

Federal Utility Partnership Working Group  
Providence, Rhode Island  
April 15, 2010

**Renewable Generation and  
Interconnection to the Electrical Grid  
in Southern California**

**Daniel Tunnicliff, P.E.  
Manager, Government & Institutions**

# Overview

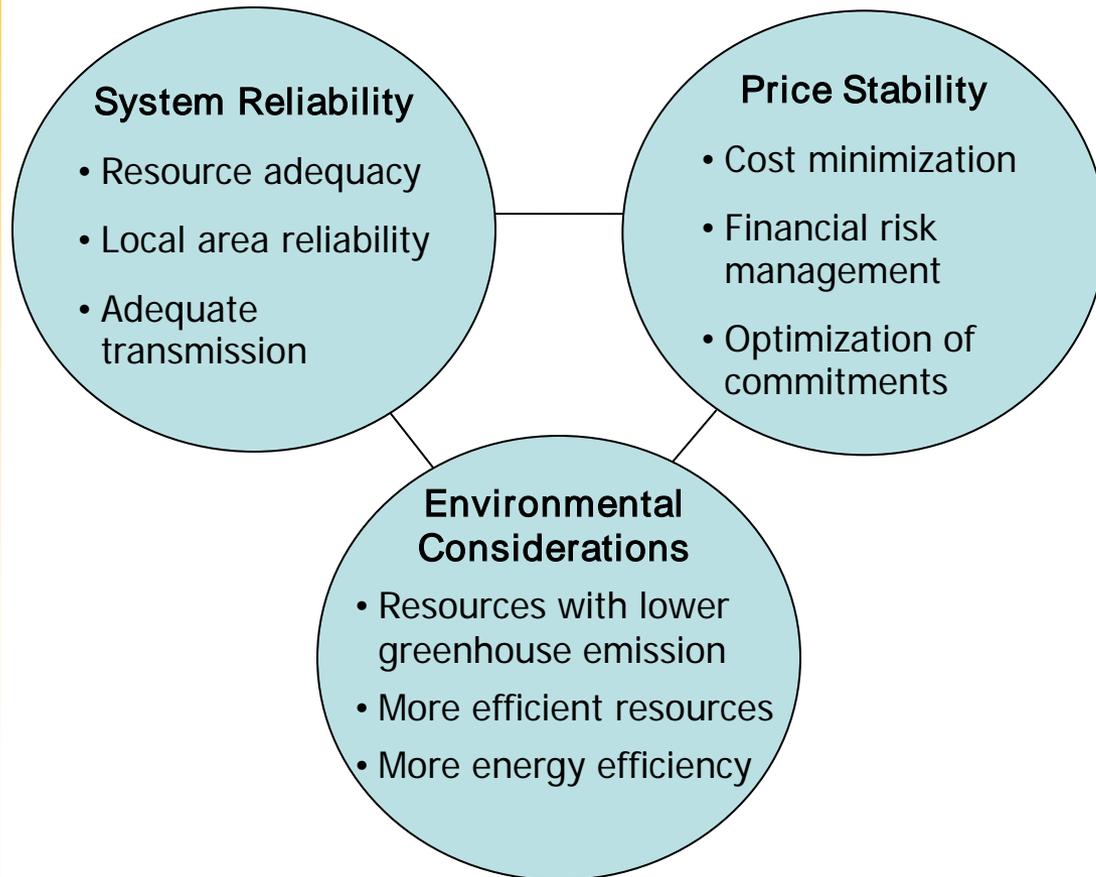
- SCE Overview
- SCE Procurement Objectives
- Renewable Procurement
- Challenges to Meeting Renewable Goals in California
- Interconnection Processes
- Lessons Learned

# SCE Overview

- Large system
  - 13 million residents
  - 4.8 million customer accounts
  - 50,000-square-mile service area
- Nation's leader in environmental solutions
  - Energy efficiency
  - Renewable energy procurement
  - Electric transportation
  - Advanced meters
  - Smart grid



# SCE's Procurement Objectives



**Balance objectives through CPUC/CEC's loading order:**

- **Energy efficiency**
- **Demand response**
- **Renewable resources**
- **Distributed generation**
- **Clean and efficient fossil-fired generation**

