Eric J. Long

RC19-245 R. Green moved, B. Fuller seconded

WHEREAS, Eric J. Long has served as a valuable, full-time employee of the Washtenaw County Road Commission from December 12, 1984 through July 31, 2019; and has elected to retire on July 31, 2019 to enjoy time with his family and friends; and

WHEREAS Eric J. Long has provided 35 years of knowledge and experience as a Heavy Truck Driver, Group Leader and in the majority as Foreman, which has greatly benefited the Road Commission, the citizens of Washtenaw County and the traveling public; and

NOW THEREFORE BE IT RESOLVED, that we, the Washtenaw County Board of Road Commissioners, thank, acknowledge and commend Eric J. Long for his dedicated service, and wish him continued good health, happiness, and success in all his future endeavors.

Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

Retirement Resolution of Public Service – Stephen J. Hubbard

RC19-246 R. Green moved, B. Fuller seconded

WHEREAS, Stephen J. Hubbard has served as a valuable, full-time employee of the Washtenaw County Road Commission from January 30, 2001 through July 31, 2019; and has elected to retire on July 31, 2019 to enjoy time with his family and friends; and

WHEREAS Stephen J. Hubbard has provided over 18 years of knowledge and experience as a Heavy Truck Driver, which has greatly benefited the Road Commission, the citizens of Washtenaw County and the traveling public; and

NOW THEREFORE BE IT RESOLVED that we, the Washtenaw County Board of Road Commissioners, thank, acknowledge and commend Stephen J. Hubbard for his dedicated service and wish him continued good health, happiness, and success in all his future endeavors.

Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

2019 Preventative Maintenance HMA Overlay Program – MDOT Contract No. 19-5335

RC19-247 R. Green moved, B. Fuller seconded that upon the recommendation of the Director of Engineering/County Highway Engineer and the concurrence of the Managing Director, the Board hereby approves and authorizes the Chair and Managing Director to sign the MDOT Contract No. 19-5335 for the 2019 Preventative Maintenance HMA Overlay Program, Phase 2. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

Grove Road Slope Stabilization – Construction Bid

RC19-248 R. Green moved, B. Fuller seconded that upon the recommendation of the County Highway Engineer and the concurrence of the Managing Director, the Board hereby accepts the bid and proposed Contract start date, and authorizes the Managing Director to sign the contract with Dan's Excavating, Inc. to complete the Grove Road, Slope Stabilization project in Section 15 of Ypsilanti Township. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

2019 Ypsilanti Township Third Agreement

RC19-249 R. Green moved, B. Fuller seconded that upon the recommendation of the Director of Operations, and the concurrence of the Managing Director, the Board hereby approves and authorizes the Chair and the Managing Director to sign the 2019 Ypsilanti Township Third Agreement with the Township's estimated share being \$40,000.00. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

Ypsilanti Township – US-12/M-17 Road Improvement Agreement

RC19-250 R. Green moved, B. Fuller seconded that upon the recommendation of the County Highway Engineer and the concurrence of the Managing Director, the Board hereby approves the Ypsilanti Township Road Improvement Agreement and authorizes the Chair and Managing Director to sign said Agreement for the improvement of US-12 between I-94 and Wiard Road and M-17 (Ecorse Rd) between Ford Boulevard and US-12 located in Section 11 of Ypsilanti Township. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

Approval of Waiver and Plan for Defined Benefit Pension System

RC19-251 R. Green moved, B. Fuller seconded that upon the recommendation of the Director of Finance and IT and the concurrence of the Managing Director, the Board hereby approves the Protecting Local Government Retirement and Benefits Act Application for Waiver and Plan: Defined Benefit Pension Retirement Systems. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

Payroll & Bills for July 10, 2019

RC19-252 R. Green moved, B. Fuller seconded the Board hereby approves Voucher 10358 totaling \$321,939.30 for payroll of July 10, 2019, and Voucher 10359 totaling \$3,218,504.74 in payment of bills for July 10, 2019. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

ACTION ITEM

Termination of Herbicide Spraying Program

RC19-253 B. Fuller moved, R. Green seconded that upon the recommendation of the Managing Director, the Board hereby terminates the roadside herbicide spraying contract and abstains from the use of herbicides as a part of the WCRC roadside vegetation control program. Voice Vote: YEAS: 3 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

REPORTS

COUNTY COMMISSIONER REPORTS

County Commissioner Jammick thanked the Board for meetings to discuss herbicide spraying and for approving the termination of the herbicide spraying program.

ROAD COMMISSIONER REPORTS

Commissioner Rod Green

Commissioner Green attended a Bike and Pedestrian Safety Workshop on July 10th presented by SEMCOG.

Commissioner Barb Fuller

No report.

