CITY OF MARINE ON ST. CROIX
CITY COUNCIL MEETING
MONDAY, JULY 19, 2021

VILLAGE HALL 6:00 PM
AND VIA ZOOM

1. **Call to Order**

2. **Leslie MacKenzie**

   Presentation and Document Review

3. **Questions and Comments**

4. **Adjourn**

Marine on Saint Croix GreenStep Cities

Building a More Resilient & Sustainable Marine

Submitted by Marine GreenStep Cities, Council members Gwen Roden and Wendy Ward, coordinator Leslie MacKenzie

Minnesota GreenStep Cities is a voluntary challenge, assistance and recognition program to help cities achieve sustainability and quality-of-life goals.

Marine on St. Croix became a GreenStep City in 2014 by City Council resolution.

Our Goals for This Workshop

1

Review progress and next steps for top priority projects proposed June 2020

2

Discuss GreenStep 4

3

Review lower priority projects for upgrading to a higher priority

Update on Priorities for 20-21 Projects

- Efficient Public Buildings with Energy Benchmarking & Energy Assessments
- EV Charging & Go Electric Education
- Dark Sky Education
- Clean, Safe Water and Septic Education
- Become a Step 4 City

Energy Efficient Public Buildings

B3 Building Benchmarking

Tracking energy and water usage to identify ways to save money and resources.

- Define process to review and act on benchmarking data.

Building Energy Data in your Hands
B3, which stands for Buildings, Benchmarks, and Beyond, puts the power of building energy data in your hands. Using basic building and meter information, the online tool summarizes energy consumption, costs, and carbon emissions in easily digestible monthly and annual reports for Minnesota public buildings.

Energy Efficient Public Buildings

RETAP Energy Assessment

- Set date for public works staff to complete the form in order to schedule RETAP visit.
- Determine if public works staff or a GreenStep volunteer will join RETAP staff when they visit.

MINNESOTA POLLUTION CONTROL AGENCY

RETAP Energy Assessment

Retired engineers and scientists are available FREE through the Retired Engineer Technical Assistance Program (RETAP) to assist municipalities. Written reports containing specific recommendations to save money, increase efficiency, eliminate waste, minimize waste disposal, reduce toxic chemical usage, and promote a positive public image. The reports include resource and cost savings estimates.

Go Electric

Improve public health and reduce greenhouse gases by switching from fossil-fuel-burning vehicles and equipment to next-generation electric equipment.

1. **Electric Vehicle Charging Station**
2. **Go Electric Municipal and Community Program**

EV Charger Considerations

- Approve installation of an EV charger to benefit city and its businesses
- Approve identified location on 3rd and Maple or propose another one
- Approve recommended “dumb charger” or choose to upgrade to smart charger
- Identify date for installation of charger
- Choose to fund the project through the city budget or undertake a fundraising campaign
- Choose to ask for donations from users or find business/municipal underwriters for electricity used
- Approve providing planning commission with example EV parking ordinances

NEXT STEP

Go Electric - Municipal

- Catalog municipal vehicles and equipment that use gas or diesel
- Identify electric replacement options, the cost, and pros and cons of making the switch
- Identify potential funding sources (for example, grant money from the MPCA or Met Council)
- Report back to the Council for planning purposes

NEXT STEP

Go Electric - Community

Communications/education campaign using the city newsletter and community Facebook page to raise awareness among residents of the feasibility and benefits of using electric cars and electric equipment for transportation, lawn care, landscaping, snow removal, etc.

Dark Sky Lighting

Improve the efficiency and quality of outdoor lighting in order to save money and protect natural systems, including human health, wildlife, and plant life.

1. Dark Sky Educational Campaign
2. Ordinance Review
3. Ordinance Enforcement

Dark Night Sky Considerations

NEXT STEP

- Allow planning commission to review Dark Sky model ordinance recommendations and to consider revising Marine's ordinance to match it.
- In upcoming communications, the Dark Sky team will begin informing residents about our town lighting ordinance. How are ordinances enforced? How do people bring a complaint?

NEXT STEP

Clean, Safe Water

Best practices for stormwater, surface water, septic operation

- Septic system operational brochure for new homeowners
- Salt use education and oversalting prevention
- Flood risk and well and septic protection
- Strategies to minimize surface water pollutants

Step 4

Step 4 involves measuring in preparation for Step 5, which is goal setting and action. Because of Marine's size, we only need to report on the core metrics but we can choose additional goals that we might want to measure.

The GreenStep Committee is recommending that this action be set aside at this time in favor of more immediately practical work.

Proposed Next Projects

- Renewable Energy
- Community Resilience
- Local Food Team

Renewable Energy

- Solar on Schools
- Community Solar

Community Resilience

Preparedness Education & Community Building

Engage Marine (and Scandia) residents in preparing their families, homes and blocks for climate/weather-related emergencies using asset-based programs like Ready Together and Map Your Neighborhood.

- Increase awareness of current and future risks
- Provide speakers and resources to enable practical action
- Connect neighbors on a block or neighborhood level
- Plan for support of medically vulnerable, seniors, children

Local Food Team

- Community orchard
- Community garden
- Food education

Energy Efficient Public Buildings

The Opportunity

When a municipality, a business, or a homeowner has data about the performance of their building(s), they are better able to understand their current costs and develop a plan of action to budget for and implement improvements to reduce future costs.

The GreenStep Cities program was developed to help Minnesota cities undertake voluntary actions with a focus on, among other things, cost-savings and energy reduction. Two activities will enable the City of Marine to work on these goals: **B3 Benchmarking** and **RETAP building energy assessments**.

Discussion

GREENSTEP BEST PRACTICE 1: Efficient existing public buildings: Benchmarking energy and water usage, identify savings opportunities to implement cost-effective energy and sustainability improvements. Best practices here include:

1.1. Enter/update building information into the MN B3 Benchmarking database, and routinely enter monthly usage data for all city-owned buildings/infrastructure that consume energy/water.

1.6. Improve the operations & maintenance of city-owned/school buildings by using a customized online energy efficiency tool, or asset management tool.

B3 Benchmarking: "Funded by the MN Departments of Commerce and Administration, B3 Benchmarking puts the power of public building energy data in the hands of Minnesota public building owners to manage and reduce energy costs… The online B3 benchmarking tool summarizes energy consumption, costs, and carbon emissions in easily understood monthly and annual reports."

The program currently supports over 7,500 public buildings in 22 state agencies, 410 cities, 55 counties, 214 school districts and 60 college campuses. You can see benchmarked cities across the state here - https://mn.b3benchmarking.com/Report (including Scandia and Stillwater). This technology has identified more than $23 million in potential energy savings for municipal and educational users.

B3 Benchmarking is currently required for Step 3 Cities; a level that Marine received in 2019. B3 Benchmarking will enable Marine to:

- Understand our municipal energy consumption, costs and emissions, and
- Move to GreenStep 4, which involves measuring the current baseline resource use and environmental impacts of municipal functions.

Participating in B3 Benchmarking will require staff or volunteer time for two things:

1) **Setting Up the System:** Reports from other users and from B3 Benchmarking staff are that it takes approximately 7-10 hours to set up the system (as a very small city with

few buildings, we would be on the faster side). B3 staff are available to assist with this, as well as a GreenStep volunteer.

2) **Reporting:** Users (including Scandia's treasurer) report spending approximately 15 minutes a month to generate reports. Since the information is found in utility bills that are open to the public, this could be done by a volunteer.

Reports should be reviewed by the Council members responsible for city buildings, as well as public works staff as these are the most likely people to be able to act upon information on facility performance in comparison to historic performance and similarly-sized municipalities.

RETAP Building Energy Assessments: A second and related activity involves accessing the free services of RETAP volunteers (Retiree Environmental Technical Assistance Program) to conduct **energy assessments** of the municipal buildings that were not previously assessed: the school building, fire station, and public works building.

These building assessments will provide a list of energy-saving capital improvements that can be implemented over time, as budget allows. Actions undertaken later, guided by the energy assessment, could meet GreenStep Best Practices 4.2 (low-cost lighting and operational changes), and 4.3 (larger energy efficiency projects). With benchmarking in place, we can then track the cost savings that results from any upgrades.

