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# FutureReady

*WHERE THE SMART GRID IS HEADING*

## KNOW THE LINE
Distribution Data Helps Utilities Mitigate Line Losses

Quadrennial Energy Review
## An Integrated Approach to Grid Planning

## POWER SURGE
Getting Ready for Renewables

# PREVENTING CYBERATTACKS
CAN UTILITIES HACK IT?

## UTILITIES AND MICROGRIDS:
Getting Closer to Customers

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# Information Continues to Transform Industry

A Message from Prasanna Venkatesan

Many North American utilities have completed or are in the process of completing the first phase of smart grid implementation—advanced metering infrastructure. Advanced meters provide a wealth of data from every circuit on the distribution grid. Consequently, the role of the meter is changing.

The historical purpose of the meter was to collect a billable measurement of power consumption. Now, the meter is becoming a grid sensor that delivers load, voltage and power quality information to the utility at a moment's notice. Using this data to better understand and proactively manage the distribution grid is what the next phase of smart grid is all about.

In this issue of *FutureReady*, we explore some ways expanded knowledge of the distribution grid is helping utilities more effectively manage line loss and improve power quality.

We also take a look at emerging trends, such as utility-managed microgrids, and the technology that is enabling some utilities to see distributed generation as a business opportunity.

Finally, we provide an update on network and data security and how the industry approach to security threats continues to evolve.

As utilities gradually transition to an integrated approach to grid management, the value of metering data is highlighted by all of the ways utilities are finding to put that data to work.

**Prasanna Venkatesan**
*Landis+Gyr, Executive Vice President, Americas*

# PREVENTING CYBERATTACKS

## CAN UTILITIES HACK IT?

# The recent cyberattack on Sony Pictures brought the cybersecurity of critical infrastructure, including the U.S. energy grid, back into the spotlight. A recent CNN Money report[1] demonstrates some potential vulnerabilities, with incidents reported by various sources:

- **79 hacking incidents** at energy companies, according to the Department of Homeland Security *(DHS)*
- **Hackers broke into 37% of energy companies** between April 2013 and 2014 *(ThreatTrack Security)*
- Nearly **50 types of malware** specifically targeted energy companies in 2013 *(FireEye, a cybersecurity firm)*
- BlackEnergy, a **Russian malware, was detected on software** that controls electrical turbines *(DHS)*

The same digital controls that enable utilities to gain unprecedented visibility into and control over their networks have made those networks vulnerable to cyberattacks. All that connectivity makes it possible for cybercriminals to highjack sensitive data, damage equipment and interrupt operations.

And the risks are growing. According to a recent report from the Bipartisan Policy Center's Electric Grid Cybersecurity Initiative, "cyberattacks on key energy infrastructure—and on the electricity system in particular—are increasing, both in frequency and sophistication … the system and its operators must be prepared to contain and minimize the consequences."[2]

The main threats, according to Hugh Head, Senior Product Manager of Security and RF Networks, Landis+Gyr, come from three main sources—nation-states, the anti-smart grid community and individuals with personal agendas. "The types of attacks will differ depending on the motivations," he says. "For example, when a nation-state or people with a domestic agenda attempt to disable infrastructure for a period of time or go after a specific distribution asset like a control center or generation facility, that's going to raise real concerns."

*All that connectivity makes it possible for cybercriminals to highjack sensitive data.*

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[1] "Hackers attacked the U.S. energy grid 79 times this year," CNN Money, Dec 2014, http://money.cnn.com/2014/11/18/technology/security/energy-grid-hack/

[2] "Cybersecurity and the North American Electric Grid: New Policy Approaches to Address an Evolving Threat, Bipartisan Policy Center's Electric Grid Cybersecurity Initiative, Feb. 2014, http://bipartisanpolicy.org/wp-content/uploads/sites/default/files/Cybersecurity%20Electric%20Grid%20BPC.pdf, p. 9

Recent incidents that have raised concerns about the security of the U.S. grid include the attack on the 2013 telecommunications and power substation at the Pacific Gas & Electric Metcalf transmission facility. Former Federal Energy Regulatory Commission (FERC) Chairman John Wellinghoff called the attack, "the most significant incident of domestic terrorism involving the grid that has ever occurred."

How is the U.S. energy industry reacting? According to a recent Ernst & Young survey of U.S. energy executives,[3] cybersecurity is moving to the top of industry concerns, with 76 percent of organizations indicating that they conduct self-assessments or commission an independent external assessment of information security measures.

"The electric power industry is very security-conscious," says Head. "We have many utility partners that are very passionate about preventing systemic attacks via the Internet or physical attacks on their infrastructure. When it comes to preventing cyberattacks, it's important to understand that there are plenty of cost-effective safeguards that utilities can employ."

## Cybersecurity regulations and standards

In 2013, recognizing cybersecurity as a growing national concern, President Obama set a national goal to develop a framework for reducing cybersecurity threats in Executive Order 13636, Improving Critical Infrastructure Cybersecurity. The Order demands development of processes to expedite the sharing of cyber threat information.

The response was quick and effective. Last February, the National Institute of Standards and Technology (NIST), in cooperation with the Department of Homeland Security (DHS), took the lead with the first version of the framework, which includes standards, guidelines and practices for managing cyber risk across sectors. Subsequent updates to this framework and multiple bills in Congress in 2014 attempt to address key energy sector concerns about liability for sharing information on cyberattacks; otherwise, tort concerns could reduce information exchange on cyberattacks, adoption of security solutions and overall grid reliability.


