FROST & SULLIVAN

Excellence in Resourcefulness - Energy

Grid Intelligence

NORTH AMERICA

Contents

Background and Company Performance

Industry Challenges

According to the US Environmental Protection Agency (EPA), extreme weather conditions are one of the main drawbacks of climate change. Between 2011 and 2013, the United States experienced 32 weather-related events, each costing $1 billion. Collectively, weather-related interruptions can cost anywhere between $18 billion and $33 billion a year, according to the U.S. Department of Energy's Office of Electricity Delivery and Energy Reliability[1]. Storm weather is, by far, the number one cause of power interruptions, and with climate change, extreme storms are not expected to slow down in the near term.

Ensuring high reliability is a top priority for utilities. Given the circumstances of aging infrastructure combined with extreme weather conditions, utilities have chosen to evaluate and implement technologies that address these issues in a cost-effective and efficient manner. Technologies such as Itron's advanced meter infrastructure (AMI) combined with advanced distribution management systems provide utilities with exceptional situational grid awareness.

Frost & Sullivan estimates that approximately 45.3 million AMI units have been shipped in the United States since 2011. In addition to situational grid awareness and recording customer load for billing, these smart meters can manage supply during peak load demand periods and enable demand repose programs.

This Excellence in Resourcefulness award recognizes either an investor owned utility (IOU) or municipal's ability to conduct successful technology implementation and behavioral change, producing strong results in reducing significant waste of electricity.

Focus on the Future and Best Practices Implementation

CenterPoint Energy, Inc., is an energy delivery company that includes electric transmission and distribution, natural gas distribution, and competitive natural gas sales and services. The company is based in Texas, but also serves Arkansas, Louisiana, Minnesota, Mississippi, and Oklahoma.

CenterPoint Energy (CNP) has been identified as an early adopter of smart meters. The company initiated its AMI project with Itron in 2009 and completed the deployment of 2.42 million smart meters in August 2016. This project was part of a grid modernization effort in response to the devastating impact of Hurricane Ike. In addition to AMI, the utility also invested in advanced distribution management systems (ADMS) to improve overall resiliency of its grid network. This included installing 858 intelligent grid switching

[1] "Economic Benefits of Increasing Electric Grid Resilience to Weather Outages", prepared by the President's Council of Economic Advisers and the U.S. Department of Energy's Office of Electricity Delivery and Energy Reliability, with assistance from the White House Office of Science and Technology. August 2013

devices and automating 31 substations. Since 2011, the company has avoided 187 million customer outage minutes and experienced 22.7% improvement in reliability. Furthermore, it has been able to restore electricity to over 1.5 million customers without a single phone call.

Unlike many utilities, CNP chose to build its own communication infrastructure consisting of Itron's wireless radio frequency (RF) mesh telecommunication network with public carrier backup. The company has saved over $107 million in operations and maintenance since 2009 in areas such as reduced meter reading, fleet and equipment costs, and recovered revenue/prevented loss from electricity theft. With this built meter read automation, CNP has been able to conserve a considerable amount of energy. CNP conserved nearly 900,000 gallons of gasoline, prevented 8,100 metric tons of CO2 emissions, and eliminated almost 10 million vehicle trips.

Societal Impact	1–3 Poor	4–6 Fair	7–8 Good	9–10 Excellent
Improving customer awareness and participation				X
Enabling behavioral change for reducing waste through customer engagement and technology-driven programs				X
Yielding impressive waste reduction results that benefit the overall served community				X
Business Impact	**1–3 Poor**	**4–6 Fair**	**7–8 Good**	**9–10 Excellent**
Drafting a clear vision to address excessive waste through technology implementation				X
Achieving operational effectiveness as a result of successful strategy for sustainability				X
Strengthen utility's brand image as a leader for sustainability				X

Societal Impact

Improving Customer Awareness and Participation

CNP scores top points for improving customer participation and awareness. The utility has been a noticeable advocate of smart grid technology. Its Energy Insight Technology provides tours to community leaders, media, students, and consumers to educate them about the benefits of smart grids. Additionally, the utility has actively participated in customer outreach programs involving numerous articles and case studies outlining its vision for the grid. Awareness increased from 40% in 2009 to 85% in 2013. The results have been that out of 2.4 million meters that were deployed, only 105 customers have opted out.

Enabling Behavioral Change for Reducing Waste through Customer Engagement and Technology-driven Programs

The utility has been instrumental in the region's effort to conserve energy. Between 2011 and 2013, the utility had a sizable number of participants enrolled in the company's Biggest Energy Saver campaign. Through this program, participants experienced a 50% reduction in overall electricity usage.

In collaboration with other utilities in the region, the company launched the Smart Meter Texas portal, which provides customers access to 15-minute interval AMI data. Currently, the company rolled out a pilot project for real-time display. Over 9,000 customers get real-time data from in-home displays. The utility estimates with real-time displays and automated usage reports that customers will be able to save as much as $100 per month. Already, the project has demonstrated significant change in electricity usage, as well as a 93% satisfaction level with the program.

Yielding Impressive Waste Reduction Results that Benefit the Overall Served Community

As a result of remote reads and remote connect and disconnect capabilities enabled by Itron technology, consumers save between $20 million and $25 million per year in eliminated fees from service automation. The community has also benefited from a reduction of 14,186 tons of CO2 in the form of reduced emission from power plants, as well as 1.5 million gallons of gas saved.

Business Impact

Drafting a Clear Vision to Address Excessive Waste through Technology Implementation

The success of CNP has been founded upon its commitment to develop an intelligent grid that is prepared for a future that involves combating climate change, embracing renewable power and electric vehicles, as well as respecting changing customer perceptions and preferences. CNP's intelligent grid is a perfect example of what the convergence between IT and OT can do for guaranteeing sustainability, while delivering exceptional operational performance.

Achieving Operational Effectiveness As a Result of Successful Strategy for Sustainability

The utility has saved over $107 million since 2009 as a direct result of reduced meter reading, reduced fleet costs, and recovered costs from non-technical revenue losses. CNP's meter data management system is able to process over 230 million meter reads per day, at a 99.8% accuracy level. The utility has also been able reduce the time to localize fuse- or transformer-level outage by an estimated 50% to 70%.

Strengthen Utility's Brand Image as a Leader for Sustainability

The excellent execution of an intelligent grid clearly positions CNP as an industry leader for sustainability. The trust it has gained with its community is unprecedented. Customer

satisfaction level is at an all-time high of 90% and customers have avoided over 187 minutes of power outage as a result of improved automation.

Conclusion

CNP is aiming toward its ultimate goal of delivering the next generation of intelligent grid that is not only reliable and safe, but also has the ability to tackle the changing reality of our future that integrates clean and renewable energy and enables customer choice. With its strong overall performance, CenterPoint Energy has earned Frost & Sullivan's Excellence Award for Energy.

Frost & Sullivan

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