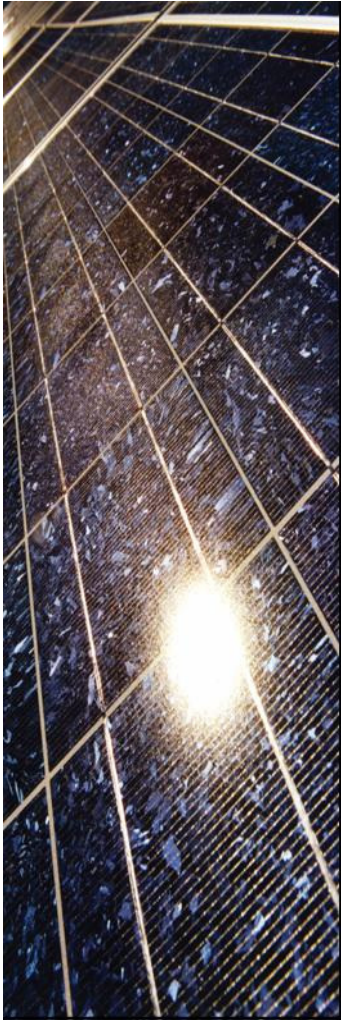


California Solar Success



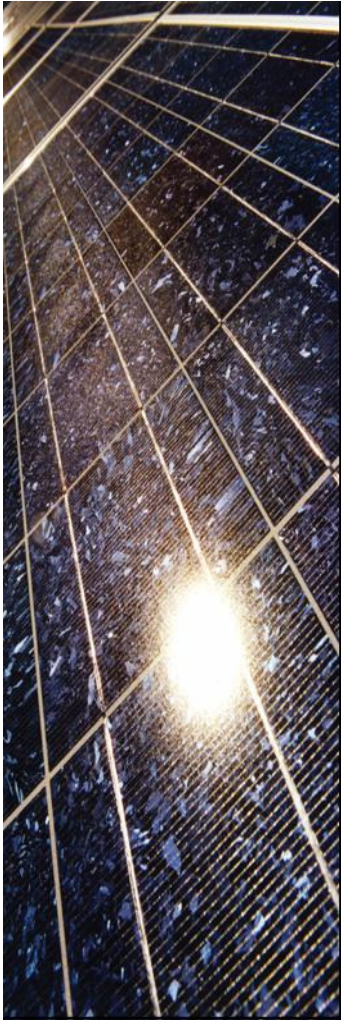
Adam Browning
The Vote Solar Initiative
www.votesolar.org



It's a whole new world

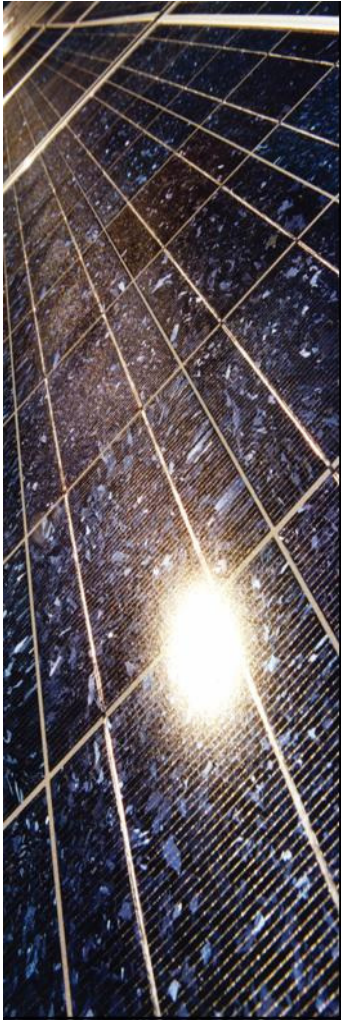
- Solar is getting dramatically cheaper
 - Cheap solar makes wholesale a scalable opportunity
- Most policy is at state level
- Two markets: DG and Wholesale
 - Separate policy for each
- Goal: long-term, sustainable market





