SMART MONEY

How a community-owned utility leveraged its smart meter network to save millions of dollars
Like many U.S. utilities, Jacksonville-based JEA has invested millions of dollars into advanced metering infrastructure (AMI) over the last 10 years. The investment enabled JEA, one of the largest community-owned utilities in the U.S., to avoid monthly meter reads in the field. Although the utility saw payback, it wanted to extract more value from its sizable investment.

As a not-for-profit community-owned utility serving 420,000 electric and 305,000 water customers in northeast Florida, “everything we spend belongs to the community,” said Brian Novak, program manager for advanced metering systems at JEA. “There are so many components that we have, from the systems to the meters to the infrastructure in the field that communicates with the meters, and it was all extremely expensive,” Novak said. “It really culminated into, ‘What kind of value can we get out of everything we put in?’”

In 2009, JEA was awarded a $13 million Smart Grid Investment Grant by the U.S. Department of Energy.
of Energy with the utility contributing matching funds. JEA’s Smart Energy Project included the installation of two-way smart meters, supporting communications infrastructure, a web portal for both water and electric customers and an upgraded meter data management system (MDMS).

“We really took advantage of [the ARRA funding] to tie everything together,” said Novak. With a focus on maximizing the return on investment for the community and providing its customers with new and enhanced services, JEA was ready to “take things to the next level.”

The challenge: Extracting additional value from AMI

While a meter data management system (MDMS) can streamline the meter-to-billing process for a utility, the MDMS needed to serve as the focal point for all of JEA’s systems to take advantage of expanded AMI capabilities. JEA recognized that offering additional services and giving its customers more control over their electricity and water use would require integration of utility enterprise applications and field infrastructure systems.

JEA needed a platform that could interface with the utility’s legacy systems, tying together its Oracle billing and customer information system (CIS), CGI mobile workforce management system (WMS), outage management system (OMS), geographic information systems (GIS), asset management and distribution planning systems, and Landis+Gyr metering infrastructure. To achieve demonstrable savings without adding staff, JEA needed the MDMS to collect, consolidate and validate meter reads, outage events, and start/stop orders and pass that data on to the various utility systems to automate workflows.

Automating the utility’s connect/disconnect service was one area that JEA identified for getting additional value from its AMI systems. The ability to remotely start or stop service would significantly reduce manual field work and avoid truck rolls. Although apartments and college student housing comprise only 15% of JEA’s meters, those types of residences with frequent turnover account for 40% of the connect and disconnect activity, according to the utility. Targeting these locations would result in significant savings if truck rolls could be avoided.

But confidently connecting or disconnecting service without manual intervention 24 hours a day year-round entails more than just operating a meter – it requires managing many workflows behind the scenes. Program Manager Brian Novak said JEA needed “a piece of intelligence built into the process that would help us manage the remote connect-disconnect workflow.”

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JEA Program Manager for Advanced Metering Systems
The Solution: An Intelligent MDMS

JEA needed a MDMS that could utilize out-of-the-box integration points that would work with the utility’s legacy systems. After considering different vendor technologies, JEA selected Siemens’ eMeter EnergyIP platform as its MDMS because the platform is agnostic — interoperable among various systems — with flexible architecture to address both electric and water resources. One of the biggest factors for choosing EnergyIP was the standard AMI adapters for seamlessly interfacing with JEA’s billing, CIS, WMS, OMS and metering systems. The standard adapters transform data coming from the various data collection systems to a common format that EnergyIP can process.

Backed by Siemens experience with numerous head-end systems and technologies, the EnergyIP platform has been deployed to read and collect data from more than 70 million smart meters at 50 utilities worldwide.

Siemens has worked with different types of utilities, from investor-owned to municipalities to cooperatives, so the company has a good understanding of the regulatory and business issues facing each utility. That experience and support was important to JEA for making sure the integration went smoothly.

“The biggest lesson learned from the integration that I would carry forward...is that when you integrate, you make sure that all the parties involved are going to be with you throughout the entire process,” said Novak. “As long as you’re all in it together, it’s going be successful.”

The EnergyIP serves as the focal point for all of JEA’s systems. And while getting the data into the system was a primary focus, getting the data out is equally important. Two-way meters precisely monitor electricity usage in real-time and the head-end system communicates that data to EnergyIP. EnergyIP then verifies data accuracy and interfaces with other systems, allowing JEA to remotely manage its metering assets.

“What EnergyIP brings is the validation, editing and estimation (VEE) of the data,” explained Siemens’ Jim Fisher, account executive for JEA. “One of the key deliverables that we have is that the data they receive is good data.”

