Smart Grid Drivers and Challenges for Deployments in Europe

Pietro Macchiarella, *Research Analyst,* **Parks Associates**

Governments, energy providers, and technology developers in many countries around the world are actively participating in the development of smart grids. In its most complex form, a smart grid consists of two-way communicating meters, measuring devices, communication networks, energy data management systems, Home Area Networking (HAN) platforms, and energy management programs.

The smart meter is the key base component of smart grids and the first step toward full-scale smart grid deployments. Smart meters are capable of recording and reporting usage data, and when equipped with proper user interfaces, they allow customers to make informed decisions based on real-time power consumption data. They can also enable home automation control features, such as optimized use of lighting, HVAC, and appliance controls, and energy-efficiency features.

As more governments set ambitious goals to address climate change concerns, advance metering infrastructure (AMI) is often seen as an important element of energy policies. One of the energy-efficiency programs with the largest reach and visibility is the EU action against climate change, setting ambitious targets for 2020:

- Cutting greenhouse gases by 20%
- Reducing energy consumption by 20% through increased energy efficiency
- Meeting 20% of the EU's energy needs from renewable sources

These are often referred to as EU 20-20-20 targets. Many European governments are using smart meter deployments as a tool to meet these objectives mandated by European regulators.

COMMON DRIVERS AND CHALLENGES

While each country is faced with cultural, geographic, and socioeconomic peculiarities, there are several common drivers and challenges associated with the deployment of smart meter installations.

SMART GRID DRIVERS

- **Efforts to obtain higher efficiency in energy distribution and consumption:** The goal of utilities is matching demand and supply to minimize waste or loss in the grid. Current distribution systems do not allow supply adjustments based on demand. Since electricity cannot be efficiently stored, its cost depends heavily on the timing of user consumption. Smart meters allow utilities to implement Demand Response (DR) programs to manage the supply and demand of electricity by directly monitoring and influencing consumption.

IN THIS ISSUE

Smart Grid Drivers and Challenges for Deployments in Europe:

- Common Drivers and Challenges
- Smart Grid Drivers
- Smart Grid Challenges

UPCOMING EVENTS

CONNECTIONS™ Europe
  ‣ November 8-9, 2011

CONNECTIONS SUMMIT at CES
  ‣ january 10, 2012 | Las Vegas, NV

Smart Energy Summit
  ‣ February 28-March 1, 2012

LINKS

Smart Energy Insights Blog

IP Services

Energy Research

Smart Energy Summit

SMART GRID DRIVERS (Cont.)

- **Governments encouraging or mandating smart meters**: Several governments have made smart meters essential elements of national energy policies. Most are aimed at improving efficiency and reducing CO_2 emissions. Some governments have mandated national rollouts (e.g., the U.K.). Others are funding pilots (the EU, for instance, currently supports multiple projects involving smart meters).

- **Efforts to integrate renewable energy and microgeneration**: Sources of renewable energy such as wind and solar are effective sources of alternative energy to counter power shortages. Smart meters make it easier for households that have their own microgeneration systems—such as solar panels on their roofs—to supply electricity back to the grid.

- **Increase in competition within energy markets**: The progressive deregulation of energy markets around the world has led to an increase in competition among energy retailers. Data from smart meters allow energy companies to compete more aggressively on pricing and service. Advanced meters also allow retailers to offer tiered plans that incentivize use during low peak hours, thereby generating higher margins for the utility. Finally, in-home monitoring and remote energy management offer companies an opportunity to differentiate.

- **Smart meters utilized as a tool of economic policy**: Some governments have incentivized "green" technologies, including smart meter deployments, hoping they will generate employment and counterbalance the global recessionary climate.

- **Revenue protection**: Smart meters allow utilities to reduce the amount of non-technical transmission and distribution (T&D) losses (electricity theft, billing errors, etc.). In developing countries, revenue protection can be a very powerful driver due to the high percentage of electricity loss due to theft.

- **Consumer appeal**: Parks Associates' consumer study *Connected Consumer in Europe* asked consumers to select among several potential value-added services they would be interested in receiving from a broadband service provider or energy utility. Remote energy management, defined as a service that informs you of your current electrical usage and cost and enables you to remotely turn off and on electrical appliances, was consistently a top choice in France, Germany, Italy, Spain, and the U.K.

