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# Renewables Portfolio Standard (RPS)

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# RPS Presentation

- RPS Policy
- RPS Procurement Process
- RPS Compliance Rules
- Progress Towards Goals
- Project Development Hurdles
- Future of RPS

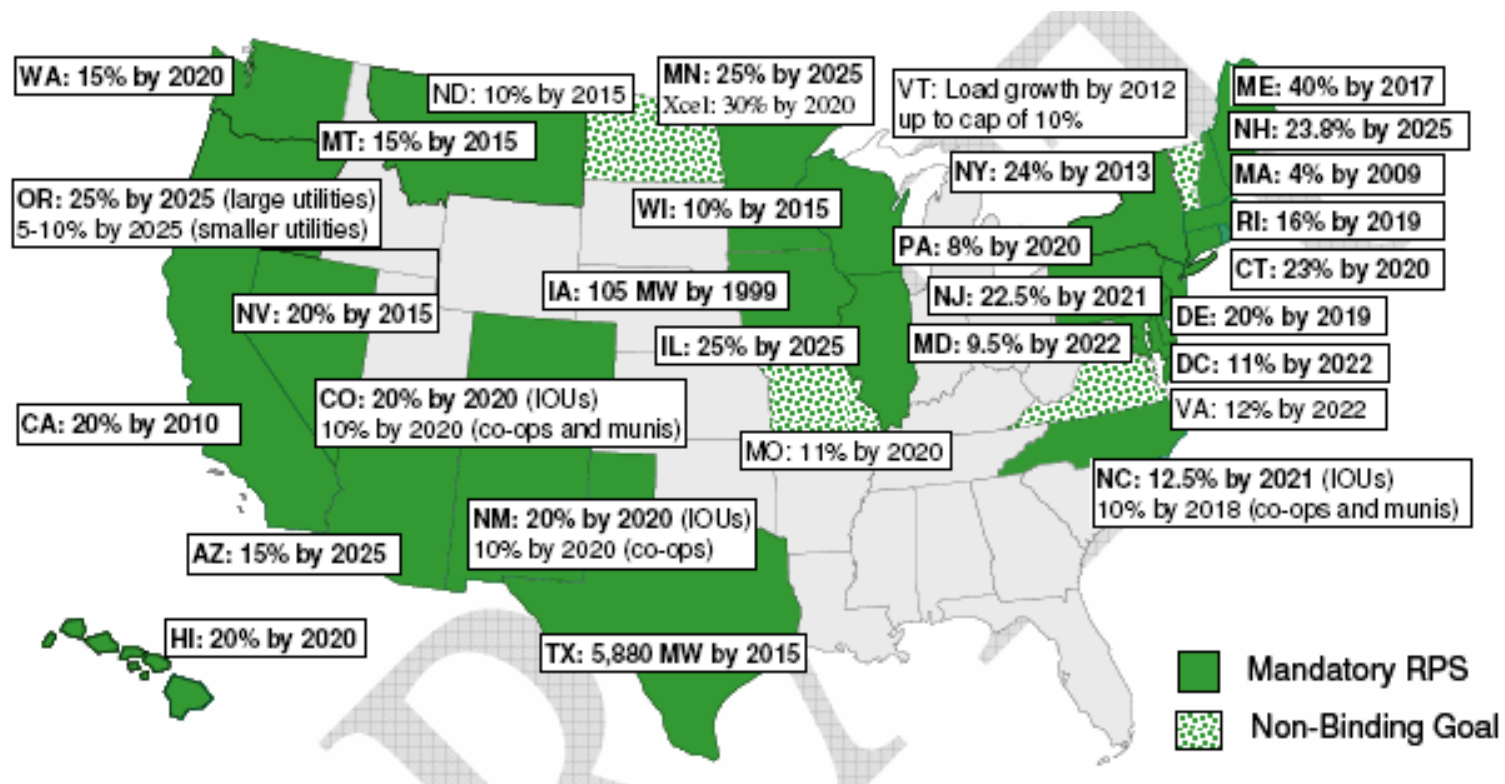


# RPS Policy

- A Renewables Portfolio Standard (RPS) requires that a minimum (and growing) percentage of renewable generation be included in the electricity mix of a particular energy market.
- It has become a popular policy tool at the U.S. state level, as it has been enacted in 25 states and in Washington DC.
- Benefits:
  - Larger economies of scale for renewable technologies brings renewables down the cost curve
  - Environmental protection & public health – clean air, global warming
  - Hedging against volatile natural gas prices
  - Jobs, economic development



