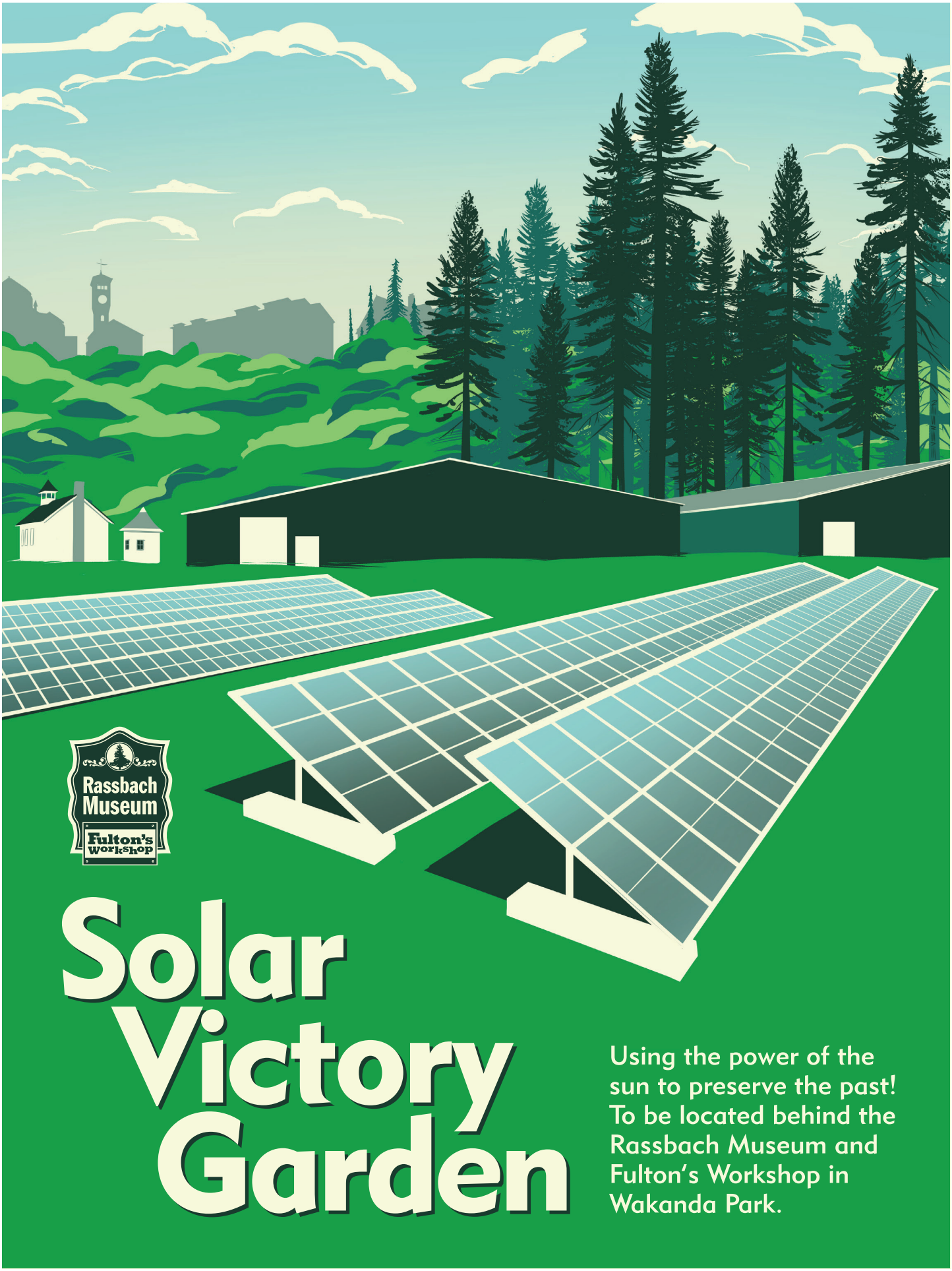

Rassbach Museum
Fulton's Workshop
Solar Victory Garden
Using the power of the sun to preserve the past! To be located behind the Rassbach Museum and Fulton's Workshop in Wakanda Park.

