

California's Approach to Designing a Feed-in Tariff



Sara Kamins California Public Utilities Commission June 19, 2014



California Public Utilities Commission: About Us

- Regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies.
- CPUC mission: to ensure safe and reliable services at just and reasonable rates, with a commitment to environmental enhancement and a healthy California economy.







Energy Market is large, diverse

Utilities have a "duty or obligation to serve" all Californians in their service territory in exchange for reasonable rate of return

California Statistics							
Population	38 million					Dependenc natural gas	
Electric customers	11 million						Dependence o natural gas =
In-state generation resource mix						volatile electr	
			Energy	Capacity		diversity	
		Nat. Gas	61%	62%		-	·
		Nuclear	8%	3%			
		Hydro	10%	16%			
		Coal	<1%	<1%			
		Renewable	20%	19%			
Annual electricity consumption	302 TWh						
Peak load	60 GW						
Geographic diversity	70% of electricity from in state						
Power plants	1,008						
Electric rates	Range from \$0.13-\$0.36 for residential; low income from \$0.08-\$0.21					_	CALIFORNIA REPUBLIC

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California is Committed to Clean Energy



- "Loading Order" of Energy Resources:
 - Energy efficiency
 - **Demand response**
 - **Distributed generation**
 - Renewable generation
 - Cleanest available fossil resources





Numerous clean energy policies

Renewables Standard	 Highest in US, 33% by 2020
Greenhouse Gas Cap	• 1990 levels by 2020
Electric Car Mandate	• 15% of sales by 2025
Energy Efficiency	Gets first priority in resource planning
Decoupling	Utility profits not tied to sales volume
Smart Grid	One of the earliest & largest adopters of AMI
Solar Rooftops	Goal set for 1 million by 2016
Nuclear	New plants prohibited by state law



Success from market specific policies

Utility-Scale

- > 20 Megawatts
- Energy for thousands of homes
- Renewables Portfolio Standard

Distributed Generation

- 1 20 MW
- Energy for 200-4,000 homes
- Feed-in tariff (qualifies for RPS credit)

Customer-Side

- < 1 MW
- Distribution Grid
- Energy for 1 to 200 homes
- Net Energy Metering and California Solar Initiative







Renewable programs have many goals





- Reduce dependence on fossil fuels
- Electric portfolio diversity
- Climate change goals
- Reduce air pollution
- Electric price stability
- Capacity needs





Utility-scale and DG procurement is required by law

- RPS established in 2002 for 20% by 2017; updated law is for 33% of electricity sales by 2020.
- Multi-year targets (2010-2013; 2014-2016; 2017-2020)
- Annual reporting on utility progress
- Regional tracking system to ensure accuracy of generation claimed for compliance
- CPUC imposes penalties to utility shareholders for noncompliance
- □ Result:
 - Since 2002, the CPUC has approved more than 320 contracts for over 20,000 MW of renewable generation capacity.
 - Since 2003, 7,267 MW of renewable generation capacity have achieved commercial operation under the RPS program.
 - On target to achieve 33%, but incremental procurement is valuable to hedge risks of failed projects





We are rapidly adding new renewable generation





Source: CPUC, Energy Division June 2014



Solar will be most important renewable







California's should achieve 33% renewables by 2020







We are diversifying renewables mix with less risky, small DG

California's attracts solar, wind, and geothermal in remote locations

- Economies of scale = cheaper
- Need new transmission
- Significant financing
- Environmental permitting

Smaller FiT projects can be located closer to load

- Development timelines shorter
- + Less risky
- + Easier to finance







Interest in selling DG projects began around 2008-2009





Source: California Public Utilities Commission, 1st Quarter 2010





Data is from 2008 - 2010 and consists off all interconnection requests (active, withdrawn, or complete)

