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Feature Articles

Scheduling a smart meter rollout

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Utilities and many commercial and residential customers are looking forward to a time when smart meters, which provide intelligent, real-time electricity, gas and water usage information, are pervasive. Smart meters promise overall cost reduction, better information for utilities and customers about usage, and ideally a "green" approach to generating, delivering and consuming energy and water.

That said, global smart meter deployment and usage is still in its infancy. Challenges lie ahead for markets such as the U.S. and the U.K., which are on the cusp of launching smart meter initiatives for electric utilities. Aside from funding the projects and working out the technical logistics, the process of simply replacing hundreds of thousands of existing meters with smart meters presents a significant workforce management undertaking. Scheduling workforces to carry out the activities involved in the deployment of a smart meter program in a short timeframe could prove to be an expensive proposition for utilities that don't have an optimized workforce management system in place.

The following is an overview of the global smart meter landscape, including some of the challenges early adopters face, and some guidelines on what electric utilities can do to prepare for widespread deployment and ensure a smooth transition and successful adoption, which is the key measurement for success.

Smart benefits

Smart meters are digital devices that provide real-time, accurate electricity usage information to both utilities and their customers over different time periods, whether for 15 minutes or several hours. They can also become the platform for an advanced metering infrastructure (AMI) that yields a broad range of benefits, including:

- * Demand management -- By sharing real-time usage information with customers and pricing usage higher during peak times, utilities can steer customers toward better conservation;
- * Accurate billing -- Smart meters eliminate standard estimated billing usage headaches because they send accurate information wirelessly so utilities can issue precise bills, and customers know exactly what they're paying for because they've seen the actual usage.
- * Micro-generation power -- Smart meters enable community-shared power generation because they measure both the power being used by customers as well as the surplus power that customers want to put back into the grid. In other words, customers not only see what they owe, but what they've earned with surplus energy.
- * Better managed grids -- Utilities must constantly reconcile the quantity of electricity going into transmission and distribution systems with the amount being consumed. Smart meters give them an immediate view of this balance, so they have more accurate information about transmission and distribution losses, theft and fraud.

The global landscape

Smart metering dramatically changes the relationship between electric utilities and their customers because information is exchanged, rather than fed one-way to customers. It completely changes utilities' business models by providing them more accurate information about delivery and consumption and gives them better measures to encourage customers to conserve usage.

Smart metering's slow adoption is a result of that radical change. Utilities can take some reassurance from successful projects such as Enel SpA's roll out of smart meters to all of its nearly 30 million customers in Italy. Since it launched the almost \$3 billion project in 2002, Enel expects to save over \$700 million per year on energy conservation and reduced staffing needs.

Smart meter programs are in progress in the U.K., Sweden, Turkey, Australia and Canada. In the U.S., utilities in California, Texas and Illinois are rolling out smart meters widely, and pilot projects are planned or underway in Washington, D.C., New Jersey and Louisiana.

The Federal Energy Regulatory Commission estimates that smart meters are installed in about six percent of homes and businesses in the U.S. Industry analyst firm Datamonitor predicts that by 2012, 89 percent of U.S. households and 41 percent of European households will have smart meters, sparked by emerging legislation calling for energy conservation.

Planning ahead

No matter how large or small a utility's scheduled smart meter deployment, planning for the rollout should begin now. Effecting such a radical change can lead to rows of vans and trucks clogging streets, missed appointments, improperly installed meters, frustrated customers who don't know how to use the smart meters and other headaches.

Even if a utility plans to slowly phase in installation, it will likely need several crews of subcontractors to replace the meters. Regular maintenance, repairs and emergencies such as downed power lines or gas leaks will also continue to require field technicians' attention.

An integrated and optimized forecasting, planning and scheduling system should account for variables such as skills matching, training, problems encountered with conventional meters that are difficult to access, post-installation problems and maps. It should also be able to automatically reroute and reschedule technicians based on emergencies and trigger customer service calls to re-book appointments.

Since timely, efficient meter replacement will affect customer satisfaction, utilities will want to automate scheduling decisions such as which technician with what skills and tools to send to which job, when and where. That scheduling system should have route optimization as part of the decision making process to ensure technicians go from job to job maximizing their time completing replacements and minimizing time on the road. Street-level routing using geographic information system (GIS) data points will ensure each technician has a clear map of where to go throughout the day. Automated traffic updates connected to the scheduling system enables utilities to make fast and effective decisions about how to reroute technicians to avoid traffic jams. Responding in real-time to this sort of information helps utilities reduce travel time and increase customer satisfaction by ensuring on-time arrivals.

To stay on top of progress and ensure timely job completion and productivity, utilities can also use global positioning system (GPS) technology to monitor precisely where technicians or their trucks are throughout the day. Providing technicians with mobile devices for report entry gives managers up-to-date information about jobs as they are completed, and allows workers to file reports as they go, rather than waiting to do them all at night.

Deploying smart meters is a considerable undertaking with the potential for greatly improving customer relationships, cutting costs, increasing revenues and minimizing large power outages. Electric utilities that automatically plan and schedule their field technicians throughout the rollout stand the best chance of adoption success. Why? Because customers are more likely to trust that this new, seemingly complex technology will reliably deliver the promised benefits (reduced costs, better information) if the replacement process goes smoothly. Customer buy-in is the end game for an initiative aimed at minimizing power consumption for a "greener" environment.

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