“The biggest help from the MDMS is taking that interval data from the head-end system and going through the validation processes that are
critical to ensure we have correct data...and the value is passing that on to multiple systems” including the customer portal, Novak said.

EnergyIP serves as the foundation that allows API interfaces to link with JEA’s workforce management system (WMS) so that based on any type of event, alarm or notification, the utility can select that data to be sent to its WMS and a work order can be executed.

In the case of the remote connect-disconnect process, EnergyIP acts as the intelligent interface between JEA’s upstream systems, such as its CIS, and the Landis+Gyr head end system. An in-house system handles the prioritization, queuing and time-of-day management for its remote connect-disconnect process, but the EnergyIP integrates all the workflows, starting with the billing system to the WMS, all the way up to the meter, handling exceptions and notifying the utility if anything doesn’t work correctly so those issues can get rectified quickly. This helps avoid overwhelming system and people assets so “we don’t get 500 phone calls at one time,” said Novak.

The Benefits: Empowering Customers and Increased ROI

EnergyIP has been “the difference of us being able to use remote connect-disconnect or not use it,” Novak said. He also noted it made the difference between “getting value out of the system or just getting one meter read a month and not realizing the benefits of this incredibly large investment.”

And those benefits are huge. Remote connect-disconnect alone has allowed JEA to avoid 130,000 truck rolls, which equated to $1.6 million in savings in just the last year and half. Fewer truck rolls also reduces fuel consumption and greenhouse gas emissions.

The remote connect-disconnect service also has allowed JEA to offer new services such as prepaid accounts. “We would not be able to do prepaid without an automated remote connect/disconnect process,” said Novak. Such services put customers in complete control of their account. The system automatically responds to the customer’s actions, including adding money to a prepaid account, paying a bill, requesting new service (or reconnection) or disconnecting service at a customer-selected date and time.

“One of the greatest benefits that we’ve seen is really from a customer standpoint,” said Novak. Customers can get utilities turned on at any time — including holidays or weekends.

“If a customer pays on Christmas Day at 10 o’clock in the morning, they are going to get turned on automatically without any human intervention,” Novak added. Whereas in the past a customer may have to wait four hours, or longer over the weekend, to be reconnected, now once

![EnergyIP report, displaying unbilled electricity usage](image)
their account is paid, they get power turned back on within two minutes. EnergyIP has also improved the timeliness and reliability of interval data that’s passed on to the customer portal. Customers are able to view their daily, weekly and historical consumption and adjust their habits accordingly to reduce usage and save money.

Leveraging EnergyIP’s validation, editing and estimation (VEE) capabilities, interval data can be analyzed more frequently, decreasing the time that JEA spends assessing loads across the system. Data is passed from EnergyIP to the transformer load management and distribution planning systems to allow JEA to appropriately build infrastructure assets going forward and identify assets that may need replacement. EnergyIP “is the centerpiece of everything we have,” Novak said.

Next Steps: Tapping the Full Potential of a Smart System

To date, JEA has deployed 65,000 two-way meters and continues to install new meters as older meters need replacement. The utility is targeting meter investments where they will see the most return, including bellwether meters for voltage management or outage notification, and targets places where there is a lot of customer turnover such as apartment complexes. EnergyIP’s architecture is scalable to handle the complexity of data as increasing numbers of smart meters are deployed. The MDMS also supports data analytics to improve efficiencies across all of the utility’s critical systems.

Recently, the utility launched a pilot program using two-way meters and EnergyIP to improve outage management and restoration. Two-way meters are much more than just a measurement device — they are sensors that emit a signal to inform the utility in real-time when power is lost and when it has been restored. The MDMS receives this data and filters the outage information, passing it to the outage management system (OMS) to automatically generate trouble tickets. This prevents the OMS from being overloaded with smart meter data and makes it easier to validate outages and optimize the dispatch of restoration crews.

The pilot program is allowing JEA to assess how well its system is performing, troubleshoot meter sensitivity, and determine how quickly outage and restoration notifications are received. This information could enable JEA to communicate proactively with customers during
outages and may possibly be put into a new service offering in the future.

JEA is looking forward to leveraging more from the type and amount of data that EnergyIP can capture — and having its customers realize additional benefits from the investment. Siemens' Jim Fisher says that JEA has a “great foundation built with EnergyIP. When JEA is ready to take the next step with analytics, they can take the data and turn it into powerful information.”

That foundation supports event analysis to detect meter tampering and reduce theft, identifying unusual load events and combining meter data with other information to offer new programs and increase operational efficiencies. “We’ve only tapped into a small portion of what we’re capable of,” Novak said. “We’re going to take all these systems to the next level.”

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