

Carriers Embrace the Smart Grid Revolution

By Jesse Cryderman

As a high school student, I was an active debater; not the type that stirred the pot around the lunch table, but a member of the debate team, a group whose membership meant better luck on college entrance exams and generally worse luck at prom. Armed with the principles of deductive logic, we set about facing down our equally equipped opponents from other schools on weeknights in semi-lit basements around the state. Okay, so it wasn't like Fight Club for nerds, but you get the picture.

The statewide debate topic my senior year was the environment: green initiatives, recycling, energy management, and the like. Many of the solutions we investigated have since been implemented around the world: we've seen hybrid and electric vehicles moved from concept to mass-production reality; wind and solar energy powering data centers; and even recaptured methane gas from water treatment powering breweries (New Belgium). But back in the 90s, before these changes came to pass, I felt that environmental initiatives weren't rapidly enacted simply due to greed and laziness on the part of the ubiquitous yet elusive "Man." I didn't understand the complexity and scale of some of the problems we debated, nor the actual cost of



viable solutions. And in many cases, a regulatory overlay existed that colored the entire landscape of options. Smart energy management was one such conundrum.

Today we refer to smart energy management and the underlying networks that enable it as smart grid. For the purposes of this article, the term smart grid encompasses both the modernization of the energy grid itself as well as the provisioning/management of energy services and the end-user devices. Herein, a smart grid:

- Predicts and responds to usage patterns and peak demand.
- Optimizes the power grid around efficiency and clean/green resources.

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- Dramatically improves reliability.
- Exhibits a very high level of cybersecurity.
- Utilizes self-healing technology.
- Enables end-users to monitor and manage their consumption in real-time.
- Creates incentives to manage peak energy usage.

The potential positive impact of smart grid is astounding. Following the modern communication revolution, smart grid implementation it is probably the largest advance in the past century in terms of scope and impact. And at the forefront of the smart grid revolution are the carriers, poised to enable and monetize this global energy transformation.

How Big is smart grid?

By all accounts, the market for smart grid transformation is enormous, and so are the positive benefits. Sustainable technology analysts Greenbang predict the European smart electricity market will reach \$25 billion by 2020. ABI Research predicts smart grid spending will top \$45 billion by 2015. In "Benefits of a Transformed Energy System," a report commissioned by the US Department of Energy, researchers calculated that a smart grid transformation in the US would net \$46 to \$117 billion savings over 20 years. And in South Korea, home to the world's largest smart grid testbed, the government aims to have a fully integrated smart grid by 2030 and . Clearly we're talking very big numbers, and there is immense and urgent interest in smart grid from worldwide governments, utility companies, and network providers.

The Carriers Respond

To better understand how carriers are responding to the smart grid opportunity and the competitive landscape in the US as well as how it differs from the European market, Pipeline connected with the Sprint, AT&T, and Verizon. All three companies have aggressive smart grid strategies, and have invested heavily in the smart grid future.

Sprint

Pipeline: How interested are utilities in smart grid?

Robert Gustin, Industry Solutions Manager for Utilities,

ABI Research predicts smart grid spending will top \$45 billion by 2015.

Sprint: "I've never seen this kind of focus and receptivity to the technology deployment for advanced automation in the utilities space." Not a single utility we speak with today doesn't have a plan for [smart grid].

P: How is Sprint embracing smart grid?

RG: Sprint's solutions address four key platforms that are the foundation of smart grid: the reliability of the network; the introduction of renewable energy focus (we're seeing incredible interest here); consumer engagement, getting the consumer engaged in the supply and demand equation, managing their energy use; and cybersecurity. Smart grid transcends many verticals, and includes advanced metering, data collection, supervisory control, demand response (load management), and many other technologies.

Sprint has committed incredible resources over the last three years in the embedded machine group entirely focused on the development of the ecosystem and application development in this space. We as a company are very engaged with the largest utilities and the largest municipalities tremendous engagement and discovery of our customer's needs and requirements.

Last fall Sprint opened our M2M collaboration center in Burlingame, CA. The Sprint M2M Collaboration Center brings together Sprint partners, equipment providers, customers and employees to rapidly prototype, test and launch concepts and new ideas.

Sprint is also highly engaged with regulators on all levels of government, and we're seeing the nature of the regulatory environment aggressively support smart grid as the national energy perspective changes to embrace initiatives.

P: What makes smart grid customers unique for carriers?

RG: Hybrid architecture is brought up by all of our utility customers; it's important to note that every architecture in utility will be a hybrid public/private network. There is no single silver bullet.

P: How does the US market differ from the European market?

RG: Unquestionably, in the past decade to 15 years, deregulation and implementation of solid state technology and embedded based solutions in Europe preceded the US. Italy automated 29 million meters 10 years ago. Technologies vary (GSM vs. CDMA) so different geo-markets will deploy different solutions, but the European regulatory environment has been very supportive. I don't think their strategies are all that different, though.

