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FutureReady

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A MESSAGE FROM **Richard Mora**

According to a recent report from the Institute for Electric Efficiency (IEE), nearly one-third of U.S. households now have a smart meter, with projections that over 50 percent will have smart meters by the middle of the decade.

As U.S. utilities begin, continue and complete the implementation of smart grid networks to serve their customers, *FutureReady* documents the lessons we're learning along the way.


According to the "2012 State of the Consumer Report" published by the Smart Grid Consumer Collaborative, consumer awareness and knowledge about the benefits of smart grid remains low. In this issue of *FutureReady*, we explore why this continues to be the case and the importance of consumer education about smart grid benefits. This issue also lends advice and resources from experts for use in your own efforts to overcome customer resistance and boost adoption of smart grid technologies.

Also in this issue, you'll learn about new best practices for educating consumers about smart grid benefits and how a proactive communications plan helped one utility complete a successful smart meter deployment in less than a year.

We've asked experts how utilities can make the smartest choice when selecting a network platform. Their insight demonstrates how utilities are adjusting their financial platforms to integrate distributed generation and other energy efficiency programs into their energy mix.

We hope that, no matter where you are in your smart grid deployment, you will continue to find *FutureReady* to be a valuable resource for the latest news and best practices in this new era of energy management.

Richard Mora
Landis+Gyr President & CEO Americas



Selecting a network platform:

HOW TO MAKE THE SMARTEST CHOICE

A network platform is like the central nervous system of a smart grid, enabling vast amounts of two-way communications to travel between system endpoints and control centers. Naturally, selecting the right system for your utility is crucial. Choose incorrectly and miss realizing the full benefits of smart grid; even worse, costly supplemental solutions to achieve your goals may be required.

The challenge for today's utilities is to find a system that delivers immediate results, evolves as needs change and lasts for at least a decade. It's a difficult job, but — when armed with the right criteria — not impossible.

Qualities to look for:

1 Scalability

In essence, smart grid is a large sensor network that generates massive amounts of data. Transmitting this data efficiently and preventing system overload are some of the main jobs of a network platform. Yet, every time a new application is added, the amount of data traveling through the network increases exponentially. So a solution with plenty of “growing room” is essential for long-term success.

Driving the need for scalability are two types of network traffic — data from advanced meters and messages from distribution devices.

“You have to be able to manage a high volume of

data from a large sensor network,” says Tim Weidenbach, VP Product Management, Landis+Gyr. “And that’s becoming more and more granular as people want load profile with smaller increments.” At the same time, utilities need enough bandwidth to perform command and control activities related to distribution automation. “Grid management devices will grow over time until the network just has a massive amount of data constantly streaming in for analytics.”

To find a solution with maximum scalability, look for headroom in processing capacity, data speed and executable memory. This will stretch your investment by accommodating all network traffic on one platform.

1 Scalability

2 Flexibility

3 Future-
Proof
Design

4 Expert
Solutions

2 Flexibility

Because no two utilities are exactly alike, a customizable solution is always more desirable. That makes flexibility a key consideration.

Flexible network platforms typically offer several options for communications media, such as RF mesh, cellular and power line carrier. This enables a more customized mix of communications for utilities serving customers in urban, suburban and rural areas.

But flexibility goes beyond communications. Traffic prioritization and message routing are also important. Opt for a solution with the built-in logic to relay messages effectively, without labor-intensive monitoring.

3 Future-Proof Design

To avoid obsolescence and be prepared for emerging applications, utilities need network platforms that can evolve in an ever-changing industry. The keys to finding a future-proof solution are migration flexibility and interoperability. Flexibility ensures components across previous and future hardware and software releases provide an interchangeable migration path for upgrades. Interoperability means the solution is built to accepted global standards and will support integration of existing systems as well as complementary applications from third-party vendors.

Not only do standards represent a consensus on industry best practices, but also they are often designed to integrate with other industries' regulations as well. By adhering to standards, network platform vendors ensure solution longevity and compatibility with a host of other tools.