Scalable opportunity

- Current clearing price for wholesale distributed generation solar in CA *under \$0.14/kWh*
- Current solar module average selling price:
 - Now: ~\$1.80/W
 - 2011 projected: ~\$1.50/W
- Significant potential for additional cost reductions in material and installation



Until 2004, solar prices dropped ~19% for every doubling of demand

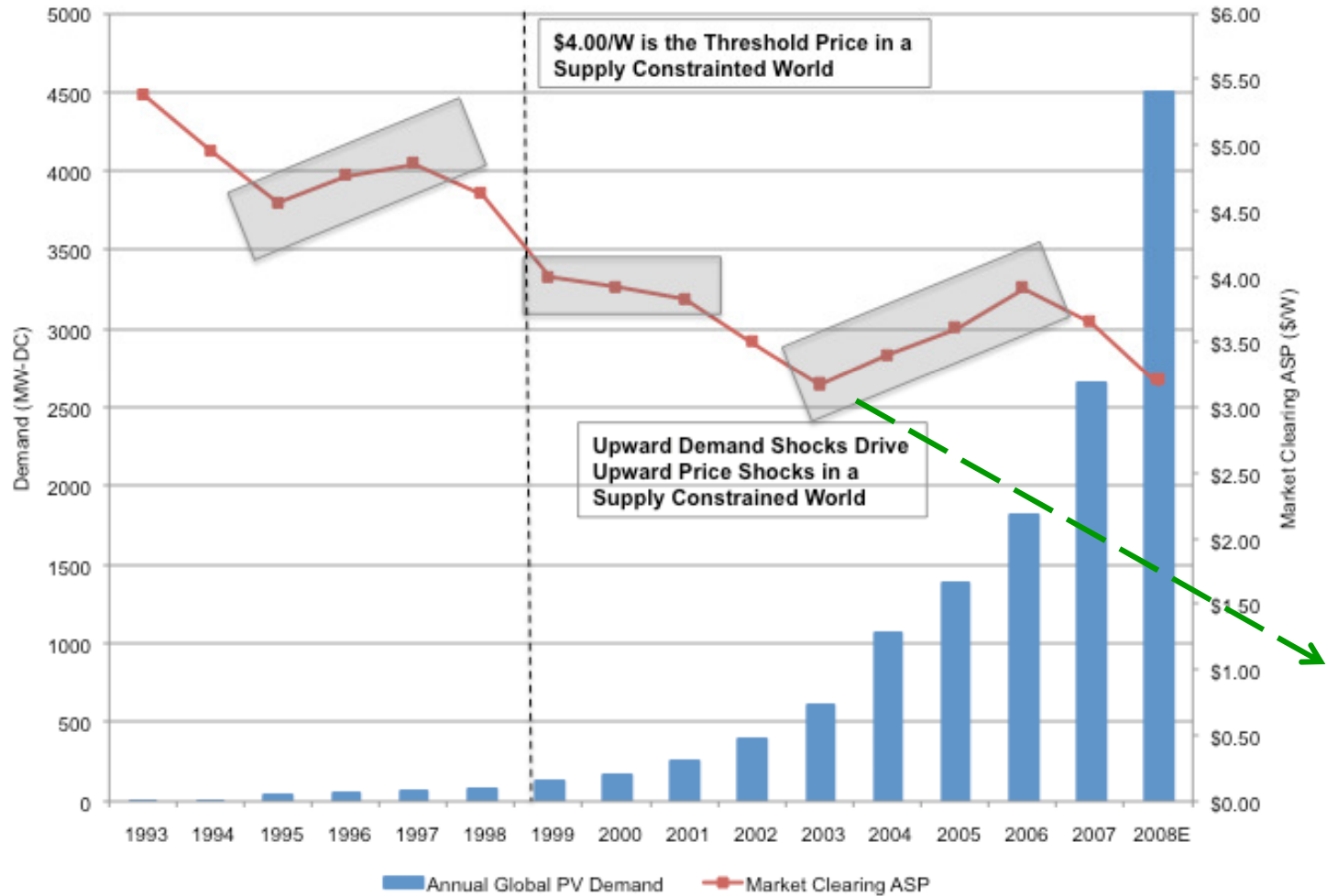
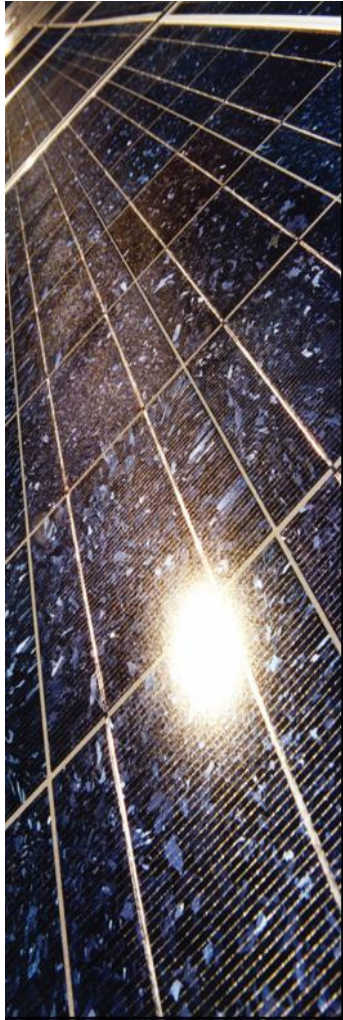


