Southern California Edison Backgrounder

Contact: Corporate Communications: 626-302-2255, www.edison.com/pressroom

Building a Smarter, Greener Neighborhood Power Grid

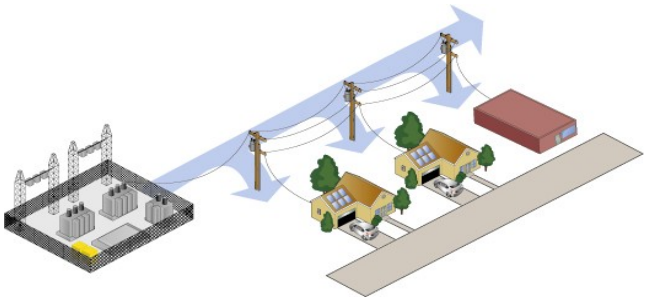
Southern California Edison (SCE) is building one of the largest networks of commercial solar photovoltaic power stations in the nation. The program will eventually place roughly four-square-miles of advanced photovoltaic panels on more than 200 otherwise unused Southern California warehouse roofs. The solar generating stations will eventually have a combined generating capacity rivaling utility-scale power plants – 500 megawatts of power – enough electricity to serve 325,000 average homes at a point in time.

Game Change

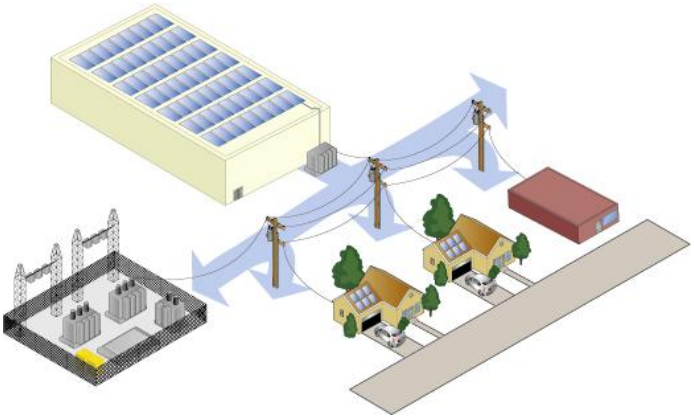
To integrate hundreds of one- and five-megawatt solar stations into neighborhood power circuits, SCE engineers have begun reinventing the utility distribution circuit.

Two-Way Power Paths

The challenge SCE grid engineers are tackling can be traced back to the beginning of the U.S. electricity industry. Neighborhood distribution circuits were designed for one-way power delivery. They carried electrons from neighborhood substations, where higher transmission voltages are reduced by transformers to customer usage levels, across lines and through pole-top grid components to homes and businesses.



Placing large commercial rooftop solar generating stations in the middle of these neighborhood circuits means they must function as two-way power paths.



Dynamic Voltage Stability

Existing neighborhood power circuits were not designed to carry millions of watts of "intermittent" fluctuating solar energy. When the sun shines, solar photovoltaic panels generate maximum energy. When clouds pass overhead, output levels can drop quickly. Then, when the sunlight returns, panel output increases sharply.

This cycle can happen rapidly and frequently, and create power stability challenges that spell trouble for consumer electronic devices. In addition, poor voltage quality can cause industrial equipment controlled by microprocessors to simply shut down.

SCE grid engineers are working on circuitry designs that include smart grid technologies capable of compensating for the variables created by large local solar generating stations.

Southern California Edison's Smart Grid Goal

SCE is collaborating with the industry to develop new circuit designs and smart grid technologies that can connect large neighborhood solar panel installations to customers, circuitry that can instantly adjust to unprecedented power factors without sensitive home devices and business equipment noticing. What SCE learns will be shared with the industry to help speed the nation's deployment of distributed solar generation resources.

0510GA