

# Energize Ohio: Building Ohio's Energy Future

## On-Farm Solar Energy

DEMONSTRATE PHOTOVOLTAIC TECHNOLOGY AND THE POWER OF EXTENSION

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The agriculture sector was an early adopter of off-grid photovoltaic (PV) solar systems as a remote energy source. Over the last decade, high cost have limited the widespread adoption of on-farm PV solar systems that are connected to the grid. However, energy policy tools combined with significant reductions in the price of PV solar panels has made on-farm solar systems more affordable to install.

The On-Farm Solar Energy curriculum is intended for farmers who are interested in farm energy efficiency and generating their own electricity to offset electric demands for agricultural facilities. The program educates participants on renewable energy policy, net metering agreements, renewable energy technology, and utilizes case studies designed to help farmers identify on-farm energy applications and conduct an assessment to inform energy investment decisions. It is designed to enhance farmers knowledge of on-farm solar energy applications in Ohio, promoting best practices and informed decision making on solar energy projects and the implementation of energy management strategies on their farm.

Since 2014, OSU Extension has conducted 21 On-Farm Solar Energy programs reaching more than to 800 participants. Furthermore, 100% of the program evaluation respondents indicated the program provided them valuable information that they would

recommend to others. In addition, six farmers who attended a program have since developed an on-farm solar system to offset a portion of the electric needs for their farms. Combined the six systems will generate roughly 130,000 kWh annually while offsetting nearly 197,626 (lbs. CO<sub>2</sub>e) Greenhouse Gases per year.

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### Learning Objectives

- Understand net metering and renewable energy policy drivers
- Comprehend how photovoltaic solar technology generates electricity
- Assess on-farm solar applications
- Identify key site assessment considerations
- Know how to estimate PV solar system size
- Better understand economics of developing an on-farm solar system

### Program Materials

- Presentation Slides
  - Recorded Presentation with Narration
  - Fact Sheet - Introduction to On-Farm Solar
  - Fact Sheet – Estimating Your Solar System Size
  - Fact Sheet - On-Farm Solar Site Assessment
  - Fact Sheet - Financial Considerations of Solar
  - Short Video – Swine Facility Rooftop Solar
  - Short Video – Solar Construction Process
  - Short Video – Financial Considerations of Solar
  - Program Evaluation Form
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**THE OHIO STATE UNIVERSITY**

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## Mobile Solar Unit

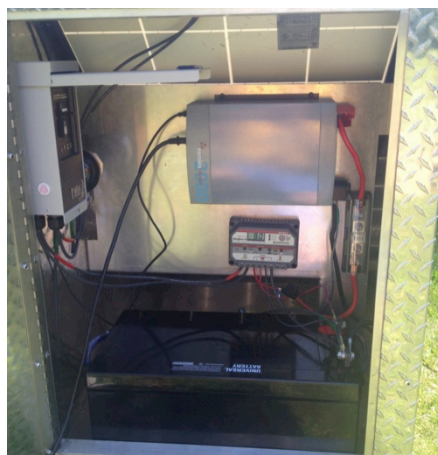
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In 2014, a team of OSU Extension Educators designed and built a Mobile Solar Unit to compliment renewable energy programming. The Mobile Solar Unit consists of a 140 watt Photovoltaic (PV) solar panel, charge controller, 250 amp hour battery, 2000 watt inverter, and safety disconnects. All of the components are built into a mobilized cart that can be transported to events throughout Ohio in the back of a pickup truck.

The Mobile Solar Unit is as a teaching tool used to demonstrate the major components of how PV

solar technology works, assist in disseminating renewable energy curricular materials and videos, as well as promote Extension impacts via short videos at the many Extension events throughout Ohio. The Mobile Solar Unit is ideal for remote outdoor events, field days, county fairs, and 4-H camps where it can enable access to power many appliances the presenter might need such as a projector, TV, computer, or microphone. The Mobile Solar Unit also serves as a great teaching tool at indoor events as well, acting as an attraction by allowing visitors to plug-in cell phones and laptops to get a quick charge.



## Future Solar Plan of Work

With funding from an OSU Cares Grant, OSU Extension will partner with Ohio Sea Grant, Office of Energy and Environment and OSU Department of Facilities, Operations and Development to conduct real-time and historical energy production research from the solar photovoltaic installations at OSU's Stone Laboratory on Gibraltar Island and weather data from a Stone Lab owned weather buoy deployed in Lake Erie. The research will inform the development of a high quality, locally relevant solar energy curriculum targeting homeowners and youth audiences and to be used by both formal and informal educators.