Chart: Greentech Media/Prometheus Institute

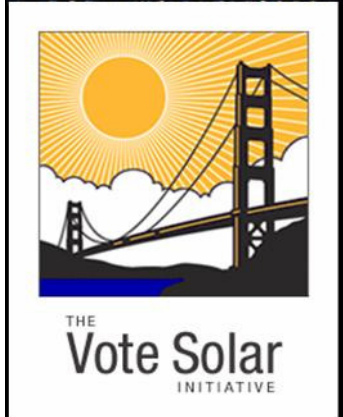
Green dotted line: Adam Browning

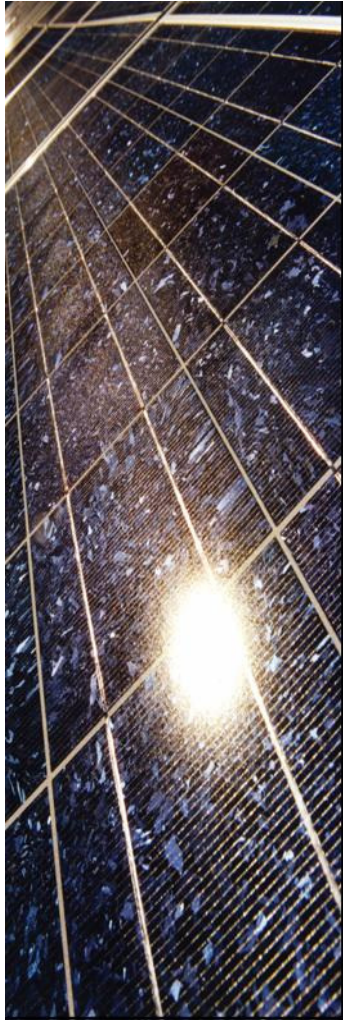




Two Markets

- Retail
 - Generation and consumption on customer side of meter
- Wholesale
 - Generation for further distribution and sale to utility customers





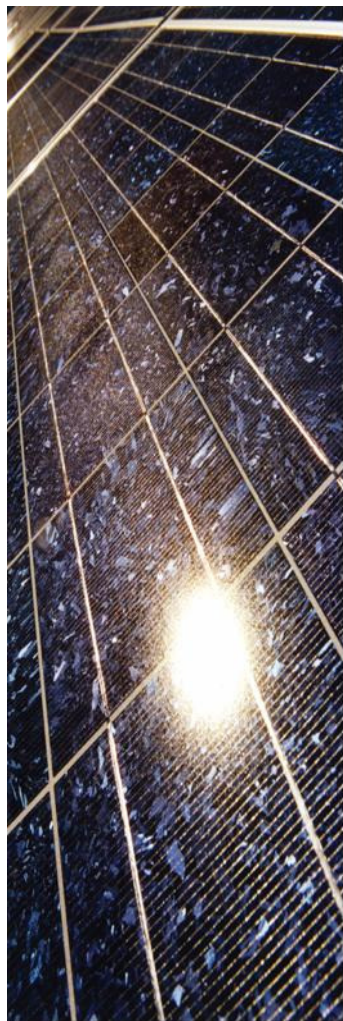
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California Solar Initiative

