

Smart Grid and Climate Change

Michael Hoover, Senior Director, State Regulatory Affairs

Agenda

- Overview
- Climate Policy in California – Now and Then
- SCE's Demand Response Portfolio Overview
- Demand Response – Market Integration
- Overview of Regulatory Proceedings/Path Forward

Overview – Key Points

- Current legislation and CPUC policy are focused on GHG reduction
- SCE's efforts through grid modernization and "Distributed Energy Resources" support achieving California's overall policy
 - Grid modernization efforts will enhance the ability to integrate Distributed Energy Resources (DERs)
 - SCE's demand response programs are a type of DER and are being integrated into the wholesale market
- Numerous proceedings in California are underway to advance these efforts
- Achieving the State's climate goals requires a broader recognition of DERs

Climate Policy in California – Now and Then

- AB32 created a GHG Goal for the State
 - Return to 1990 levels by 2020
- Regulators relied upon Renewable Generation, markets (Cap-and-Trade), mandates to achieve AB32 vision
- Governor Brown's Executive orders sketch out the path post-2020
 - 40% below 1990 levels by 2030, and 80% below by 2050
 - 50% Renewables, 50% increase in building EE
- SB350 enshrines much of the Governor's post-2020 vision in legislation, and more
 - Creates an Integrated Resources Planning process
 - Permanent role for utilities in Transportation Electrification

DERs and Grid Modernization May Enhance System Reliability and Safety

- Potential enhanced grid capabilities that can be achieved from DERs, coupled with grid modernization investments include:
 - Support grid reliability during system problems by providing power to the grid during significant voltage and frequency variations
 - Local voltage support
 - Microgrids
- Potential grid modernization and grid reinforcement solutions are needed to enable these enhanced grid capabilities.
 - Communications needed to fully integrate DERs
 - Grid Reinforcement for resiliency
 - Modernization of protection relays
 - Mitigation of cybersecurity risks

SCE Demand Response Portfolio Overview

	Approx. Load Impact* (MW)	Program Design
Commercial & Industrial Customers		
Base Interruptible Program	660	Emergency interruptible load (customer control).
Agricultural Pumping & Interruptible	60	Emergency interruptible load (utility direct load control).
Demand Bidding Program	110	Economic, day-ahead energy.
Critical Peak Pricing	25	Economic, day-ahead energy (TOU rate structure).
Aggregator Managed	145	Third-party economic energy and capacity.
Summer Discount Plan	65	A/C cycling direct load control (both economic and emergency).
Residential Customers		
Summer Discount Plan	295	A/C cycling direct load control (both economic and emergency).
Peak Time Rebate	30	Economic, day-ahead energy.

*Approximate MW Load Impact using 2014 Ex Ante Load Impact Tables for an August monthly peak, 1-in-2 weather year.

Demand Response – Market Integration

Regulatory Directives

- The California Public Utilities Commission (CPUC) has required California utilities to integrate their DR programs as resources available for dispatch in the CAISO wholesale energy market.
- Per Decision D.14-12-024, programs that are not integrated by January 1, 2018 could be subjected to devaluation and operational constraints.

Policy Rationale

- Treat DR more like a true “resource” that both responds to market signals and provides information to the market.
- Increase CAISO visibility to available and utilized DR resources.
- Subject DR to higher operational and performance requirements so it can better meet future grid needs from renewable integration, ramping periods, increased storage, etc.

Current Status

- As of July 2015, SCE completed the integration of approximately 90% (1,100 MW) of its DR portfolio.

