Renewable Energy

Building on previous investor-owned utility (IOU) and publicly owned utility (POU) renewables portfolio standards (RPS) in California, a new law was signed in 2011 to establish the following statewide generation portfolio targets: an average of 20 percent of retail sales from eligible renewable resources by December 2013, 25 percent by December 2016, and 33 percent by December 2020. Figure 1 shows the amount of renewable generation for California, excluding large hydro, from 1982-2009 as well as estimates of the amount of renewable generation needed to meet the renewable targets. The graph also shows the amount of renewable energy that could be expected if all investor and public utility renewables portfolio standard contracts are realized and scenarios if 30 or 40 percent of the contracts fail. Each target year range is based on factors that can affect retail sales, including policy goals for energy efficiency, self-generation and combined heat and power, as well as expected levels of economic growth and population growth.

Figure 1: Renewable generation for California and RPS goals
Figure 2 compares the amount of energy that would be available each year if all IOU approved and pending contracts are successful compared to an estimate of the IOU RPS requirements. It also shows utility estimates of the viability of contracts for facilities not yet on-line, based on site control, permitting status, interconnection progress, and transmission system upgrade requirements.¹

Figure 3 shows renewable generation for California from 1982-2009 by fuel type.

Figure 3: California renewable energy generation by fuel type
Figure 4 shows biomass and geothermal in California compared to the amount of these technologies that may be added through 2020. These two types of renewable generation can be operated as dispatchable resources. Figure 4 also shows that the total renewable dispatchable generation has been in decline since 2004. This is due, in large part, to closures and generation curtailments at existing solid fuel biomass facilities. From 2004 through 2008, the decline in the biomass industry out-paced development of new landfill gas and biogas generation units. During this period, six solid-fuel biomass facilities (60 MW, 400 GWh/yr) shut down. During 2010, six facilities temporarily shut down for various reasons, including low energy prices and failure to comply with air regulations. Most of these facilities restarted operations in 2011, but a 30 MW solid-fuel biomass facility announced it is suspending operations early 2012. Signed contracts for new facilities in California and scenarios for the 2010 long-term procurement plan suggest that there may be limited growth in dispatchable renewable facilities by 2020. For more information on efforts to address challenges for existing and new biomass and biogas power plants, see http://www.energy.ca.gov/bioenergy_action_plan/index.html.

Figure 4: Dispatchable renewable generation in California (biomass and geothermal sources)

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2 Generation estimates for the CPUC LTPP scenarios assumed an 80% capacity factor. Generation for operating projects was estimated using generation reported in the Total System Power Report. Total system power may not fully account for biogas and biomass resources co-fired at in-state fossil fuel (natural gas and coal) generation facilities.


4 February 20, 2012 Letter to David Lewis, Director- Renewable Transactions at PG&E, from John Richardson, Vice President of Madera Power, LLC.
Figure 5 shows capacity installed to date and authorized capacity under current programs to advance distributed renewable generation in California. If the programs shown in Figure 5 are fully subscribed, they will provide about 7,400 MW by 2016 beyond the amount (about 1,600 MW) installed prior to the RPS. For more information, see the California’s Clean Energy Future metric on renewable distributed generation.
Figure 6 shows the location of existing, utility-scale renewable facilities in California. For a map showing distributed generation, please refer to the distributed generation metric.
Links:


For more information on investor-owned utility, electric service provider, and community choice aggregator progress, see the RPS Quarterly Reports and the Status of RPS Projects, available on-line at http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm. Also, see the project viability information available at http://www.cpuc.ca.gov/NR/rdonlyres/CFD76016-3E28-44B0-8427-3FAB1AA27FF4/0/FourthQuarter2010RPSReporttotheLegislature.pdf (page 4) and http://www.cpuc.ca.gov/PUC/energy/Renewables/procurement.htm (Project Viability Calculator).


For more information on the amount of new renewable generation required to achieve the 33 percent by 2020 target, see http://www.energy.ca.gov/2011_energypolicy/documents/index.html#03082011.

References:
The following data sources were used to prepare the figures in this metric:


Figure Sources:
2. California Public Utilities Commission based on source [8].
6. California Energy Commission based on source [23]