Participating in the RETAP energy assessment program requires staff time for two things:

1) The completion of a survey to provide information about municipally owned buildings. We received a copy of this survey in December. Public works staff are the most appropriate people to fill it out as they know the buildings best, but it could be done by a volunteer. It *may* require two hours to complete.
2) RETAP volunteers would come to Marine to do an onsite visit of the buildings. They said it would take 4 hours. A public works staff member should accompany them to answer questions.

The RETAP report should then be reviewed by the Council members responsible for city buildings. Recommendations selected for action should then inform any capital improvement planning and future budget cycles.

Goals

- Improved understanding of city resource use through improved data gathering and reporting.
- Continuous improvement in the management of city resources, reduction in costs, and reduction in municipal greenhouse gas emissions to meet the state's GHG reduction goals.

Activities

B3 Benchmarking

- Marine office staff and GreenStep volunteer work with B3 staff member to set up the system and import data.
- Reporting can be generated on a monthly, quarterly and/or yearly basis.

RETAP Building Energy Assessment

- Complete facilities survey required by RETAP before a site visit can be scheduled.
- RETAP energy assessors will conduct on-site building assessment with a member of public works staff.
- RETAP volunteer will prepare a report for the Council.

Approximate timeline for that activity	**Approximate budget for that activity**
B3 Benchmarking can be set up in 10 hours or less; reporting takes 15 minutes. It can be scheduled at any time. RETAP scheduling within 3 months; report available about 6 weeks after that.	Staff time
Activities accomplished by whom? (staff, teams, partners) Public works staff, city administrator, Kevin Hein, B3 Benchmarking staff. Some data capture is automated through Xcel; some will need to be done by staff or volunteers.	**Potential funding sources** None needed

> “The cost avoidance report is a great tool for B3 to have.”
>
> Samantha McKeough & Jeff Connell
> Saint Paul Public Schools

> “We used the benchmark to determine the Lake Crystal Recreation Center building had room for improvement and installed a lighting retrofit.”
>
> Teri Thompson
> City of Lake Crystal

> “We use the tool, because it combines monthly bill entry, reporting and ENERGY STAR® into one intuitive package. The software is accessible from the Web so that multiple users (with password capability) can enter information. We utilize the report features for analyzing trends in consumption verses costs, and especially like the weather normalization when comparing monthly and annual consumption. We also use the data export feature to create additional spreadsheets and customize to particular business needs.”
>
> Tammy Carter
> Energy Project Supervisor for Cedar Rapids Community School District

Electric Vehicle Charging

The Opportunity

The future is electric: In January 2021, GM announced that it plans to discontinue producing gas and diesel vehicles by 2035. Drivers are ready for it. 71% of drivers are interested in an EV, and 31% of drivers are considering an electric car for their next car purchase. The State of Minnesota has set a goal of **20% EVs by 2030,** but at least 70,000 EV chargers are needed to support that shift. That would save MN drivers $1 billion in fuel costs and significantly reduce the state's greenhouse gas emissions.

GREENSTEP BEST PRACTICE 23: Local Air Quality. Prevent generation of local air contaminants so as to improve community health.

> **23.5.** Install, assist with and promote **publicly available EV charging stations** or public fueling stations for alternative fuel vehicles.

Discussion

Public EV charging is a missing piece of **transportation infrastructure** in Marine on St. Croix. We are currently not prepared to accommodate the needs of visitors and tourists with electric vehicles.

EV drivers use apps to find charger locations. Marine is invisible on these apps because we do not have public EV charging. That's a **missed opportunity for our local businesses** because visitors who stop in a town to recharge stay an average of 50 minutes *longer* and businesses with a charger in their parking lot generate 131 times more revenue from people who use the charger than the cost incurred by providing free electricity.

THE BENEFITS OF INSTALLING AN EV CHARGER IN MARINE

1. It would keep our city "on the map" for the growing number of EV drivers.
2. It would increase the opportunity for visitors to frequent local businesses, enhancing the vitality of our village center.
3. It would reduce range anxiety for drivers who want to visit our community.
4. Marine would be doing its part to help Minnesota reach its greenhouse gas reduction goals, protecting the environment we cherish, as well as human health.

Goals

1. Add an EV charger in the town center
2. Get Marine listed on EV charging apps

Activities

- Participate in Communities Charging Ahead (https://www.driveelectricmn.org)
- Identify optimal charging locations within downtown Marine

<table>
<tr><td colspan="2">

- Identify appropriate charging station technologies
- Identify technical problems and strategies to overcome them
- Identify funding options for hardware and electricity
- Secure bids from EV charging vendors
- Review potential grant opportunities
- Secure or assist with securing funding
- Install a charger

</td></tr>
<tr><td>Approximate timeline for that activity
12 months for research. The installation can happen at a future time.</td><td>Approximate budget for that activity
No money to do planning; money required to purchase and install charging station (ranging from approx. $9,000 to $15,000)</td></tr>
<tr><td>Activities accomplished by whom? (staff, teams, partners)
Marine GreenStep EV Team, local businesses, Great Plains Institute, Drive Electric MN</td><td>Potential funding sources
Possible state or federal funding, potential for crowdfunding</td></tr>
</table>

Go Electric Awareness

The Opportunity

The future is electric: and not just electric cars. It's also gas and diesel outdoor equipment like lawn mowers, snow blowers, leaf blowers, chain saws, and more.

GREENSTEP BEST PRACTICE 23: Local Air Quality. Prevent generation of local air contaminants so as to improve community health.

Discussion

For some residential uses, electric equipment is actually a more economical choice than gasoline-powered equipment. Battery technology has advanced dramatically and we're seeing more powerful electric cars and more capable electric lawn mowers and other yard care tools. But many people are unaware of all the available options, or they have a mis-impression that electric-powered equipment would not work for them.

We propose an informational campaign to educate the community about the availability of electric equipment options and benefits, such as:

1. Reduced air pollution and GHG emissions
2. Reduced noise pollution
3. Protection of the environment and human health

The municipality of Marine can also begin to prepare for the switch to electric.

Goals

- Increase awareness about electric vehicles as a reliable transportation option for residents in Marine, including those who commute to the Twin Cities for work.
- Increase awareness of electric equipment in place of gas or diesel equipment.
- Begin planning for replacement of municipal vehicles and equipment.

Activities

- Share electric vehicle and equipment information on the community Facebook page and the GreenStep Cities page on the city website
- Write an article about electric equipment benefits for the city newsletter or local paper
- Include EV cars in the 4th of July Parade
- Host a ride-and-drive event
- Catalog city vehicles and equipment that currently use gas or diesel and develop a replacement plan and preliminary budget.

Approximate timeline for that activity	**Approximate budget for that activity**
12 months/ongoing	0

Activities accomplished by whom? (staff, teams, partners)	Potential funding sources
Marine GreenStep EV Team	

Clean, Safe Water

The Opportunity

The St. Croix area is blessed with an ample supply of fresh and clean water – some of the best in the state. Marine residents greatly value the natural environment, particularly the river. Focusing on water-related GreenStep best practices will allow the city and its citizens to continue to protect water quality.

- **GREENSTEP BEST PRACTICE** 17. **Stormwater:** Best practices include minimizing the volume of and pollutants in rainwater runoff and programs such as adopt-a-drain, and reduction of de-icing and dust suppressant salt (on gravel roads) to prevent surface and groundwater pollution.
- **GREENSTEP BEST PRACTICE** 19. **Surface Water**: Best practices include water quality monitoring; community conversations and actions around water quality and quantity; and the adoption of goals to revegetate shoreland and outreach to property owners**.**
- **GREENSTEP BEST PRACTICE 29. Climate Adaptation.** Best practices include protecting wells and wastewater treatment (sewers, septic) to reduce physical damage and sustain their function during extreme weather events.

Discussion

The GreenStep committee proposes to expand on existing conversations with an educational component. For example:

The CMSC Watershed District has recently begun rebuilding its flood risk models to take climate change into account, improving our ability to predict future flood risks. Helping people understand flood risks can enable them to take action to protect their well and septic system from contamination and failure during excessive rain events.