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History of FiT program

- 2007 FiT was available for RPS-eligible technologies up to 1.5 MW,
- FiT price was an avoided cost, equivalent to the cost of building a new combined-cycle natural-gas power plant(about \$100 \$120/MWh)
- 2009-2011 Legislature modified the law many times to change the capacity and price mechanism
- 2012 CPUC decided that now the renewable market is sufficiently robust to serve as the point of reference for establishing the market price for small renewable projects rather than the very different market used to calculate the original FiT price.
- CPUC calculated new avoided cost based on renewables rather than fossil generation
- 2013 CPUC adopted standard contract





Goals of California's new FiT

- Establish a feed-in tariff price based on quantifiable ratepayer avoided costs that will stimulate market demand;
- Contain costs and ensure maximum value to the ratepayer and the utility;
- Ensure administrative ease and lower transaction costs for the buyer, seller, and regulator;
- Use existing transmission and distribution infrastructure efficiently; and
- Establish project viability criteria to increase probability of successful projects within the program.





Feed-in tariff rules designed to streamline procurement for DG

- Revised program start: November 1, 2013
- Eligible projects: up to 3 MW
- **Program size:** 500 MW
- Program period: Every 2 months
- Capacity available: 3 or 5 MW offered per program period
- Pricing: Renewable Market Adjusting tariff (ReMAT) is tied to FiT market demand
- Standard contract: Long-term contract pre-approved by CPUC







FiT rules continued...

Eligibility Requirements

- Projects must be located within utility service territory;
- Project developers must have completed at least one project;
- Project must utilize commercialized technology;
- Project must have site control;
- Project must achieve commercial operation within 24 months, with one 6-month extension permitted for regulatory delay.

Procurement Process

- Three product types: Peaking / Off-peak / Baseload
- Pricing set by the Renewable Market Adjusting Tariff (ReMAT), which will starts at \$89.23/MWh and then adjusts every other month based on market subscription levels at the previously offered price.





How does ReMAT work?

- Starting Price: \$89.23/MWh
- Price Adjusts: Every two months, based on market subscription levels at the previous offered price.
- Adjustment: If conditions for an adjustment are met, price adjusts by +/-\$4, then by +/-\$8, then by +/-\$12 for successive adjustments.
- Min. Participants: Price adjusts only if 5+ projects participate during a period.





Only solar prices have fluctuated (decreased) thus far

Product type	Current Price (\$/MWh)					
	PG&E	SCE	SDGE			
As available peaking	\$65.23	\$77.23	\$89.23			
As available off-peak	\$89.23	\$89.23	\$89.23			
Baseload	\$89.23	\$89.23	\$89.23			





Lesson #1: Prices are hard, but don't let perfection be the enemy of the good

Original California FiT price was at first too low, then too high. Once market is competitive, can move to market price. New market price is flexible - adapts to market conditions, stimulates development and prevents overpayment.



Use cost containment to mitigate any total cost concerns.

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Sources: Navigant team, Deutsche Bank, Goldman Sachs, Industry Consensus, 2012.

Note: Data for 2012 are estimated (E).



Lesson #2: Standard contract can streamline procurement process







Lesson #3: Attracting private capital is key to success

With no subsidy payments, FiT provides the market opportunity, and we depend on independent power producers to build the projects

- Regulatory certainty (Regular contracting opportunities; transparent rules)
- Long-term price signals (750 MW capacity distributed over multiple years)
- Guaranteed payment with creditworthy offtaker (Standard, pre-approved utility contract)





Lesson #4: Proactively address inevitable transmission and interconnection issues with stakeholders







Conclusion: FiT guiding policy principles

- 1. Fair compensation
 - New pricing mechanism stimulates development without overpaying
 - Capacity cap limits cost exposure
- 2. Streamlined for developers, utilities and regulators
 - First come, first serve
 - More predictable, non-negotiated price
 - Project viability criteria
 - Standard contract
 - Provide transparent data on website
- 3. Attracts capital

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- Long-term price signal with regular solicitations
- Long-term contracts with utilities are bankable





More information

Re-MAT Feed-in Tariff webpages

- www.sce.com/remat
- **www.pge.com**/.../wholesaleelectricsuppliersolicitation/**ReMAT**
- www.sdge.com/regulatory-filing/654/feed-tariffs-smallrenewable-generation

