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Bright Side of Blackouts

Two years after North America's largest blackout, entrepreneurs offer better technologies. But few utilities are buying.

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On August 14, 2003, the largest blackout in North American history swept through the northeastern part of the United States and eastern Canada. Lights went out in an area of about 9,300 square miles, costing an estimated $6 billion and affecting 10 million people in Ontario, Canada, and 40 million people in eight U.S. states.

When the lights came back on, New Yorkers sported t-shirts reading: "We survived 9/11 and now the blackout. What next NYC?"

The U.S.-Canada Power Outage Task Force blamed high electrical demand, strained high-voltage power lines, and "overgrown trees." That blackout, and many less dramatic ones, have raised awareness of the grid's problems.

'The potential is huge, well in the billions.'
-Roberto Torres, Frost & Sullivan

The grid is aging, with many transformers approaching or surpassing their design life. It is also under-maintained and overstrained. In every year since 1975, about $117 million less was invested in the electricity transmission grid, according to the U.S. Department of Energy.

The result is a brittle grid constantly on the edge of failure, with research firm Primen estimating the annual cost of power outages and fluctuations at between $119 billion and $188 billion yearly.

To many entrepreneurs, those high costs for failures sound like a good market. Startups and big players alike are joining the movement to improve reliability, prevent blackouts, and make the grid "smart."

"These are technologies that are going to get a lot more attention in the next couple of years," said Roberto Torres, a strategic analyst at Frost & Sullivan. "The potential is huge, well in the billions."

Some of the technologies are hardware solutions, electronics being developed to improve the efficiency of the power flow. Companies like American Superconductor are working on new conductor technologies to make cables more efficient.

Others are working on IT, specifically on energy management systems to better monitor the grid. In the 2003 blackouts, utilities were unaware that trees were choking off power, said Mr. Torres. And utilities still rely on calls to find out about outages.

"The basic goal is that we could someday have a system that will automatically identify a solution and implement it to correct the grid whenever something is wrong with it," said Mr. Torres.

Companies Abound

Companies like State Estimator, Fat Spaniel, and EleQuant develop components for monitoring the electric system. Another is GridPoint, which has a system to monitor power usage at the circuit box to tell you how much energy separate appliances are using. It also has a battery that it uses to store energy, which the system buys when it's cheapest, and sells back when it's expensive, saving 10 to 15 percent for an investment.

That system would belong to customers, not utilities. But eventually, Gridpoint CEO Peter Corsell hopes utilities will use the system to partner with GridPoint's customers, defraying power shortages by buying back power from generators, he said.

Another company, Beacon Power, which trades on the Nasdaq under the ticker BCON, is about to ship a flywheel-based system that stores energy when there's a surplus, spinning it back out when there are fluctuations or a danger of shortage.

The test system will be installed in a PG&E facility in San Ramon, California, at the end of this month, and the company is building the same type of system for New York, said spokesperson Gene Hunt. Beacon stock—which was worth less than a dollar as recently as June—reached a four-year high of over $3.40 in the last two weeks and closed Friday at $2.87.

Serveron takes another approach. Most utilities send out meter readers to manually test oil in transformers. Serveron, which has sold about 300 transformer monitors, has a product that constantly tests oil on transformers. A central computer predicts failures, and prioritizes maintenance to avoid those blackouts.

The price is $35,000 to $40,000, but transformers cost $4 million, so it's "a pretty compelling business case," said CEO Bart Techelman.

But its customers, including Arizona Public Service and PacifiCorp, are among only a handful of utilities that have adopted these new technologies. If these technologies save them money, why aren't they being installed?

Lots of Reasons

The reasons are numerous. First of all, until this month no national energy bill was in place to set reliability standards and create a roadmap for improving the grid.

Also, even if the technologies save money, utilities must make the investment in the first place. Some utilities are still regulated, and it can be hard to convince regulators to spend money if nothing is actually broken. "Our technology is like an insurance policy, so it's a hard sell, even if you know the transformer is going to fail at some point," said Mr. Techelman.

In fact, two years after the blackouts, very little has changed, said Mr. Corsell. "To be honest with you, it's been rather disappointing," he said. "The utility industry points its finger at the grid, the government points its finger at the utilities, but the grid is going to have to become exponentially smarter to become more reliable, safer, and less vulnerable to terrorist attack."

The challenges these startups face are enormous. They're up against companies like Siemens, ABB, and General Electric, and have not found a way to enter the market. "Some of these big companies have not wanted anything to do with these startups, because apparently they view them as somewhat of a threat disrupting their normal business in the utility sector," said Mr. Torres.

Another problem is confusion about who owns different parts of the infrastructure, said Nancy Floyd, a managing director for Nth Power, a VC firm focused on new energy technologies.

"That's really the issue," said Ms. Floyd. "Anything beyond the substation and distribution station, and wires from the substation to homes, gets a little muddy."

And the utility industry is traditionally slow and conservative. "Utilities are waking up and looking at new solutions, but the blackout only occurred two years ago," said Ms. Floyd. "These things are going to happen, but it's going to take time."

Ultimately, it might take more blackouts to push the industry to these new technologies, said Mr. Corsell.

Pressure is increasing, added Mr. Torres. "Nobody wants to be the next company in the news blamed for a big blackout."