SCE’s Microgrid Projects: Fort Irwin

SAME Conference

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Today’s Objectives

• Introduce the Fort Irwin Project microgrid project
• Discuss Project Objectives, Scope, and Function
• Customer Benefits
• Trends / Questions
Distributed Energy Resources (DERs)

SCE is modernizing the grid to support customer adoption of new technologies, referred to collectively as Distributed Energy Resources, or DERs.

Types of DERs:

• **Distributed renewable generation resources:** Solar power generated from rooftop solar panels or other energy sources on the customer end of the power grid.

• **Energy efficiency:** Reducing demand for energy through upgrades such as improved lighting, smarter appliances and better insulation.

• **Energy storage:** Batteries that can be charged during off times, such as mornings, and then discharged during peak times, such as hot afternoons, to reduce peak energy needs.

• **Electric vehicles:** Plug-in cars and other innovative vehicles that will reduce our dependence on fossil fuels.

• **Demand response:** SCE's Summer Advantage Incentive and similar programs that give customers incentives to reduce the use of electricity at peak times.
Microgrids

What is a microgrid?
A microgrid is a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.

What potential benefits do they have?
• Support disaster/emergency operations
• Improve customer and grid resiliency
• Reduce costs through increased efficiency and reduced peak energy consumption
• Microgrids that incorporate DER solutions may improve air quality and reduce GHG emissions
Fort Irwin Microgrid
Fort Irwin Army Base

Customer Overview

Fort Irwin is the US Army’s Principal Desert Warfare Training Center

- Located near Barstow, CA at the end of a 30-mile transmission line
- SCE has owned, operated and maintained the electrical distribution system for Ft. Irwin since March 2003
- 26MW max demand
- Leadership has zero tolerance for vulnerability
The DOD has an established objective to enhance resilience at its bases.

Specifically, the DOD’s Office of the Assistant Secretary of Defense, Energy, Installations, and Environment is leading energy resilience initiatives to help ensure that the DOD has the ability to prepare for and recover from energy disruptions that impact mission assurance on military installations.

The DOD believes “energy resilience” encourages the necessary planning and capabilities to ensure available, reliable, and quality power to continuously accomplish DOD missions” and as such, the DOD “continues to pursue a number of initiatives to enhance the energy resilience of its military installations....”

**Solution**: Install microgrid behind-the-meter to:
- Power critical loads during grid outages
- Support DOD objectives to increase energy resiliency and renewables at its bases
Fort Irwin Microgrid – Overview

**Area Map and Key Components**

**MG Generation**
**FUNDING SOURCE:** Customer through third party developer
- New synchronous generation*
* Microgrid will incorporate existing renewable generation

**MG Infrastructure**
**FUNDING SOURCE:** Customer through Edison Utility Privatization Agreement
- Includes switches, conductors, communication, control equipment, etc.
- Advice Letter 3510-E was approved by the Commission on June 15, 2017

**ES System**
**FUNDING SOURCE:** SCE through Energy Storage Integration Program
- Renewables smoothing
Fort Irwin Microgrid Project Learnings

• Demonstrating the technical viability of microgrid technology
• Gaining knowledge about the design, installation, operation, control and management of microgrid systems
• Studying the role of the utility, if any, in the provision of microgrid services, including installation of added facilities, controls, and when such services are appropriate
• Determining the time, effort and costs involved in facilitating the proper maintenance and control of microgrids
• Gauging the extent to which microgrids may facilitate the energy resilience and renewable energy goals of the DOD
• Gauging the extent to which microgrids may be replicated and scalable (possibly with modifications) to develop potential energy resilience and renewable energy solutions for other DOD facilities and/or other retail customers
• Improving knowledge regarding the scope and mix of energy resources required to support the microgrid, including the extent to which on-site renewable generation may reliably support load requirements
• Studying the interaction between energy storage and microgrid systems if possible, and developing best practices for the implementation and operation of such systems;
Fort Irwin Microgrid – Activities

- SCE partnering with Fort Irwin to finalize design
  - Evaluating multiple sources of generation
  - Confirming critical facilities
  - Reviewing economic payback
- SCE installing infrastructure to support microgrid
- Kicked-off efforts to design microgrid controller, communications, interconnection, etc.
- Fort Irwin partnering with third-party provider to implement natural gas pipeline
- Expected in-service date in 2021
Opportunities/Trends
California Environmental Goals & SCE’s Pathway*

- Climate change and air pollution driving green house gas (GHG) and air pollution goals
- Goal for 40% reduction in GHG by 2030
- Electric grid supplied by 80% carbon-free energy
  - Grid integration of renewable resources (solar, wind, etc.) for use of zero-emission

*Click here for information on SCE’s Clean Power and Electrification Pathway
Community Microgrids - Considerations

Community Microgrids serve groups of customers within a limited geographical area, and the energy company manages the elements of the microgrid, including one or more sources of generation and potentially storage. Electricity produced by customers in a Community Microgrid is delivered to other customers within the microgrid, which normally requires the use of the utility’s distribution system.

Although Single-Meter Microgrids are permissible under utility regulations, Community Microgrids can introduce regulatory and technical challenges.

- Current CA regulations do not support or allow implementation of Community Microgrids as they involve linkages to the grid which pose technological and safety challenges in emergency situations and because they may require utility equipment, management, and energy procurement that could shift costs to customers who will not benefit from the project; this is not currently authorized by state regulations.

- SCE is currently working on the development of new standards, tariffs, and cost allocation methodologies to address potential microgrid developments not contemplated in existing regulations.
Opportunities/Trends

• Resiliency is the word
  – Public Safety Power Shut-off vents are driving customer and utilities to seek alternatives

• For SCE integrating and communicating with and controlling multiple types of DERs id the next frontier
  – Concerns over cybersecurity are paramount
Q & A