

Solar Farm at Elon University Fact Sheet

The solar farm at Elon University is a visible, functioning demonstration of the university's commitment to sustainability. It covers nearly 15 acres of campus property leased to Facile Solar LLC, a private company that owns the solar facility. Operations started in the fall of 2015. Requiring minimal tree removal and land disturbance, the site was ideally suited for a large-scale solar system. The original owner of the system took advantage of the tax incentives available for the facility.

The solar farm consists of 9,900 solar panels designed for a maximum generation of 4,500 megawatt hours of electricity each year delivered directly into the power grid. Duke Energy purchases that energy from Facile Solar LLC. This solar power is part of Duke Energy's Renewable Energy Portfolio because they also purchase the Renewable Energy Certificates (RECs) from the facility. The university does not purchase or utilize electricity directly from the solar farm due to state laws in place when the farm was constructed. The solar farm models responsible global citizenship and benefits Elon students by providing an opportunity to study the equipment, operation and economics of the system.

The average actual generation of the facility over a recent three-year period was about 2,420 MWH, which is enough to power about 225 average U.S. homes for a year. This amount of electricity is equivalent to about 6% of Elon University's electricity consumption (3-year average). This much electricity produced with solar, rather than fossil fuels, prevents about 660 metric tons of carbon emissions, based on recent data from Duke Energy. This is the equivalent of removing the annual emissions of about 142 cars. The real-time production of the solar farm can be viewed on Elon University's Building Dashboard system – <http://buildingdashboard.net/elon/#/elon/solarfarm>.

System Details

- Commercial operation date: October 20, 2015
- System size: 3 Megawatt (MW) DC capacity (peak performance)
- AC power rating: 2 MW AC, (peak performance)
- System is owned by Facile Solar, LLC
- Carolina Solar Services, on behalf of the owner, operates, monitors and maintains the system
- Designed by: Black & Veatch, Cary, NC
- Constructed by: Suntuity

The system is comprised of fixed-tilt panels oriented to maximize the solar incidence on the panels. The panels are fixed to a ground mounted support frame with 20 panels in one string. Multiple strings are wired in series to create an array. The farm has three arrays, each wired into a separate inverter.

Solar panel specifics

- Manufactured by CSUN (China Sunergy Co., Nasdaq: CSUN), has over 1GW of panels in operation
- Model # CSUN 300-72P (qty. 5300) & Model # CSUN 305-72P (qty 4600)
- Polycrystalline solar cells
- 15.49% module efficiency
- 300W and 305W max power output (DC)
- 25 years linear power output warranty
- Certified to withstand wind loads of 50 lbs./sf, snow load of 112 lbs./sf, 1" hail diameter at 51.2 mph impact speed

- 39" w x 77" l x 2" d, weighs 10.8 lbs.

Inverter specifics

- (3) Schneider Electric XC680
- Maximum output: 680kW, 60 Hz
- Peak efficiency: 98.9%
- Maximum input: 1000 Vdc; 1280 amps
- Provides grid power delivery management
- RS485/Modbus data communication standard
- 82" w x 94.5" l x 26" d, weighs 3505 lbs.

Information from the system is collected to analyze its effectiveness by collecting data measured by the inverter and a weather station installed at the site. There are two systems collecting data simultaneously, one is by and for the owner, the other is by and for Elon University. The owner's data is used to monitor performance and to verify meter readings with Duke Energy. They also use it to provide a graphical dashboard via a website of the overall system performance.

The university's data collection is available for research and analysis in educational studies and used by staff for performance and feasibility studies. The university also displays solar farm performance data on the Building Dashboard.