

## **Executive Summary - ESB Networks in Ireland, the Ireland Government, EPRI and the Electricity Research Centre Demonstrating Elements of the Smart Grid**

ESB Networks, the electric network utility in Ireland, and the Ireland government are developing one of the most comprehensive smart grid initiatives that will support the Irish government's aggressive targets for wind integration, energy efficiency, and electric vehicle integration.

ESB Networks has joined the smart grid demonstration initiative organized by the Electric Power Research Institute (EPRI) to collaborate during the development of the smart grid in Ireland while learning from other smart grid deployments around the world. The Electricity Research Centre (ERC) of Ireland, with 16 industrial partners, is helping to coordinate and conduct the ongoing smart grid research. The two Ireland government agencies associated with this effort are the Sustainable Energy Authority of Ireland (SEAI) and the Commission for Energy Regulation (CER).

A key aspect of this demonstration project will be to understand the challenges of integrating renewable energy resources such as wind power into the electricity grid. The country has a target of providing nearly 40 percent of the total electric energy production through wind energy by 2020, and because it is an intermittent resource system operators will need to understand how this resource will impact grid planning and operations.

This ESB Networks smart grid project will explore the further development of wind farm connections, assess the effectiveness of customer response and interest in demand and consumption management, investigate the readiness of secondary networks for high penetration levels of electric vehicles and maximize existing distribution electricity networks.

This EPRI / ESB Networks smart grid project has four primary elements:

1. **Renewable integration.** With a target of providing 38 percent of the total electric energy production in Ireland with wind energy by 2020 and over half of this wind generation being connected at the distribution level, advanced approaches for integrating the wind generation management with management of the grid are needed.
2. **Energy efficiency.** Ireland has established a goal to improve energy efficiency by 20 percent by 2020. ESB Networks has established a target to be a carbon neutral utility by 2035. Energy efficiency initiatives include measures to reduce losses in the supply system and an extensive trial that is designed to develop an understanding of customer response to different pricing and technology strategies for reducing and shifting energy use.
3. **Electric transportation.** 10 percent of vehicles in Ireland are expected to be electric by 2020 and there is expected to be 6,000 electric vehicles in Ireland by the end of 2012. ESB Networks is installing 1,500 public charging points and 30 fast chargers by the end of 2011. The first 2000 vehicle owners will get free domestic chargers. The smart grid initiative includes an assessment of electric distribution system impacts associated with increasing penetration of electric vehicles, including a trial in South Dublin.

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4. **Flexible grid.** The smart grid initiative is defining new technologies and control strategies that will be used to integrate demand side resources, storage, and renewable generation with the reliable and secure operation of the grid.

“In the past two years, EPRI and collaborating electric utilities have made significant progress in developing tools to support the advancement of integration of distributed energy resources (DER) in large scale demonstrations,” said Arshad Mansoor, senior vice president of research for EPRI. “The ESB Networks project will enhance the knowledge we are acquiring and will benefit the entire industry.”

EPRI smart grid demonstration projects are part of a five-year collaborative initiative with utility members around the world. The effort is focused on integrating distributed energy resources like demand response, storage, distributed generation, and distributed renewable generation to advance widespread, efficient, and cost-effective deployment of utility and customer-side technologies in the distribution system and to enhance overall power system operations.

#### **About EPRI**

The Electric Power Research Institute, Inc. (EPRI, [www.epri.com](http://www.epri.com)) conducts research and development relating to the generation, delivery and use of electricity for the benefit of the public. An independent, nonprofit organization, EPRI brings together experts from academia and industry as well as its own scientists and engineers to help address challenges in electricity generation, delivery and use, including health, safety and the environment. EPRI's members represent more than 90 percent of the electricity generated and delivered in the United States, and international participation extends to 40 countries. EPRI's principal offices and laboratories are located in Palo Alto, Calif.; Charlotte, N.C.; Knoxville, Tenn.; and Lenox, Mass.

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