

**Getting “Connected”: Energy Efficiency
Opportunities through Product
Communication
with Energy Management Systems & the Grid
– *Smart Grid Climate & Energy Policy Drivers***

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SCE Smart Grid Vision

- ❖ Develop and deploy a more reliable, secure, economic, efficient, safe and environmentally-friendly electric system



**Renewable & Distributed
Energy
Resource Integration**

Integrate and manage new sources of renewable and distributed energy supply and storage



**Grid Efficiency
& Resiliency**

Improve capital efficiency and assets using better intelligence and technology for optimal system management



**Workforce
Safety &
Effectiveness**

Maximize workforce productivity, effectiveness, and safety by using enabling tools and technologies



**Information &
Communications
Technology**

Enable the grid to automatically adjust to changing loads and supply requirements



**Customer
Empowerment**

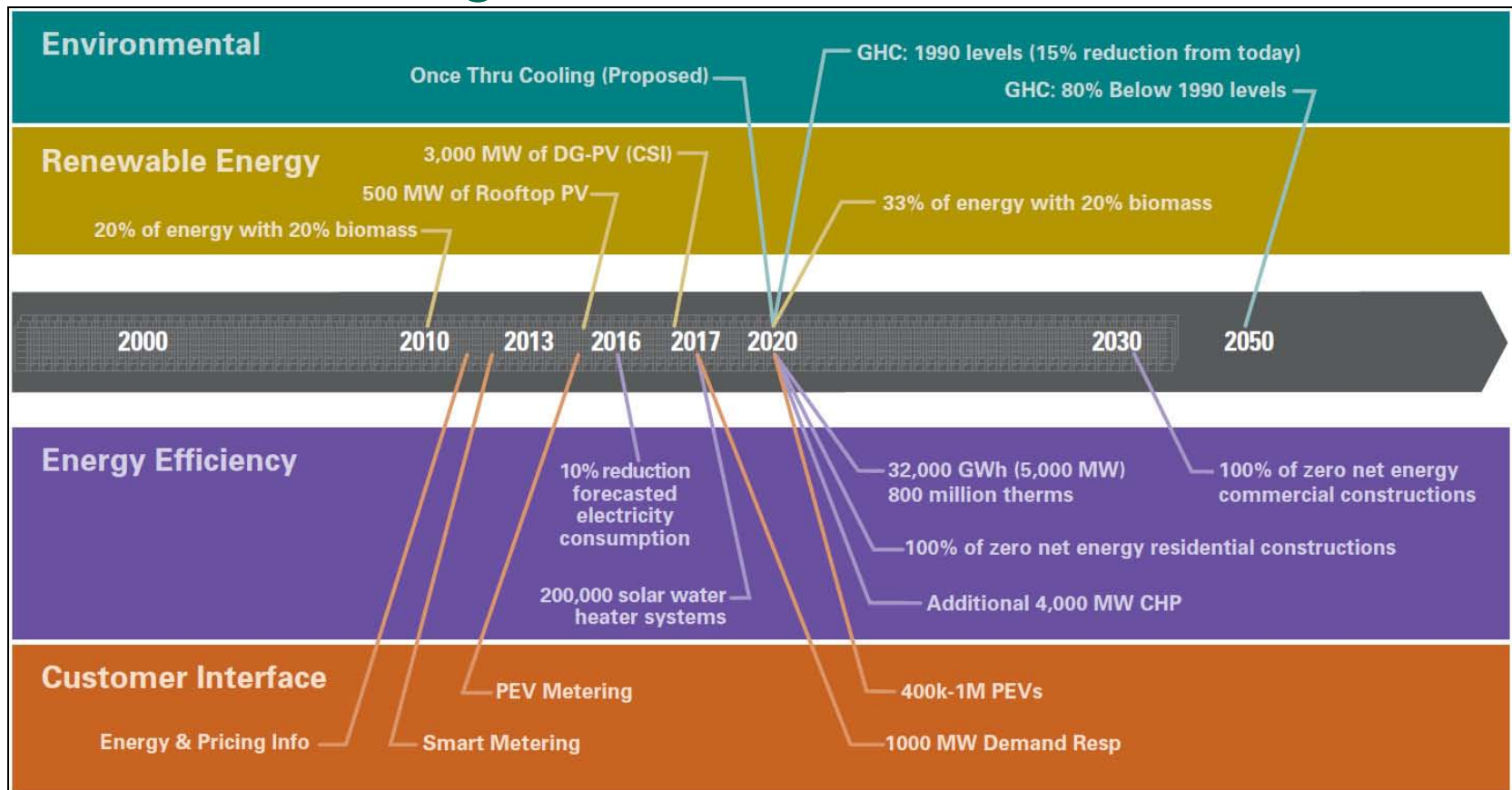
Empower customers to become “active” participants in the energy supply chain managing their own energy consumption

Smart Grid Benefits to Customers

- ❖ Empower Customers to Manage their Energy Costs and Provide New Services
- ❖ Create Customer Value thru Advanced Metering Solutions
- ❖ Support Customer Energy Choices and Strategies
 - TOU/CPP/RTP rates and service automation
 - Solar metering and plug-in electric vehicles/hybrids
 - Premise automation networks and smart appliances
 - 2013 CEC Title 24 communicating thermostats (PCTs)
 - 2013 CEC Title 24 demand response lighting controls
 - 2013 CEC Title 24 addressable ballasts

