

Introduction

At the turn of the century, the National Academy of Engineering designated the electric grid as the most important engineering achievement of the 20th century. The reliable nature of the grid has allowed the nation's economy to thrive and has enabled innovation across all sectors of society. However, changes in the way we live our lives and environmental realities necessitate the need to improve our conventional electric grid.

What is the Smart Grid?

Most of the definitions of the smart grid rely on highlighting the technical aspects of the electrical infrastructure. For consumers, a more practical and effective definition of the smart grid is *an electrical network enhanced with communications technology that allows consumers to better control their electric usage and enables the utility company to use cleaner sources of fuel and improve the reliability of its network.*

Why Do We Need the Smart Grid?

While the current electric grid is reliable in that it delivers power when required, there are three unavoidable realities that form the basis of the national movement toward a smart grid. 1) the need to control the increasing demand for electricity, 2) the need to produce electricity with cleaner sources of fuel and 3) the need for the nation to convert its transportation sector to run on electricity as opposed to foreign oil.

First, the demand for electricity is growing at a rapid pace. Increasing population, larger homes and devices in those homes that require electricity are causing the demand for electricity to skyrocket. According to the Energy Information Administration, the demand for electricity is expected to increase 30% by the year 2030. In order to meet this demand, utility companies need to either increase the production of peaking generating plants or build new power generating plants. Both of these options will increase the cost consumers pay for electricity.

Second, half of the electricity produced in the United States is generated by burning coal. Unfortunately, burning coal is a major contributor to global warming. Although the US represents 4% of the world's population, the country is responsible for 25% of the greenhouse emissions worldwide. Therefore, the United States needs to find cleaner methods of producing electricity such as wind, solar and hydro electric. To be a successful part of our energy solution, these alternative generation resources must be able to supply their power output to a modern electric grid.

Third, the United States needs to reduce its dependence on foreign oil by producing cars that operate on electricity as opposed to gasoline.

As the current conventional grid cannot adequately address these issues, an improved grid is a necessity. The improved grid is known as the smart grid.

PEPCO's Smart Grid

PEPCO's smart grid, entitled the Blueprint of the Future, is comprised of three physical components:

1. Advanced Metering Infrastructure
2. Distributed Automation
3. Communications Infrastructure

1. **Advanced Metering Infrastructure** ("AMI") is a network of smart digital meters and other communications technology that reads and records consumers' electric consumption on an hourly basis and transmits that data to the utility company's central data base.
2. **Distributed Automation** ("DA") a collection of digital switches, controllers, sensors and electronic relays that allows PEPCO to identify where there are faults and potential problems exist on the network. The DA network also allows PEPCO to better understand the status of its network and deliver better service by preventing outages and restoring service quickly when outages occur.
3. The **Communications Infrastructure** ("CI") is a wireless mesh network that ties all of the other elements of the smart grid (AMI and DA) together allowing PEPCO to have near real-time communications with its customers and its network.

Smart Grid Pricing

PEPCO has proposed two pricing programs to accompany its AMI network -- dynamic pricing and direct load control. Both programs allow consumers to manage their energy usage based upon price signals that reflect the actual cost of electricity.

Dynamic pricing ("DP") is designed to price electricity based on market conditions as opposed to a flat rate. Specifically, DP alerts consumers to times when the price of electricity is high and rewards consumers for lowering their energy usage during these times.

Direct load control ("DLC") is a voluntary program whereby the consumer allows PEPCO to control their air conditioning units when the price of electricity is high. The direct load control program is very similar to the Kilowatchers program PEPCO implemented years ago. Consumers who elect to participate in DLC receive a one-time bill credit depending upon the amount of control they give PEPCO. In May 2011, the D.C. Public Service Commission rejected Pepco's initial dynamic pricing proposal and opened a docket to address a range of issues related to dynamic pricing.

Smart Meters

People often confuse the terms "smart grid" and "smart meters." The two are not the same. A smart meter is a component of the smart grid. A layman's definition of a smart meter is *a digital device that records electricity usage on an interval basis, usually hourly.* Smart meters are equipped with wireless communications technology that transmits the consumer's usage data to PEPCO and also sends pricing data from PEPCO to a smart thermostat or in-home display located inside the consumer's home.

What's in it for Consumers?

The smart grid will dramatically alter the landscape in the District of Columbia as it will transform the relationship between PEPCO and its consumers. Specifically, it will facilitate a participatory relationship that yields a number of benefits to consumers. Once fully deployed, the smart grid will provide the following benefits:

- Provides consumers with more detailed information about how energy is being consumed in their home. This will allow consumers to:
 - Develop a home energy profile.
 - Know how much their bill is on a near real time basis. This avoids the end of the month 'bill surprise'.
 - Make informed energy efficiency choices by talking to energy advisors.
 - Understand which appliances use the most energy in their home.
- Offers a wider range of pricing options which allows consumers to:
 - Select a pricing program that best fits their lifestyle.
 - Choose a pricing program that automatically reduces their energy consumption.
- Empowering technology such as smart programmable thermostats and in-home displays that allows consumers to:
 - Program energy reductions based upon price signals sent by PEPCO.
 - Monitor and control energy from remote locations using the Internet.
- Fewer estimated readings which reduces the number of catch-up bills.
- Fewer outages and shorter outage times as the utility has increased knowledge about how power is flowing through the network and the exact cause and location of outages.



OPC's Involvement in the Smart Grid

OPC's involvement in the smart grid goes back to 2002. In that year, the Commission considered Pepco's request to merge with Conectiv in Formal Case No. 1002. That case eventually ended in a settlement agreement. One of the terms of the settlement agreement introduced by the Office of the People's Counsel required Pepco's shareholders to pay \$2 million to implement a smart meter pilot program.