PRESIDENTIAL EXECUTIVE ORDER 13636

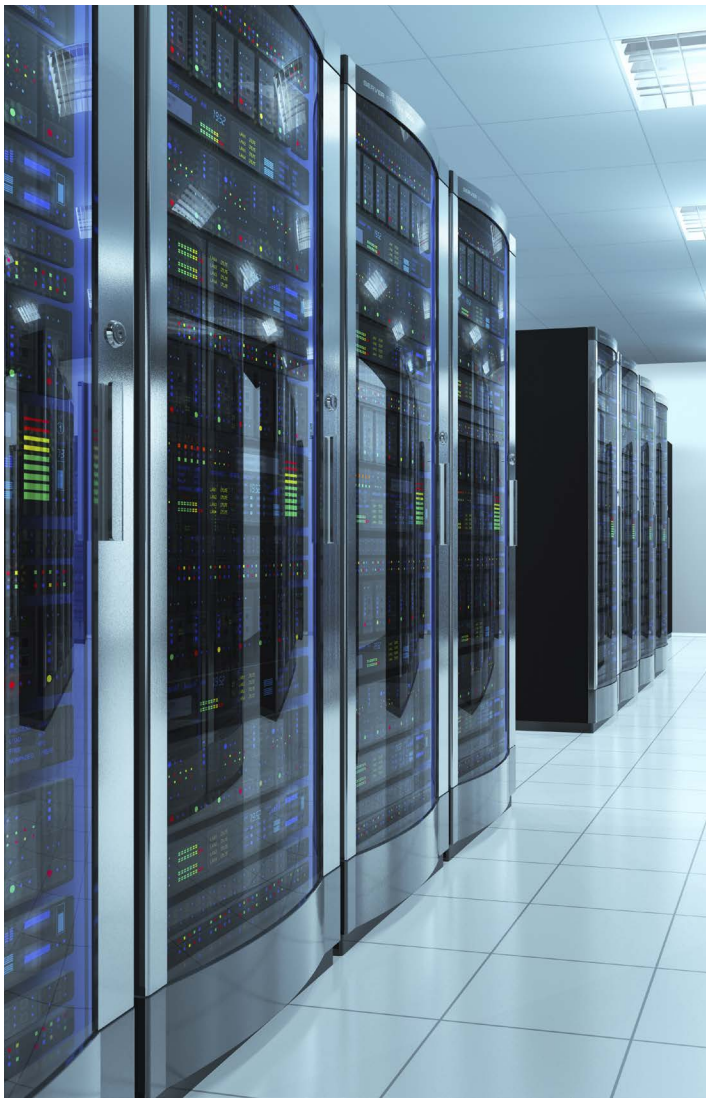
**Improving Critical Infrastructure Cybersecurity**

[3] Under cyber attack: EY's Global Information Security Survey 2013, Oct 2013, http://www.ey.com/Publication/vwLUAssets/EY_-_2013_Global_Information_Security_Survey/$FILE/EY-GISS-Under-cyber-attack.pdf.

[4] CIP V5 Transition Program, http://www.nerc.com/pa/CI/Pages/Transition-Program.aspx.

"Adding protective measures for cyber-security and physical security ... is an expense item that has to be recovered through rate cases."

– Hugh Head, Senior Product Manager, Landis+Gyr



In addition to executive branch activities, the energy sector continues to be proactive in enhancing its security posture. In November 2013, FERC adopted the North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) Version 5 standards for physical and cybersecurity, which include new requirements for system operators to protect more clearly specified electricity distribution and control assets. This means that utilities must identify the potential impact of those assets as high or medium. Understanding the significant time and resources needed to comply with Version 5, NERC provided further implementation guidance to utilities in June 2014 to help them make this transition by 2017.[4]

"Complying with each new version of the NERC CIP standards nearly always involves an expense and a challenge to existing utility operations," says Head. "There's a classic struggle between cybersecurity and the legacy physical hardware required to operate a utility. After all, adding protective measures for cybersecurity and physical security and retrofitting existing facilities is an expense item that has to be recovered through rate cases."

## Cybersecurity intelligence

The electric power industry has its own organization dedicated to sharing cyber threat information. The vision for the Electricity Sector Information Sharing and Analysis Center (ES-ISAC) is to serve as a

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one-stop resource for the latest security information. The security experts at ES-ISAC analyze reports from utilities and distribute their findings to security professionals who can identify trends. "It serves as a contact point upstream and a distribution point downstream to utility security professionals," says Head. "The goal is to proactively provide the best information possible about something that might be coming their way."

Utilities can visit the secure ES-ISAC portal to report any malicious software vulnerabilities on their systems. ES-ISAC then responds with analyses about the cause and source of the attack.

"When an event occurs, the best security posture is to ensure that the information about how the attack occurred and what was done to resolve it is shared through an organized network of utility security professionals," says Head. "That is the major function of ES-ISAC."

Attack mitigation is another role of ES-ISAC. In the event of an emergency, there are centers operated by NERC that serve as operational command posts for addressing a security event.

The energy industry is also testing the vulnerability of the entire system through biannual disaster preparedness checks called GridEx, which NERC facilitates with a number of utility partners and federal agencies across North America. The latest exercise, held in 2013, simulated a combined physical-cyber assault on substations and grid control rooms. Lessons learned included the need to improve information sharing and to clarify reporting roles and incident response. The next GridEx occurs this coming November.

