

Northfield: Sustainable Energy for All Energy Subcommittee Report

Climate Action Plan Advisory Board
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Forward: Northfield's Energy Future

Affordable energy is the essential resource of the industrialized world. Our modern lives depend on it, as do the economies of the world, the security and stability of nations, and the well-being and resilience of our communities. Everything we consume, construct, and operate requires quantities of energy our pre-industrial ancestors could not have imagined. And these modern energy demands — resulting from urbanization, the industrial and agricultural revolutions, and new modes of transportation — have been magnified by the explosion of humanity's population.

Climate change is the largely unexpected and daunting consequence of our wild success in meeting explosive worldwide energy demand through the extraction and burning of fossil fuels. The science of climate change is undeniable in its broadest conclusions: the atmospheric accumulation of carbon dioxide and other greenhouse gases (GHGs) generated by human activity has reached a level that is changing the climates of all places on earth, with compounding and cascading consequences that will soon be unstoppable. And, we are told, that requires that we wean ourselves off fossil fuels as fast as possible. Can we do that and still meet the world's astounding energy demands?

The good news is that we have the knowledge and resources to address this unprecedented challenge in ways that could improve quality of life for all of earth's inhabitants. Industry, science, and technology have already given us the tools we need to replace fossil fuels with green, clean, abundant, affordable, reliable energy. It's a revolution already well underway, and Northfield is off to a great head start. St. Olaf College now runs on 100% green electricity, Carleton College is transitioning its 100-year old steam system to geothermal heating and cooling, many local industry leaders have comprehensive sustainability plans, and 145 Northfield residents and businesses are subscribed to community solar. Electricity from Northfield's public utility, Xcel Energy, is currently 58% carbon-free,¹ and Xcel Energy is committed to providing 100% carbon-free electricity by 2050. Continuing and expanding these transformative actions will not only help avert the worst effects of climate change, it will generate hyper-growth of our economy, enhance our national security, diminish international tensions by reducing climate change migration, and promote the resilience and viability of communities everywhere.

The choices made in small cities and towns all across America will have a profound effect on our nation's ability to deal with consequences of climate change. The City of Northfield's 2017 Strategic Plan recognizes this by prioritizing climate action as one of its six strategic priorities. This Energy Subcommittee Report offers the City actionable goals based on local energy data and identifiable community resources. The report was written as a working document to be updated regularly — always striving to raise the bar on its own goals. It isn't meant to be perfect, but rather to use the tools at hand to take advantage of immediate opportunities, and to act knowing we have a vital responsibility to do our part.

Although the City is asked to lead these actions, the success of this plan depends on the will, participation, dedication, and enthusiasm of the community as a whole. With the help of its

¹ [Xcel Energy Upper Midwest Energy Plan](#)

conscientious residents, vibrant businesses, and anchor institutions, Northfield is poised to be a leader on our path to a clean energy future.

1. Executive Summary

1.1 Background

The Energy Subcommittee Report was prepared by the Northfield Energy Subcommittee, which included over two dozen volunteers from Northfield residences, nonprofits, businesses, institutions, and industries. The subcommittee was appointed by the Northfield Climate Action Plan Advisory Board (CAPAB) as part of its charge by the City Council to advance the City of Northfield's Strategic Plan priority #6: Address climate change impacts. It is intended that the Enregy Subcommittee Report serve as a standalone document, but that select portions will also be folded into a more comprehensive Northfield Climate Action Plan. The City engaged Xcel Energy's Partners in Energy offering to collaborate on developing and implementing our community's energy goals. Through a series of facilitated workshops, the subcommittee created this report. The report also draws upon energy and sustainability-focused text from many past Northfield planning documents (e.g. the Comprehensive Plan, 2008 Mayor's Energy Task Force Report) and various state, federal, and global goals and targets.

1.2 Where are we now?

Current Northfield area energy consumption and production provide a data-based understanding of where we are now. Data from the Northfield substation in 2017 shows that of the 7,421 premises served by Xcel Energy, 88% are residential and 12% are commercial/industrial.

In 2017, Northfield consumed 2.7 million MMBTU² of energy.³ About two-thirds of Northfield's 2017 energy consumption was from natural gas (67%) and one-third from electricity (33%). Energy data shows that of the 2.7 million MMBTU consumed by Northfield, 21% is consumed by residential premises and the remaining 79% is consumed by commercial/industrial premises. This means that the highest impact opportunities for energy conservation, energy recovery, and renewable energy are with commercial/industrial premises.

Northfield is also experiencing rapid growth in renewable energy produced by three college-owned wind turbines, 81 solar panel installations, 145 community solar garden subscribers, and almost 26 million kWh⁴ of purchased green energy. For a full report of Northfield energy consumption data and participation in Xcel Energy's energy conservation programs, see Appendix 2.

1.3 Where are we headed?

This report proposes the following vision and energy emissions reduction goal supported by eight guiding principles implemented via fifteen strategic priorities.

² Reference Appendix 8: Glossary of Terms.

³ Behind-the-meter renewable energy from two of the college wind turbines plus privately-owned solar PV is not included in the energy supplied by Xcel Energy via the Northfield substation.

⁴ Reference Appendix 8: Glossary of Terms.

1.3.1 Vision

Northfield strives to ensure all citizens have access to clean, renewable, reliable, and affordable energy systems that will adapt to a changing climate by conserving energy, reducing our community-wide carbon footprint, and supporting sustainable energy solutions.

1.3.2 Carbon reduction goal

For community-wide energy metered at the Northfield substation plus local, behind-the-meter renewable sources, achieve a 50% reduction in energy-related carbon emissions from 2015 levels by 2030, and achieve 100% carbon-neutrality no later than 2050.

This goal is based on the International Panel on Climate Change [Guide for Policy Makers](#), which says that to limit global warming to 1.5 degrees Celsius, “global net human-caused emissions of carbon dioxide (CO2) would need to fall by about 45% from 2010 levels by 2030, reaching ‘net zero’ around 2050.”

1.3.3 Guiding principles

- Pursue a sustainable energy future with clean energy available to all businesses and residents, with particular support for under-resourced households.⁵
- Increase overall energy literacy among residents and business owners and operators, including knowledge of where energy comes from, the environmental impacts of different types of energy generation, and what can be done to reduce energy use.
- Expand renewable energy generation.
- Lead by example and offer recognition for successful energy efforts
- Make energy efficiency feasible, affordable, and achievable for both residents and businesses.
- Promote economic growth while increasing energy conservation and renewable energy generation.
- Empower future generations to be self-motivated in working toward a sustainable energy future.
- Inspire and support a high quality of life for future generations.

1.3.4 Strategic priority summary matrix

This report intends to be highly actionable and is centered on a set of specific strategies and recommended actions that address future-focused approaches to energy reduction, renewable energy, and energy resilience.

Area A: Education and Engagement (EE)	
EE-1	Small Consumer Energy Engagement
EE-2	Large Consumer Energy Engagement
EE-3	Energy Marketing and Tourism

⁵ Includes households on a fixed-income, experiencing energy burden, or are eligible for income qualified programs.

EE-4	Energy Reporting and Transparency
Area B: Policy and Planning (PP)	
PP-1	Building Energy Use Benchmarking and Disclosure
PP-2	Building Energy Efficiency Standards
PP-3	Energy Conscious Strategic Growth
PP-4	Forward-Thinking Utility System Expansion
PP-5	Renewable Energy Development Plan
PP-6	Community Energy Resilience Plan
Area C: Innovation and Demonstration (ID)	
ID-1	Deep Energy Efficiency Retrofits
ID-2	Net Zero Energy Buildings
ID-3	Strategic Electrification
Area D: Supporting and Continuing the Plan (SC)	
SC-1	City Energy Coordinator Position
SC-2	Advancing and Updating the Plan

1.4 Resources and funding

Northfield benefits from no-cost resources in the form of active civic engagement from community volunteers, a strong network of nonprofit organizations, and partnerships with two liberal arts colleges. Furthermore, the Xcel Energy Partners in Energy offering provides 18 months of free implementation support to help facilitate and market the small and large consumer energy engagement strategies described in Appendix 3. Past Northfield planning documents and the charters of many existing City Departments and Commissions already align with many of the strategic priorities listed in this plan. The report can achieve many of its stated strategic priorities based on these existing City and no-cost community resources, but the plan also recommends hiring a full-time energy coordinator to provide leadership, continuity, and dedicated support to make the most of these willing partners and ripe opportunities. Additional resources, potential partners, and funding opportunities are listed in Section 8.

2. Planning Process

2.1 Climate Action Plan Advisory Board

In 2017, the City of Northfield published its strategic plan, which included six strategic priorities. One of these priorities was to address climate change impacts, and a desired outcome was to write a City of Northfield Climate Action Plan. In 2018, Mayor Rhonda Pownell appointed the Northfield Climate Action Plan Advisory Board (CAPAB) and two city staff members to take on this task. The advisory board was guided by an emphasis on economic health, physical health, environmental health, and quality of life in six focus areas: energy, water, food, transportation, land, and waste.

2.2 Northfield Energy Subcommittee

CAPAB member Martha Larson was assigned to be the Energy Subcommittee chair. In partnership with Northfield Public Works Director, David Bennett, and GIS Technician, Bryanna Paarmann, Ms. Larson recruited more than two dozen Northfield Energy Subcommittee volunteers representing Northfield's residents, businesses, industries, nonprofits, and institutions. See Appendix A for a full list of participants.

2.3 Xcel Energy's Partners in Energy offering

The committee utilized the Xcel Energy Partners in Energy offering, which dedicates at no cost a team of Xcel Energy and Center for Energy and Environment staff to help city staff and community members develop an energy action plan. Xcel Energy's free services include a six-month planning period, five workshops, and an 18-month implementation period during which the Xcel Energy Partners in Energy team will provide marketing and communications support, data tracking and measurement, program expertise, and project management for a set of specific, near-term strategies outlined in the Energy Subcommittee Report. The Xcel Energy Partners in Energy offering also provides access to Northfield's energy data, energy plan examples from other community energy action plans, webinars, and other resources to support plan creation and implementation.

2.4 Strategic priorities

The core team consisting of the Energy Subcommittee chair, city staff, and the Xcel Energy Partners in Energy team compiled a list of proposed strategic priorities to be included in this report. These were meant to capture the wide variety of ideas and discussions generated at the Northfield Energy Subcommittee workshops. Energy Subcommittee members were surveyed on whether they agreed with each priority and had opportunities to review and comment on each proposed priority during various workshop activities and discussions. In the end, the core team reviewed the rankings of each priority and the associated comments to determine what appeared to be the best strategies to include in the Energy Subcommittee Report.

2.5 Review Process and approval

The final Energy Subcommittee Report will be reviewed and endorsed by the Northfield Climate Action Plan Advisory Board, the Planning Commission, and the Environmental Quality Commission before going to the City Council. The City Council will review and approve the full Climate Action Plan at a later date.

3. Planning Context

3.1 Northfield history of energy action

The City of Northfield has a long-standing commitment to energy stewardship as part of a broad and dedicated focus on sustainability as a key component to quality of life. This report aligns with, and builds on, the work of many prior Northfield planning documents as noted below.

Title	Year	Purpose	Summary of Recommendations
Comprehensive Plan	2008	A community “blueprint” for the future, the broadest policy document a community can have to guide decision-making on long-term physical development.	Northfield comprehensive plan emphasizes sustainability, energy efficiency, and “smart growth” (e.g. prioritizing infill development over expansion). See Appendix 5 for specific strategies from the implementation matrix that align with this energy plan.
Mayor’s Energy Task Force Report	2008	This task force was created by a City Council resolution to address the challenges related to fossil fuel energy: 1) supply and price uncertainty and 2) global climate change, driven largely by the release of carbon dioxide from fossil fuel combustion.	This plan recommends various strategies for community engagement in energy efficiency, expansion of local renewable energy developments, and growth of a local “green economy.” It also examined, but recommended against, forming a separate municipal utility. See Appendix 4 for a summary report. <i>Note: This report was submitted to, but never adopted by City Council.</i>
Northfield GreenStep Cities	2010	A voluntary challenge, assistance, and recognition program to help cities achieve their sustainability and quality-of-life goals.	In 2015, Northfield achieved “Step 3” in this program, the highest level at the time. Many of the “steps” include energy efficiency and renewable energy actions.
Northfield City Council Strategic Plan	2017	To examine the current state of the organization, determine a desired future state, establish priorities, and define a set of actions to achieve specific outcomes.	Strategic priority #6 is “Climate Change Impacts.” Desired outcomes are a clear vision for climate action, an economy resilient to energy and environment impacts, and reduced net carbon emissions.
Northfield Climate Action Plan Advisory Board	2018	An advisory board to lead and engage the Northfield area community in responding strategically, rapidly, and responsibly to a changing climate by developing a Climate Action Plan that includes a carbon reduction goal to be presented to the City Council.	Work in progress, draft plan will be presented to City Council in 2019. Select portions of the Energy Subcommittee Report will be included in Northfield’s Climate Action Plan.

3.2 State, Federal, and Global Energy Action

The Energy Subcommittee Report comes at a time of rapidly increasing global awareness of the threats posed by fossil fuel consumption and rising concentrations of greenhouse gases in the atmosphere. It is therefore bolstered by many existing state, federal, and international energy and carbon reduction targets, reports, and recommendations including:

Title	Created	Applies to	Description
Minnesota Renewable Energy Standard	2007	Electric utilities operating in Minnesota	Requires electric utilities to generate at least 25% of their energy from renewable sources by 2025. The state's largest utility, Xcel Energy, must hit a higher standard of 30% by 2020.
Next Generation Energy Act (Minnesota Statutes Chapter 216H)	2007	State of Minnesota	Requires a reduction by 80% between 2005 and 2050 for state GHG emissions, while supporting clean energy, energy efficiency, and supplementing other renewable energy standards in Minnesota. Interim goals were also set: 15% reduction by 2015, and a 30% reduction by 2025.
MPCA Climate Solutions and Economic Opportunities (CSEO) Initiative	2016	State of Minnesota	A report written to evaluate strategies for Minnesota policy makers to reduce GHG emissions while growing our state economy.
Xcel Energy 100% carbon-free electricity by 2050 commitment	2018	Xcel Energy customers	Xcel Energy commitment to deliver 100% carbon-free electricity to all customers by 2050. Interim targets are to reduce carbon emissions 80% by 2030, from 2005 levels in the eight states it serves.
International Panel on Climate Change (IPCC)	2018	International	The IPCC is the United Nations body for assessing the science related to climate change. Its 2018 report states “With clear benefits to people and natural ecosystems, limiting global warming to 1.5°C compared to 2°C could go hand in hand with ensuring a more sustainable and equitable society.”

