Community-wide Climate Action Plans

An initial summary of best practices from cities similar to Northfield, MN

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CAP Best Practices

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GENERATION to GENERATION Creating a Sustainable Community









Northfield: A City Committed to Addressing Climate Change

The Northfield Energy Task Force (NETF) was created by resolution of the Northfield City Council in May 2007. Recognizing that reliance on conventional energy resources posed a clear and present threat to quality of life and economic security in the community, the City asked the NETF to develop an energy action plan that would address these resources for generations to come. The NETF was composed of eight community volunteers and reported to the Mayor and Council.

The Task Force was charged with four major goals:

- 1) To assess opportunities to develop local energy efficiency and clean energy projects
- 2) To assess the efficacy of creating a municipal electric utility or special energy district in achieving the above
- 3) To recommend citywide target greenhouse gas emissions reductions to fulfill the next step in 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 three above and report to City Council by the end of May, 2008

Several recommendations came out of the work NETF did. The link to the Mayor's Energy Task Force Report from 2008 is available <u>here</u>.

There has been progress made by the city and community of Northfield to reduce energy use and greenhouse gas emission: the City of Northfield participates in the Minnesota GreenStep Cities program; local colleges have created and are implementing Climate Action Plans; and there is local effort to develop residential solar and community solar gardens.

There is still more urgent work to be done to reduce greenhouse gas emissions. In September of 2016, the Northfield Energy Working Group (NEWG) a task force, was assigned by the City of Northfield Environmental Quality Commission (EQC) to advance the recommendations stated in the 2008 Northfield Mayor's Energy Task Force Report. In 2016 the NEWG was tasked by the EQC with a list of four "quick start" actions; these actions include the following:

- 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 NEWG.

In response to item #3 on this task list, the NEWG would like share some of our initial research. The following report highlights findings from a comparison study of other community-wide Climate Action Plans that target carbon emissions reductions to inform future creation of a Northfield Climate Action Plan.

Climate Action Plans Overview

Around the world cities have written and adopted climate action plans to commit to reducing their carbon footprints and create a more sustainable society. Many cities go through similar processes to write a complete plan. First, most become members of an organization such as ICLEI (the International Council for Local Environmental Initiatives), the Global Covenant of Mayors, or the Compact of Mayors, which standardize the process. ICLEI describes five milestones to the climate action plan creation and implementation process¹: 1. Conduct a baseline inventory and forecast, 2. Adopt an emissions reduction target for the forecast year, 3. Develop a local climate action plan, 4. Implement policies and measures, 5. Monitor and verify results. The Compact of Mayors similarly outlines four steps:² 1. Register Commitment, 2. Take Inventory, 3. Create reduction targets and establish a system of measurement, 4. Establish and action plan (and then monitor the progress). Most cities cite joining ICLEI as the impetus for their Climate Action Plan and use the support from the organization to successfully complete an emissions inventory and meet early goals. The formats of the plans and the strategies that cities outline have less guidance from these organizations and are unique for each city.

Our Study

In order to gain an idea of what could create a successful climate action plan for Northfield, we limited our search of plans to cities that had a population around 100,000 or below, and had a similar climate to Minnesota³. Through searching through cities that are members of ICLEI, the Compact of Mayors, or are Transition Towns with these specifications, we found 47 cities with climate action plans or sustainability plans. A sustainability plan is a more general plan for a city that does not necessarily promise carbon emission reduction, so we focused on the climate action plans. We found that most climate action plans we observed follow the steps outlined by ICLEI or the Compact of Mayors. For a preliminary summary, we chose 10 plans that follow these milestones and seem to set clear goals. These 10 plans also comprehensively describe and research strategies to reach these goals. These plans are from the cities of:



¹ http://archive.iclei.org/index.php?id=810

² https://data.bloomberglp.com/mayors/sites/14/2015/07/Compact-of-Mayors-Full-Guide_July2015.pdf

³ This included the states of MN, IA, WI, ND, SD, NE, IL, IN, KS, MO, MI, OH, and CO. However, two of our plans are from NY and CA because they are excellent examples.

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Summary of Plans

There is a wide range of emission reduction goals described in the plans. Four have short-term goals, ending in 2020 or sooner, while the other six have longer-term goals, usually with at least two milestones. The chart below summarizes the goals of each of the ten plans in this sample.



Carbon Emission Reduction Goals

Figure 1. Summary of emission reduction goals. % in white at the end of the bar indicate the % decrease in green house gas emissions for the goal. The time the bar begins represents the baseline year, not the year the plan was written. *This represents the goals that Northfield set in the 2008 climate action plan.