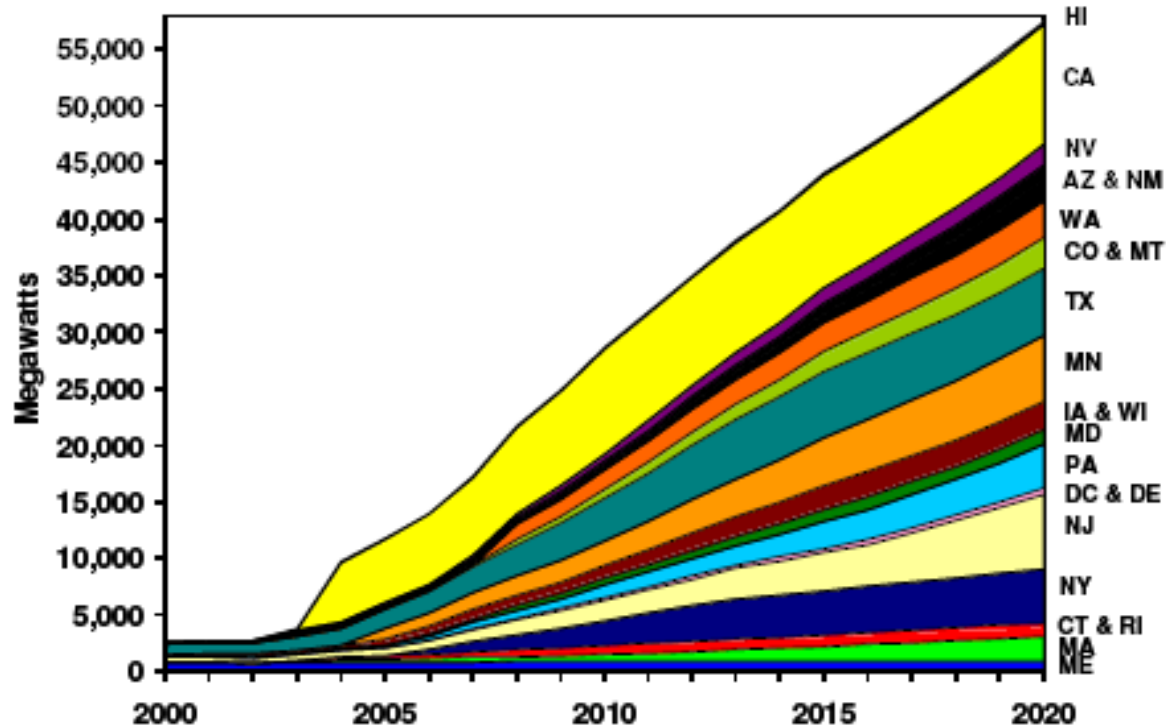
# Half of U.S. States have RPS





# California's RPS is Most Aggressive

Renewable Energy Expected From State Standards\*



\* Projected development assuming states achieve annual renewable energy targets.



# 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 targets 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
- California has set itself a further goal of 33% renewable energy by 2020

\*RPS-obligated entities include: Investor Owned Utilities (IOUs), Energy Service Providers (ESPs) and Community Choice Aggregators (CCAs). Municipal utility RPS obligations are voluntary



# California's RPS Policy

## **California Public Utilities Commission is responsible for:**

- Approving utility procurement plans, and approving or rejecting contracts executed to procure RPS-eligible electricity
- Establishing the market price referent (MPR)
- Making determinations regarding RPS compliance and potentially imposing penalties for non-compliance

## **California Energy Commission is responsible for:**

- Certifying renewable generating facilities as RPS-eligible
- Verifying the RPS-eligibility of energy procured to meet RPS targets
- Developing RPS generation verification and tracking system



# California's RPS Eligibility Guidelines

## 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)



# RPS Procurement Process

- IOUs develop, and CPUC approves, short term procurement plans
  - Project RPS need
  - Bid solicitation materials
  - Pro Forma contract (with standard terms and conditions)
- IOUs hold annual solicitations
  - 5 RPS solicitations conducted
- IOUs rank bids pursuant to 'least-cost, best-fit' methodology
- Procurement review group (PRG) reviews shortlist
- Independent evaluator oversees bid evaluation and negotiations
- IOUs negotiate bids, execute contracts
- CPUC review and approves/rejects contracts



# RPS Procurement Process

## CPUC reviews contract for

- Pricing 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



# Market Price Referent (MPR)

- CPUC developed MPR methodology to satisfy SB 1078 requirement to determine the long-term "market price of electricity"
- MPR represents the presumptive cost of building and operating a combined cycle gas turbine power plant (CCGT) under a long-term contract
  - The proxy CCGT assumes an average heat rate of 6,918 Btu/kWh and utilization of a GE F-Series turbine
  - Natural gas accounts for ~ 70% of the MPR's all-in levelized price (\$/MWh)
  - Technical capacity factor ~72%, Economic capacity factor
- RPS contracts at or below MPR will be considered *per se reasonable*, and can be recovered in rates