“The promise of standards-based, multi-purpose utility networks is finally arriving,” says Bob Gohn, Chief Research Director, Pike Research. “While there is still room for innovative proprietary network elements, the momentum is clearly with standard, IP-based wired and wireless technologies, whether provided by public carriers or on privately built networks.”¹

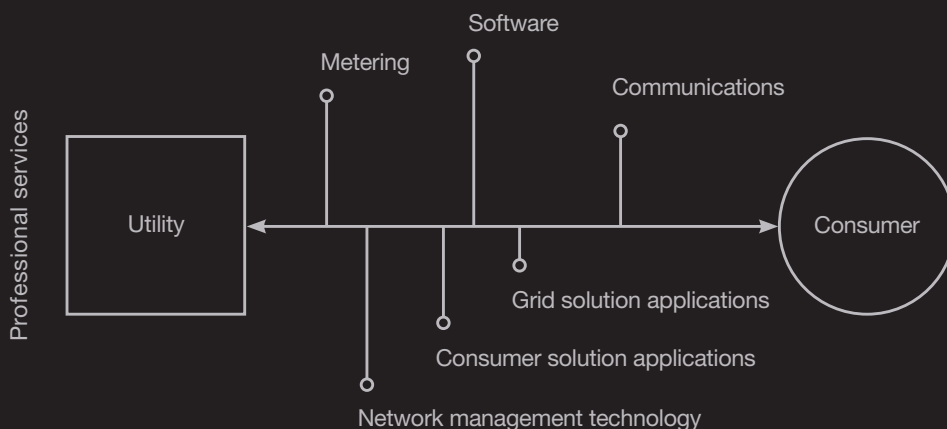
4 Expert Solutions

Implementation is often the most challenging part of a smart grid project — and network platforms are no exception. So it is critical to examine the track record of your solution vendor. By seeking providers with a history of success in large-scale implementations, you can avoid pitfalls that trip up more inexperienced teams. Seasoned providers' on-staff experts know their way around implementation challenges and provide support to you throughout the process. Plus, they are accustomed to meeting deadlines and delivering on service level agreements.

A Simple Solution to a Complex Challenge

One way to simplify the process of vetting smart grid network platforms is to choose a proven, widely deployed solution. “At **Landis+Gyr**, we build **Gridstream**® to deliver the four key utility requirements — scalability, flexibility, future-readiness and expert support,” says Tim Weidenbach, Vice President of Product Management at Landis+Gyr. “It integrates easily with other utility systems, as well as meter data management systems, home area networking and more. In addition, our Gridstream solutions can be built to address an immediate need or use case, while supporting comprehensive smart grid functionality well into the future.”

No matter what network platform you choose, look for a solution with the qualities discussed here for maximized investment and optimized smart grid performance — the answer to advanced metering, distribution automation and beyond. ■



Gridstream

Smart Grid

The rich new data collected by smart grids is used to provide utilities and their consumers with more reliability, efficiency and control. This is raising concerns about **security and privacy**.

Privacy Policies:

What's Happening Now



Smart meters provide residential energy usage information at a level of detail previously unavailable, revealing more about consumer lifestyles and time of use than ever before. While the billing data

Smart meters promises consumers with greater energy efficiency. That same data is also a double-edged sword when it comes to data privacy.

collected from the meter has changed very little over the years, the fact that it is available over a communication network raises concerns about the increased potential for unauthorized access.

In addition, because the sheer volume of data collected and stored by utilities is greater than ever, many consumer groups are calling on utilities to revisit privacy policies and to reconsider how data is stored and used, to prevent unauthorized access or third-party commercial use.

New Consumer Privacy Risks

Recognizing how this new, more granular energy usage data is changing the game, the [U.S. National Institute of Standards and Technology \(NIST\)](#) issued a document in 2010 intended to provide “[Guidelines for Smart Grid Cyber Security](#),” or NISTIR 7628, in which it summarized the challenge facing the industry: “The sharing and storage capabilities that the smart grid network brings to bear created the new need to protect the items specifically named within existing laws, in addition to protecting new types of personal information that is created with the smart grid.”

