

Progress of The California Renewable Portfolio Standard
As Required by the Supplemental Report of the 2006 Budget Act



california public
C P U C
utilities commission

Report to the Legislature
APRIL 2007

California's Renewable Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country

Established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107, California's RPS obligates investor-owned utilities (IOUs), energy service providers (ESPs) and community choice aggregators (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. The California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are jointly responsible for implementing the program.

CPUC set to make first determinations of RPS compliance

The CPUC is responsible for determining RPS compliance, based on IOUs' actual RPS deliveries as verified by the CEC. The CEC will soon issue revised 2004-2005 verification reports, using the revised 2003 baseline that the CPUC adopted in March 2007 in response to an application for rehearing.¹ The CPUC expects to determine each IOU's 2004 and 2005 compliance this summer, based on the revised report. In the event of non-compliance, the CPUC will determine whether penalties should be applied, taking into consideration the flexible compliance mechanisms allowed by statute. These mechanisms allow IOUs to apply excess renewable procurement in one year to deficits in other years, subject to certain limitations.

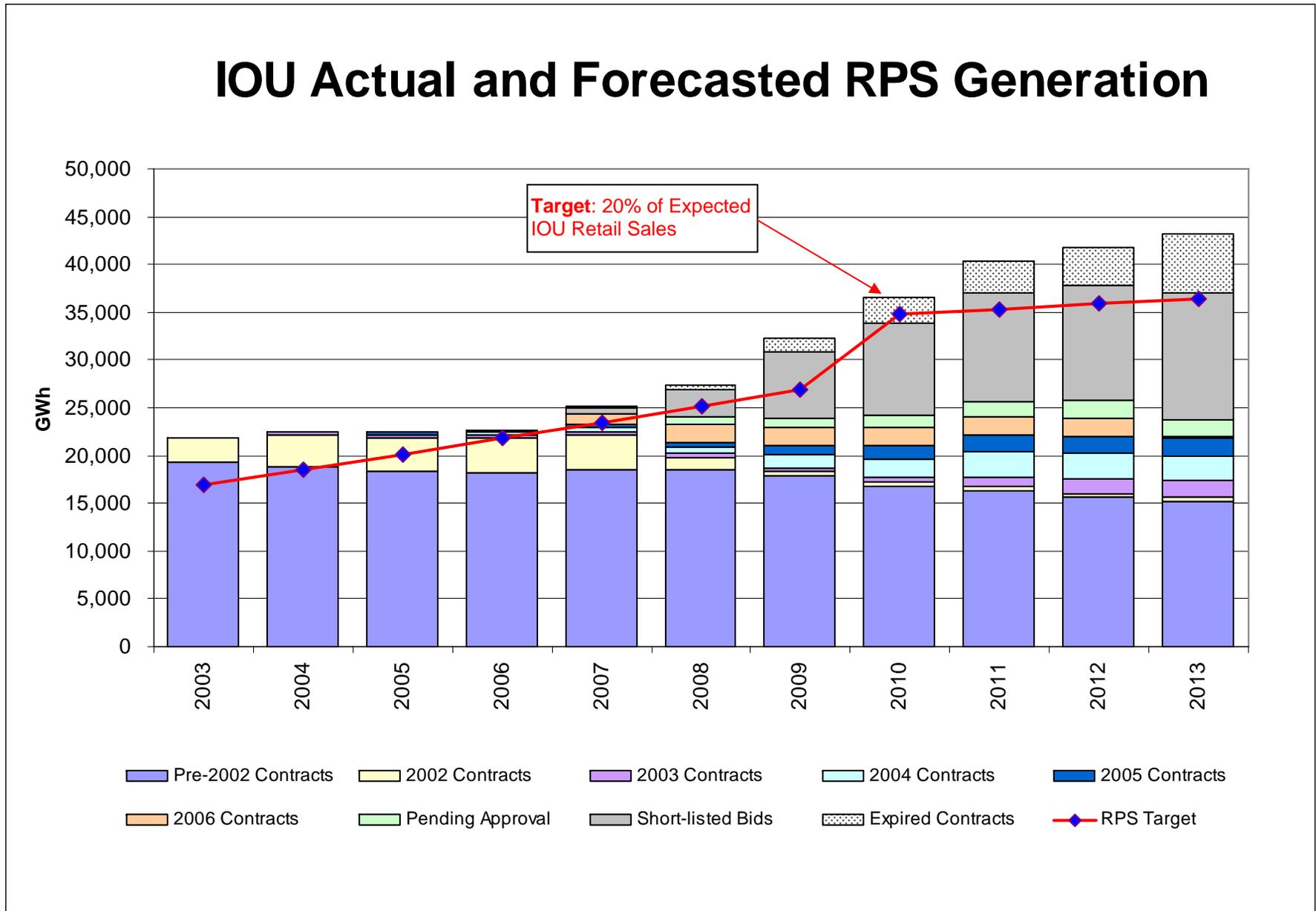
Figure 1, on the next page, is a forecast of RPS generation to 2013. The chart includes (1) actual generation, (2) projected generation from signed contracts, (3) projected generation from contracts seeking CPUC approval, and (4) projected generation from bids, still under negotiation, that resulted from RPS solicitations and bilateral offers.

