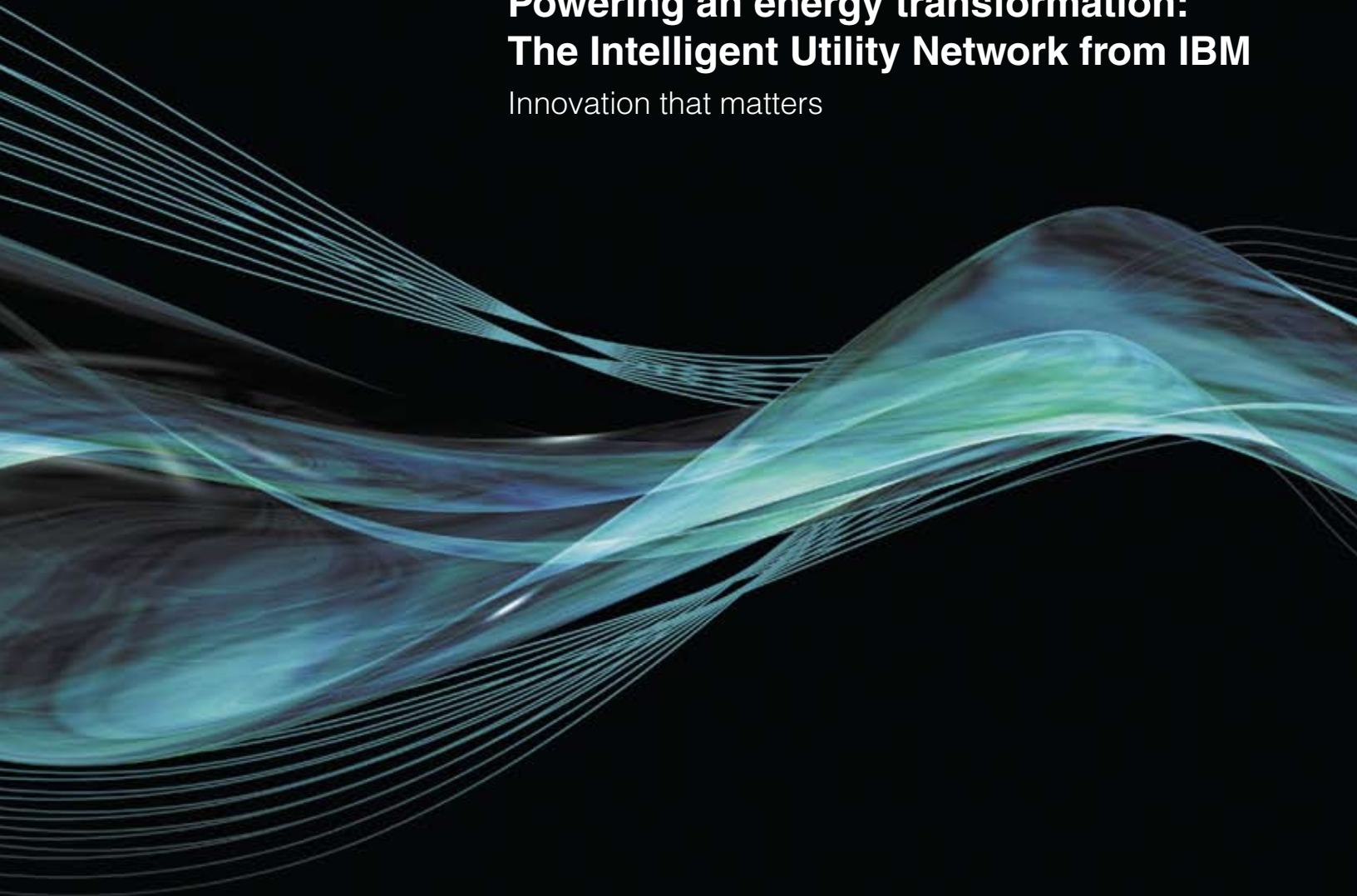


Powering an energy transformation: The Intelligent Utility Network from IBM

Innovation that matters



Today's challenges

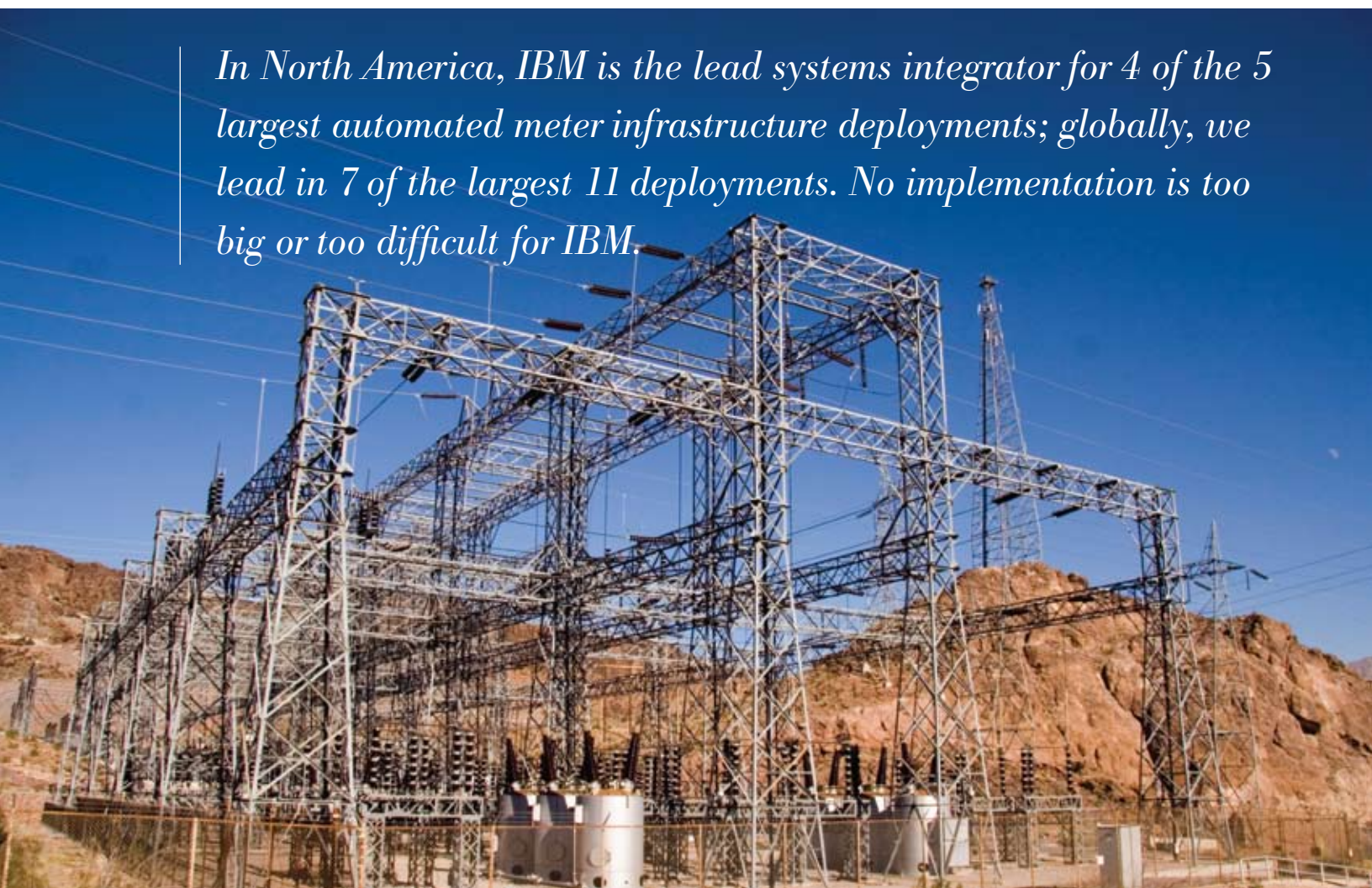
Today's utility companies are being driven to upgrade their aging transmission and distribution networks in the face of escalating energy generation costs, serious environmental challenges, and rising demand for cleaner distributed generation from both developing and digital economies worldwide.

The current utilities environment requires companies to drive down costs while increasing the ability to monitor and control utility assets. Yet

due to aging infrastructure, many utilities operate without the benefit of real-time usage and distribution loads — while also contending with limited resources for repair and improvement. At the same time, they must balance escalating costs of energy generation against the regulatory pressures of prices and stockholders demands for a profitable return. Even consumers, with climate change on their minds, are demanding that utilities find more innovative ways to help them reduce energy consumption and costs.