> "The nation's largest utilities are actually quite good at protecting their public facing Internet assets."

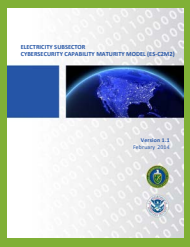
So, how is the industry performing? A May 2014 report published by BitSight Technologies[5] about the security performance of four critical industries found, "the nation's largest utilities are actually quite good at protecting their public facing Internet assets." The report posits the assumption that this positive performance is a result of executive-level focus on cyber risk as well as industry regulation, citing NERC CIP regulations.


[5] BitSight Technologies Industry Report: Will Healthcare Be the Next Retail?, May 2014, http://info.bitsighttech.com/bitsight-insights-industry-security-ratings-vol-4-rc, p. 4.

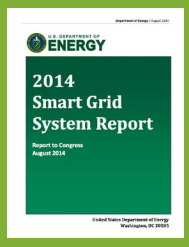
## New technologies

The energy industry is also coming together to develop a robust arsenal of technologies designed to support utility efforts to develop cybersecurity practices. The Department of Energy (DOE)'s *2014 Smart Grid System Report* lists tools and resources being developed through public and private investments. These include the Network Access Policy Tool developed at the University of Illinois to help utilities map control system communication paths for faster vulnerability assessments and compliance. The DOE has also released a new version of its Electricity Subsector Cybersecurity Capability Maturity Model for utilities to use in self-evaluation of their cybersecurity capabilities and planning actions for improvement.

Technology companies like Landis+Gyr are working to stay ahead of the curve and meet the cybersecurity needs of utility customers. "Industry thought leaders that advise utilities—and the utilities themselves—are realizing that open standards-driven solutions offer the strongest security mechanisms for protecting the interests of utilities and their customers," says Head.




*Electricity Subsector Cybersecurity Capability Maturity Model*




*2014 Smart Grid System Report*

## Conclusion

Landis+Gyr continues to listen to our utility partners and continues an active role with industry standards alliances to deliver secure solutions for utility business problems. While the topic of security is serious and can be intimidating, the new standards, intelligence and technology available today—or on the horizon—promise a brighter future for the cybersecurity of our nation's grid. ■

# KNOW THE LINE

No one knows for sure how much electricity is lost on transmission and distribution lines before reaching the consumer. **The U.S. Energy Information Administration estimates 203 million megawatt hours went unsold in 2012.**

Line loss occurs as a result of either technical losses during the process of transmitting and distributing energy through the system, or commercial losses from theft, unmetered loads or inaccurate metering. Low power factor, incorrectly-sized distribution assets, leaking power and phase imbalance also can contribute to the problem. While technical losses can never be eliminated completely, reducing line losses is within reach.

Various utility studies indicate technical losses in a distribution system can range from 6 to 15 percent or more, depending upon the utility. Regardless of the amount, losses have a significant effect on a utility's revenue and point to potential power quality issues. Fortunately, one of the benefits of smart grid technology is the ability to more accurately determine losses and, more importantly, help detect the source.

Utilities such as Baldwin EMC in Summerdale, AL, have long tracked line loss for traditional business purposes. But smart grid technology is enabling more proactive mitigation as part of a larger strategy to improve reliability and power quality.

The utility's service territory ranges from a densely populated section of the Gulf Coast to rolling hills and pine forests further inland.

# Distribution Data Helps Utilities Mitigate Line Losses

Inclement weather, vegetation along distribution lines and aging infrastructure all pose challenges to power quality and contribute to line losses.

"We get a lot of lightning, heavy rain and hurricanes as well," says Ken Pimperl, System Engineer at Baldwin EMC. "Because of this, we've always had a focus on trimming the right-of-way to prevent outages. But keeping the lines clear also has a positive effect on line loss."

Regular system maintenance can address some common causes of line loss. Overloaded or faulty equipment is a big contributor, and Baldwin EMC uses thermal imaging equipment to inspect areas where heat loss is suspected. Climate conditions can impact infrastructure, as well. The utility is regularly checking and replacing older steel core distribution line that has deteriorated over time.

Meter data is also proving an effective tool in locating line issues. In the past, Baldwin EMC evaluated line loss by comparing kWh sales across the system to total purchased power on an annual basis. While this method helps put a dollar figure on system losses, it doesn't allow for feeder-level analyses that pinpoint when and where losses occur.

In 2011, the utility began deploying a Gridstream® RF network for advanced metering and grid management.

Gridstream

Networking all meters not only improved accuracy of line loss studies, it improved identification of causes for them.

"We used to compare yearly sales to purchased energy to determine line loss. Now, we have the ability to look at each substation on a monthly

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## Common areas of line loss that advanced metering can identify and address:

- ***Inaccuracy of wholesale metering***
- ***Energy theft***
- ***Unmetered loads such as street or security lights***
- ***Phase imbalance***
- ***Overloading of distribution equipment***
- ***Low power factor***
- ***Leaking power from faulty connectors or vegetation***

basis, and eventually we will be analyzing each feeder," Pimperl says.

The utility uses integration between its meter data management system, SCADA and other systems to compare actual demand at the meter against the distribution models to locate improperly sized transformers or other distribution components. Outage information is analyzed, with plans to also use blink count information to help find potential trouble spots.