# Renewable Generation Procurement

- Open Solicitations
- Renewable Standard Contracts
  - Individual contracts up to 20 MW
  - Solar, wind, geothermal, small hydro, biomass
- SCE Solar PV Program
  - 500 MW over 5 years in SCE's service territory
    - 250 MW will be utility-owned generation
    - 250 MW owned by independent power producers
- CREST Feed-in-Tariff
  - Maximum project size of 1.5 MW, may increase to 3 MW
  - Solar, wind, geothermal, small hydro, biomass

# Challenges to Meeting Renewable Goals in California

- Transmission, Transmission, Transmission
  - Several new large transmission projects are required to significantly increase the State's renewable generation
  - California Independent System Operator (CAISO) generation queue is severely backlogged, but reform initiative appears to be working to manage more effectively
- Multiple agencies involved
- Managing customer and developer expectations
- Tradable Renewable Energy Credits (TREC)s are recognized by the California Public Utilities Commission (CPUC) to satisfy obligations under California's RPS

# Interconnection Processes

- The purpose of interconnection processes is to facilitate access to the grid in a safe, reliable, equitable and economic manner
- Interconnection and tariff regulations are overlapping, evolving, and can range from “streamlined” to “involved”
- Interconnection projects fall into two categories:
  - Wholesale projects
    - Load
    - Transmission
    - Large generators (greater than 20MW)
    - Small generators (20MW or less)
  - Retail projects
    - Typically non-export

# Wholesale Generation Interconnection

- FERC jurisdictional
  - The Federal Power Act defines a “wholesale sale” as “a sale of electric energy to any person for resale”
- Applicant may sell services (energy, capacity or RECs) to qualified entities other than SCE
  - FERC has stated States have jurisdiction over RECs
- Project size determines the procedure for processing the generation interconnection applications and the study methodology
  - Projects greater than 20 MW
    - Cluster study methodology
  - Projects equal to or less than 20MW
    - Serial study methodology

# Retail Generation Interconnection Projects

- CPUC jurisdictional
- Interconnection request are processed pursuant to Rule 21
- A System Impact Study and Facilities Study may be required
- Typically applicable to “behind the meter” projects
- Ability to export is limited

# Basics on the Interconnection Process

- Project developers (“Applicants”) provide a completed application for interconnection pursuant to established tariffs
- Interconnection studies are performed, based upon the application, to examine the impact of the project on SCE’s electric grid and to identify upgrades required to safely and reliably interconnect the project
- Projects are assigned a certain cost responsibility related to the cost of the required upgrades the project triggers
- Based upon the results of the interconnection studies, an interconnection agreement is drafted and tendered to the customer
- Typically, the interconnection agreement must be executed, or accepted by FERC, before SCE commits to engineer, permit, procure and construct the required facilities

# Cost Responsibility under the CAISO/WDAT Tariff

- Network upgrades costs
  - Financed by the applicant
  - Refunded to the applicant after the project goes into service over a five year term
- Distribution system upgrades costs
  - Applicant is required to pay actual cost if sole use facility. Otherwise, applicant splits costs with other customers also using the facility.
  - Non-refundable
- Interconnection facilities costs
  - Specific to the interconnection request
  - Applicant is required to pay actual cost
  - Non-refundable

# Interconnection Agreement

- Interconnection Agreements contain:
  - Estimated cost and schedule
  - Defines the network upgrades, distribution upgrades, and interconnection facilities to be constructed
  - Identifies major milestones
  - Defines the point of interconnection
  - Specifies the required financial obligations
- Interconnection Agreements do not contain:
  - Provisions for power procurement
  - Generation tie-lines
  - Access to SCE rights-of-way
  - Power purchase provisions / obligations

# Lessons Learned

- Determine objectives
- Initiate discussions early
- Leverage working group members and others that have developed projects

# Questions and Answers

## Useful Links

- The CAISO Tariff can be found on the CAISO website at:  
<http://www.caiso.com/pubinfo/tariffs/index.html>
  - CAISO's CLGIP is Appendix Y to the CAISO Tariff
  - CAISO's SGIP is Appendix S to the CAISO Tariff
  
- SCE's WDAT and interconnection requirements for wholesale generation can be found at:  
<http://www.sce.com/AboutSCE/Regulatory/openaccess/>
  - SCE's CLGIP is Attachment H to the WDAT
  - SCE's SGIP is Attachment G to the WDAT
  
- SCE's Tariff Rule 21  
<http://www.sce.com/NR/sc3/tm2/pdf/Rule21.pdf>
  
- Interconnection Handbook, Wholesale Generators  
<http://www.sce.com/AboutSCE/Regulatory/openaccess/>