As reported in the NIST document, a [privacy impact assessment \(PIA\)](#) was conducted in 2009 by the [Smart Grid Interoperability Panel](#) — a NIST subgroup that comprises energy and

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utilities industry experts, state public utilities commission representatives, information security and privacy experts and others. The PIA found that “personal information traditionally collected by utility companies can be used to identify individuals through data such as house number and/or street address...name, date of birth, and last four digits of the SSN. Smart Grid data elements that reflect the timing and amount of energy used, when correlated with traditional personal information data elements, can provide insights into the lifestyle of residential consumers...”²

Clearly, new smart grid technologies are posing new privacy concerns for consumers and their utilities. These concerns range from the potential for using energy usage data to reveal personal behavior patterns and lifestyle information to identity theft and fraud.

Personally Identifiable Information

It is generally agreed that “personally identifiable information (PII)” is any information associated with a name or personal identity. “Anonymous” (non-personal, or non-PII) information is data about usage and service operation, reported in aggregate that is not associated with a specific personal identity. “Aggregate” information is data

collected and summarized for a broad category of customers.

“When we talk about PII, we’re usually talking about revealing fairly personal information about someone — like when they’re home, when they’re not — and things about their individual behavior,” says Stephen Chasko, Principal Security Engineer at Landis+Gyr. “With the smart grid, now you have all of that data in a single repository.”

Privacy Guidelines, Rules and Regulations

Organizations at all levels of government, privacy groups and energy industry groups are actively working to address the privacy issue.

At the state level, privacy rules are in development in [Colorado](#), [Illinois](#), [California](#), [Ohio](#) and New York. Public Utilities Commission decisions in California and Colorado, while endorsing a utility’s right to collect and use customer usage data in providing regulated utility services, require customer consent when it comes to third-party use of their data.

[Naperville Smart Grid Initiative](#) includes a [Smart Grid Customer Bill of Rights](#) that outlines basic rights for utility smart meter customers. Last March, the

“With the smart grid, now you have all of that data in a single repository.”

*Stephen Chasko,
Principal Security Engineer at Landis+Gyr*



Oklahoma State House passed the Electric Utility Data Protection Act, which establishes standards for access to and use of electric utility usage data. In the meantime, Ohio and Michigan are gathering feedback and investigating the privacy implications of smart meter deployments in those states.

Industry groups are actively working to determine best practices for mitigating privacy risks. The North American Energy Standards Board (NAESB) Data Privacy Task Force, for example, is working to develop best practices for maintaining smart grid privacy.

Private organizations, such as the Electronic Privacy Information Center (EPIC), a nonprofit public interest research center, publishes reports and other informational resources about smart grid privacy issues.

Activity at the Federal Level

Currently, there are no clearly defined federal laws or regulations that define the protections of energy usage data. The NISTIR Smart Grid Privacy Guidelines offers recommendations for 189 security requirements and ways to assess privacy risks, while deferring policymaking responsibilities to individual states and utilities.

The U.S. Department of Energy (DOE) has also addressed smart grid privacy issues with the development of guidelines for future legislation and regulations. In its 2010 “Data Access and Privacy Issues Related To Smart Grid Technologies” report, the DOE surveyed industry, state and federal practices and discussed issues including the type of data that utilities should be allowed to collect and disclose to third parties.

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Mitigating Privacy Concerns

Privacy challenges are not new to utilities. But today, the stakes are higher as they prepare or continue smart grid deployments. “The tools are in place to mitigate risks to privacy,” says Chasko.

“What’s needed now is clear language about what we mean by ‘privacy.’ First, define the data to protect. Then, take care in communicating to customers and reflect your belief that consumers own their own data. Then, identify potential risks.”