Solar Victory Garden
Dunn County Historical Society

"If we're really concerned about the global energy situation, leaving carbon dioxide emissions and global warming out of the discussion, I feel that it's incumbent upon each of us to "plant our own renewable energy 'Victory Gardens.' As with the Victory Gardens of the 1940s, such an idea would benefit us, individually, as well as the nation and indirectly, the world. Another win-win (-win) situation. The people who would plant a PV, or other renewable energy 'Victory Garden' will have done those same two things: created a perennial harvest for themselves of reliable, clean energy and made a significant contribution to reduce and ease their share of the load on the system."

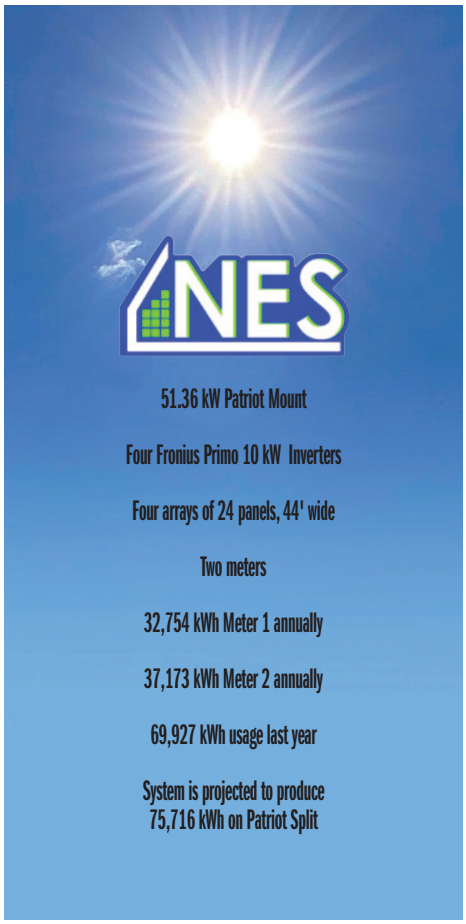
Bert Reslock, Independent Power Corporation, Reno, Nevada

Executive Summary

The Solar Victory Garden is a vibrant, forward thinking, exciting new initiative consisting of ground-mounted solar arrays installed at the Dunn County Historical Society's (*DCHS*) Rassbach Museum located in Menomonie's Wakanda Park. These solar arrays will produce enough electricity through most of the year to power the museum facilities, ensuring substantial financial savings that will be invested in furthering the Society's mission:

> *"Formed in 1950, the Dunn County Historical Society discovers, preserves, interprets and shares knowledge about the history of Dunn County and its role in Wisconsin, and inspires interest in the past."*

POTENTIAL SITE PLAN



The Solar Victory Garden project will not only meet the Society's goals of creating diverse income streams and reduce costs to ensure the stability of the institution, but with its theme of a WWII Victory Garden, it will utilize the innovations of the past to inspire the future. The educational opportunities for the county we serve will fit seamlessly into our organizational mission. The Society is a community nonprofit leader and collaborator, and the Solar Victory Garden project will serve as a kickoff response to the Menomonie City Council's resolution to join state, county and local agencies to ensure all electricity generated in the state is carbon-free by 2050. It will also inspire and demonstrate the utility, environmental, and financial benefits of solar panel power generation to the community as well as other nonprofit organizations.

The Society is working with Next Energy Solution, Inc. (*NES*) on the Solar Victory Garden project.

A Victory Garden for the 21st Century

Existing Energy Planning Efforts

In October of 2019, DCHS had a business energy assessment completed by Xcel Energy in order to determine how best to reduce energy use at the museum. The Society has worked toward making the assessment's recommended adjustments including upgrading light bulbs and fluorescent light fixtures to LED and adding programmable thermostats to the HVAC system. These improvements have helped reduce energy consumption, optimizing our proposed use of solar energy production, especially in the winter months when solar production is at its lowest.

