



December 29, 2010

Utilities Seek Fresh Talent for Smart Grids

By **TOM ZELLER Jr.**

GRANVILLE, Ohio — Speaking to a classroom of seventh and eighth graders at the middle school here, Lisa Magnuson shared a popular dictum from the power industry: if Alexander Graham Bell, the inventor of the telephone, could see how his technology had evolved over the last century, how would he react?

“He’d be amazed,” offered one student, mentioning that his cellphone can play music, display movies and send [text messages](#).

And if [Thomas Edison](#), the pioneer of power distribution, were to return?

“He’d probably go, ‘Wow, everything is still the same,’ ” said Ms. Magnuson, the director of marketing for Silver Spring Networks, which produces hardware and software to make the electric grid as smart as the phone network.

To pull off the modernization, Ms. Magnuson and others are trying to persuade this generation of fidgety teenagers to put their creativity to work in the power industry once they graduate. “We want to help make utilities cool again,” she said.

The power companies desperately need a jolt of youthful energy. The industry and the creaky distribution system it manages are on the cusp of a major technological overhaul just as about half of electric utility employees are expected to retire in the next 5 to 10 years.

At the same time, the federal government and utilities are spending billions of dollars to upgrade the electric grid with intelligent digital technology so they can vary a customer’s price for power based on the time of day and more seamlessly integrate electricity from a variety of sources like wind and solar.

The upgrade would give the power generation and distribution network the sort of nervous system it has lacked since Edison first conceived it in the late 19th century. By some estimates, the smart grid could help reduce electricity use by more than 4 percent a year by 2030 and save \$20 billion a year for utilities and their customers.

To push along the transformation, educators and government officials, often in partnership with

utilities, are drawing up smart grid curriculums for elementary classrooms, vocational schools and university laboratories. In addition to educating youngsters about electricity, the goal is to lure some of the technologically inclined away from Silicon Valley and toward a profession that, in the popular mind, long ago became the province of Homer Simpson drones.

Last spring, the energy secretary, [Steven Chu](#), awarded \$100 million in stimulus money to 54 training programs in the smart grid aimed at high school and college students around the country. “Building and operating smart grid infrastructure will put tens of thousands of Americans to work,” Mr. Chu said at the time. “Today’s investment will help ensure that we have the work force in place to meet this need.”

The Energy Department estimated that some 30,000 workers would be trained because of the grants, which range from \$87,000 for the Preparing Occupations for Lineman Education, or Pole, program at the Austin Community College District to \$5 million to [Florida Power & Light](#) to develop its Gateway to Power Program, which aims to bring industry and academia together to develop power system and smart grid education.

And just as Reddy Kilowatt, a cartoon character created by a utility company, was used to promote the benefits of nuclear power to previous generations of students, the electric industry aims to use the new curriculums to promote its vision of the future.

“How will the smart grid change your life or your future career?” students are asked in one of the six lessons that Silver Spring Networks, based in California, helped to develop, and which were part of a pilot program this month in Ohio and in Oakland, Calif. “Write a journal entry in which you imagine how life or work will change after the smart grid is ready to go.”

[Part of the coursework](#) is aimed at preparing young consumers for the arrival of dynamic pricing — the ability to vary the price of electricity throughout the day, based on overall demand, rather than charge one rate all day, as is the norm now. Dynamic pricing is an oft-promoted benefit of the smart grid, although it has proved contentious in some of the early markets where it has been proposed, particularly among ratepayers at home during the day, when the electricity cost is higher.

Here in central Ohio, [American Electric Power](#), the big regional utility, was awarded \$75 million in stimulus money last year for a \$150 million smart-grid pilot project now in development.

In addition to replacing roughly 110,000 analog electric meters at customers’ homes with digital meters that can transmit data to and from the utility in real time, A.E.P. — working with Silver Spring Networks and other companies — will deploy and test a full menu of interconnected grid technologies, like digital management, distribution networks, plug-in hybrid cars and smart appliances.

“These elements are designed to demonstrate the full benefits of installing a comprehensive distribution smart grid for consumers and the utility,” the company said in announcing the financing.

To address the shortage of trained workers, utilities have been working jointly through organizations like the [Center for Energy Workforce Development](#), which concluded in a survey last year that retirements and attrition would force the energy industry to replace roughly half of its engineers and skilled technicians by 2015.

Toward that end, the organization recently received a \$1.37 million grant from the [Bill & Melinda Gates Foundation](#) to train low-income adults in eight states for careers in the power industry, and it has also developed the [Get Into Energy](#) career pathways program, aimed at luring young people, ex-military personnel and engineers into utility work.

In November, the organization announced a partnership with ACT, the big college testing and work force development company, to develop a skills test to certify new recruits, which will help streamline their flow into jobs.

Top research labs are also improving their offerings.

Jin Wang, an assistant professor of electrical and computer engineering at [Ohio State University](#) near here, said that in the last two decades, many universities had cut back on energy programs. “It was somehow regarded as an area that does not allow new innovations,” said Mr. Wang, who heads his department’s Integrated Curriculum for Smart Power Engineering, which received \$2.5 million in stimulus money.

But blackouts, increased demand, new loads from electronics and computers, new power sources like solar and wind and the expected adoption of [electric vehicles](#) are all presenting new engineering and control challenges, he said.

The team at Ohio State, home to one of just a few high-voltage laboratories in the country, is now developing a virtual platform to simulate the functions of a smart grid in a laboratory or classroom setting. The program, which is also receiving \$150,000 from A.E.P., calls for community outreach, including sending the university’s engineering staff to speak at local schools.

“When you look at the electrical power system, people say that if Edison came back, he could still operate it,” Mr. Wang said with a chuckle, before being told that the aphorism seemed to be getting a lot of mileage these days.

“Well, it’s a common feeling,” he replied. “Lots of research needs to be done on the power system.”