With utilities at a crossroads, energy executives face tough choices. Maintain the status quo. Divest or acquire new capabilities. Out-task to reduce some costs. Or implement new technologies, systems and processes. At IBM, we've focused on the latter choices as a way to help utilities achieve two crucial goals simultaneously. Meet head-on the demands of the present while laying the foundation for tomorrow.

In North America, IBM is the lead systems integrator for 4 of the 5 largest automated meter infrastructure deployments; globally, we lead in 7 of the largest 11 deployments. No implementation is too big or too difficult for IBM.



Intelligent Utility Network from IBM: The future starts here

For utilities with an eye on the inevitable shift to cleaner, more reliable and efficient energy distribution, IBM has created an Intelligent Utility Network (IUN) solution to transform the way power is delivered and managed, analyzed and used. The IUN solution addresses traditional utility pressures such as financial expectations, regulatory compliance, and aging infrastructures. At the same time, this highly flexible network is able to adapt to changing environmental requirements, competitive markets, supply security and aging workforce.

IUN is based on an open-standards based sensing network that connects all parts of the utility, including equipment, control systems, applications, employees and customers. This enables automatic data collection and storage across the utility based on a Common Information Model and event-driven Service-Oriented Architecture (SOA). Using the IUN platform, analytics, simulation and modeling can be performed to optimize assets, processes and operations. Additionally, IUN facilitates the inclusion of distributed energy and enhanced pricing programs.

Adoption of IUN technologies has enormous implications to the business of energy delivery. To start with, an automated grid is less costly to run. It greatly improves outage detection and restoration times. It can even handle emergency situations with 'self-healing' actions like automated diagnostics. An intelligent grid can also change consumer behavior by rewarding them with incentive services for lowering usage during peak hours. As a business tool, the smart grid is designed to analyze data from millions of end points, and then integrate that knowledge into a myriad of business applications, enabling informed decision-making.

From changing the nature of the business to altering consumer behavior, IUN promises to transform the future of the power industry.

Standing up the smart grid:

The 'building blocks'

The IBM offerings within the Intelligent Utility Network are the important building blocks of a smart, efficient and reliable delivery system. Key components include:

Advanced Meter Management

(AMM). Advanced meters are the first stage in developing a smart grid. AMM enables utilities to remotely collect usage data via sensors — eliminating manual meter readers in the field. Instead, smart meters automatically collect and transport the reads, at regular intervals or on demand. AMM analytics then extract meaningful knowledge from the volumes of data. This knowledge enables more informed decisions about operations during times of high demand. It can also help consumers better manage their energy consumption habits and costs.

Network Automation & Analytics (NAA). Intelligent networks generate a tremendous amount of data that needs to be converted into usable information. NAA can automatically transform raw data into information that can be acted upon, in the forms of decision support, business intelligence, technical analytics or performance indicators that influence operations or planning. In the past, utilities have often used stand-alone analytic systems that had little or no ability to integrate with other business systems. However, in an IUN framework, utilities can implement flexible and scalable analytic systems that enable them to realize the full value of their legacy investments. This includes transforming legacy utility networks to a self-healing environment capable of automated diagnostics and control.

Solution Architecture for Energy (SAFE). Underlying the IUN is SAFE, an open, flexible architecture that enables AMM and NAA solutions to be integrated across the enterprise—finance and administration, customer management, human resources and procurement. The SOA-based SAFE allows the utility to build and extend new services to customers easily and cost effectively.

An Intelligent Utilities Network will help utilities anticipate problems, leading to fewer and shorter outages, and also provide a platform for new products and services.

