



Community “Solar Garden” Powers Ontario Homes & Businesses - Case Study

Engenuity Systems Collaborates with Endura Energy and RainWise for Best-in-Class Photovoltaic (PV) Solar Systems

OVERVIEW:

A new analysis from the National Renewable Energy Laboratory finds that shared photovoltaic (PV) solar systems — also called community solar gardens — could account for one-third to one-half of all solar PV power in the United States by 2020.

These shared community solar systems greatly benefit the many businesses and homes (especially rental properties) that have been unable to install renewable energy systems such as onsite solar PV systems on their own property, due to expensive or local policy restrictions. Developers can install small-to mid-sized solar PV systems on available rooftops or land, and then sell portions of the locally produced power to individual subscribers within the same utility service territory. In turn, consumers receive the benefits of lower cost energy without the installation and maintenance hassle of onsite solar equipment.

THE CHALLENGE:

While solar gardens are growing in popularity in the United States, at least one Canadian province has jumped on board as well. Ontario needed to better understand how much - or little - energy is being produced on any given day - and then turns that knowledge into more reliable and less expensive power for homes and businesses throughout the province.

THE SOLUTION:

PVMET200 Environmental Weather Station:

Under the directive of the Ontario Minister of Energy, a solar co-op (led by Engenuity Systems in partnership with Endura Energy and RainWise Inc.) worked with the Ontario Power Authority (OPA) to amalgamate hundreds of MicroFIT projects into multiple 500 kW solar farms across the province. Each farm will be comprised of best-in-class dual axis trackers. With a reputation for providing best-in-class services in all aspects of design and construction of PV systems, Endura Energy is engineering this project as a modular design, to be easily repeated across all 33 sites. The end result: energy produced at these solar gardens will be fed into the Ontario electric grid to



THE SOLUTION:

To collect and analyze data on energy production each day, the companies required weather stations for each solar garden. Irradiance, temperature and wind speed all need to be measured quickly and accurately, and fed into the facility control system.

Engenuity Systems collaborated with RainWise to create the PVMET200, which included Back of Cell temperature sensors for monitoring, setting the trend for weather stations in the solar world. The back of cell temperature sensor allows facility managers to monitor the temperature of photo cells to make sure they are not overheating, maintaining maximum productivity, and improving equipment longevity. One PVMET200 is installed at each facility, with a spare kept on hand to rotate through as units are sent for calibration.

"RainWise differentiates itself with fully integrated and cost effective weather stations that make monitoring sites, solar installations, or large commercial buildings extremely easy," said Tim McLaughlin, Director of Business Development at Engenuity Systems. "Setup is a breeze, with SunSpec compliant/Modbus based connectivity allowing for quick integration within the solar PV marketplace. In addition to continually offering new and innovative products, Engenuity offers excellent technical support should any installation questions arise."

The PVMET200 meets the needs of alternative energy power by providing opportunity to gather environmental data with the following features:

- Wind speed and direction sensors
- Adjustable solar irradiance sensor for global or Plane-of-Array monitoring
- 1 or 2 x Back-of-PV Panel Temp Sensor(s)
- Ambient air temperature sensor
- SunSpec/Modbus RS-485 communication
- Ethernet Modbus TCP option available

Meteo data measured using the PVMET200 will be used in conjunction with site energy production data to analyze the instantaneous and long-term performance of the facility. For example, the facility owner's monitoring system might show very low energy production on a given day. The PVMET200 station then allows the facility to determine if this is due to a problem with the system, or simply a cloudy day.

KEY RESULTS:

For this solar garden project, the PVMET200 will:

- Measure performance by monitoring the amount of sun generating energy
- Monitor cloud coverage to help manage energy production expectations
- Detect overheating with ambient and back of cell temperature sensors now
- Combined with data logging and metering technology it tracks and documents the amount of energy likely to be produced over time
- Manage environmental factors like rain and dust to ensure panels are staying clean and producing energy

“RainWise’s ability to meet all our projects requirements and stay within our budget made the PVMET200 station an ideal choice to power this project,” said Dan Nicksy, Technical Coordinator, and Endura Energy. “Weather stations like this prolong performance and provide environmental data, improving operations and allowing project leaders to be in the know. As a result, they make less expensive power solutions for homes and business throughout Ontario much more reliable.”



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