Energy and Environmental Roadmap for Minnesota Communities

A report generated by the City of Morris and The Morris Model

Prepared By
Griffin Peck
Sustainability Project Coordinator
Morris Model Coordinator
E: griffin@ci.morris.mn.us

Table of Contents

Introduction

In the face of a changing climate and an uncertain future, municipalities across the country are preparing in many unique and resilient ways. This guide aims to introduce the reader to the City of Morris and the Morris Model Partnership. The City and the Morris Model have been able to accomplish what many would consider impossible in a rural municipality. In this guide we offer a look into how our sustainability work began, where it is now, where we are going in the future and how this process can be replicated across the state of Minnesota in municipalities of all sizes.

This guide consists of four parts. First I will discuss the Morris Model Partnership, how it was started, how work is supported and what kind of projects have been accomplished through the partnership. Next I will discuss the importance of benchmarking energy use and using performance tracking to achieve reductions in GHG emissions and overall energy use. Next I will examine our city's strategic plan and our community resilience building plan. I will emphasize the importance of these plans to achieving long-term sustainable and equitable outcomes. I will discuss the process of developing these plans, and present some work that has been completed based on the final versions of the plans. Finally, I will discuss how these three elements are paired together to create long term success.

The city of Morris is a small agri-business community located in west central Minnesota. It is located about 150 miles west of the Twin Cities Metro Area, and about 100 miles south-southwest of Fargo. The town, of a little over 5000 people in size, is the county seat for Stevens County. Stevens County has a population of a little under 10,000 people. In addition to agriculture, Morris is also home to Superior Industries, an agricultural equipment manufacturer, and Westmor which manufactures equipment and tools to support the gas and oil industry. Morris is also the home of Denco II an ethanol production facility. Morris is also home to the University of Minnesota- Morris campus. UMN Morris is also a Native American serving Non-Tribal institution, offering free tuition to indigenous students. The campus has around 1,000 students. UMN Morris, in many ways, helped to jumpstart our community's commitments to sustainability and resiliency. The campus, which produces the most renewable energy per student in the country, has an entire suite of renewable energy facilities including two 1.68 MW wind turbines, over 260 kW of installed solar, a solar thermal array, and a biomass gasification demonstration facility. In 2020 the campus was able to claim carbon neutrality for is electrical use for the first time. Morris is also home to the West Central Research and Outreach Center which is a part of the UMN Extension program. The WCROC is home to agricultural research including a wind to ammonia generation facility, several solar arrays, a carbon-neutral dairy parlor, and asynchronous farm robots that can treat fields and manage grazing land without need for a human operator.

Morris is also home to many essential services that serve our county and other surrounding communities. Stevens Community Medical Center provides general and specialized medical care. Willies Supervalu and Meadowland Discount Foods Market serve as the main businesses to

purchase food in the county. As the county seat and the provider of so many essential services, Morris is a hub of activity. The town was started in the late 19th century as another stop along the expanding rail networks of the era. And over the years it has hosted a wide variety of people. While for many decades the main crops in the area have been corn, wheat, and soy beans, in recent decades this has evolved to include sugar beets and several industrial dairy operations with well over 1000 limousine cattle at each site. Morris is now also home to the Fresha LLC which produces carrots, and Bonanza Bean which produces several varieties of legumes and sells to customers around the world. While the community has always been anchored by European settlers, a sizeable Latino population has also settled here. Latino people first came to Stevens county to work as veterinarians and dairy scientists at the large dairy operations, or in other operations such as hilltop swine. Over the decades, these large dairy farms and other agri-businesses have sponsored entire families to come and settle in Morris. In 2020, Latino or Hispanic people made up almost 10% of our county's population; and in the schools, Latino or Hispanic kids make up over 17% of new enrollment.

Morris Model

Membership

What is the Morris Model? Put most simply, it's a partnership between prominent stakeholders in our community, our county, and within our wider region. The core members of this group are the City of Morris, UMN- Morris, UMN WCROC, and Stevens County. Other members include faculty and staff from Morris Area Schools, Stevens Community Medical Center, and Horizon Public Health. The member organizations and entities bring together people from a wide background who are all focused on making our community more sustainable. But beyond the traditional environmental sustainability, the partnership also works to bring long term social and economic sustainability to our community. (Morris 'Model' in pursuit of a model community in rural MN) By coming together, we are able to bounce ideas and concepts off of each other and use other members of the partnership as a resource within our own projects. When one organization completes a new project, it benefits everyone in the partnership because we can learn from the different challenges that these types of projects face and find ways to avoid those challenges in future projects with other organizations.

Partnership

The partnership is grounded by weekly to bi-weekly meetings of the partnership. In these meetings, which usually take place virtually, members share updates about the projects they are working on and seek feedback from other members in the meeting. These meetings are also used to plan events and other activities that will involve members from across the partnership.

Whether it is a site visit from the MN Department of Commerce or hosting a regional farm energy conference.