Fifty metro-area water bodies are already impaired by salt. Educating the community about ways to reduce salt usage for ice removal and water softening can help minimize water contamination.

Lawn care is another way we introduce pollutants into our water supply through the use of fertilizers and pesticides. Educating the community about these potential hazards and explaining options can reduce the risk of chemical contamination.

Goals

- Educate the community on ways we can be responsible stewards of our water resources by delivering a **Clean and Safe Water campaign** with speakers, news stories, and informational materials.

Activities

- Short stories in the city newsletter
- Information on the GreenStep page of the city website
- In-person or online webinar speaker a water pollutant topic
- Activities on Arbor Day and Millstream Day

Approximate timeline for that activity	**Approximate budget for that activity**
Ongoing education	Minimal; perhaps speaker fee
Activities accomplished by whom? (staff, teams, partners)	**Potential funding sources**
GSC committee and team members, community volunteers, residents	

Septic Education

The Problem

A poorly functioning septic system is a threat to human health and the environment because it may not remove pathogens, nutrients and other chemicals from the used water before it enters our groundwater or lakes. Thousands of property owners in Washington County have outdated septic systems that are at risk. In a community as old as Marine, some of those systems are sure to be located nearby. The Washington County Board has said they want to place more emphasis on addressing failing septic systems to protect groundwater. (https://www.startribune.com/urgency-needed-on-problem-septic-systems-washington-county-says/208003391/)

GREENSTEP BEST PRACTICE 21. **Septic**: Best practices include having a system to report suspected noncompliant or failing septic systems to the property owner, and educational and financial assistance programs designed to trigger voluntary landowner action.

Discussion

Marine has seen an influx of new residents in recent years, many of whom previously lived in communities that provided a public sewer system. These residents may not know about the proper maintenance of a private septic system, how to determine if it is failing, what they should do if they suspect a problem, financial assistance available to address a failing or failed system, or how to protect their septic system in case of flooding.

This workplan will create educational materials that can be provided to new residents and put on the City website for general information. Information would include:

- How septic systems work
- What can cause them to fail
- How to maintain the proper functioning of your septic system
- What to do if you suspect a problem
- County assistance programs to help homeowners with failed systems
- What to do/know to protect your septic system if a flood occurs

Goals

- Reduce potential for septic system failure and risk of water and well contamination.
- Expand community knowledge about our community's sewer collector system.

Activities

- Create a brochure for new residents that includes the above information
- Add content to the City's website
- Host an expert guest speaker

Approximate timeline for that activity 1 month to create materials; a speaker sometime within a year	**Approximate budget for that activity** Cost of photocopying
Activities accomplished by whom? (staff, teams, partners) John Goodfellow, master watershed steward, and Kitsi Vadheim will write material. Leslie MacKenzie will prepare print and online material.	**Potential funding sources** None needed

Dark-Sky/Night-Time Lighting

The Problem

According to the International Dark Sky Association, night-time over-lighting is costly in terms of energy use, as well as detrimental to the life and health of wildlife, insects, plants and people. Some steps have already been taken in Marine to improve energy-efficiency when Xcel Energy replaced streetlights in Marine with LEDs in 2017. But there are additional opportunities for energy savings, and there are municipal and private property opportunities for reducing light pollution.

The following GreenStep Best Practices address these concerns.

- **GREENSTEP BEST PRACTICE 4: Public Lighting, which focuses on replacing outdoor lighting fixtures with energy-efficient, dark-sky-compliant versions.**
- **GREENSTEP BEST PRACTICE 10: Protect Natural Systems and Valued Community Assets**, which includes a focus on natural resource conservation and ordinances and process to protect natural systems. This includes pollinator and wildlife protection

Discussion

Energy and cost savings:

- Municipal building lighting has not been assessed for energy efficiency or dark-sky compliance. There are potential cost-saving opportunities here (which will be determined as part of the RETAP energy assessment in a different workplan).
- It's unclear that energy-efficiency can be required on private buildings.

Protecting natural systems:

There exist model dark-sky ordinances for municipalities. Our own city ordinance is very close to model language (see attached). Increased awareness and enforcement of our existing municipal ordinance is an opportunity for further improvement.

- We propose that our city planning commission review model dark-sky ordinance language in comparison with our existing city zoning code to determine if they would recommend any updates to our code.
- We propose that there is an opportunity for community education to help people understand the problems of over-lighting at night, the value of a dark night sky, what our city ordinance says, and how homeowners can take action on their own property.

Goals

- Identify opportunities for the city to save energy and money *and* reduce its night-lighting impact with energy-efficient, dark-sky compliant lighting.
- Increase awareness of light pollution impacts and Dark-Sky lighting options among residents.
- Bring Marine's lighting ordinances (in zoning code) in line with model dark-sky ordinances.
- Increase awareness of and compliance with City lighting codes.

Activities

1. Inventory and assess energy efficiency of outdoor municipal building lighting as part of the RETAP energy assessment, and at the same time assess compliance with dark-sky standards.
2. Share model Dark-Sky ordinances with the Marine planning commission for their review and possible revision of zoning codes.
3. Conduct an educational campaign within the community (see communications campaign detail) regarding:
   (a) The problem of light pollution and its negative impact on natural systems, including humans,
   (b) dark-sky compliant lighting options and other strategies for reducing the negative impact of night-time lighting,
   (c) Marine City ordinances regarding lighting.

Benefits of This Workplan

1. Enhancing the health of the ecosystem and protect the health and life of migratory birds, pollinators, insects, nocturnal wildlife, and people by reducing damaging night-time lighting.
2. Potential cost-savings to the municipality and residents when switching to lower-energy lighting options, or lower light-use strategies.

Approximate timeline for that activity	**Approximate budget for that activity**
12+ months	None at this time. Potential costs—and savings—could be associated with enactment of any revised municipal lighting ordinances.
Activities accomplished by whom? (staff, teams, partners)	**Potential funding sources**
GSC committee and volunteers, if the City chooses to replace some light fixtures it might require city public works staff (or a hired electrician, or a volunteer)	If opportunities for energy reduction are found, the committee or public works staff can source replacement light fixtures, the cost of which can then be factored into future city budgeting.

Communications Plan

Month	Topics/Key Messages	Communications Channels				
		City Web	Mess	City News	**Face**	**Other**
April	**Messaging:** Become a Citizen Scientist – Loss of Night App **Messaging:** Home Lighting Assessment & Options (Newsletter, Website)	 **X**	**X**	 **X**	**X**	
May	**Messaging:** Lighting and Wildlife Fertility (Lusty month of May - Toads/Frogs)	**X**	 **X**		 **X**	
June	**EDUCATION:** July DNS app teach-in **Messaging:** Wildlife and pollinator impacts **Messaging**: Equinox Event announcement	 **X**	 **X**		 **X** **X**	
July	**Messaging:** Know your city ordinances – be a good neighbor, report a problem	**X**	**X**	**X**	**X**	
August	EDUCATION: River Radio re Equinox? EDUCATION: Equinox article for Messenger **Messaging:** DS and Migratory Birds	 **X**	 **X**		**X** **X** **X**	River Radio
September	**EDUCATION:** Equinox Event **Messaging:** All messaging for DS program	**X** **X**	**X** **X**		**X** **X**	Fliers
October	**Messaging:** Lighting and Crime / Safety - Halloween	**X**	**X**		**X**	
November	**Messaging:** Holiday Lights – purpose, timing, appropriate	**X**	**X**	**X**	**X**	
December	**Messaging:** Human Health and Sleep	**X**	**X**		**X**	
January	**Messaging:** New Year's Resolution – Become more Dark Sky Friendly		**X**		**X**	

Relevant City Zoning Codes Related to Lighting

https://www.marineonstcroix.org/vertical/sites/%7BE6A156D5-6FCB-4DD8-BA60-2F231F862CF9%7D/uploads/Zoning_Ordinance_Oct20.pdf

404.7 Nuisance Characteristics.

No noise, odors, vibration, smoke, air pollution, liquid or solid wastes, heat, glare, dust, or other such adverse influences shall be permitted in any district that will in any way have an objectionable effect upon adjacent or nearby property. All wastes in all districts shall be disposed of in a manner that is not dangerous to public health and safety nor will damage public waste transmission or disposal facilities. The following standards apply to all districts.