The plans were written and adopted between 2008 and 2013 with seven of the plans written in 2011 or later. The populations of the cities in this sample from eight states range from 8,000 (Oberlin) to 117,000 (Ann Arbor), with a mean population of 45,000.



Figure 2. Summary of years climate action plans were written.



Education

Policy

Transportation

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Resources

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Conclusion

Based on the research performed in this phase of our Climate Action Plan Comparison study, the Energy Working Group has the following conclusions:

- All ten cities referenced in this report were members of some guiding organization that provides structure for creation and implementation of their Climate Action Plan. Example organizations include ICLEI, the Global Covenant of Mayors or the Carbon Neutral Cities Alliance (CNCA).
- Some cities had a checklist of numerous, specific carbon reduction strategies and others have fewer, more general categories. But a more granular level of detail in a plan does <u>not</u> necessarily correlate to a better chance of success.
- All cities assembled a climate action plan taskforce to write the plan that included various degrees of representation from city, business, transportation, energy suppliers, and community members. Avenues for all to engage in the CAP process varied from city to city, but plans that engage the community and local businesses from the outset contributes to greater progress on plan implementation.
- Some cities hire a consultant to compile data and calculations and/or provide expertise that may not be locally available. Most relied on internal city, college and community resources.
- Implementing the plan takes much coordination. The city sometimes hires a sustainability or energy coordinator. The community sometimes forms a designated coalition or collaborative.
- It is essential that the primary plan overseer elicit continued, sustained, long-term commitment and effort by trained and designated city staff as well as involvement of community and business stakeholders. Once the CAP is written, a task force or collaborative group often subdivides the tasks.
- All plans include a timeline or phasing of actions. Many cities set an example with the municipal leading the way by purchasing renewable energy and supporting renewable energy systems for residents and businesses.
- Some cities calculate carbon emissions based on a production basis, others on a consumption basis. All cities put effort into compiling an annual carbon emissions inventory in order to accurately forecast future growth and emissions and determine realistically how much and how emissions can be reduced over time. Strategies to reduce carbon emissions are developed but also must be tied to these forecasts stipulating anticipated costs, funding and people power required to make progress in the face of growth.
- Timeline, cost, and who is implementing the strategies must be clearly indicated in the plan. Each strategy has a specific task group assigned to its implementation.

Next Steps

The Energy Working Group recommends the following next steps:

- EQC members review some of the sample reports from the list of cities highlighted in this report. See Appendix II Selected Screen Shots.
- EQC members review the Carbon Neutral Cities Alliance (CNCA) Framework and the Global Covenant of Mayors. See Resources.
- 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.
- Energy Working Group engages in the continuation of the Climate Action Plan comparison study from cities of similar size and climate to Northfield. This would include detailed evaluation of:
 - community-wide engagement during pre-plan writing,
 - carbon reduction renewable energy strategies/projects and tangible options for the municipality and the community,
 - funding structures and opportunities,
 - CAP implementation structure and process, and
 - the progress and current challenges of some cities, via phone calls, to city staff and key community members who assisted with creation or implementation.

Appendix I: Details of the Summary

This appendix provides details from the summary given on pages 5 and 6, moving from top to bottom and left to right across the first page, then the second.

- Emeryville is the only city that is not a member of ICLEI, but rather a member of the Global Covenant of Mayors. Ann Arbor, Creve Coeur, Evanston, Dubuque and Urbana are members of the Compact of Mayors.
- Bedford and Emeryville are the only two cities that do not cite community involvement in the creation of their plans. Ann Arbor, Burlington, and Oak Park & River Forest hired consultants to help in the creation of the forecasts, strategies and plan.
- Dubuque did not include a climate change "primer" in it's plan and Emeryville did not include details of how they planned to monitor progress, but all plans included all of the seven components typical of a successful plan (primer, green house gas inventory, emissions forecast, target emissions, risk assessment, strategies and a plan to monitor progress).
- Evanston, Urbana, Burlington, and Oberlin mention the college or university in the city and include the college in the strategies.
- Bedford, Emeryville, Urbana, and Creve Coeur's plans are strictly concerned with carbon reduction, while the rest of the plans address sustainability in general.
- Urbana does not include strategies related to waste nor water resources and Creve Coeur does not include strategies related to transportation nor waste.
- Bedford, Burlington, Evanston, and OPRF met or are meeting their goals. The rest of the cities were not on track to meet their goals and have adjusted their plans.
- Evanston's is the only plan that was accepted rather than adopted by the city council.
- Emeryville and Oak Park & River Forest are the only two cities that don't describe implementing their strategies in phases in their plans. However, since both plans do not initially meet their goals, they both adapted their plans and are now implemented in phases.