- Goal: 3 GW statewide
- All behind-the-meter, with net metering to roll-back meter
- 600 MW of solar connected to the grid at nearly 65,000 sites
- 300 MW applications since 1/2010
- Incentives dropped from \$4.50/W to \$0.65/W – very near grid-parity
- AB 920: payment for net excess generation

California RPS

- Currently: 20% by 2010
 - >7 GW of solar contracts signed
 - PV, CPV and solar thermal electric
 - ~5 GW of solar contracts priced less than 20-year LCOE of gas turbine
 - 2009 RPS -- chock-full of PV
- Executive Order: raise to 33% by 2020 (SB 722, too)
- ReDEC Analysis
 - 17 GW of wholesale DG PV potential

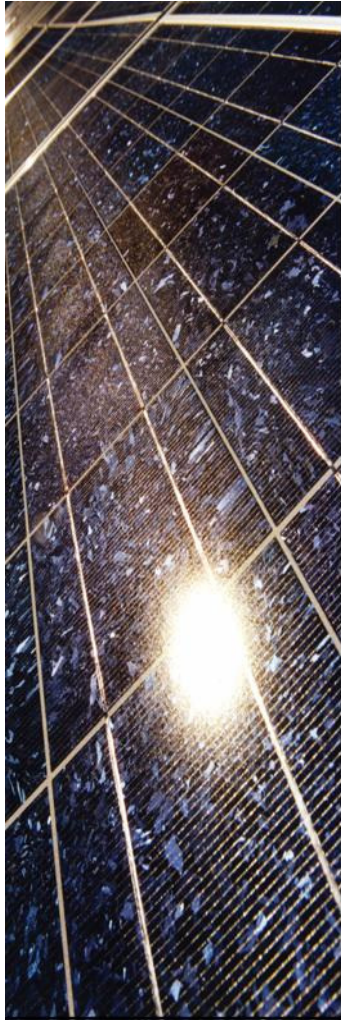


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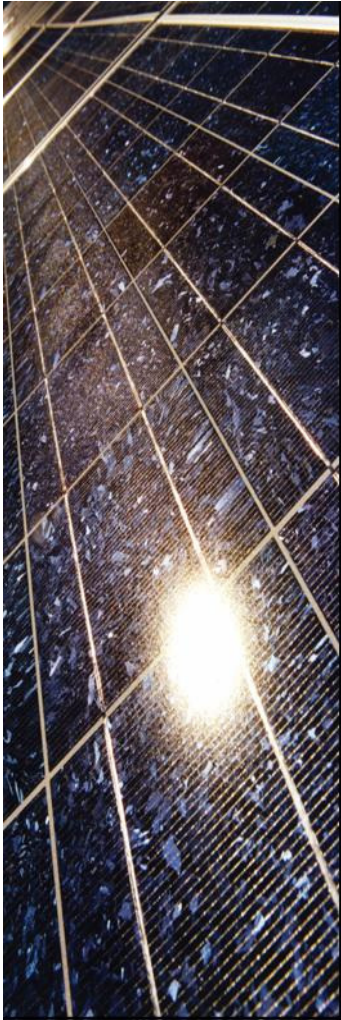
MPR=20 yr LCOE of a combined cycle gas turbine

Adopted 2008 Market Price Referents¹
(Nominal - dollars/kWh)