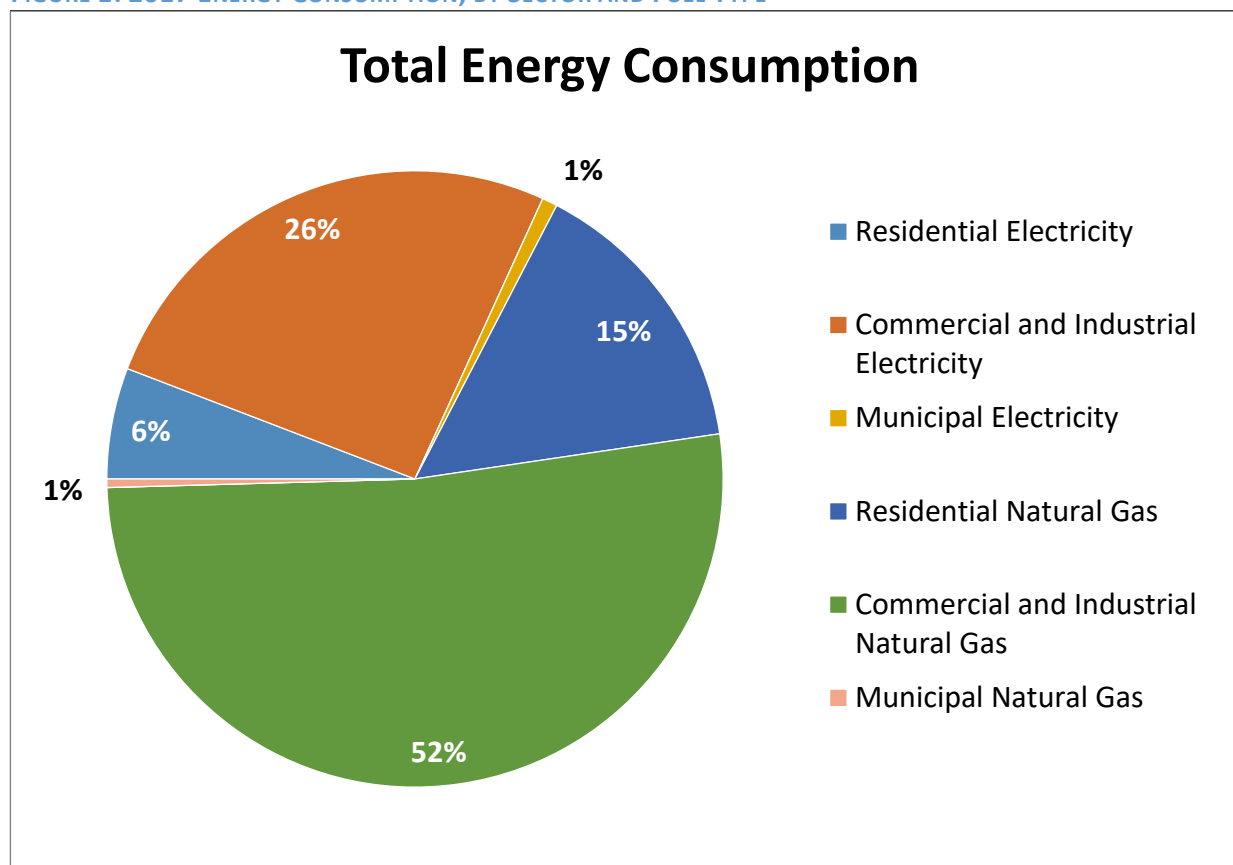
4. Where We Are Now?

An integral part of the Partners in Energy planning process is reviewing historic energy data for Northfield. Xcel Energy provided data on energy use and participation in utility energy conservation programs, as well as savings associated with participation in those programs. The summary below is for 2017. See Appendix 2 for a complete picture of Northfield's baseline energy data.

4.1 Summary of grid energy use

Xcel Energy is the electric and natural gas utility provider for Northfield. Of the 7,421 premises served, 88% are residential, 11% are commercial/industrial, and 1% are municipal. In 2017, Northfield consumed 2.7 million MMBTU of energy. About two-thirds of Northfield's 2017 energy consumption is from natural gas (67%), and one-third from electricity (33%). Energy data show that of the 2.7 million MMBTU consumed by Northfield, 21% is consumed by residential premises, 78% is consumed by commercial/industrial premises, and 1% is consumed by municipal premises. See Figure 1 for a breakdown of energy consumption by sector and fuel type.

FIGURE 1: 2017 ENERGY CONSUMPTION, BY SECTOR AND FUEL TYPE⁶



4.2 Off-site renewable energy

Off-site renewable energy subscriptions offer residents and businesses the opportunity to use renewable energy without having to install equipment. Two popular examples are utility-sponsored renewable programs and community solar gardens. In 2017, 613 Northfield residential premises subscribed to renewable energy,⁷ totaling more than 1.8 million kWh of electricity. Sixteen commercial/industrial premises subscribed to renewable energy for a total of 33.6 million kWh of electricity.⁸

⁶ Electricity and natural consumption for all premises in Northfield served by Xcel Energy. Behind-the-meter energy generation is not included in energy consumption data.

⁷ Subscriptions include both Xcel Energy's Windsource® and Renewable*Connect® subscription programs, and community solar garden subscriptions.

⁸ Ibid.

4.3 On-site renewable energy

On-site renewable energy, sometimes called “behind-the-meter,” includes solar panels and wind turbines installed on-site to supply some or all of the power for a building.

In 2017, 76 residential and five commercial/industrial premises had solar panels on their home or facility with a total capacity of 554 kW. Two wind turbines — one at Carleton College and one at St. Olaf College — also generated power for those organizations totaling just over 6.7 million kWh.

4.4 Summary of energy conservation program participation

Northfield residents and businesses have actively participated in Xcel Energy’s energy conservation programs, saving an average of 1.2% of electricity consumed and 0.7% of natural gas consumed between 2015 and 2017.⁹ In 2017, 813 total premises participated in Xcel Energy’s programs, including 11% of residential premises and almost 8% of commercial/industrial premises. By participating in energy conservation programs, premises saved a total of 18,710 MMBTU (0.7% of total energy use in 2017). The most popular programs for residents include Saver’s Switch and rebates for heating and cooling equipment. For commercial/industrial premises, lighting, heating, and cooling efficiency rebates are the most popular programs for saving energy.

⁹ Xcel Energy’s energy conservation programs include the portfolio of approved utility energy efficiency and demand management programs.

5. Where We Want to Go

5.1 Vision

Northfield strives to ensure all citizens have access to clean, renewable, reliable, and affordable energy systems that will adapt to a changing climate by conserving energy, reducing our community-wide carbon footprint and supporting sustainable energy solutions.

5.2 Carbon reduction goal

For community-wide energy metered at the Northfield substation, achieve a 50% reduction in energy-related carbon emissions from 2015 levels by 2030, and achieve 100% carbon-neutrality no later than 2050.¹⁰

5.3 Guiding principles

- Pursue a sustainable energy future with clean energy available to all businesses and residents, with particular support for under-resourced households.
- Increase overall energy literacy among residents and business owners and operators, including knowledge of where energy comes from, the environmental impacts of different types of energy generation, and what can be done to reduce energy use.
- Expand renewable energy generation.
- Lead by example and offer recognition for successful energy efforts.
- Make energy efficiency feasible, affordable, and achievable for both residents and businesses.
- Promote economic growth while increasing energy conservation and renewable energy generation.
- Empower future generations to be self-motivated in working toward a sustainable energy future.
- Inspire and support a high quality of life for future generations.

¹⁰ This goal is based on the International Panel on Climate Change [Guide for Policy Makers](#) which says to limit global warming to 1.5 degrees Celsius “global net human-caused emissions of carbon dioxide (CO₂) would need to fall by about 45% from 2010 levels by 2030, reaching ‘net zero’ around 2050.”

6. Strategic Energy Action Priorities

This report draws on the City of Northfield’s responsibility to protect our community from crises and insecurity while also providing services that maintain order and enhance quality of life. Modern energy supply has become a basic human right, but the negative impacts of its production and consumption — devastated landscapes, air and water pollution, depleted resources, climate change — present fundamental challenges to the rights of future generations. The City is in the unique position of addressing problems that require collective action — from business, industry, institutions, and residents — and a “systems thinking” approach to benefit everyone in our community. The City can facilitate such an approach by engaging the whole community in energy literacy, awareness, and action; enacting policies and plans that guide us toward a more energy-conscious future; and serving as a role model through innovation and demonstration projects that help normalize forward-thinking concepts. Although it is intended that the City will lead these actions, the success of this plan rests on the will, participation, dedication, and enthusiasm of a broad array of local community members, businesses, and institutions.

6.1 Area A: Education and engagement

When considering the immense challenge of reducing carbon emissions while maintaining high quality of life, a fundamental task is to provide our whole community with an understanding of why carbon reduction and “clean” energy is important, plus actions they can take to reduce their own energy footprint and that of their business or organization. The strategies in this section also seek to actively engage Northfield residents, businesses, and institutions in implementation of energy conservation measures and renewable energy options to reduce their operating costs, energy consumption, and carbon emissions. Strategies in this category are focused on easy access to information, knowledge-sharing pathways, and outreach efforts that bring solutions to consumers rather than relying on them to actively seek out information.

EE-1 SMALL CONSUMER ENERGY ENGAGEMENT

- **Description:** Give households, small institutions, and small businesses easy access to energy education, energy conservation, and renewable energy programs that are directly applicable to their energy needs. Residents, small institutions, and small businesses represent the highest number of premises in the Northfield energy data, so broad and accessible outreach strategies will be the primary focus for this group. The City will ensure information will be accessible to all residents, regardless of age or income.
- **Recommended Actions:**
 - Implement the small consumer section of the “18-month Energy Action Plan” described in Appendix 3.
 - Establish an energy information “one-stop shop” on the City’s website and at City Hall.
 - Update and refresh information on an ongoing basis with current programs, incentives, and project resources.
 - Establish a Northfield Energy Task Force including local neighborhood “energy captains” to assist with outreach efforts described in Appendix 3 and the one-stop shop.

- Partner with the public schools to create energy education curricular materials and youth-focused events.

EE-2 LARGE CONSUMER ENERGY ENGAGEMENT

- **Description:** Engage Northfield's top energy consumers in efforts to achieve community-wide energy reduction targets and encourage them to share or develop their own in-house energy or carbon reduction plans and targets. These consumers use the largest percentage of energy and therefore can implement the highest impact energy reduction and renewable energy projects.
- **Recommended Actions:**
 - Implement the large consumers section of the "18-Month Energy Action Plan" outlined in Appendix 3.
 - Conduct 2–3 voluntary gatherings per year for at least three years after Energy Subcommittee Report adoption to facilitate and compare energy and carbon reduction plans, share knowledge and conduct tours of energy conservation and renewable energy projects.
 - Conduct at least five energy efficiency or renewable energy tours within three years of adopting this report.
 - In coordination with EE-4, develop an opt-in public energy and carbon emissions reporting platform for Northfield's largest energy consumers.

EE-3: ENERGY MARKETING AND TOURISM

- **Description:** This strategy focuses on outward engagement by marketing Northfield's energy conservation and renewable energy projects and programs in a way that attracts and retains tourists, residents, and local businesses. Northfield can position itself as an innovative, future-focused community that couples economic vitality with environmental stewardship in ways that enhance overall quality of life. This strategy takes advantage of existing innovations, such as the college wind turbines, community solar gardens, and community sponsored agriculture, while also envisioning future attractions such as net zero energy buildings and green developments. This strategy also hopes to position Northfield as a model city for energy innovation and sustainability.
- **Recommended Actions:**
 - Incorporate local energy initiatives into Northfield's tourism marketing materials.
 - Create a "sustainability tour" of local turbines, solar developments, CSAs, etc.

- Consider strategies for recruiting sustainability- and energy-focused businesses to existing Northfield spaces and/or a future green business park or industrial development.
- For any new residential or industrial development, evaluate the potential marketing value of green building construction and energy strategies.

EE-4: ENERGY REPORTING AND TRANSPARENCY

- **Description:** Increase energy awareness and engagement in Northfield's energy reduction efforts by making community-wide energy data readily available.
- **Recommended Actions:**
 - Develop a consistent reporting format for both Xcel Energy data from the Northfield substation and behind-the-meter data from privately owned renewable energy systems.
 - Establish a permanent page on the City's website to publish community-wide energy use from Xcel Energy data at the Northfield substation, renewable energy production, and green power purchases.
 - Compile calculations showing how much of Northfield's current total energy use (total of both substation data and behind-the-meter use) is renewable.
 - Publish annual updates by March 31 of each year including progress toward energy reduction targets.
 - Consider launching a real-time City building energy use dashboard for public/online display and education.

6.2 Area B: Policy and planning

The City of Northfield will join other leading communities and reinforce consistency with its own Comprehensive Plan by incorporating more specific energy and carbon reduction language in existing policies and planning documents. The goal of this section is to evolve Northfield's built environment into one that is more affordable, equitable, and resilient, as well as to institutionalize a low-carbon approach by weaving practical energy conservation and renewable energy opportunities into formal City of Northfield policies and planning activities. Strategies in this category are particularly focused on the existing environment, but overlap with practices related to land use and transportation.

Energy efficiency policies and programs that may have seemed far-fetched in the recent past are becoming increasingly common. Cities across the country are beginning to implement zero-energy building performance codes,¹¹ efficiency standards for rental housing,¹² and energy disclosure policies

¹¹ The California Public Utilities Commission now enforces net zero energy performance statewide for all single family homes and Washington D.C. is currently working toward adopting a residential zero-energy policy.

¹² The City of Boulder adopted the country's first standard for rental housing. Source: Rocky Mountain Institute: [Better Rentals, Better City](#)

for buildings,¹³ and home sales and rentals.¹⁴ The U.S. Department of Energy has a [Zero Energy Ready Home](#) program that “supports and recognizes builders for their leadership in increasing energy efficiency, improving indoor air quality, and making homes zero energy ready.” Policy examples and resources like these are growing rapidly as cities strive to have more efficient, more affordable, and better quality building stock.

