



The Future of Power

Southern Company continues to transition to a Smart Grid system that touts sustainability and innovation
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With a growing focus on energy efficiency and sustainability, it comes as no surprise that consumers are expecting more from their utility companies—and in turn, these companies are investing millions of dollars to overhaul their existing grid systems in an effort to operate more efficiently and maintain reasonable rates.

This sort of electrical evolution has a name: the Smart Grid. And simply put, it is the convergence of information and operational technology applied to the electric grid, allowing sustainable options to customers and improved security, reliability and efficiency to utilities. Moving to a Smart Grid not only increases efficiency and adds more service and monitoring options for electric utilities, but also has ongoing political ramifications as consumers demand lower rates

and politicians, including President Barack Obama, continue to pledge the ongoing creation of a Smart Grid system.

Numerous justifications certainly exist for the Smart Grid, but it's no easy project. Often costing millions of dollars—if not more—the Smart Grid also requires a time-consuming upgrade of existing equipment and infrastructure that can deliver enhanced services and handle a huge amount of incoming data that will provide consumption and other pertinent information.

Leading the Smart Grid transformation

Several electric utilities have proactively pursued this transition to a Smart Grid. Southern Company, one of the nation's largest generators of electricity, has been among the leaders in this transition pursuing a Smart

Grid evolution that extends to its operating companies including Alabama Power, Georgia Power, Gulf Power and Mississippi Power. Georgia Power is in the midst of several substation projects the goal of which, according to Southern Company Services (the engineering arm of Southern Company) Protection and Control Supervisor Steve Campbell, is “to modernize or update protective relaying in a lot of our facilities.”

One of the primary components of the project involves removing much of what Campbell calls “the old technology,” or electro-mechanical relays, in order to install microprocessor-based relays.

Although updating the relays is a small part of the overall Smart Grid transformation process, Campbell says the project has several benefits as related to the company's



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Smart Grid services. A Smart Grid, to Southern Company, is defined as a two-way telecommunication-enabled power delivery system that optimizes grid performance and reliability and creates customer-enhanced options with feedback provided by electronic data and other technologies.

“One benefit is that these relays are going to be able to provide data to an automated fault trouble response system,” he says. “The goal is to automate and speed up response to outages, so we’ll be able to get customer power restored more quickly and do it in a more efficient manner.”

Secondly, Campbell adds these new relays give Georgia Power employees “a better handle” on the health of the system. “These relays monitor their own health so we’ll know when they’re operating correctly,” he says. “To have that capability, we’ll be able to extend our maintenance intervals and that should reduce maintenance costs.”

Smart Grid may be the buzzword du jour, but there’s no mistaking that this is a costly, time-consuming transition. Georgia Power has significantly accelerated the relay upgrades, estimating that they’ll be completed by the end of 2012—a three-year timeline as opposed to the typical six- to ten-year period for this sort of project.

Despite the significant costs in evolving an electrical system to Smart Grid standards,

an added benefit to these types of projects is a far-reaching economic impact. Southern Company applied for—and received—\$165 million in stimulus funding from the Department of Energy to help fund Southern Company’s three-year transmission and distribution crosscutting project. The recent work has also had a positive economic impact on the involved parties.

For Burns & McDonnell, a Kansas City-based architectural, engineering and consulting firm, working with Georgia Power presents an opportunity to build on the company’s renowned electrical transmission and distribution expertise. Arnold Olender, Associate Vice President in the company’s Atlanta office, says these types of projects will remain necessary as the transition of the electrical system continues. “It has created a domino effect all the way from Georgia Power to the vendors who supply the equipment to firms like ours who provide the engineering,” Olender says. “We have had to increase staff as a result of the increased workload, which is always a good thing. It’s great to be a part of projects like this that contribute to the economic climate as a whole and put people to work.”

What can the Smart Grid do?

“The systems we’re working on now are really going to impact the consumer, even if

indirectly,” Campbell says. “The data from these devices is going directly into our control systems and, as a result will speed up the automatic restoration of power to customers.”

As things like energy usage patterns, load factors, equipment age and condition and voltage factors, among others, become more clearly understood as a result of the analysis that is possible, it will ultimately allow utilities to develop much needed data-based action plans.

As this data collection is fine-tuned, these huge volumes of collected data can be applied to a variety of electrical service components, creating information that not only benefits the consumer but also makes the company more responsive.

Looking toward the future

As the grid continues to evolve, a new service landscape awaits consumers. Primary goals include accurate meter readings, reduced operating costs and a technology platform that enables future customer services.

“There are smart meters being installed that will, down the line, be able to communicate cost points and cost information so consumers can make intelligent decisions on their consumption,” Campbell says. “There are schemes being installed to automatically isolate and sectionalize portions of our system by adding communications capabilities and some logic to our distribution system.”

Simply put? The Smart Grid is not only efficient and innovative—it is sustainable. In an age when energy and resource consumption is of an increasing concern, Southern Company and Burns & McDonnell are among the leaders in installing a system that brings a necessary efficiency to the country’s electrical grid, paving the way for other utility companies to adopt similar systems to transform the way we use and think about energy.

“The Smart Grid is expected to be fully functional by 2030,” wrote Mike Beehler, PE and Jim Cupp, PE in a technical paper called *Defining the Smart Grid for Electric Utilities*. “Data collected, analyzed, visualized and warehoused from the Smart Grid will contribute to many new ideas and inventions that can improve the lives of people.” ❖