DOE/FEMP's New Program for Affordable Distributed Energy Resources

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ABSTRACT

Distributed Energy Resources (DER) technologies offer a promising opportunity for the federal government to lead by example—by developing more affordable energy resource portfolios at federal facilities. FEMP is helping federal agency facilities partner with industry to apply a wide array of DER technologies. The new DER program provides technical assistance, financing assistance, education, and outreach to these facilities to meet energy efficiency and renewable energy goals.

These goals were set by legislation and Executive Order 13123, a directive on "Energy Conservation at Federal Facilities (May 3, 2001)," and the National Energy Policy.

DER refers to a variety of relatively small-decentralized power-generating technologies (i.e. microturbines, fuel cells, and photovoltaics) that can be combined with energy management and storage systems and located close to the point at which the electricity is consumed. DER offers some unique benefits to federal customers that are not available from centralized generation.

DER BENEFITS TO FEDERAL AGENCIES

By implementing DER integrated systems, federal facilities can make a significant contribution toward attaining a sustainable energy future. DER technologies potentially offer federal agencies the following benefits:

- Potential source of high-reliability power for sensitive facilities when coupled with uninterruptible power supply (UPS) systems;
- Greater predictability of energy costs and reduction in energy and electric demand charges;
- Economic source of energy-efficient thermal energy due to combined heat and power capabilities;
- Cost-effective source of peak demand power;
- Environmental benefits—including cleaner, quieter operation and reduced emissions (because the generators often rely on natural gas and/or renewable power);
- Faster response to new power demands because capacity additions can be made more quickly.

In certain circumstances, DER technologies also potentially offer benefits to the overall power grid including:

- Deferral of new transmission and distribution (T&D) capital investments;
- Reduction of T&D electrical line losses;
- Improved power quality and reliability (voltage support, source of reactive power, and power factor correction);
- Optimal use of the existing grid assets—including potential to free up transmission assets for increased wheeling capacity.

It should be understood the availability of these benefits depends on the specific site and its energy needs, and the particular physical, economic and regulatory situations in which the existing centralized electric grid is operating. Maximizing these benefits and their value often requires the right kind of technical, market and policy expertise.

DER is more than just a mix of generation technologies; it is the full system integration of the generation source and the storage and delivery of that generation. The system might include components such as the generator, the control system, energy storage and interaction with the grid. DER technologies include:

- Microturbines
- Advanced industrial turbines
- Combined heating and power systems (CHP)
- Fuel Cells
- Natural gas reciprocating engines
- Photovoltaic systems
- Biomass systems
- Wind energy systems

TECHNOLOGY DEMONSTRATION

FEMP's New Technology Demonstration Program introduces new energy-efficient technologies to the federal sector, thereby empowering federal agencies to assess and, if appropriate, deploy new technologies to meet their energy goals. By providing timely information, the program aims to narrow the gap between private sector and federal deployment rates of new technologies.

FEMP is currently demonstrating a microturbine CHP technology at a federal facility. FEMP will conduct a measurement and verification data analysis and final reporting for use by other federal agencies. This will be an excellent opportunity for FEMP's team to participate in design reviews and collect before and after data to demonstrate the benefits.

TECHNICAL ASSISTANCE

FEMP provides technical assistance to help federal sites assess and verify their DER potential. Technical assistance may consist of screening for project opportunities, feasibility studies, writing procurement specifications, design review, and taking performance measurements. Technical assistance is provided by DOE national laboratory employees and subcontractors selected from the best energy and sustainability consultants in the country for selected federal agency projects.

EDUCATION AND OUTREACH

FEMP disseminates information on energy efficiency, renewable energy, water saving technologies and DER through print material, on-line resources, recognition and award programs, training workshops, and an annual conference/trade show.

Our education and outreach program includes the following:

- FEMP held a one-day DER Workshop in San Jose, California targeting facility managers at federal agencies and other federal employees interested in distributed energy resources. The workshop informed federal facility managers about the benefits and opportunities available from using DER at federal facilities. Presentations are available at our website: *http://www.eren.doe.gov/femp/techassist/der_agenda.html*.

- FEMP will develop a "How To" guide, available March 2002, to help agencies answer questions regarding interconnection agreements, environmental regulations and permits, and financing opportunities. This guide will be helpful to agencies before they actually pursue a DER project.

- Case studies will be developed for federal facilities utilizing a DER system that might be similar to their facility. Case studies will include useful detailed data analysis, available June 2002.

- FEMP is currently developing a DER and CHP federal market analysis, available March 2002, for use by federal agencies. The analysis will include information on federal facilities that have

installed DER systems and assess federal facilities for DER potential.

- FEMP's education and outreach program also includes developing outreach materials regarding DER benefits and technology fact sheets for federal agencies. Education and outreach materials are available at *http://www.eren.doe.gove/femp*.

DER technologies represent a promising opportunity for the federal government to lead by example by developing a cleaner, more reliable, and more affordable energy resource portfolio. FEMP is helping agencies partner with industry to apply a wide array of technologies and integration strategies for on-site use as well as for grid-enhancing systems.

Successful integration of DER depends on regulatory and institutional actions at both the state and federal levels of government. Such actions include uniform grid interconnection standards, streamlined environmental siting and permitting, and equitable utility policies to open competitive markets.

ABOUT THE AUTHOR

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