Adopted 2007 Market Price Referents <sup>1</sup> (Nominal - dollars/kWh)			
Resource Type	10-Year	15-Year	20-Year
2008 Baseload MPR	0.09271	0.09383	0.09572
2009 Baseload MPR	0.09302	0.09475	0.09696
2010 Baseload MPR	0.09357	0.09591	0.09840



# Above-MPR Cost Recovery

- Pursuant to SB 1078 and SB 107, the CEC was authorized to “allocate and award supplemental energy payments (SEPs)” to cover above-MPR costs of long-term RPS-eligible contracts executed through a competitive solicitation
  - SEPs were collected as part of IOUs’ public goods charges
- SB 1036 (2007) modified the above-MPR cost recovery mechanism
  - SEPs were returned to IOUs
  - CPUC can now provide above-MPR cost recovery through electric retail rates
  - Above-MPR Funds (AMFs) are capped at the amount of SEPs that the CEC returned plus those funds that would have been collected through 2011
- If the cost limitation is exhausted, IOUs can limit RPS procurement to renewable energy resources that can be procured at or below the MPR
- CPUC is currently developing rules on how to efficiently and effectively administer AMFs in a manner that maximizes ratepayer benefit



# RPS Compliance Rules

- **Annual Procurement Targets (APT):** Prior year's APT plus incremental procurement target; First compliance year in 2004 for IOUs and 2006 for ESPs; All entities APT is 20% in 2010
- **Incremental Procurement Target:** 1% of prior year's retail sales
- **Baseline (IOUs):**  
= (2001 RPS-eligible procurement/2001 total retail sales) x 2003 total retail sales + 1% of 2001 total retail sales
- **Non-compliance Penalty:** 5 cents per kWh, up to \$25 million per year



# RPS Flexible Compliance Rules

- **Banking:** LSEs can apply excess procurement in one year to all subsequent years
- **Deferring Deficits:** Inadequate procurement up to 25% of incremental procurement target (IPT) can be deferred – no questions asked
- **Earmarking:** Inadequate procurement greater than 25% of IPT in one year can be made up in the following 3 years by signing contracts that will deliver within 3 years
- For deficits not satisfied with above options, an LSE can petition the Commission to waive penalties pursuant to several approved reasons:
  - inadequate funds to cover above-market costs
  - insufficient transmission
  - lack of competition
  - insufficient response to solicitation
  - seller non-performance



