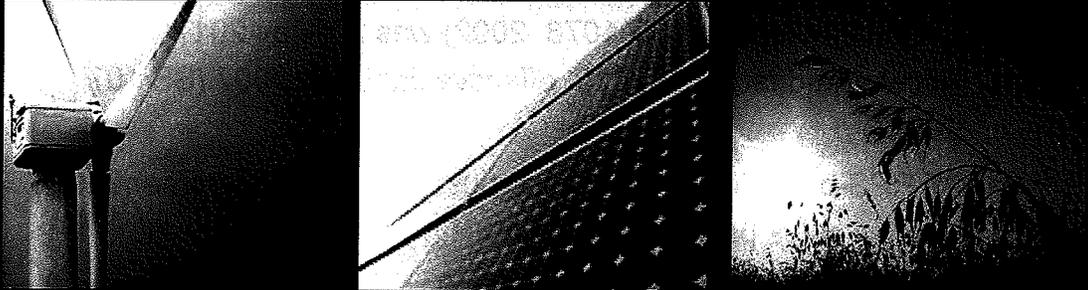


CALIFORNIA'S RENEWABLES PORTFOLIO STANDARD



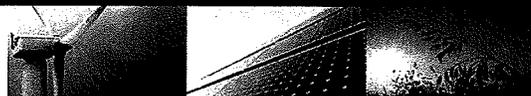
Implementing one of the most ambitious renewable energy standards in the country

September 17, 2009

California Public Utilities Commission



RPS Overview

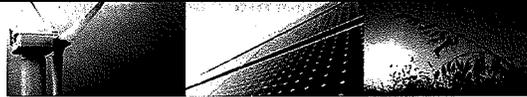


California's RPS Policy

The RPS Program requires all retail energy sellers to procure 20% renewable energy by 2010

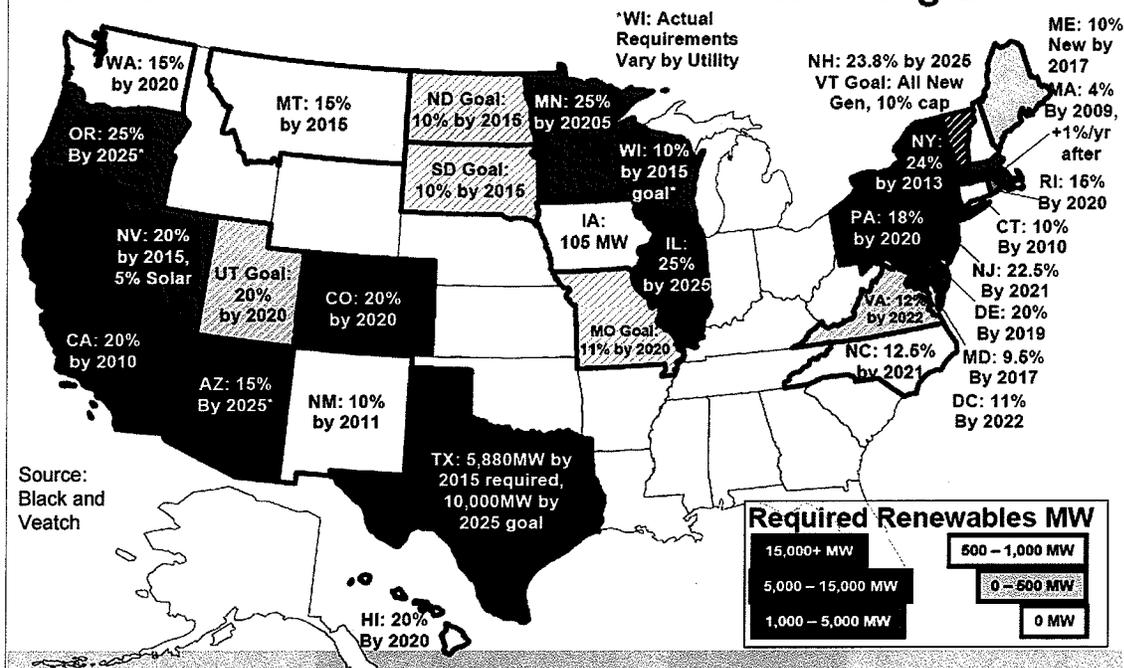
- Original legislation (SB 1078, 2002) was 20% by 2017; Accelerated target to 2010, effective January, 2007 (SB 107, 2006)
- All RPS-obligated retail sellers must procure an incremental 1% of retail sales per year until 2010
- 20% obligation continues post-2010
- RPS procurement compliance is measured in terms of electricity deliveries, **not signed contracts**
- California has set a further goal of 33% renewable energy by 2020