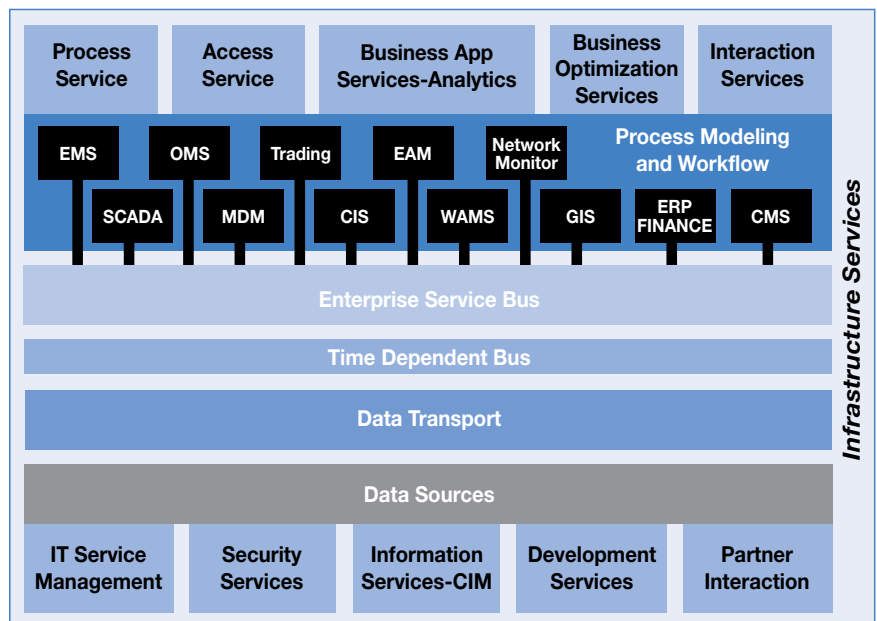
Harnessing the benefits of the smart grid

A better level of connectivity and observability across the electricity supply chain enables the ability to supply the right information, to the right person, at the right place, at the right time. A well-designed and well-built intelligent utility network can produce a broad range of strategic and operational benefits for the utility and its customers.

Drives operational excellence

At its core, an Intelligent Utility Network drives continuous optimization through the smarter use of information across the utility. As a result, utilities experience enhanced network performance and reliability as well as optimized physical asset utilization and workflow management.

SAFE — and how it enables full integration



Utilities have fewer and shorter outages, for example. Automated smart meters and analytics allow the utility to continuously monitor the operational status of the network at the end points. Network component failures are instantaneously observable and can be isolated directly to the portion of the grid impacted. During an outage, the utility will already know a customer's power is out and is able to provide an accurate estimate for the time of restoration when a customer calls. Interestingly, average consumers on an IUN experience a reduction in outage minutes by up to 10 percent, resulting in overall improved customer service and satisfaction.

Additionally, smart meters and sensors on equipment eliminate system "blind spots," allowing for better load balancing and system stability. Because an IUN continuously analyzes the grid, utilities can better manage peaks under real-time operating conditions. Also, improved grid planning capabilities—utilizing

accurate historical operations and asset data—can help identify potential reliability issues before they impact the customer. This level of real-time asset health and condition monitoring also means utilities can reduce intermittent or momentary faults and improve power quality.

Improves financial performance

In many ways, the intelligent grid ensures a return on investment. It increases asset life through improved condition monitoring. It reduces power theft. It improves workforce productivity and safety by limiting the amount of onsite work required. As a result, capital investments and maintenance costs can be reduced; meter-reading costs alone can be lowered by 25-50 percent. As a smart network, efficiencies abound in the form of automated tasks such as meter reads and billing. Additionally, easy integration with business applications allows for informed decision-making that's more responsive to the bottom line.

Global Intelligent Utility Network Coalition — A Commitment to Leadership

CenterPoint Energy® and Pepco Holdings, Inc. are two of the founding members in the Global Intelligent Utility Network Coalition, an international group of utility companies working with IBM to accelerate the adoption of 'smart grid' technologies and solutions on a global basis.

"We share IBM's vision that an Intelligent Utility Network will transform the way power is delivered, managed and used. By providing tools....to reduce electricity usage, we can make a measurable contribution to meeting the nation's environmental challenges and...help customers keep their electric bills affordable."

Dennis Wraase
Chairman, President and CEO
Pepco Holdings, Inc.

"We expect that the Intelligent Grid will improve electric power line grid planning, operations and maintenance, enabling us to deliver power more efficiently. We also expect the technology to contribute to fewer and shorter outages and higher productivity while maintaining our high level of data security."

Tom Standish
CNP Energy Group President,
Regulated Operations

IBM smart grid solutions address the challenges of rising energy costs, aging infrastructure and increased demand for reliability by leveraging all of the benefits of automation and digitization.

An IUN also provides cost benefits on the business management side of a utility. On demand access to real-time grid information, for instance, allows utilities to realize advantages across a broad spectrum of business management functions, including grid management from substation to meter, workforce management, and customer management using two-way communications capabilities. Benefits range from higher revenue potential and increased customer satisfaction to reduced costs and risks. In workforce management alone, IUN's automated metering management capabilities reduce the frequency and duration of site visits to collect usage data. Utilities save labor and capital costs, capture accurate data quickly, and enjoy the

flexibility of deploying crews where they're needed most.