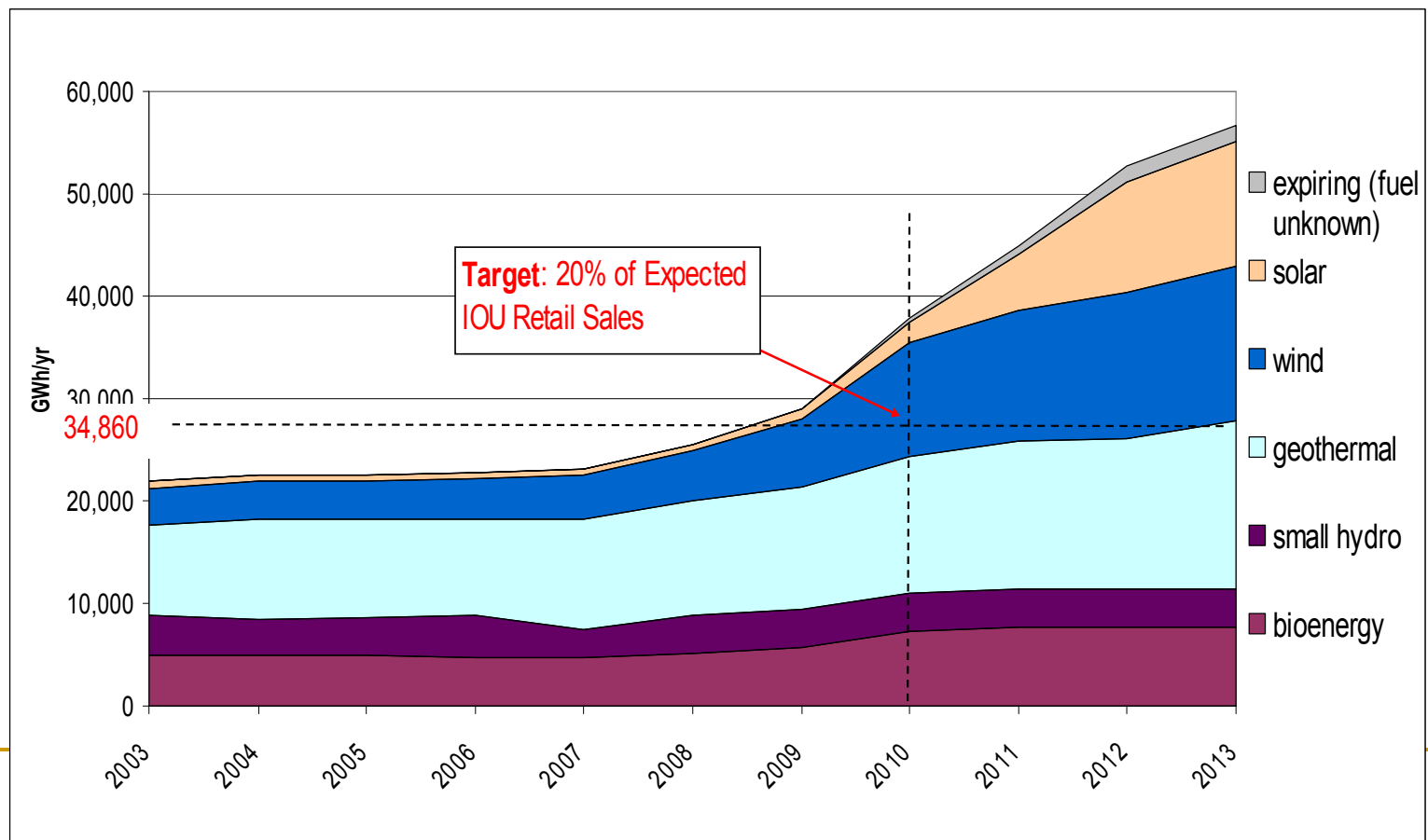
## RPS Progress Towards 20%

- 82 contracts approved by CPUC
- 2006 estimated renewable deliveries for the large utilities:
  - Pacific Gas & Electric – 11.9% (9,114 GWh)
  - San Diego Gas & Electric – 5.3% (900 GWh)
  - Southern California Edison – 16.0% (12,706 GWh)
  - Total large utility RPS procurement – 13.2%
- Of the 57 approved contracts for approximately 2,000 MW of *new capacity*, 14 contracts for approximately 400 MW have come online



# IOUs RPS Generation by Fuel Type

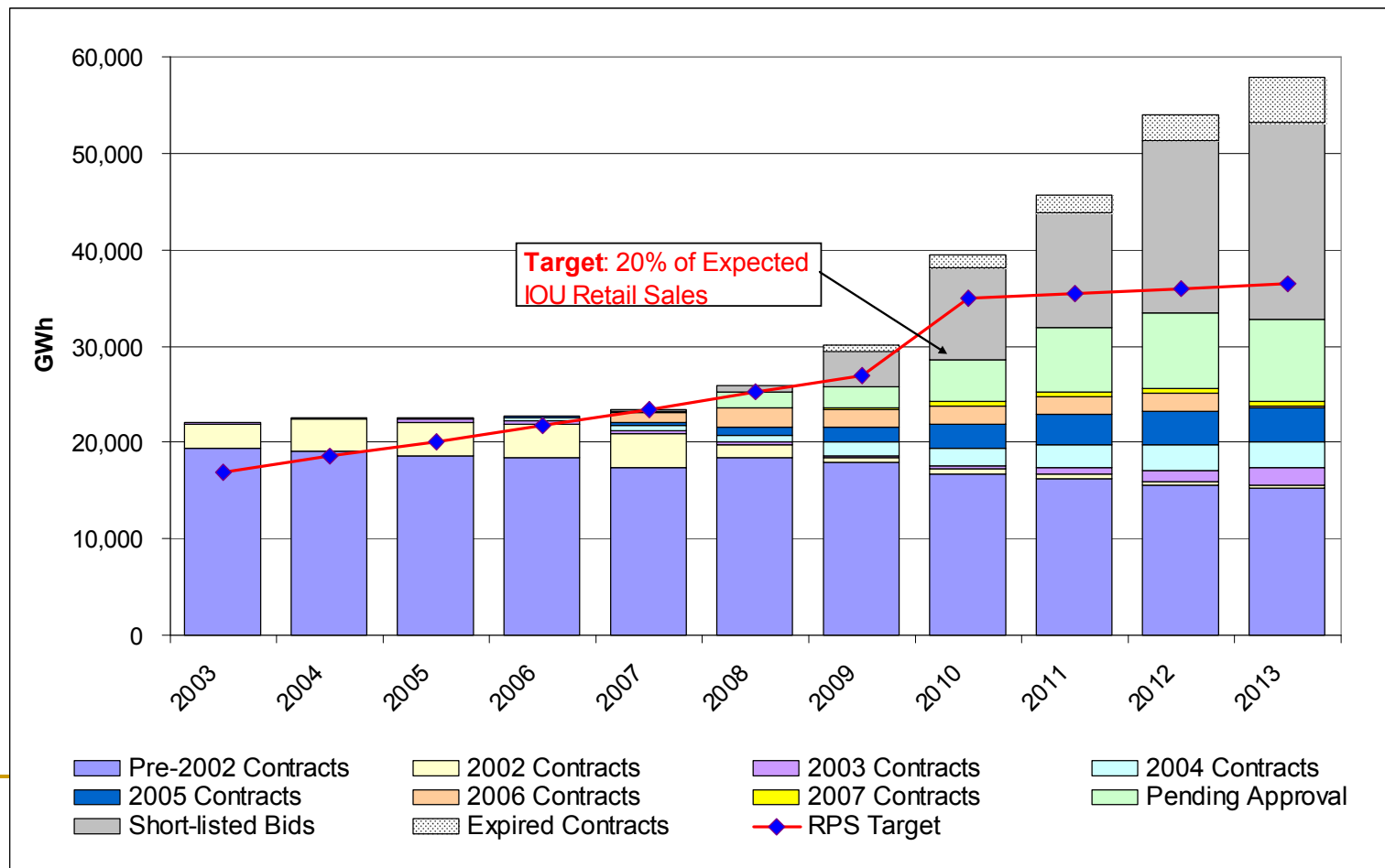
- Geothermal and wind provide most RPS energy
- Wind price trending up; opening door for solar





