Illinois SMART GRID Initiative

Honorary Co-Chairs

Richard M. Daley
Mayor, City of Chicago

J. Dennis Hastert
Former U.S. House Speaker

SMART GRIDS: IIT Leading the Way

By John Kelly

While many of us look forward to the last few hot days of the year, the last thing Joe Buri can do is relax. That's because he is the facilities manager at the Illinois Institute of Technology and responsible for managing the campus when the power goes out.

As heat-related brownouts and blackouts have become commonplace over the past few years, Buri has found himself relocating students into temporary housing, replacing damaged equipment, and fielding complaints from researchers demanding answers about why their time and money were wasted.

Buri's experience has taught him that the vast network of local power lines and power plants—the electricity grid—is far more fragile than a flip of the light switch would have us believe. He knows that many of the problems that lead to power outages and brownouts are the result of an aging electricity infrastructure in desperate need of an upgrade. If the 1950s technology on which our electricity system is based were upgraded with today's technology, he would be able to prevent problems long before they happen—even if those problems are not on his campus.

That's why Buri started working with ComEd and the Galvin Electricity Initiative in 2006 to adopt smart grid designs and technologies that promise to make electricity at IIT more reliable, secure, and environmentally sustainable. For instance, IIT's new smart grid—which will be the Galvin Electricity Initiative's flagship Perfect Power System—will reroute power as needed to prevent outages. Because the campus electricity supply is prone to outages, IIT will utilize on-site generators to supply electricity locally. In addition, this back-up power can be operated to provide ComEd with 10 megawatts of extra power if they need it during peak periods, while providing a revenue stream for IIT—demand response.

With Perfect Power, Buri also will be able to take proactive measures to prevent damage and losses when the likelihood of a power outage increases. For instance, when a storm approaches or when it is very hot outside, Buri can put the campus into a "safe mode," which allows him to use the back-up generators to prevent power loss and in many cases to generate the campus' own power at prices that are cheaper than had the power been purchased from the grid. Buri estimates that the smart grid will save IIT about $1.5 million a year, while eliminating the need for a new $5 million substation.

CNT

GALVIN ELECTRICITY INITIATIVE
Sponsored by The Galvin Project, Inc.

The new smart grid upgrades also will help IIT meet its long-term sustainability goals. For instance, part of the upgrade involves making significant energy efficiency improvements that touch on almost every aspect of the campus, from new high-efficiency lighting to more efficient building cooling systems. These improvements are expected to reduce the campus' electricity demand by at least 1 megawatt a year, which translates into 4,000 tons of CO_2 from a coal-fired power plant. He also learned that using IIT's back-up natural gas-fired generators would further reduce carbon emissions by another 4,000 tons a year, when compared to the same amount of electricity generated from coal.

Buri hopes that his work at IIT will become an example for others in the state. He speculates that a state-wide implementation of smart grid technologies would eliminate power outages and significantly reduce greenhouse gas emissions. For IIT alone, a more reliable system will save as much as $500,000 in lost productivity and damage to equipment annually. Similarly, when other organizations add their own natural gas generators, they could collectively contribute as much as 10 gigawatts to the electricity grid—enough to power about 3 million homes. Not only does this additional power help prevent power outages, but it also saves consumers money by eliminating the need to build new central generation.