3



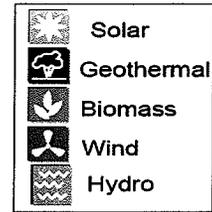
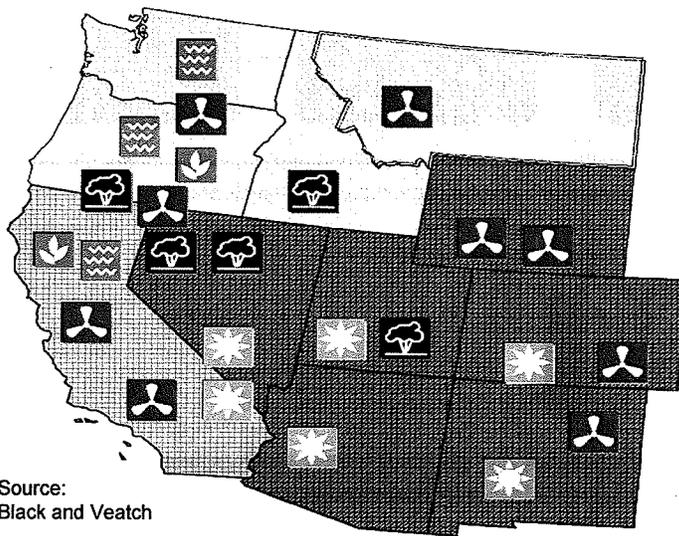
California's RPS - most Aggressive in the Country

State Renewable Portfolio Standards – Aug 2008



California has all major renewable resources within its borders

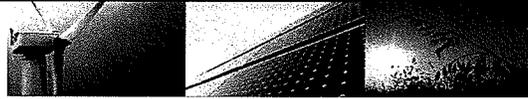
Renewable Energy: Choices, Choices



Source:
Black and Veatch

- Renewables vary greatly in:
 - Quality
 - Quantity
 - Location

5



California's RPS Eligibility Rules

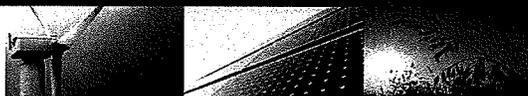
Delivery Rules

- Energy must be delivered into California
- Energy can be consumed by any California consumer, IOUs may remarket
- Out-of-state facilities (located in WECC) can firm and shape energy to deliver into California

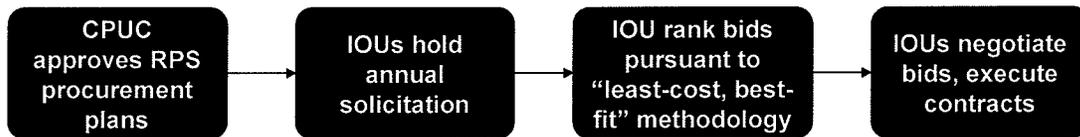
Eligible Resources

- Biodiesel
- Biomass
- Conduit hydroelectric
- Digester gas
- Fuel cells using renewable fuels
- Geothermal
- Wind
- Landfill gas
- Municipal solid waste
- Ocean wave, ocean thermal, tidal current
- Photovoltaic
- Small hydroelectric (30 MW or less)
- Solar thermal electric
- Hydroelectric (incremental generation from efficiency improvements)