NIST recommends conducting a PIA before making the decision to implement a smart grid deployment and developing and formally documenting privacy policies and practices. It’s also important to educate consumers about steps the utility has taken to mitigate security risks and ensure that privacy is protected.³

“When planning smart grid deployments, utilities should make sure to limit access to data only for legitimate utility business,” says Chasko. “That means that, inside and outside the utility, only those individuals using it for defined business uses would have access and only for those processes.”

“That can be accomplished through effective data encryption — to ensure that all data transferred over the network is unavailable to any third parties.”

“Protecting privacy is about encrypting data ‘in flight’ and ‘at rest,’” Chasko continues. “Landis+Gyr encryption is from end to end, preserved as it progresses through our network. From the moment you send out a command, the data stays encrypted to the endpoint all the way back again — everything has a unique key. Skeptics doubt that unique keys are possible, but Landis+Gyr is doing this now, proving it is totally possible. ■





Distributed Generation:

DOES IT REQUIRE DECOUPLING?

While renewable energy programs are generally considered socially responsible and desirable, they create unique challenges for utilities. Take distributed generation (DG), for example. At first glance, it seems like a boon to have consumers generating energy via renewable sources on their premises; not only could this improve grid capacity during times of high demand, it could also curb utility spending on new generation.

Look closer at DG, however, and many concerns emerge — from the risk of grid destabilization to fluctuations in power quality. Yet, the biggest hurdle of all is a financial one. Utilities are wary of DG because it can adversely affect revenue and add costs — especially when utility commissions insist that generators be compensated at rates above local market prices.

The Case for Decoupling

With rate structures as they currently exist in U.S. energy markets, utilities tend to resist energy efficiency initiatives like DG because they cut into profits by decreasing sales and revenues. Some states have implemented revenue decoupling, a strategy that severs the link between the recovery of a utility's authorized

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fixed costs and its sales — thus, reversing the traditional financial incentive to sell more energy.

According to the [Institute for Electric Efficiency \(IEE\)](#), 14 states now have some form of “revenue decoupling,” a rate structure that severs the link between energy sales and the recovery of fixed costs.⁴ By eliminating a utility’s incentive to sell more electricity, decoupling has the potential to make DG and other energy-efficiency programs more financially attractive.

Landis+Gyr is cautiously optimistic. Along with parent company, [Toshiba](#), Landis+Gyr is working with utilities that are embracing DG programs and supporting them with solutions like bi-directional metering, microgrid energy management systems and electricity storage. These initiatives involve profound technical challenges, according to Gary High, VP Sales, Landis+Gyr. “The unregulated flow of power back onto the grid is very complicated and not something the grid was initially designed to handle,” he says. “So we should proceed with caution.”

But Landis+Gyr believes that — if the complex engineering challenges of DG can be overcome — then the financial barriers should be surmountable as well. ■

Related Content

Bi-directional metering solutions from Landis+Gyr

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But can it pave the way to widespread DG



Guam Power Authority Taps **Landis+Gyr:** For Smart Grid Rollout

Landis+Gyr's Gridstream® RF advanced metering solution has been selected by the **Guam Power Authority (GPA)** — the official electricity provider for the U.S. Territory of Guam — for its shift to smart grid technology.

GPA plans to deploy more than 52,000 **E-350 FOCUS AX-SD** meters with available integrated service switch and **ZigBee®** capabilities over the next two years. The Gridstream RF network will make communication with other grid devices and home area networks possible moving forward, as the utility plans to deploy more advanced functions from Landis+Gyr. Additionally, GPA is exploring other consumer services

that could be implemented and brought to customers in the future, such as pre-pay.

“We have been working directly with GPA over the past two years to help identify the ways Gridstream can meet their long-term needs,” said Abe Ortega, Vice President of International Sales and Marketing at Landis+Gyr. “GPA will have many options for using smart grid solutions to impact customer service, improve efficiency and manage operating costs.”

