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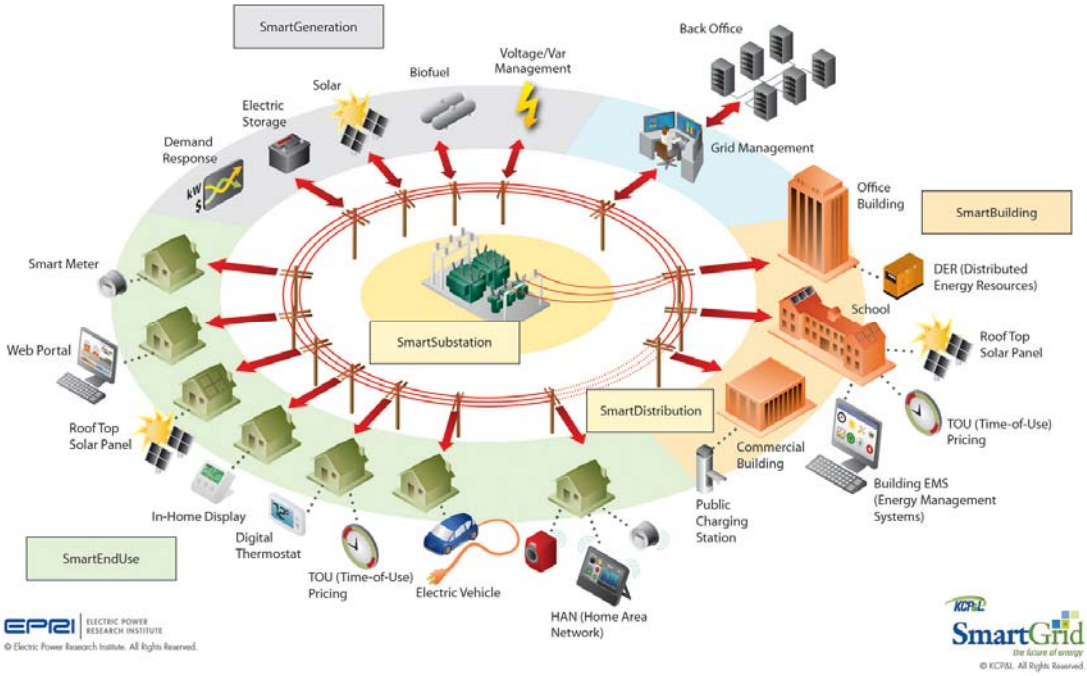
Kansas City Power & Light Smart Grid Demonstration Project



Kansas City Power & Light (KCP&L) Project Overview

The project objective is the integration of distributed resources into all levels of grid operations including market trading, generation dispatch, distribution operations, and consumer interaction that creates an end-to-end SmartGrid—from SmartGeneration to SmartConsumption built around a major SmartSubstation. KCP&L will work with select partners to demonstrate and test renewable energy and distributed generation (DG) sources in a way that will provide benefits to an underserved population, in a designated "Green Impact Zone," and surrounding urban area, while enabling key stakeholders to better understand and demonstrate the technologies, business models, and prices required to further commercialize the concepts.

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, DG, 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

KCP&L'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 will integrate demand response programs and dynamic voltage control working with other SmartGrid technologies in order to defer the need to build additional fossil-fuel-fired generating resources and defer distribution system upgrades. The project includes the following elements:

1. DER Diversity and Scale
2. Demand response (DR) Thermostats, Customer Load Curtailment
3. Distribution Voltage Control (DVC)
4. Roof-top Solar Photovoltaic Generation
5. Grid-Connected Battery Storage
6. Stand-By to Parallel Bio-fuel Generation
7. SmartConsumption

Application of critical integration technologies and standards

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

The project will coordinate implementation with National Institute of Standards and Technology (NIST) efforts (IEC-61968/61970, IEC-61850, DNP3, OpenADR, OpenHan, SEP, IPv6;) to integrate a number of DER technologies, and work to ensure cyber security.

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

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

KCP&L will incorporate time-of-use (TOU) pricing, In-Home Displays with energy and pricing information and DER Management and balancing of intermittent resources for reliability and economic performance.

Integration into system planning and operations

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

The project will implement a regional distribution grid control system that contains five major components including: distribution management system (DMS), distribution control and data acquisition (DCADA), automated metering infrastructure (AMI) and Meter Data Management, distributed energy resource management (DERM), and Home and Vehicle Energy Management.

Compatibility with initiative goals and approach

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

The project fully complies with EPRI SmartGrid initiatives and goals through the selection and use of open standards, requirements based approach enabling interoperability, supports wide-scale deployment of DER, and sharing of information. The goals of this demonstration are: to reveal the benefits of optimizing energy, information flows, and utility operations across supply and demand resources, transmission and distribution (T&D) operations, and customer end-use programs; to increase efficiency with reduced cost and environmental impact through the introduction of new technologies; and to integrate a wider urban revitalization effort (the Green Impact Zone) to provide a catalyst for high customer engagement.

Leverage of additional funding sources

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

The project will leverage funding and support from the U.S. Department of Energy (DOE), KCP&L, The City of Kansas City, and the Mid-America Regional Council. Other technical expertise, equipment, and in-kind financial support are provided by Siemens, OATI, Landis+Gyr, Intergraph, GridPoint, and Exergonix.

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