6



California RPS Procurement Process

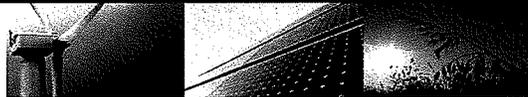


-
- Independent evaluator oversees solicitation, bid evaluation, and negotiations
 - Utilities can also sign bilateral contracts



Once the IOU executes contract, must submit to the CPUC for approval

7

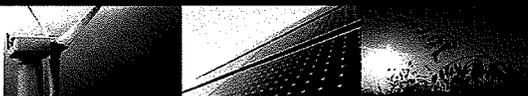


CPUC Contract Approval

CPUC reviews contracts for price reasonableness and project viability

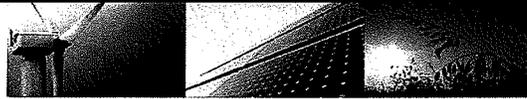
- Price reasonableness
 - Per se reasonable at or below 'market price referent'
 - Bid supply curves for recent solicitation, technology
- Project viability
 - Technology
 - Financing
 - Permitting
 - Transmission
 - Online date
 - Developer experience

8



Procurement Progress and Trends

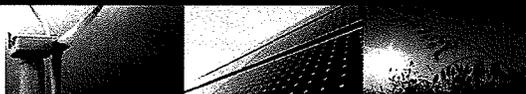
9



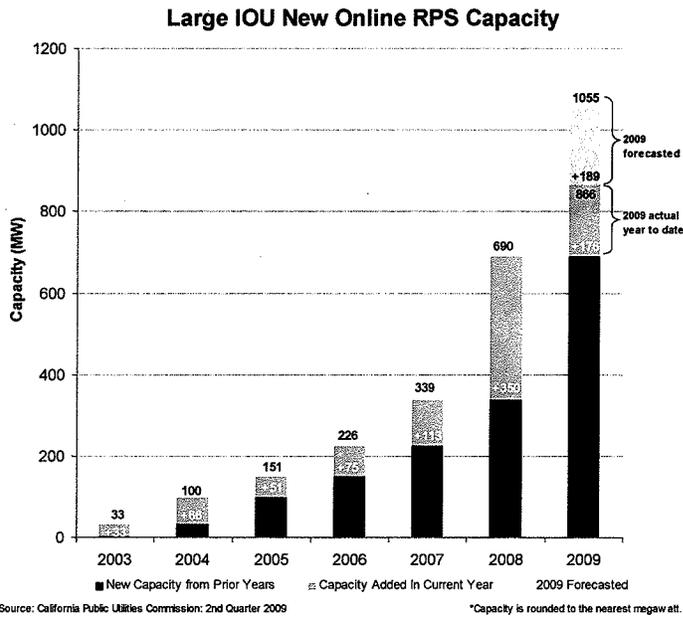
Status of 20% RPS Procurement

- CPUC has approved **118 contracts** for over **8,000 MW** of new and existing eligible renewable energy capacity.
 - **4,000 MW** of long term contracts currently under review.
- **866 MW** of renewable energy has come online since the start of RPS program
 - Additional 190 MWs is forecasted to come online by end of 2009
- IOUs are forecasted to achieve 20% RPS in the 2013 – 2014 timeframe
- Recent RPS solicitations have been robust:
 - Increased participation from larger and more experienced developers
 - IOUs shortlisting 10x their incremental procurement targets
 - California renewable market is maturing