Commissioner Doug Fuller

Commissioner Doug Fuller will be at MCRCSIP meetings on Wednesday & Thursday of this week.

MANAGING DIRECTOR'S REPORT

Sheryl Siddall, Managing Director

Sheryl Siddall stated that Peter Psarouthakis, Sharon Township Supervisor, offered his compliments to the WCRC staff for all the gravel work being performed in Sharon Township.

OPERATIONS REPORT

Jim Harmon, Superintendent of Maintenance

- The chip seal program has begun with 75 miles to complete county wide.
- The county wide limestone and gravel resurfacing program is a little over half complete.
- Rawsonville Road at Judd Road culvert – a permit has been obtained by the drain commission. The Engineering Department is working on having overhead and underground utilities relocated. This culvert will be replaced this fall.
- The crack seal program is ongoing.
- Countywide asphalt resurfacing program is progressing well.

FINANCE & IT REPORT

Dan Ackerman, Director of Finance & IT

Finance Report

- There have been several meetings with departments to review 2019 Second Quarter Budget items as well as 2020 and 2021.
- The Finance Department is continuing to prepare for the elimination of the payroll paper check stubs to an electronic system.
- Electronic vendor payments – there were some snags that need to be smoothed out. Finance will try sending out electronic vendor payments with the next pay cycle. Dan reported that the cost savings of utilizing electronic payroll is approximately \$2,000/per year and the cost savings for paying vendors electronically is a little over \$7,000/per year.

IT

- The final server migration will take place later this month.
- IT will be installing a new product called Mail Store to archive emails.

ENGINEERING REPORT

Matt MacDonell, Director of Engineering

- Grove Road Stabilization – upon board approval at today's Board meeting, a letter and media advisory will be going out today advising Grove Road will be closed to through traffic beginning on Thursday, July 18th. The crews will arrive on site to begin stabilization construction. Matt provided a review of how this project is being handled.
- Pontiac Trail/7-Mile Road Roundabout – this project is scheduled for 2020. Draft plans were just received for this project and staff is looking at right of way acquisition needs.
- N. Territorial/Pontiac Trail Roundabout – This project is scheduled for 2021.
- Miller Road Bridge and Miller Road at Wagner Road Roundabout – the GI plans will be submitted shortly. There will be some right of way acquisitions for these projects.
- Lehman Road Culvert – the survey work has been completed and staff met with MDEGEL on site for a field review. Staff is tasked with working on cost estimates for replacement options for the township to consider such that a MDEGEL permit application can be made.

ADJOURNMENT

RC19-254 B. Fuller moved, R. Green seconded to adjourn the July 16, 2019 meeting at 3:13 p.m. Voice Vote: YEAS: 6 NAYS: 0 ABSENT: 0 ABSTAIN: 0 Motion Carried.

Douglas E. Fuller, Chair

Sheryl Soderholm Siddall, Deputy Clerk

Minutes Approved: _____

Roadside Herbicide Spraying



Every year the Washtenaw County Road Commission (WCRC) conducts its Roadside Vegetation Control Program to help keep the roadside reasonably clear of vegetation. One part of this program is the spraying of a mixture of herbicides, approved by the Michigan Department of Agriculture and the U.S. Environmental Protection Agency, along rural county road right-of-ways.

Where will WCRC spray?

WCRC and its licensed contractor, G & T Services, sprays the herbicide mixture along rural road right-of-ways in one-quarter of the county each year. The schedule over the next four years is as follows:

- 2019 – Webster, Dexter, Lyndon, Sylvan and Lima Townships
- 2020 – Salem, Northfield, Scio, Ann Arbor and Superior Townships
- 2021 – Sharon, Freedom, Manchester, Bridgewater and Saline Townships
- 2022 – Ypsilanti, Pittsfield, Lodi, York and Augusta Townships

Roadside spraying will occur between August 1 and mid-September each year. Only areas with encroaching vegetation will be sprayed.

WCRC **does not** spray herbicide...

1. In subdivisions
2. Adjacent to bodies of water
3. Along mowed lawns
4. Along officially designated “Natural Beauty Roads”

Can I opt out?

As a property owner, you do have a choice regarding the use of herbicides in the road right-of-way abutting your property. You can opt out by completing the following steps before **July 15, 2019**.

1. Complete an application form for a “No Treatment Zone”. Applications can be found on wcroads.org/roadside-vegetation-control/. Return completed form to WCRC no later than July 15, 2019.
2. Clear the road right-of-way abutting your property of weed growth and brush. A minimum of 14 feet off the traveled portion of the road and 14 feet above the road must be cleared of vegetation.
3. Once you have cleared this area, notify WCRC. Prior to the herbicide spraying, WCRC will mark the start and end of your property using stakes and direct its contractor to not spray the staked area.