"We are looking at placing more equipment at the feeder level, such as additional meters, to track losses more closely," says Pimperl. "This will help us see if we need to target certain areas for right-of-way trimming or look for overloaded equipment."

Today, Baldwin EMC continues experimenting with the data and is working toward finishing an analysis of substation-level energy savings. While they have seen typical annual line losses at around 5 percent, they will use the new data from the metering system and analysis tools to seek ways to improve this.

For many utilities, line loss savings can form a significant part of the business case for smart grid technology. Immediate access to a wide range of metering values and analytic tools, combined with grid automation controls, provide cost-effective solutions to identify and mitigate losses. ■

# An Integrated Approach to Grid Planning

Many forces drive change in the energy industry today, forces promising to impact issues like security, power reliability, sustainability and economic growth. Today, the U.S. electric grid faces unprecedented threats that must be addressed, including extreme weather events and cyberattacks.

In its most recent Long-Term Reliability Assessment,[6] the North American Electric Reliability Corporation (NERC) reported on three key issues it believes will impact long–term reliability of the U.S. grid:

1. **The downward trend of reserve margins in many regions**
2. **Environmental regulations creating uncertainty**
3. **A changing resource mix requiring new approaches to assessing reliability**

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Until now, the various regulatory agencies working on the future of the grid have focused on different issues. For example, the major concern of the Environmental Protection Agency (EPA) is reducing emissions, while the NERC focuses on reliability and state public utility commissions are concerned about local, rather than system, reliability.

Recognizing the need for a whole-system approach, President Obama launched a Quadrennial Energy Review (QER) process in 2014, which is now being led by the U.S. Department of Energy (DOE). This historic first review focuses on identifying, "the threats, risks and opportunities for U.S. energy and climate security, enabling the federal government to translate policy goals into a set of integrated actions."[7]

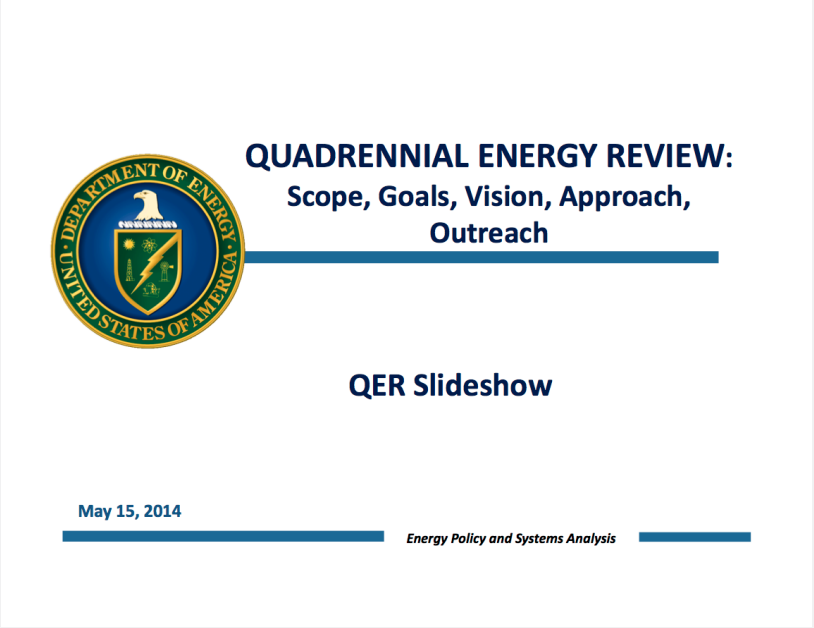
Modeled on a similar initiative—a review of U.S. Department of Defense strategy and priorities launched by the Pentagon—the QER is designed to provide a roadmap that includes policy and research and development recommendations for advancing the grid.

Over the next four years, the QER will conduct regular reviews of federal policy to ensure it is keeping pace with the needs of a changing energy landscape.

In recent months, the DOE has been holding meetings across the country, gathering comments from local energy stakeholders. Many industry organizations have also weighed in on the first phase of the QER. The Edison Electric Institute (EEI), for example, recently issued a statement asking the QER to make it a high priority to promote policies encouraging investment in new technologies.

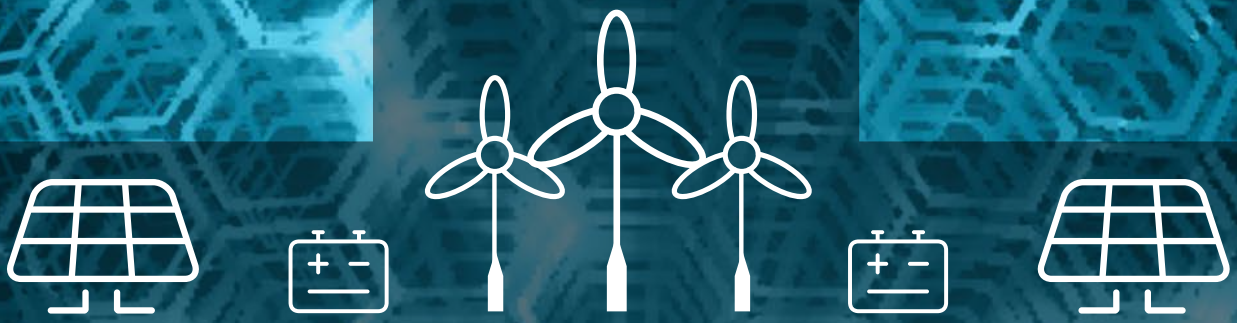
The first section of the QER—focused on energy transmission, storage and distribution—was published in January. "By encouraging policies that enable integration of new technologies onto the grid, the QER will represent a major step forward in enabling the continued delivery of reliable electricity to U.S. consumers," says Tim Weidenbach, Senior Vice President for Customer Delivery, Landis+Gyr. "There are many technologies available today that can be quickly integrated to improve the performance and resilience of the grid." ■

> "QER will represent a major step forward in enabling the continued delivery of reliable electricity to U.S. consumers."
>
> – Tim Weidenbach, Senior Vice President for Customer Delivery, Landis+Gyr




[6] "2014 Long-Term Reliability Assessment (Nov 2014), NERC, http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014LTRA_ERATTA.pdf.