PP-1 BUILDING ENERGY USE BENCHMARKING AND DISCLOSURE

- **Description:** Protect consumers, encourage better buildings and raise energy awareness by establishing a building energy benchmarking program and exploring policies that require owners to disclose building utility use relative to benchmark data as a pre-condition of any building sale or space lease. This could include providing information such as an energy audit report, benchmark data, or housing energy rating score (HERS).
- **Recommended Actions**
 - Establish an opt-in energy benchmarking program for commercial buildings including tools, resources and engagement.¹⁵
 - Research energy benchmarking requirements in other cities.¹⁶
 - Research energy use disclosure policies in other states or cities (e.g. Minneapolis, MN and Boulder, CO) and reference other disclosure requirements (e.g. radon) as examples.
 - Develop an educational fact sheet for realtors, lenders, city building officials, and others to educate buyers and renters about things they should know related to building energy use before making a purchase or signing a lease.
 - Make instructions on how to access building energy use, obtain a HERS rating, or conduct Xcel Energy audits available at City Hall and on the City website.
 - Support any future state-level legislation regarding building energy use disclosure.

PP-2 BUILDING ENERGY EFFICIENCY STANDARDS

- **Description:** There is never a better time to achieve meaningful energy efficiency than during new construction and gut renovations. This strategy proposes strengthening energy efficiency requirements for both of these key moments of opportunity.
- **Recommended Actions:**
 - Develop processes and procedures to enforce the existing energy-related goals of the Northfield Comprehensive Plan (See Appendix 5).

¹³ City of Minneapolis: [Energy Benchmarking and Transparency, Commercial and Multifamily Residential Buildings](#)

¹⁴ City of Minneapolis: [Time of Rent Energy Disclosure \(2021\) and Time of Sale Energy Disclosure \(2020\)](#)

¹⁵ City of St. Paul: [Energy Benchmarking Program](#)

¹⁶ City of Chicago: [Energy Benchmarking Program](#)

- Develop procedures that will strongly enforce existing energy codes.
- Consider requiring that all publicly funded buildings participate in Xcel Energy's Energy Efficient Buildings (EEB), Energy Design Assistance (EDA), or other similar programs that provide comprehensive energy efficiency recommendations.
- Develop guidelines for City-funded buildings to achieve an energy use intensity (EUI) 30% or more below the suggested ENERGY SMART® Portfolio Manager® average for that building type.
- Develop and distribute education and outreach tools that provide local builders and building owners with information on energy efficiency resources such as Xcel Energy's Efficient New Home Construction, Energy Efficient Buildings (EEB), and Energy Design Assistance (EDA) evaluations, the US Department of Energy Net Zero Homes certification, or similar programs.
- Explore ways of incorporating more specific energy efficiency requirements or stretch codes¹⁷ into new building or gut renovation projects.

PP-3 ENERGY-CONSCIOUS STRATEGIC GROWTH

- **Description:** Identify the energy and emissions impacts of new growth due to industrial or residential developments. Enforce and build on existing strategic growth policies in the Comprehensive Plan that prioritize infill and redevelopment before expansion (See Appendix 5).
- **Recommended Actions:**
 - Develop procedures to review energy and carbon emissions impacts of new developments relative to City of Northfield carbon reduction goals.
 - Report annually to the Planning Committee, Environmental Quality Commission and City Council on how strategic growth strategies in the Comprehensive Plan that emphasize infill over expansion or energy efficiency have been implemented to date and how they are being applied to upcoming developments.
 - Meet with City Departments and Commissions that have authority over applicable Comprehensive Plan strategies to review how their responsibility for implementing those strategies intersects with advancement of the City's energy and climate goals.
 - Model projected City growth over the next 50 years and resulting effect on energy consumption and greenhouse gas emissions. Report results to the Community Development Department, Planning Commission, Environmental Quality Commission and related City Departments & Commissions.

¹⁷ Stretch codes are jurisdictional energy efficiency requirements that exceed state or federal codes.

- Consider how renewable energy and net zero energy buildings can be incorporated into new residential or commercial/industrial developments

PP-4 FORWARD-THINKING UTILITY SYSTEM EXPANSION

- **Description:** Evaluate opportunities to incorporate forward-thinking district and renewable energy systems into City planning for new and existing developments.
- **Recommended Actions:**
 - As part of any new development conversation, study the cost, energy and carbon impacts in comparison to utility options that propose lower energy and carbon intensive outcomes versus a business-as-usual approach.
 - Conduct a concept study to assess opportunities for district energy systems that utilize current resources and envision a lower carbon approach to new developments.
 - Conduct a comprehensive life cycle cost–benefit analysis (considering cost, energy, and carbon) on any new development over 100 acres to determine whether district energy or on-site renewable energy should be considered in combination with — or in lieu of — running existing utilities to a new location.

PP-5 RENEWABLE ENERGY DEVELOPMENT

- **Description:** Renewable energy technologies are rapidly becoming less expensive, more productive, and easier to deploy on both private and public properties. Large-scale renewable energy projects including commercial-scale wind turbines and community solar gardens are predominant in Northfield, thanks to our rural environment and availability of undeveloped land. As both small and large scale renewable energy technologies advance, the City and its citizens could benefit from a more intentional, planned approach to incorporating them into our buildings and landscapes to assure we are taking full advantage of the energy production and resilience benefits, balanced with other land use priorities.
- **Recommended Actions:**
 - When evaluating current and future land development plans including any updates to the Northfield Land Development Code, consider intentionally incorporating areas for large-scale renewable energy developments.
 - Develop ways to support and encourage privately owned on-site renewable energy and energy storage technology.
 - Compile renewable energy grants and other funding opportunities, partner with local organizations, such as Northfield Area Community Solar and Growing Up Healthy, and develop targeted outreach campaigns that will support on-site

renewable energy installations for income-qualified residents and affordable housing properties.

- Develop policies that require all new homes and businesses be electric vehicle (EV) ready by a fixed date.
- Develop ways to encourage solar installations or solar-ready construction strategies on homes and businesses that are well-situated to take advantage of solar technologies.

PP-6 COMMUNITY ENERGY RESILIENCE PLAN

- **Description:** Power outages and energy-related emergencies can have especially profound impacts on Northfield's most vulnerable populations and its small business community. These events could result from floods, tornadoes, excessive heat, extreme cold and snow or non-weather related utility system outages. Given the increasing frequency and intensity of extreme weather events in Northfield, it is important to plan for these events in ways that both protect vulnerable citizens, particularly senior citizens and under-resourced community members, and ensure business continuity. A community energy resilience plan would help identify and connect people in need with available resources in an energy emergency.
- **Recommended Actions:**
 - Inventory local backup generator locations and capacity at schools, colleges, businesses, and residences. Identify which facilities can support local residents in an extended power outage.
 - Identify vulnerable households and conduct targeted outreach and energy reliability assistance to help them avoid or react during an energy emergency.
 - Develop outreach materials that will assist and encourage local businesses and residents to proactively develop their own energy resilience plan in preparation for energy outages and emergencies.

6.3 Area C: Innovation and demonstration

Meeting ambitious carbon emissions reduction targets will require a new approach to many standard practices. We therefore need ways to test unfamiliar concepts as we prepare to scale up those that prove to be both feasible and effective. The goal of this section is to develop and learn from pilot projects that demonstrate innovative solutions to lowering community-wide carbon emissions. Demonstration projects could be fully implemented by the City of Northfield, Northfield residents, businesses, and institutions, or implemented through public-private partnerships. The City of Northfield could spearhead such projects or provide grants, loans, or other incentives that encourage others to lead by example. City buildings, public school buildings, and affordable housing are called out as priorities given their potential to maximize the outreach and educational opportunities associated with innovative demonstration projects.

ID-1 DEEP ENERGY EFFICIENCY RETROFITS

- **Description:** Deep energy retrofits are improvements to existing buildings intended to significantly increase their energy efficiency. They could include updated insulation, windows, energy efficient heating and cooling systems, or installation of on-site renewable energy technologies. There is never a better time to achieve deep energy efficiency than during new construction and gut renovations, so this strategy proposes encouraging demonstration projects that promote this type of building retrofit and providing construction firms with the education and resources to implement successful deep energy efficiency projects.
- **Recommended Actions:**
 - Develop educational information and a targeted outreach campaign to owners, developers, and contractors.
 - Build, partner on, or incentivize at least three deep energy efficiency projects within City limits and highlight as demonstration projects.
 - Evaluate opportunities, grants, and other incentives to support weatherization and deep energy efficiency retrofits in all housing with particular focus on affordable housing developments.¹⁸

ID-2 NET ZERO ENERGY BUILDINGS

- **Description:** In order to meet local, state, and international carbon reduction goals, building construction must become net zero energy. Net zero energy buildings produce as much or more of their own energy with onsite renewable energy as they use within a year. The design industry recognized this and developed the [Architecture 2030 challenge](#) which aims to “rapidly transform the global built environment from the major contributor of greenhouse gas (GHG) emissions to a central part of the solution to the climate crisis.” The U.S. Department of Energy focused on the construction industry by developing its [Zero Energy Ready Home](#) certification. Cities and states are already implementing policies that require all new homes to be net zero energy by certain dates. A concept which once seemed futuristic is now poised for broad implementation. This section aims to begin bringing net zero energy buildings to Northfield.
- **Recommended Actions:**
 - Develop educational information and a targeted outreach campaign to qualified owners, developers, and contractors. Reference the U.S. Department of Energy

¹⁸ [U.S. Department of Energy: Low Income Community Energy Solutions](#)

[Zero Energy Ready Home](#), the [Net Zero Energy Coalition](#), and the Rocky Mountain Institute's [Pathways to Zero](#) programs as a starting point.

- Identify firms qualified to design, develop, or construct net zero energy buildings and encourage them to lead by example through projects in Northfield.
- Explore opportunities to build, incentivize, or partner on at least one net zero energy project within City limits. Prioritize municipal and education building projects with high potential for educational outreach, and affordable housing developments that will reduce operating costs and improve quality for under-resourced residents.

ID-3 STRATEGIC ELECTRIFICATION

- **Description:** The public electric grid is getting rapidly greener thanks to large-scale wind and solar development. Xcel Energy has recently pledged to provide 100% carbon-free electricity by 2050. Privately owned, on-site, renewable electricity technologies, such as rooftop solar PV, are being rapidly deployed thanks to financial incentives and technological advances that have increased productivity and decreased cost. Energy storage technologies (including electric vehicles) are becoming more mainstream, and smart grid infrastructure will allow renewable energy to be used at all hours of the day. The path to carbon neutrality is truly conceivable given a willingness to lean into electricity as the primary form of energy. This requires electrification of equipment and appliances that are commonly powered by gas, oil, or propane.
- **Recommended Actions:**
 - Review existing nationwide programs promoting electrification and present a written summary to the Environmental Quality Commission for consideration of ideas that could be implemented in Northfield.
 - Establish outreach and incentive programs to promote a switch to electricity for specific equipment and appliances (e.g. lawn mowers, hot water heaters, etc.).
 - Develop education and outreach information on electric forms of heating, such as cold climate heat pumps.
 - Require that all new homes and businesses be built electric vehicle (EV) ready.
 - Develop ways to encourage solar installations or “solar ready” construction strategies on homes and businesses that are well-sited to take advantage of solar technologies.

6.4 Area D: Support and continuation

The goal of this section is to establish a reliable, multi-level approach to implementing and sustaining this plan into the future. We must also establish processes that allow the recommendations and resources listed in this plan to be regularly updated in alignment with technological, financial, and policy

advancements at the local, state, and federal level. The greater our dedication and commitment to implementing the strategies in this plan, the greater its benefits will be. There is no quick fix to the environmental challenges that now demand strong focus on how we create and use energy. Thus, dedicated staff, strong, community-wide collaboration, and a long-term approach are key to making progress on the Energy Subcommittee Report and moving our community toward a lower-carbon future.

SC-1 CITY ENERGY COORDINATOR POSITION

- **Description:** Assure the goals of this plan are met by establishing a City Energy Coordinator position, on its own or as part of a City Sustainability Coordinator position, to facilitate the above recommendations. This plan proposes a wide array of engagement activities, policy research, and demonstration project facilitation efforts. Although volunteers can be recruited to assist with some of these tasks, a full-time paid position will provide much-needed continuity and dramatically increase the rate of success.
- **Recommended Actions:**
 - Hire a qualified energy coordinator that reports to the City Administrator. This person shall create and implement the programs described in this plan.
 - Establish an Energy Task Force to assist the Energy Coordinator with energy outreach efforts, development partnerships, etc. See Appendix 6 for a sample energy task force description.

SC-2 ADVANCING AND UPDATING THE PLAN

- **Description:** Regularly update and advance the Energy Subcommittee Report in response to progress to date and ongoing technological, financial, and policy developments. This plan should be seen as a working document that can only be effective if it keeps pace with rapidly changing energy-related developments and opportunities.
- **Recommended Actions:**
 - Energy Coordinator and Energy Task force shall deliver a bi-annual Northfield energy “report card” to the Planning Commission, Environmental Quality Commission noting progress on this plan, recognizing achievements, and targeting areas in need of further action.
 - Present a bi-annual progress summary to the City Council.
 - Every five years, update the goals and strategic priorities to align with current technological, economic, and policy developments.

7. Resources and Funding

There are a variety of City and community partners that are poised to assist with implementation of the Energy Subcommittee Report goals. A vigorous outreach campaign will help to bring potential partners on board and build collective action. Furthermore, key strategies from this plan will be incorporated into the broader Climate Action Plan and supported within that context. These local resources are long-term and thus offer continuity through the useful life of this plan and momentum for future updates. The external resources and funding suggestions noted here are by no means complete and will change over time. It is essential for the lead implementers of this plan to frequently review these resources and funding opportunities to stay abreast of current options.

7.1 Existing and potential city resources

- City of Northfield Community Development Department.
- City of Northfield Program Coordinator.
- Energy Coordinator position — a dedicated facilitator recommended as part of this report.
- Environmental Quality Commission — provides review and endorsement to City Council, assists with marketing engagement, and recognition programs.
- Planning and Zoning — aligns Comprehensive Plan goals, updates and implementation with Energy Subcommittee Report recommendations.
- Housing & Redevelopment Authority — reviews and collaborates on energy efficiency policies, building energy audits and efficiency, and net zero energy demonstration projects.
- Northfield Economic Development Authority (EDA) — adopts the goals of this report as it promotes the economic, commercial, housing, industrial development and redevelopment of the city.
- Engineering Department — considers incorporating strategic priorities in this report as it proposes and executes projects.
- Utility bill credits from community solar subscription — potential fund source for energy coordinator position or small grants and incentives.
- Utility savings from energy efficiency projects — potential fund source for more energy projects.

7.2 Potential community partners

- Northfield Energy Task Force and “energy captains” (recommended as part of this report).
- Greater Northfield Sustainability Collaborative (GNSC) — a collective group of representatives from the colleges and community that implement projects and assist with facilitating connections between community needs and college contacts.
- Northfield Public Schools.
- Carleton College — resources include the community and civic engagement office (CCCE), sustainability office, plus faculty, staff, and students engaged in sustainability and energy projects.
- St. Olaf College — community engagement office, facilities office, plus faculty, staff, and students.