# IOUs RPS Generation by Solicitation

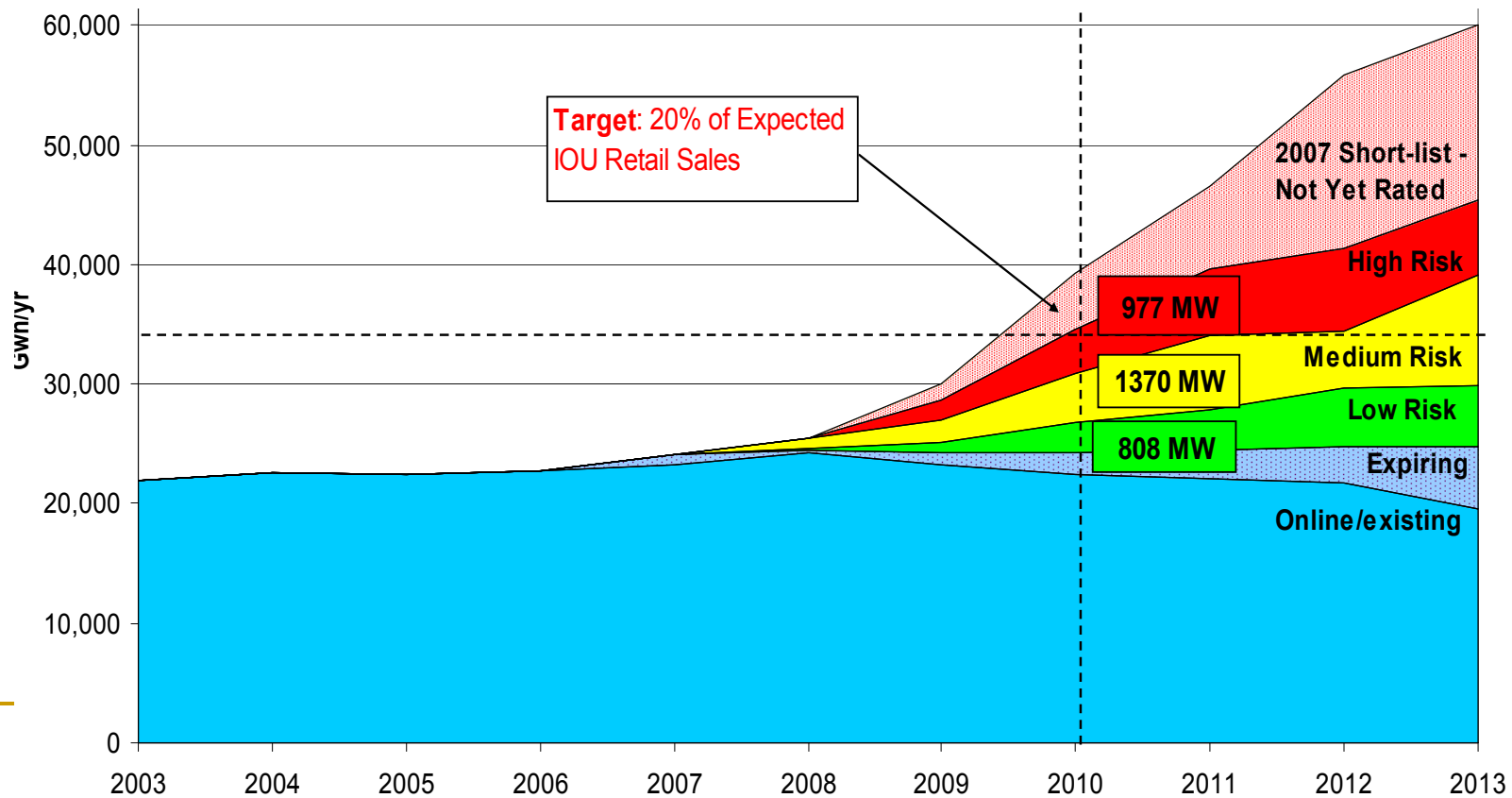
- IOUs close to 20% on a contracted basis





