

Strengthening Energy Security through Federal Partnerships

USACE and DOE spearhead a major energy initiative across the Southeast, a region that boasts the nation's fastest growing population and future energy demands.

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The need to shrink dependence on fossil fuels is not a new concept in the nation's energy discussion, nor is the need to invest in clean, renewable energy. But the challenge of *how to deliver* solar, biomass, wind, wave, geothermal and other power generation technologies in a cost effective, large-scale manner—and meet the changing energy demands of the nation—is a very current one indeed.

Through a partnership with the U.S. Army Corps of Engineers (USACE) Savannah District, Department of Energy (DOE), Savannah River National Laboratory (SRNL) and other federal entities, the Southeast Energy Initiative (SEEI) is proactively addressing ways to deliver renewable energy technologies such as biomass, solar and waste-to-energy generation at the best value. The partnership aims to attract private industry development of these technologies on federal land with federal customers.

The Department of Defense (DOD) is addressing the challenge as a key player in the U.S. energy transformation. In fact, the number one objective according to the DOD Strategic Sustainability Performance Plan, signed June 2010, is to reduce the use of fossil fuels to ensure continued availability of resources that are critical to its mission.

Further, legislation enacted by Congress—such as the *Energy Policy Act of 2005* and the *Energy Independence and Security Act (EISA) of 2007*—has set the minimum, escalating standards for reducing fossil fuels across the nation. For example, EISA currently requires that



Biomass steam and electricity is produced at the newly-constructed Ameresco Biomass Cogeneration Facility, located at the Department of Energy's Savannah River Site. PHOTO COURTESY SRS

all new federal facilities be designed to consume 55 percent of the fossil fuel-generated energy compared to buildings that were constructed in 2003. These energy-reduction percentages escalate to 65 percent by 2015, 80 percent by 2020, 90 percent by 2025, and finally to 100 percent (the net-zero energy state) by 2030. As such, DOD installations are actively seeking ways to reduce energy consumption on new construction and existing buildings with more efficient designs, and to generate electricity through renewable energy sources.

REGIONAL INITIATIVES

Within DOD, the U.S. Army is charging ahead on achieving energy goals through the development of Regional Energy Initiatives (REIs). REIs are geographically-organized partnerships that combine the

energy demands of multiple federal partners within a region to address how to deliver large-scale renewable energy projects at the best value. The goal is to create an attractive business case for financiers and for utilities to develop renewable projects on available federal lands with a guaranteed federal customer base.

One REI gaining momentum as an example of successful partnering is SEEI, a partnership spearheaded by USACE Savannah District, DOE and SRNL. The agencies are developing solutions to meet the energy demands unique to the Southeast through alternative, non-fossil-fuel burning energy sources.

Another active REI is the Northwest Energy Initiative, anchored by USACE Seattle District and the DOE's Pacific Northwest National Laboratory. Plans are underway to develop similar partnerships

in other regions of the country. And since the unique characteristics and opportunities in each region differ, these REIs are able to chart the best-value solution for their region, while sharing ideas and successes between them.

TAKING THE LEAD

Several issues make the Southeast unique. Census projections forecast a 32 percent population growth in the region between 2000 and 2030 rate, significantly higher than any other in the nation. Likewise, demand for energy will rise 32 percent in a similar timeframe, according to the Energy Information Administration. This increasing trend in population and energy demand is complicated with the region's high temperatures and humidity rates, which necessitate environmental controls for human comfort, equipment protection and mold control.

To address these increasing energy demands, USACE Savannah District, working with SRNL, is serving as the SEEI technical and program management agency to provide regional leadership, planning, execution and oversight of the program. Addressing renewable energy needs on a regional basis allows SEEI to leverage USACE Savannah District's existing knowledge and relationships with installations, other federal partners, utility companies and regional energy regulators. The approach focuses on what is the best value for the region complementing national solutions, and it allows for development of subject matter expertise related to regional issues. Customers who will reap the benefit include personnel at military installations throughout the Southeast as well as other federal entities, local governments and municipalities, and private sector partners.

USACE Savannah District has a proven track record for managing and executing environmental, real estate, programming, planning, design, contracting and construction activities for federal installations. It has provided more than \$7 billion in military construction in the past seven years (from FY2005 to FY2011) for 11 Army and Air Force installations across Georgia and North Carolina. Additionally, USACE Savannah District has

a technical staff with localized expertise in optimizing energy efficiencies and developing renewable power sources for individual buildings and clusters of facilities. It also is established as a power provider in coordination with the local utility companies and regulators, operating three hydroelectric dams along the Savannah River, which produce more than 1.5 million-MW Hr of power annually.

SAVANNAH RIVER PARTNERSHIP

USACE Savannah District has developed an important partnership with SRNL, located at the DOE's Savannah River Site (SRS), consistent with the DOE/DOD Memorandum of Agreement signed July 22, 2010.

SRNL plays a key role in SEEI as a leader in renewable energy technologies, such as biomass, biofuel, hydrogen and a potential location for small modular nuclear reactors. Located near Aiken, S.C., the 310-mi² SRS is already implementing several renewable energy projects using private funding. In the past three years, SRS has built four biomass plants—three smaller units providing 60,000-lb of steam per hour, and one large unit providing cogeneration of 20-MW of electricity and 200,000-MW of steam per hour. These biomass plants supply 40 percent of the site's required electricity and 100 percent of its required steam, all constructed and operated with private support and minimal federal investment.

Additionally, the Three Rivers Landfill, a regional landfill located on SRS, provides 1,800-ft³ per minute of methane via a dedicated pipeline to a local industrial user. Based on this successful operation, Three Rivers is investigating whether to install digesters to further maximize production of methane. The relationships and lessons learned in the development of these and other private-public partnerships are being leveraged and expanded via SEEI.

At SRS, one of the objectives is to develop and demonstrate "islandable" micro-grids powered by a portfolio of renewable energy sources and small modular reactors. The initial SEEI focus is on renewable energy and secure micro-grids, with the longer term DOE focus encompass-

ing small modular reactors and nuclear renewable hybrid energy systems. The nuclear renewable hybrid energy systems will use nuclear process heat to maximize the conversion of biomass to solid, liquid and gaseous fuels, as well as biochemical products.

THE WAY AHEAD

The REI concept is being adapted into the Army's Guidebook, identifying a path for providing renewable power on military installations. The Savannah and Seattle districts are leading the initiative within USACE.

The next steps involve collecting and synthesizing regional data to define the best-value opportunities. Participating agencies are working to develop a regional master plan, which would include a feasibility study and regional analysis to identify specific energy needs and determine energy options at each location. It would also include an economic analysis of options. Projects with the best value for regional federal partners will be developed and vetted through both the Army and the partner's review processes. Successful solutions will be further developed with environmental assessments and other necessary activities, ultimately resulting in a formalized agreement and contract with all involved parties.

Overall, the ability to provide energy security and surety to multiple federal partners through this collaborative, best-value approach will serve to meet the nation's needs for alternate fuel sources and reduction of greenhouse gases. As the nation's energy landscape continues to transform, USACE Savannah District and SRNL will continue to work with public and private partners and customers to strengthen the Southeast's energy independence and security.

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