SDG&E's EPIC Program

Overview and Status

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Panel Presentation for
iPCGRID Workshop
March 25, 2015

Overview

- IOU EPIC Planning Framework
- SDG&E's Approved First Triennial Plan
  - Two Example Projects
- SDG&E's Proposed Second Triennial Plan

IOUs EPIC Funding Limited to "Pre-Commercial Demonstration" Projects

"The installation and operation of pre-commercial technologies or strategies at a scale sufficiently large and in conditions sufficiently reflective of anticipated actual operating environments to enable appraisal of the operational and performance characteristics and the financial risks"

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Investor Owned Utility EPIC Framework

Safety	Affordability	Reliability	Key Drivers & Policies

Cross Cutting/Foundational Strategies & Technologies
Smart Grid Architecture, CyberSecurity, Telecommunications, Standards

Renewables and Distributed Energy Resources Integration

- Demonstrate Strategies & Technologies to Increase Renewable Resources on the Grid
- Adaptive Protection Strategies
- Demonstrate Grid-Scale Storage Strategies & Technologies

Key Drivers & Policies:
- 33% RPS
- CSI
- Gov's 12,000 MW DG Plan
- OTC retirements
- AB32
- Storage OIR

Grid Modernization and Optimization

- Demonstrate Strategies and Technologies to Optimize Existing Assets
- Prepare for Emerging Technologies
- Design and Demonstrate Grid Operations of the Future

Key Drivers & Policies:
- SB17
- Aging Infrastructure
- Workforce Development
- CA Economic Resiliency

Customer Focused Products and Services Enablement

- Leverage the SmartMeter Platform to Drive Customer Service Excellence
- Provide Greater Billing Flexibility & Visibility
- Integrate Demand Side Management for Grid Optimization

Key Drivers & Policies:
- ZNE
- CSI
- Net Energy Metering
- Peak Reduction
- Electric Transportation

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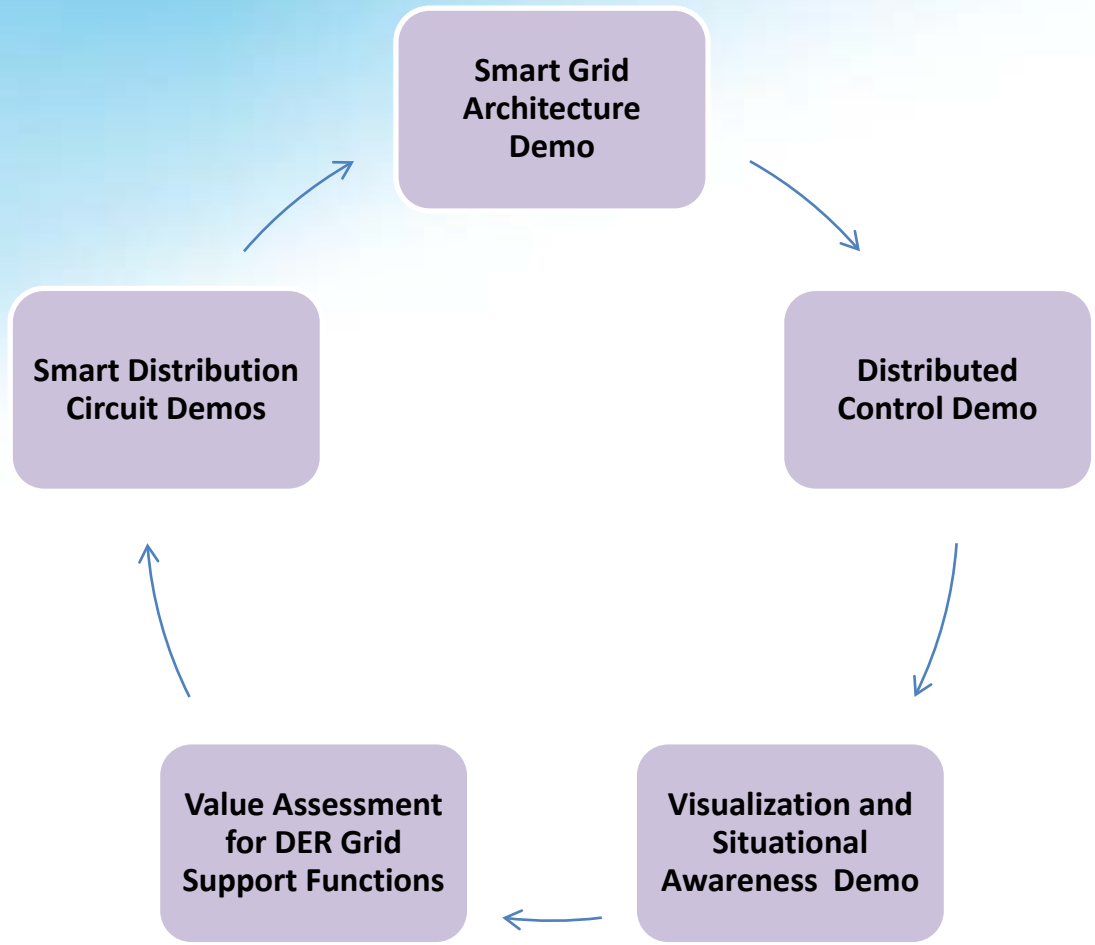
SDG&E's First Triennial Plan: Five Advanced Distribution System Automation Projects



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Example Project: Value Assessment of DER Grid Support Functions

Objectives

- To assess the viability of specific DER functions (such as volt/VAR regulation, providing fast response emergency power, peak shaving, and system monitoring) and to determine in which situations there may be sufficient value to warrant commercial adoption
- To aid in developing standards for future DER integration systems

Approach

- Test pilot grid support DER functions to evaluate the cost-benefit relationship in specific application situations
- Determine grid support functions' interconnection and interoperability system and standards requirements and gaps
- Establish capabilities for control and dispatch of specific grid support functions in viable application situations
- Focus work in SDG&E's Integrated Test Facility for cost efficiency

Example Project: "Smart" Distribution Circuit Demonstrations

Objective

- To identify best practices for adopting new distribution technologies, integration strategies, communication protocols, and software in more fully automated future distribution circuits by performing a series of "pre-commercial demonstrations" of alternative solutions

Approach

- Perform demonstrations of alternative new distribution circuit features and associated simulation work
- Example features to be considered are fault location and anticipation, communication protocols, power electronic components, CVR practices, voltage regulation equipment, and strategic use of DER
- Analyze test results and identify best practices for robust distribution circuit design and networked automation to maximize the benefits derived from the emerging technology, software, and integration strategies
- Focus work in SDG&E's Integrated Test Facility for cost efficiency

SDG&E's Filed Second Triennial Plan

Renewables and Distributed Energy Resources Integration

- *Modernization of Distribution System and Integration of Distributed Generation and Storage*

Grid Modernization and Optimization

- *Data Analytics in Support of Advanced Planning and System Operations*
- *Monitoring, Communication, and Control Infrastructure for Power System Modernization*
- *System Operations Development and Advancement*

Customer Focused Products and Services

- *Integration of Customer Systems into Electric Utility Infrastructure*

Cross-Cutting / Foundational Strategies & Technologies

- *Collaborative Institute RD&D Programs*

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Questions / Discussion