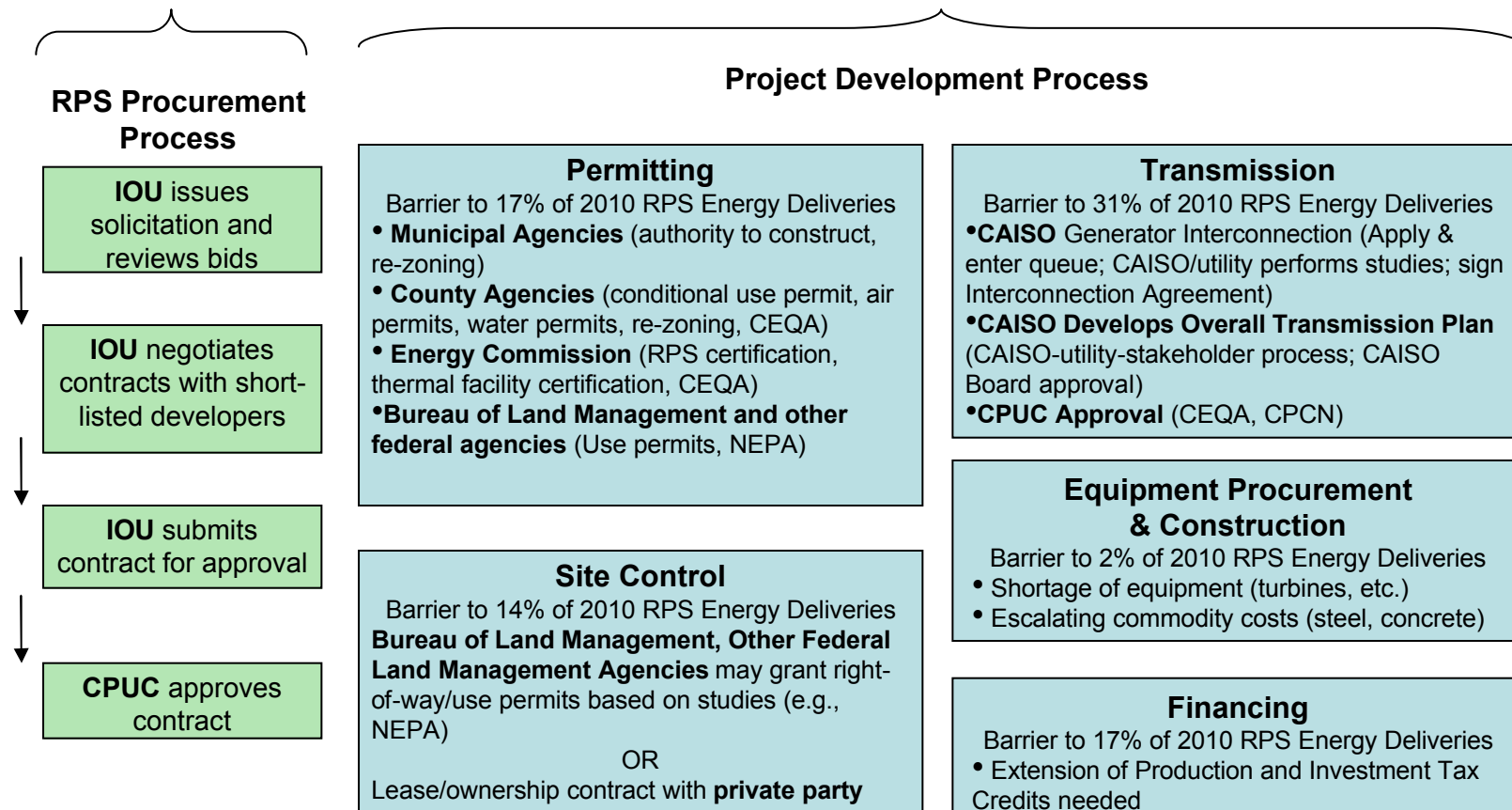
# Project Viability a Concern

- CPUC quantifies risk from expected IOU RPS Generation
- With low and some medium risk projects come online by 2010, IOUs will be at 16-18%; 20% by 2011-2013