10



New capacity installed under IOU contracts

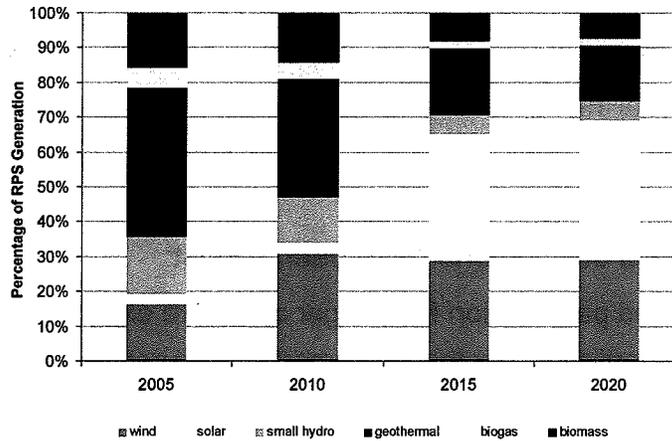


11

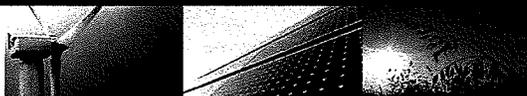


Geothermal dominates current renewable mix

Actual and Forecasted Large IOU RPS Resource Mix

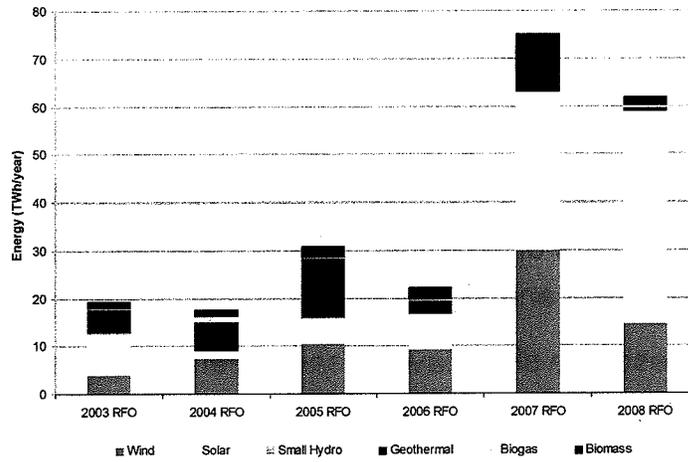


12



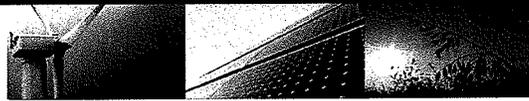
Solar bids have increased

Large IOU RPS Solicitation Bids by Fuel Type

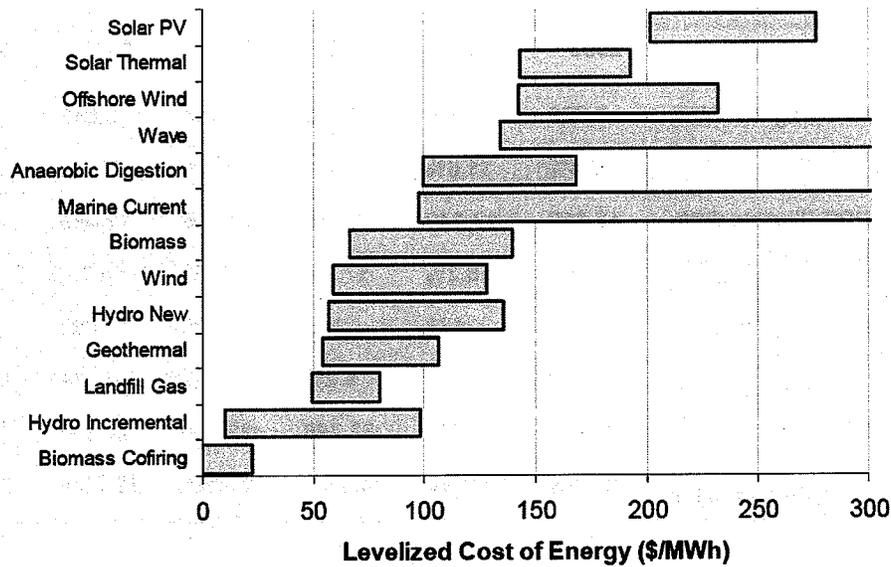


Source: California Public Utilities Commission: 2nd Quarter 2009

13

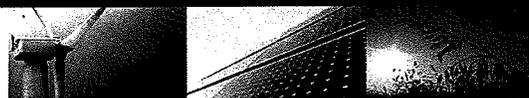


Generation costs of renewable technologies



Source: Renewable Energy Transmission Initiative Phase1A Report

14

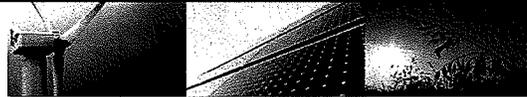


Renewable costs are increasing

RPS bid prices have increased from 2002-2008

- Construction costs increasing for both renewable and conventional generation
- Resource mix is shifting
 - Little geothermal and biomass in response to recent RFOs
 - Increase in share of solar thermal and PV – relatively high installation costs and significant permitting challenges
- Many prime resource sites have already been developed
- Concern that constrained supply and policy-driven demand drive up costs

15



2008 is first year that total RPS percentage outpaced load growth

		2003	2004	2005	2006	2007	2008
PG&E	RPS Eligible GWh	8,828	8,575	8,543	9,114	9,047	9,774
	RPS GWh as % of bundled sales	12.4%	11.6%	11.7%	11.9%	11.4%	11.9%
SCE	RPS Eligible GWh	12,613	13,248	12,930	12,706	12,465	12,573
	RPS GWh as % of bundled sales	17.9%	18.2%	17.2%	16.1%	15.7%	15.5%
SDG&E	RPS Eligible GWh	550	678	825	900	881	1,047
	RPS GWh as % of bundled sales	3.7%	4.3%	5.2%	5.3%	5.2%	6.1%
TOTAL	RPS Eligible GWh	21,991	22,500	22,298	22,719	22,393	23,394
