



## CASE STUDY: Solar on Northeast Wisconsin Technical College

### PROJECT SUMMARY

The NWTC Great Lakes Energy Education Center was constructed with the intent of becoming a NET ZERO facility. The Great Lakes Energy Education Center was designed as an instructional facility, teaching guests and students about renewable energy systems and describing the mission of becoming a NET ZERO education center. A geothermal climate control system, 96.6 kW solar system on the upper roof and 77 kW on the solar lab roof are currently installed. A 40 kW/190 kWh battery storage system has also recently been installed to the building to better balance energy production with energy consumption. Throughout the year many continuing education classes and tours are provided, including explanations of current and proposed systems.

The two installations were done as part of a Solar Energy Technology class project; with help from Faith Technologies. System design was done by students and overseen by the Solar Energy Technology Instructor, John Hippensteel, PE. Two systems were designed as part of this project. The first is a 10-kW system on NWTC's flat lab roof, which is light grey in color. This system faces southeast is being used as a comparison to the existing south facing 96-kW mono-crystalline array on the upper roof as well as the 50 kW east/west array on the lab roof. The second is a 10-kW ground mounted installation located west of the GLEE center. The production of this bifacial system

is being used as comparison to a 10 kW monocrystalline array on the same structure. Using the 20-kW of bifacial modules has gotten the building center closer to its goal of being net zero and is giving students an education in comparing the production of the different modules and systems installed, with a specific focus on the increased production and snow melt capability. The combined 20 kW installation will offset 10% of the building's energy needs while dramatically increasing winter production due to the much steeper tilt of the array.

Part of the system cost was approved in the NWTC Center budget. This project was also supported through a Solar on Schools grant as well as in part through the Department of Energy and Wisconsin Solar Ready program.

### HELPING WISCONSIN SCHOOLS GO SOLAR

The Couillard Solar Foundation Solar on Schools program is managed by Midwest Renewable Energy Association (MREA). The initiative educates schools on the benefits of solar energy, provides resources to simplify the project development process, and offers grants to lower the upfront cost of solar.

Learn more at:  
[midwestrenew.org/solar-on-schools](http://midwestrenew.org/solar-on-schools)

### PROJECT CONTACT

John Hippensteel  
Solar Energy Technology Instructor  
Northeast Wisconsin Technical College  
[John.hippensteel@nwtc.edu](mailto:John.hippensteel@nwtc.edu)

## SYSTEM AT A GLANCE

**Commissioned:** December 2022  
**Electric Utility:** WPS  
**System Size:** 20 kW DC  
**Expected Annual Performance:** 26,000 kWh  
**Solar Installer:** NWTC students  
**Total Billed System Cost:** \$30,000  
**Cash Grants, Rebates, Incentives:** \$0  
**Cost/Watt:** \$1.50  
**Cost/Watt Excluding Cash Grants:** \$1.50  
**Y1 Electric Savings:** \$4500  
**30 Year Electric Savings:** \$120,000  
**30 Year Cash Flow:** \$83,000  
**30 Year IRR:** 12%  
**Array Tilt and Azimuth:** Tilt: 30°; Azimuth: 180°  
**Racking:** Unirac  
**Modules:** Philadelphia 370  
**Inverters:** SolarEdge

\*Total System Cost excludes the 10 kW Solar on Schools in-kind grant value estimated at \$10,000

## ABOUT NORTHEAST WISCONSIN TECHNICAL COLLEGE

NWTC is a two-year technical college, serving Northeast Wisconsin by providing education, training, and life-long learning opportunities for individuals and businesses leading to the development of a skilled workforce. NWTC customers stimulate the economic vitality of the district and nationwide as a result of the application of skills and knowledge acquired through the completion of certificates, degrees, diplomas, and courses.

NWTC's Solar Energy Technology program provides installers, designers, and technical sales personnel the skills to assess sites; design systems; an install, operate, and maintain solar electric and solar thermal systems for residential and commercial applications in the growing renewable energy industry. Potential employment possibilities will be with existing solar, electrical, and mechanical contractors to help expand their offerings of solar energy technologies. Other potential areas of employment are with energy consulting firms, design firms and utilities. With additional education and experience, graduates can expand their careers to energy analyst, journeyman electrician/plumber, project manager, energy engineer, and environmental consultant.

## ENVIRONMENTAL BENEFITS

In the first year the 20 kW DC system will offset CO2 emissions equivalent to:



Electrical usage of 2-8 homes



28,000 pounds of coal burned



## PROJECT PARTNERS