Resource Type	10-Year	15-Year	20-Year	25-Year
2009 Baseload MPR	0.10043	0.10537	0.11126	0.11480
2010 Baseload MPR	0.10175	0.10748	0.11390	0.11761
2011 Baseload MPR	0.10400	0.11046	0.11730	0.12110
2012 Baseload MPR	0.10698	0.11405	0.12126	0.12509
2013 Baseload MPR	0.10998	0.11776	0.12527	0.12915
2014 Baseload MPR	0.11278	0.12122	0.12897	0.13290
2015 Baseload MPR	0.11605	0.12503	0.13290	0.13690
2016 Baseload MPR	0.11971	0.12915	0.13706	0.14111
2017 Baseload MPR	0.12367	0.13352	0.14144	0.14549
2018 Baseload MPR	0.12802	0.13814	0.14603	0.15001
2019 Baseload MPR	0.13271	0.14298	0.15080	0.15464
2020 Baseload MPR	0.13776	0.14797	0.15578	0.15937



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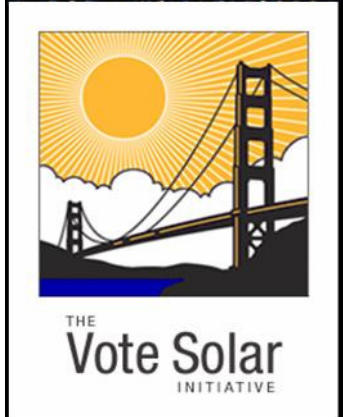
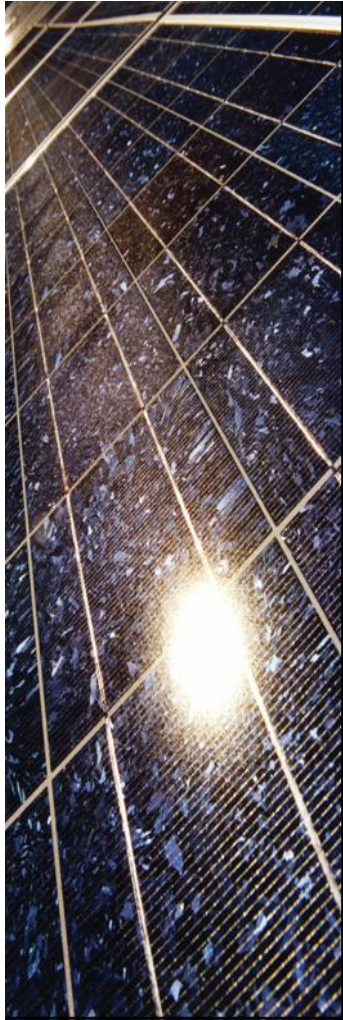
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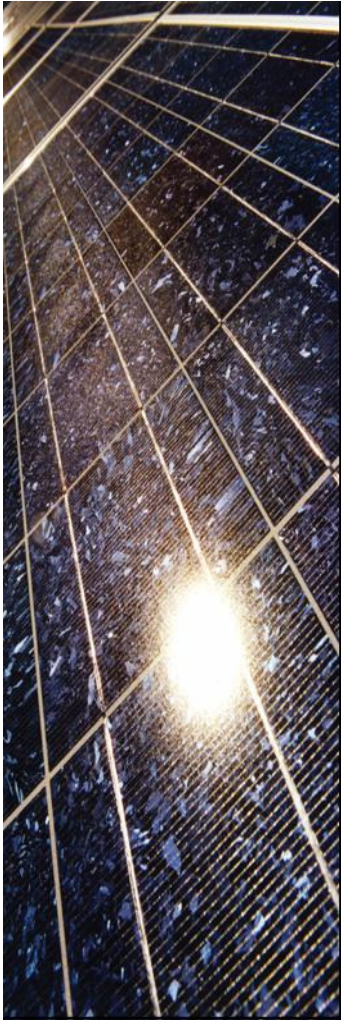
Jurisdictional Issue

- FPA gives FERC exclusive jurisdiction over wholesale sales
- States are preempted from setting wholesale power rates that exceed utility avoided cost
 - Price at avoided cost
 - Create new requirement, price set by market (competitive bid)
 - Avoided cost + marginal difference covered by REC or tax benefit
- Petition for Declaratory Order at FERC

California Feed-in Tariff #1

- AB 1969 (2006)
- 500 MW statewide
- Projects <1.5 MW
- Priced at MPR (20 year LCOE of a combined cycle gas turbine)
- Nominal uptake
 - 9 PV contracts in PG+E territory in 2009