Important points:

- Figure 1 is not a probabilistic assessment of renewable generation each year – it is a forecast showing contracted and short-listed generation to date
- Forecast reflects only minimum energy deliveries; many contracts and short-listed bids include options for the developer or IOU to increase a project's generation
- Annual RPS targets are based on the revised 2003 baseline and the CEC's 2005 IEPR retail sales forecast; actual targets, determined by the CPUC, may change due to consumer choices re: direct access, community choice aggregation, etc.
- Forecast does not assume a percentage of contract failure - see January 2007 Report to the Legislature for discussion on contract failure
- Forecast is based on the most recent scheduled completion dates for required transmission upgrades
- "Expiring contracts" are included – these contracts represent built RPS capacity, and it is reasonable to assume that they will be re-contracted upon expiration.

¹ At the end of 2007, the CEC will issue a 2006 verification report to verify 2006 deliveries for IOUs, 2001-2006 deliveries for small and multi-jurisdictional utilities, and 2005-2006 deliveries for electric service providers.

Figure 1.



IOUs are actively pursuing contracts for renewable energy

Based on RPS compliance filings made on April 3, 2007, Pacific Gas & Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E) estimate that RPS-eligible energy in 2006 represented 11.9%, 16.0%, and 5.3%, respectively, of their 2006 retail sales.² These percentages represent year-on-year increases in actual renewable deliveries for PG&E and SDG&E, although the growth in percentage terms is diminished because of larger-than-expected retail sales. SCE's renewable deliveries, however, decreased for the second year in a row.

Each IOU is actively pursuing more contracts for renewable energy. Negotiations are ongoing with short-listed bids from the 2005 and 2006 RPS solicitations, and each IOU initiated its 2007 RPS solicitation in March 2007. Not every short-listed bid will receive a contract, but many represent viable projects that may receive contracts and contribute to the 2010 goal. Table 1 provides a summary of the contracts approved since the first interim solicitation was held in 2002, anticipating the program's implementation in 2003:

Table 1.³

Year*	PG&E	SCE	SDG&E
2002	4 contracts (119 MW)	5 contracts (268 MW)	15 contracts (239 MW)
2003	3 contracts (44 MW)	8 contracts (687 MW)	1 contract (40 MW)
2004	6 contracts (371 MW)	0 contracts	6 contracts (580 MW)
2005	7 contracts (180 MW)	4 contracts (37 MW)	4 contracts (139 MW)
2006	6 contracts (219 MW)	0 contracts	0 contracts
Total	26 contracts (933 MW)	17 contracts (992 MW)	26 contracts (998 MW)

* Solicitation year or year that bilateral negotiations concluded

Technologies offer varying benefits and challenges

A variety of resources are considered eligible under the RPS statute: biomass, biodiesel, digester and landfill gas, municipal solid waste, fuel cells using renewable fuels, geothermal, small hydro, ocean thermal and wave, tidal current, solar thermal, photovoltaic, and wind. Many of these resources are represented in RPS contracts, but growth trends for each resource vary due to their unique characteristics.

Wind continues to be one of California's lowest-cost sources of renewable energy and is poised for more near-term capacity growth than any other resource in California's RPS program (see Figure 2). California was a pioneer in developing the modern wind energy industry, and led the country in installed wind capacity until 2006.⁴ A planned build-out of transmission in the Tehachapi region is expected to give access to approximately 4,500 MW of new wind capacity between 2008 and 2013.