In April of 2020, the Menomonie City Council adopted a resolution to join state, county and local agencies to ensure all electricity generated in the state is carbon-free by 2050. Steps to reach that goal include carbon reductions of 25 percent by 2030 and 60 percent by 2040. We are working to do our part with the solar victory garden.

Ongoing, Multifaceted, Educational Community Project

The historical society's Rassbach Museum is located in Menomonie's Wakanda Park. The park is a community gathering place and features an 18-hole disc golf course, six ball diamonds, playgrounds, the Wakanda Water Park, the Menomonie Lions Club Game Park and Nature Trail, and Wakanda Elementary School. It offers rentable spaces for outdoor gatherings, and people of all ages and income levels enjoy all the park has to offer.

The Solar Victory Garden will be a unique outdoor educational addition to Wakanda Park. Visitors can visit the museum and learn about the solar garden during open hours, and with the planned outdoor educational signage, even those who choose not to visit the museum can learn about WWII Victory Gardens and how our Solar Victory Garden is a next step in helping to grow our community through sustainable energy production. They can learn how the solar panels work, and be inspired to learn more about how and why this project can have a big impact on our community. We sometimes hear that people feel that museums can be old, boring and unexciting. The Solar Victory Garden will no doubt pique interest in what is happening in our corner of the park and in sustainable energy. When visitors look in on the solar arrays and read the interpretive signage, we will have expanded our community engagement in a forward-looking way.

Education and Awareness

The Solar Victory Garden will serve as an educational platform not only within the museum's history- and STEM-based curriculum, but also for the larger community.

Museum Curriculum As a museum, we often look to the past as a manual for how to inspire the present. The Solar Victory Garden draws on the inspiration of the Victory Gardens of WWII. We will draw clear parallels for visitors between the gardens of the 1940s and our solar garden today, with informational signage, and guided educational tours for all ages. We will offer classes that introduce and explain solar energy, including hands-on workshops, design opportuni-

ties, and guest speakers such as individuals from the Midwest Renewable Energy Association, Xcel Energy and University of Wisconsin-Stout.

HISTORIC VICTORY GARDEN	SOLAR VICTORY GARDEN
During WWII, Victory Gardens served as a successful means of:	**Our Solar Victory Garden has goals similar to those of the past. These include:**
Boosting morale – Individuals and communities all pitching in for a common cause.	**Boosting morale** – We live in a forward-thinking community that cares about its impact on the planet.
Safeguarding against food shortages on the home front.	**Safeguarding** our museum against power and monetary shortages by investing in reliable energy and spending realized savings wisely.
Easing the burden on the commercial farmers working arduously to feed troops and civilians overseas.	**Easing the burden** of fundraising for operational costs.
Self sufficiency of families who provided at least part of their food.	**Self sufficiency** of the museum facility for our energy.
Sustainable food source.	**Sustainable** energy source.
Education through hands-on learning for all ages while making a tangible difference in the community.	**Education** through hands-on learning for all ages while making a tangible difference for the environment and benefitting the museum.

We welcome more than 1,000 students to the museum annually for educational field trips and the Solar Victory Garden will become an integral part of their museum experience. Once the panels are in place, trained personnel will explain the operation of the solar garden and how it produces energy to run the museum. We plan to include online monitoring capability linked to the museum website. This will allow everyone interested to go online and see how well the panels are producing in real time and what kind of impact that has on the museum's energy usage.

Community Education The Solar Victory Garden will not only be a point of pride for the community and county, but it will also serve as a reminder that investment in renewable energy can be a boon to small businesses and nonprofits, which could allow them to invest more of their funds towards their missions, as opposed to operations costs. We will work with other nonprofits in our area to help them develop their ideas of how they can use solar energy generation and bring our community closer to its 2050 energy goals. The Dunn County Historical Society looks to solar as a way to benefit the community and invest in our shared future.