[7] "The Quadrennial Energy Review (QER)," U.S. Department of Energy, http://energy.gov/epsa/quadrennial-energy-review-qer.



# POWER SURGE

## GETTING READY FOR RENEWABLES

In many parts of the country, greater availability of lower-cost renewable energy resources is spurring the development of microgrids, residential solar installations and other projects. Often driven by state policies, many utilities are exploring new strategies for integrating these energy resources onto their grids.

In fact, U.S. utilities are adopting more wind and solar generation each year. In the case of wind energy, for example, the National Renewable Energy Laboratory (NREL) reports that, in some regions, "instantaneous penetrations of wind have reached levels of 25 to 55 percent of generation." Yet, predicting energy production from these resources is difficult.

System operators must become increasingly flexible and find solutions to accommodate the addition of variable renewables. Following are a few measures utilities are adopting to integrate renewables in a cost-effective manner.

- ***Demand response.*** When there is an imbalance in the supply of renewable generation, demand response is a more cost-effective way to balance the system than maintaining additional spinning reserves.
- ***Advanced forecasting.*** Wind and solar power forecasts can help system operators accommodate changes in renewable generation and prepare for extreme events. Some options provide forecasts ranging from several minutes to several days or weeks in advance.
- ***Energy storage.*** Deploying energy storage technology and capturing renewable energy for future use can alleviate some of the inherent challenges of unpredictable resources.
- ***A well-trained workforce.*** As renewables grow in importance, utilities will need to assess whether current organizational structures and staffing levels are sufficient to meet new demands. Recently, the Solar Electric Power Association (SEPA) released the results of a study about how 14 U.S. utilities are adapting their organizational structures and hiring to meet the challenges of renewable integration.

Integration of renewables promises to become the new normal at U.S. utilities. A proactive approach calls for careful planning to ease the transition and expedite realization of all the utility benefits these low-cost energy resources have to offer.

# UTILITIES AND MICROGRIDS:

## GETTING CLOSER TO CUSTOMERS

Think of a microgrid as a microcosm of an electricity distribution system. It's scalable, so it can deliver power—from a mix of generation sources—to targeted geographic areas, remote locations or communities. It can operate independently from the main electricity system and it can connect and disconnect from the system. It can even feed electricity back into the system if and when it's needed.

The U.S. Department of Energy defines a microgrid as a "group of interconnected loads and distributed energy resources (DER) with clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid [and can] connect and disconnect from the grid to enable it to operate in both grid-connected or island mode."

In reality, the definition of a microgrid is often based on the motivation of the operator. According to the Microgrid Institute, a think tank focused on microgrids and DER, microgrids are defined by their function not their size.

"It's true that microgrids are different things to different people," says Martin Rovers, Director of Energy Services and Solutions at PowerStream, a municipally owned energy company that provides power and related services to more than 370,000 customers residing or owning a business in communities located north of Toronto and in central Ontario. "A real estate developer may view a microgrid as a way to get lower electricity costs for his customers, while a residential customer can see it as a way to prevent outages, and an industrial customer sees it as a way to ensure voltage stability. It's really interesting that each microgrid is tailored to meet that specific customer's demands and interests."

"Microgrids are defined by their function not their size."

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universities

businesses

hospitals

municipalities

military bases

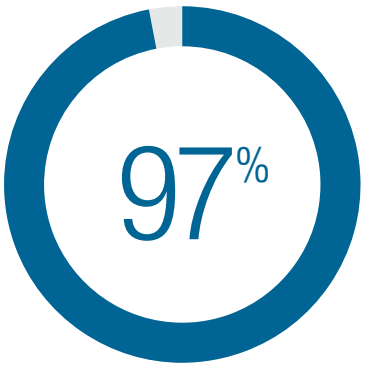
data centers

## Utilities and microgrids

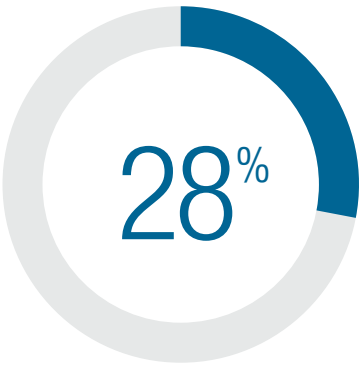
Microgrids have been around for decades, with many of the first versions located on college and business campuses. Since those early days, the microgrid customer base has grown considerably to include hospitals, municipalities, military bases and data centers. This is due largely to growing concerns about grid reliability, cybersecurity and an aging infrastructure.

