

Sensing & Measurement Strategy

National Labs: ORNL, NETL, ANL, INL, LANL, LBNL, LLNL, NREL, PNNL, SNL
Industry Partners: ComEd, Dominion, Entergy, EPB, EPRI, NASPI, NIST, OSIsoft, Southern Co., TVA



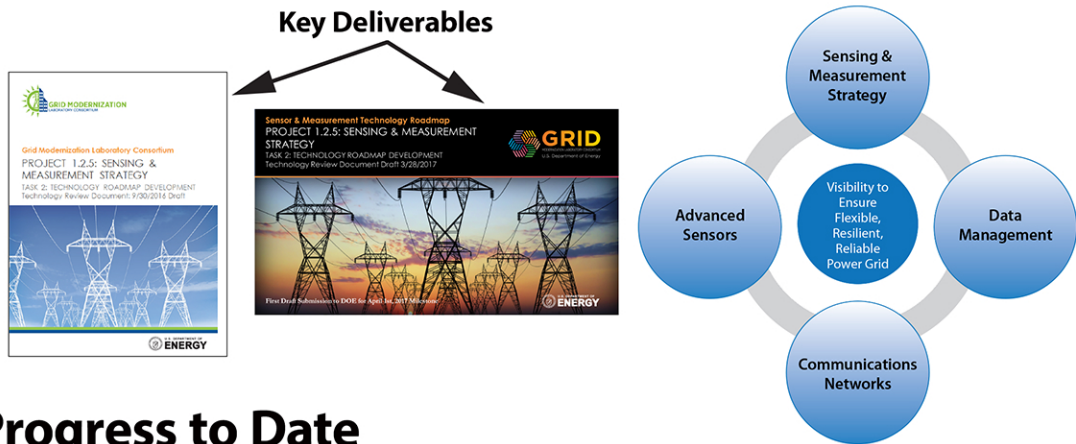
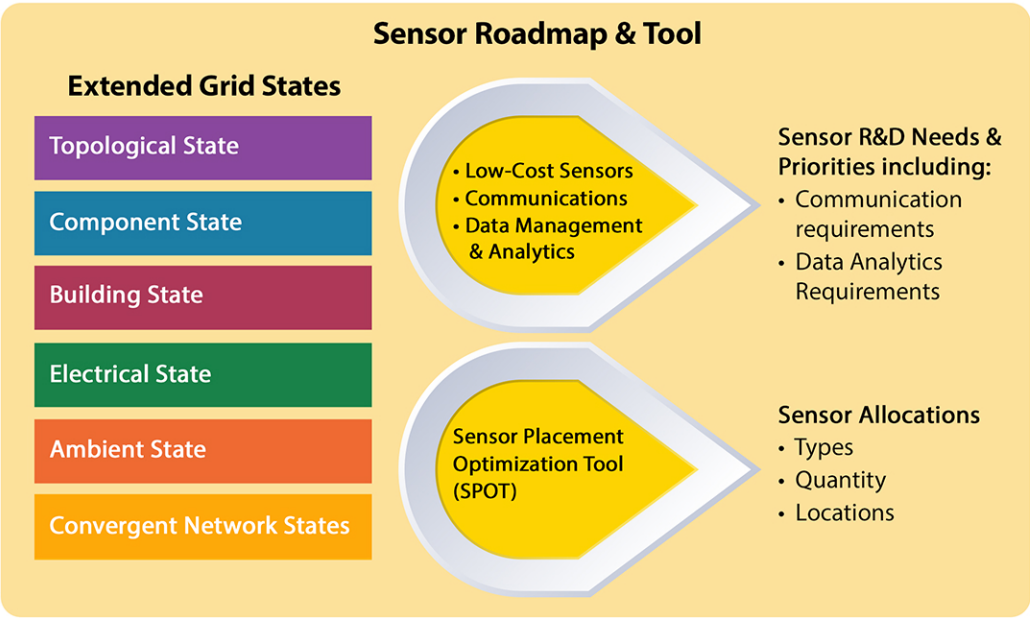
Project Description

The Electric Grid is undergoing a major transformation (integration of new devices, major shift in generation mix, aging infrastructure, added risk of extreme grid events) which presents new and greater challenges for effective grid operation and management requiring greater grid visibility through sensing and measurement. A Sensing & Measurement Strategy (measurement parameters, devices for making measurements, communications to transfer data, and data analytics to manage data) is needed to allocate and turn grid measurements into actionable information.

Expected Outcomes

- Creation of an Extended Grid State Reference Model to identify the information needed to understand how to instrument the modern grid with conventional sources/loads and renewables, storage, EVs, etc.
- Development of a Technology Roadmap to identify the state of sensors and to determine sensor R&D needs/priorities needed to measure grid measurements and to provide actionable information.
- Development of a Sensor Placement Optimization Tool (SPOT) to assist utilities in deciding what sensing & measurement technologies to use and how to allocate them to achieve effective grid observability.
- Outreach to technical groups to coordinate with industry needs/priorities and identify new standards and enhancements needed.
- Value Proposition: A cohesive strategy for sensing & measurement will provide what is needed to characterize the state of the grid at much higher fidelity/resolution to maintain system resiliency, reliability, and security.

SIGNIFICANT MILESTONES	STATUS	DATE
SM CY1 – Development of Technology Roadmap	Completed draft with industry feedback and submitted to DOE	4/1/2017
CY2 Roadmap – Fully compiled report outlining roadmap and gap analysis to DOE	On track	10/10/2017
SM CY2 – Development of prototype optimization tool	On track	4/1/2018
CY3 Outreach – facilitate the creation of a PAR, task forces or working groups for standards to respond to new sensor and measurement requirements	On track	4/1/2019
SM CY3 – Validated framework of optimization tool based on field test of utility stakeholders	On track	4/1/2019



Progress to Date

- Industry meeting (Sep. 20, 2016) hosted with EPB (Chattanooga, TN) to share draft project results with industry partners/stakeholders and gain knowledge of EPB's distribution system sensor and communications activities
- Draft Extended Grid State Framework and Definitions (Sep. 30, 2016)
- Draft Sensing Technology State-of-the-Art Review (Sep. 30, 2016) submitted to DOE
- Webinars on Extended Grid State with industry partners and stakeholders (Fall 2016)
- Webinars on Roadmap with industry partners and stakeholders (Winter 2017)
- Draft Sensor Optimization Placement Tool development and implementation plans (Feb. 1, 2017)
- Industry meeting (Feb. 9-10, 2017) hosted with ComEd (Oak Brook, IL) to share project activities of this and two related GMLC projects and to gather feedback from a broader audience of industry partners and stakeholders
- Development of sensor placement optimization tool or SPOT initiated (Mar. 30, 2017)
- Draft Sensing & Measurement Technology Roadmap (Mar. 31, 2017) with industry feedback and matrix categorization of R&D thrusts submitted to DOE