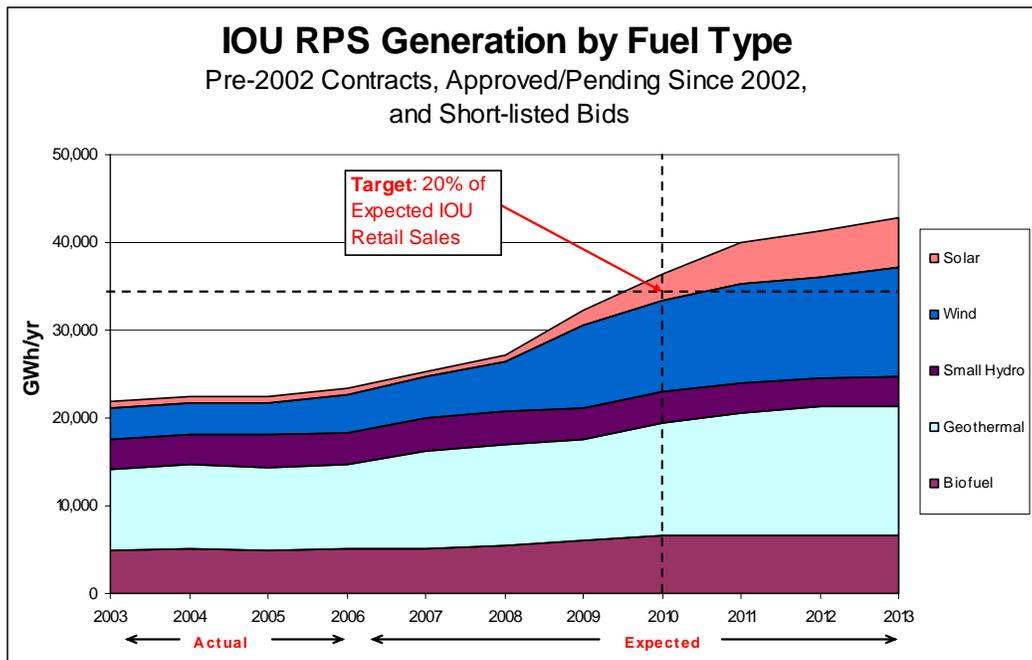
² Annual RPS procurement targets are calculated by adding 1% of the *previous year's* retail sales to that previous year's procurement target. Similarly, compliance in 2010 is calculated as 20% of 2009's retail sales. In this way, IOUs know their targets at the beginning of each year, and will not be out of compliance simply because they underestimated overall electricity demand in a certain year. 2006 RPS deliveries represent 12.5%, 16.7%, and 5.6% of 2005 retail sales for PG&E, SCE, and SDG&E, respectively.

³ 6 of these contracts, totaling 104 MW, were later canceled (see January report for discussion). In cases where contracts were later renegotiated for price and/or capacity, the final minimum capacity is counted here.

⁴ Texas, which now leads the country in installed wind capacity, is estimated to have 20 times California's potential for wind generation. (AWEA, http://www.awea.org/pubs/factsheets/Wind_Energy_An_Untapped_Resource.pdf)

While California has great potential for further increases in wind generation, the price of that power per kWh has trended upwards in California due to a number of factors, including high worldwide demand for turbines, high demand for renewable power in general, and, in some parts of the state, lower capacity factors as developers begin to look beyond the state's prime wind resources. These market forces may open the door for the increased use of other technologies, e.g. solar thermal, photovoltaic, geothermal, biomass and others, that have historically been more expensive than wind. Economies of scale may drive the price of these technologies downward, as they did with wind, creating more opportunities for a diversified renewable energy market in California.

Figure 2.



Important points:

- Forecast includes energy from approved, pending, and short-listed RPS projects (including pre-2002 contracts)
- The majority of 2010 RPS generation will likely come from geothermal and wind energy, but solar energy may see a large percentage increase in coming years
- Energy from biofuels is trending slightly up in real terms but down as a percentage of overall RPS energy (18% in 2010), despite Governor Schwarzenegger's goal that biomass account for 20% of RPS eligible energy in 2010
- Forecast assumes re-signing of IOU contracts set to expire before 2013. Even if not re-signed by an IOU, such contracts will likely be re-signed somewhere in California, and will benefit California ratepayers

RPS procurement employs transparent, least cost/best fit bid evaluation

IOUs are directed to evaluate bids for renewable energy using a transparent, technology neutral least cost/best fit methodology. This methodology captures the effect of market forces such as those discussed above, balancing the need for “portfolio fit” against cost minimization objectives.