Customer Impact

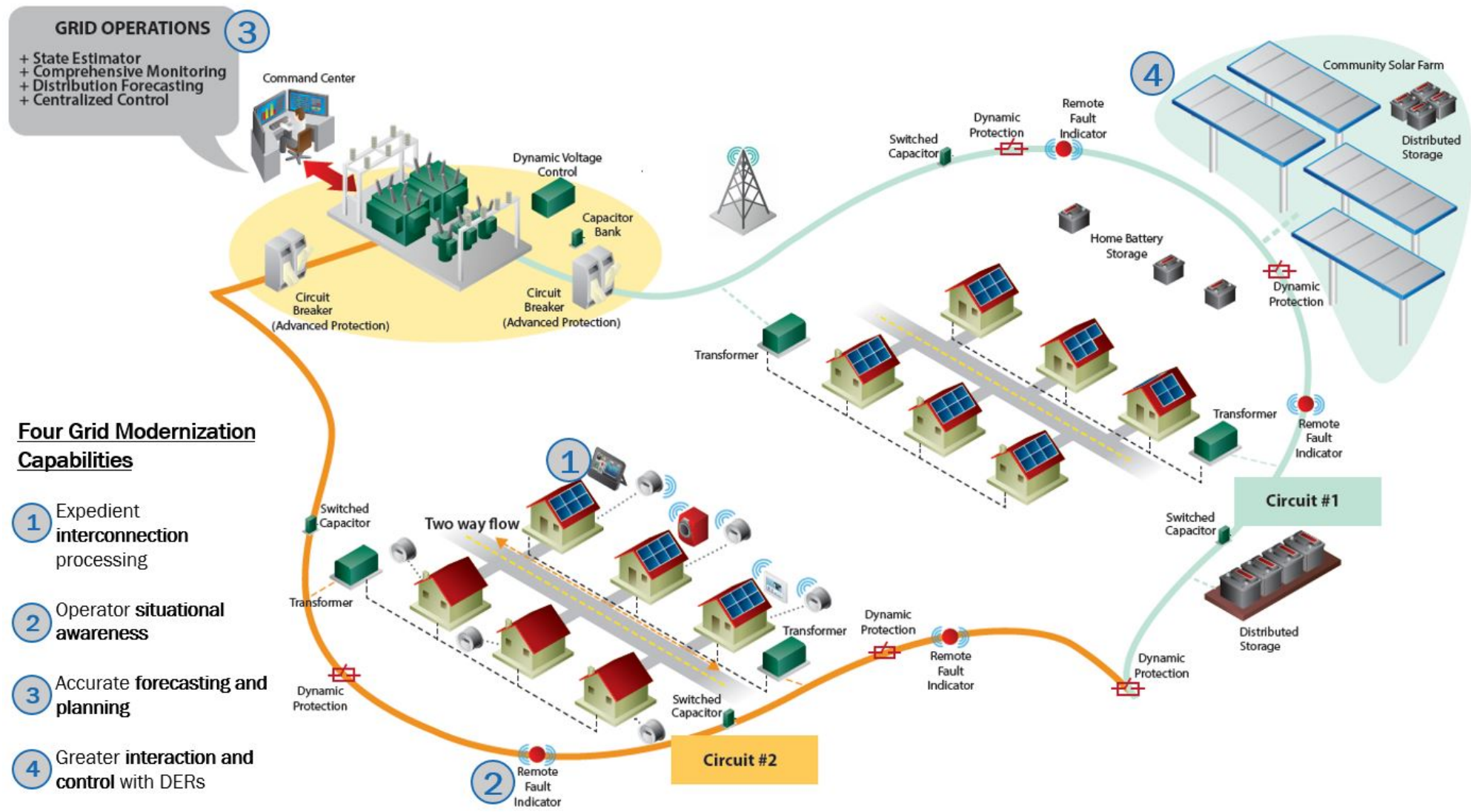
- Should be minimal, as programs are still dispatched according to the same criteria.

Overview of Regulatory Proceedings/Path Forward

- Distribution Resources Plan OIR (DRP)
 - AB 327 required utilities to submit a DRP by July 1, 2015
 - DRP OIR will delineate the distribution system needs and how those needs can be optimally provided by DERs
 - DRP OIR underway, proceeding schedule to be issued 4Q 2015
- Integrated Distributed Energy Resources OIR (IDER)
 - Develop a framework to determine how the DERs could be sourced
 - Determine how to implement mechanisms proposed in DRPs
 - IDER to be handled in two phases. CPUC Decision pending to finalize scope.
- SB 350 and SB 802
 - SB 350 creates an Integrated Resources Plan process
 - AB 802 provides utilities incentives to bring buildings up to code
 - Additional regulatory proceedings to be initiated to implement goals