GPA is a generation and distribution utility serving more than 49,000 customers. ■

What utilities should know about their customers:

2012 STATE OF THE CONSUMER REPORT

Recent research conducted by the Smart Grid Consumer Collaborative (SGCC) — a nonprofit organization dedicated to advancing the adoption of smart grid through consumer research, the collaborative development of best practices, and education and outreach — yielded key findings about consumer awareness of smart grid and best practices for driving enrollment and acceptance. These findings are summarized in the recent publication of SGCC's "2012 State of the Consumer Report."

The report includes data and information about consumer education, smart grid benefits that resonate most with consumers, effective communications and why utilities should be moving to a customer-focused service model.

Deliver the Right Message

As demonstrated in the SGCC Report, when smart grid and smart meter awareness increases, favorability toward the technology and support for its implementation increases. Yet, the report found that only about 25% of consumers currently have at least a basic understanding of smart grid.

According to Patty Durand, Executive Director of SGCC, when it comes to planning for consumer education, it's better to start earlier rather than later. "Ideally, consumer education should start before AMI deployment," Durand says, "and the utility should use staged messaging strategies to educate customers throughout the deployment process."



Consumer awareness and understanding about the benefits of smart grid continues to be surprisingly low. How can utilities effectively communicate these benefits? The “2012 State of the Consumer Report,” recently published by the Smart Grid Consumer Collaborative, offers a wealth of information and actionable advice.

One pitfall to avoid: Promising too much too soon. “When utilities promise things to come that aren’t there yet, that creates consumer anger,” says Durand. Even if the deployment is already in progress, it’s not too late to communicate with customers about smart grid benefits. “A lot of the benefits promised by smart grid — the ability to charge electric vehicles, manage bills online and purchase green energy — all of those things are still to come. Start with the immediate benefits,” she advises.

And when it comes to messaging, it’s better to be simple and clear — and to convey those benefits that resonate most with consumers. When SGCC researchers asked consumers what benefits they would like to see from smart grid or smart meters, consumers indicated that “saving energy” and “saving money” were the improvements they most desired.

Today’s utility has many communication channels to choose from when reaching out to consumers with smart grid communications and it’s important to leverage every touchpoint — bill inserts, energy reports, social media and more. It is important, where possible, that trusted community-based organizations and consumer advocates should be encouraged to promote smart grid awareness and activities.

Know Your Audience

Another pitfall utilities should try to avoid, according to Durand, is treating consumers as a monolith by sending everyone the same message. “Research shows that people respond to different aspects of smart grid in different ways,” she says.

The one-size-fits-all approach to marketing and communication strategies simply doesn’t work anymore. In fact, according to the

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SGCC Report, market segmentation is the key to message optimization and efficient engagement. Yet, according to “[Excellence in Consumer Engagement](#),” a study published by SGCC in October 2011 that documents the 20 best U.S. smart grid consumer engagement programs,⁵ very few utilities use segmentation to shape their messaging. Those utilities are segmenting customers based on demographic profiles that include square footage of home, credit history and average monthly bill amount.

A few utilities are beginning to employ attitudinal segmentation to deliver targeted messages about smart grid benefits beyond just “saving money.” Attitudinal segmentation is a strategy that clusters consumers into groups based on differences or similarities in the way they think, perceive, decide or act on energy. According to the report’s findings, U.S. electric consumers fall into five distinct segments based on the factors that influence their willingness to participate in energy management programs. “It’s all about value,” says Durand. “What do people value — technology, the environment, saving money, energy independence? Everyone has different views and opinions.”

Resources for Consumer Education

One element of SGCC’s mission is to help utilities educate consumers about the benefits of smart grid. “A lot of our materials are designed for that purpose,” says Durand.

“With resources like our ‘Excellence in Consumer Engagement’ study, you can read about real-world examples of what other utilities are doing, what’s working, and you can get going on educating your consumer base.”

SGCC also offers educational videos, including a recent video entitled, “[Top 10 Things Consumers Want Most from the Smart Grid](#).” According to Durand, SGCC members will soon be able to access a toolkit that includes a white paper, best practices for ensuring community support and dealing with backlash, as well a number of consumer-facing editorials utilities can edit for placement in their own local media.

