

Smart Grid and Climate Change

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Demand Response and Smart Grid Coalition
 IETA Side Event at COP 15
 December 16, 2009

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Smart Grid

Putting today's digital technologies in areas such as communications, controls, sensors and information into the electricity system to allow operation of the grid to be dynamically optimized at all times, with the result being increases in security and reliability, and decreases in costs and emissions

Smart Grid – Why it's not so smart now

- Present state of outage management
 - Rolling the trucks
 - Waiting for the calls
- When the wind stopped blowing in Texas
- Cranking up the AC during peak period regardless of wholesale costs
- Supply resources in one place and demand in another
- Policy does not encourage/stimulate it

Smart Grid

- Smart Meters
- Home Area Networks and Information Displays
- Prius Effect
- Time-based Pricing
- Demand Response
- Energy Storage
- Plug-in Electric Vehicles
- Automated Sensors and Controls
- Holistic Energy Efficiency
- Enabling more Renewable Energy than otherwise

FERC's estimated 20% reduction in peak demand "if realized, can reduce significantly the number of power plants needed to meet peak demand and thereby reduce carbon emissions by as much as 1.2 billion tons of carbon annually."

Jon Wellinghoff, Chairman, Federal Energy Regulatory Commission (FERC), testimony before the Committee on Environment and Public Works, United States Senate, August 2009

"Demand response [is] a 'dance partner' for variable renewable generation, such as wind power. Demand response can ... manage the down 'ramps' that occur in wind plant output."

Rick Sergel, President and CEO North American Electric Reliability Corporation, Executive Remarks to the Energy Future Coalition Working Group, November 2008

According to one utility, installing smart meters will take 114 meter reading and maintenance vehicles off the road and avoid 1.2 million miles of driving and eliminating 1.5 million pounds of CO₂.

Portland Gas & Electric, "PGE Moves Forward on Smart Meter Installation Territory-Wide," April 2009

“Pairing another environmentally friendly resource—demand response—with renewable power will help the [California] ISO maintain grid reliability. Demand reduction is just as effective, and often less expensive, than adding megawatts onto the grid and it doesn’t add a single pollutant.”

California Independent System Operator (CAISO), “eGrid Technologies Help Achieve Environmental Goals,” December 2007

“The U.S. Conference of Mayors urges mayors from around the nation to join this effort and to add intelligent energy systems to their climate change and energy efficiency efforts. Connecting smart buildings with a smart grid will have a greater impact on energy efficiency, further the reduction of GHG emissions, and increase the reliability, security and economic viability of the US Electric grid.”

US Conference of Mayors, Resolution No. 82, GridWise and Smart Grid Policies, “Adopted Resolutions: June 2007,” June 2007

"If the grid were just 5% more efficient, the energy savings would equate to permanently eliminating the fuel and greenhouse gas emissions from 53 million cars."

U.S. Department of Energy, "The Smart Grid: An Introduction," 2008

Studies show that consumers who receive information about their electricity usage through Smart Grid devices use up to 20% less energy.

The Brattle Group, "The Impact of Informational Feedback on Energy Consumption---A Survey of the Experimental Evidence," May 2009

When wind-generated power dropped unexpectedly in Texas on February 26, 2008, the grid operator called for and received 1,200 MW of voluntary demand response in 12 minutes, thus avoiding rolling blackouts and ensuring that no one involuntarily lost their power during the emergency.

National Renewable Energy Laboratory and Oak Ridge National Laboratory, "ERCOT Event on February 26, 2008: Lessons Learned," July 2008

"Thus, the incorporation of consumer energy use management into the operation of the electric grid will reduce consumer costs, and will reduce the carbon footprint of our electricity supply."

Jon Wellinghoff, Chairman, Federal Energy Regulatory Commission (FERC), testimony before the Committee on Environment and Public Works, United States Senate, August 2009

"Investments in grids need to be carried out to introduce intelligent technologies that will benefit consumers and also help to reach GHG reduction targets."

International Confederation of Energy Regulators, "World Energy Regulators' Statement on Climate Change," October 2009

The Smart Grid empowers consumers to control their own carbon footprints.

North American Electric Reliability Corporation (NERC), "Electric Industry Concerns on the Reliability Impacts of Climate Change Initiatives," November 2008

"To get a greener grid, you need a Smart Grid. Solar and wind power are necessary and desirable components of a cleaner energy future. To make the grid run cleaner, it will take a grid capable of dealing with the variable nature of these renewable resources."

U.S. Department of Energy, "The Smart Grid: An Introduction," 2008

"With two-way digital communications between power plants and users, smart grids can balance supply and demand in real time, smooth demand peaks, and make consumers active participants in the production and consumption of electricity. As the share of generation from variable renewable resources such as wind and solar increases, a smart grid can better handle fluctuations in power. It can allow electric vehicles to store power when needed or to sell it back to the grid. Smart meters can communicate with customers, who can then reduce costs by changing appliances or times of use."

World Bank, "World Development Report 2010: Development and Climate Change," September 2009

Thank You

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