Appendix II: Selected Screen Shots

This appendix contains screen shots from the climate action plans in this report. Text in the colored boxes explains the components of the screen shot and why it was chosen.

Ann Arbor:

Matrix Ke	City of Ann Arbor	Recommend	ed Actio	ns		
Implement AAPS – Ann A AATA – Ann A CC – City Cou BC – Busines CD – Commu	Interview HC – Housing Commission PDS – Planning and Development Arbor Public Schools HC – Housing Commission PDS – Planning and Development Arbor Transit Authority DDA – Downtown Development Authority PMU – Project Management Unit uncil FS - Field Services PU – Public Utility s Community GDT – Get Downtown PRU – Parks and Recreation Unit unity Development NGO – Non-Governmental Organization RES – Residents	SPU – Systems Planning Unit UM – University of Michigan WTP – Vater Treament Plant WWTP – Wastewater Plant	Impact (Annual MTCO, Reduction) * - Low (0-5,000) * Medium (5,001-20,000) *** - High (20,001+)		Impact Timeframe S – short (1-5 years) M – medium (6-19 yea L – long (20+ years)	
		Annual MTCO ₂ e				
Action ID	Energy and Buildings Actions	Reduced	\$/tCO ₂ e	Impact	Implementation Leads	Impact Timefram
EB-1	Weatherize existing housing stock	14,197	-\$56		SPU, CD, WC	м
EB-2	Build or renovate energy efficient affordable housing units	1,030	-\$46	•	HC, CD, BC	s
EB-3	Offer incentives for energy audits and implementation of identified energy conservation measures	Not Estimated	Not Estimated	•	SPU, PU, NGO, DDA	5
EB-4	Promote use of efficient lighting technologies for both outdoor and indoor applications	8,034	-\$155		SPU, PMU, PU	s
EB-5	Provide incentives to commercial building owners to install motion-sensing light switches and automated thermostats	13,781	-\$136		SPU, PU	s
EB-6	Promote conversion to green roofs for commercial and industrial buildings	2,004	\$232		SPU, PU, DDA	s
EB-7	Promote the use of reflective roofs in the commercial and industrial sectors	2,691	-\$143		SPU, PU, DDA	L
EB-8	Provide incentives to builders to exceed state energy codes in their renovations and new construction	542	-\$102	•	SPU, PDS	м
E8-9	Use Property Assessed Clean Energy (PACE) to finance commercial building energy improvements	14,846	-\$87	••	SPU, NGO	м
EB-10	Expand and Enforce current ordinance, Chapter 105 Section 8:524 that requires landlords to provide energy budgets to tenants	7,971	-\$92	•	SPU, PDS	L
EB-11	Strengthen housing code energy standards for rental properties	2,781	\$1		SPU, PDS	L
EB-12	Implement a Residential Energy Conservation Ordinance with required upgrades	7,103	-\$98		SPU, PDS	S
EB-13	Strengthen energy code for new and renovated buildings at the state or local level	2,791	-\$59		SPU, PDS	м
EB-14	Increase use of combined heat and power units	35,134	-\$126		SPU, PDS	L
EB-15	Create a downtown geothermal heating and cooling district	12,482	-\$63		SPU, PDS, DDA, PMU	S
EB-16	Implement a downtown combined heat and power district system	17,567	-\$126		SPU, PDS, DDA, PMU	L
EB-17	Create a geothermal utility to implement ground source heat pumps for residential heating and cooling	26,387	-\$23		SPU, PMU	м
EB-18	Ensure availability of utility-level solar incentives	3,952	\$188	1.00	SPU, PU	S
EB-19	Utilize digestion of waste water treatment plant material, or post consumer organics, to generate useful biogas	2,080	-\$160		SPU, WWTP	5

Ann Arbor created a detailed list of strategies including the amount of carbon reduced, the cost per ton of carbon, the impact on a scale, specific organizations that they can work with, and it if is a short term or long-term project

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Bedford:

Community Scale Renewable Energy

Renewable energy - energy generated by natural resources - contributes little or no greenhouse gasses (GHG) to the atmosphere, reduces unhealthy by-products of burning fossil fuels and helps us reduce the need to import energy fuels from overseas. Renewable energy sources include: solar, wind, hydroelectric, and geothermal.