Implementation of new smart grid technologies is changing the way utilities do business. “The transformative thing that needs to happen now is that utilities must start educating consumers and communicating using messages that are relevant and meaningful,” says Durand. “Segmentation is an effective way to reach each unique audience.”

⁵ The study is available at <http://smartgridcc.org/wp-content/uploads/2011/10/SGCC-Excellence-in-Consumer-Engagement.pdf>

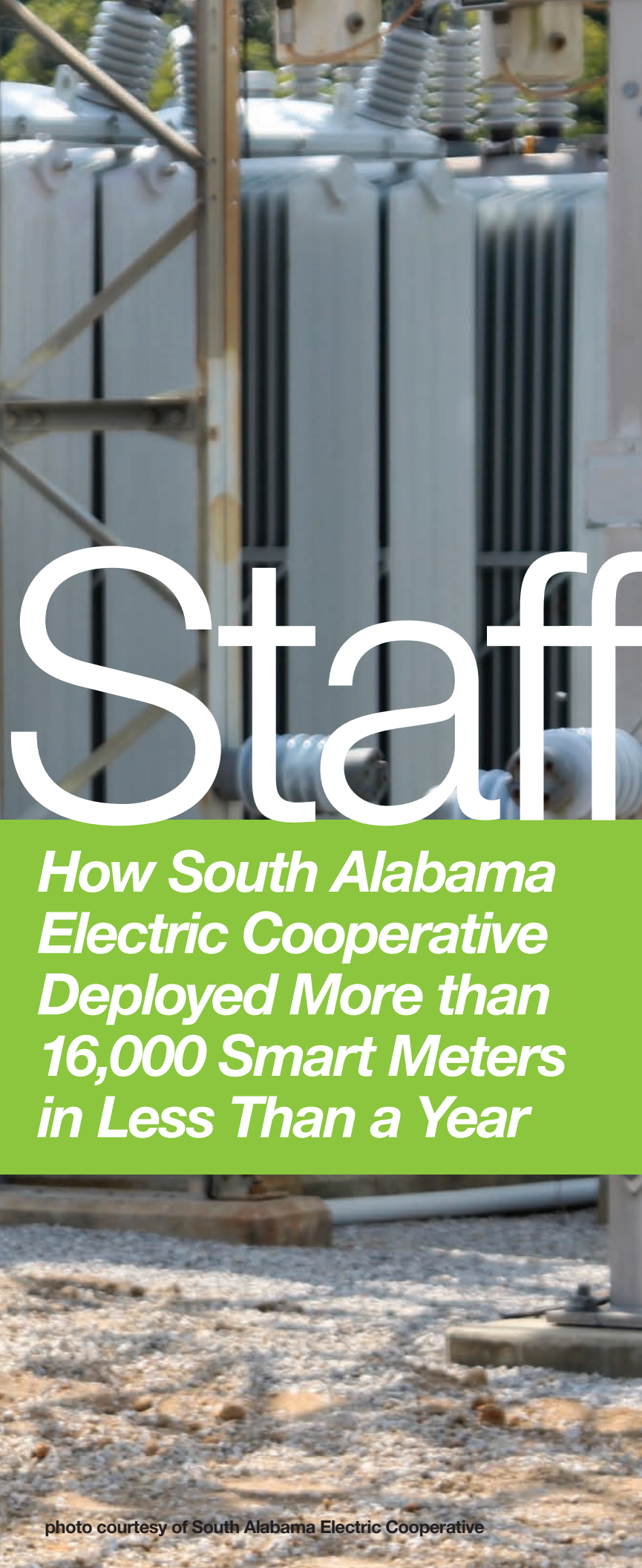


Clearly, utilities need to adapt to a new way of communicating with their customers. “Utilities never had to do segmentation before,” says Durand. “All that will change rapidly. And we’ll continue to do research around it.”



