

Modernizing the California Grid

Robert Sherick

Southern California Edison

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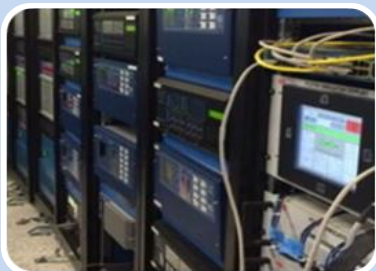
California Distribution Resource Plan Goals

- Modernizing the electric distribution system to accommodate two-way flows of energy and energy services throughout the IOUs' network
- Enabling customer choice of new technologies and services that reduce emissions and improve reliability in a cost efficient manner
- Animating opportunities for DERs to realize benefits through the provision of grid services

- Is Plug and Play technically feasible?
- What are the benefits and burdens of Energy Services?
- What does it take to actively manage the distribution grid?
- What are the possible technology, process, and capability gaps?
- What are the customer and business implications of an actively managed grid?

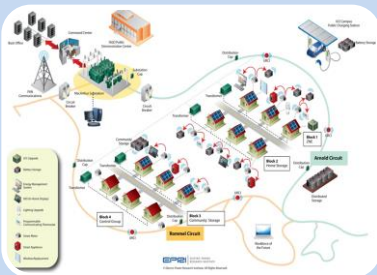


Predict/Monitor/Control/Optimize



Distributed Control Systems

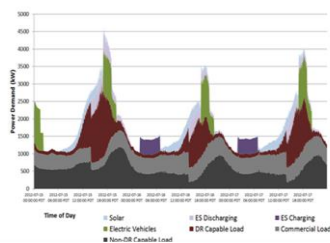
- Enabling, planning, forecasting, monitoring, controlling, and optimizing distributed resources
- Integrating with existing control systems, protocols, and business practices
- Transitioning to distributed control architecture and autonomous control algorithms



Advanced Telecommunications

- Increasing bandwidth and reducing latency across fiber and wireless networks
- Rationalizing communication protocols across customer and utility devices directly and through third parties
- Integrating advances with legacy systems

Categorized Loads, Energy Storage and EVs - Rossi Circuit, July 15-17, 2012



Advanced Analytics

- Increasing awareness of customer resource capabilities and demand characteristics
- Integrating customer technology adoption decisions with grid modernization planning
- Evaluating integration capacity and locational value

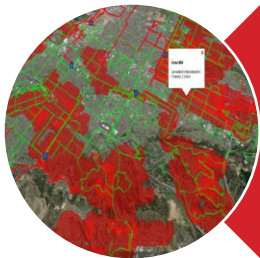
Demonstrations



Network Optimized Distributed Energy Systems - NODES



Integrated Grid Project



Distribution Resource Plan Demonstrations A-E

Coordination

- Utility/Customers/Providers/Regulators/Local Jurisdictions/Vendors/Standards
- Planning and Operations
 - People/Process/Technology
- Optimizing Grid and Customer Resources
- CAISO and Utility/DSO
- Utility/DSO and CPUC
- Safe/Reliable/Affordable

Questions

