

Energy Working Group Resources for the EQC

March 9, 2017

This document is not intended to be a formal presentation for broad distribution. It is a collection of resources compiled by the Energy Working Group for use by the Environmental Quality Commission as they prepare their contributions to the City of Northfield Strategic Planning Process.

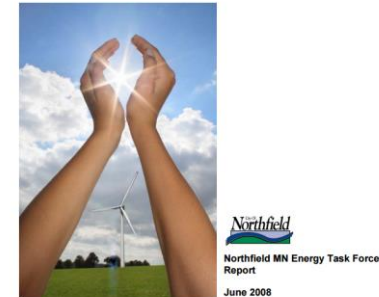
Precedent Environmental Actions and Policies in Northfield, MN

What Northfield is Already Doing: Policies & Actions

- City of Northfield facilities energy efficiency projects
- City of Northfield solar panel installations
- Environmental section of the Comprehensive Plan
- GreenStep Cities Program - tier three
- Non-Motorized Transportation Task Force
- 2008 Mayor's Energy Task Force [Report](#)
- Streetscape Task Force Report
- Johnson Controls Program
- Urban Forest Asset Management Plan -- in
- EQC programs and priorities
- Complete Streets Program



With Hope: A Resilient Community
An Action Plan for Northfield Area Energy Sustainability



2008 Mayor's Energy Task Force Report Charge

1. To assess opportunities to develop local energy efficiency and clean energy projects that will:
 - a. Protect the community from future energy price and supply instability
 - b. Enhance local economic development
 - c. Provide local, regional and global environmental benefits
2. To assess the efficacy of creation of a municipal electric utility or special energy district in achieving the above.
3. To recommend citywide target greenhouse gas emissions reductions to fulfill Milestone 2 of the City's commitment to the Cities for Climate Protection Campaign (CCPC).
4. To develop an action plan to meet the CCPC targets identified in step 3.

2008 Mayor's Energy Task Force Report summary

Recommendations (Charge 1):

1. Lead in and model energy conservation/efficiency efforts and clean energy projects for the community to create social norms of energy conservation/efficiency for all.
2. Develop local policies and initiatives that help create demand for green collar occupations through public sector investments and incentives and requirements that drive private sector investments.
3. Create a permanent Energy Commission reporting directly to the City Council.
4. Direct city staff to consider climate, energy, environmental and social impact of all decisions using life cycle analysis.
5. Set up a *1-Stop-Shop* for energy and staff it with a professionally qualified Energy Coordinator.
6. Create/expand city policies, ordinances, plans and guidelines

2008 Mayor's Energy Task Force Report summary

Recommendations (Charge 2):

The City should work with key stakeholders to ensure that any new industrial park be powered by renewable energy, be developed using best environmental practices, and attract green businesses of many types

Recommendations (Charge 3):

Set aggressive carbon emission reduction targets for Northfield and the surrounding, partnering townships:

"Carbon-free by '33" (100% reduction by 2033)

15% reduction by 2013 (i.e. within five years)

50% reduction by 2028 (i.e. within 20 years)

Begin annual measurement (inventory update) immediately, with inventory results for the previous calendar year reported to EQC, the City Council and the public (on the City website) no later than June 30 of every year

2008 Mayor's Energy Task Force Report summary

Recommendations (Charge 4):

Develop a Climate Action Plan by using a broad array of local government policy tools to facilitate achievement of the carbon emission reduction targets.