(1) Glare. In all districts, any lighting used to illuminate an off-street parking area, sign, or other structure, shall be arranged so as to deflect light away from any adjoining residential zone or from the public streets. Direct or sky-reflected glare, including glare from floodlights or from high temperature processes such as combustion or welding, shall not be directed into any adjoining property. The source of lights shall be hooded or controlled in some manner so as not to light adjacent property. Bare incandescent light bulbs shall not be permitted in view of adjacent property or public right-of-way. Any light or combination of lights which cast light on a public street shall not exceed one (1) foot candle (meter reading) as measured from the centerline of said street. Any light or combination of lights which cast light on residential property shall not exceed 0.4 candles (meter reading) as measured from said property.

Recommended Additions/Changes to Marine City Code based on model ordinances

- Homeowners using outdoor night lights may use only those with motion detectors and avoid using dusk to dawn lights.*
- Fixtures shall be of a downcast, cutoff type concealing the light source from view and preventing glare and spinoff into other residential areas.
- All parking lot and security lighting shall be directed away from adjoining residential areas.
- Linear LED or neon architectural or sign accents are not allowed on any building, canopy or sign with the exception of temporary seasonal lighting.

*Another alternative is a light switch timer to turn off at a certain hour and establishing hours when lights should be off.

REFERENCES

- International Dark Sky Association (IDA) darksky.org
- IDA model for city codes. https://www.darksky.org/wp-content/uploads/bsk-pdf-manager/16_MLO_FINAL_JUNE2011.PDF
- An example of a Dark Sky community – Lake Superior IDA

GreenStep 4

The Opportunity

Minnesota GreenStep Cities is a voluntary challenge, assistance and recognition program to help cities achieve their own sustainability and quality-of-life goals – goals that make sense to their community. Step 4 sets the stage for Step 5, in which communities enact changes and then measure the outcome of those changes.

Discussion

GreenStep 4 asks communities to measure and report on a number of core metrics per calendar year. As a Category C city, Marine only needs to report on the core categories found below. (B3 Benchmarking must be in place to embark on Step 4 because data gathered by B3 provides data for reporting metrics.)

The community can choose to capture information on other metric categories for goals that it wants to pursue and for which having a structure and reporting mechanism would make it more likely to achieve its goal. These are a few examples of possible areas of interest:

Social Vitality (Civic Engagement): As a small community with limited staff, there is a great need for citizen volunteers in activities like operating the Stonehouse Museum, assisting with holiday events, planting trees and removing buckthorn, maintaining the new raingardens, etc. The city might choose to establish a goal of increasing the number of citizen volunteers. It might choose to create a volunteer role of volunteer coordinator.

Social Vitality (Community Health): There are a significant number of seniors in the community. Understanding the health and wellness needs of seniors could lead the city to encourage senior-specific activities and create infrastructure to support healthy activity (more benches for walkers, for example, or an outdoor exercise circuit in a greenspace).

Social Vitality (Arts & Culture): This community includes a large number of artists. How do artists increase the economic and social vitality of our community? What support do they need? With the cancellation of the art fair, how might other art-related events take its place to increase tourism and provide income for local artists?

Transportation (Commuting & Telecommuting): Many residents in the area telecommute. Are there services or amenities that would make telecommuting easier? For those who commute, often into the Twin Cities, are there ride-sharing options available to reduce emissions and save commuters money?

Preserving natural resources is another area where the community may want to set specific goals for itself.

Step 4 Required Metrics for Community Assets

City Buildings and Lighting (**CORE**) Data from B3 Benchmarking tool, plus RETAP energy assessment, plus public works	METRICS **City Buildings:** 1.1 kBtu per square foot, per year 1.2 Dollars spent on energy per square foot, per year 1.3 Ratio of actual energy use to predicted energy use **Percent of LEDs in:** 1.4 Street lights 1.5 Traffic signals 1.6 City buildings & property
City Fleets (**CORE**) Public works records	▪ **City Vehicles:** 3.1 Vehicle miles traveled (VMT) for gasoline fleet 3.2 Average miles per gallon (MPG) for gasoline fleet 3.3 Vehicle miles traveled (VMT) for diesel fleet 3.4 Average miles per gallon (MPG) for diesel fleet 3.5 Number of electric vehicles in city fleet
Open Space, Parks & Trees (**CORE**) Data from city maps, (recently completed) city tree inventory, staff knowledge, forest committee, DNR data	METRICS ▪ **Open Space** 8.1 Percent of total city acres in open space ▪ **Parkland Quantity & Access:** 8.2 Acres of parkland 8.3 Percent of city residents within ½ mile/a 10-minute walk of parkland ▪ **Tree Canopy** 8.4 Percent canopy coverage 8.5 Three most prevalent tree species (by percent genus) 8.6 Net number of new trees planted 8.6a Percent of 8.6 trees that are "likely to thrive"
Stormwater (**CORE**) Data from public works staff and/or city planner and Municipal Stormwater Mgmt Assessment tool (https://survey.mn.gov/s.asp?k=160709445647)	METRICS • 9.1 Assessment score from the GreenStep Municipal Stormwater Management Assessment • 9.2 Climate Adaptation Stormwater Score
Waste Water (**CORE**) Cities that do not own and operate a treatment plant should report residential and business gallons, I & I (inflow and infiltration) data, and only energy and cost data related to the part of a sewer system they do operate, such as lift stations.	METRICS • 11.3 annual energy used per million gallons treated/pumped (MMBtus/million gallons) • 11.4 annual operating cost in collars per mission gallons pumped • 11.5 ration of inflow and infiltration volume to total volume entering collection system
Renewable Energy (**CORE**) Xcel community energy reports and city records	METRICS • 14.1 # of City-owned and private renewable energy generation sites • 14.2 Generation capacity at City-owned and private renewable energy generation sites (kW) • 14.2a Storage and off-grid capacity of renewable energy generated by City-owned and private renewable energy generation sites (kW) • 14.3 Annual production at City-owned and private renewable energy generation sites (MWhr/yr) • 14.4 Annual renewable energy purchases for city operations (MWhr/yr) • 14.5 # of non-city entities participating in renewable energy purchasing/green power programs

	• 14.6 % of total city operations energy use that is generated and purchased renewable energy
Climate (**CORE** fore Regional Indicator Communities) Marine on St. Croix IS a Regional Indicator Community (see https://www.regionalindicatorsmn.com/energy-chart) Data comes from the regional indicators initiative, from city data, from an EPA calculator with the help of GreenStep staff reviewing data collected from other core metrics	METRICS • 17.1 Greenhouse gas (GHG) emissions from travel (tonnes CO2e) • 17.2 GHG emissions from waste (tonnes CO2e) • 17.3 GHG emissions from non-transportation energy (tonnes CO2e) • 17.4 total citywide GHG emissions (tonnes CO2e) • 17.5 Total city operations GHG emissions (tonnes CO2e)

Optional Metrics

1) Green Buildings
2) Infrastructure for Biking and Walking – this includes bike trails and walkability scores
3) Car, Transit, and Bike Options – this includes EV charging stations
4) Transportation Modes & Miles – this gathers information on commuting, telecommuting
5) Land Use – this looks at economic sustainability/tax productivity, market value, affordability
6) Surface Water - this looks at shoreline vegetative buffers, water clarity, citizen water monitors
7) Solid Waste – this looks at solid waste, recycling and composting in a community
8) Social Vitality – this can include social vulnerability, livability, civic participation, arts & culture, community health, volunteerism

Activities

GreenStep staff work with communities to help them identify appropriate metrics and data gathering tools.

The process of choosing metrics could be done by Council members, or it could be a community-wide project that engages a large number of people in visioning positive goals and engaging in volunteer opportunities to help meet those goals.

Approximate timeline for that activity Ongoing. At least a year of data is needed to move to Step 5. There is a yearly reporting requirement which can be done by GreenStep volunteers and City staff.	**Approximate budget for that activity** Staff time
Activities accomplished by whom? (staff, teams, partners) Council members, GreenStep volunteers, city staff, MPCA staff	**Potential funding sources** None needed

Bringing Electric Vehicle (EV) Charging to Marine on St. Croix

EV CHARGERS BRING IN BUSINESS!

