



SOME RECENT DEVELOPMENTS IN US SOLAR MARKETS

PACE and WDG

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www.votesolar.org



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Scalable opportunity

- Current clearing price for wholesale distributed generation solar *under* \$0.14/kWh
- Current solar module average selling price:
 - Now: ~\$1.80/W – \$1.50/W
 - 2011 projected: ~ \$1.50/W – \$1.25
- Significant potential for additional cost reductions in material and installation



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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Retail Market

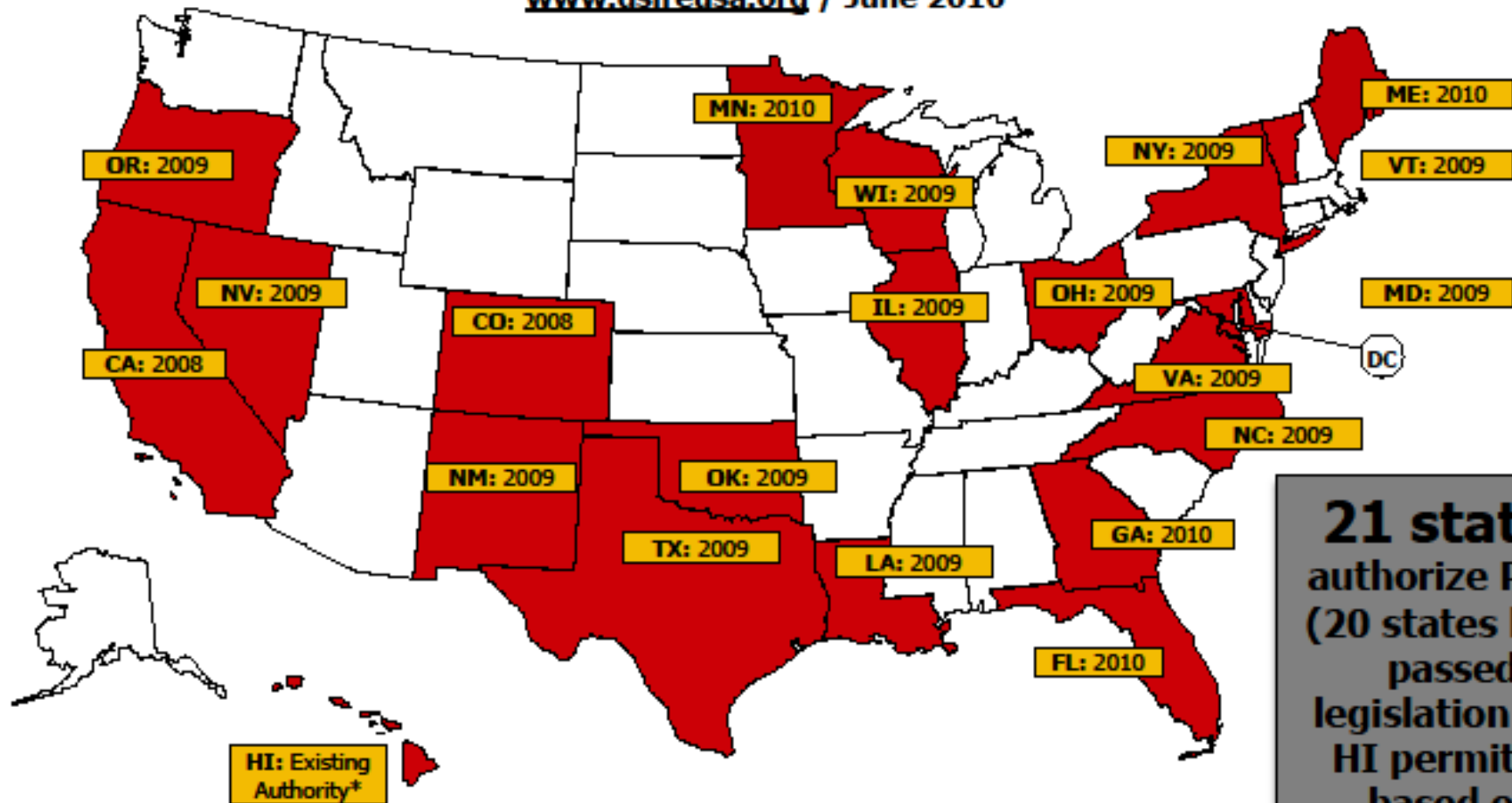
- Behind the customer meter
- Value of generation comes from avoided utility purchase
- Incentives decline to grid parity
 - Incentives:
 - Public goods fund (CSI)
 - RECs
 - Fixed (residential AZ, CO, etc)
 - Market-based (NJ)
- Grid parity = unsubsidized market
 - CA: incentives down from \$4.50/W to \$0.65/W; now ~2.5% capacity basis
 - 600+ MW at 65,000 customer sites