Northfield Working Group Charge

August 24, 2016

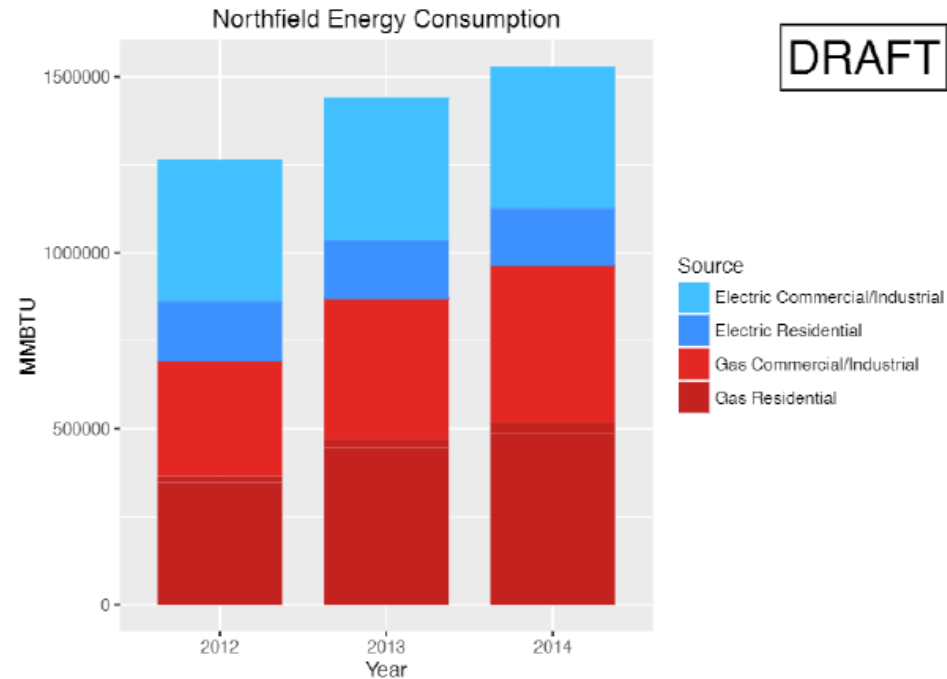
- 1) Per Northfield's commitment to the CCPC , do an annual carbon emissions calculation and post publicly. This report should take into consideration carbon emissions for City of Northfield owned properties and emissions for the City of Northfield as a whole.
- 2) Engage a citizen task force with the charge of utilizing the City's participation in the Minnesota B3 program to advance public awareness and education regarding building energy use in Northfield.
- 3) Initiate a comparison study of other city-wide Climate Action Plans that target net zero carbon emissions to inform future creation of a Northfield Climate Action Plan
- 4) Upon completion of the three above items, determine the ongoing role of the Energy Working Group.

Evaluations in Progress

Community energy profile

Northfield Substation Energy Consumption (Gas + Electric)

The data show a notable rate of increase in just three short years, although weather does have a strong influence. Although gas usage is split fairly evenly between commercial/industrial and residential customers, electricity usage is strongly dominated by the commercial/industrial sectors. This graph normalizes gas and electricity usage into energy units of MMBTUs (million British Thermal Units) but the carbon emissions factor of electricity is roughly three times greater than gas.



To perform a comprehensive community carbon emissions inventory, further data on transportation, municipal waste, etc. will be needed. The Energy Working Group recommends selecting a framework such as the Compact of Mayors to help facilitate this process. (<https://www.compactofmayors.org/>)

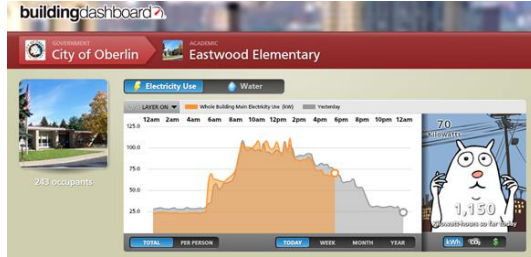
City carbon calculations

Calculations in progress

The Northfield Energy Working Group has been working with a Carleton student to complete this task. The amount of manual data entry and manipulation required to do this has resulted in a fairly slow process. To facilitate an ongoing annual carbon footprint calculation, the Energy Working Group recommends working with City staff to develop a more efficient means of data collection and data management.