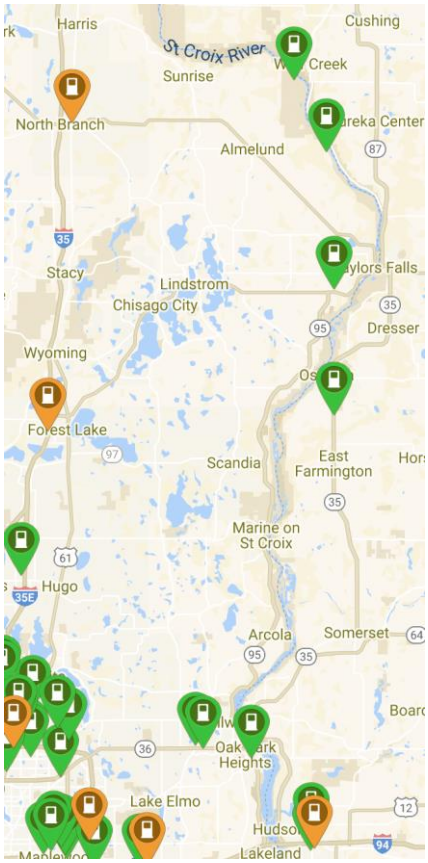
Public EV charging is a missing piece of **transportation infrastructure** in Marine on St. Croix. We are currently not prepared to accommodate the needs of visitors and tourists with electric vehicles.

Following is a proposal to install a non-Tesla EV charging station in our commercial district. This proposal will:

1. Explain the need to add EV charging infrastructure.
2. Propose a location for a charging station based on a variety of best practices and advice from public works.
3. Propose the type of EV charger that will likely work well for our community, given its size, budget and connectivity challenges.
4. Include an estimate of costs

Marine on St. Croix is Not on the Map for EV Users

EV drivers use apps to find charger locations. Marine is invisible on these apps because we do not have public EV charging. That's a **missed opportunity for our local businesses** because visitors who stop in a town to recharge stay an average of 50 minutes *longer* and businesses with a charger in their parking lot generate 131 times more revenue from people who use the charger than the cost incurred by providing free electricity. (There are EV chargers equipped to take payment but as you will see later in this proposal, those are likely not cost-effective for Marine.)



Nearest chargers on 95

There is a public charger at the Goodwill in Stillwater. There are no other public chargers along Highway 95. (There is a private campground charger in Taylor's Falls, and a private charger further north at a ski resort.)

Why This Matters

Range: Marine on St. Croix is an easy commute from St. Paul, about 40 miles from Minneapolis, and at least 60 miles from the west metro. A round trip is 80 to 120 miles.

In the summer, every fully charged EV has sufficient range for a round trip journey to reach Marine and back. In the winter, though, when vehicle range may be cut in half by low temperatures, some vehicles could not make this round trip without stopping to recharge.

And of course, not everyone tops up their battery before they take a trip. Drivers feel more comfortable heading back home when they have sufficient charge.

A Level 2 EV charger provides 50 to 60 miles of charge in 2 hours. What opportunities could this present for our Marine businesses? It would create ample opportunity for:

- A trip through the General Store
- A visit to Hwy North
- A meal at the Brookside
- A stop at the St. Croix Chocolate Factory, Marine Café or the Scoop
- A walk to the river and through the Marine Mill historic site

Capturing people's free time could have a significant business benefit.

(Although it is a short walk away, EV charging may also be attractive to Twin Cities folks attending a class at the Folk School. Our proximity to the Cities should be attractive to students whose electric vehicles couldn't easily make the 4-hour to Grand Marais. When in session again, Folk School classes are often 2 hours long – the perfect length of time for recharging.)

How many drivers are we talking about? Currently, there are 14,484 electric and hybrid vehicles in Minnesota, mostly in the metro area. Although that is a small number, it has been increasing rapidly.

The future is electric: In January 2021, GM announced that it plans to discontinue producing gas and diesel vehicles by 2035. Drivers are ready for it. 71% of drivers are interested in an EV, according to Consumer Reports (December 2020), and 31% of drivers are considering an electric car for their next car purchase.

The State of Minnesota has set a goal of **20% EVs by 2030,** but we need charging infrastructure to support that shift. A 2017 study by MnDOT estimated that Minnesota would need at least 70,000 chargers to reach its goal of 20% EV infiltration. Not only would it save MN drivers $1 billion in fuel costs, but it would significantly help the state reach its greenhouse gas reduction goals. (Transportation is the largest source of greenhouse gas emissions in MN.)

RECAPPING THE BENEFITS OF INSTALLING AN EV CHARGER IN MARINE

1. It would keep our city "on the map" for the growing number of EV drivers.
2. It would increase the opportunity for visitors to frequent local businesses, enhancing the vitality of our village center.
3. It would reduce range anxiety for drivers who want to visit our community.
4. Marine would be doing its part to help Minnesota reach its greenhouse gas reduction goals, protecting the environment we cherish, as well as human health.

WHAT KIND OF CHARGER WOULD WORK BEST?

Ideally, Marine on St. Croix would have a DC fast charger (Level 3) because of our proximity to a highway. However, a Level 3 charger is much more expensive both to install and to maintain. And because Highway 95 is not on a high traffic corridor, it's unlikely Marine would receive state grant funding to cover the cost.

For that reason, the GreenStep EV team is recommending that Marine install a Level 2 charger which provides 50 to 60 miles of charge in 2 hours. A Level 2 charger is best suited for locations where people can spend 2-4 hours accessing amenities.

WHERE WOULD IT BE LOCATED?

Location selection criteria: Drive Electric Minnesota suggests these considerations when choosing a location:

- Proximity to power
- Proximity to businesses or activities, especially those you most want to promote
- Available to the general public 24/7
- In an area where installation will require the least disturbance of paved surfaces
- In an area with good lighting, which helps people feel safer and makes it easier to use the charger.
- If in a parking lot, it should be in as large a lot as possible and it should not be placed in the most desirable parking spot to minimize ICEing (internal combustion engine cars parking in the EV charging spot)
- In a "safe" location, one that is least likely to be accidentally damaged. This may mean adding bollards near the charger. Snow removal is also a consideration.
- Outside funding sources often require spaces that can meet ADA accessibility requirements, or that can accommodate 2 chargers.

In summary, technical feasibility, user security, and public access are the critical factors.

The GreenStep EV Team reviewed the entire downtown area to identify potential parking spots that met these criteria. In October 2020, we met with city public works staff to review these locations. They identified a location on **Maple and 3rd**, next to the streetlight. This is a perfect site due to its proximity to an Xcel electric pole with an electrical transformer. Signage can be added here and would be highly visible to people driving into town.

(The school building would also be a good location when the school is in use again. Level 2 charging would be the ideal technology for students at the Folk School and elementary school staff because they are in the building for a longer period of time.)

CHARGING TECHNOLOGY

Decisions to be made regarding charging technology include:

- Single or double charger
- Wall mount or ground (pedestal) mount
- Networked (smart) or not-networked (dumb)
- Cord management – retractable or not retractable, stored or not stored
- Touchscreen
- Beacon light to ensure visibility at night

Due to cost and location, the GreenStep EV team's recommendation is as follows:

- A single Level 2 charger
- Pedestal mount is required for the 3rd St location
- Non-networked (dumb) is much less costly, is appropriate given our community's challenge with internet connectivity, and is adequate for the expected level of use
- Retractable, stored cord management would be needed to reduce the chance of cord damage.

