



# Green California Summit



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## Presentation Overview

- **What is Smart Grid**
- **Why Smart Grid**
- **California's Commitment to Smart Grid**
- **Challenges**
- **Next Steps**





# What is Smart Grid?

- **A Smart Grid is a constantly evolving energy network that operates efficiently and seamlessly integrates and adjusts to dynamic operational, supply and demand conditions.**

**A Smart Grid will enable utilities to leverage technology and information to provide reliable and timely service to customers.**

- **The Smart Grid employs:**
  - Advanced information technology and ubiquitous communications infrastructure;
  - Distributed sensors
  - Automated control technologies and methodologies
  - Real-time ratings
  - Renewables and other distributed resources
  - Informed decisions and optimization strategies
  - Customer feedback and participation





# Why Smart Grid?

- ✓ **Growth of renewables and distributed generation**
  - Dynamics that could have a huge effect on a utility's ability to deliver reliable power at a reasonable price
- ✓ **Distribution systems are inefficient –**
  - Huge amounts of energy are wasted in line losses and an inefficient system (5%)
- ✓ **Aging infrastructure that will impact the reliability of power as well as inevitable rising costs**
- ✓ **Generation shortfalls as demand growth well exceeds new generation**
- ✓ **The need for infrastructure to support dispatchable demand response**

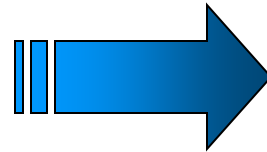




# Why Smart Grid?

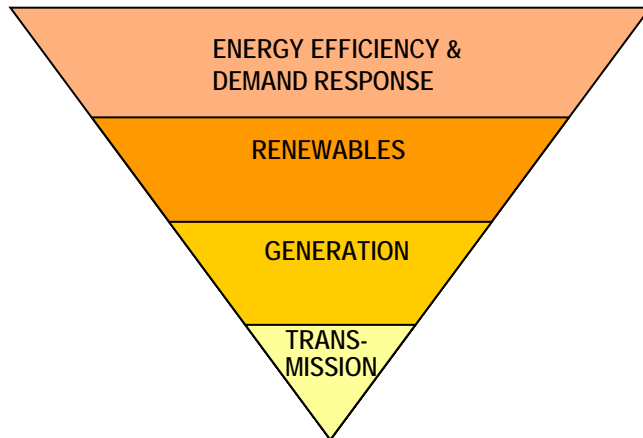
## Policy Drivers

- **Aging Infrastructure**
  - Significant investment in T&D system likely in coming years
- **Help Achieve / Integrate policy goals**
  - Renewable Portfolio Standards
  - Greenhouse Gas Reductions
  - CA Loading Order



## Business Drivers

- Exceptional customer service.
- Maturing workforce.
- Utilities need to create a power grid that meets the growing and changing needs of customers.
- Advance State policy initiatives by incorporating green renewable resources.
- Advancements in IT and communication systems are accelerating and provide opportunities to achieve operational efficiencies, streamline processes, and incorporate new technologies.
- Utilities are already planning to incorporate modern grid technologies and building blocks when available and cost effective.





## California Committed to Implement Smart Grid

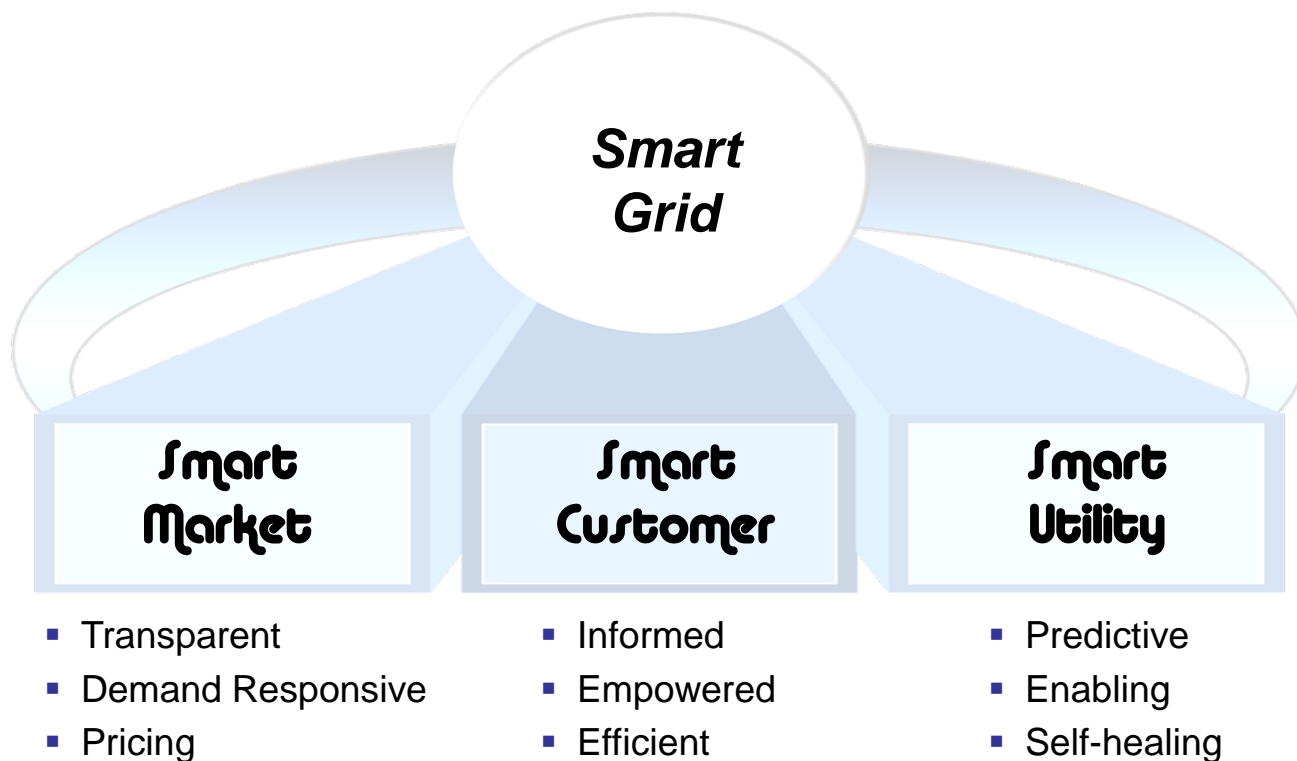
- **Statewide advanced metering deployment launched in 2006**
- **California regulatory agencies are launching key Smart Grid initiatives**
  - California Public Utilities Commission (CPUC)
  - California Energy Commission (CEC)
- **Three large Investor-Owned Utilities have significant Smart Grid initiatives in progress**
- **Smart Grid legislation (SB17 – Padilla) adopted in 2009.**