Innovation

This project is innovative in that it will allow the Society to be one of only a handful of museums in Wisconsin that derive their power from solar energy. Our Solar Victory Garden will put us on the forefront of our field in the state of Wisconsin in renewable energy. By reaching this goal with the completion of this project and sharing widely with national, state and local historical organizations, we hope to shed light on the benefits of solar energy to small historical organizations, specifically community historical societies that may not, at this point, be considering solar energy as an option for long term investment and institutional stability.

Financial Leverage and Economic Impact

The investment of the City of Menomonie, and businesses and community members county wide is integral for the success of the Solar Victory Garden. We have observed that donors are more likely to donate (*and donate generously*) when there is enthusiasm and financial and in-kind support from multiple community leaders.

Savings and Payback

After the Focus on Energy Rebate, the Solar for Good Grant, and the Energy Innovation Grant program, the **net** cost of the DCHS Solar Victory Garden arrays will be $90,314 dollars, including installation. If we were a for-profit business, this would mean a return on investment of 10.5 years based on the annual production of the unit — which creates energy valued at $8,613 annually at today's electricity rates. However, we do not believe that this is a true reflection of ROI, as DCHS is a nonprofit. The table below breaks down the costs, percentages covered by grants and rebates, and the remaining cost for DCHS to raise. We have worked hard to apply for all possible grants/funds available to make this project a success:

ORGANIZATION	COSTS	% OF TOTAL
Focus on Energy Reserved Incentive	$18,580	11.95%
Solar For Good Grant	$12,500	8.04%
2021 Energy Innovation Grant Program	$34,098	21.93%
Dunn County Historical Society	$90,314	58.08%
Total »	**$155,492**	**100%**

Although the funds needed are significant, it cannot be over-emphasized that during the lifespan of the array, that investment will mean a savings of approximately $200,000 over 25 years for the Society, based on the museum building's average annual electric bill. Producing an annual 75,716 kWh of renewable electricity would come close to eliminating our energy bill for many years to come as our current use is roughly 69,000 kWh annually.

	CURRENT COSTS	EST. SOLAR COSTS*	YEARLY SAVINGS**	25 YR. SAVINGS
Rassbach Museum	$5,249.76	$1,089.83	$4,178.97	$104,474.25
Holtby Hall	$4,513.56	$752.90	$3,799.36	$94,984.00
		Estimated Total Savings »	**$7,987.33**	**$199,458.00**

** Projected using 2019 data* *** Estimate includes potential reimbursement for excess energy*

As a small nonprofit in a rural county, the savings from this project are extremely significant, and would allow us to continue in our goal to invest in the financial security of the Society, as well as create a sophisticated, forward-thinking historical and educational center for Dunn County and keep the history of our great community alive. This would also allow future expansion on new and established projects and collaborations, as well as ways to give back to the community that supports us.

If we as an institution want to inspire and engage, we must ***be*** inspiring and engaging! This Solar Victory Garden is one of the pillars of the bridge to our future.

Good for the Community | Good for the Planet

During a 30-year lifespan, the Solar Victory Garden will save CO_2 emissions equaling:

176,719 gallons of gasoline consumed

1,730,474 Pounds of coal burned

266 homes' electricity use for one year

200,289,158 number of smartphones charged

Appendix 1: Next Energy Solution, Inc. Solar Array Breakdown

Dunn County Historical Society
50.32 kW South Facing Solar System Installation
1820 John Russell Road
Menomonie, WI 54751

Next Energy Solution
461 Hwy 63
Shell Lake, WI 54871
715-416-3022

Website: www.nextenergysolution.com

Executive Summary

Based on the detailed site assessment and information given, Next Energy Solution, Inc. recommends the following system installation.