- Rotary Club — the Northfield Rotary Climate Action Team (RCAT) has a sustainability committee focused on implementing projects that enhance the sustainability and resilience of the Northfield community.
- Northfield Earth Day committee — the annual Northfield Earth Day Celebration is a forum for the community to come together to celebrate progress on issues related to climate action and mobilize next steps toward a more sustainable Northfield.
- Northfield Chamber of Commerce — The Northfield Area Chamber of Commerce helps cultivate a healthy business environment for the Northfield area.
- Northfield Enterprise Center — conducts lunch and learns and provides business resources and assistance.
- Northfield Convention and Visitors' Bureau.
- Northfield Downtown Development Corporation (NDDC) — founded to support, strengthen, and grow Northfield's unique downtown district. The NDDC is made up of business owners, buildings owners, and engaged residents who value the role downtown plays in Northfield's vibrancy.
- Other local businesses, service clubs, building managers, developers, and contractors
- Northfield community members and volunteers.

7.3 External resources and potential funding opportunities

- Xcel Energy's Partners in Energy offering — committed to supporting 18 months of implementation efforts focused on energy engagement, audits, and efficiency.
- [State of Minnesota Commerce Department](#) — offers loans, grants, credits, or rebates for energy-related improvements to homes, seeking assistance with energy bills, and other programs available to Minnesotans to help with energy conservation, efficiency, and renewable energy projects.
- [Clean Energy Resource Teams](#) (CERTs) — connects individuals and communities in Minnesota to the resources they need to identify and implement community-based clean energy projects.
- [United States Department of Energy](#) — mission to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions.
- [Bush Foundation](#) — the Bush Prize celebrates organizations with a track record of successful community problem solving.
- [Rocky Mountain Institute](#) — RMI engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables.

As noted above, this is not a comprehensive list and should be regularly reviewed, expanded and updated.

8. Conclusion

This report and the action items included is a first attempt by the City of Northfield to aggressively work on energy efficiency and reduction of energy use. The City of Northfield staff, elected officials, residents, businesses and institutions will all need to be involved in a variety of ways to carry out the actions. As changes in technology and other opportunities arise the actions in this report will be amended.

Given the extremely serious nature of anticipated effects of our changing climate we have a responsibility to our community and beyond to take action. The City has made a commitment in its Strategic Plan and has begun to carry that out by starting to increase staff capacity. Implementing the actions in this document will require an even stronger commitment in terms of staff time, financial resources and policy choices that help reach the goals that have been set forth.

Northfield is a community which cares about its residents, businesses and the natural environment. Achieving the goals outlined in this plan will increase engagement with under-served populations, promote economic development of our businesses, strengthen our tourism and improve public health for our entire community. We believe the strategic priorities identified in this report will put Northfield on its path towards achieving carbon neutrality.

9. Appendices

Appendix 1: Acknowledgements

Appendix 2: Northfield's Baseline Energy Analysis

Appendix 3: 18-month Energy Action Plan

Appendix 4: 2008 Mayor's Energy Task Force Report Summary

Appendix 5: Comprehensive Plan Implementation Matrix Excerpts

Appendix 6: Sample Energy Task Force Solicitation

Appendix 7: Xcel Energy Partners in Energy Plan Development Process

Appendix 8: Glossary of Terms

Appendix 1: Acknowledgements

Thank you to the following individuals and organizations who contributed many hours of service to the Northfield's Climate Action Plan Advisory Board's Energy Subcommittee. Their perspective and input were essential to developing this plan.

Climate Action Plan Advisory Board Representatives	
Bruce Anderson	Dakota County Weatherization & Energy Efficiency Programs
Martha Larson	Manager of Campus Energy and Sustainability, Carleton College
Climate Action Plan Advisory Board Energy Subcommittee	
Bill Jokela	Community representative
Bruce McKendry	Community Representative
Charles Hayes	Sheldahl, a Flex Company
David Frost	Just Food Coop
Joe Gasior	Northfield Plant Engineering Manager, Post Consumer Brands; Northfield Planning Commission
David Higgs	Educational Associate, Carleton College
Don Anderson	Community representative, Retired energy engineer
Eric Johnson	Community representative, Former teacher at Northfield Public Schools
Jennyffer Barrientos	Coordinator, LINK Center
Jerry Ehn	Northfield Hospital and Clinics
Jim Kulseth	Director of Facilities and Grounds, Northfield Public Schools
Kevin Larson	Facilities Director, St. Olaf College
Laura Tiano	Growing Up Healthy; Healthy Community Initiatives
Lee Dilley	Rotary Climate Action Team (RCAT); 2008 Mayor's Energy Task Force
Matt Rohn	Professor, St. Olaf College; Board Member, Northfield Area Community Solar
Richard Debeau	Rotary Club
Tony Huettl	Community representative
City of Northfield	
Beth Kallestad	Program Coordinator
Bryanna Paarmann	GIS Technician
David Bennett	Public Works Director/City Engineer
Rhonda Pownell	Mayor
Partners in Energy Team	
Marisa Bayer	Partners in Energy Lead Community Facilitator
Jamie Johnson	Partners in Energy Community Facilitator
Tami Gunderzik	Manager of Partners in Energy, Xcel Energy
Trisha Duncan	Community Relations Manager, Xcel Energy
Yvonne Pfeifer	Community Energy Efficiency Manager, Xcel Energy

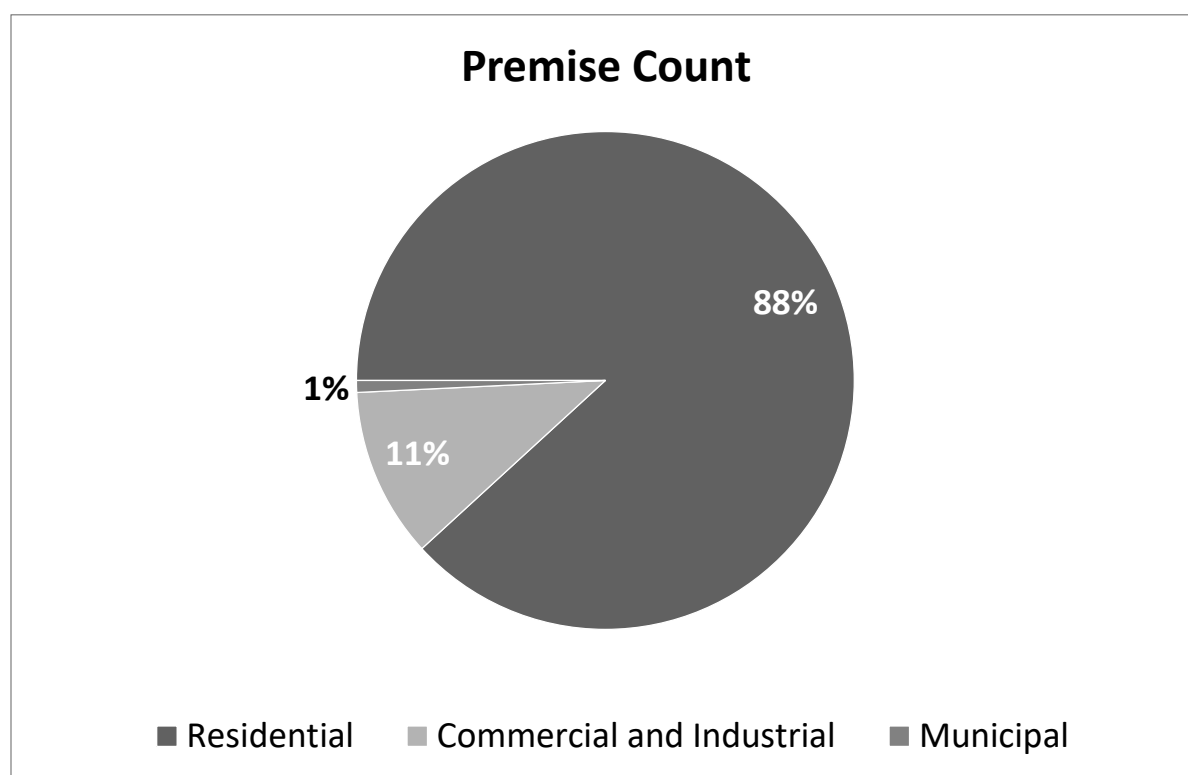
Appendix 2: Northfield's Baseline Energy Analysis

An integral part of the Partners in Energy planning process is reviewing historic energy data for Northfield, which includes data on energy use, participation in utility energy conservation programs, and savings associated with participation in those programs. Data was provided by Xcel Energy for all Northfield premises for 2015–2017.¹⁹ The data helped the Energy Subcommittee understand Northfield's energy use and opportunities for energy conservation and renewable energy. Data included in this section will also establish a baseline against which progress toward goals will be compared to in the future.

Premises

A premise is a unique identifier for the location of electricity or natural gas service. In most cases, it is a facility or building location. In Northfield, there are 7,421 premises served by Xcel Energy. The distribution of premises among residential, commercial and industrial, and municipal sectors is shown in Figure 2.

FIGURE 2: DISTRIBUTION OF PREMISES, 2017



Energy consumption

Northfield premises consumed a total of 265.7 million kilowatt-hours (kWh) of electricity and 18.7 million therms of natural gas in 2017. Combined, all sectors spent \$31.2 million dollars on energy in

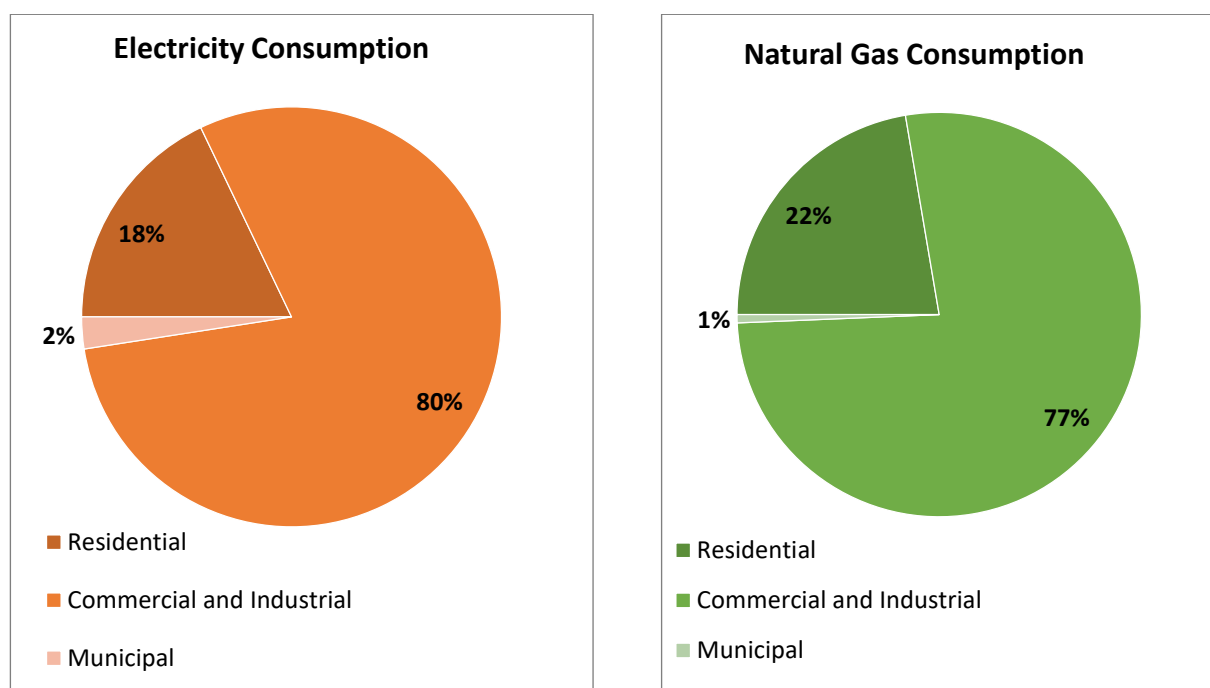
¹⁹ The electricity and natural gas data in this plan complies with Xcel Energy's 15 x 15 privacy rules. No premises were removed from the summary.

2017.²⁰ Although the majority of premises are residential, most electricity and natural gas are consumed by commercial and industrial premises (

Figure 3).

Commercial and industrial premises consumed 80% of the electricity and 77% of the natural gas consumed in Northfield in 2017, spending an average of \$27,000 on electricity and \$4,600 on natural gas per premise per year.²¹ Residential premises consumed 18% of electricity and 22% of natural gas, spending an average of \$900 on electricity and \$400 on natural gas per premise in 2017. The remaining energy was consumed by municipal premises, representing 2% of electricity and 1% of natural gas.

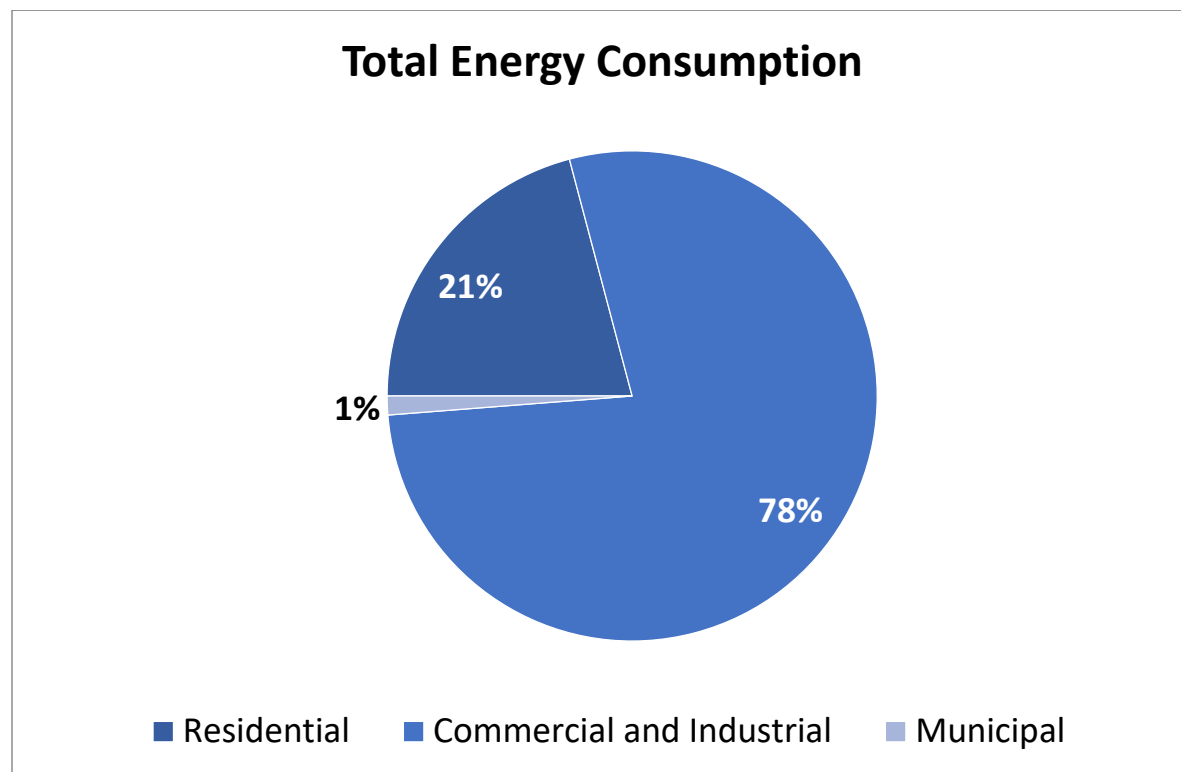
FIGURE 3: ENERGY CONSUMPTION BY FUEL SOURCE, 2017



²⁰ This excludes any taxes and fees.