Community Outreach and Engagement

(Minnesota B3 vs. Oberlin, OH Dashboard)



Although it provides an overview of building energy use intensity and a basic comparison structure, the MN B3 public dashboard is not broad enough, applicable enough, or engaging enough to be considered a useful public outreach tool. By comparison, the Oberlin site – using the Lucid Building OS system – was created with a focus on community connectedness, education and awareness.

Next Steps

1. Explore potential stakeholders who would be eager to engage with a whole system, community-focused energy and water dashboard [like that of Oberlin, OH]. This could include teachers in the public school system, college faculty, City staff, library staff, senior facilities and citizens of various ages.
2. Evaluate the existing metering systems in City of Northfield facilities and Northfield Public School buildings to further understand their existing meter hardware and capabilities.
3. Contact the Lucid Design Group to explore the cost of an energy and water dashboard system similar to that of Oberlin. This evaluation should include the cost of any additional metering or hardware requirements, system start-up, and ongoing hosting or maintenance fees.
4. Contact Lucid Design Group to explore the possibility of doing a webinar presentation with interested parties such as the city and the public schools to gain a better understanding of the management, optimal applications and shared operational responses that are possible.

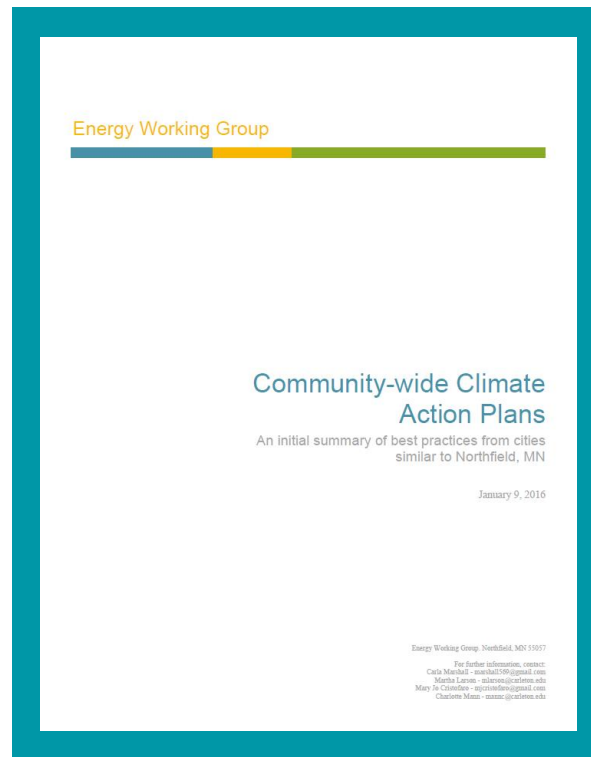


Comparison study

The evidence from this comparison study is the framework from which we keep moving toward the creation of a CAP. From this report, the Energy Working Group recommended the following next steps:

Energy Working Group drafts a resolution with the goal that the EQC and the Northfield City Council will review and accept the following points:

- Signing the Global Covenant of Mayors as a structure and resource for creating and implementing a Northfield Climate Action Plan.
- Direct the City to support the creation of a Climate Action Plan.
- Includes the basic elements of community engagement, information gathering, and drafting of a measurable plan with an implementation process that will assure continuous progress and success.



Sample Climate Action Plan Process (pre-planning)

GOAL: To assemble necessary parts to write a climate action plan

1. Choose a framework:

- a. Mayor to commit to Compact of Mayors *campaign* goals
- b. Become a *member* in a network or coalition for access to resources - e.g. ICLEI or USDN

2. Gather baseline information: Core collaborators to engage with city staff to budget and contract with a consultant or assign city staff/community members to conduct per Compact of Mayors:

- a. community-wide greenhouse gas inventory
- b. Hazard reporting
- c. Climate change risk and/or vulnerability assessment

3. Assess / assign resources:

- a. City staff to develop a budget for Sustainability Coordinator or comparable position in the event that the CAP conclusions specify the need for one.
- b. Environmental Quality Commission (EQC) with input from city staff will complete an audit of programs and policies that affect climate action planning.
- c. Core collaborators will generate system by which to monitor available funding sources and apply for funding opportunities (grants, fellowships, etc).