Another important aspect of the partnership is working together on specific projects. In Morris, the University was the entity that first started to pursue clean energy projects and energy efficiency upgrades. Their leadership helped to jumpstart other projects within the community. These initial projects are what helped to form the core membership of the partnership. The UMN Morris campus partnered with the UMN- WCROC Extension to pursue wind energy for their respective operations and UMN worked with the city of Morris to transition city owned light fixtures to LED.

Case Study: LED Lighting Retrofit Along Main Street (Atlantic Ave)

One of the first major projects that was completed with help of the Morris Model was city operations transition to LED lighting. This process specifically started with replacing the street lights along Atlantic avenue (main street). Prior to the retrofit, the lights along Atlantic Avenue used around 65,000 kWh each year. After the retrofit, lighting used just 15,000 kWh each year. A savings of more than 50,000 kWh each year; according to the USEPA this is equivalent to the electricity use of 7 homes for a year. After this initial switch to LED's on Atlantic Ave the city manager, Blaine Hill, wondered what savings would look like from a complete LED conversion. This project was the first to be completed by the newly formed Morris Model. LED lighting had begun being used in some areas of the campus, and Troy thought it could be a good project for the city to do. The city worked with Eutectics and Cedar Creek energy to complete a more in depth LED project viability study. This included studying all interior and exterior lighting fixtures in the City and deciding whether or not a given fixture would see long term benefit from being switched to LED. Unsurprisingly, almost all lighting fixtures benefitted in the long term from being retrofitted to LED. A total of 1,499 lighting fixtures were ultimately retrofitted with LED's. The energy savings that this project saw was one of the first major reductions that the city made in their overall energy use. Approximately 250,000 kWh was and is being saved every year. This is equivalent to the electricity that 35 homes typically use in a year. The projects initial capital cost was $266,913. The city chose to enter into a 7-year municipal lease resulting in a total project cost of $295,343. The project will be paid off by 4/1/23. The lifetime of the bulbs is approximately 15 years, meaning continued net savings will continue after the initial assumed balance is paid off. The project lifetime total savings is $603,984, with a net savings of over $300,000. With the success of this municipal retrofit in 2015 and 2016, Ottertail Power Company chose to retrofit their outdoor lighting fixtures to LED's in March of 2018. The retrofit, which included over 800 outdoor lighting fixtures, saved approximately 541,000 kWh each year which is equivalent to the use of around 45 homes.

Another significant project was the installation of 240 kW Solar Array at the UMN Morris Campus. This installation in particular was a partnership between UMN Morris and UMN WCROC. The array, whose energy is used to help power the campus, is lifted over 10 feet off of the ground. This custom mounting was done to allow cattle from the farm at WCROC to graze in an around the solar production. The elevated array also provides a source of shade for the cattle to use during the hottest hours of the day. This array, that can graze cattle underneath, is still a novel idea when it comes to finding ways to produce energy alongside livestock. Only one or two other arrays like this currently exist in the entire United States. Another project that involved many members of the Model from Morris Area Schools, UMN Morris, and The City of Morris was the electric school bus project. This project focused on securing funding and purchasing two electric school busses for Morris Area Schools to use to transport kids to and from school. The busses, which each are equipped with a 100 kWh battery packs, can travel up to 100 miles on a single charge.

Finally, one of the central parts of the partnership is how we frame our work within our community. Unfortunately, over the last two decades, clean energy projects, energy efficiency, and sustainability have all become highly politicized subjects which evoke a strong party-based divide. In rural and predominantly conservative communities in Morris and Stevens County, it becomes necessary to frame our work with concepts and ideas that are popular within our community. For example, when we chose to install solar power on some of our city owned buildings in 2021, we framed the project around the cost savings that the city's operations would see, as well as, regional recognition we would receive for pursuing this type of project. Another way that we frame our clean energy work is by framing it around building rural wealth and making our community more resilient when it comes to interruptions to power supply. In May of 2022 our region experienced a high wind event with winds of over 100 mph. While most of the city had their power turned back on within 24 hours, there were parts of our county where power wasn't restored for more than three days. By installing more clean energy generation facilities within our city and within the county, we are working towards a future where we will not have to rely on a private utility for our electricity needs. Another way to frame the work is by showing how it will help build the collective wealth of our community. By installing more clean energy facilities, we can add jobs to the local economy and by producing more of the energy we consume locally, we can keep more money within the community.

