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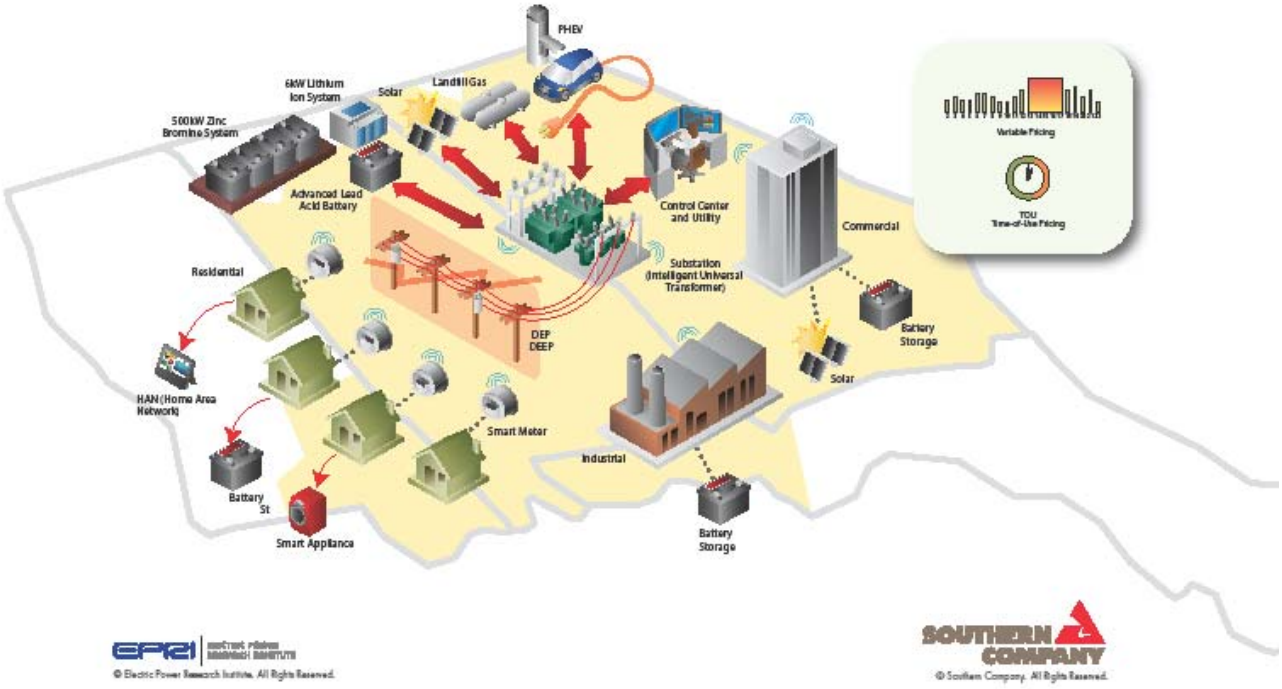
Southern Company Smart Grid Demonstration Project



Southern Company Project Overview

This project intends to approach the Smart Grid in a fully-integrated systems approach across four retail operating companies: Alabama Power, Georgia Power, Gulf Power, and Mississippi Power. Southern Company demonstrates a more complete model of a Smart Grid by incorporating an integrated distribution management system (IDMS), renewable energy generation including photovoltaic (PV), landfill gas and wind, energy storage at transformer and substation level, an intelligent universal transformer, advanced distribution operational measures, customer response to dynamic pricing in two different demographic regions, and new communications applications. By deploying and demonstrating integration of these technologies and applications, it will address many of the unknowns and enable Southern Company to create an overall aggregated virtual power plant, increase system reliability, lower greenhouse gas emissions, and lower system demand.

EPRI Smart Grid Demonstration Project Overview

Electric Power Research Institute (EPRI) Smart Grid Demonstration Host-Site projects are part of a five-year collaborative initiative with 19 utility members focused on integrating distributed energy resources (DER) 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 and to enhance overall power system operations. Host-site projects apply EPRI's IntelliGrid methodology to define requirements for technologies, communication, information, and control infrastructures that support integration of DER. Operations experience, integration issues, and lessons learned will reveal the full range of standards and interoperability requirements needed to support the industry. Gaps revealed will identify critical areas of future smart grid research. Public updates are available on www.smartgrid.epri.com.

Project Criteria: 6 Critical Elements

Southern Company's Smart Grid Project aligns with the six critical elements that EPRI has identified as key criteria to achieve the goals of our five-year Smart Grid initiative.

Integration of multiple distributed resource types

To further expose issues that need to be addressed and enable widespread integration of DER.

The project uses a variety of distributed resources at both the customer and system levels throughout the service area. Southern Company will test several different batteries for energy storage at transformer and substation level. The project will develop renewable resources through photovoltaics, solar thermal units, landfill gas units, and small community wind systems, and the project will use the Distribution Energy Efficiency Program (DEEP) and Distribution Efficiency Program (DEP).

Application of critical integration technologies and standards

To identify gaps associated with standards, harden critical integration technologies and advance adoption.

Southern Company's Smart Grid project utilizes existing communications infrastructures with new and emerging technologies including SIM card-based devices and WiMax enabled devices coupled with the SmartSynch GridRouter to form one cohesive communications system. The project also investigates the usefulness of cellular services for machine-to-machine applications. The project continues the testing and investigation of the DNP3, IEC 61850, SES92, Zigbee, common information model (CIM), and internet protocol (IP)-based standards.

Incorporation of Dynamic Rates or other approaches to line wholesale conditions to customers

To evaluate integration issues and incentives associated with customer response and linking supply with demand.

The project plans to base the critical peak pricing program and residential service variable pricing program on historical dynamic pricing data while responding to customer input and activities to further the ability to predict customer response to price changes.

Integration into system planning and operations

Demonstrate integration tools and techniques to achieve full integration into system operations and planning.

The project integrates new Smart Grid technologies and applications into an existing energy grid. Southern Company intends to test the DEEP, DEP, capacitor controlled operations, IDMS, advanced metering infrastructure (AMI), and demand response capabilities in combination in order to optimize their capacities and capabilities in systems planning and operation.

Compatibility with initiative goals and approach

Enable high-penetration of DER and advance interoperability and integration for the electric power industry.

The project is compatible on all levels with EPRI's initiatives and goals through its use of the IntelliGrid process and its demonstration and testing in vital areas including the coordination of CIM and other standard activities, customer response to dynamic pricing, the merger of new and existing communications systems, and the introduction and testing of new technologies with their integrated universal transformer.

Leverage of additional funding sources

Secure required participation, commitment, and funding for a successful project.

For the project, Southern Company has partnered with academia and venders for modeling, impact studies, and smart grid technologies. The project utilizes an already existing AMI, and will be receiving funding from the Department of Energy (DOE) in a Smart Grid Investment Grant and on the development of their IDMS.

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