Sample Climate Action Plan Process (pre-planning)

GOAL: To assemble necessary parts to write a climate action plan

4. Engage the community: GNSC will begin the process of community outreach.

- a. Meet with town champions to determine community expertise and access.
- b. Conduct interviews in preparation for a community-wide survey.
- c. Hold town hall meeting(s) to give all community members opportunities to engage in the creating and implementing a CAP.

5. Assemble the Core Team: A Climate Action Team (CAT) will be assembled to include expertise from City staff, City boards and commissions, the environmental, social services, religious, business and education communities, subject matter experts, and other key participants to include our youth.

6. Establish Basic Parameters: The CAT/City will conduct a community-wide survey to inform the process and content of the Climate Action Plan. Assess the team and resources needed to advance to the planning phase.

END OF PRE-PLANNING PHASE

Vulnerabilities - Variation in Precipitation



New	Flood						Flood					Flood	Flood	Flood	Flood	
1957	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010	2014	2015	2016	2020	
		3 ft.				6 in.				1 ft.	6 ft.	3 ft.		4 ft.		

Local resident flood data from 1957 to 2017 on the Straight River.

Vulnerabilities - Variation in Precipitation

	SOCIAL	ECOLOGICAL	ECONOMIC
Agriculture - Variability and character of precipitation events.	Fiscal strain, loss of livelihood, and threat to community cohesion.	Heavy rains causing run off of top soil and drought causing a drying of microorganisms in soil to dust.	Nearly 81,000 farms in Minnesota, and an estimated 367,000 jobs associated with agricultural or food-related companies.



2014 MPR News Worthington, MN

Over the past 12 years of farming, we have seen very erratic weather from droughts to flooding to softball size hail to extreme heat . Gone are the days of gentle weekly or biweekly rains that life long farmers talk about. These same farmers have remarked that pests come earlier and in greater abundance, the rains come more sporadically and in more severe forms. There is no normal in terms of weather anymore, this is "global weirding". - Open Hands Farm (Northfield, MN)

Vulnerabilities - Increased Temperature

	SOCIAL	ECOLOGICAL	ECONOMIC
Agriculture and heat	Agriculture is a fundamental part of the state's economy. Nearly 81,000 farms in Minnesota, and an estimated 367,000 jobs associated with agricultural or food-related companies sustain numerous rural communities.	Heat waves can drastically cut down crop yields, and stress or kill livestock. Longer frost-free growing seasons and higher concentrations of atmospheric carbon dioxide would increase some crop yields but reduce others.	Heat waves require large amounts of water for irrigation and electricity for cooling. Agricultural land is particularly vulnerable to the effects of extreme heat.

"After the early warm weather in February, even though we lost our hardiness, we're glad to see the cold back -- weird things happen when spring starts extremely early, and sometimes those weird things are expensive to farmers -- like early and big populations of insect pests, or, for apple growers, early blossoming followed by damaging late frosts. We've heard that apple and other fruit trees did not start to swell and open flower buds yet, which is very good news for all the tree fruit growers in the area."- Open Hands Farm (Northfield, MN)

Proposed Climate Action Plan resolution

A RESOLUTION OF THE CITY OF NORTHFIELD, MINNESOTA'S CITY COUNCIL, TO INITIATE THE PROCESS OF CREATING AND IMPLEMENTING OF A CLIMATE ACTION PLAN (CAP) TO ENSURE AN ENVIRONMENTALLY SAFE, HEALTHY AND RESILIENT FUTURE FOR OUR COMMUNITY.

Whereas, Minnesota is vulnerable to the effects of a changing climate such unpredictable and increasingly severe precipitation patterns along with rising air temperature that will have adverse effects on our residents, water, agriculture, and ecosystem and our economy.