If the Town of Bedford purchased 100% renewable energy from conventional sources, such as those currently available through your utility, the cost would amount to over \$215,000 annually. The Town of Bedford , working with the Bedford 2020 Coalition and its partners, should commence a study to identify all available renewable energy assets in the community as well as opportunity sites where RE projects might best be implemented to bring this cost down. In addition, the study would include potential finance options. The results of this study could allow us to move toward increasing renewable energy production locally, bring down the incremental cost of using renewable energy, and ultimately move to 100% renewable energy use in town-owned buildings by 2020. **Total Cost:** \$215,532 annually (\$0.10 per kWh additional cost) **Payback:** Not available

Co-Benefits: 👝 종 🛖

Scope 100% RE Purchased

Annual Reductions

CO₂e: 803 Tonnes in total Community Emissions and 15% reduction in TOB total Emissions and 75% of 20% by 2020 goal) Energy: N/A NOx: 2,145 lbs SOx: 9,044 lbs CO: 2,246 lbs VOCs: 252 lbs PM10: 1,981 lbs

CAP Co-Benefits

Throughout the Bedford Climate Action Plan, the term Co-Benefits refers to positive impacts our proposed measures will have on our lifes.



Business as Usual

Assuming an annual 2% growth rate, Bedford needs to reduce the predicted "Business as Usual" 2020 emissions by an additional 102,872 tonnes of CO2e in order to reach the desired 20% reduction below 2004 levels



Bedford created images to represent the co-benefits for each strategy. Their "business as usual" plot is also a good example of this sort of graph from climate action plans. For each strategy, they include how much it will cost, the payback, cobenefits, the amount of reductions, and a detailed explanation.

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Dubuque:

DMASWA - Methane Gas to Energy

1) Sector: Local energy - infrastructure

2) Policy name: DMASWA methane gas to energy

3) Policy type: Municipal/County

4) Affected entities: DMASWA; City of Dubuque; Dubuque County; landfill clients and customers.

5) Current status: Early planning

6) Estimated GHG reduction: $61,799 \text{ mt CO}_2e$ annually (11,799 mt from electricity/waste heat in addition to 50,000 mt from captured methane-see section: *Methane capture and flaring at DMASWA*). Future expansions at currently active/uncapped cells could expand this capacity in the future.

7) Scope of emissions reduction: Scope 1 (methane combustion); Scope 2 (electricity/heat generation)

8) Specific description of policy: In 2007, Dubuque commissioned a study from Cornerstone Environmental Group, LLC, which identified the potential for a 2 MW Combined Heat and Power (CHP) landfill-gas-to-energy facility (Cornerstone 2008). This facility would capture methane and burn it to create energy equivalent to powering over 1,000 homes. CHP facilities produce electricity and also utilize resulting waste heat in surrounding buildings.

9) Barriers to implementation: Finding buyer(s) for electricity/heat; up front costs; transmission of heat/energy; permitting and siting of facility.

10) Co-benefits: Based on estimates from Cornerstone (2008), the landfill-gas-to-energy project could yield a high rate of return, with a net present value of approximately \$1,909,431.

11) Explanation of GHG reduction impact:

 $50,000 \text{ mt CO}_2\text{e}$ per year from methane flaring plus 11,799 mt from electricity and waste heat from 2 MW landfill-gas-to-energy facility (Cornerstone 2008) using projected 2030 emission factors (Appendix A).

12) Relative confidence of GHG reduction estimate: High

13) Sources of uncertainty in GHG reduction estimate: Capture efficiency of collection system; capacity of CHP facility.

> While less flashy than other reports, Dubuque adds many details to each of their strategies (which can be seen here). The report is written like a research paper.

CAP Best Practices

Creve Coeur:

Table 1: Phases of the Climate ActionPlan

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Phase 1:

Build awareness, knowledge, capacity, and commitment for reductions in energy use and greenhouse gasses. Implement highprofile initiatives that promote those goals. Pursue easy and cost-effective strategies to reduce energy use and greenhouse gas emissions in municipal operations. Lead by example.

Phase 2:

Continue Phase 1, but also undertake more complex and ambitious initiatives to make reductions. Lay the groundwork to encourage the community as a whole to make reductions.

Phase 3:

Continue initiatives started under the previous phases. Implement more ambitious initiatives that involve more significant change in both municipal operations and the community as a whole. Creve Coeur conceptualized their plan in phases outlined here.

> Oberlin gives specific timelines and similar details for each strategy as Ann Arbor, Bedford, and Dubuque.

Oberlin:

<u>Strategy</u>	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

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CAP Best Practices

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Urbana:

Together, these example actions can help Urbana achieve 80% of it's 2020 greenhouse gas emissions reduction target.¹

• Purchasing Renewable Energy Certificates for 20% of community electricity requirements can help Urbana achieve **32%** of its emissions reduction target.