²¹ The commercial and industrial customer usage and spending can be highly variable, which can have an impact on customer averages.

FIGURE 4: TOTAL ENERGY CONSUMPTION, 2017



Greenhouse gas emissions

Energy-related greenhouse gas (GHG) emissions have slightly decreased since 2015. The commercial and industrial sector accounts for most of Northfield's emissions (Figure 5), but has reduced its carbon emissions since 2015 by almost 4%. When looking at emissions by fuel source for baseline years,²² electricity has consistently contributed to just over half of Northfield's annual GHG emissions (Figure 6).

²² 2015, 2016, and 2017.

FIGURE 5: ENERGY-RELATED GREENHOUSE GAS EMISSIONS, BY SECTOR

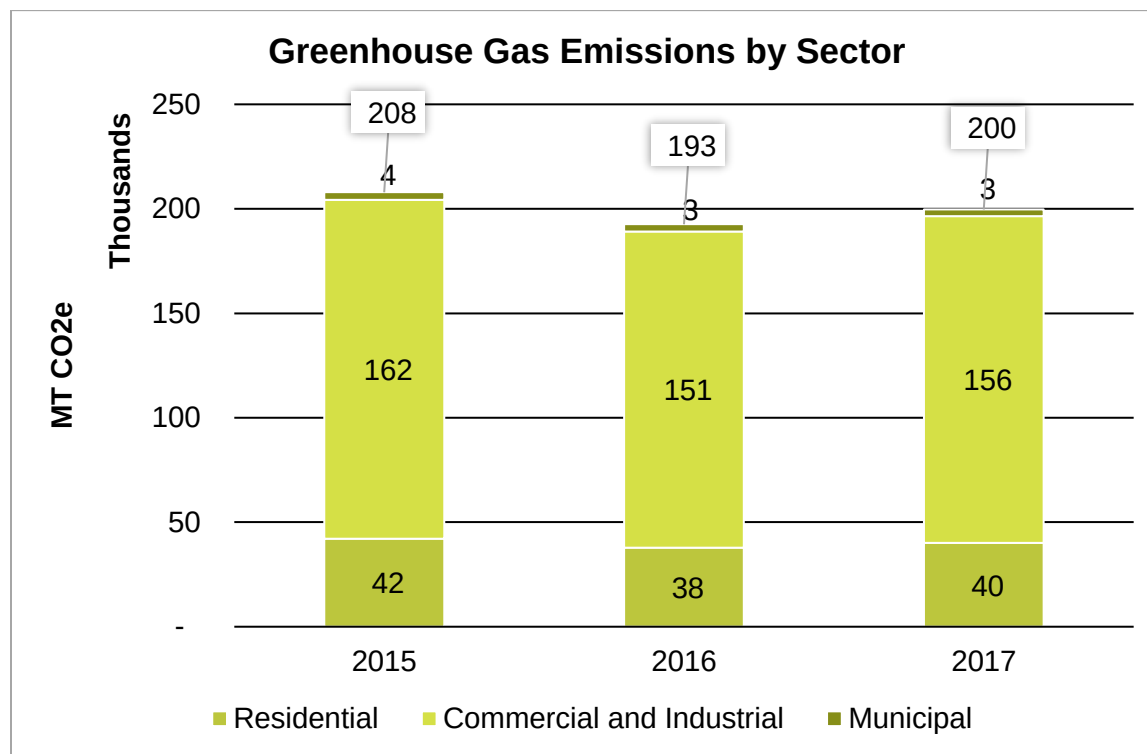
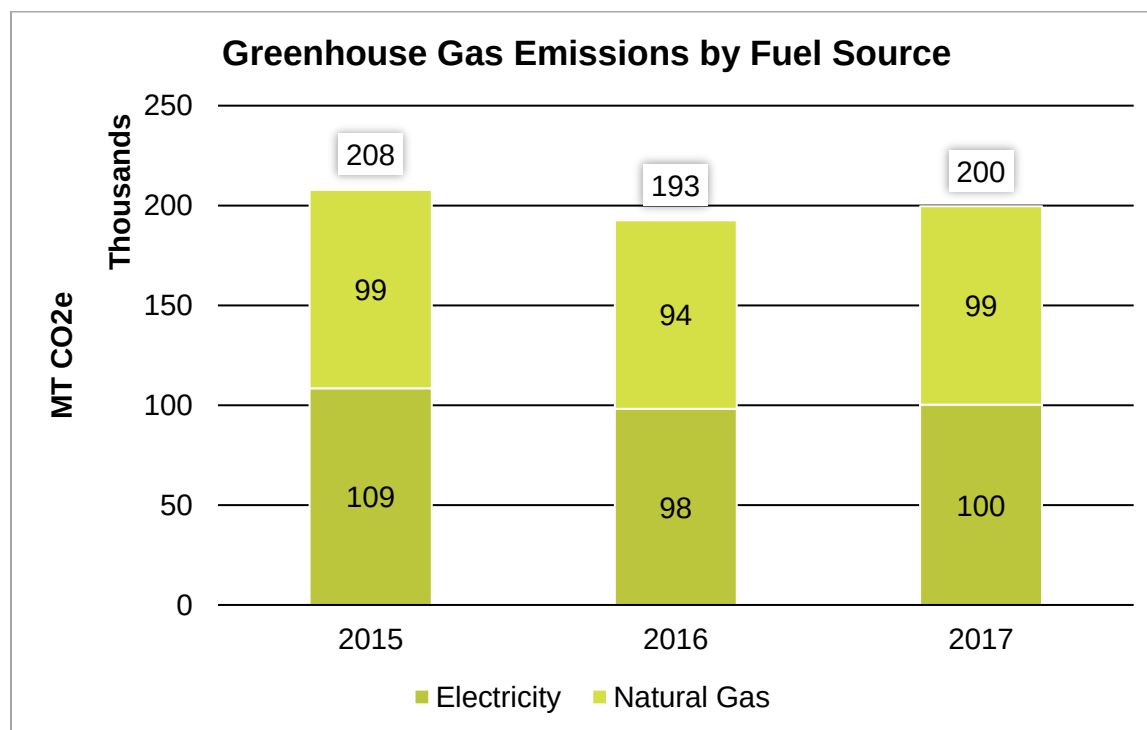


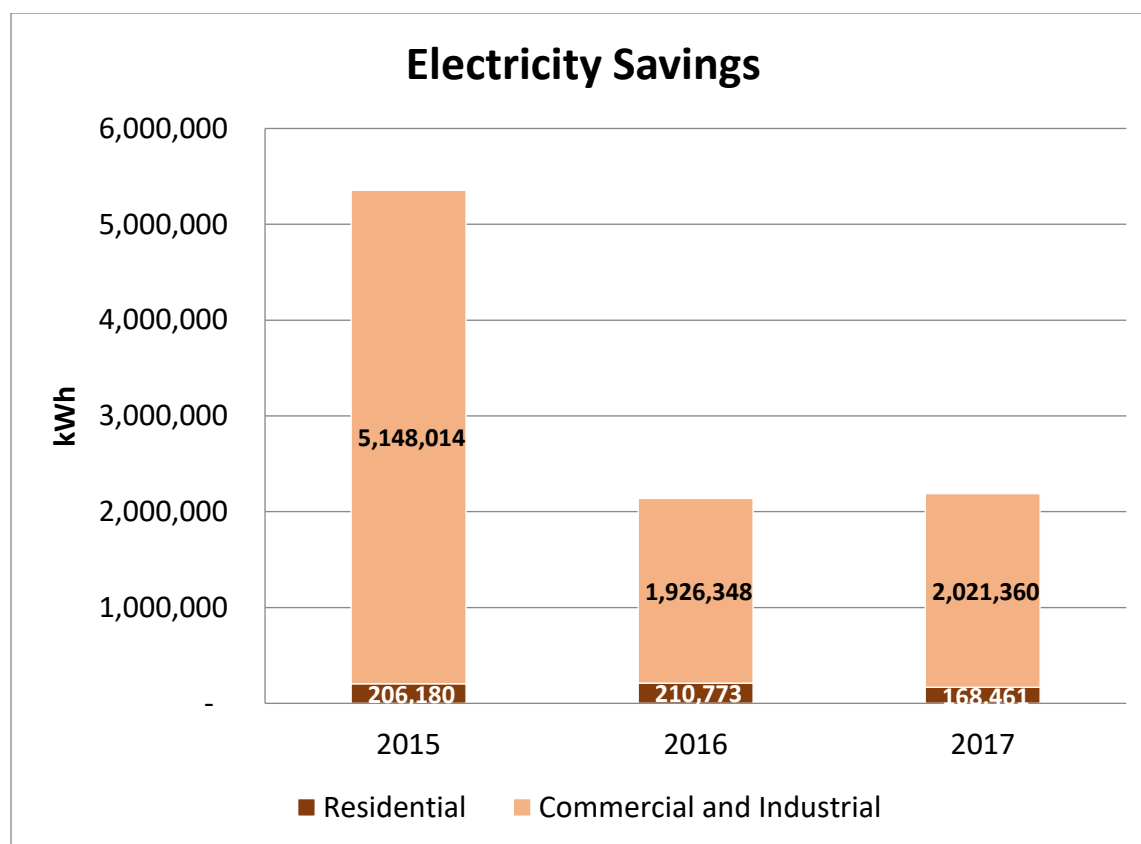
FIGURE 6: ENERGY-RELATED GREENHOUSE GAS EMISSIONS, BY FUEL SOURCE



Energy conservation

Energy conservation is an important first step toward energy resiliency. By increasing efficiency, residents and businesses can save energy and money. Xcel Energy offers a wide variety of energy conservation programs to help residents and businesses increase energy efficiency. Between 2015 and 2017, annual energy conservation savings have amounted to an average of 1.2% of electricity consumption and 0.7% of natural gas consumption.

FIGURE 7: ELECTRICITY SAVINGS FROM ENERGY CONSERVATION PROGRAM PARTICIPATION, BY SECTOR²³



²³ Commercial and Industrial electricity savings includes municipal premises.

FIGURE 8: NATURAL GAS SAVINGS FROM ENERGY CONSERVATION PROGRAM PARTICIPATION, BY SECTOR²⁴

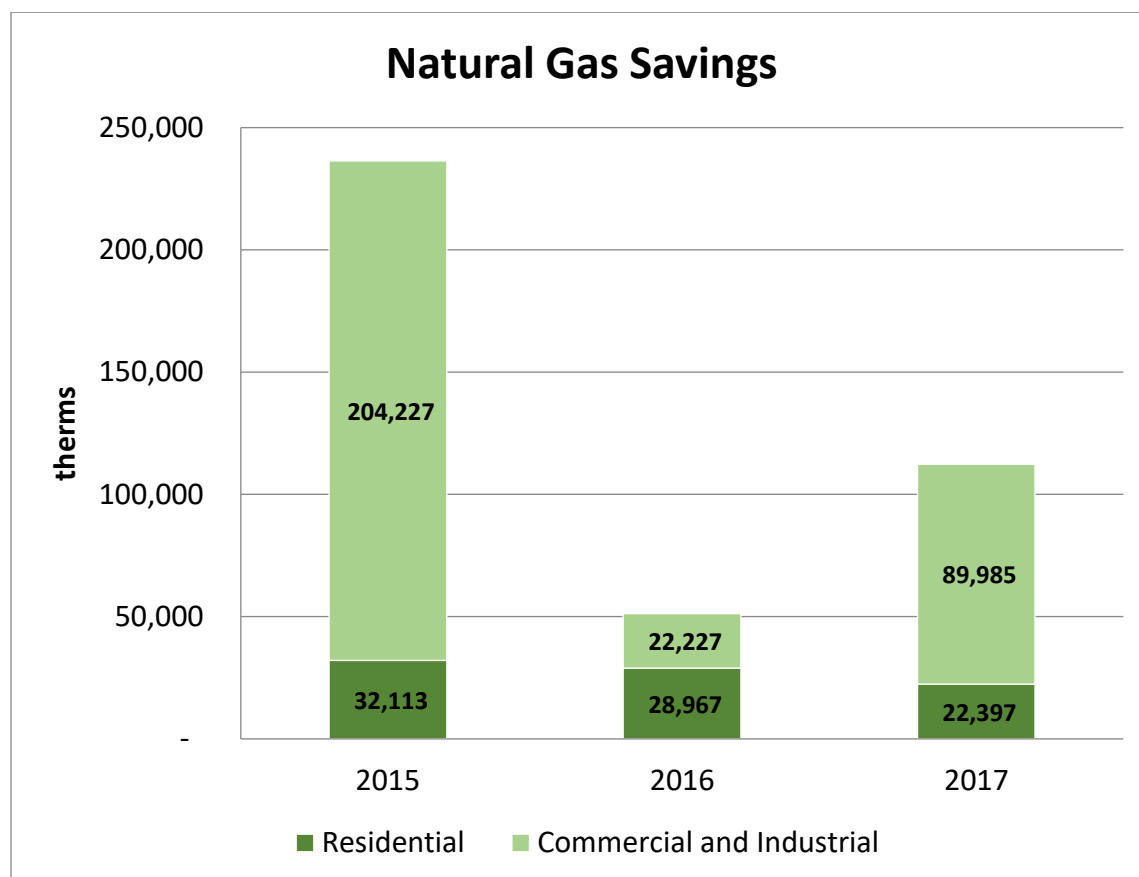


Table 1 summarizes residential and commercial/industrial participation in Xcel Energy's energy conservation programs for the past three years. Total participation in residential conservation programs has increased slightly since 2015. In 2017, Northfield residents saved 168,000 kWh and 22,000 therms, 0.5% of total residential energy use. Residential program participation has been highest in the Saver's Switch rate savings program. Participation in home efficiency rebates, including the replacement of heating and cooling equipment, has also seen high participation. Lighting rebates have been most popular among commercial and industrial customers. In 2017, commercial and industrial premises saved 2 million kWh and 90,000 therms, representing 0.7% of total sector energy use.