This pilot program eventually became *PowerCentsDC*. The pilot was administered by a Board comprised of OPC, PSC, CUB, PEPCO and the International Brotherhood of Electrical Workers. The pilot began in July 2008 and concluded in October 2009. The final results of the pilot indicate that District residents benefitted from dynamic pricing and a majority of the participants indicated that they would recommend it to their friends. The findings of the pilot regarding customer response to dynamic pricing will serve as a guide to PEPCO's dynamic pricing program. Results of the pilot and videos about the pilot can be found at www.PowercentsDC.org.

In March 2010, *PowerCentsDC* received a national award for Best Pricing and Demand Response Program from the Association for Energy Services Professionals.

OPC's Position on Smart Grid

Based upon OPC's involvement with the *PowerCentsDC* pilot and studying other pilot programs, the Office supports the smart grid to the extent that it 1) empowers consumers to be able to control energy usage, 2) supports energy efficiency, 3) reduces the District of Columbia's overall electricity load thereby reducing the cost of energy to all consumers and 4) does not burden seniors and those on fixed income.

It is OPC's position that in order for the smart grid to succeed, consumers must adopt the technology. OPC submits, in order for consumer adoption to occur, three fundamental elements must be in place: 1) a comprehensive consumer education program, 2) a set of rules that protects consumers, especially privacy rules that instills confidence in consumers that their data will be safe, and 3) a network that delivers safe adequate and reliable service.

Consistent with its position on smart grid, OPC continues to assert leadership in the smart grid arena. In April 2010, OPC filed comments requesting the Commission to conduct a field acceptance test of PEPCO's smart grid network to ensure that it is capable of providing safe, adequate and reliable service. On May 3, 2010, to ensure that the Commission's rules address the new dynamics of the smart grid, OPC filed a Petition requesting the Commission to establish a proceeding to review and amend its rules to address issues such as consumer privacy and data security as it pertains to the smart grid. On the same day, OPC filed a Motion requesting the Commission to establish a smart grid task force to develop a comprehensive educational program to ensure consumers are adequately educated and empowered to use and benefit from the smart grid.

Regulatory History of the Smart Grid D.C.

On April 4, 2007, Pepco filed an Application to institute a comprehensive advanced metering infrastructure and energy efficiency plan entitled the "Blueprint for the Future". Pepco's Blueprint for the Future will usher in smart grid technology and a new pricing structure into the District of Columbia.

On April 23, 2007, the Commission established Formal Case No. 1056 and invited interested parties to comment PEPCO's Application. Shortly thereafter, the parties in the case began issuing data requests and adhering to the procedural schedule as outlined by the Commission.

In February 2009, President Obama signed the America Recovery and Reinvestment Act of 2009 ("ARRA"). Included in the ARRA was a \$4.5 billion Smart Grid Investment Grant ("SGIG") program to be administered by the Department of Energy ("DOE") to help spur the deployment of the smart grid.

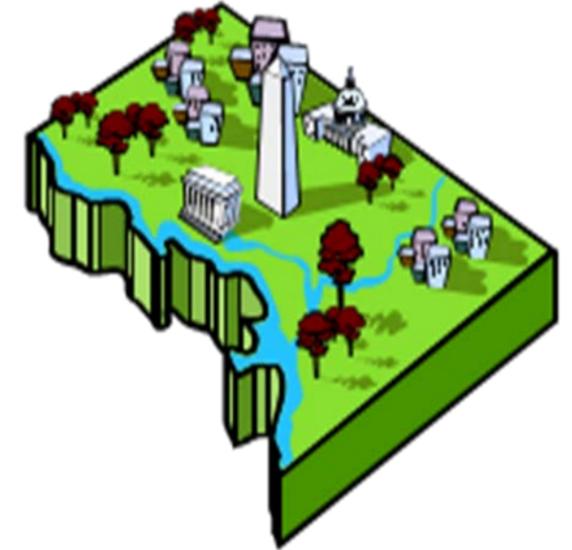
In June 2009, in an effort to allow Pepco to have the best opportunity to receive money from the DOE's SGIG, the DC City Council enacted the "Advanced Metering Infrastructure Implementation and Cost Recovery Authorization Emergency Act of 2009" ("AMI Act")(D.C. Code § 34-1562). The AMI Act approved the implementation of AMI in the District of Columbia, provided the Commission determines that PEPCO received a sufficient amount of funds from the DOE to make AMI cost effective.

In August 2009, PEPCO filed its Smart Grid Investment Grant application with the Department of Energy. PEPCO's application detailed the Company's plan to deploy a smart grid infrastructure in the District of Columbia. The total cost of the project is \$89.3 million. In accordance with the rules of the grant, PEPCO requested the DOE fund half of the program.

In December of 2009, the DOE notified PEPCO that the Company would receive \$44.6 million from the federal government to fund the deployment of the smart grid in the District of Columbia. The award was the maximum amount PEPCO could receive from the Smart Grid Investment Grant. The remaining \$44.6 million of the cost of deploying the smart grid plus other costs related to full implementation will be recovered from ratepayers after the Commission conducts a rate case.

On December 17, 2009, the Commission issued an order finding that PEPCO received sufficient funds from the DOE to make the deployment of the smart grid cost effective. In October 2010, Pepco began installing smart meters in the District of Columbia. According to Pepco, full deployment should be complete by the end of 2011.

The Office of the People's Counsel's



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