**THE MOST
CRITICAL
SMART GRID
COMPONENT:**

Can-Do



When South Alabama Electric Cooperative (SAEC) — one of 23 rural electric cooperatives delivering power to more than one million Alabama residents⁶ — decided to make the switch to smart meters, they faced a host of issues requiring quick resolution.

Staff

How South Alabama Electric Cooperative Deployed More than 16,000 Smart Meters in Less Than a Year

Internal concerns included staffing. Would they use their own service crew or a contract crew? What about members — would they resist the new meters? “A neighboring co-op that recently implemented AMI encountered many issues,” says Chellie Phillips, SAEC’s director of marketing, member service and communications. “We wanted to make sure our process went as smoothly as possible.”

Thanks to intensive pre-work planning, it did. The cooperative decided to use contract crews to complete the installations. The main challenge was communicating the benefits of smart meters — to internal (employee) and external (member) audiences.

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Communicating **with Internal Audiences**

The first step was to get staff on board quickly. “Without their buy-in, it’s never going to work,” says Phillips. A multidisciplinary committee comprising key front-line employees was charged with considering vendors and providing feedback.

At monthly safety meetings, staff were kept up to date about installs and issues. They also learned how the various departments would be affected — and how they would benefit — from new data to be collected by the smart meters.

“It’s important to sell the benefits to everyone who will be working with the data, so they all have the same comfort level,” Phillips continues.

Communicating **with External Audiences**

To prevent backlash from members throughout the deployment, management staff met early in the process to determine a messaging strategy. They decided to:

- ***Coordinate communications with the meter installation schedule. For example, before an install, the member would receive an information packet about the new smart meter***
- ***Send targeted communications to various customer segments. For example, technology-savvy younger members were encouraged to get involved via social media channels.***
- ***Have a proactive plan to answer concerns. When customers asked questions about how to read their meters, a display was built to illustrate the process.***

Lessons **Learned**

Thanks to internal buy-in and member messaging strategies, SAEC completed a smooth deployment of 16,232 smart meters in less than a year — from late 2010 to the end of 2011. “We had very few questions or complaints,” says Phillips.

What’s Phillips’ advice for other utilities? “The important thing is to plan your communications carefully for every group and every medium,” she says. And repeat your message again and again. We still talk about AMI and why it’s important.”

After all, as study after study shows, consumer education is critical at every stage of a smart grid deployment. Proactive, consistent communications benefit everyone: It’s good for your customers because they understand how to improve their energy and cost savings. And it’s good for the utility, by preventing backlash — and lowering costs. ■

