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An Intelligent Approach to Smart Grids

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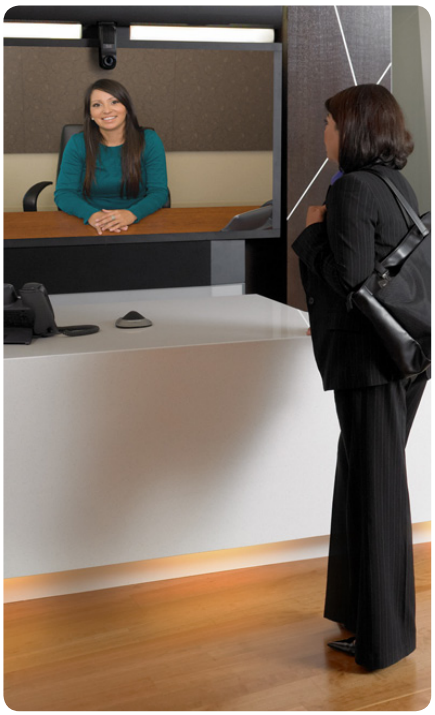


Worldwide interest in developing smart grids presents the IT leaders of utility companies with unprecedented opportunities – and equally formidable challenges. Moving an industry with decades-old infrastructure, assets, and mindsets into the twenty-first century requires clear leadership and intelligent planning.

Christian Blais, Vice President of Information Technology for Bermuda Electric Light Company (BELCO), is particularly interested in the benefits smart grids represent because Bermuda, like most island nations, relies primarily on oil-based diesel engines paired with smaller gas turbine engines to generate the country's electricity.

"Our inconvenient truth is that oil cannot remain our primary fuel source indefinitely," Blair observes. "Consequently, we are seeking alternatives ranging from large- and small-scale renewables to more efficient baseload generation technologies."

In addition to being able to more easily incorporate renewable energy sources such as solar and wind, smart grid technology engages consumers with real-time usage and pricing information that can save them money and potentially reduce power consumption. Electricity use can be shifted to off-peak times that may flatten the demand curve and avoid the need for expensive and environmentally unfriendly peak-generation plants. Utilities can react more proactively and quickly to outages, reducing supply disruptions and lengthening the life of existing grid assets. Better field-crew management, enhanced billing, reduced theft, and improved cash flow provide efficiencies across the organization.

Blais believes that combining the smart grid vision with the realities of existing infrastructure requires clear focus on two major components of technological strategy and architecture: "First and most obviously, is the communications infrastructure that blankets the existing electrical grid and provides the telemetry, monitoring, and operational capabilities to manage the grid remotely without having to dispatch crews to far locations." Blais points out that this new infrastructure provides enormous benefits for utilities that serve large geographical areas, and allows smarter decisions to be made in operating the electrical grid.

The second component is the backend IT architecture, which needs to be completely reconsidered and possibly redesigned. Hundreds of thousands or perhaps even millions of IP addressable devices will be added to the network, each sending data back to the utilities' operational systems. "This is analogous to drinking from a fire hose when it comes to the impact of the data architecture of today's corporate IT environments," Blair notes. "Some very important decisions will need to be made about data warehousing, application integration, data storage, middleware, and business intelligence, to mention but a few."

Extending utilities' corporate networks into homes, businesses, and throughout the electrical grid also necessitates serious security considerations. "We're opening up many more vulnerabilities in places where ne'er-do-wells might be able to infiltrate our network," Blais comments. He explains that significant work is underway, especially in the United States, to develop security standards that will lock down the smart grid environment and make it impenetrable.

A primary goal of smart grids is to reduce the demand for electricity, but a paradox arises when utilities achieve success. Although beneficial for the environment and the world's long-term energy security, the effect of reduced demand on utilities is reduced revenues and earnings. Operational savings can offset some of the loss in revenues, but utilities need to explore ways to derive incremental revenue from smart grid technology.

"One of the most obvious opportunities that people speak of will likely emerge from the communications infrastructure and information access that Smart Grids will provide into every home and commercial environment," Blais observes. Yet to take full advantage of this potential, he points out, utilities and regulators must address privacy concerns and how proprietary data can be used. "There will be opportunities, and significant changes in thinking may be required to bring these to market."

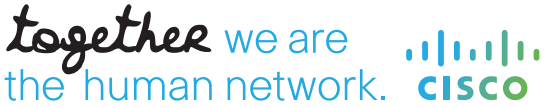
Smart grids will require a significant increase in collaboration, integration, and organizational cohesion befitting a paradigm shift of this magnitude. For example, within BELCO, the integration between Blais's teams and business processes will be more intense than ever. Due to the "fire hose" effect of newly added IP devices, he comments, "The organization will need to react more quickly as our operational activities become more and more reactive to this deluge of real-time data and more proactive in response to the predictive capabilities that will emerge from this sophisticated technology."

Externally, his organization will interact more frequently and intimately with customers. From controlling appliances to providing real-time pricing and energy consumption information, the IT group will need to make this relationship more responsive and enriching than ever before.

Blais believes that smart grids will be socially transformational. "As with the Internet and cell phones, our experience with electricity is about to change dramatically, along with its supporting processes. I don't think we've ever seen anything like this before, and it will have a massive impact on these relationships."

For More Information

For information about how Cisco can assist in planning and implementing smart grid solutions, contact your local Cisco representative or visit http://www.cisco.com/web/strategy/energy/external_utilities.html



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