• Purchasing Green Electricity for 100% of government operations and 50% of Community electricity requirements can help Urbana achieve **27%** of its emissions reduction target.

• If 100 City Fleet vehicles and 2500 privately-owned vehicles are flexible fuel vehicles able to run on up to 85% ethanol and 15% gasoline it will help Urbana achieve **5%** of its emissions reduction target.

• Targeted outreach and education programs that offer information about and encourage and incentivize conservation measures can help Urbana achieve **5%** of its emissions reduction target.

• Education and individualized surveying of people to find out their interest in automobile alternatives and sending out targeted information on lowcarbon transportation options can help Urbana achieve **3%** of its emissions reduction target. • Outreach and educational programs that offer information about and encourage conservation measures tailored specifically for small businesses and active participation of 500 businesses in green practices can help Urbana achieve **2%** of its emissions reduction target.

• Generating 50kW photovoltaic energy for powering City Operations and 5000 kW photovoltaic energy towards community energy needs will help Urbana achieve **2%** of its emissions reduction target.

• If 50 City Fleet vehicles and 1000 privately-owned vehicles are electric vehicles, it can help Urbana achieve **2%** of its emissions reduction target.

• Replacing inefficient and older lighting fixtures with new electronic ballasts and T-8 size tubes for 50,000 sq ft of City property and 4,000,000 sq ft of private facilities can help Urbana achieve **2%** of its emissions reduction target.

¹ This contribution to be updated after the first quarterly municipal electric aggregation report showing the total energy supplied from green energy sources and the quantity of Renewable Energy Credits (RECs) purchased towards the total energy supplied to Urbana residential and small commercial customers in the municipal electric aggregation program is available.

Urbana illustrates how a city can use the CAPA software from ICLEI to outline a plan for a specific percent reduction goal.

Resources:

Organizations:

- ICLEI: http://www.iclei.org, http://icleiusa.org/programs/emissions-management/5-milestones/
- Compact of Mayors: <u>https://www.compactofmayors.org</u>
- Global Covenant of Mayors: <u>https://www.compactofmayors.org/globalcovenantofmayors/</u>
- Carbon Neutral Cities Alliance (CNCA): <u>http://usdn.org/uploads/cms/documents/cnca-framework-12-16-15.pdf</u>

Climate Action Plans & Progress Reports:

- Ann Arbor: <u>http://www.a2gov.org/departments/systems-planning/planning-</u> areas/energy/Documents/CityofAnnArborClimateActionPlan_low%20res_12_17_12.pdf, <u>http://www.a2gov.org/a2energy/be-</u> informed/Documents/Climate%20Action%20Plan%20Update%20%281.5.2016%29.pdf
- **Bedford:** <u>http://www.bedfordny.gov/wp-content/uploads/2014/05/Climate-Action-Plan-Final.pdf</u>, <u>http://www.bedfordny.gov/wp-content/uploads/2013/12/2014_Jun_CAP_Progress_Rpt.pdf</u>
- Burlington: <u>https://www.burlingtonvt.gov/sites/default/files/CEDO/Sustainability/Climate%20Action%20Plan.pdf,</u> <u>https://www.burlingtonvt.gov/sites/default/files/u268/City%20of%20Burlington%20Emission%20Sum</u> <u>mary%20and%20Trends.pdf</u>
- Creve Coeur: <u>http://www.creve-coeur.org/index.aspx?NID=727</u>, <u>http://creve-coeur.org/DocumentCenter/View/5897</u>
- Dubuque: <u>http://www.cityofdubuque.org/1374/50-by-2030-Plan</u>
- Emeryville: <u>http://www.ci.emeryville.ca.us/DocumentCenter/Home/View/1971</u>, <u>http://www.ci.emeryville.ca.us/338/Climate-Action-Plan</u>
- Evanston: <u>http://www.cityofevanston.org/pdf/ECAP.pdf</u>, <u>http://www.cityofevanston.org/sustainability/</u>
- Oak Park & River Forest: https://sevengenerationsahead.org/sustainability/planit-green http://sevengenerationsahead.org/sustainability/planit-green
- Oberlin: http://www.cityofoberlin.com/wp-content/uploads/2014/07/2013-cap-online-pdf.pdf
- Urbana: <u>http://www.urbanaillinois.us/sites/default/files/attachments/climate-action-plan-phase-1-web.pdf</u>, <u>http://www.urbanaillinois.us/residents/sustainability/city-wide</u>