Guiding Principles

The partnership has 5 guiding principles. These principles are Energy Conservation, Clean Energy, Community Resilience, Cultural Exchange, and Celebration. One or more of these principles applies to every project or event that the members of the partnership undertake. Energy Conservation and Clean energy are the main principles that our work falls under. Community Resilience connects to the long-term social and economic sustainability that we hope to bring to the city and regional community. Cultural Exchange refers to a more unique aspect of Morris and the Morris Model. Morris is part of something called the Climate Smart

Municipalities. The Climate Smart Municipalities partnership self describes itself as a "multi-partner intergenerational collaboration between 12 Minnesotan and German cities." Each of these cities serves different types of populations in different environments and ecosystems. All of the partner cities have made considerable investments in areas like locally generated energy, clean energy projects, energy efficiency projects, and residents' energy literacy. Each of these municipalities has identified changing weather and decreased agricultural yields, among others, as major issues that they hope to address through advanced and local action. Morris' sister city is Saerbeck, an agricultural community that produces four times more energy than they use. Many of the projects that Saerbeck has pursued, and that we have been able to learn about through the CSM partnership, have inspired our work in Morris and the Morris Model. We have hosted German delegation visits to Morris and the Germans have hosted delegations of Morris model members and other CSM partners. The last principle of the Morris Model is Celebration, or rather taking time to celebrate our triumphs. The sheer amount of work that oftentimes goes into these types of projects makes it hard to zoom out and appreciate the magnitude of the work accomplished. By stipulating that celebration is a part of the model, we can take the time to stop and celebrate our accomplishments.

Energy-Use Monitoring and Benchmarking

The most important first step to understanding how your municipality uses energy is to be able to actively monitor and benchmark the data. While tracking energy use is oftentimes commonplace, the long term implications of being able to compare performance and resource use year over year are immense. The data that any building or meter produces not only holds the secrets of the operating systems connected to the meter, but also the occupant's behavior within the space. Also, by actively monitoring energy use, when a piece of equipment fails it is easier than ever to look at the data and be able to identify what needs to be fixed in a timely and efficient manner. Finally, by benchmarking data year after year, it is possible to identify specific reduction goals and pursue them while also having access to real time data that will show whether or not a given reduction goal is having any effect on the overall energy use. Also, by tracking energy use across an entire municipalities operation, specific thermal and electrical loads can be targeted for future renewable energy or energy efficiency projects.

Energy-Use Monitoring

When it comes to monitoring energy use there are several different ways to obtain data. The most straightforward way to monitor energy usage is by going off of invoices from your municipalities' utility company. In Morris, our utility is Otter Tail Power Company. At the city of Morris, this is the method we currently use to obtain our electrical and natural gas usage.

The benefits of using invoices from your utility is that it is pretty straightforward and doesn't require any major technical training. Also, even if you have questions about your bill, most utilities offer help reading your bill.

However, there can be many drawbacks of tracking and benchmarking your energy data in this way. First, you are limited by the types of data your utility chooses to include on their invoices. For example, if your municipality is hoping to install solar to help offset electrical demands, granular 15 min electrical demand data may be required in order to properly size the system. This type of data is not necessary for utilities to include on their invoices because the average consumer will likely not need this specific of data. In the case of Morris, we have to work directly with our utility in order to access this kind of data from our own properties. This process can be time consuming and difficult to navigate, even for people experienced in working with energy data and benchmarking. Another drawback of using your utility invoices for data tracking is that the data is not live, rather you are only able to access data after the resources have been used. This limits the ways you can use the data. Because you are not able to directly access the data that comes from the meters, you miss out on benefits like learning about building occupant behavior or being able to identify equipment problems from the data in real time.

Another way to monitor energy use is to directly monitor the meters you are interested in. There are a couple of ways to do this. One way is to have someone read the meters themselves. Most buildings are equipped with some sort of aggregate use meter that will track the buildings overall use of electricity and natural gas. This is the meter that the utility will read when creating invoices.

The benefits of directly monitoring your data by reading the meters yourself is that you can access the data source whenever you want. For example, if you wanted to monitor energy use over the course of a week, it would be relatively simple to read the meter and record the usage number once a day to track energy use overall.

However, similarly to using invoices from your utility provider, direct monitoring only allows you to track electrical or natural gas use from an aggregate perspective. When using direct monitoring you would likely still have to work with your utility to access 15 min electrical demand data. Additionally, the data is still not live which makes it difficult to use data to address problems in real time.

The final most common way to monitor energy use is to use automatic or live monitoring. Monitoring your live data offers the most benefits of any of the mentioned methods for tracking data. However, most utilities do not offer live monitoring meaning that it would be up to the municipality to purchase and install the necessary metering tools; something which can be exorbitantly expensive.

However, there are many benefits of live monitoring. One of the most promising use cases for this type of monitoring is to detect areas of inefficiency as they occur. This means that you could receive live alerts on your phone about the state of the building systems across your entire municipality. And with the increased integration of machine learning and AI, these systems can detect and report on a wide range of problems in real time. Live monitoring can also offer

building managers a unique perspective. A building manager could use the live monitoring feature to observe what kinds of occupant behavior cause what kinds of electricity or natural gas usage on a given day.

The main drawback of opting to use live monitoring is that it is often times not offered by the utility. This means that the municipality must pay for and install the equipment that allows for live monitoring. Another drawback of using live monitoring is that it usually involves the use of advanced computer systems that may require additional training to operate.