# CPUC's Vision of Smart Grid

- In 2010 the Commission issued its decision setting the requirements for utilities deployment plan of smart grid. Utilities will file their plans on July 1, 2011.





## California IOU Smart Grid Investments in Progress

- **Three largest investor-owned utilities have significant smart grid initiatives already in progress. Some examples:**
  - Advanced metering infrastructure
  - Substation and Distribution automation
  - Grid failure prevention, detection, repair
  - Enable integration of Distributed Energy Resources
  - Operational efficiencies





# Challenges Facing a Smart Grid System

- **Regulatory Challenges**
  - Federal, state and industry alignment
  - Coordinating proceedings and activities
  - Approvals, implementation and integration
  - Infrastructure development
  - Dynamic pricing
- **Costs and Rate Pressure**
- **Investment Climate**
- **Technology Maturity, Standardization and Adoption**
- **Information and Systems Security**





# Next steps on Smart Grid implementation

- **Metrics**
- **Privacy**
- **Cyber-Security**
- **Home Area Networks**





# Smart Grid Metrics

- **Initiated phase to determine consensus Smart Grid metrics to measure progress on Smart Grid deployments**
- **Held workshops and informal webinars with participants**
- **Utilities distributed consensus and non-consensus metrics**
- **Metrics cover:**
  - Customer/AMI issues
  - Plug-in Electric Vehicles
  - Electricity Storage
  - Grid Operations
- **Further discussions on metrics for:**
  - Environmental
  - Cyber-security
  - Customer/AMI
  - Grid Operations
- **Proposed Decision expected 2nd Quarter 2011**





## Customer Access to Information

- **Customer access to information major goal of PUC**
- **Who should have access to that information, and how are privacy protections enforced?**
  - Where is PUC jurisdiction over third parties, e.g., Google?
- **Smart Grid privacy groups recommend reliance upon Fair Information Practices principles**
- **Final Decision issued in June 2010 directs PUC to consider customer access and privacy issues later this year to meet customer access goals.**





# Privacy Issues

- **Initiated phase to discuss privacy rules relating to obtaining access from utility**
- **Governor signed SB 1476 (Sen. Padilla) which addresses utility privacy requirements**
- **Workshops held to address privacy issues**
  - Proposal by Center for Democracy and Technology
- **Three types of access:**
  - Third party obtaining data via the utility backhaul
  - Third party obtaining data via customer's Home Area Network
  - Third party utility contractor
- **Jurisdictional concerns raised over third parties**
- **Proposed Decision expected 2nd Quarter 2011**





# Cyber-Security

- **Difference between security of customer data and overall grid security**
- **Two phase approach to address customer security and grid security**
- **National Institute of Standards and Technology (NIST) issued guidelines for regulators on cyber-security and privacy earlier this year**
- **Anticipate new phase of Smart Grid proceeding to address potential cyber-security rules and policies 2<sup>nd</sup> Quarter 2011**





# Home Area Networks

- **Utilities AMI investments include Home Area Network (HAN)**
- **Currently, HAN is not activated by utilities**
  - HAN loaded with Zigbee SEP 1.0(X)
  - Waiting for SEP 2.0 to be finalized in national standard making process
  - Estimated date for SEP 2.0 completion and market readiness uncertain
- **Third parties participating in Smart Grid proceeding advocating for HAN to be activated**
  - Texas in process of activating HAN with SEP 1.X
- **A number of concerns raised by utilities**
  - Security and privacy risks
  - Stranded costs
  - Questions related to interoperability and upgrading of devices





# The Home of the Smart Grid Future