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Property Assessed Clean Energy (PACE)

www.dsireusa.org / June 2010



21 states authorize PACE (20 states have passed legislation and HI permits it based on existing law)

■ PACE financing authorized

Current status

- FHFA/Fannie Mae/Freddie Mac effectively blocked PACE
- Direct attack on a municipality's authority to tax – local rights issue
- **H.R.5766 (Rep. Thompson)** would provide a fix
- Expecting new Senate bill
- All eyes on lame duck session



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Wholesale Market

- Generation for sale to utility
 - Renewable Portfolio Standard
 - Feed-in tariff
 - Utility PV programs
 - Competitive wholesale DG



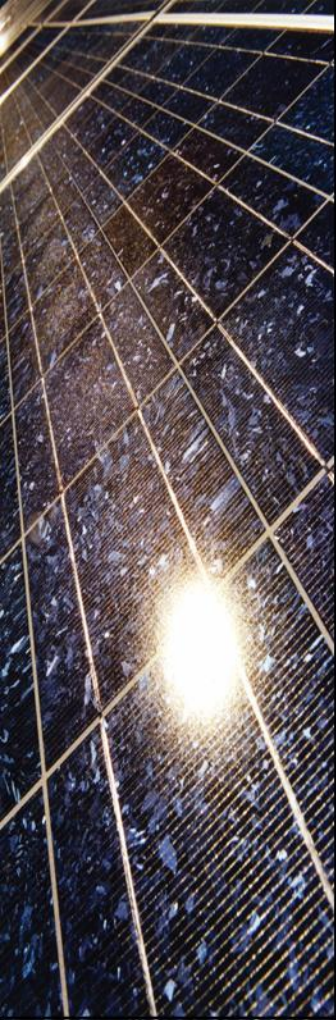
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California RPS

- 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
- Executive Order: raise to 33% by 2020
 - Prop 23?
 - special legislative session?
- Multiple WDG programs
 - ReDEC Analysis: 17 GW of wholesale DG PV potential



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Wholesale DG: Key Issues

1. How to deal with jurisdictional issue?
2. How to set the price?
3. Cost control: capped or uncapped?
 1. If capped, how to pick winners?
 2. How to ensure only viable projects are selected?
4. Drive down price and cost?



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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
- Petition for Declaratory Order at FERC: EL10-64-000, EL10-66-000
 - Price at avoided cost
 - Create new requirement, price set by market (competitive bid)
 - Avoided cost + marginal difference covered by REC or tax benefit



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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



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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



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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
- San Diego Gas and Electric
 - ~100 MW; 76 MW IPP, 24 MW utility-owned
- Total: 1.1 GW over 5 years



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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



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Keys to Successful WDG Program

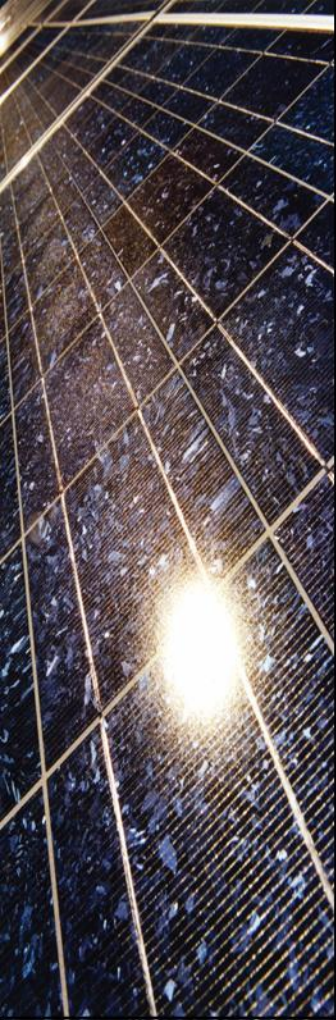
- Make it legal
- Big/broad enough for biz growth
- Equitable standard contracts to facilitate financing
- Strong mechanisms to weed out non-viable contracts
- Synch interconnection/contracting



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

Pass the NY Solar Jobs Act



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