²⁴ Commercial and Industrial natural gas savings includes municipal.

TABLE 1: RESIDENTIAL AND COMMERCIAL/INDUSTRIAL CONSERVATION PROGRAM PARTICIPATION SUMMARY²⁵

Residential	Program Name	2015	2016	2017
	Efficient New Home Construction	9	16	3
	Home Energy Audit	29	11	17
	Home Energy Savings Program	4	7	-
	Home Energy Squad	26	4	8
	Insulation Rebate	2	2	5
	Low-Income Home Energy Squad	8	-	1
	Multi-Family Energy Savings Program	-	8	-
	Refrigerator Recycling	24	20	19
	Residential Cooling	108	135	123
	Residential Heating	137	147	145
	Residential Saver's Switch	20	45	383
	Smart Thermostat	-	47	22
	Whole Home Efficiency	-	1	-
	Water Heater Rebate	19	19	20
	Total	386	462	746
Commercial/Industrial	Program Name	2015	2016	2017
	Computer Efficiency	-	1	-
	Cooling Efficiency	2	7	6
	Custom Efficiency	6	-	6
	Data Center Efficiency	-	-	-
	Efficiency Controls	-	-	-
	Electric Rate Savings	3	7	1
	Energy Design Assistance	-	-	2
	Energy Efficient Buildings	1	-	-
	Fluid System Optimization	-	3	-
	Foodservice Equipment	-	1	5
	Heating Efficiency	4	5	8
	Lighting Efficiency	19	22	18
	Motor Efficiency	1	6	5
	Multi-Family Building Efficiency	-	6	5
	Process Efficiency	-	-	-
	Recommissioning	4	12	-
	Saver's Switch For Business	2	28	1
	Turn Key Services	-	-	-
	Small Business Lighting	8	4	10
	Total	50	102	67

Renewable energy

Northfield has made strides to support both off-site and on-site renewable energy generators. Supporting renewable energy development is important to ensuring Northfield remains resilient to future impacts of climate change.

²⁵ Commercial and Industrial Conservation Improvement Program participation includes municipal premises.

Off-site renewable energy

Renewable energy generators, such as solar panels or wind turbines, are off-site from the facility or home that they are powering. We see support for this type of renewable energy through participation in utility-sponsored renewable energy subscription programs and community solar garden subscriptions. Table 2 shows the breakdown of renewable energy subscriptions in 2017.

TABLE 2: RENEWABLE ENERGY SUBSCRIPTIONS, 2017

Windsorsource®	Residential	Commercial & Industrial
Subscribers	437	3
Subscription Amount (kWh)	1,370,700	14,707,249
% of Sector Electricity Use	2.9%	6.8%
Community Solar Gardens		
Subscribers	143	2
Production Allocation (kWh)	252,528	9,223,272
% of Sector Electricity Use	0.5%	3.6%
Renewable*Connect²⁶		
Subscribers	33	11
Subscription Amount (kWh)	196,031	9,711,809
% of Sector Electricity Use	0.4%	4.6%

On-Site renewable energy: Behind the meter

Renewable energy generators, such as solar panels or wind turbines, are installed on-site to supply some or all of the power for that facility or home.

TABLE 3: BEHIND THE METER ENERGY GENERATORS, 2017

Solar*Rewards ²⁷	Residential	Commercial & Industrial
Installations	76	5
Total Capacity (kW)	487	67
Total Energy Produced (kWh)	310,468	43,677
Wind Turbines		
	Carleton College	St. Olaf College
Total Energy Produced (kWh)	3,863,546	2,840,218

²⁶ Renewable*Connect subscriber data for 2018.

²⁷ Solar*Rewards is an incentivized program, so monthly payments are made to the owner of the solar system in exchange for Renewable Energy Credits (RECs) for the energy produced by the solar system. Data for 2017.

Appendix 3: 18-month Energy Jump Start

The 18-month Energy Jump Start includes 14 strategies and near-term targets to help Northfield hit the ground running towards meeting our carbon reduction targets. Implementation of these strategies and achieving near-term targets will require a lot capacity building and problem solving. The City of Northfield will lead these strategies, but additional human, financial, and policy resources will be needed to ensure we are successful. Xcel Energy's Partners in Energy will provide marketing and communications support, data tracking and measurement, program expertise, and project management to keep our team on track during the 18-month implementation.

At the core of the 18-month Energy Jump Start is accessible education and outreach. This will ensure everyone in the Northfield community is aware of the benefits of energy efficiency and renewable energy, and resources are available. The City of Northfield will make an effort to ensure materials are available in different formats and other languages, as needed.

Our outreach is focused on two target audiences:

- **Small Consumers:** inclusive of all residents, including homeowners and renters, small businesses, and nonprofit organizations.
- **Large Consumers:** inclusive of local institutions, such as the colleges and hospital, large businesses, and industrial businesses.

Detailed strategies were created for each target audience and include specific tasks, near-term targets, outreach tactics, implementation team, and resources. Near-term targets will be achieved by the end of 2020 and measured against a 2017 baseline.

Part 1: Small consumer strategies

Small Consumer Strategy A) Create centralized, quick-reference guide on energy efficiency and renewable energy options for residents	
Description	The centralized, quick-reference guide will make it easy for residents to learn about different energy efficiency and renewable energy options. The guide will be available electronically and hard copy.
Tasks	• Identify information and tips to include in guide • Draft content for guide • Format and design guide • Print hard copies of guide
Outreach Strategy	• Host guide on City website • Distribute guide at City and community events • Social media posts on City social media to promote guide's availability • Share guide with community partners to share with their network
Timeline	• Q3 2019
Goal(s)	• Create and publish guide
Implementation Lead	• Partners in Energy
Implementation Team	• City of Northfield • Northfield Energy Task Force
Resources	• Webpage(s) to host guide on City website • Hard copy of guide • Information and tips to include in guide • Partners in Energy hours to help write and design guide • Community partners for dissemination, such as Greater Northfield Sustainability Coalition, Rotary Club, Carleton College, St. Olaf College, Northfield School District, and By All Means Graphics • Funding to assist with printing costs

Small Consumer Strategy B) Promote home energy audits through city-wide marketing campaign	
Description	Home energy audits are an easy way for residents to learn about energy efficiency opportunities in their home. Home Energy Squad® offers custom energy-saving solutions in one visit. Homeowners and renters who live in 1–4 unit buildings are eligible to participate and free visits are available to income-qualified households.
Tasks	• Create informational flyer/postcard • Identify communication channels to promote information • Identify City and community events to table at • Identify volunteers to help with tabling • Identify neighborhood captains to help promote Home Energy Squad in their neighborhood • Train neighborhood captains
Outreach Strategy	• Host information on City website • Informational flyer/postcard • Social media posts on City social media • Table at City and community events • Conduct targeted outreach in neighborhoods using neighborhood captains • Share information materials with community partners to share with their network
Timeline	• Q4 2019–Q4 2020
Goal(s)	• 100 Home Energy Squad visits completed in 2020 ○ Baseline: 8
Implementation Lead	• Northfield Energy Task Force
Implementation Team	• City of Northfield • Partners in Energy • Home Energy Squad • Neighborhood Captains
Resources	• Information materials about • Webpage(s) to host materials • Community events for tabling • Volunteers to table • Tabling kits • Volunteers to be neighborhood captains • Training materials for volunteers • Community partners for dissemination, such as the Greater Northfield Sustainability Coalition, ISAIAH, Northfield Rotary Club, Northfield School District, and Northfield Community Education

Small Consumer Strategy C) Design city-wide challenge for residents to subscribe 100% to renewable energy	
Description	Renewable energy is important to helping our community reduce its carbon footprint. A renewable energy challenge will help promote renewable energy subscriptions, which are an easy way for all residents to access renewable energy. The challenge will be for residents to subscribe to 100% renewable electricity.
Tasks	• Create challenge structure and rules • Create promotional materials for challenge • Identify dates for challenge • Identify prizes or incentives to offer to participants • Create entry form • Promote challenge • Engage Neighborhood Captains and Energy Task Force to conduct door-to-door outreach or host block parties to promote
Outreach Strategy	• Promotion on City communication channels • Table at City and community events to encourage registration • Engage in door-to-door marketing or energy block parties • Share challenge information with community partners to share with their network
Timeline	• Q1 2020–Q2 2020
Goal(s)	• Double the number of residents who subscribe 100% of their electricity to renewable energy ○ Baseline: 86
Implementation Lead	• City of Northfield • Northfield Energy Task Force
Implementation Team	• Partners in Energy
Resources	• Challenge structure • Challenge rules • Prize or incentive for challenge participants • Webpage(s) to host challenge information • Informational materials to promote challenge • Entry form for prizes or incentives • Data to track progress towards challenge goal • Volunteers to table and promote during events • Community partners to promote challenge, such as Greater Northfield Sustainability Coalition, ISAIAH, and Northfield Rotary Club

Small Consumer Strategy D) Targeted outreach to under-resourced residents at manufactured home parks to promote energy efficiency upgrades	
Description	Under-resourced households, which include low-income and fixed-income residents, typically experience energy burden at a higher rate than others. These households can greatly benefit from energy efficiency upgrades. There are free programs and resources available to income-qualified households that would be the focus of this outreach.
Tasks	• Identify manufactured homes for outreach • Identify local service provider partners • Coordinate outreach with service provider partners • Create information materials and handouts • Translate information materials (if needed) • Identify date(s) for outreach • Identify volunteers to help with outreach • Conduct door-to-door outreach
Outreach Strategy	• Informational flyers and handouts for outreach • Flyers or emails to manufactured home park residents about outreach • Newsletter article about outreach and success • Share information with service providers and community partners to distribute within their network
Timeline	• Q3 2019–Q4 2019
Goal(s)	• Conduct outreach at both manufactured home parks in Northfield • 50 participants in Xcel Energy’s low income programs: Home Energy Savings Program (HESP) and Low Income Home Energy Squad ○ HESP Baseline: 0 ○ Low Income Home Energy Squad Baseline: 1
Implementation Lead	• City of Northfield • Growing Up Healthy
Implementation Team	• Northfield Energy Task Force • Home Energy Squad • Partners in Energy • Manufactured home park property managers • Service providers and partners, such as Community Action Center of Northfield, , and Northfield Housing and Redevelopment Authority
Resources	• Co-branded information materials targeting under-resourced residents and programs • Volunteer time to assist with door-to-door outreach • Partnership with local service providers to help with outreach • Staff hours/volunteers to help coordinate outreach between partners • Translation services for materials and outreach (if needed) • Community partners to support outreach, such as Greenvale Park Community School, ISIAH, Neighbors United, and Northfield Rotary Club.

Small Consumer Strategy E) Co-host free electric vehicle ride and drive events at existing community events, places of employment, and/or destinations	
Description	Electric vehicles have the potential to drastically reduce emissions and air pollution by utilizing increasingly green electricity fueled by renewables. Electric vehicle ride and drives help educate the public about the benefits of owning an electric vehicle. Ride and drives give community members an opportunity to sit in and in some cases, test drive a vehicle.
Tasks	• Identify existing events, places of employment, and destinations to host ride and drives • Outreach to local event organizers and places of employment to assess interest in partnering to host ride and drive • Outreach to local electric vehicle groups to assess interest in providing vehicles for event • Coordinate event logistics with event coordinators • Table at event to share utility program information, such as rate structures and incentives
Outreach Strategy	• Promote ride and drive events on City website and social media • Share event information with local business associations and community partners to distribute to their network • Promote ride and drive events using the host event or host destination's network and marketing materials
Timeline	• Q3 2019–Q4 2020
Goal(s)	• Host 3 ride and drive events
Implementation Lead	• City of Northfield • Northfield Energy Task Force
Implementation Team	• Northfield Area Chamber of Commerce & Tourism • Northfield Downtown Development Corporation •
Resources	• Volunteers to conduct outreach to potential event co-hosts • Existing community events to co-host ride and drive • Informational materials about electric vehicles and charging rates to share during event • Partnership with local electric vehicle groups to supply vehicles • Community partners to host, such as Greater Northfield Sustainability Coalition, , Northfield Rotary Club, Northfield School District, Carleton College, and St. Olaf College, and local car dealers that sell electric vehicles. • Community events to host, such as Riverwalk Market Fair, Defeat of Jesse James Days, Crazy Days, Home & Garden Show • Local businesses or destinations with parking lots to host, such as local car dealerships who sell electric vehicles.

