CPUC Self-Generation Incentive Program (SGIP)
Ninth-Year Impact Evaluation Highlights

This report summarizes an evaluation of impacts resulting from distributed generation (DG) technologies under the ninth Program Year (PY09) of the SGIP.

Program Overview

- SGIP was established in 2001 as response to peak demand problems facing California.
- DG technologies eligible under the SGIP have included solar PV; wind energy; and fossil and renewable-fueled internal combustion engines (IC Engine), fuel cells (FC), microturbines (MT), and small gas turbines (GT). As of 01/01/08, only wind and fuel cell technologies remained eligible. Additionally, advanced energy storage (AES) technologies are eligible for incentives if they accompany an eligible SGIP project.
- Under SB 412, the CPUC is examining reconfiguration of the SGIP. SB 412 extends the SGIP to January 1, 2016 and limits incentives to DG technologies that help achieve greenhouse gas (GHG) emissions. The CPUC is investigating the role of combined heat and power technologies in the reconfigured SGIP.
- SGIP as of 12/31/09:
  - Over 1,300 on-line SGIP projects.
  - Over 350 MW of rebated generating capacity.
  - Nearly $623 million incentives paid to Complete projects, with approximately $94 million reserved for Active projects.
  - Matched by private and public funds at a ratio of over 1.4 to 1.
  - Total eligible project funds more than $1.8 billion, corresponding to Complete projects.
- Rebated Capacity:
  - PV technologies: nearly 136 MW (close to 40% of SGIP total capacity).
  - FCs, IC Engines, GTs, and MTs powered by non-renewable fuels: over 173 MW (approx. 55% of SGIP total capacity).
- Incentives Paid:
  - PV technologies: nearly $461 million (approx. 74% SGIP total incentives paid).
  - IC engines (renewable- and non-renewable fueled): over $89 million (approx. 14% SGIP total incentives paid).

Program Impacts

- Energy: By the end of 2008, SGIP facilities were delivering over 868,000 MWh of electricity to California’s electricity system—enough electricity to power nearly 130,000 homes for one year.
Cogeneration facilities supplied nearly 77% of that total.
PV systems provided nearly 23%; down 4% from PY07.
PG&E, the largest PA contributor, providing 40% of total delivered electricity.

Peak Demand: 1,295 SGIP projects on-line during CAISO 2009 peak, providing over 349 MW of generating capacity and representing an aggregated capacity factor of 0.47 MW of peak SGIP capacity per MW of rebated capacity
- GTs: highest peak capacity factor at 0.90 kWh of peak capacity per kWh of rebated capacity.
- PV: aggregate CAISO peak capacity factor of 0.51 kWh per kWh.
- PV: 39% of peak capacity from SGIP facilities during CAISO 2009 peak

Greenhouse Gas (GHG) Emissions: SGIP provided net GHG emission reductions of over 63,000 tons of CO₂ equivalent in 2009; making a total cumulative GHG reductions from SGIP since 2005 of over 561,000 tons of CO₂ equivalent. For PY09:
- PV provided approx 72% of total reduction; up by 7% from PY08.
- Biogas-fueled DG facilities reduced nearly 33,000 tons of CO₂ equivalent.
- PA % of total: PG&E, approx. 59%; SCE, approx. 22%; CCSE, approx. 8%; SCG, approx. 10%.

Efficiency and Waste Heat Utilization: Cogeneration facilities made up close to 61% of the SGIP PY09 capacity, providing electricity and recovering and using waste heat for on-site heating and cooling needs. These facilities are required to achieve efficiency and waste heat requirements set by Public Utility Code (PUC).
- All SGIP cogeneration technologies achieved and exceeded PUC 216.6(a) efficiency and waste heat requirements.
- FCs, GTs, and IC engines were able to meet and exceed PUC 216.6(b), but MTs fell short.
- Good match of electrical and thermal loads can play significant role in offsetting peak demand and reducing GHG emissions.

Additional Observations:

The SGIP continues to provide significant value as a unique test bed for examining the actual performance of a mix of DG technologies operating in a commercial setting within California’s utility and regulatory framework.
- Multiple year trend analyses have provided important information on the impact of aging and deterioration on DG performance.
- Impact evaluations have provided insights into possible areas of improvements of DG technologies and how additional benefits may be gleaned from DG systems.

As the CPUC moves forward with reconfiguring the SGIP in response to SB 412, impact evaluation results can be useful in helping to set targets for the new program and identifying ways to measure progress towards those targets.