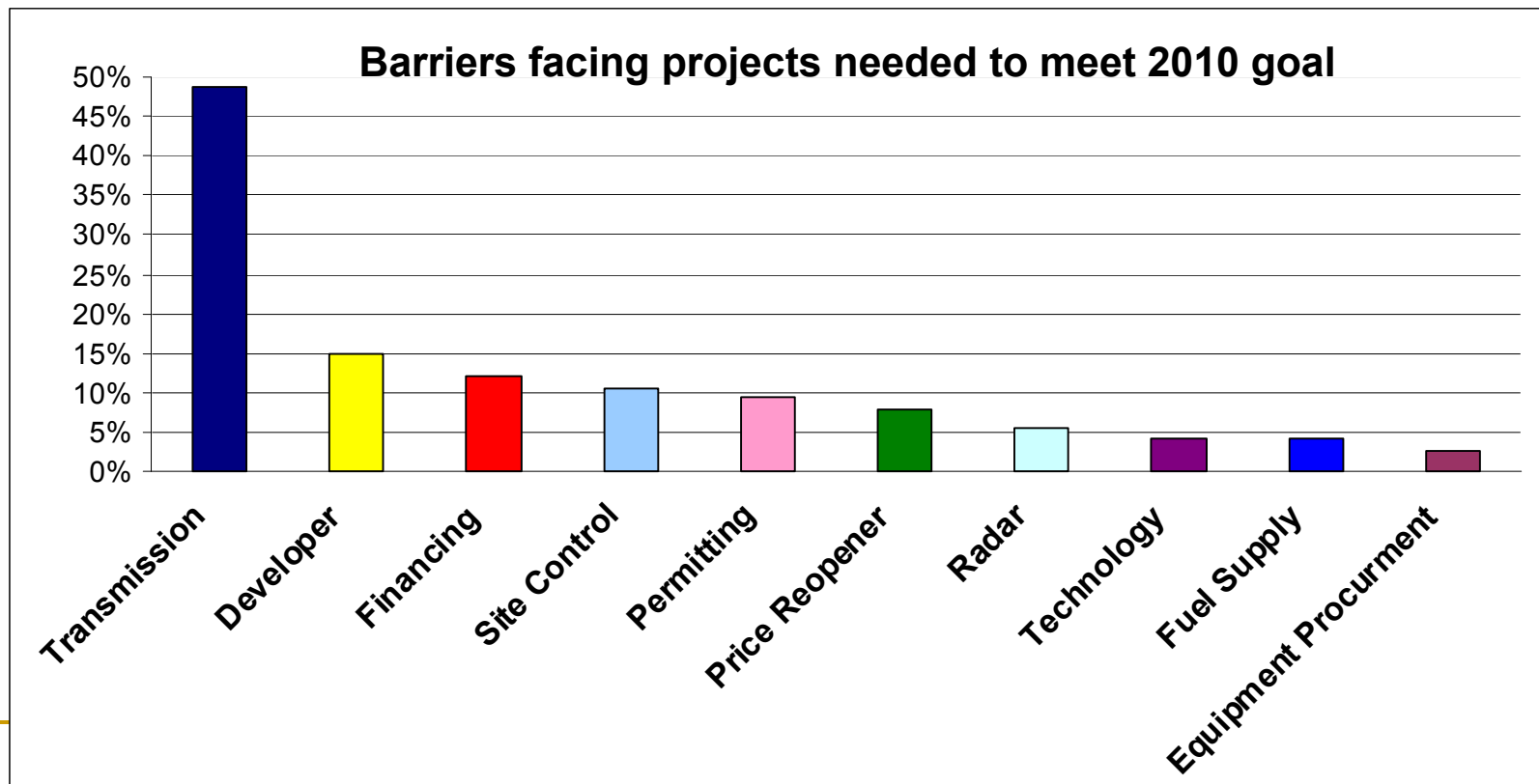
# Procurement and Development Process





# Project Development = Major Risk

- CPUC contract approval is only one step in the complex project development process.
- Inter-agency coordination is key to reaching 20%





## CPUC working on solutions

- Addressing transmission barriers: Renewable Energy Transmission Initiative (RETI), ISO Queue reform, further streamlined permitting
- Increasing supply: Feed-in tariffs (AB 1969), tradable RECs (CSI), Emerging Renewable Resource Program (ERRP)
- Contract management work to track projects, improve analysis and reporting of challenges to project development
- Future: Solutions team works with relevant agencies



# Renewable Energy Transmission Initiative (RETI)

- Renewable resources are often located in remote areas, far from load and robust transmission infrastructure
- Proactive transmission planning required
  - End the “chicken and egg” problem of no transmission without generation, and vice versa
  - Ensure cost-effective and environmentally-superior investment
- RETI is a statewide, inter-agency effort to identify the most cost-effective renewable resources in CA and neighboring regions and expedite the planning the transmission needed to access them
  - Coordinated by CPUC, CEC, CAISO, POU reps
  - Involves broad range of stakeholders in a consensus-based process