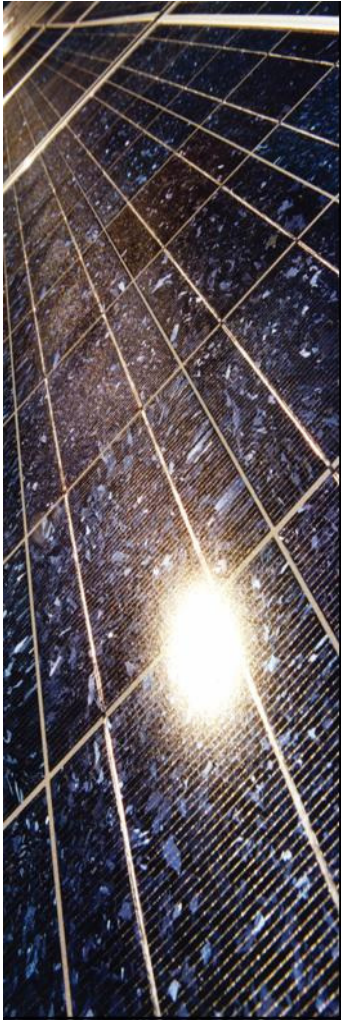


CA Feed-in Tariff #2

- Sacramento Municipal Utilities District
 - 100 MW feed-in-tariff
 - All renewable technologies eligible
 - Projects up to 5 MW
 - Pricing based on time-differentiated avoided cost
 - Modeled on PV production, comes out around 14 cents, 20 year LCOE
 - Sold out first day– all PV (projects may or may not be daisy-chained)
 - Also have retail policies--rebates for DG, SolarShares



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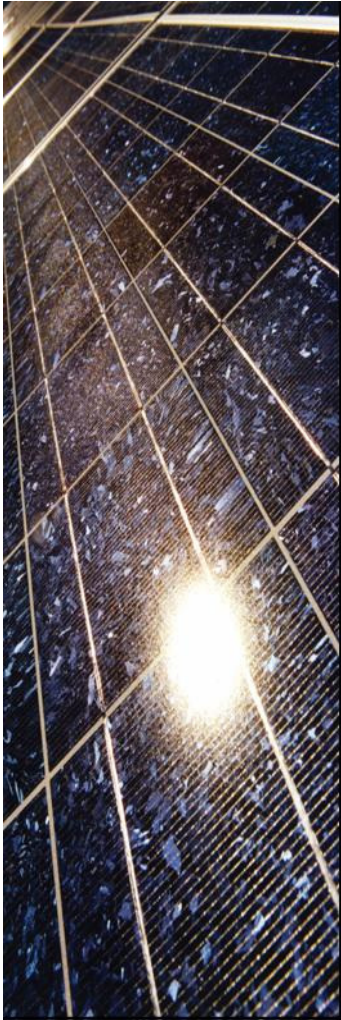


CA FiT# 3: SCE Standard Offer Contract

- Up to 20 MW system size, eligible to all renewables, priced at MPR
- Sold out; 140 MW of PV in 20 MW increments
- 2008 MPR: with TOD, ~\$0.15/kWh
- <http://www.sce.com/NR/sc3/tm2/pdf/2457-E.pdf>
- 2010: Moving to competitive solicitation, 250 MW annually