If you have successfully completed these steps by July 15, 2019, WCRC’s contractor will not spray in the road right-of-way abutting your property. If you do not complete each step outlined above, WCRC reserves the right to spray the road right-of-way in the area abutting your property as part of this program.

Still have Questions? Contact WCRC

Phone: (734) 761-1500

wcroads.org/roadside-vegetation-control/

Facebook/Twitter: @WashtenawRoads



An example of overgrown roadside vegetation that **will be** sprayed with herbicide



An example of mowed roadside that **will not** be sprayed with herbicide

Title

Urging the Washtenaw County Road Commission to reduce herbicide use through the adoption of a strong Integrated Pest Management policy.

Body

Whereas, persistent herbicides can remain active in the environment for long periods of time, potentially causing soil and water contamination and adverse effects to other plants, animals, and humans; and,

Whereas, every year the Washtenaw County Road Commission conducts its Roadside Vegetation Control Program to help keep the roadside clear of vegetation by boom mowing and spraying of a mixture of herbicides along rural county road right-of-ways, covering one-quarter of the county each year; and,

Whereas, Integrated Pest Management (IPM) theory involves regular monitoring of pest levels, and prescribing control measures only when pest levels and/or host damage threaten or impact the desired biological community's long term health, or significantly degrade its aesthetic value; and,

Whereas, the City of Ann Arbor's Natural Area Preservation unit updated their state of the practice, stringent, and protective herbicide policy consistent with IPM theory in December of 2018; and,

Whereas, Ann Arbor's Parks and Recreation department, golf courses, and Public Services divisions have also adopted IPM policies; and,

Whereas, the Washtenaw County Road Commission has no jurisdiction within the City of Ann Arbor so no spraying will take place within the City;

Therefore be it resolved, that the Environmental Commission recommends that City Council urge the Washtenaw County Road Commission to reduce herbicide use through the adoption of an Integrated Pest Management policy.



CITY OF ANN ARBOR, MICHIGAN

301 E. Huron, P.O. Box 8647, Ann Arbor, Michigan 48107
Phone (734) 794-6110 FAX (734) 994-8297

Office of the City Administrator

July 3, 2019

Washtenaw County Road Commission
555 N. Zeeb Road
Ann Arbor, Michigan 48103

Sent via E-mail: wcrc@wcroads.org

**RE: City of Ann Arbor Council Resolution R-19-327
*Resolution Urging the Washtenaw County Road Commission to Reduce Herbicide Use through Adoption of a Comprehensive Roadside Vegetation Control Plan Based on Best Environment Management Practices***

Dear Washtenaw County Road Commission:

The City of Ann Arbor City Council approved Resolution R-19-327, ***Resolution Urging the Washtenaw County Road Commission to Reduce Herbicide Use through Adoption of a Comprehensive Roadside Vegetation Control Plan Based on Best Environment Management Practices*** at its July 1, 2019 meeting. Attached is a certified copy of the approved resolution. This resolution was also approved by the City's Environmental Commission. The City of Ann Arbor Council urges the Washtenaw County Road Commission to develop a comprehensive roadside vegetative management plan without the use of herbicides based on best environmental management practices.

Please feel free to contact me should you have any questions or concerns at (734) 794-6110.

Sincerely,

Howard S. Lazarus
City Administrator

Attachment: Resolution R-19-327

cc: John Fournier, Assistant City Administrator
Missy Stults, Manager, Sustainability and Innovation
Emily Drennen, Sustainability Analyst
Councilmember Bannister
Councilmember Smith



City of Ann Arbor

301 E. Huron St.
Ann Arbor, MI 48104
<http://a2gov.legistar.com/Calendar.aspx>

Certified Copy

Resolution: R-19-327

File Number: 19-1298

Enactment Number: R-19-327

Resolution Urging the Washtenaw County Road Commission to Reduce Herbicide Use Through Adoption of a Comprehensive Roadside Vegetation Control Plan Based on Best Environmental Management Practices

Whereas, Persistent herbicides can remain active in the environment for long periods, potentially causing soil and water contamination and adverse effects to other plants, animals, and humans;

Whereas, Every year, the Washtenaw County Road Commission conducts its Roadside Vegetation Control Program to help keep the roadside clear of vegetation by boom mowing and spraying of a mixture of herbicides along rural county road right-of-ways, covering one-quarter of the county each year; and

Whereas, The Washtenaw County Road Commission will not spray within the City.

RESOLVED, That City Council urges the Washtenaw County Road Commission to develop a comprehensive roadside vegetative management plan based on best environmental management practices; and

RESOLVED, That the City of Ann Arbor City Council directs the City Administrator to send a certified copy of this approved resolution, upon passage, to the Washtenaw County Road Commission.