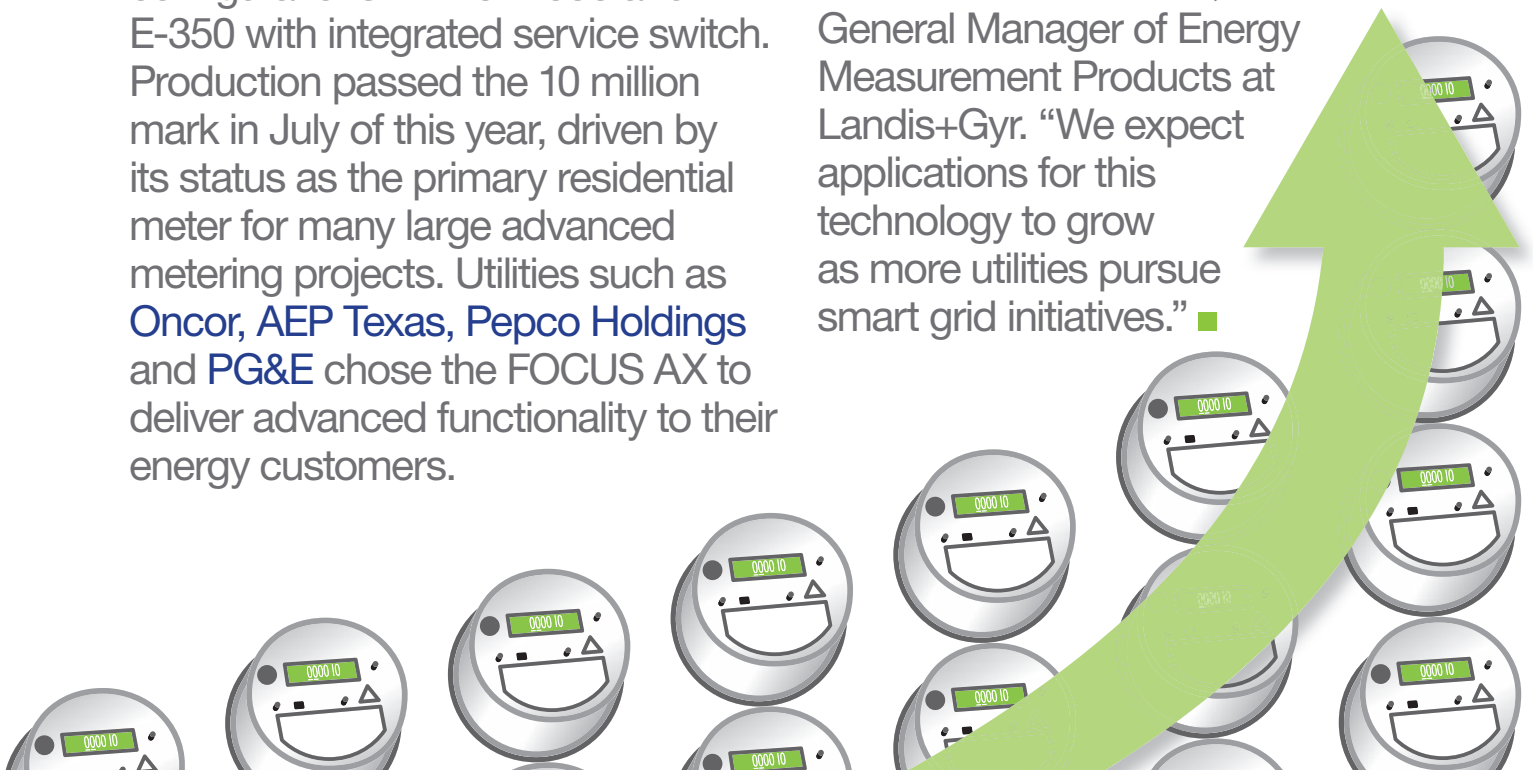
Landis+Gyr Reaches 10-Million Meter Milestone

Landis+Gyr has reached a new milestone in the smart grid industry — building and shipping more than 10 million FOCUS® AX-SD meters. It is currently the best-selling advanced electric meter in North America.

Launched in 2007, the FOCUS AX is a solid-state advanced electric meter available in two residential configurations — the E-330 and E-350 with integrated service switch. Production passed the 10 million mark in July of this year, driven by its status as the primary residential meter for many large advanced metering projects. Utilities such as **Oncor**, **AEP Texas**, **Pepco Holdings** and **PG&E** chose the FOCUS AX to deliver advanced functionality to their energy customers.

Electric utilities are eager to harness the power of the meter's **sophisticated features**, which include an optional service switch operated by a 200-amp relay that enables remote service connections using advanced metering networks. Plus, the meter's single circuit board design provides room for seamless integration of advanced metering communications — including **Landis+Gyr's Gridstream®** technology.

“For utilities working to improve their electric distribution systems, the AX was the first meter of its kind to provide this level of flexibility, information and control in a residential metering platform,” said Steven Schamber, VP and General Manager of Energy Measurement Products at Landis+Gyr. “We expect applications for this technology to grow as more utilities pursue smart grid initiatives.” ■



Future. Ready.SM

- System reliability
- Distributed generation
- Data analytics
- Grid automation
- Interoperability
- Consumer engagement
- Peak load management

Where is smart grid heading?

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