P: What does the future look like?

RG: The future looks very good, with incredible opportunities in embedded solutions and 100s of millions of connected devices in the decades to come.

AT&T

Pipeline: How is AT&T embracing smart grid?

Ed Davalos, Director of Product Management for Utility/Smart Grid solutions, AT&T Business Solutions:

AT&T is using wireless technology to help modernize the nation's electric grid. Our efforts in the smart grid space are focused on using M2M (machine-to-machine) technology to streamline business processes and provide real-time monitoring of energy assets. Through relationships with several industry-leading Smart Grid device providers and Advanced Meter providers, we're enabling the reading of millions of electric meters today.

AT&T, for instance, offers a smart grid application that provides outage alerts, giving utility companies a reliable means to locate and isolate problems on electricity delivery lines. We also enhance customers' smart grids with sensors that serve as alternatives to manual inspection of equipment that controls the voltage supplied to consumers.

P: How does AT&T enable smart grid?

ED: The key to fully tapping the promise of the smart grid in the electric utility industry is highly secure and reliable communications. One company that knows a great deal about providing such communication services is AT&T, offering utilities a trusted provider to manage the backbone networks that will make the smart grid a reality. AT&T's robust M2M capabilities, combined with our experience in deploying smart grid devices on our

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wireless network and our rate plans designed specifically for smart grid devices, makes our smart grid offer highly competitive.

P: What does the future of smart grid look like?

ED: The future will continue as in the past with more devices being automated on wireless networks. When smart grids first emerged as a way to monitor energy use and reduce consumption, the focus was almost exclusively on smart metering. Today, utilities are beginning to move beyond the meter and look at a whole new set of applications that will help transform the electric energy industry.

We see integrated, smart grid solutions – rather than just standalone smart meters – as the future of this technology. As more and more utility providers adopt smart grids, I believe that we'll see continued development of innovative applications and devices to support efficient energy use.

At the same time, as smart grids progress, we'll see an increasing amount of data to transmit and manage. The management, processing and storage requirements will create opportunities for AT&T to assist energy companies in meeting these goals. To this end, all of AT&T's traditional products and services – highly secure communications over wireless and wired networks, data storage, hosting and network management – are ready to help meet this demand for secure communications and efficient data management.

Verizon

Pipeline: How is Verizon embracing smart grid?

Ernie Hayden, managing principle of Verizon's Energy and Utility practice: I believe we have a good game plan. As we see it, the "smart grid" is about overlaying the generation, transmission and distribution electricity system with a proven and reliable digital communications

and control network. Modernizing the grid with digital technology enables utilities to operate more efficiently, spot outages more quickly or avoid them in the first place and to engage in two-way communications with customers and with distributed generation and storage systems.

Pipeline: How do you leverage your assets for smart grid?

EH: For our part, we leverage our wireless and wireline networks and know-how to provide utilities with solutions that support the deployment of smart meters, sensors and control systems. We've formed partnerships with companies like Ambient, Itron, Current and eMeter to provide turnkey solutions for advanced meters and SCADA enhancements. We've invested heavily to enhance our cloud computing services. We operate more than 200 data centers in 22 countries and recently acquired Terremark, an industry leader in cloud computing.

Our teams are engaged with the U.S. government's efforts to address cybersecurity issues with for critical infrastructures and in the effort by NIST to develop smart grid standards. We offer cyber-security services, including device certification through ICSA Labs, professional and managed services and device sales. We offer data management solutions for the flood of data that smart meters will generate. And we bring significant economies of scale to utilities. Not only can we connect smart electricity meters, but also gas and water meters using the same wireless infrastructure. To date we have more than a million smart grid end points in service with more than three dozen utilities in the U.S.

Verizon has a dedicated Global Energy & Utility practice that is expanding into in the Europe/Middle East/Africa (EMEA) and Asia Pacific (APAC) market areas. Some of our U.S. utility clients for Smart Grid also have operations in other parts of the world. We expect a natural progression in terms of being able to offer our Smart Grid solutions to their non-U.S. Subsidiaries. We have approached, or been approached, by electric utilities in the UK, France, Germany and Spain and we have a strong relationship in these international markets with Vodafone, which is our joint venture partner in Verizon Wireless in the U.S.

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Pipeline: Who is Verizon competing with to enable smart grid?

EH: Utilities have a lot of options to choose from as they modernize their systems. Verizon competes not only with other service providers, but also equipment makers, systems integrators and providers of Wi-Fi mesh technologies and so on.

Pipeline: What does the future look like?

EH: In short, we see attractive markets for our services in the growing demand for not only smart grid, but also smart homes and buildings, smart communities and transportation systems and so much more. The machine-to-machine communications that are essential to smart systems of all sorts is a growth market for us.