	RPS GWh as % of bundled sales	14.0%	13.9%↓	13.6%↓	13.2%↓	12.7%↓	13.0%↑

16



More information

RPS website:

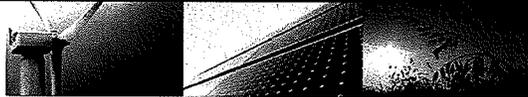
www.cpuc.ca.gov/PUC/energy/electric/RenewableEnergy/

Renewable Energy Transmission Initiative (RETI):

www.energy.ca.gov/reti/

33% RPS Implementation Report, model, work papers:

www.cpuc.ca.gov/PUC/energy/Renewables/hot/33implementation.htm

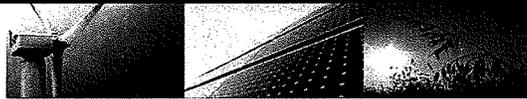


Renewable Energy Credits may increase supply

RECs may increase market efficiency and potentially lower costs of RPS compliance

- One REC = 1 MWh of renewable energy generation
- Authorizing REC trading would enable a utility to buy RECs from a facility, without buying the underlying energy
 - Would increase contracting flexibility
 - Help overcome some transmission barriers
 - Provide a transparent revenue stream for renewables
 - Facilitate compliance for small utilities and energy service providers
- CPUC issued a proposed decision authorizing the use of tradable RECs for RPS compliance

21

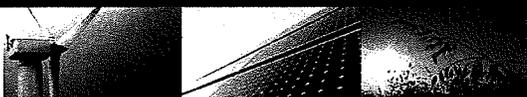


California seeks further increase of renewables

California is considering a 33% by 2020 RPS

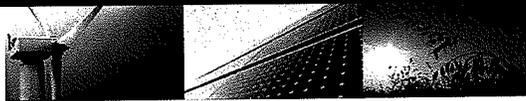
- The CPUC, California Energy Commission, and the California Air Resources Board recommended 33% renewables by 2020 to meet the state's climate change goals
- The Governor has also endorsed a 33% by 2020 RPS and signed an Executive Order for the California Air Resources Board to adopt regulations to achieve the higher RPS goal
- CPUC staff are analyzing the barriers to reach a 33% RPS and will work with other state entities to develop and implement solutions