Appendix

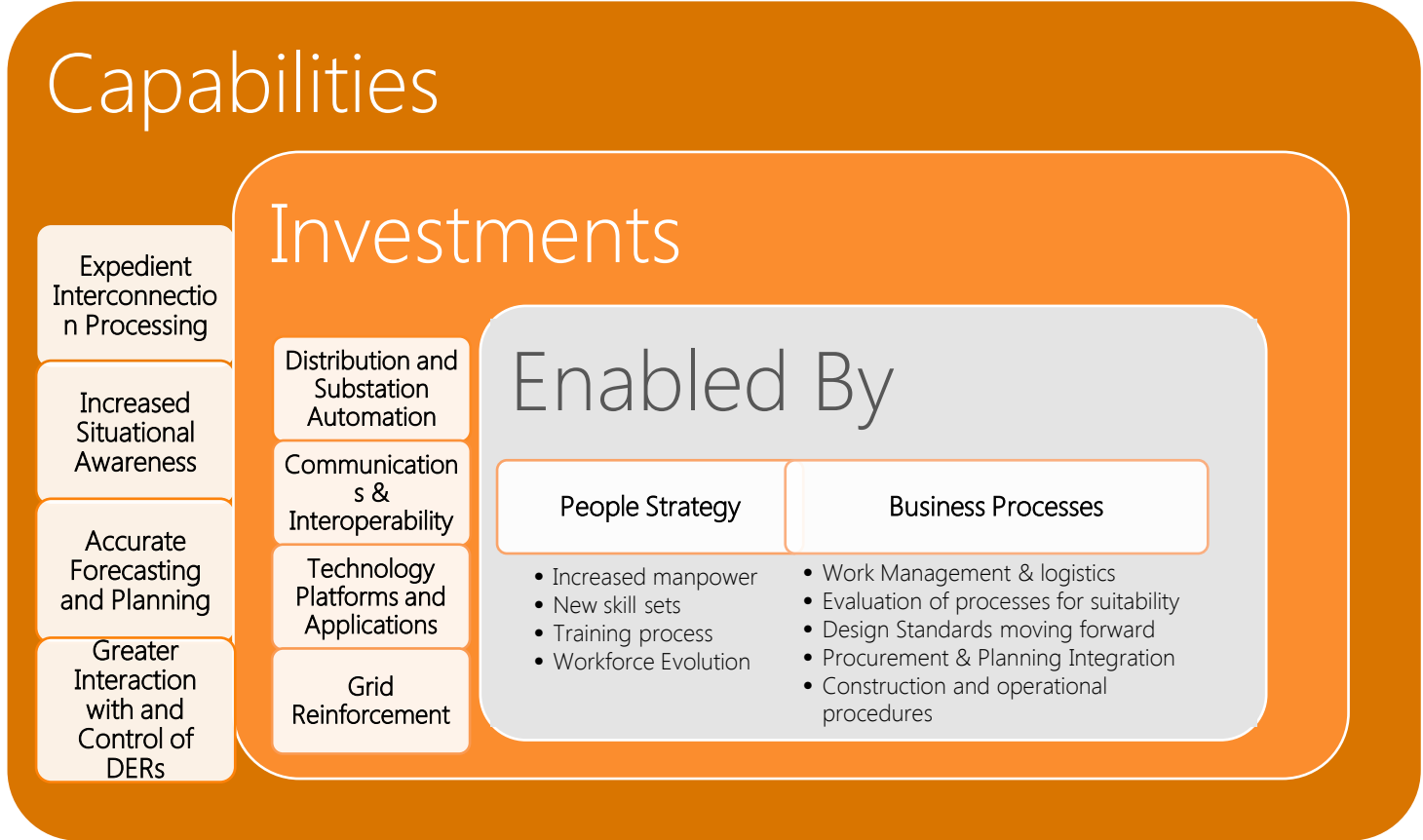
SCE's Vision for a 21st Century Power System



Grid Modernization Investment Plan

- To meet the Commission's objectives, SCE plans to begin foundational grid modernization investments immediately
 - Investments to increase distribution grid capacity and resiliency for DERs in some areas
 - Integrated grid technologies necessary for the 21st century power system
 - Broad deployment over a number of years beginning with foundational and enabling deployment of tools, applications, and grid devices

Grid Modernization Requirements



Integration Status of SCE's Demand Response Portfolio

Demand Response Program/Contract	Integration Status	Customers (Aug. 2015)	Customer Class	MW (approx.)
Base Interruptible Program	Real-Time Reliability Energy	611	Non-Res	590
Ag Pumping & Interruptible	Real-Time Reliability Energy	1,224	Non-Res	55
Summer Discount Plan	Real-Time Reliability Energy with Day Ahead Economic Energy	313,010	Res & Non-Res	385
Capacity Bidding Program	Day Ahead Economic Energy	838	Non-Res	15
Aggregator Managed Portfolio	Day Ahead Economic Energy	1,266	Non-Res	80
Total Integrated MW (aka Supply Resource DR)				1,125
Critical Peak Pricing	Not Integrated	3,588	Non-Res	30
Save Power Day	Not Integrated	385,612	Res	30
Demand Bidding	Not Integrated	801	Non-Res	5*
Total Non-Integrated MW (aka Load-Modifying DR)				65

*Due to BIP/DBP dual participation, approximately 95% of DBP's 100 MW load impact is integrated under BIP.