SOLAR VICTORY GARDEN SPECIFICATIONS	
System Capacity	51.36 kW (DC) & 40 kW (AC)
Brand Name	Module: VSUN 535 W Bifacial Panels Inverter: Fronius Primo 10 kW single-phase
Type	Grid Tied; Ground Mounted PV System
Area Designated	South Facing (*area/lot behind workshop*)
Mounting Structure	Patriot Adjustable Solar Ground Mount
Energy Generation in kWh	75,716 kWh annually
Solar PV System Cost	155,492.00

About Next Energy Solution Solar Company

Next Energy Solution, Inc. is located in Shell Lake, Wis. NES is a full-service solar electric installer and manufacturer of related products. We specialize in grid-tied and off-grid systems for homes, businesses, farms and cabins. We have been in business for over seven years and have over 500 systems in place today.

Our staff has over 20 years of experience in the solar energy industry and all electrical designs are completed by our certified NABCEP PV Installation Professional. We have kept great working relationships with local utility companies, municipalities and Focus on Energy. We have helped our customers get a total of over $2,500,000 from Focus on Energy to go towards funding their solar electric projects in the past four years.

We take pride in our quality of work and in helping those who want to go solar. We commit to a five-year installation and operational warranty. We use top of the line and UL-listed inverters, solar modules, mounting and racking equipment.

References

References from Projects with multiple owners:
St. Anthony's Spirituality Center
Contact: Deacon Hilts, 715-443-2236

RECIP Recipients:

Lakewood SuperValu
Contact: Dave Seeber, 715-276-6678

Wirth Brother Farms
Contact: Dave Wirth, 715-850-0494

Birchwood School
Contact: Diane Nelson, 715-354-3471 ext. 504

Soda Farms
Contact: Kevin Soda, 920-291-5150

Local Projects:

Bayfield County Forestry Building
Contact: Mark Abeles, 715-373-6181

Equipment

Modules: VSUN 535 Watt Bifacial Panels

- Innovative all-weather technology; optimal yields with excellent low-light and temperature behavior; extreme weather rating; certified for high snow and wind loads
- 30 year linear power output warranty
- Up to 30 percent extra power generation yield from the back side
- Certified salt/ammonia corrosion resistance

Racking: 50.32 kW Patriot Mount

- 25-year warranty
- ARRA compliant
- 2-week lead time
- Easy installation

Inverters: 4 Fronius Primo 10 kW Inverters

- Utilizes power optimizers for maximum efficiency
- Excellent reliability with 10-year warranty and extendable warranty up to 20 years
- Internet connection using ethernet or wireless
- Superior and easy-to-use monitoring platform
- NEMA 3 compliant (*indoor or outdoor mounting*)
- ARRA compliant
- Built-in rapid shutdown for safety
- Listed on California's List of "Incentive Eligible Photovoltaic Inverters," See https://www.gosolarcalifornia.ca.gov/equipment/documents/Grid_Support_Inverter_List_Simplified_Data.xlsx (*Specifically listed in Section 491*)

Fronius Monitoring Platform:

- Internet connection using ethernet or wireless, Including Wi-Fi and SunSpec Modbus Interfaces for seamless monitoring and data logging.

Funding

NES will complete required documentation for DCHS to receive the Focus on Energy prescriptive grant funding. NES will also cooperate with the special OEI grant to remain in good standing and comply with all grant requirements.

NABCEP Installer and Equivalent

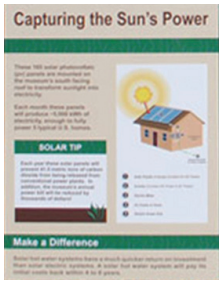
The design and installation guidelines will be provided by certified NABCEP Installer Paul Hopkins with NABCEP #091209-82. Paul has designed over 2,000 PV systems of all sizes and is a current employee of NES.

Appendix 2: Stretch-Goal for Estimated Additional Costs

The $155,492 outlay, including grants and rebates, described previously in this proposal represents the base amount needed to install the solar arrays. Further funds, outlined below, are required to provide security for the arrays and implement the educational component of the project. It is our intent to raise both amounts in a single campaign, but by breaking the project into two components we can begin to reap the environmental and financial benefits of the project as soon as the solar arrays are funded.

