



## SHOWCASE PROJECT: SCHNEIDER ELECTRIC: SOLAR FIELD AND CONTINUOUS ENERGY EFFICIENCY IMPROVEMENT

### SOLUTION OVERVIEW

Schneider Electric is advancing energy efficiency and renewable energy at its Smyrna, Tennessee plant through two major initiatives: 1) the construction of a 1 megawatt (MW) solar farm; and 2) a robust energy management program, which includes certification under the Department of Energy's Superior Energy Performance (SEP) Program. SEP requires development of an advanced energy management system, conformant with ISO 50001, as well as verified energy performance improvement over a three-year time period.

Schneider Electric's Smyrna plant manufactures medium voltage switch gear and also houses a design center for engineered-to-order switchgear. In July of 2011, the company completed construction of a 1 MW solar farm, which is specially designed to allow operational voltage to be configured for either 600V or 1000V. By transmitting electricity at a higher voltage, Schneider Electric uses 40 percent fewer parallel connections and reduces the fraction of energy lost to resistance. This capability provides the opportunity for a more efficient solar farm operation, enabling Schneider Electric to further its research and testing of alternative energy.

Additionally, in April 2013, the Smyrna plant became certified under DOE's SEP program. SEP requires facilities to adopt ISO 50001, the international energy management standard, and demonstrate verified energy performance improvements of at least 5% over a three-year period. Through the adoption of SEP, the company documented an energy intensity improvement of 16% between 2008 through 2011. The company has maintained its robust energy management system since then, yielding additional energy efficiency improvements and is seeking recertification under SEP at the Smyrna plant.

Combined, as a result of the solar project and energy efficiency measures, the plant's net energy consumption was approximately 30% lower in 2013 than it would have been without taking these actions. The plant has seen a 44.5% reduction in net electricity use, with about 19% of that reduction coming from the solar project and the other 25.5% from energy efficiency projects. Efficiency measures have resulted in another 15% reduction in natural gas usage at the facility.

### SECTOR TYPE

Industrial

### LOCATION

Smyrna, Tennessee

### PROJECT SIZE

<https://betterbuildingssolutioncenter.energy.gov/showcase-projects/schneider-electric-solar-field-and-continuous-energy-efficiency-improvement>

For more information, visit <https://betterbuildingssolutioncenter.energy.gov>

200,000 Square Feet

**FINANCIAL OVERVIEW**

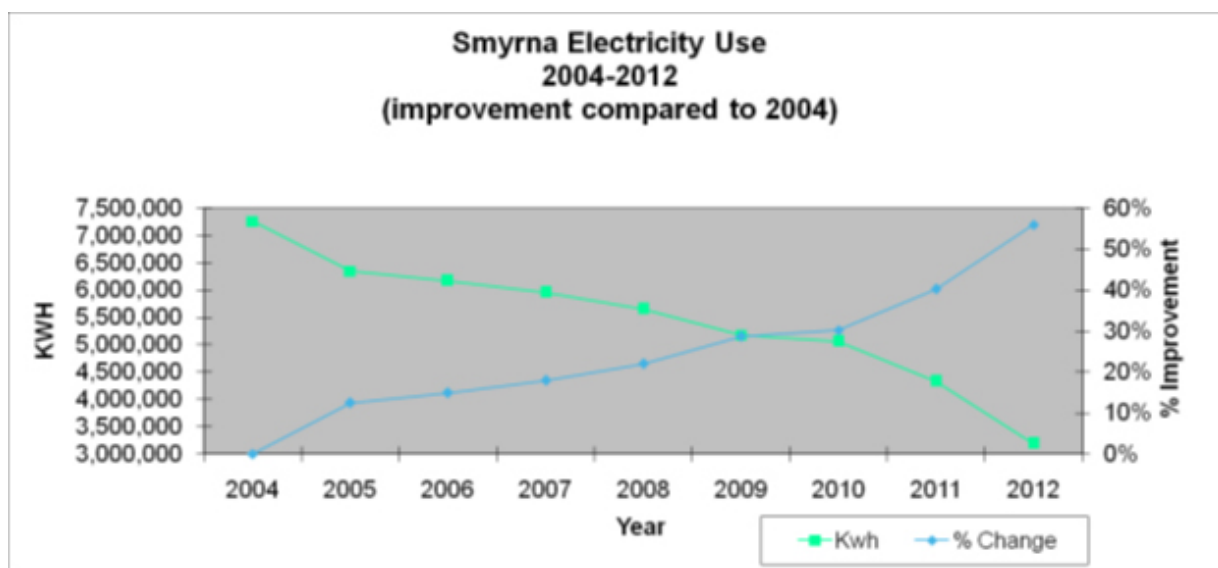
Project Cost \$6.25 million\*

**SOLUTIONS**

Schneider used its own engineering professionals, services, and products to build the solar field, which generated over 1.1 million kilowatt hours (kWh) of renewable energy in 2013. Schneider participates in Tennessee Valley Authority’s (TVA) Generation Partners Program, which values the price of electricity at \$0.11/kWh above the commercial rate. Schneider maximizes the revenue from the energy it produces by selling it to the grid rather than using it on site.

Since Schneider uses grid tie inverters that do not allow it to use the electricity internally, 100% of the electricity produced by the solar field is sold to TVA. This resulted in revenue of around \$250,000 in 2013.

The annual effect on electricity consumption of the solar farm and energy efficiency measures put in place from 2004 to 2012 is shown below.



The project cost is equivalent to \$3,000,000 for a “typical” solar installation. Additional construction costs of \$3,250,000 incurred by Schneider were dedicated to a renewable research facility to provide a real-time laboratory for solar product development. The initial installation qualified for a 30% federal tax credit. In April 2012, renewable sales from the solar field offset Schneider’s total electricity bill for the month.

In total, the solar field and energy efficiency improvements are netting over \$400,000 in energy cost savings at the Smyrna plant, equivalent to about a 62% reduction. These cost savings are proportionally larger than the energy savings being experienced because of the premium TVA pays to purchase Schneider Electric’s solar power.

## **OTHER BENEFITS**

The solar field project will help Schneider Electric meet the requirements of DOE's Superior Energy Performance Program, and the Better Buildings, Better Plants Challenge. The renewable energy generated at the Smyrna plant is displacing fossil fuel consumption and reducing greenhouse gas emissions by approximately 917 metric tons per year.

\*Project cost for solar farm.

### Annual Energy Use

(Source 30%)

Baseline(2011) 1

Expected(2013) 0.7

Actual() Coming soon

### Energy Savings

EUI

### Annual Energy Cost

Baseline(2011) \$650,000

Expected(2013) \$245,000

Actual() Coming soon

### Cost Savings

62%



Solar farm