Small Consumer Strategy F) Survey small businesses and nonprofit organizations about how they use and think about energy to develop a targeted outreach campaign	
Description	Small businesses and nonprofit organizations are an important part of our action plan. Identifying how they use and think about energy will allow the City of Northfield and Energy Subcommittee to further identify and refine strategies for engaging businesses and nonprofits. The survey will include questions about energy efficiency and renewable energy generation.
Tasks	• Gather input on questions from implementation team • Create survey • Set timeline for survey responses • Distribute survey • Identify business associations to help with promotion and outreach • Review and analyze survey results • Create and refine small business strategies to further engage business community
Outreach Strategy	• Promote survey on City communication channels • Share survey with local business associations and community partners to distribute to their network
Timeline	• Q1 2020–Q2 2020
Goal(s)	• Distribute one small business/nonprofit organization survey
Implementation Lead	• Partners in Energy
Implementation Team	• City of Northfield • Northfield Energy Task Force • Northfield Economic Development Authority
Resources	• Survey platform • Survey questions • Partnerships with local business associations to disseminate survey, such as Northfield Area Chamber of Commerce & Tourism, Northfield Downtown Development Corporation, and Northfield Rotary Club • Community partners to disseminate survey, such as the Greater Northfield Sustainability Coalition, ISAIAH, Carleton College, and St. Olaf College

Small Consumer Strategy G) Engage small businesses and nonprofit organizations in energy efficiency action through door-to-door outreach with energy coaches	
Description	Door-to-door outreach, sometimes call a “business blitz,” can be an effective way to engage small businesses and nonprofit organizations to spread the message of energy efficiency and renewable energy. As part of a blitz, volunteers will go door-to-door with a simple call to action, such as sign up for a free energy assessment. Energy coaches act as points of contact for businesses to answer questions and encourage action.
Tasks	• Identify call to action for businesses to take • Use business/organization survey (see Small Consumer Strategy F) results to create information materials with call to action information • Identify volunteers to serve as energy coaches • Train volunteers • Establish partnerships with local business associations and civic associations • Identify dates for door-to-door outreach • Coordinate volunteers and energy coaches for door-to-door outreach • Conduct door-to-door outreach to businesses and nonprofit organizations • Conduct follow up to encourage action and follow through on recommendations • Identify date and host for a celebration event for organizations and volunteers who participated in blitz • Send invitations and collect RSVPs for celebration event • Order refreshments and food for celebration event
Outreach Strategy	• Promote outreach on City communication channels • Distribute information materials on City communication channels • Issue a final report celebrating the total number of businesses reached during the blitz, and the number of projects completed with savings information (if available) • Share information materials, door-to-door outreach dates, and final report with local business associations to distribute to their network • Host celebration event for all organizations and volunteers who participated to share success stories
Timeline	• Q2 2020–Q3 2020
Goal(s)	• Conduct one door-to-door “blitz” campaign in downtown Northfield • Sign up 30 businesses or nonprofit organizations to complete/move forward with the call to action
Implementation Lead	• City of Northfield • Northfield Energy Task Force
Implementation Team	• Partners in Energy • Clean Energy Resource Teams (CERTs) • Local business organizations (to be identified)

Resources	• Volunteers to help with outreach • Volunteers to act as energy coaches • Training materials and talking points for energy coaches • Information materials with call to action information, such as free assessment and audit information • Local business organizations to support outreach, such as Northfield Area Chamber of Commerce & Tourism, Northfield Downtown Development Corporation, Northfield Enterprise Center, and Northfield Rotary Club • Community partners to support outreach, such as the Greater Northfield Sustainability Coalition, Carleton College, and St. Olaf College • Space for celebration event • Invitation platform for celebration event • Refreshments and food for celebration event
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Small Consumer Strategy H) Host an “energy” booth for the 2020 Northfield Home & Garden Show, Earth Day Celebration, River Walk Market Fair and other city-wide events	
Description	The Northfield Home & Garden Show is an excellent opportunity to reach small consumers about energy efficiency and renewable energy information. An “energy” booth will share information about how to integrate energy efficiency into a home renovation and programs available to help keep costs low.
Tasks	• Engage Northfield Area Chamber of Commerce about adding booth to 2020 event • Identify and mobilize volunteers to table • Create tabling materials, including flyers about energy efficient renovations
Outreach Strategy	• Leverage existing marketing for event by Northfield Area Chamber of Commerce • Promote energy booth on City communication channels
Timeline	• Q4 2019–Q2 2020
Goal(s)	• Energy booth at 2020 Northfield Home & Garden Show
Implementation Lead	• City of Northfield • Northfield Energy Task Force
Implementation Team	• Northfield Area Chamber of Commerce & Tourism
Resources	• Volunteers for tabling • Information materials • Tabling kit and materials

Part 2: Large consumers strategies

Large Consumer Strategy A) Host best practice energy workshops and tours with case studies	
Description	Energy workshops and tours are an effective way to share energy efficiency and renewable energy success stories with other large consumers. Workshops are a great way to share best practices and ROI information that resonates with businesses. Tours can show attendees real life application of energy efficiency and renewable energy measures.
Tasks	• Identify potential workshop/tour hosts • Coordinate initial tour and or workshop structure • Distribution list or contact information for large consumers and other attendees to invite • Send invitations for tour(s) • Draft case study/flyer about improvements • Host tour(s) • Follow up with attendees to encourage action and to host their own workshop or tour
Outreach Strategy	• Promote workshops/tours on City communication channels • Press release to promote workshops/tours • Case studies to highlight host's improvements • Share tour dates and information with local partners to share with their network
Timeline	• Q4 2019–Q4 2020
Goal(s)	• Host 5 tours, per year
Implementation Lead	• City of Northfield • Northfield Energy Task Force
Implementation Team	• Partners in Energy • Xcel Energy
Resources	• Structure for tours • Invitation and RSVP platform • Workshop/tour hosts • Presenters • Presentation materials for workshop/tour hosts • Refreshments and food for event • Local partners to support outreach, such as Greater Northfield Sustainability Coalition, Northfield Area Chamber of Commerce & Tourism, Northfield Downtown Development Corporation, Northfield Enterprise Center, Economic Development Authority and Northfield Rotary Club • Local institutions to act as initial hosts, such as Carleton College, St. Olaf College, Northfield School District, and Northfield Hospital

Large Consumer Strategy B) Facilitate a large consumer energy coalition to share best practices on action plans and carbon reduction goals	
Description	Each large consumer must be entrusted to develop their own action plan tailored to their specific organizational mission and operations. The purpose of this strategy is to encourage large users to compare existing action plans and goals, create a plan and set goals (for those who haven't already done so), and share resources, approaches and best practices with respect to large consumer energy conservation and carbon reduction strategies.
Tasks	• Identify group facilitator/convener • Invite large users to join coalition • Create platform or process for sharing best practices with coalition
Outreach Strategy	• Engage existing network of institutions and large consumers to promote network and best practices
Timeline	• Q3 2019–Q4 2020
Goal(s)	• Create energy coalition • One action plan created by member of energy coalition
Implementation Lead	• City of Northfield • Northfield Energy Task Force
Implementation Team	• Large consumers represented on Energy Subcommittee
Resources	• Large consumers and institutions willing to share best practices for creating action plan and carbon reduction goals, such as Carleton College, St. Olaf College, and Northfield Hospital • Network of large consumers to engage and work together • Volunteer(s) to coordinate and conduct initial outreach to join coalition

Large Consumer Strategy C) Recognize large consumers' renewable energy investments and energy efficiency upgrades through different communication channels	
Description	Promoting local efficiency and renewable energy investments can help demonstrate action and leadership by Northfield's large consumers. Actions of large consumers can inspire others to take action.
Tasks	• Identify large consumers to feature • Identify platforms where success stories will be featured • Interview or collect information about investments • Create content and distribute to all applicable platforms • Identify location to archive success stories in a single location
Outreach Strategy	• Promote success stories on City communication channels • Feature articles in City's Economic Update Newsletter • Engage local business organizations to share information with their network
Timeline	• Q4 2019–Q4 2020
Goal(s)	• Feature one large consumer each quarter
Implementation Lead	• Northfield Energy Task Force
Implementation Team	• City of Northfield • Partners in Energy
Resources	• Large consumer contact information • Interview questions to collect success story information • Different communication channels to feature success stories • Local business organizations to disseminate information, such as Northfield Area Chamber of Commerce & Tourism, Northfield Downtown Development Corporation, Northfield Enterprise Center, and Northfield Rotary Club

Large Consumer Strategy D) Targeted outreach to large consumers to complete energy assessments and audits	
Description	Energy assessments and audits are a great way for a business to learn how they use energy and to identify areas of opportunity for efficiency and conservation. Ranging from free assessments to full service audits, there are different options available for large consumers to identify energy saving opportunities.
Tasks	• Identify all assessment and audit options • Create information materials • Identify communication channels for large consumers • Partner with local business organizations and community partners to promote/share information • Conduct targeted outreach using business organization networks • Track number of 1-1 contacts and resulting actions
Outreach Strategy	• Include audit and assessment information on City website • Share information materials with local business organizations to share with their network • Feature article about free and low-cost assessments in local newspaper • Use Xcel Energy account managers to share information with customers
Timeline	• Q3 2019–Q4 2020
Goal(s)	• 10 participants total in Xcel Energy energy assessment and audit programs: Process Efficiency, Recommissioning, and Turn Key Services ○ Baseline: 0
Implementation Lead	• Partners in Energy
Implementation Team	• Northfield Energy Task Force • City of Northfield
Resources	• Information materials on assessment and audit options • City webpage(s) to host information materials • Local business organizations to disseminate information, such as Northfield Area Chamber of Commerce & Tourism, Northfield Downtown Development Corporation, Northfield Enterprise Center, and Northfield Rotary Club

Large Consumer Strategy E) Promote fleet electrification by sharing information with large consumers and organizations with fleet vehicles to encourage electrification	
Description	Electric vehicles have the potential to drastically reduce emissions and air pollution by utilizing increasingly green electricity fueled by renewables. Fleet electrification is an opportunity for organizations to reduce their carbon impact, and find cost savings in maintenance and fuel.
Tasks	• Identify relevant fleet electrification information • Identify fleet electrification case studies and best practices • Create fleet electrification information materials • Identify local businesses and organizations with fleet vehicles • Identify communication channels to share information materials • Develop a list of available financing options, grants, incentives and other resources
Outreach Strategy	• Partner with other communication channels to share information materials • Outreach to fleet vehicle owners to share information materials
Timeline	• Q3 2020–Q4 2020
Goal(s)	• Create information materials and distribute to community
Implementation Lead	• Northfield Energy Task Force
Implementation Team	• City of Northfield • Partners in Energy
Resources	• Fleet electrification information • Examples/case studies for fleet electrification • Volunteers to conduct outreach and share information with local fleet owners

Large Consumer Strategy F) Encourage transparency in annual energy and carbon footprint reporting to help track progress by Northfield's large consumers	
Description	Transparency in large consumers' energy use and carbon footprint will demonstrate to the community the benefits of energy efficiency and renewable energy, as well as give a clear picture of their contribution towards achieving our community-wide goal.
Tasks	• Identify the desired format and frequency for reporting • Identify how/where the data will be displayed and used • Identify how this data will be incorporated into annual reporting of total community energy data received from Xcel Energy • Identify large consumers for outreach and specific point person • Identify volunteer to conduct outreach • Create talking points for outreach • Conduct outreach
Outreach Strategy	• Volunteer to conduct one-on-one outreach • Feature annual article in City's Economic Update Newsletter listing large consumers who participate
Timeline	• Q1 2020–Q4 2020
Goal(s)	• Points of contact made with 10 large consumers to encourage transparency
Implementation Lead	• City of Northfield • Northfield Energy Task Force
Implementation Team	• Large consumers represented on Energy Subcommittee
Resources	• List of large consumers to contact • Volunteers to conduct outreach • Talking points for volunteers • Platform or resource to share reporting for all participants in a single place

Appendix 4: 2008 Mayor's Energy Task Force Report Summary

With Hope: A Resilient Community

An Action Plan for Northfield Area Energy Sustainability

Introduction

Northfield, along with the rest of the world, faces twin energy challenges: fossil energy supply with price uncertainty and global climate change, driven largely by the release of carbon dioxide from fossil fuel combustion. The recent surges in oil, gasoline, and diesel prices; accompanying economy-wide inflation concerns; and the growing scientific consensus on climate change highlight the urgency of these problems. The Northfield Energy Task Force (NETF) was created by resolution of the Northfield City Council in May 2007 to respond to these challenges.

Four charges and summary of recommendations

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, and c) provide local, regional and global environmental benefits
 - a. **Six viable opportunities for city government listed in the report**
2. To assess the efficacy of creation of a municipal electric utility or special energy district in achieving parts a, b, and c of Charge 1.
 - a. **Recommend not to pursue a municipal utility at this time because costs are so great**
 - b. **Ensure any new industrial park be powered by renewable energy, developed using best environmental practices and attract green businesses.**
 - c. **Work toward establishing a special energy district for high efficiency combined heat and power (CHP) and cooling to service existing industrial and institutional users**
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)
 - a. **"Carbon-free by '33" (100% reduction) with milestones of 15% reduction by 2013 and 50% reduction by 2028**
 - b. **Begin annual measurement /inventory and update annually**
4. To develop an action plan to meet the CCPC targets identified in Charge 3 and report to City Council by the end of May 2008.
 - a. **Use local government policy tools to facilitate achievement of CCPC targets**
 - b. **Recommend a Climate Action Plan of ten items**

City Action Steps

1. Lead clean energy projects and model energy conservation/efficiency efforts within the community to create social norms of energy conservation/efficiency for all.
2. Direct City staff to consider climate, energy, environmental, economic, and social impact of all decisions using life cycle analysis and monetary impact analysis. Life cycle analysis should include social cohesion and dislocation, community resiliency and vulnerability, physical,

economic, environmental, security, energy, and climate assessment. In addition monetary impact analysis would include financial cost/benefit analysis and consideration of available funding resources (see Appendix 5)

3. 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.
4. Create a permanent Energy Commission reporting directly to the City Council.
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 (see full report for suggestions)

Community Action Steps

1. Citizen group reports and next steps (see list of reports below)
2. Alliance organizations (CERTS, Green workforce education, America in Bloom CRWP, etc.)
3. Suggestions for residential energy users (green, greener, greenest)
4. Suggestions for commercial / industrial / institutional energy users (green, greener, greenest)
5. All-community challenge: greening up your organization

Future Opportunities

- **Systems integration** – coordinate all elements of energy supply, demand and production in a holistic manner that maximizes Northfield’s resiliency. (e.g. the Natural Step Program).
- **Transportation** – Significant reduction in transportation fuel use will likely require the slow creation of a new fleet of highly efficient vehicles. Suggestions include develop local transportation infrastructure, use van and car pools, use existing and explore additional transit bus services, continue to explore creation of the Dan Patch Line.
- **Hydro-electric power** – Based on advice from experts, the group determined [hydro power] was not feasible at this time due to the condition of the dam, the negative environmental impact and the economic cost. However, suggest the city continue to monitor the availability of run-of-the-river or other appropriate technologies.
- **Wastewater management** – The Task Force looked at anaerobic digestion as a means to generate power but the cost to convert the current plant to add digestion while maintaining quality water treatment makes the conversion unprofitable.
- **Solid waste management** – The City of Northfield may decide to manage the collected city waste by directing the waste to a “waste to energy” plant that generates electricity, or may decide to develop a combined heat and power plant or gasification plant as described in the Appendices.

Ideas on how to pay for climate work (see report for full list)

- City department budgets
- Operating savings from energy efficiency
- 2% bond issue
- Third party agreement (private / public partnership)

- Corp of Engineers funding
- Financing initiatives
- Federal tax credits
- Carbon tax
- Employee bonus programs
- Give departments a greenhouse gas budget to live within
- Reduce commuting
- Parking fees
- Local government roadmap
- EPA
- Streamline permitting for those who adhere to standards
- Loans
- Clean renewable energy bonds

Citizen reports – see report appendices for details

- **Biomass gasification and combined heat and power** – using biomass feedstocks to produce gas, capturing the heat off an electric generator and/or producing electricity as a byproduct of making heat.
- **Cluster heat pump system** – for new development that shares a common “green space” that can be used for horizontal or vertical ground source heating and cooling loop.
- **Minnesota energy challenge** – energy conservation measures pledged by households, businesses, schools, and religious organizations.
- **Small and large wind turbines** – currently difficult to develop a single or small number of large turbines but Northfield area could support wind farming (20 or more large turbines). Small wind production should also be promoted and encouraged as housing codes, regulations, etc. are developed in the city. But fragmentation of energy, rather than constructive focusing, is a direct concern. Some don’t see wind as the most viable means for Northfielders reducing their carbon footprint, could focus instead on solutions like conservation, solar thermal, etc.