Until recently, utilities viewed the microgrid concept with some skepticism, even as a threat to their businesses. Now, according to a survey of more than 250 U.S. electric utility executives conducted by Utility Dive,[8] 97% of utilities view microgrids as a viable business opportunity over the next decade.

It's not happening yet. A mere 28% of utilities that have microgrids operating in their service territories actually own microgrid assets.




**97% of utilities view microgrids as a viable business opportunity** over the next decade




**28% of utilities** that have microgrids operating in their service territories actually **own microgrid assets**

Yet, a recent report by Navigant Research[9] reports that a, "small but growing number of utilities view utility distribution microgrids (UDMs) as the next logical extension of their efforts to deploy smart grid technology." And, while UDMs still represent a small percentage of the microgrid market as a whole, the number of these deployments is growing. In the U.S., especially, recent extreme weather events have caused major power outages that may prompt regulatory reforms designed to benefit both utilities and their customers wishing to develop microgrids.

## The PowerStream sandbox

PowerStream, one of the early entrants into the UDM marketplace, began its investigation of microgrid technology as a result of customer demand.

"What was surprising to us was the diversity of customer types that expressed interest in the concept, including big box retailers and condo developers," says Rovers.

In November 2013, the utility launched a microgrid pilot project at its corporate headquarters. "We wanted to get an understanding

of the economics and technical challenges involved in running a system using a variety of generation and storage technologies," says Rovers. "One of the most exciting challenges we faced was understanding the portfolio of products—solar, storage, CHP [combined heat and power], natural gas, geothermal—and determining the right combination of generation storage assets for each customer base."

The project is proceeding in two phases. The first phase, now complete, included the development, design and operations needed for a functioning microgrid. "We put in a SCADA system that could do real-time communications—an integrated platform across the various generation and storage assets," says Rovers. In phase two, plans include additional sources of generation, including CHP, fuel cells and electric vehicle-to-grid technologies.

What has PowerStream learned to date? One of the main lessons is that each of the assets (solar panels, batteries and inverters) requires some degree of autonomy to manage the power. "We're learning about where controls should be housed and getting experience with the control platforms," says Rovers.

PowerStream is looking to its microgrid pilot as a sandbox for testing new technologies. "Every time a new microgrid technology comes out, we can test it and integrate it into our microgrid and get an understanding about how the technology can be rolled out," Rovers adds.

PowerStream is now using its microgrid to draw power from many sources to provide electricity for lighting, air conditioning and refrigeration at its headquarters building.

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[8] "The Utility View of Microgrids 2014," Utility Dive: http://www.utilitydive.com/news/surprise-97-of-utilities-see-microgrids-as-a-business-opportunity/289045.

[9] "Utility Distribution Microgrids: Investor-Owned and Public Power Utility Grid-Tied and Remote Microgrids: Global Market Analysis and Forecasts," 4Q 2014: http://www.navigantresearch.com/research/utility-distribution-microgrids.

## Microgrid types

The way PowerStream sees it, there are two types of microgrids. One is considered, "behind the meter," a self-managed microgrid for which the customer can install their own generation and storage assets. With the PowerStream business model, PowerStream would own the assets and provide them to customers as a service. "The average customer does not want to invest the capital costs for new batteries and storage," says Rovers. "They just want to see a lower electric cost."

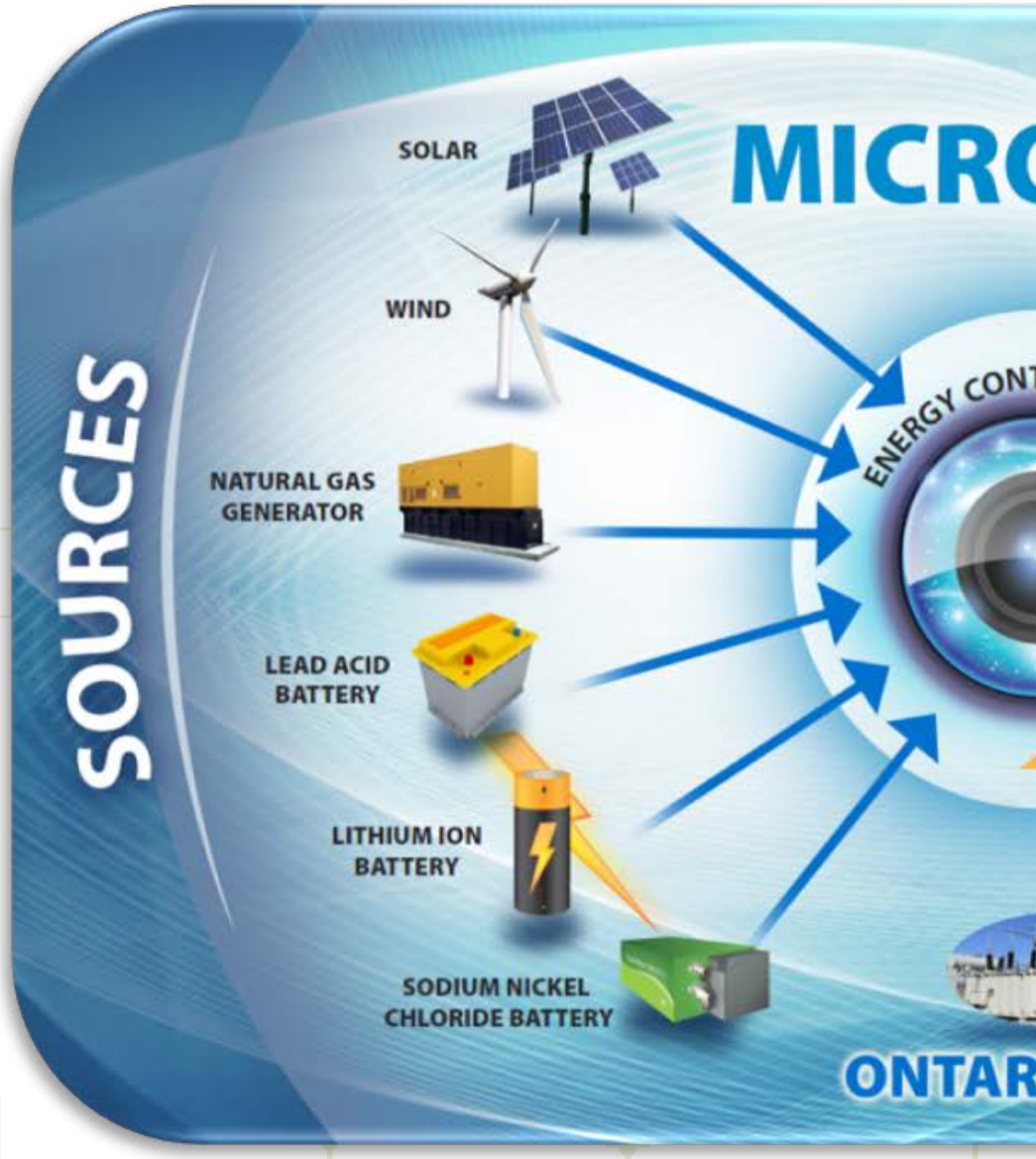
The other type of microgrid, a grid-connected system, is connected to meters and substations and functions as another rate-based grid asset. "It's another way of helping us provide electricity for our customers," Rovers says.

