

# THE HILL



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## **Distributed generation: a power plant on every block**

*By Jean Gossman*

With energy markets increasingly linked to economic and national security, U.S. small businesses are developing new technologies to increase energy efficiency by offering consumers demand-side management of power consumption. This “distributed power,” also known as “distributed generation” (DG), provides cleaner energy and greater local control over production and individual control over consumption.

DG encompasses any small-scale power-generation technology that produces electricity at a site closer to customers than central-station generation is. A power unit can be connected directly to the consumer or to a utility’s transmission or distribution system. Technologies used include turbine generators, internal-combustion engine and generators, microturbines, photovoltaic or solar panels, wind turbines and fuel cells.

Plug Power, a fast-growing firm in Latham, N.Y., makes devices that produce electricity through an electrochemical reaction. According to the company, the benefits over a conventional combustion reaction include greater reliability, higher efficiency and near-zero emission of pollutants

“Peak shaving” — or reducing peak power demands to the electricity supply network — is yet another benefit of DG adoption. One of the most attractive uses of DG is the ability in some locations to use net metering to sell excess power back to the grid at the price that the customer buys power at during other periods.

DG provides a number of vital services to utilities and consumers. Standby generation, for example, is especially important to airports and hospitals. Hotels and university housing also particularly benefit from DG, since they consume high levels of energy 24 hours a day.

And although you and your neighbors are not likely to have your own fuel cell out on the deck in the near future, Plug is working with several European firms in a development project supported by the European Union. The initiative involves installing several fuel-cell heating devices in decentralized home-energy units in multifamily houses, small-business sites and public institutions.

According to the company, the goal is to network about 30 devices and control them centrally. As a “virtual power plant,” the systems should contribute to decentralizing electricity supply, generating electricity directly at the place of use, without power loss.

Plug says the effort “is an essential milestone in moving fuel-cell heating devices forward on the path toward market-readiness.” Rigorous tests under real-life conditions in various environments should demonstrate how this technology would meet technical standards and customer demands for reliability, feasibility and reducing emissions or carbon dioxide.

Another company venture, a fuel-cell demonstration program funded by the Department of Defense at the Watervliet Arsenal in Watervliet, N.Y.,

provided supplemental power to a telecommunications facility and a research and development laboratory and provided power for the four base housing units.

There are quite a few challenges to widespread use of DG, however. Although site selection is a relatively fast process, developers still run into “not-in-my-backyard” issues when trying to locate a plant. The Distributed Power Coalition of America points out that regulations for plants are designed for large, central generation plants and need to be reworked for distributed power facilities.

Apart from supplying military and government facilities, there are national security benefits from DG in the larger consumer milieu. DG takes some power generation off-grid, increasing power security as a whole in the tense climate since the 2001 terrorist attacks.

A National Research Council report on the Department of Energy’s research programs, titled “Was it Worth It?” states that from 1978 to 2000, the department’s efficiency efforts produced an economic return of at least \$30 billion. Now that the word “security” resonates with new meaning, demand-side energy-management systems could provide a greater sense of warmth and refuge than merely the heat that they generate.

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