California Climate & Energy Policies

❖ Policies Driving the Need for a Smart Grid



Impact of Energy Policies on the Grid by 2020

- ❖ High penetration of Solar and Wind generation
 - 33% electricity from renewable sources
 - Clean Energy Job Plan
 - 20,000 MW of renewable generation
- ❖ Zero Net Energy (ZNE) Residential New Construction
 - California Long-Term Energy Efficiency Strategic Plan (CLTEESP)
- ❖ Plug-in Electric Vehicle (PEV) charging at home or work
 - Projected : ~1M PEVs
- ❖ Renewable Portfolio Standard (RPS)
 - Utility-Scale PV (500 MW) and CSI PV (2000 MW) by 2017
- ❖ Smart Connect Goals
 - Load Control: 1000MW of Demand Response by 2015
 - Conservation: 1% of load reduction from using IHD

SCE Smart Grid Efforts

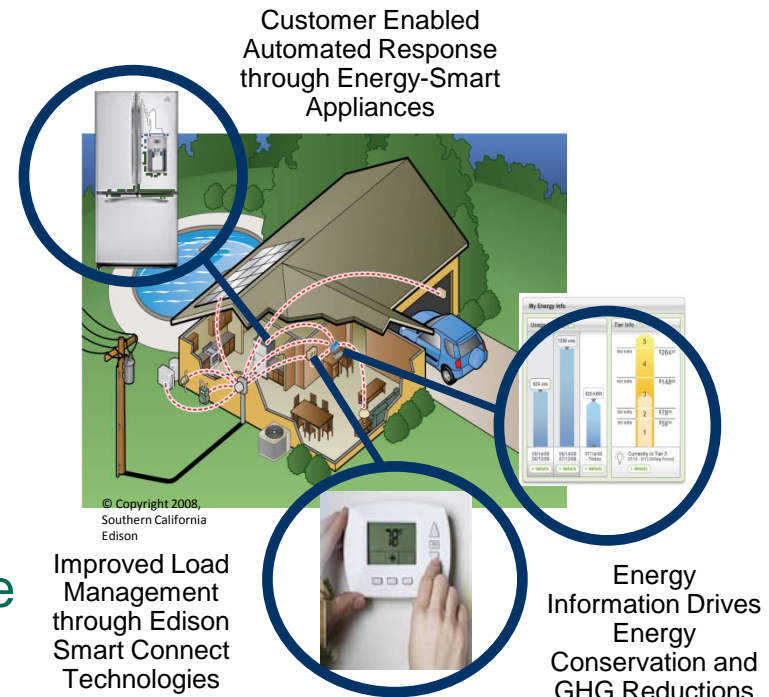
❖ Irvine Smart Grid Demonstration

- Energy Smart Customer Devices
 - Evaluating ZNE home on the grid
 - PEV charging at home/work
- Y2020 Distribution System
 - Distribution circuit constraint management using energy storage
 - Enhanced circuit efficiency and power quality thru Volt/VAR and frequency control
 - Self-healing distribution circuits
 - Deep grid situational awareness for transmission operators using Phasor technology
- Secure Energy Network
 - Demonstrating end-to-end cyber security and interoperability of three primary networks inter-utility, intra-utility and field area
- Workforce of the Future
 - Identify the organizational impacts and educational curriculum development to produce the next generation utility worker

SCE Smart Grid Efforts (cont'd)

❖ Evaluating ZNE Homes on the Grid

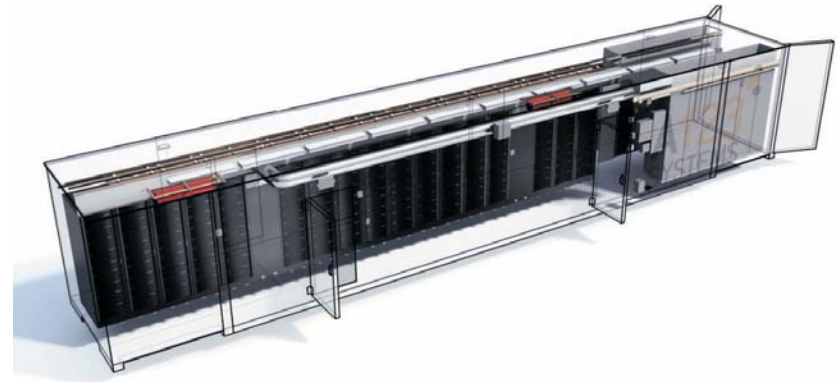
- Demonstrate and test the effect on distribution circuits as residential loads are reduced through aggressive Energy Efficiency (EE) measures and smart appliances, and further altered through the addition of on-site solar generation and energy storage systems
- Explore feasibility of the 2020 CLTEESP's ZNE home vision and manage the home's demand on the electric grid through demand response (DR) programs and home automation methods



SCE Smart Grid Efforts (cont'd)

❖ Tehachapi Wind Energy Storage Project

- The project is the largest grid applied lithium-ion energy storage system (8MW-4hr or 32MWhr) coupled with a Smart Inverter
- The project intends to test and demonstrate 13 research objectives, both individually and “stacked”



Integrated Demand Side Management (IDSM)

- ❖ Energy Efficiency and Demand Response Programs Delivery Integration Efforts
 - Commercial New Construction program
 - USGBC LEED DR credit
 - Third Party IDSM program
 - Energy Efficient Permanent Load Shifting program
 - IDSM pilot for food processing
 - IDSM marketing
 - Technology Resource Incubator Outreach (TRIO) program
 - DR Energy Leaders Partnership program

Thank You!