COSTS

- **Installation Cost:** A Level 2 charger can be installed by any certified electrician.
- **Maintenance Cost**: Of the communities we surveyed, only one had experienced a repair. (It was $250). Because of the low cost of the unit itself, communities usually choose to replace it rather than repair it.
- **Operating Cost:** Operating costs include the cost of electricity (and the cost of internet connectivity, for smart chargers). When not in use, the technology itself has a minimal phantom power load of less than 7 watts.
    - The cost to be able to accept credit payments is about $4,500, in addition to monthly service fees.
    - This proposal recommends a "dumb" meter, with no connectivity. Such a system has no mechanism to track usage or to charge users for the amount of electricity they use. See discussion below regarding user payment.
- **Insurance Cost:** Of the communities we surveyed, it was typical for the city to insure the hardware under its municipal liability insurance. One city reported an insurance cost of $86, but that was for a Level 3 charger (which costs upwards of $50,000). Since the cost of the equipment itself is less than $1,500, we expect the insurance cost would be minimal.
- **Signage:** Signage should be added for wayfinding, as well as roadway marking to designate the parking spot for protected usage by electric vehicles only. The cost for metal signage is approx. $100 and for a pavement painting stencil, $100. Installation and painting would need to be done by Marine public works.

EV installation proposals have been received from Sternberg Electric Service and Electriccity Corporation, providing an idea of what it may cost to purchase and install a level 2 “dumb” charger.

- Sternberg: $8,897
- Electriccity: $10,125

The electricians would provide the following:

- Establish new 100amp service from the Xcel pole, grounding and bonding to code
- Furnish and Install a new meter socket
- Install utility line side conductors and raceway
- Furnish and install raintight panel to supply car charger
- Furnish and install underground piping from the service to the site of the EV charger with circuitry wiring
- Provide and install concrete footing and a 4” square x 10’ tall mounting pole to mount the EV Charger and cord management system. Wiring to be concealed within the pole.
- Furnish and install a 50 amp Level 2 EV charging station, 22’-25’ cord, and cord management system
- Provide and install 2 bollard posts (5.5” x 36” embedded in concrete to protect the charger.
- (Optional LED lighting above charger)

The estimates include electrical permit and inspection fees and taxes. Supplied parts and labor carry a one-year warranty. Not included are any fees from Xcel for establishing new service and landscaping repair.

Charger Equipment

Electricians tend to have product preferences.

- Sternberg proposes to install a Leviton EVR40-B2C Level 2 charger. The EV Team notes that Leviton products are made in China. They have a 2-year warranty. Cost online, approx. $1,141.

- Electriccity proposes to install an EVoCharge EVSE, non-Wi-Fi enabled, 7.7 kw EV charger. This product is made in America (a Minnesota company) and has a 3-year warranty. Cost online, approx. $480.
- The Marine GreenStep EV team suggests the Clipper Creek, HCS-50. It's an American-made product, very simple and reliable, with no buttons or displays. You just plug in. It comes with a 3-year warranty. The company has been in business since 2006. Cost online, approx. $635.

If the City Council wants to pursue installation of a smart EV charger that has the ability to connect to the internet and to accept payment, the committee further reviewed a ZEFNET-PRO dual-port pedestal charger. The cost of this technology is approximately $8,900.

WHO PAYS FOR ELECTRICITY?

According to the Great Plains Institute, a nonprofit working to transform the energy system to benefit the economy and the environment, it is almost always better to make Level 2 charging free to the user. The goal of adding a Level 2 charger is usually to bring new business to an area, not to make money. (Because of its high installation and operating cost, Level 3 fast charging is almost always charged back to the user.)

Communities across Minnesota have taken different approaches to paying for or charging for electricity:

- The City of Siren, Wisc., reported that their Village Hall has not seen a significant increase in energy consumption since the addition of a charger on the Hall. The city pays for any usage. They have a sign inviting donations and have received about $75.
- The Milaca Chamber of Commerce reports that their charger was purchased by a local electrician, sited at the local bank, and that the bank picks up the tab. They have an understanding that if usage was "crazy" the Chamber of Commerce would pick up the cost, but that has never happened.
- The City of Red Wing installed a Level 3 fast charger, the electricity for which is paid by businesses that have their logos displayed on a sign at the charging site. It provides free charging in a municipal lot.
- The city of Winona operates with a donation model. Their charging station is located outside their food co-op and the business requests (and usually receives) a donation of $1 to $2/hr.
- Shoreview posted a sign stating free charging for 2 hours. There is no enforcement mechanism, but the real-world response has been that people leave at the stated time.

What does electricity cost? An hour charge gives a battery boost of 30 miles. The cost to charge per hour (for a 50-amp output) is as follows:

- Small Commercial Service - $2.00
- General Service - $1.50 to $3.00 per hour (the reason for the range in cost is due to the potential impact on peak demand. If peak demand increase the cost is on the higher end, if peak demand doesn't increase, then the cost is on the lower end.)

How much usage is Marine likely to see? MnDOT has classified Highway 95 as a "minor connector," as are most roadways in northern Washington County. It receives the lowest level of traffic – fewer than 8,000 travelers a day. There is no forecasted increase in traffic in coming years.

- Average daily traffic at highway 95/County 4 is 950 cars per day. Commercial traffic is 220 vehicles a day.
- Average daily traffic at Highway 95/County 7 is 360 cars a day.

It is important to note that usage estimates are for visitors only. Local EV owners have their own chargers at home and highly favorable evening charging rates so it would be highly unlikely they would use a public charger.

The EV team does not have information about the number of tourists who visit Marine each year. That would be useful to more accurately forecast usage. Lacking that data, we are providing a cost range based on what we believe is likely weekend usage during tourist season.

- **Early Adoption Usage**: 2 hrs/day, 1 day/week, 25 weeks x $1.50/hr to $3.00/hr. Cost of electricity = $75-$150/yr. This is 1 vehicle charging 2 hours per weekend.
- **Midrange Usage Once Established**: 4 hrs/day, 2 days/week, 25 weeks x $1.50/hr to $3.00/hr. Cost of electricity = $300-$600/yr. This is 4 vehicles charging per weekend.
- **High Estimated Usage**: 8 hrs/day, 2 days/week, 25 weeks x $1.50/hr to $3.00/hr. Cost of electricity = $600-$1,200/yr. This is 8 vehicles charging per weekend.

ORDINANCES

Marine may wish to establish a parking ordinance. The Great Plains Institute has put together a summary of best practices in EV ordinances (found separately). This can be reviewed by the Planning Commission.

FUNDING OPTIONS

Current state grant funding has not been available for projects outside of major transit corridors. With the focus on infrastructure at the federal level, the potential for grant funding at the federal level may be changing.

Other (larger) communities have funded their EV chargers in a few ways:

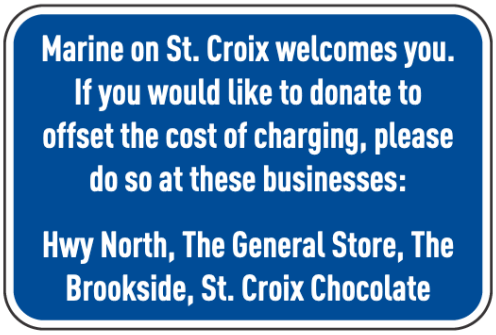
- The municipality picks up the cost of the charger and the electricity
- The municipality pays for the cost of the charger and one or more businesses pay for the electricity
- One or more businesses pay for the charger and the electricity
- Users donate to cover the cost of electricity

The EV team believes that funding the lower-cost Level 2 “dumb” charger might be possible for a smaller community like Marine using a Public-Municipal-Business partnership to secure the equipment and maintain the space, with a “tip jar” feature at local businesses to invite users to donate to help cover the cost of charging. Signage could look like this:
Before any step is taken to fundraise for a charger, a determination must be made about who will accept ultimate responsibility for underwriting electricity costs in case donations don’t cover the cost. Monthly payments cannot be fundraised.

This proposal has been submitted for consideration by the Marine GreenStep Cities EV team: Leslie MacKenzie, Anne Reich, and Greg Johnson.

References

- **State Electric Vehicle Dashboard** https://www.dot.state.mn.us/sustainability/electric-vehicle-dashboard.html
- **Level 2 Chargers in Stillwater** *https://www.sustainablestillwatermn.org/post/sustainable-stillwater-mn-sponsors-drive-electric-earth-day-april-22-2020*
- **Consumer Reports: Survey Finds Majority of Drivers are Interested in Electric Vehicles** *https://advocacy.consumerreports.org/press_release/new-consumer-reports-survey-finds-most-drivers-are-interested-in-electric-vehicles/*
- **GM announces goal to eliminate gas and diesel vehicles by 2035** https://www.nytimes.com/2021/01/28/business/gm-zero-emission-vehicles.html
- **Drive Electric Minnesota** operates the Cities Charging Ahead program, which Marine volunteers participated in.