Creates goodwill with regulators and customers

Expect today's highly regulated energy environment to continue down that path. The Intelligent Utility Network helps utilities gather and analyze near real-time information that can automatically be prepared into timely reports for regulators. The IUN also allows utilities to implement innovative environmental initiatives tackling anything from peak demand management to reliability issues.

For energy-conscious consumers, an intelligent grid opens up a portal to valuable information and services.

They can view more usage information to better manage consumption and energy costs at home. They benefit from more service choices, such as price alerts and other forms of demand response. Likewise, utilities are able to quickly build new conservation-oriented services, and promote them through an online portal, as the world moves toward cleaner, alternative energy sources. With a heightened focus on service in the future, the IUN allows utilities to improve customer satisfaction on all levels, while simultaneously helping the environment.

Traditional Grid vs. Intelligent Grid

IBM solutions are embedded in our vision of the utility of the future

Using "smart" technologies and analytics, this intelligent network, or grid, enables continuous automated monitoring of a utility's assets, operations and customer electricity usage. The grid then uses this on demand information to improve reliability, services, efficiencies and even regulatory transparency. IBM has joined forces with a coalition group of energy companies to accelerate the deployment of IUN technologies and power a transformation toward a highly automated, responsive and resilient energy delivery system.





Why IBM

IBM has proven successful around the world in delivering IUN infrastructures that provide superior reliability and end-to-end network data in near real-time. We bring to the table the integration skills, leading-edge technology, and partner ecosystem required to support every stage of an IUN initiative.

Extensive experience from IUN deployments,

as evidenced by our extensive engagements with CenterPoint Energy and Pepco Holdings, Inc. Because of our experience, we understand the business processes and technical architecture for an effective IUN implementation. In addition to IUN, we have implemented successful, innovative solutions with energy and utility companies of all sizes around the world.

Proven, tested and validated solutions and methodologies.

Our successful Energy and Utilities Solutions Framework has been validated with top energy and utilities companies, and is focused on business transformation solutions that are adaptive and flexible as needs change. In addition, our global Centers of Excellence and solutions labs ensure proven solutions even before they are implemented—minimizing risk in scheduling, cost and performance.

CenterPoint Energy, Inc.

Headquartered in Houston, Texas, CenterPoint Energy serves more than five million metered customers primarily in Arkansas, Louisiana, Minnesota, Oklahoma and Texas. The company's goal is to enhance efficiency and reliability of its utility operations while elevating customer satisfaction levels.

Solution

IBM and CenterPoint engaged in a limited deployment pilot to develop and deploy IUN solutions—including an automated meter system deployed initially to 10,000 customers in the Greater Houston area. The solution also includes a self-healing grid to detect outages and improve restoration times, advanced grid analytics, managed infrastructure, and a communications network linking CenterPoint to customers and select partners.

Benefits

- Speeds up responses to customer service requests
- Improves workforce productivity by automating electricity usage collection
- Allows for faster outage identification and restoration
- Improves service reliability

Comprehensive services, combined with a unique breadth and depth of resources, from technical (consulting, hardware and software) to business and utilities regulation expertise. We provide planning and business case development all the way through pilot programs and full-scale execution. Our extensive integration experience can deliver a comprehensive IUN solution that is manageable and scalable in a secure environment.

Relevant industry knowledge and expertise, supported by an industry-leading partnership ecosystem.

IBM alliances with innovative, best-of-breed Business Partners reduce customer project costs and minimize implementation and integration risks. We bring together the relevant tools, methodologies, resources and people experienced in the Energy and Utilities industry.



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Global reach with local service.

We can send in local teams that understand your business, as well as your technical and regulatory environments. IBM has unique capabilities and presence in 160 countries mean utility companies around the globe have the resources and responsiveness they need to implement and support an IUN solution—no matter how large or complex.

Financing options. IBM Global Financing offerings are available. Flexible payment structures allow utilities to more effectively distribute initial costs and match payments to service benefits.

For more information

To learn more about how the Intelligent Utility Network from IBM can benefit your company, please contact your local IBM representative or visit our Web site at:

ibm.com/energy