Appendix 5: Comprehensive Plan Implementation Matrix Excerpts

The following are examples of Comprehensive Plan strategies that intersect with the goals of the Energy Subcommittee and could be enhanced or enforced through implementation of the Northfield Energy Plan recommendations.

Community Identity

CI 1.1 Preserve the scenic quality of the rural landscape by defining the edge of the community and maintain the rural character of roadways on the edges of the community.

C 1.4 Ensure that all development, redevelopment and expansion be compatible with the desirable features of the natural and man-made environment.

CI 3.2 Provide economic incentives and design flexibility to aid in the restoration and long-term economic vitality of historically significant buildings in the Downtown.

CI 4 Encourage a traditional development pattern – could this also include requirements to rethink utility structures, integrate renewables, etc.?

CI 7.1 Coordinate with the school district on population growth and residential developments in order to reserve sites for future school facilities as population growth may require – *can these facilities soon be built as net zero energy buildings?*

Land Use

LU 1.6 Annually monitor the land use of residential as compared to commercial and industrial land use as a means to accomplish the overall planning objectives of the city.

LU 2.4 Encourage pedestrian paths and trail connections from commercial uses to adjoining residential developments and places of employment.

LU 2.5 Encourage more compact housing as a component of infill, redevelopment or land intensification projects.

LU 3.1 Create incentives to encourage infill, redevelopment, and land intensification.

LU 3.2 Work collaboratively to identify structures and sites for redevelopment, intensification or reuse.

LU 3.3 The EDA with assistance of City staff will prepare a marketing program for targeted structures and/or sites for infill, redevelopment, and land intensification.

LU 3.4 Establish priorities for capital improvements that are directed toward infill sites and mature neighborhoods.

LU 3.5 Facilitate redevelopment of uses that do not fit the development pattern of downtown but which with better design could increase density and provide more commercial, office or housing opportunities.

LU 6.2 Prepare educational material on alternative development choices for protecting natural areas – for the public and development community. *Can these be created for energy efficiency outreach also?*

LU 6.4 Identify and prioritize land for open space preservation.

LU 6.5 Create a program to acquire open space and environmentally significant lands.

LU 7.4 Encourage the use of conservation easements as a means to preserve productive agricultural land, greenways and environmentally significant areas.

LU 7.5 Work with other units of government, including Rice and Dakota Counties, to preserve agricultural land uses.

LU 8 Provide locations that facilitate economic development opportunities –*are there ways to integrate new approaches to utilities, i.e. district energy and integration of renewables?*

LU Improve the development review process – *Can it incorporate energy efficiency requirements?*

Environmental Resources

ER 1.1 Promote education about energy and resource conservation in the community.

ER 1.2 Incentives should be developed to promote energy efficiency in the design, construction and operation of residential, commercial and industrial buildings.

ER 4.1 Encourage the use of energy conservation technologies and techniques and promote the exploration and innovation of new methods to conserve energy.

ER 4.2 Strive to build or renovate city-owned buildings to meet LEED standards.

ER 4.3 Building design standards will allow for and accommodate changing solar technologies.

ER 4.4 Evaluate the recommendations of the Energy Task Force and promote implementation of the strategies as appropriate.

ER 10 The City will remain responsive to issues of climate change and will act to reduce Northfield's contribution to climate change.

ER 10.3 Promote the reduction of greenhouse gas emissions at residential, industrial and commercial scales.

ER 10.4 Encourage conservation standards at residential, industrial and commercial scales.

Sewer and Water Resources

SW 1.4 Address legal limitations, fairness, property benefits and responsible use of public funds when financing public utility extension that force the City's growth and redevelopment objectives. Priority will be given to infill and redevelopment of the existing urbanized area to maximize efficiency of the existing water and sewer infrastructure systems *and energy utilities?*

SW 3 Heighten community awareness of sustainability issues through education and training.

CR 1.1 The City's Capital Improvement Plan should include funding for future building renovations and / or new construction. *Can we include emphasis on energy efficiency requirements, LEED, net zero energy, integration of renewables in city funded renovations or construction?*

CF 2.3 Construction or renovation of publicly-owned buildings should be environmentally responsible and energy efficient.

Economic Development

ED 1.2 Assure availability of key informational resources to support decision-making of existing businesses.

ED 1.3 Offer leveraging financial tools to strengthen businesses and promote business expansions. *Can public funding come with energy efficiency requirements?*

ED 1.4 Adopt a regulating policy that accommodates and provides incentives for infill and redevelopment opportunities. *What are these incentives and can they also come with energy efficiency requirements?*

ED 2.2 Land resources that are adjacent to the city limits of Northfield and are relatively easy to serve with the extension of infrastructure should be pursued for future commercial and industrial development.

ED 2.3 The City will support strategies of annexation that are designed to provide additional land resources for commercial and industrial development, and that are in compliance with the overall objectives of the Comprehensive Plan. *Can new development be net zero?*

ED 2.4 The areas that have been identified west of the Northfield Hospital, west of the existing industrial area and south of Hwy 19 and north of the city limits in Waterford Township along the Thye Parkway corridor should be viewed as priority areas for additional evaluation and possible annexation into the city. When these areas are considered for annexation the City will review the requests with a Master Plan for the area. *Can this plan include renewable energy, net zero, district energy development?*

ED 3.4 Encourage further redevelopment / intensification in downtown as a means to maintain the vitality of this area. Downtown redevelopment / intensification should focus on retail uses, professional services, arts activities including opportunities for live-work development, businesses that support other businesses, and downtown housing.

ED 4.2 Seek opportunities for the Northfield Hospital to be a stimulus for economic development.

ED 4.4 Seek ways to better integrate the economically-challenged into the economic life of Northfield, such as providing for affordable housing and targeting small business incentive programs to this segment of the economy.

ED 4.6 Support programming efforts to further tourism in Northfield, e.g. historic and festival programs, arts and culture programs and tours. *How about eco/energy tourism?*

Housing

HS 1.2 Revise zoning and subdivision ordinances to ensure opportunities for development of alternative housing types and styles, including mixed-use neighborhoods, accessory or mother-in-law apartments, modular homes, manufactured home parks and other innovative approaches to housing.

HS 1.5 As determined necessary, conduct a city-wide housing analysis to identify current housing types, densities, values, vacancy rates and locations for use as a guide to future housing development and as a measure of affordable housing.

HS 1.6 Establish standards for compact residential development and intensified land uses.

HS 1.7 The preference for new residential development should be for infill, then redevelopment, and then greenfields within the city limits, and then within the Priority Growth Area.

HS 1.8 The needed balance between housing and commercial / industry and the current supply of housing will be important factors in consideration of annexation requests for additional housing. *Can growth of carbon emissions also be a consideration?*

HS 2 Preserve the character and style of existing neighborhoods that have created Northfield's sense of place. *There are many items in here that present opportunities for integrating energy conservation and net zero energy building into our standards.*

HS 3 The City should assist in providing affordable housing. *Especially if this housing is subsidized by City funds, we should be able to integrate energy efficiency or net zero standards into the design and development of these properties.*

HS 4 The City will encourage homes to be well-maintained, environmentally friendly and energy efficient. *All items in this category could be amplified with more stringent energy efficiency, renewable energy or net zero building requirements.*

HS 4.1 Establish standards for and encourage the use of "green" building techniques to provide housing that is energy-efficient and environmentally friendly.

HS 4.2 Investigate "green" practices that would reduce the cost of housing.

HS 4.3 Review the City's non-conforming structures ordinance for mechanisms to allow homeowners to intensify, rehabilitate and maintain nonconforming structures.

HS 4.4 Enforce rental ordinances that provide for minimums in housing maintenance.

HS 4.6 Revise City zoning and other applicable ordinances to ensure implementation of these Objectives and Strategies.

Appendix 6: Sample Energy Task Force Solicitation



Are you passionate about energy conservation and renewable energy? Do you want to help Northfield residents and businesses save money on their energy bills? Join Northfield's Energy Task Force.

Northfield's Energy Task Force will be responsible for leading and supporting implementation activities for Northfield's Energy Subcommittee Report, developed through Xcel Energy's Partners in Energy offering. Partners in Energy will provide Northfield with 18 months of project management support, plus marketing and communications resources, program expertise, and data to measure progress.

Energy Task Force Activities

Level 1

Time commitment: As needed, some nights or weekends

Types of activities:

- Table at events to distribute information about energy efficiency and renewable energy
- Conduct outreach to event organizers to confirm tabling opportunity
- Share information materials with personal network

Level 2

Time commitment: Occasional, less than 5 hours a month

Types of activities:

- Use talking points and information materials to conduct outreach to Northfield residents, small businesses, and large consumers
- Use talking points and information materials to engage local nonprofits, worship facilities, and other partners to support Energy Action Plan

Level 3

Time Commitment: Frequent, 5-10 hours a month

Types of activities:

- Keep Energy Task Force informed about Energy Action Plan activities
- Participate in monthly check-in calls or emails with City of Northfield and Partners in Energy staff
- Coordinate level 1 and 2 Energy Task Force volunteers
- Support level 1 and 2 activities

Interested? Contact _____

Appendix 7: Xcel Energy Partners in Energy Plan Development Process

Xcel Energy is the main electric and natural gas utility serving the City of Northfield. In the summer of 2014, Xcel Energy launched Partners in Energy to support communities like Northfield to develop and implement energy action plans that supplement existing sustainability plans, strategies, and tools. The content of this report is derived from a series of planning workshops held in the community with a planning team committed to representing local energy priorities and implementing plan strategies.

Partners in Energy will work with the City of Northfield to coordinate support for implementing the plan and will develop a Memorandum of Understanding that outlines specific support Xcel Energy will provide to help Northfield deploy its strategies and achieve its goals over an 18-month period.



Figure 9. Partners in Energy Process for Success



Figure 10. Resources from Xcel Energy for Implementation

Plan Development Process

The CAPAB energy subcommittee chair actively recruited a diverse group of community representatives, including representatives from small businesses, industrial businesses, the colleges, community organizations, and greater community to create the Energy Subcommittee Report. Please see Appendix 1 for a complete list of participants.

The Energy Subcommittee met over the course of six months, reviewing community energy use data, identifying energy priorities, and developing strategies to put Northfield on the path towards a carbon free future. A summary of the workshop process can be found in Table 4.

TABLE 4: PARTNERS IN ENERGY PLANNING WORKSHOP SUMMARY

Planning Workshop Summary	
Workshop 1 November 5, 2018	• Met members of Northfield's Energy Subcommittee • Learned about the Partners in Energy offering • Shared thoughts on why an energy action plan is important to Northfield • Examined data on Northfield's energy profile and community background • Envisioned Northfield's energy future
Workshop 2 December 6, 2018	• Drafted Northfield's energy vision and greenhouse gas reduction goal • Reviewed Northfield's past work towards energy efficiency and reducing emissions • Learned about Xcel Energy's clean energy future • Identify community assets • Brainstormed near- and long-term strategies
Workshop 3 January 14, 2019	• Reviewed results from community climate action survey • Learned about Xcel Energy programs and rebates • Identified communication channels in Northfield • Identified barriers and benefits to energy action • Evaluated feasibility and impact of near-term strategies
Workshop 4 February 27, 2019	• Refined Northfield's energy vision and community-wide goal • Reviewed initial structure of energy subcommittee report • Completed a gallery walk to give input on strategic priorities Set near-term goals for 18-month Energy Action Plan
Workshop 5 April 3, 2019	• Reviewed Northfield's energy subcommittee report outline and structure • Reviewed and discuss strategic priority survey results • Identified implementation leads and support for 18-month Energy Action Plan • Completed a SWOT analysis for Northfield's energy subcommittee report • Celebrated all the work the subcommittee has accomplished

PHOTO 1: NORTHFIELD'S ENERGY SUBCOMMITTEE AT WORKSHOP 5



Appendix 8: Glossary of Terms

15 x 15 Privacy Rule: Xcel Energy's privacy rule, which require all data summary statistics to include at least 15 entities, with no single entity responsible for more than 15% of the total. Following these rules, if an entity is responsible for more than 15% of the total for that data set, it is removed from the summary.

Conservation Improvement Programs (CIP): Portfolio of approved utility energy efficiency and demand management programs. Minnesota electric utilities have a goal of saving 1.5% of their total energy sales each year via customer conservation efforts. Minnesota natural gas utilities have a goal of saving 0.5% of their total energy sales each year via customer conservation efforts.

Energy Burden: Percentage of gross household income spent on energy costs.

Greenhouse Gases (GHG): Gases in the atmosphere that absorb and emit radiation and significantly contribute to climate change. The primary greenhouse gases in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

Grid Decarbonization: The current planned reduction in the carbon intensity of electricity provided by electric utilities through the addition of low or no carbon energy sources to the electricity grid.

Kilowatt-hour (kWh): A unit of electricity consumption.

Million British Thermal Units (MMBtu): A unit of energy consumption that allows both electricity and natural gas consumption to be combined.

Metric Tons of Carbon Dioxide Equivalent (MTCO_{2e}): A standard unit of measure for greenhouse gas emissions. The unit "CO_{2e}" represents an amount of a greenhouse gas whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO₂), based on the global warming potential (GWP) of a particular gas.

Net Zero Energy Building: A structure that on an annual basis produces as much energy on site as it consumes

Premise: A unique identifier for the location of electricity or natural gas service. In most cases it is a facility location. There can be multiple premises per building, and multiple premises per individual debtor.

Renewable Energy Certificate (REC): For every megawatt-hour of clean, renewable electricity generation, a renewable energy certificate (REC) is created. A REC embodies all of the environmental attributes of the generation and can be tracked and traded separately from the underlying electricity. Also known as a Renewable Energy Credit.

Resilience: The ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally-occurring threats or incidents.

Therm (thm): A unit of natural gas consumption.

Trade Ally: Trade Allies, or Business Trade Partners, are vendors and contractors who work with business and residential customers servicing, installing, and providing consulting services regarding the equipment associated with utility rebate programs. Their support for utility programs can range from providing equipment or assisting with rebate paperwork, to receiving rebates for equipment sold.