Sponsored by: Councilmembers Bannister and Smith

I, Jacqueline Beaudry, Clerk of the City of Ann Arbor, Michigan, certify that this is a true copy of Resolution R-19-327, passed by the Ann Arbor City Council on 7/1/2019.

Attest:


Jacqueline Beaudry

July 02, 2019

Date Certified

Open Meetings Act—Email Quorum Violation

Introduction

The Michigan Court of Appeals has ruled that email deliberations among a quorum of public body members violates the Open Meetings Act (OMA). The November 1, 2016, unpublished opinion was issued by a three-judge panel in the case of *Markel v Mackley*, Case No. 327617.

Meeting requirements

Section 3 of the Michigan Open Meetings Act, PA 267 of 1976, as amended (OMA), requires that:

- “All meetings of a public body shall be open to the public and shall be held in a place available to the general public,” and
- “All deliberations of a public body constituting a quorum of its members shall take place at a meeting open to the public.”

Interpreting these provisions, the Court explained that, “[u]nder the OMA, public bodies must conduct their meetings, make all of their decisions, and conduct their deliberations (when a quorum is present) at meetings open to the public,” (quoting *Speicher v Columbia Twp Bd of Trustees*, 497 Mich 125, 134-135 (2014).

Deliberations

In *Markel*, four members of a seven-member elected public body engaged in numerous email exchanges regarding matters of public policy which would soon come before the public body for consideration. Three of the members on the group emails actively exchanged thoughts and plans to handle the matters. The fourth member on the group emails simply received the emails but did not actively engage in the exchange. At subsequent public meetings, the matters were handled just as had been planned in the email exchanges. The Court found that the group emails constituted a “meeting” under the OMA because there was a quorum present and deliberations occurred on a matter of public policy. Furthermore, the Court found that, “Because the meeting was held privately via email, the four defendants violated [Section 3(3) of the OMA] which required such deliberations to be open to the public.”

The Court acknowledged that the mere receipt of an email by a public body quorum does not, itself, constitute “deliberation” and that there must be some level of discussion on the issue of public policy being presented. While the Court ultimately ruled that such a finding is often fact-specific, in reaching its decision it relied on the facts that:

- 1) The members who received the emails were not “mere observers,” and that their tacit agreement to the substance of the email was later demonstrated at public meetings by, “acting consistently with decisions made in the emails;”
- 2) None of the members objected to their inclusion on the emails; and
- 3) The response by members to some of the emails, but not all, could indicate participation on behalf of a member.

While the Court’s ruling did not specifically address group text messages, the rationale applied in this case would apply equally to group text messages and other forms of electronic communications. Thus, members of Michigan public bodies must act with great care to avoid group communications that may constitute an impermissible “meeting” under the Open Meetings Act. See the following Fact Sheets: OMA—Definitions and Requirements, OMA—Posting Requirements, OMA—Calling Closed Meetings, and OMA—Closed Meeting Minutes.

This Fact Sheet was provided by the law firm of Miller Canfield.

Changes to Curbside Recycling

For more information on our recycling program follow this link:

<https://cityofpsilanti.com/301/Recycling-Program>

ITEMS ACCEPTED CURBSIDE

Plastic Bottles or tubs with numbers 1 (PET), 2 (HDPE), 4 (LDPE), 5 (PP), #6 (PS) or #7 on the Bottom

NO plastic lids or plastic bags

NO motor oil bottles

NO Styrofoam

Clean plastic and discard caps

Tin & Aluminum

Need to be cleaned before placing in bin

Includes cans, foil, trays

Scrap metal up to 1 cu.ft.

Paper

Bundle paper separately with string or place in paper bags or cardboard boxes

Paper may be placed next to bin, but don't block the view of bin

Shredded paper

Corrugated Cardboard & Box-board

Bundle in 3 x 4 foot bundles, or box or bag

If too large to bundle, take to Recycle Ann Arbor drop-off center

Place next to or on top of bin

Cereal boxes, cardboard egg cartons and similar type material

Flatten and remove inner bags or packaging

NO box-board that touched food

Newspaper, Magazines & Junk Mail

Newspapers include glossy inserts

Magazines and paperback books, including phone books

Mixed paper, glossy coated OK

NO plastic or metal tabs, binders, transparencies, carbon paper, or tissue paper

NOTES OF IMPORTANCE:

Place your red bin at the curb 6 feet or more from your rubbish and yard waste, by 6:30 a.m. on your regular collection day.

All recyclables need not fit in your red bin, but please make sure the bin is visible from the street.

The new single-stream collection for recyclables means that paper and containers may be mixed in the bin. Please do not put bottles of oil or bags of rechargeable batteries in the red bin.

50 pound weight limit