Whereas, Minnesotans are already incurring the costs associated with a changing climate such as increasing insurance rates, heat-related health emergencies, and disruption to farming and other local industries.

Whereas, creating a more environmentally sustainable and resilient community strengthens the social, economic and physical health of Northfield residents, enhancing overall the desirability and quality of life of our community

Whereas, in 2005 the City of Northfield began the process of committing to reducing its greenhouse gas emissions by completing the first milestone of the Cities for Climate Protection Campaign and other environmentally-focused efforts such as the Greenstep Cities program, have continued to reinforce our community's commitment to environmental stewardship.

Therefore be it resolved, that the Northfield City Council will create and implement a climate action plan (CAP) to reduce Northfield's community-wide greenhouse gases, to increase Northfield's community resilience in response to a changing climate and to ensure a livable planet for current and future generations.

Resources for cities

Boswell, Michael R., Adrienne I. Greve, and Tammy L. Seale. 2012. Local Climate Action Planning. Washington, DC: Island Press. <http://site.ebrary.com/id/10513517>

Carbon Neutral Cities Alliance (CNCA) - A project of the Urban Sustainability Directors Network
<http://www.cleanenergyresourceteams.org>

Clean Energy Resource Teams (CERTS) <http://www.cleanenergyresourceteams.org>

Compact of Mayors <https://www.compactofmayors.org>

Global Climate Change. <http://nca2014.globalchange.gov/report/regions/midwest#graphic-17083>
Global Protocol for Community-Scale Greenhouse Gas Emission Inventory (GCP)
<http://www.ghgprotocol.org/city-accounting>

ICLEI - Local Governments for Sustainability <http://www.iclei.org>

Urban Sustainability Directors Network (USDN) <http://usdn.org/home.html?returnUrl=%2findex.html>

Bibliography

Environmental Protection Agency. 2016. What Climate Change Means for Minnesota. <https://www.epa.gov/sites/production/files/2016-09/documents/climate-change-mn.pdf>

Minnesota Department of Health. 2015. Minnesota Climate and Health Profile Report: An Assessment of Climate Change Impacts on the Health & Well-Being of Minnesotans. <http://www.leg.state.mn.us/edocs/edocs.asp?oclnumber=904349892>.

Minnesota Department of Health. 2014. Minnesota Climate Change Vulnerability Assessment. <http://www.leg.state.mn.us/edocs/edocs.asp?oclnumber=960456870>

Minnesota Department of Health. 2012. Changing Geographic Range of Vector-Borne Disease. <http://www.health.state.mn.us/divs/idepc/dtopics/vectorborne/vectorborne.html>

Minnesota Environmental Quality Board (MEQB) <https://www.eqb.state.mn.us>

Minnesota Environmental Quality Board (MEQB). 2017 Minnesota and Environment Report Card. <https://www.eqb.state.mn.us>

MPR News. 2015. Climate Change in Minnesota: 23 Signs. <http://www.mprnews.org/story/2015/02/02/climate-change-primer>

Sample of Collaborative Effort

Core Collaborators (NEWG, EQC, GNSC)											
Update City Council and City Staff (Strategic Plan)	Meet with community champions Community Engagement - Hold Town Hall Forums										
City hires Sustainability Coordinator (Resolution passes)	Compose Climate Action Team (CAT) Community engagement - Community-wide survey										
City and Community Collaboration	Compose Task Forces										
	Energy	Waste/ Recycle	Transporta tion	Land Use	Food/Ag	Water	Comm. Residents	Businesses	Schools	Civic/ Religious	Marketing/ PR
	Community Engagement – Call for Working Groups										
	Working Groups	Working Groups	Working Groups	Working Groups	Working Groups	Working Groups	Working Groups	Working Groups	Working Groups	Working Groups	
	Deliver community Outreach Programs										