Communications Plan

Month	Topics/Key Messages	Communications Channels				
		City Web	Mess	City News	**Face**	**Other**
April	**Messaging:** Become a Citizen Scientist – Loss of Night App **Messaging:** Home Lighting Assessment & Options (Newsletter, Website)	 **X**	**X**	 **X**	**X**	
June	**Messaging**: Equinox Event announcement, **City ordinance** info					City council meeting, volunteer fair
July	**Messaging:** Lighting and Wildlife Fertility (Toads/Frogs) **Messaging**: Wildlife Impacts **Messaging**: Equinox Event announcement	 **X** **X** **X**	**X** **X**	**X** **X** **X**		
August	**Messaging**: Equinox article **Messaging:** DS and Migratory Birds	**X** **X**	**X**		**X** **X**	
September	**EDUCATION:** Equinox Event **City Ordinance**	**X**	**X**		**X**	Fliers EQ event
October	**Messaging:** Know your city ordinances – be a good neighbor, report a problem	**X**		**X**	**X**	
	Messaging: Lighting and Crime / Safety - Halloween	**X**	**X**		**X**	
November	**Messaging:** Holiday Lights – purpose, timing, appropriate	**X**	**X**	**X**	**X**	
December	**Messaging:** Human Health and Sleep	**X**	**X**		**X**	
January	**Messaging:** New Year's Resolution – Become more Dark Sky Friendly		**X**		**X**	

Projects Marine GreenStep Suggests

Renewable Energy

Goals:

- Increase community **energy independence** by reducing reliance on fossil fuels.
- Increase community **energy resilience** by producing some of our own energy from renewable sources.
- **Save the City of Marine money** by producing our own renewable energy.
- **Reduce greenhouse gas emissions** to help our state meet its greenhouse gas reduction goals.

Task: Determine if the Marine Community School would be a candidate for solar on the rooftop or nearby.

- Work with a solar installer or engineer to review structural soundness of school building roof to determine if it could hold a solar installation. If not, identify ground location.
- Talk with installers and schools in Chisago County to learn how they managed their installation and secured funding. *See stories about the Solar4Schools Program in Chisago, which has put solar on 5 schools, including nearby Taylors Falls Elementary, here and here.*
- Research and identify funding sources for school-based solar programs (e.g., Solar for Schools Bill, HF1133).
- GSC committee will provide the City Council a feasibility report and funding options.

Tasks: Identify a location for a community solar garden.

- Work with a solar installer or an engineer to identify potential locations for a community solar garden. (See document about community solar gardens.)
- Survey the community to determine how many people want to participate.
- GSC committee will provide the City Council with a list of proposed sites and solar capacity.

Local Food Team

Goal: Increase food resilience while providing residents with food-growing options, food-storage knowledge, greater connections to local growers.

Create a local food team to explore community interest in growing and/or supporting local food.
Task: Survey community members about their interest in community food growing and local food.
Task: Identify potential options for meeting community needs and interests, such as:

- Starting a community garden.
- Forming a partnership with the Marine Folk School or another area school or restaurant to teach food preservation skills.
- Producing a newsletter or newspaper article informing residents of all local CSAs.
- Forming a partnership with the Urban Forest Committee to distribute fruit and nut trees.

Task: Report the results of the community survey and recommendations to the City Council for further consideration and development

Community Resilience

In light of recent and increasingly severe impacts of our changing climate – more than 600 deaths attributed to the recent heatwave in the Pacific northwest, worsening air quality, extended droughts, etc. – it is both relevant and timely for communities to prepare themselves to respond to potential crises.

Minnesota's state climatologist, DNR, and MN Department of Health have identified the following as climate-related risks for the next several decades:

- Increasingly severe storms
- Increasingly heavy rain, with longer dry spells between
- Increasing risk for dangerous heatwaves in 2025 and beyond
- Increasing risk of power outages as a result of excessive use in heatwaves
- Increasing risk for insect- and water-borne illness
- Less snow but more ice, causing dangerous driving and walking conditions

We can prepare our families and our neighborhoods to know how best to respond and be prepared to help each other when faced with these challenges. The Marine GreenStep team sees great opportunity to enhance our community's resilience. We also see an opportunity to do this work in collaboration with Scandia's GreenStep team.

Goal: Help households of Marine on St. Croix become more prepared to respond to potentially life-threatening weather-related challenges, both individually and as a community.

Task: Identify a team to work on a multi-pronged community engagement project.

Task: Partner with local and county emergency response officials to help community members understand what happens in times of emergency and how they can help, not hinder, efforts.

Task: Develop a community education program with speakers and resources to educate the community about current and future risks and practical actions they can take. (For example, a doctor can explain how to identify and provide first aid for heatstroke during a heatwave; a county emergency response official can explain what to do in case you are caught in a flash flood in your car, etc.)

Task: Review curriculum that block clubs or neighborhoods can use for group preparedness. Choose a curriculum and recruit community members to participate in small groups.

Task: Partner with local and county emergency response officials to help community members understand what happens in times of emergency and how they can help, not hinder, efforts.

WHAT IS A COMMUNITY SOLAR GARDEN?

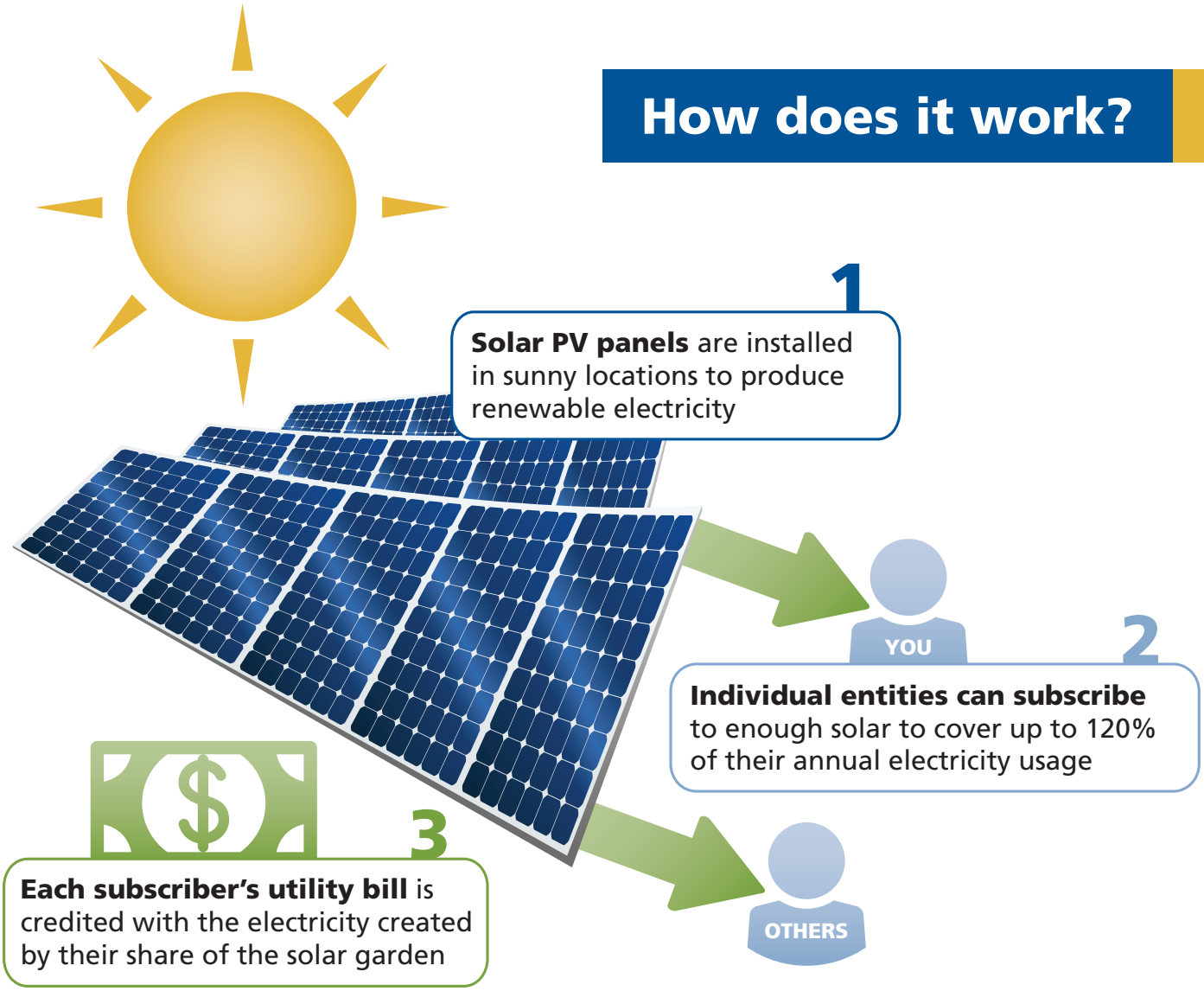
Community Solar Gardens are centrally-located solar photovoltaic (PV) systems that provide electricity to participating subscribers. Could it work for you?