22



Future for RPS

19

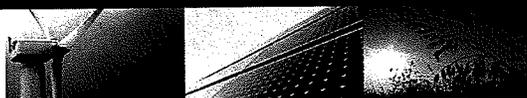


Working on Solutions for Project Development

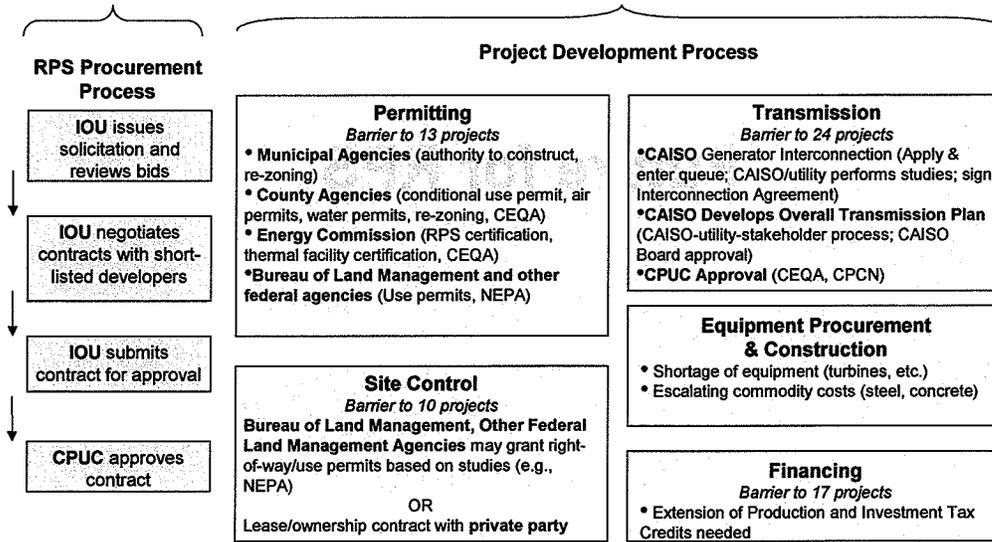
CPUC is working to create multi-agency solutions to known barriers

- Transmission
 - Streamlined permitting process
 - Initiated Renewable Energy Transmission Initiative (RETI)
 - Working closely with California ISO on queue reform
- Permitting / Site control
 - Beginning to work with Bureau of Land Management (BLM), other relevant agencies
 - California Energy Commission (thermal facilities)
 - County agencies (wind, thermal <50 MW)
- 33% RPS Implementation Analysis

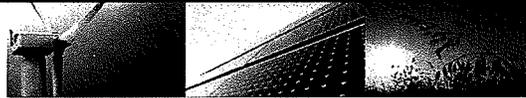
20



Project development is complicated and involves multiple steps



17



Feed-in Tariffs for Small Generators

- Assembly Bill (AB) 1969 (Yee, 2006) added PU Code Section 399.20, authorizing tariffs and standard contracts for the purchase of eligible renewable generation from public water and wastewater facilities.
- Senate Bill (SB) 380 (Kehoe, 2008) amended PU Code Section 399.20 expand the tariff to apply to eligible renewable facilities as well as water and wastewater facilities.
- Program Statistics**
 - Program start date: February 14, 2008
 - Program cap: 500 MW
 - Participating utilities: all investor-owned utilities in California
 - Price: Market Price Referent

Projects by IOU (September 2009)

IOU	Projects
PG&E	19
SCE	1
SDG&E	1

Projects by Technology

Technology	Projects	MW
Small Hydro	6	2.12
Landfill Gas	10	10.05
Wind	4	6.0
Biomass	1	0.75
Total	21	18.92

18