Energy Benchmarking

The next aspect of how we monitor and track our energy usage over time is our use of a benchmarking software. In the state of Minnesota, all public institutions, including municipalities, are required to report their energy use to the state through the B3 Benchmarking software. The B3 benchmarking tool was initially developed as a part of the legislation which passed in Minnesota in 2001 requiring all public buildings to have their energy use benchmarked. As a result of this legislation, the state developed the B3 Benchmarking tool. B3 stands for Buildings, Benchmarks, and Beyond meant to allude to the software's use for benchmarking buildings and how data visualizations and analysis by B3 can unlock further savings and insights for building owners. To date, B3 tracks over 360 million square feet of space annually from more than 8,000 organizations state wide.

B3 offers many benefits, especially for municipalities in MN. Since the B3 site contains information of other similar buildings in the state it offers a peer comparison tool. This tool allows you to compare your municipalities energy use with similar municipalities around the state. B3 also offers a wide suite of data analysis tools and data visualizations. Their data visualizations in particular are especially useful when engaging in outreach within your community. In Morris, we are currently working to build our community's energy literacy. Many of the data visualizations are fairly simple and allow the average viewer to gain a better understanding of what energy use looks like and how minor changes to operations can save money over time.

There are also other ways to benchmark data over time. Software's like Arc Skoru from the US Green Building Council, or Portfolio Manager from Energy Star.

The Arc Skoru reporting platform was specifically designed as a tool for LEED certification projects, but can be used for buildings that are not seeking LEED certification. The Arc Skoru tool also offers additional data points to track such as building waste output tracking, Indoor Environmental Quality (IEQ) tracking, and offers a suite of surveys to better gauge building occupant satisfaction and experience. Since the tool was designed for use with LEED, municipalities who want to pursue LEED certification in the future may want to use this tool over others.

Portfolio Manager is another great option for benchmarking data. Designed by the Environmental Protection Agency, Portfolio Manager is a great utilitarian option. They don't offer as many data analysis and interpretation tools, but if you are looking for a straightforward and no frills tool to track data, this is it. One thing to note though: Since Portfolio Manager and Energy Star are run by the Environmental Protection Agency, a government run agency, during government shutdowns, the tool becomes unavailable. This was a lesson I learned the hard way during the 2018 shutdown.

Case Study: Benchmarking and Solar Installations on City Properties

When we wanted to install solar panels on some of our city buildings including city hall, the community center, the library, and the liquor store, we looked to B3 benchmarking to gather some of the information we would need to share with potential solar developers. As a municipality in MN, we have access and use the B3 Benchmarking Platform to track energy use over time, as well as, to set reduction goals and other sustainability projects. Normally when you begin working with a solar developer, you have to find old utility bills and reach out directly to the utility for additional information. By continually using B3 Benchmarking, not only was all of this data immediately available to us, we are also able to share the benefits of solar through the many visualizations that the platform can provide. For example, we can look at electricity use in previous years before solar was installed to compare historical energy use with current energy use. Additionally, since B3 benchmarking serves other municipalities in MN, we are able to compare how sustainable our buildings were with other buildings both before and after we installed solar panels. For example, recently our city hall building was ranked in the 100^{th} percentile among similar buildings in the B3 system. This means that when compared against other buildings in B3, our city hall performs the best. The platform also reports metrics related to the B3 benchmark, the energy standard developed by the state of MN, the B3 peer comparison, which compares your performance to similar buildings at similar institutions, and even provides an energy star score for qualifying buildings. Finally, the B3 benchmarking platform has allowed us to quantify our solar installations with easy to read visuals which compare energy use and energy costs before and after solar installations.

Examples of Benchmarking in Practice

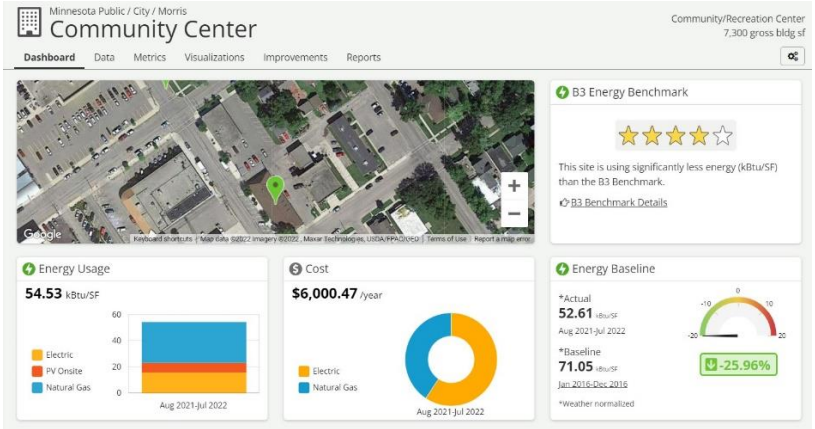

FIGURE 1: EXAMPLE OF B3 BENCHMARKING PAGE

This photo shows an example of what a B3 Benchmarking Building page might look like. This one shows the Community Center here in Morris. On this page, you can see the breakdown of energy usage and energy costs, as well as, current reductions in energy use from our baseline year. The B3 benchmark is also shown. This specific building performs better than other sites with similar sizes and uses.