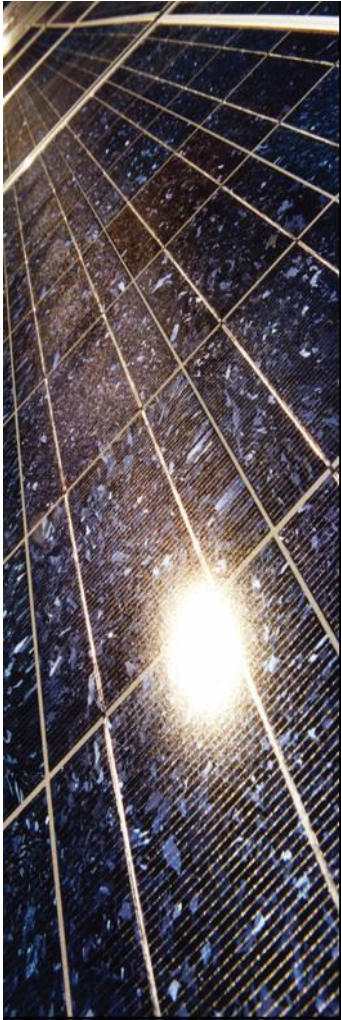


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CA Feed-in Tariff #4: SB 32

- 750 MW state-wide, POU and IOU
- Systems up to 3 MW
- Value-based price setting: MPR + TOD + environmental compliance cost + value of offsetting peak demand on distribution circuits.
- Other ratepayers must be 'indifferent'
- Rulemaking not yet begun



Utility PV Programs

- Southern California Edison
 - 500 MW split between utility and independent solar developers, all in 1-2 MW sized installations (90% rooftop)
- Pacific Gas and Electric
 - 500 MW; 1/2 utility-owned, 1/2 PPA
 - Project size 1-20 MW, over 5 years
- Total: > 1 GW over 5 years

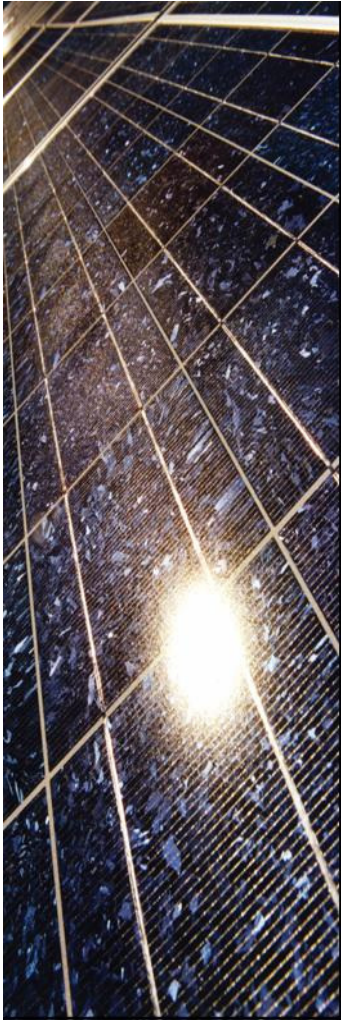


CPUC Proposed Program

- 1 GW pilot
- Systems up to 20 MW
- Utilities to conduct at least 2 solicitations a year
- 3 categories of product: baseload, peaking as-available, intermittent as-available.
- Development deposit and contract timeline
- Standard, non-negotiable contract

Long Term Planning Process

- Will determine grid and resource needs for integrating 33% renewables

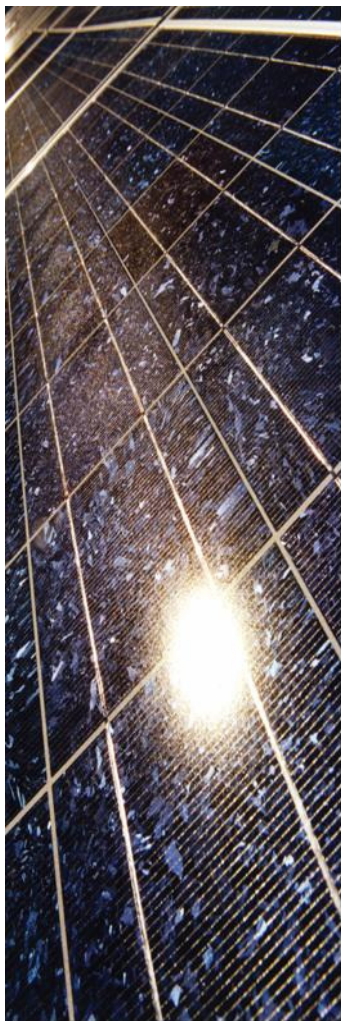


When there's a huge solar energy spill,
it's called a "nice day."

Pass the NY Solar Jobs Act

LANIER





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