PowerStream sees its move into the microgrid marketplace as an inevitable step in evolving to an energy services provider business model. "Microgrids are a necessary component of our energy portfolio," says Rovers. "We're seeing independent service providers emerge in the sector and we understand that, if we're not actively moving this forward, we could lose our position as our customers' energy partner."

## The future of microgrids

The future of microgrids and how they will affect the utility business model of the future remain unclear. As the presence of DER and microgrids on the grid continue to grow, the

**POWERSTREAM MICROGRI**

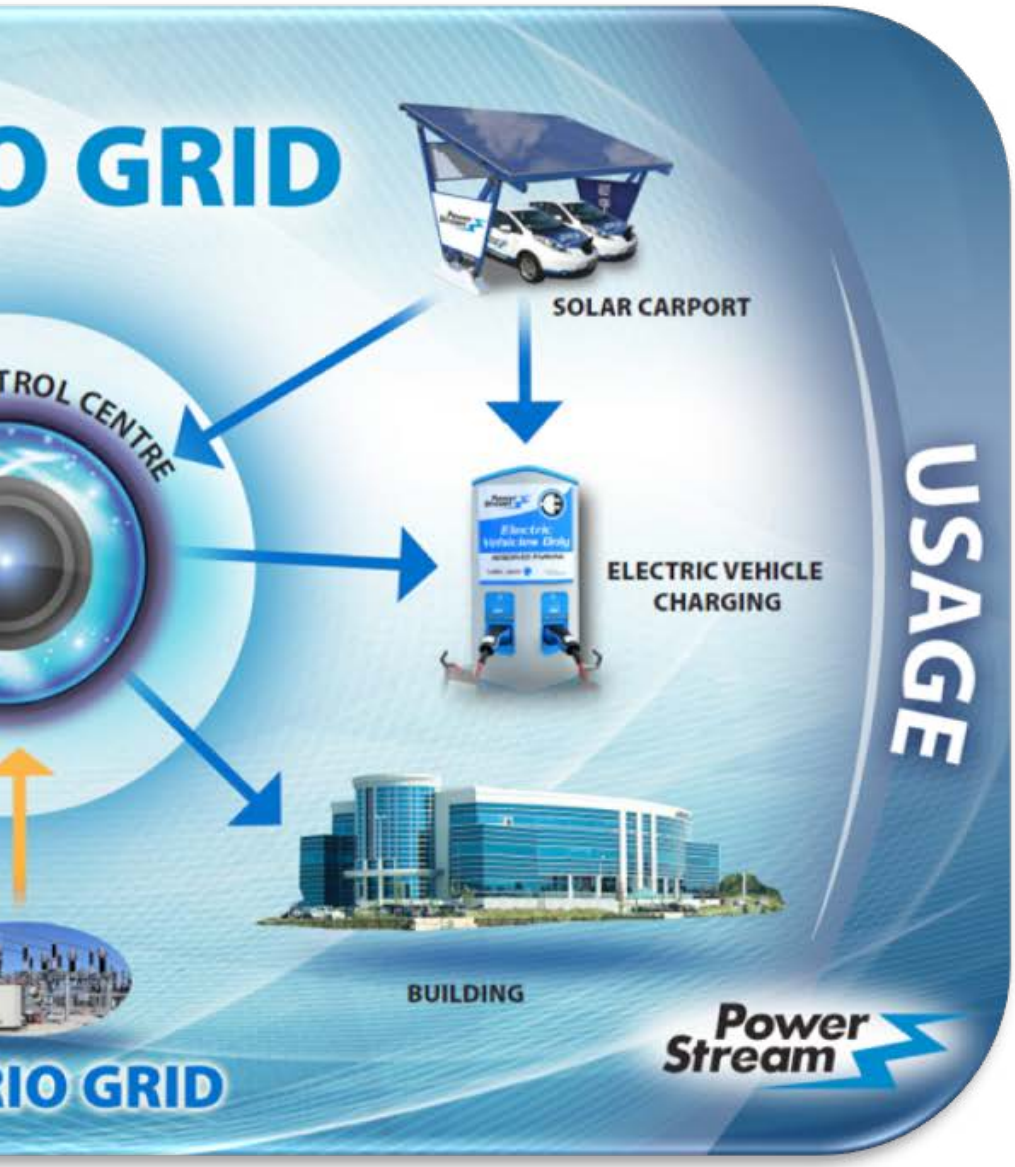


industry is looking at ways to protect utility economics. New York's Reforming the Energy Vision (REV), for example, recommends that utilities manage the grid of the future, in which microgrids, solar, energy efficiency and DER replace power plants as energy providers. According to the Utility Dive survey, many utility executives agree that the utility should act as the manager of distributed energy assets.

According to PowerStream's vision of the future, microgrids will change the way electricity is distributed, provide an innovative solution to the challenge of asset renewal in large-scale electricity delivery systems, and demonstrate how renewable energy can help address the growing demand for electricity.

Yet, before microgrids become a truly viable asset for utilities, there are many questions to be answered and issues to be resolved. Initiatives like the Microgrid Resources Coalition (of which Landis+Gyr is a founding member) are bringing together leading owners, operators, developers, suppliers and investors working to accelerate the growth and development of microgrids. ■

## D DEMONSTRATION PILOT




*This pilot aids understanding of the economics and technical requirements of microgrids, and it helps determine what business model works.*

# Intelligent Fault Circuit Indicator Available for Gridstream Network

Landis+Gyr announced commercial availability of the S610 Line Sensor, an intelligent fault circuit indicator that further extends the distribution monitoring capabilities of the Gridstream® network.

The sensor delivers fault location and accurate load logging from any point on the distribution network, improving visibility of distribution grid performance. Another key feature is that it generates necessary power from the current flowing in the distribution line, making installation simpler and less expensive than traditional devices.

