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Department of Energy

# Ariz. Rooftops Key to Unlocking the Potential of Distributed Solar

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APS will install solar photovoltaic panels like these in Castro Valley, Calif. for a pilot project studying distributed energy in Flagstaff, Ariz. | Photo courtesy of APS

Nestled in the mountains of northern Arizona and just 75 miles from Grand Canyon National Park, the city of Flagstaff, Ariz. is an ideal city for the Arizona Public Service (APS) to pilot a high concentration of solar photovoltaic energy systems.

"Flagstaff is unique electrically," says Eran Mahrer, Director of Renewable Energy for APS. "It's also a very green community, very willing to adopt [alternative energy], so we thought the power project would gain traction there."

That's the [Community Power Project](#), which APS hopes will be designed to learn how best to handle high concentrations of power generation from distributed solar energy sources.

Households that generate their own solar energy can potentially strain the larger electrical grid, which is set up for centralized generation and distribution, by

demanding or feeding in energy at unpredictable times. That's a concern for APS, because the state's Renewable Energy Standard requires utilities to generate at least 15 percent of their power from renewable sources by 2025, with 30 percent of that coming from distributed generation.

APS also plans a utility-scale solar farm of its own, plus wind turbines and a limited installation of solar water heaters in 50 low-income homes. In all, the project will install 1.5 MW of renewable energy capacity. According to APS, the project could produce an estimated 2,350 megawatt hours of solar electricity annually. This is the equivalent of avoiding an estimated 1540 tons of CO2 emissions annually, using U.S. Department of Energy emissions calculators.

### **Pilot project**

To get ready, APS is launching a pilot project installing photovoltaic panels on the rooftops of homes and businesses in a specific area of northeast Flagstaff. APS will install solar panels on qualifying rooftops at its own expense, and own and maintain them.

Using the data generated by those panels, it will then study how their high concentration of photovoltaic panels affects the power grid, and how to maximize the benefits of distributed energy generation.

The study will be funded by a \$3.3 million grant from the U.S. Department of Energy, through the American Recovery and Reinvestment Act. Much of the rest of the approximately \$15 million capital cost will be funded by the company, using Renewable Energy Surcharges already collected from APS customers. As a result, APS says, the surcharge should not go up. Private contractors will handle the installation and maintenance, creating and maintaining "green" jobs.

### **DG benefits and 20 year-rates**

With its study, APS is hoping to bolster its "smart grid": a distribution system that can respond to changes in real time. It'll look at management of the various technical challenges created by distributed energy, such as variations in the flow of power created by weather conditions.

APS will also look at whether the anticipated benefits of distributed generation, such as less strain on conventional distribution equipment, will be delivered. The goal is to be

able to respond to these challenges in a way that maximizes economic benefits to the utility and its customers.

Meanwhile, in return for hosting the solar panels, building owners are guaranteed the same rate for use of that solar electricity for the next 20 years. Locking in the solar energy rate not only guarantees a stable bill, Mahrer says, but also reduces energy costs in the long run. And, Mahrer notes, the project removes the up-front cost to customers of installing the solar panels, which can be \$10,000 or even higher, and worries about maintenance.

"We as a utility can help deploy more total solar than I think the industry can without utility participation. We can drive down the cost of solar for ourselves as well as customers," he says. "The mere increased adoption will drive down costs through economies of scale."

What does this mean for me?

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