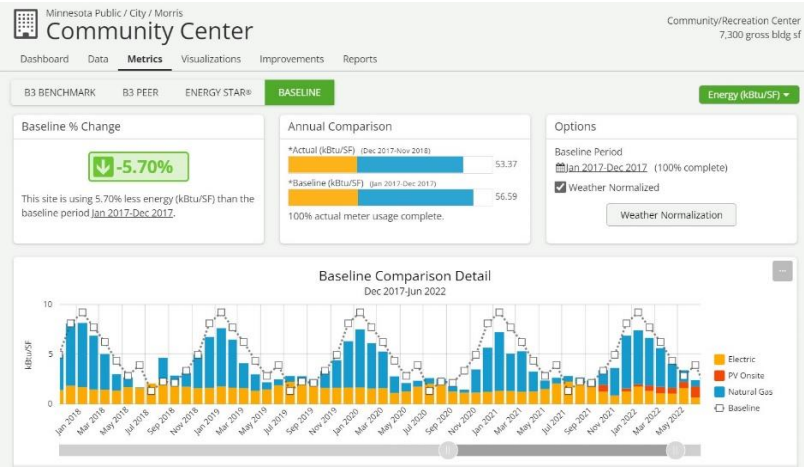

FIGURE 2: EXAMPLE OF ENERGY REDUCTIONS IN B3 BENCHMARKING

Available on the metrics page, here you can see reductions in energy use this space has seen over the last several years. You can also see that the space uses less energy than the B3 benchmark predicts for the building

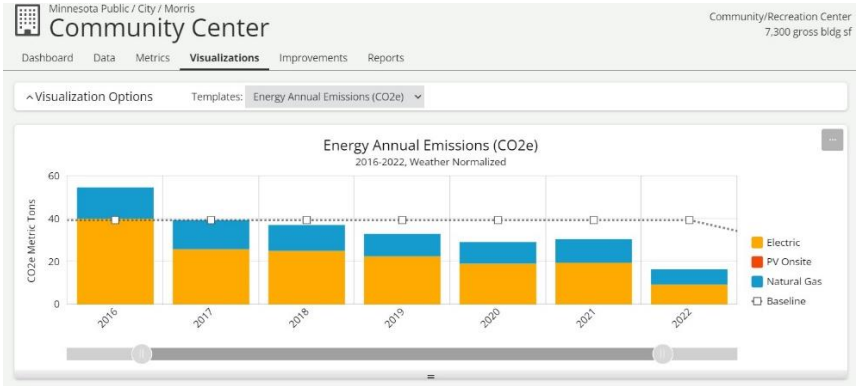

FIGURE 3: EXAMPLE OF CO2 REDUCTIONS YEAR OVER YEAR

Here is an example of how you can track more than just energy reductions but also reductions in carbon emissions. B3 benchmarking uses emissions factors based on the Electricity Transmission Region your site is in. It also uses known emissions factors to calculate how natural gas use factors into CO2 emissions.

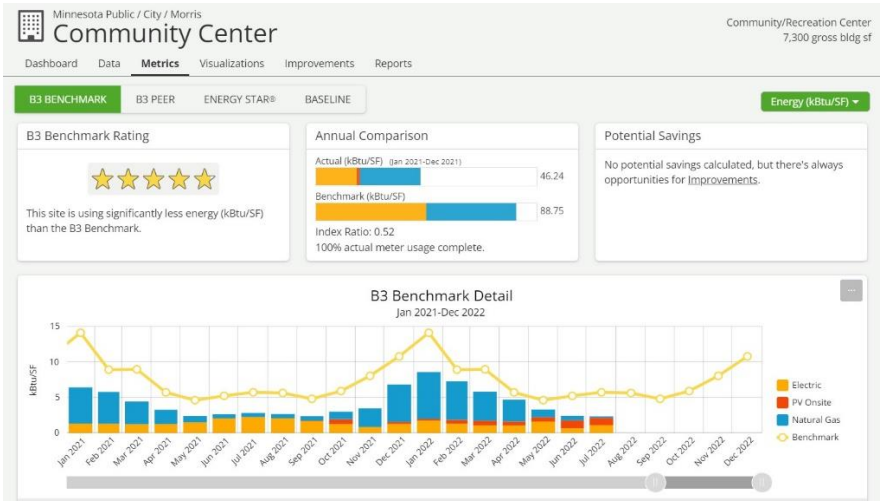

FIGURE 4: EXAMPLE OF DATA COMPARISONS WITH OTHER ENTITIES IN THE SYSTEM

On the Benchmark detail page, you can learn more about how your building or site compares to the B3 benchmark. You can also see how much more or less energy your site or building uses compared to the use expected by the B3 benchmark. For example, in this photo, you can see several comparisons. The stars in the top left show that this building uses significantly less energy than the state B3 Benchmark for similar spaces. The actual comparison shows how much less energy the space uses in the amount of kBtu normalized by square footage. Finally, the graph at the bottom shows additional details regarding which months use the least energy in comparison to the state benchmark.

