

California Legislative Perspectives on Geothermal

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Awareness of the potential of geothermal energy resources, particularly undeveloped geothermal resources within the Salton Sea region.

- 44 operating geothermal power plants in California with an installed capacity of 2,716 megawatts, most of it in The Geysers in Sonoma and Lake counties.
- 1.05 gigawatts to 1.8 gigawatts of generation capacity (NREL, November 2015)
- Baseload power.

Legislature has supported geothermal development.

- Most recently, passed SB 1074 (Hueso, Chapter 539, Statutes of 2016) which allocates \$2.5 million in federal funds to projects that recover beneficial minerals from highly mineralized geothermal brines.
- Repeatedly declared Geothermal Awareness Month and Geothermal Awareness Day (Senate Concurrent Resolution 48 (McGuire and Hueso, Chapter 72, Statutes of 2015). No “no” votes.

However, Legislature tends to let the market dictate energy procurement...

- Legislature sets general parameters--utilities must procure 50 percent of their electricity from renewable resources by 2030.
- Utilities propose specific portfolios to meet the RPS requirement, subject to CPUC approval (in the case of the investor-owned utilities).
- Legislature rejected proposal (SB 1139, Hueso, 2013) that would have required utilities to collectively procure 500 MW of electricity generated by geothermal resources. Passed the Senate but failed in the Assembly.

Except when it doesn't.

Many legislatively mandated requirements to procure specific energy resources or to encourage their procurement.

- **Self-Generation Incentive Program (SGIP):** provides financial incentives for customer installation of energy storage devices, wind turbines, fuel cells, combined heat power generators, pressure reduction turbines, and waste heat capture applications.
- **California Solar Initiative (CSI):** provides California's electric utility customers incentives for on-site solar electric systems on homes, businesses and public sites.
- **Energy Storage Procurement targets:** requires investor-owned utilities to procure 1,325 MW of small-scale storage by 2020 with installations no later than 2024.
- **Bioenergy Feed-in Tariff program:** requires the investor-owned utilities to procure a combined total of 250 MW from bioenergy projects 3 megawatts or smaller.
- **Net Energy Metering:** Each utility is required to offer Net Energy Metering until they reach a cap of 5 percent of the utility's aggregate peak demand.
- **Biofuels procurement mandate:** requires the investor-owned utilities to procure their proportionate shares of 125 MW of capacity through five-year contracts with biofuel facilities that use biomass fuel that is mainly from sustainably managed areas or from dead and dying trees in areas deemed high-hazard zones for wildfires.

Absent specific procurement mandate, utilities have procured declining amounts of geothermal.

- According to the NREL, the current levelized cost of geothermal (\$107-\$131/MWh) is greater than the current cost of solar PV (\$100-\$113).
- According to the CPUC, this cost differential remains even after accounting for integration costs (though CPUC's methodology for this calculation is controversial).
- The effect of this cost differential manifests itself in the procurement decisions of the investor-owned utilities.
 - In 2000, geothermal represented 13,456 GWhs of California generation plus net imports (5.5 percent).
 - In 2015, geothermal had dropped to 11,994 GWhs (4.1 percent).

Procurement projections reflect expectation of continued declines in the cost of electricity generated by solar PV, to the detriment of geothermal.

RPS Procurement: August 1, 2013 Compliance Reports

Energy source	PG&E			SDG&E			SCE		
	2011	2012	2020	2011	2012	2020	2011	2012	2020
Biopower	24.4%	23.9%	11.1%	16.8%	25.0%	2.8%	5.5%	4.1%	0.5%
Geothermal	25%	26.0%	10.2%	23.2%	28.1%	0.0%	46.8%	43.4%	20%
Small Hydro	18.2%	12.4%	9.2%	0.0%	0.0%	0.3%	5.1%	3.2%	3.3%
Conduit Hydro	0.0%	0.0%	0.0%	0.5%	0.6%	0.1%	0.8%	1.0%	0.5%
Solar Photovoltaic	1.4%	8.0%	33.4%	0.1%	0.1%	51.9%	0.7%	1.1%	33.1%
Solar Thermal	0.0%	0.0%	14.4%	0.0%	0.0%	0.0%	5.7%	5.8%	3.2%
Wind	31.0%	29.7%	21.8%	59.4%	46.2%	44.9%	35.4%	41.5%	39.5%
Ocean/Tidal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fuel Cells	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%