# Renewable Energy Transmission Initiative (RETI)

- Three phases:
  - Phase 1 – Identification and ranking of Competitive Renewable Energy Zones (CREZs)
    - complete by August 2008
  - Phase 2 – Refinement of analysis for priority CREZs and identification of conceptual transmission paths
    - complete ~ 8 months from end of Phase 1
  - Phase 3 –Development of plans of service for priority CREZs
  
- More information:
  - <http://www.energy.ca.gov/reti/>



# Renewable Energy Credits (RECs)

- A REC represents all of the renewable attributes associated with one MWh of eligible renewable energy generation
  - RECs can be an accounting instrument to verify compliance with the RPS program
  - LSEs can sign power purchase agreements for renewable energy + RECs or can buy RECs without the underlying commodity
  - RECs can be traded between LSEs, traders, generators and voluntary purchasers (e.g. Safeway)
- California RPS currently only allows LSEs to enter into power purchase agreements for both energy and REC to count towards RPS compliance
- SB 107 gave CPUC the authority to allow tradable RECs for RPS compliance
  - CPUC and CEC must first rule that WREGIS (REC tracking system) is operational
  - CPUC allowed to set limits on REC usage



# Renewable Energy Credits (RECs)

REC trading has the potential to promote efficient renewable markets

- Increase market efficiency
  - More competition, higher liquidity, contracting flexibility
- Encourage renewable development
  - REC revenue stream enticing to developers
- Help overcome transmission issues
  - Can build in non-congested areas
- Facilitate compliance
  - Reduces contracting risk for small LSEs with fluctuating or small future load
- Lower compliance costs
  - Because of increased market efficiency and additional renewable development, costs of renewable procurement decrease



# Renewable Energy Credits (RECs)

California energy market conditions could reduce effectiveness of RECs

- Lack of adequate transmission is the limiting factor for new renewable development
  - RECs will not lead to new renewable development regardless of the market efficiencies until new transmission is built
- New renewable projects are financed with long-term contracts
  - Long-term contracts provide investors with financial certainty
  - RECs offer uncertain revenues (like capacity markets, REC prices follow a “boom-bust” trend)
- Supply and demand imbalance leads to high REC prices, ratepayer costs
  - REC demand is much greater than available supply
  - REC prices will float up to a price cap
  - RECs, unlike bundled renewable contracts, are not a hedge against volatile fossil fuel prices



# Questions?

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RPS website: <http://www.cpuc.ca.gov/PUC/energy/electric/RenewableEnergy/>

# Renewable Portfolio Standard Policy – Key Resources

## CPUC Decisions/Resolutions<sup>[1]</sup>

1. Initial implementation of Senate Bill 1078, D.03-06-071  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/27360.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/27360.PDF)
2. Least-cost best-fit criteria (used to evaluate RPS bids), D.04-07-029  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/38287.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/38287.PDF)
3. Initial participation rules for ESPs, CCAs, SMJUs, D.05-11-025  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/51414.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/51414.PDF)
4. 2005 Market Price Referent, D.05-12-042  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/52178.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/52178.PDF)
5. 2006 Market Price Referent, Resolution E-4049  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_RESOLUTION/63132.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_RESOLUTION/63132.PDF)
6. Reporting and compliance methodology for RPS program, D.06-05-027  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/61025.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/61025.PDF)
7. 2007 IOU procurement plans approved, D.07-02-011  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/64640.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/64640.PDF)
8. Rules for ESP and CCA participation, D.06-10-019  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/60585.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/60585.PDF)
9. Minimum procurement from long-term contracts and new facilities, D.07-05-028  
[http://www.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/67490.PDF](http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/67490.PDF)

**CPUC RPS Website<sup>[2]</sup>:** <http://www.cpuc.ca.gov/static/hottopics/1energy/r0404026.htm>

**CEC RPS Eligibility Guidebook:** <http://www.energy.ca.gov/renewables/documents/index.html#rps>

**WREGIS:** <http://www.wregis.org/>

## 2007 Renewable RFO links

Pacific Gas and Electric: [http://www.pge.com/suppliers\\_purchasing/wholesale\\_electric\\_supplier\\_solicitation/renewables2007.html](http://www.pge.com/suppliers_purchasing/wholesale_electric_supplier_solicitation/renewables2007.html)

San Diego Gas & Electric: <http://www.sdge.com/renewablerfo2007/>

Southern California Edison: <http://www.sce.com/AboutSCE/Regulatory/qualifyingfacilities/RFP2007.htm>

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### <sup>[1]</sup> CPUC Rulemakings to Implement RPS

- 1.R.04-04-026: OIR to Implement RPS
- 2.R.06-02-012: OIR to Develop Additional Methods to Implement RPS
- 3.R.06-05-027: OIR to Continue RPS Implementation and Administration

<sup>[2]</sup> Includes links to Status Reports