Community Planning Documents

The final pieces that have enabled our work in Morris include the development of long-term goals and strategic/ resiliency plans made with input from a large cross-section of our community. These plans help to guide the work of the Morris Model Partnership members and other community stakeholders.

Strategic Plan (2018)

One of the most important plans for our long-term goals and work is our strategic plan which was developed in October 2018. The plan features community-wide goals, as well as, specific goals to be undertaken at different levels within our community. The goals focus on 4 areas which are energy, waste and recycling, transportation, and education. The different partners that projects can be undertaken by our City, County, University/Public Schools, and Business/Industrial. To construct the plan, a group of 35 community stakeholders from the parties mentioned above, as well as, representatives from our electrical utility and others traveled to Camp Ripley for a two-day planning retreat. The cost of this retreat was covered by a $7500 grant from the West Central Initiative.

The two-day retreat commenced with community members and stakeholders arriving at Camp Ripley and listening to presentations from a moderator that included ground rules for discussions and the presentation of a Vision and Charge for the weekend. Then throughout the afternoon and evening, guests listened to presentations from City and university leaders about the history of the Morris Model, Climate Smart Municipalities, and a Baseline of how much electricity, natural gas, and fuel is consumed in Stevens County and Morris. Then public entities and businesses gave individual reports on their organizations and their work. The first day ended with a dinner followed by round-table small group discussions. These discussions focused on two questions: “Should Morris lead, follow, or get out of the way regarding energy, waste reduction, transportation transition, and education on these topics?” and “What big goals and project ideas are needed to be leaders in these areas?”

The next day, retreat attendants listened to some brief presentations on smart goal setting and got to work on developing big community goals, smaller goals that could be undertaken by each party, and a list of projects to help achieve these goals. The community goals for energy are to reduce energy consumption by 5% annually with a minimum 30% reduction by 2030. Expanding solar generation for 50% of public buildings and 25% of privately owned buildings, and using renewable energy, produce 80% of the energy consumed in the county with strong community investment and participation. The major community goals for transportation are to reduce fuel consumption for private and public fleets by 30% by 2025 and begin community-wide monitoring of fossil fuel consumption and establish a consumption baseline. Community goals for waste are to eliminate organics from the Stevens County waste stream and achieve 60% diversion from landfills with recycling and organics programs. Finally, the big community goals for education are to raise awareness of this work through integration with the k-12 curriculum, develop a semi-annual scorecard to communicate results with the community and develop strategies for effective communication and volunteer programs. These goals were then followed with a list of 100 project ideas that can be used to help achieve these goals. Many of these goals have been realized in the four years since this plan was initially developed and others have continued to inspire our current and future work.

Case Study: Organics Composting to Reduce Overall Waste Footprint

Organics recycling and composting was started at the UMN Morris campus in the early 2010's. This was first realized by adding a food waste grinder to the dining facility on the campus. As the years progressed, compostable single use utensils, cups, straws, and take-away containers were all switched to biodegradable options. Composting cans were added to buildings across campus in classrooms and in dorm buildings. When the campus was composting on their own, they had their own pile which they aerated and flipped themselves. In the 2019 strategic plan, after seeing the success that on campus composting had had, stakeholders from across the community committed to bringing composting and organics recycling to the community at large. In 2020, the city of Morris applied for a Greencorps member to be the point person within city operations. At the same time, Stevens County applied for a grant to fund a part time Composting Coordinator to run point on the project. In 2021 the UMN Morris campus celebrated over 1,000,000 pounds of food and other organic waste being diverted from landfill bound waste streams. At the same time, the Pope-Douglas Glacial Ridge Composting Facility (48 miles round trip) came into initial operation accepting organics including meat, bones, and other items traditionally not allowed in backyard compost piles. Throughout 2021 and 2022 surveys and community input were used to develop a plan to install two community drop sites. In September of 2022 these drop sites were installed after a very busy construction season. Information on composting was distributed to residents at two

organics kick off events and earlier in the year during the Stevens County Fair. Residents in Morris, and greater Stevens county, are now able to divert organics from their collective waste stream. This provides two main benefits. Waste, whether destined for a landfill, a waste to energy facility, or to a composting facility, is trucked out of Stevens county to surrounding facilities. While a construction waste landfill still exists in Stevens county, municipal solid waste has not been landfilled in the county since 1996. MSW is currently either trucked to one of two facilities. A Waste to Energy (WTE) facility in Alexandria (90 miles round trip) where it is burned and its heat is used to spin steam turbines that produce electricity and provide thermal conditioning to buildings in Alexandria. MSW is also brought to a landfill in Gwinner, ND (228 miles' round trip), where it will be buried for time immemorial. Organics, which most often are heavy, water filled items like food waste and soiled papers, can have a substantial impact on the overall weight of MSW. By eliminating wet organics from the waste stream we are able to save time, money, and co2 emissions by reducing the amount and frequency of trips to Gwinner, ND and Alexandria, MN. We are also able to cycle nutrients consumed and used in Stevens County back into rich soil which can be used to bolster the farms around the region.