At the beginning of each RPS solicitation cycle, each IOU submits a short-term procurement plan and bidding protocol to the CPUC for approval. Filed with the plan and bidding protocol is a detailed description of the IOU’s least cost/best fit methodology. Parties are given the opportunity to file comments on all aspects of the plan, including the least cost/best fit methodology. Following CPUC approval of its plan and protocol, an IOU can initiate its RPS solicitation.

The CPUC requires an Independent Evaluator (IE) for each RPS solicitation. The IE provides third party oversight of the RPS procurement process. At the conclusion of the solicitation, the IE is required to submit a report to the CPUC providing a critical assessment of the robustness of the solicitation, the effectiveness of the least cost/best fit methodology, and a determination of whether that methodology was fairly administered. The IE is also required to submit a contract-specific report whenever a bid from a solicitation is submitted as a contract to the CPUC.

In an effort to increase procurement transparency, the CPUC organized an RPS Transparency Workshop in December 2006 at which each IOU presented its least cost/best fit methodology and the Independent Evaluators reported on their work. The workshop provided parties to the RPS proceeding and developers an opportunity to make suggestions for improving and clarifying the RPS procurement process.

CPUC works to ensure viability of approved projects, identify potential risks early in project development

As detailed in the CPUC’s January Report to the Legislature, ensuring project viability is critical to achieving RPS goals. Because there is project development risk associated with any new generation facility, conventional or renewable, the CPUC works to identify and address risks to RPS projects throughout the project development process.

Initial RPS bids usually contain very little information about project viability, and it is only through the negotiation process that issues such as transmission access, status of permitting and equipment procurement, and technology risk are explored. Throughout negotiations, the IOU consults with its Independent Evaluator, with the CPUC, and with the other non-market entities that make up the IOU’s advisory Procurement Review Group. In this way, many of the potential risks associated with a bid can be identified before it comes to the CPUC as a contract for approval.

The CPUC has assigned one contract manager for each of the three IOUs. These individuals are responsible for reviewing contracts submitted to the CPUC for approval and recommending their approval or rejection. The viability of a proposed contract is a key consideration in the contract review process. The contract manager reviews the project viability matrix submitted with the contract and contacts the IOU and developer for additional information as needed. If the project is approved by the CPUC, the contract manager tracks the project’s progress through biannual status reports and regular communication with the IOU and the developer.

Transmission remains crucial to increasing CA’s renewable generation

Unlike conventional generation, electricity from renewable sources must, for the most part, be generated at the fuel source itself.⁵ Because many of California’s most promising undeveloped renewable resource areas are far from load centers, planning and building new transmission is essential. The CPUC must, among other things, evaluate the transmission needs of proposed RPS projects when approving contracts, must consider those needs when reviewing the project online dates proposed by the developers and IOUs, and must facilitate the proactive development of transmission infrastructure to these regions.

Table 2 lists some significant scheduled and proposed transmission projects that may have a significant impact on California’s RPS. *Projected Capacity of Upgrade* refers to the amount of new capacity – conventional or renewable – the proposed line is expected to provide. *Contracted and Short-listed RPS Capacity* refers to the amount of RPS capacity already under contract or in negotiation with PG&E, SCE, or SDG&E that may benefit from the upgrade. In some cases, such as the Tehachapi Renewable Transmission Project, the RPS capacity listed cannot be brought online without the relevant upgrade. In other cases, such as the Sunrise Powerlink, a justification offered by the proponent is that the project will provide access to RPS capacity.

Table 2.

