



Power play

The electric power industry is transforming itself, and that means opportunities for Boeing to pursue innovative solutions **By Derrell Carter**

Smart utilities are the future, and it's a future that Boeing aims to be part of.

As electric utilities everywhere look for ways to make their power grids smarter, more efficient and secure, Boeing is weighing in with its expertise in cybersecurity and large-scale systems integration.

"We've developed secure technology that connects command centers in Langley, Va., with troops and weapons in Afghanistan and Iraq; so why not do the same for utilities?" said Tim Noonan, vice president of Boeing Defense, Space & Security's Energy Solutions, the organization responsible for developing and capturing opportunities in the energy field.

"Boeing is known for a number of aerospace firsts including the space station's 'micro-grid' electrical system. We can make the 'smart grid' a reality as well."

Simply defined, a smart grid enables multiple applications to operate over a shared network, similar to the way the Internet works. Smart grids allow utilities to monitor where their electricity is being consumed and know ahead of time whether problems are looming, such as a possible power shortage, or blackout. Consumers also can tell how much energy they are consuming and which appliances are using the most energy, and can make adjustments to reduce usage and costs.

A critical concern, however, is the need

for protection of the smart grid against attacks by hackers, as well as its resiliency in the face of natural disasters, equipment failures and user errors. This concern over grid vulnerability is driving utilities to work closely with system integrators such as Boeing to develop a framework for smart-grid cybersecurity. The process has accelerated over the past year, spurred in large part by the U.S. Energy Department's smart-grid stimulus program.

"This is absolutely the right direction for Boeing to pursue, and a wonderful use of the company's broad technical and highly innovative talent," said Chris Smith, director of operations for Energy Solutions.

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Services & Support, said the energy market is one Boeing should be pursuing in its expanding services business. He cited Boeing capabilities such as supply-chain management, logistics command and control, systemwide situational awareness, and real-time network management services. "We can apply our broad scope of knowledge to provide valuable solutions for energy assurance and a national power grid that is both smart and secure," he said.

Formed late last year, the Energy Solutions group is working on ways to modernize the U.S. electric grid and make it more secure and reliable. The areas of focus, which represent

a potential \$45 billion market for Boeing, include smart-grid management, technology development and energy assurance (ensuring the security of an energy infrastructure).

"Our knowledge of the energy market, from renewables to micro-grids, and our expertise in information and project integration uniquely position us," said Gautam Bahri, project manager for Energy Solutions.

Boeing's smart-grid efforts already are paying dividends. A few months after Boeing launched its Energy Solutions group, the Energy Department awarded the company federal stimulus funds worth up to \$38 million for three projects demon-

PHOTOS: Boeing's Energy Solutions is implementing three advanced smart-grid demonstrations to make power plants, power lines and substations more reliable, secure and efficient. RICHARD RAU/BOEING

(Insets, from left) Boeing's Energy Solutions is developing technologies to integrate renewable energy sources into the national grid, including building the 100-kilowatt power facility at California State University, Northridge, shown in this artist's rendering, using solar power technology. BOEING

To reduce energy consumption in cities, Boeing and Danish technology company Amplex are working on an intelligent street-light management system. PAUL PINNER/BOEING Boeing is developing technology to help power generators more securely and reliably manage electricity transmission and distribution. PAUL PINNER/BOEING



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PHOTO: PAUL PINNER/BOEING

strating advanced smart-grid technology. Boeing was the only company outside the traditional power industry to win a smart-grid grant.

Boeing is partnering with two utilities, Southern California Edison and Consolidated Edison of New York, on two separate proposals to demonstrate how Boeing’s comprehensive communications and cybersecurity network can serve as the

common operating environment and the command and control network of an enhanced smart grid. Boeing and Consolidated Edison have worked together before—to develop a supervisory control and data acquisition system for the utility 25 years ago.

The third proposal, in which Boeing is the prime contractor, includes a consortium of regional transmission

operators and utilities that collectively serve all or part of 21 states and more than 90 million people. These operators are responsible for moving electricity over large interstate areas, as well as the coordination, control and monitoring of the electricity transmission grid.

“These grants give us the opportunity to show how proven technologies already being used on a host of military and cybersecurity programs can be applied to the public sector,” said Noonan. “It also allows us to help shape an exciting and challenging market, partner with new customers and suppliers, further sharpen the skills of our work force, and contribute to the company’s business growth strategy.”

Boeing also is developing business alliances to access the energy market. The company is working with Danish

technology firm Amplex to offer an intelligent streetlight management system—Amplight—that could decrease streetlight energy consumption in major cities by 25 to 35 percent, significantly reducing their carbon footprint. Amplex already manages several million streetlights in markets including Norway, Sweden, China, Indonesia and the United Arab Emirates, as well as 50 percent of all Danish streetlights. Boeing is in discussions about Amplight with the cities of Chicago; Columbus, Ohio; and Mesa, Ariz.; as well as the state of Nevada.

Practicing what it preaches, Boeing has embedded smart-grid technologies at multiple company sites to reduce energy consumption and costs.

“Our ultimate goal is to show the value of an interoperable, well-secured energy grid, and we’re willing to invest the time

and talent to satisfy customer demand and get the job done,” Noonan said. “We’re not just creating new products or services for ourselves or our customers. We’re creating energy security, which is fundamental to national security.” ■

derrell.carter@boeing.com

PHOTO: Boeing is working with Danish technology company Amplex to offer an intelligent streetlight management system known as Amplight that could decrease streetlight energy consumption in major cities by 25 to 35 percent. SHUTTERSTOCK.COM