Community Resiliency Building

One of the other major plans that has helped to guide our energy and environmental work is a community resiliency plan that was developed using the Community Resiliency Building tool. Community Resilience Building is a tool that can be used to identify climatic and extreme weather threats to different communities at different scales. The process began with a series of 6 Resiliency Discussions with presentations on different topic areas like changing weather, effects to agriculture, effects to current infrastructure, and more. At the conclusion of the community discussions, a virtual planning summit was held in March of 2022. The City of Morris, UMN-Morris, and UMN- WCROC partnered with The Nature Conservancy and Second Nature who would act as moderators for the event. Funding for the community discussion series and the planning summit was covered by a resiliency grant from West Central Initiative.

The summit included participants from the city of Morris, Stevens County, university of Minnesota, and representatives from across the west central region ranging from business owners to non-profits. The summit was held virtually in March 2022 and attendants worked to identify different climatic and weather related threats to current operations in Morris and Stevens County. Next attendants identified existing strengths in our community and existing natural and man-made assets. Then attendants found three areas that need to be developed in the future in order to improve our resilience. This included continued improvements to infrastructure, quality of life, and our current emergency management systems. Attendants then identified priority and additional actions that the community can take. Some of these actions include identifying methods to conserve and improve existing critical infrastructure, including a wider net of our community in these discussions like the growing Spanish speaking population in Morris, and

working to secure alternative and back up energy generation for critical systems like water treatment and distribution. Many of these actions and the community resiliency plan itself became even more important when in May of 2022 one of the extreme weather events that was described in the plan as being a threat to the community happened. A high wind event occurred, and power was lost not just in Stevens county, but across western MN and the eastern Dakotas. Driving outside of town after the event, I was shocked to see transmission poles that had been snapped in half as if they were toothpicks. One of the concerns that was presented in the resiliency plan also occurred. The generator that powered pumps at our waste water plant unexpectedly stopped working. Luckily power was restored to much of the region the following day. However, this event helped to highlight to our entire community why resiliency planning has to be of the utmost importance as we continue to develop our rural community.

Community Outreach and Education

The final piece of what makes a model energy and environmental community is outreach and continued education for the community. In Morris, this has been especially crucial to our efforts. The vast majority of people whom I have come into contact with could not explain the difference between a kW and a kWh let alone explain the principles of how energy generation and transmission work. While this may seem like a small piece of realizing sustainability goals, it has been of utmost importance for us. In an age where misinformation runs rampant and reliable fact checks can be few and far between, educating our communities is our best tool to increase openness to and adoption of renewable energy technologies. Our entire country is about to go through an energy transition the likes of which we have not seen since the early 20th century when much of the country first received access to reliable electricity. The general population is vastly under-educated on energy and how the electrical grid that serves the US works. As we begin the transition to renewable energy, this under-education will only continue to worsen. It will also make misinformation more rampant. As new technologies are introduced public outreach and community education must serve as a tool to combat misinformation.

Outreach

Recently I was presenting at our County fair. I was speaking with a woman about renewable energy projects that we had completed in Morris and how Morris stands out from other communities. She then told me that “we should just turn off those wind turbines from November to April.” As someone who knows how rich our wind resource in Morris is, especially during the winter time, I pushed her to find out why she thought they should be turned off. She responded “the heating systems used to keep wind turbines warm uses more energy than the turbines can produce.” She continued “that’s what happened in Texas and why their grid failed.” She was referencing when an unusually cold winter storm knocked out the majority of the Texas power grid in 2021. When I asked where she had learned this information, she responded with one of the scariest answers a sustainability or city professional can hear “Facebook.” More than ever before people have access to a wealth of information. But this reliable information is also matched by an equal amount of misinformation. One of the ways we seek to combat misinformation is by providing a website that specifically focuses on the work of Morris Model partner organizations. On the website, we post articles and other community resources that explain and educate people on the different sustainability projects happening in Morris. This website also serves as a method of outreach for people outside of our community. We can point to our website as a source of information for all thing sustainability in Morris. By centralizing our information in one place, it creates a great baseline of knowledge for anyone wanting to learn more about the work being done in Morris.