SMART GRID CHALLENGES

- **High deployment costs**: Replacing the existing metering infrastructure is expensive. The most successful deployments to date have occurred in countries where utilities were coping with network loss and theft (e.g., Italy) and therefore obtained an immediate measurable gain from the conversion and in countries with a relatively small and wealthy population (e.g., Sweden).

- **Need for extensive installer/worker training**: Utilities that have deployed smart meters have all experienced slower than usual installations due to workers' lack of familiarity with the equipment. In some cases, worker training has helped customer acceptance. In Denmark, for instance, the utility SEAS-NVE reduced the volume of consumer complaints by training installers to address customer concerns directly.

- **Hampering consumers' ability to switch providers**: Utility companies face a number of challenges related to consumers' ability to switch providers. Often, utilities that

CONNECTIONS™ Europe, produced by Parks Associates, offers high-level analysis and consumer research, networking opportunities, and information on emerging residential and mobile technologies and services.

Digital media and connected CE
- Impact of the cloud
- New roles for service providers; broadcasters; and content producers
- Business strategies built on connected TV content and apps
- Service opportunities in synchronizing fixed and portable CE

Video-on-demand, multiplatform video, and TV Everywhere
- Expanding home entertainment
- Building the perfect interface
- Integrating social networking
- Content discovery

Impact of New Technologies
- The real potential of 3D
- Smartphones and mobile apps
- The changing role of the game console
- Controls and energy management

SPONSORS

GreenPeak

orange

pv

SIEMENS

technicolor

have not installed smart meters do not have guidelines on how to use advanced meters when a customer switches from a competitor to their service. Regulators are stepping up efforts to provide more detailed guidelines to electricity retailers. Ofgem in the U.K., for instance, considers acceptable that smart meters "revert to operating in dumb mode on change of supplier."

- **Varying demographic and geographical conditions**: Companies implementing smart grids often supply power to regions with widely ranging population densities, from rural territories to urban environments. As a consequence, differing communication technologies may be optimal for diverse areas. Varying climates also pose a challenge. Equipment may need to withstand the most extreme conditions, including extremely high or low temperatures, wet or dry weather, and varying humidity.

- **Need for augmented data security**: An interconnected smart grid is highly vulnerable to cyber attacks. Regulatory agencies and industry organizations are demanding that utilities implement strong security measures. In some cases they require utilities to inform customers of the data collected and allow

them to opt out. In the U.K., the government is creating a data communication company (DCC) that will collect, store, and protect consumer data in a centralized manner.

- **No permanent efficiency gains obtained from in-home energy management solutions**: Several companies stated that pilots of in-home energy management solutions showed significant but temporary consumption savings. After a few months, consumers went back to their old behaviors, eliminating most of the savings obtained.

- **Lack of consumer education and awareness**: Strong consumer opposition to smart meters has arisen from both legitimate concerns and misinformation. In the U.S., most consumer hostility has focused on alleged health issues and more expensive electricity bills. In Europe, challenges are mostly posed by consumers' fear of hidden costs and indifference due to low household electricity expenditures. Privacy concerns have also been an issue. In the Netherlands, citizens' vocal complaints that smart meters produced an invasion of personal privacy forced the government to change deployments from mandatory to voluntary (via opt-out provisions).

ABOUT THE AUTHOR

Pietro Macchiarella, *Research Analyst*

Pietro Macchiarella joined Parks Associates following an international career in the wireless industry. He has worked in management-level positions throughout Europe and the U.S.

In his role as a research analyst, Pietro covers home entertainment media with specific focus on video gaming, digital music, and connected CE devices. Pietro's research interests also include mobile services and 3D TV.

INDUSTRY EXPERTISE: Video Gaming, Digital Music, Connected CE devices, Global Energy Management Trends, Mobile Services, 3DTV

ABOUT PARKS ASSOCIATES

Parks Associates is an internationally recognized market research and consulting company specializing in emerging consumer technology products and services. Founded in 1986, Parks Associates creates research capital for companies ranging from Fortune 500 to small start-ups through market reports, primary studies, consumer research, custom research, workshops, executive conferences, and annual service subscriptions.

The company's expertise includes new media, digital entertainment and gaming, home networks, Internet and television services, digital health, mobile applications and services, consumer electronics, energy management, and home control systems and security.

Each year, Parks Associates hosts executive thought leadership conferences CONNECTIONS™, CONNECTIONS™ Europe, and Smart Energy Summit.