# *Southern California Edison Company*
# *Irvine Smart Grid Demonstration*

## *Project Description*

Southern California Edison (SCE) and its partners will deploy advanced Smart Grid SG) technologies in an integrated system to be more reliable, secure, economic, efficient, safe, and environmentally friendly. The technology demonstrations will include three main areas: (1) Energy Smart Customer Devices such as smart appliances, home scale energy storage, and photovoltaic (PV) solar systems to achieve Zero Net Energy homes and Zero Grid Impact electric vehicle (EV) charging at work; (2) Year 2020 Distribution System including distribution automation with looped circuit topology, advanced voltage/VAR control, advanced distribution equipment, smart metering, utility-scale storage, and dispatched renewable distributed generation; and (3) a Secure Energy Network to demonstrate end-to-end management of a complex high performance telecommunication system linking the CAISO to SCE's back office, field networks, and energy smart devices in the home. Other specific aspects of sub-projects include: distribution circuit constraint management, enhanced circuit efficiency and power quality, self-healing circuits, deep grid situational awareness, and end-to-end cyber security and interoperability. The demonstration will be conducted in Irvine, California and will include two 12kV distribution circuits fed by SCE's MacArthur Substation, residential homes, and EV charging in a parking lot at the University of California, Irving. Additional project elements include investigating the SG's impact on the Workforce of the Future and developing, as an educational outreach, an Irvine SG Demonstration Center

## *Goals/Objectives*

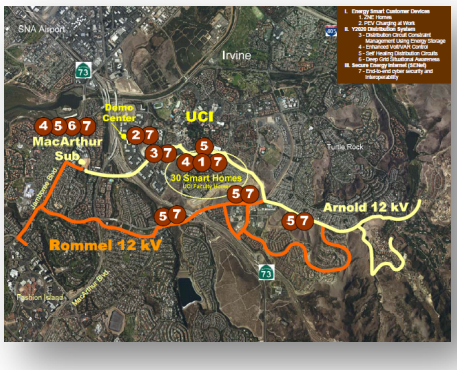
- Verification of the viability of various Smart Grid technology deployed in an integrated manner
- Quantification of Smart Grid costs and benefits
- Test and validate the scalability of several Smart Grid elements.
- Demonstrate Zero Net Energy home functionality

### *Key Milestones*

- Finalize Baseline Measurements Plan (2nd Qtr 2011)
- Engineering, Design and Specification Complete (3rd Qtr 2012)
- **Field Deployment and Installation Complete (4th Qtr 2012)**

### *Benefits*

- Energy independence advanced through increased renewable resource usage
- Greenhouse gas emissions reduced through energy efficiency & EV technology
- Test beds can advance U.S. technologies for a "Global Green-Tech Edge"
- Evaluate organizational capabilities needed for Smart Grid implementation




## CONTACTS

**David Szucs**
Project Manager
National Energy *T*echnology Laboratory
626 Cochrans Mill Road
Pittsburgh, PA 15236-0940
412-386-4899
David.Szucs@netl.doe.gov

**Michael Montoya**
Principal Investigator
Southern California Edison
2131 Walnut Grove Avenue
Rosemead, CA 91770-3769
626-302-4930
Michael.R.Montoya@sce.com

## PARTNERS

General Electric
Boeing
University of California, Irvine
University of Southern California
SunPower Corporation
A123 Systems
Electric Power Research Institute
California Energy Commission

## PROJECT DURATION

02/09/10–12/31/2014

## BUDGET

**Total Project Value**
$79,242,416

**DOE/Non-DOE Share**
$39,621,208/$39,621,208

## EQUIPMENT

***MacArthur Substation Upgrades***

***Public EV Grid Charging w/Solar PV& Battery Storage***

***Residential Solar PV & Storage***

## DEMONSTRATION STATES

California
CID: OE0000199

*Managed by the National Energy Technology Laboratory for the Office of Electricity Delivery and Energy Reliability*