Interpretive Signage

Description: As described earlier, we intend to integrate solar and other alternative energy topics into our STEM-education curriculum, as well as serve our history programming by describing parallels between our modern Solar Victory Garden to the WWII-era Victory Gardens of the 1940s. Some panels will be on free-standing mounts, while others will be attached to security fence protecting the arrays.



Cost: We are consulting with Gopher Sign for an initial 10 interpretive panels, including at least one panel to recognize donors.

Estimated Subtotal: $3,180

Funded: This category has been funded by Xcel Energy

Security

Description: Given our somewhat remote location in the park, we will erect a security fence and install trail cameras on a four-foot perimeter around each array to protect against potential vandalism and wildlife damage as well as manage visitor traffic. We are considering two styles of fencing, but given the educational goals of the project, we prefer an attractive approach that can accommodate interpretive signage.

Cost: Investigation is ongoing, but we have calculated some costs based on similar projects elsewhere. Some cost savings may be realized using volunteer labor if needed.

Estimated Subtotal: $10,000

Landscaping

Description: Installation of the solar arrays will require the removal of at least five mature trees, and perhaps a few more once we determine their final location. As interpretive signage is installed, we will include easy to maintain pathways for visitors to view the exhibit. We would also tie in solar garden plantings to those elsewhere on our campus, including a rain garden and prairie plantings at our front entrance. Replacement trees will be located elsewhere on the property to complement our buildings and create a welcoming atmosphere. A demonstration WWII-era Victory Garden in cooperation with UW-Stout students is under consideration.

Cost: Investigation is ongoing.

Estimated Subtotal: $8,000

Funded: This category has been funded by Chuck Stokke and a private gift in memory of Richard Hudec.

Estimated Additional Costs: $21,800

Appendix 3: Donor Investment and Recognition

SOLAR VICTORY GARDEN DONOR LEVELS	
Sunny	Up to $500
Bright	$501 to $1,000
Shining	$1,0001 to $5,000
Beaming	$5,001 to $10,000
Radiant	$10,001 to $20,000
Naming Rights Sponsorships	
Array Purchase	$25,000 each, one array available *
Panel Purchase	$500 each, 46 available (*24 per array*) *
Education Sponsor **	$3,180 donated by Xcel Energy
Security Sponsor	$10,000
Landscaping Sponsor **	$4,000 donated by Chuck Stokke $4,000 private gift in memory of Richard Hudec

** as of April 21, 2022 ** These categories are funded*

Appendix 4: Menomonie City Council Resolution

Menomonie adopts clean energy resolution

Dunn County News, April 21, 2020

Menomonie is taking steps for a clean energy future.

At Monday's meeting the city council adopted a resolution to join state, county and local agencies to ensure all electricity in the state is carbon-free by 2050. Steps to reach that goal include target reductions of 25 percent by 2030 and 60 percent by 2040.

The resolution states the goal aligns with goals set forth in the Conference of Mayors Climate Protection Agreement signed by the city in 2005 and the city's 2016-2036 comprehensive plan for utilities to "promote energy and natural resource conservation methods and increased use of renewable energy sources."

Mayor Randy Knaack said this is a step in the right direction and it will start the process of planning to reach these goals.

"I know it's going to take some work on the city's behalf in the next 30 years but I think it's a movement forward," he said.

City Administrator Lowell Prange said the city received about 15 emails of support for the resolution that were provided to council members on Monday.

Council member Ryland Erdman said this resolution fits with other goals the city has, such as cleaning up Lake Menomin and moving forward the city can look at low-cost options that use clean energy for building codes for new homes and commercial buildings.

"We'll achieve multiple goals through this resolution I feel," Erdman said.

Another option moving forward is providing hybrid vehicles for city police or city staff, council member Mary Solberg said. During the current pandemic it feels like people don't have much control over what happens, she said, but this is a way for the city to show it values the improvement of the environment.

"I think it is very much the right thing to do," Solberg said. "In this time, we really have no control over anything it seems, but we're looking at this and I know it's a resolution but we're stating that we want to do something that will better our environment."

DUNN COUNTY HISTORICAL SOCIETY
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715-232-8685