Q Who is it for & why would I do it?

Are you interested in going solar but unable to do so on your own? Perhaps you live in an apartment, have a shaded roof at home, or don't have space at your organization. Now you can join a community solar garden installed near you!

Community solar gardens are a simple way to go solar. You purchase an up-front subscription, then soak in the rays (much of Minnesota is as sunny as places like Houston, TX and Tallahassee, FL).

How does it work? Q



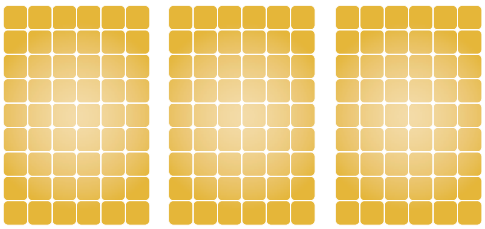
Q How much solar should I get?

The amount of electricity you use each year helps you decide how much solar to get. Your solar garden subscription can cover up to 120% of your usage. A typical Minnesota home uses 800 kilowatt-hours (kWh) a month. Remember: a more efficient home means more cost-effective solar!

Electricity Use

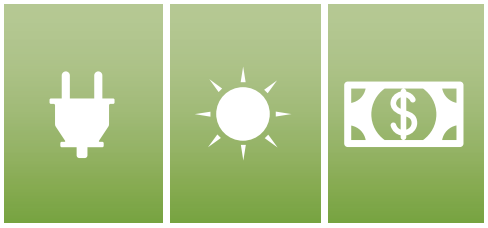
A typical MN home uses 800 kWh each month, or 9,600 kWh each year

Solar Subscription



4 kW of solar could provide half the electricity used by the typical MN home

Utility Bill



Solar power production is shown and credited on the subscriber's utility bill

Q Who is involved in a project?

As a subscriber, you don't have to worry about every detail. See below for key players.

SUBSCRIBERS: individual entities who get solar power

DEVELOPER: primary group organizing the solar garden

HOST SITE: location where solar garden is installed

FINANCE: sources of financing for the project

UTILITY: electricity provider * where solar garden is installed

SITE ASSESSOR: expert that studies solar garden location

INSTALLER: expert that installs the solar garden

OUTREACH PARTNERS: groups that find subscribers

* See more details about utility programs and rules for community solar gardens on our website at SolarGardens.MnCERTs.org#Who.

Learn more, ask questions & take action:

SolarGardens.MnCERTs.org

CERTs: Minnesotans building a clean energy future

The Schools at the Front Lines of Solar

CINNAMON JANZER APRIL 1, 2021

Surrounded by students from the Crossett Brook Middle School, Vermont Gov. Peter Shumlin, left, and Green Mountain Power President Mary Powell turn on the new solar array on Thursday, Dec. 12, 2013, in Duxbury, Vermont. Now, seven years later, more than 5.3 million students across the U.S. attend a school that uses solar power. (AP Photo/Wilson Ring)

In the early 2010's, Pat Collins, a 7th grade life science teacher at Chisago Lakes Middle School — in Lindstrom, MN, about 35 miles northeast of the Twin Cities — was having a discussion about solar panels with his students. One asked why they couldn't just use solar power at the school, so Collins said he would look into it and see.

A few school board meetings that eventually included student speakers (one of whom made her grandfather, a longtime school bus driver, cry from pride), several inventive fundraisers that

included janitors paying students by the pound for gum spit into a bucket rather than stuck under desks, and several years later, the Chisago Lakes School District is now 100% solar.

“Our students don’t see solar energy as an alternative energy source. It is the energy source that has powered every building that they have ever learned in,” Collins says.

In the early 2010’s Chisago Lakes was leading the way, but they’re now one of a growing number of school districts that are using solar not only to save money and reduce their carbon footprints, but to increase learning and vocational opportunities for their students as well.

This is thanks in part to Solar in Schools, an initiative of Generation 180, a non-profit that inspires and equips people to take action on clean energy.

When the nearly 5-year-old group was starting out, they set out to focus on two of the largest energy consumption and emissions sources: buildings and transportation. “We did a landscape analysis of what was going on to see where we could have impact and also see where there’s a gap that we can fill based on what other non-profits are focusing on,” says Tish Tablan, Generation 180’s program director. “We landed on schools because we love the ripple effect that schools have — there’s a school in every community.”

According to Generation 180, 7,332 K-12 schools, or 5.5% of all public and private K-12 schools in the U.S., use solar. With a 139% increase in the amount of solar installed since 2014, 5.3 million students attend a school powered with solar today.

Tablan says that the work they do to help schools go solar easily and often spread by students going home and talking to their parents or teachers going solar in their homes.

Ripple effects have certainly been the case in Chisago County, which has branded itself the Solar Capital of Minnesota where solar now powers 20,000 homes. Thanks to the efforts of Collins and his students, they transformed what started with a two-year, $73,000 effort to install one 10 kW system on the middle school into a fully solar school district. Today all five of the district’s buildings have a 40 kWh solar display on their roofs consisting of about 15,000 panels. It’s hard to nail down the exact savings of the system because prices fluctuate, but solar will save the district between $3 and $6 million over 30 years, which goes back into the district’s general fund.

Other schools, like one in Batesville, Arkansas, are using their solar savings to address teacher attrition by raising salaries $2,000 to $3,000 on average.

Naturally, cost can be a prohibitive factor for many districts. Solar schools have found a way around them through third-party agreements like power purchase agreements (PPAs). Chisago Lakes got theirs through a six-year lease-to-own agreement. After that, the district owns them outright.

It’s not just rural districts that have the luxury of wide-open space to install solar fields that can transform their schools to solar.

“It’s not latitude, it’s attitude,” Tablan says, meaning that solar is an option nearly anywhere. New York City has a plan to install solar on the roofs of 50 of its public schools and other buildings.

Laura Capps — a passionate parent and self-described product of public schools in Santa Barbara who joined the district’s school board four years ago — began campaigning for the Santa Barbara Unified School District to go solar in 2018.

It was then that the city’s schools played an important role during the wildfire and mudslide disasters that devastated the community. During widespread power outages, schools were “where families could still get meals and city and country officials even did their daily briefings from one of the high schools,” Capps says. “It solidified for me and other district leadership that our schools need to be safe havens in the time of disasters.”

The district is now in the early stages of creating a microgrid solar system that will both provide and store energy at six sites and provide power alone at eight more sites across high schools, junior high schools, elementary schools, a district office, and a warehouse.

“A preschool was our first building. It’s a new building so it made sense to construct it solar-ready,” Capps says. “I like the symbolism of a preschool, that for these four and five-year-old children, solar is what they’re going to know in their lifetime.”

Editor’s note: We’ve corrected the source of the stat that 7,332 K-12 schools have solar.

Cinnamon Janzer is a freelance journalist based in Minneapolis. Her work has appeared National Geographic, U.S. News & World Report, Rewire.news, and more. She holds an MA in Social Design, with a specialization in intervention design, from the Maryland Institute College of Art and a BA in Cultural Anthropology and Fine Art from the University of Minnesota, Twin Cities.