We also conduct other forms of community outreach by attending different community events and connecting with community members. We also host events that invite our community to learn more about different initiatives within our community. One example of an event we held in Morris was a solar celebration to highlight the new solar arrays installed on city properties. Featured speakers at this event included the city manager, our solar installer company, and a representative from the utility. This panel was able to answer common questions about solar and provide narratives about the benefits of installing solar. Another event focused on sharing the recent findings from our community resilience building report. This event focused on identifying the top environmental and infrastructure concerns of residents and brainstorming methods to become a more resilient community. This event helped to lay the groundwork for a larger event that is being planned for the 1st anniversary of the wind storm that struck Morris in May of 2022. We also use the Morris Model website as a tool to connect with members of our community and others who enjoy following the model's work. Using the website we are able to post events and collect RSVP responses, publish blog posts that highlight work of the model and other sustainability reporting. Additionally, Sustainability spotlight articles that are initially published in the Stevens county times are published on the Morris Model website for people who don't subscribe to the paper copy of the newspaper. The website also keeps track of all of the Morris Model work that has taken place over the last several years; it's a living record of our work and serves to remind us of the progress we have been able to make.

Education

Our job as city government professionals is, in part, to educate our citizens about the different projects that we pursue. This education can look like many things. It can include public events where citizens are invited to come and learn about new projects in a relaxed and informal setting. It can also take the form of more formal dinner events. In Morris, we have had success with both of these options. Public outreach and education can also take other forms. For example, in Morris, we have a great locally-owned newspaper. Earlier this year, I began writing informational columns explaining the sustainability work and the work of the Morris model to a general audience. This biweekly column is a great way to interact with many more individuals than targeted events ever could. Another great option is social media. In Morris, most people use Facebook and we have seen mixed results from this form of outreach. However, if you are trying to educate a younger audience, social media can be an effective tool for connecting with younger people and teaching them about sustainability and clean energy.

As with most of the other subjects we have covered in this paper, framing has also played an important role in how we educate our citizens. By introducing renewable energy technologies with the framing of building community resiliency and wealth, we create a positive association with renewable energy. Another way we can frame our education is by highlighting how current electric service in Morris, and around the US, will begin to change as we change the sources of energy we use. This community education is focused on introducing citizens to the concepts of energy, electricity, kW vs kWh, and more. Our theory is that if our citizens know to know what a

30 kW solar array is, they may be more open to exploring renewable energy for their own homes or properties.

Case Study: Morris Energy and Environmental Pathway- Passive Community Education

The Morris Energy and Environmental Pathways is a set of sustainability tours in downtown Morris, at the UMN Morris campus and at the UMN Extension WCROC. The path in downtown Morris focuses on educating residents and visitors on the projects and initiatives that serve the long-term social, economic, and environmental sustainability of our community. The model sustainable community that we envision for Morris through the Morris Model not only focuses on environmental stewardship and sustainability, but also focuses on the long term social and economic health of the community. Especially in rural MN it is important to evaluate what attracts people to live in certain communities over others. Aspects like whether or not you can work a job with a living wage, afford monthly utility bills, have access to the types of food you normally have access to, and being able to have an affordable and accessible child care option. The downtown Morris energy and environmental pathway focuses on just this. While highlighting individual building's and their operating characteristics, like how much energy they use, how big their solar arrays are, and their impacts on the environment and atmosphere. Signs also highlight social and economic sustainability initiatives too. For example, a sign outside of the Morris Movie theater shows how when the theatre was going to close, a group of Morris residents came together to keep this community institution open. Now, the theatre shows first run movies in Morris and hosts local film festivals and other events. While keep a movie theatre open isn't traditionally thought of as a sustainability move, for a community like Morris where there isn't much to do in the first place, it was an essential undertaking. Another example can be found outside of the old Senior Community Center. This building was one of the structures that had solar panels installed on it in 2021. However, aside from being home to the transit office and the city council chambers, the kitchen in the building prepares and delivers nutritious meals to senior's citizens in our community. It also provides a space for seniors to meet and hold other social events. In addition to the building being almost fully powered by solar panels, it serves as a space for seniors in our community to connect and to get free nutritional meals. One of the biggest reasons that a pathway like this was something we chose to pursue is that it offers a passive form of sustainability education. No matter how many tours or events you schedule, people generally but especially in a post-covid world, are harder to connect with and educate. By installing signs in our downtown area, we are able to passively educate residents of Morris and visitors. With a QR code on all of the signs, people can scan a link to find the information on the signs available in English and Spanish, as well as, additional information regarding the different sustainability projects.

The Model Energy and Environmental Community

Over the last 10 years, Morris has worked to become a model community that centers energy management and environmental stewardship within its growth and future plans. Through careful framing and deliberate partnerships, we have grown a coalition of diverse perspectives that are all committed to making our community more sustainable. But this sustainability extends beyond the traditional sense of saving energy and creating policies that preserve our local environments, it extends to the realms of social sustainability and economic sustainability. Especially as a small community in rural Minnesota, fostering a social environment where people can access the foods they normally would, the activities they normally participate in, and the programs and services that they need to live a happy and fulfilled life. And fostering a sustainable economic development that creates well paying, quality jobs that support the continued growth of our community. In disseminating this information, we hope to share our methods with other Minnesota communities looking to jumpstart similar sustainable model communities with partnerships that feature a diverse array of stakeholders and will eventually create a more sustainable, socially just, and economically prosperous Minnesota. We hope that a roadmap like this can aid other communities looking to become more sustainable but don't know where to start.