Network Upgrade	Projected Completion Date	Projected Capacity of Upgrade (MW)	Contracted and Short-listed RPS Capacity (MW)
Antelope Transmission Project (ATP), Tehachapi Renewable Transmission Project (TRTP) - SCE	3/2009 – 11/2013	4,500	1,896
Devers-Palo Verde 2, Devers-Valley - SCE	12/2009	1,200	447
Sunrise Powerlink – SDG&E	6/2010	1,000	488 ⁶
Vulcan-Green Borders - SCE	2012	TBD	610
Stirling Solar Dish Upgrade - SCE	TBD	500-850	500+
Green Path – Citizens, IID, LADWP ⁷	Late 2010	1,200-1,600	TBD

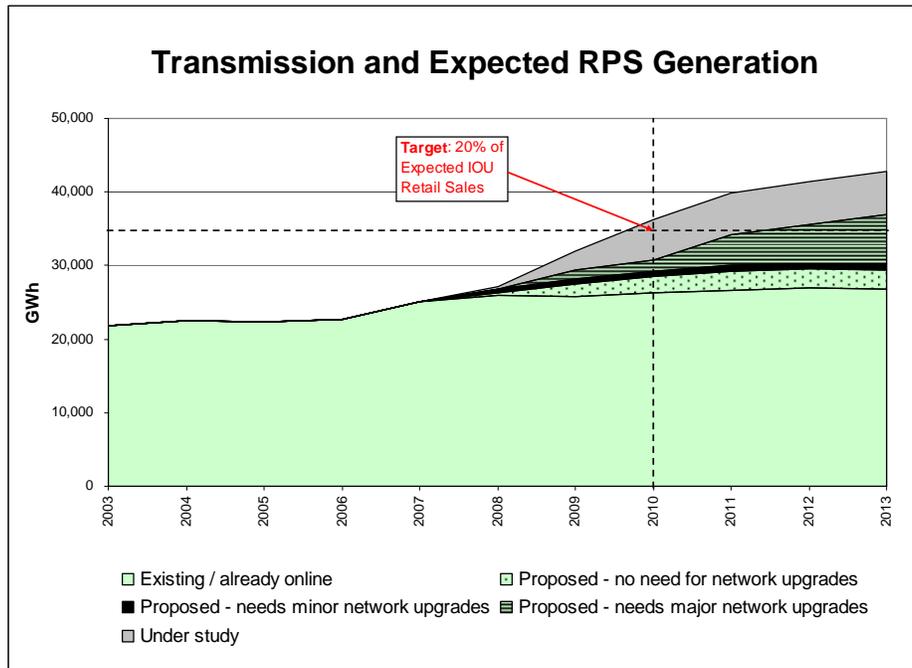
Figure 3, on the next page, shows expected RPS generation to 2013 and its transmission status.

⁵ The main exception is power from biomass, for which fuel is transported to a power plant. Transporting biomass over long distances, however, is neither cost effective nor environmentally beneficial.

⁶ This capacity could potentially be carried over the Southwest Powerlink (SWPL).

⁷ The Greenpath line is currently anticipated to be a joint venture among Los Angeles Department of Water and Power, Imperial Irrigation District, and Citizens Energy. The CPUC understands that the primary purpose of the line is to support the development of renewable resources in the Imperial Valley and that a significant portion of the line would be made available to deliver those resources to the CAISO control area.

Figure 3.



Important points:

- Significant portions of expected RPS generation depend on transmission upgrades; “major network upgrades” refers to upgrades requiring a Certificate of Public Convenience and Necessity from the CPUC.
- The chart reflects the expected online dates of the upgrades required for each individual project. If schedules for the upgrades change, project online dates and overall generation will change, as well.
- Much of the energy in the “under study” category comes from projects still under negotiation. Because some projects have not yet secured site control, the projects’ transmission needs cannot yet be determined.

Identifying, studying, and permitting RPS transmission lines is a time-intensive process that must consider, among other things, economic benefit, grid reliability, and environmental impact. The CPUC collaborates with many stakeholders, including the U.S. Forest Service, the Bureau of Land Management, the California Independent System Operator, the IOUs, city, county, and state agencies, and private landowners. In 2006 the CPUC focused on improving its transmission permitting processes. In June of that year, the CPUC issued Decision No. 06-06-034, providing assurance of cost-recovery for certain RPS-related transmission projects. In July, the CPUC streamlined its transmission permitting process,⁸ and in just the first three months of this year it issued 3 decisions approving transmission projects representing nearly \$1 billion in infrastructure investment. Several additional projects in the early stages of the permitting process have the potential to provide access to large amounts of new renewable resources, and the CPUC is collaborating with all parties in preparing to review these projects as quickly as possible.

⁸ See the Executive Director’s Statement Establishing Transmission Project Review Streamlining Directives: http://www.cpuc.ca.gov/static/energy/environment/060713_transmissionprojectreviewstreamliningdirective.pdf