In addition to sensing current, conductor temperature and voltage characteristics, the S610 also features GPS location identification and a precision clock. Since it attaches directly to the distribution line and can be installed with a hot stick, the sensor requires no secondary attachment or power source. A super capacitor in the sensor allows operation during periods of very low current flow in the line and can quickly recharge when current increases.

# Advanced Grid Analytics Now Offered in the Cloud

Advanced Grid Analytics is now available as one of Landis+Gyr's software as a service (SaaS) offerings, enabling utilities to access a variety of useful analytical tools from a secure, hosted environment.

The advanced analytics package provides visualization, planning and grid management capabilities using near real-time metering and grid sensor data. Utilities can now choose a number of deployment and support options, including self-directed, hosted or consultative support. Analytics applications are being used by utilities for revenue protection, asset management, optimization of renewable integration and improving reliability and power quality.

# Frost & Sullivan Recognizes Landis+Gyr for Global Smart Grid Technologies

Frost & Sullivan recently honored Landis+Gyr with the, 2014 Global Frost & Sullivan Company of the Year, award.


Each year, Frost & Sullivan presents this award to the company that has demonstrated excellence in devising a strong growth strategy and robustly implementing it.

Landis+Gyr was recognized for demonstrating strength in terms of innovation in products and technologies, leadership in customer value and speed in response to market needs. In short, the award looks at the emerging market players in the industry and recognizes their best practices that are positioned for future growth excellence.

# DONG Energy Selects Landis+Gyr for Metering Data Management

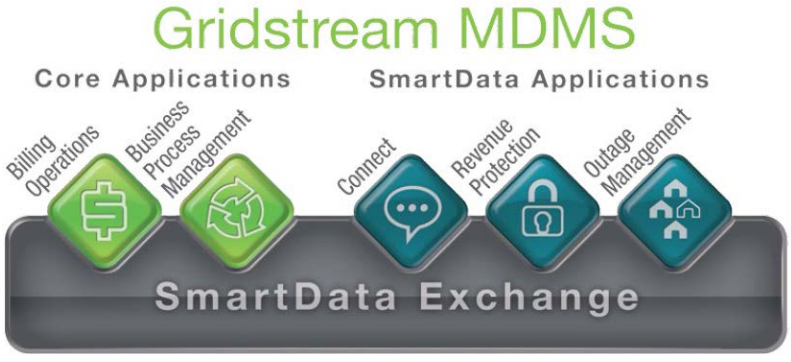
DONG Energy, one of the leading energy groups in Northern Europe, selected the Gridstream® Meter Data Management System (MDMS) to support its advanced metering initiatives.

The Gridstream MDMS brings many benefits to Dong Energy. The system provides automatic consumption, trending and validation of revenue-based meter readings and of power quality data, which means that potential issues such as poor voltage quality in the network can be identified and remedied—quickly.

Further benefits include the automation of business processes.

"The Landis+Gyr solution has been chosen with our exact market needs and expectations in mind," says Anders Vikkelsø, Vice President at DONG Energy. "We have now taken the first important step to ensure that, by the end of 2020, all of DONG Energy's one million customers have remotely read electricity meters."

DONG energy

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