

Reverse Auctions, Renewable Energy, and RPS

State-Federal RPS Collaborative Webinar

Hosted by Clean Energy States Alliance
January 27, 2012

CleanEnergy States Alliance

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CleanEnergy States Alliance

State-Federal RPS Collaborative

- With funding from the Energy Foundation and the US Department of Energy, the Clean Energy States Alliance facilitates the **Collaborative**.
- Includes **state RPS administrators and regulators**, **federal agency representatives**, and other stakeholders.
- Advances dialogue and learning about RPS programs by **examining the challenges and potential solutions** for successful implementation of state RPS programs, including **identification of best practices**.
- To get the **monthly newsletter** and announcements of **upcoming events**, sign up for the listserv at: www.cleanenergystates.org/projects/state-federal-rps-collaborative

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Reverse Auctions, RE and RPS

Presenters:

Neil Auerbach, Founder and Managing Partner, Hudson Clean Energy Partners

Jaclyn Marks, Senior Policy Analyst, California Public Utilities Commission

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CleanEnergy States Alliance

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Reverse Auctions

A Policy Option Worth Exploring for the Renewables Industry




1/27/2012

Topics for discussion

Reverse Auction Mechanism

- What is a Reverse Auction?
- Reverse Auctions in Use Today
- Flow Diagram
- Good Policy
- Potential Driver of Renewable Demand
- Proposed Federal Reverse Auction
- Creative Ideas to Pay for Future Support
- Critiques of the Federal Proposal as Written
- Proposed Edits to the Language of H.R. 909 as Written
- Q&A

What is a Reverse Auction?

- An auction where the prices go down instead of up
- In a typical auction, multiple buyers come to buy something from a single seller
- In a reverse auction, multiple sellers come to sell something to a single buyer
- When applied to power markets, it is a contracting mechanism whereby project developers bid for power purchase agreements (PPAs) from a utility or other contracting authority
- The goal is to promote competition and reduce costs for rate payers

BOUGHT, from this gentleman over here for $45/MWh!

Reverse Auctions in Use Today

- **US General Service Administration (GSA)**
  - GSA has been successfully holding reverse auctions in Texas since 2002 to contract for renewable power and save the US taxpayer money

- **California**
  - California held their first "Renewable Auction Mechanism" in November, 2011. Short-lists are expected to be posted in late January, 2012 and PPAs issued by February, 2012

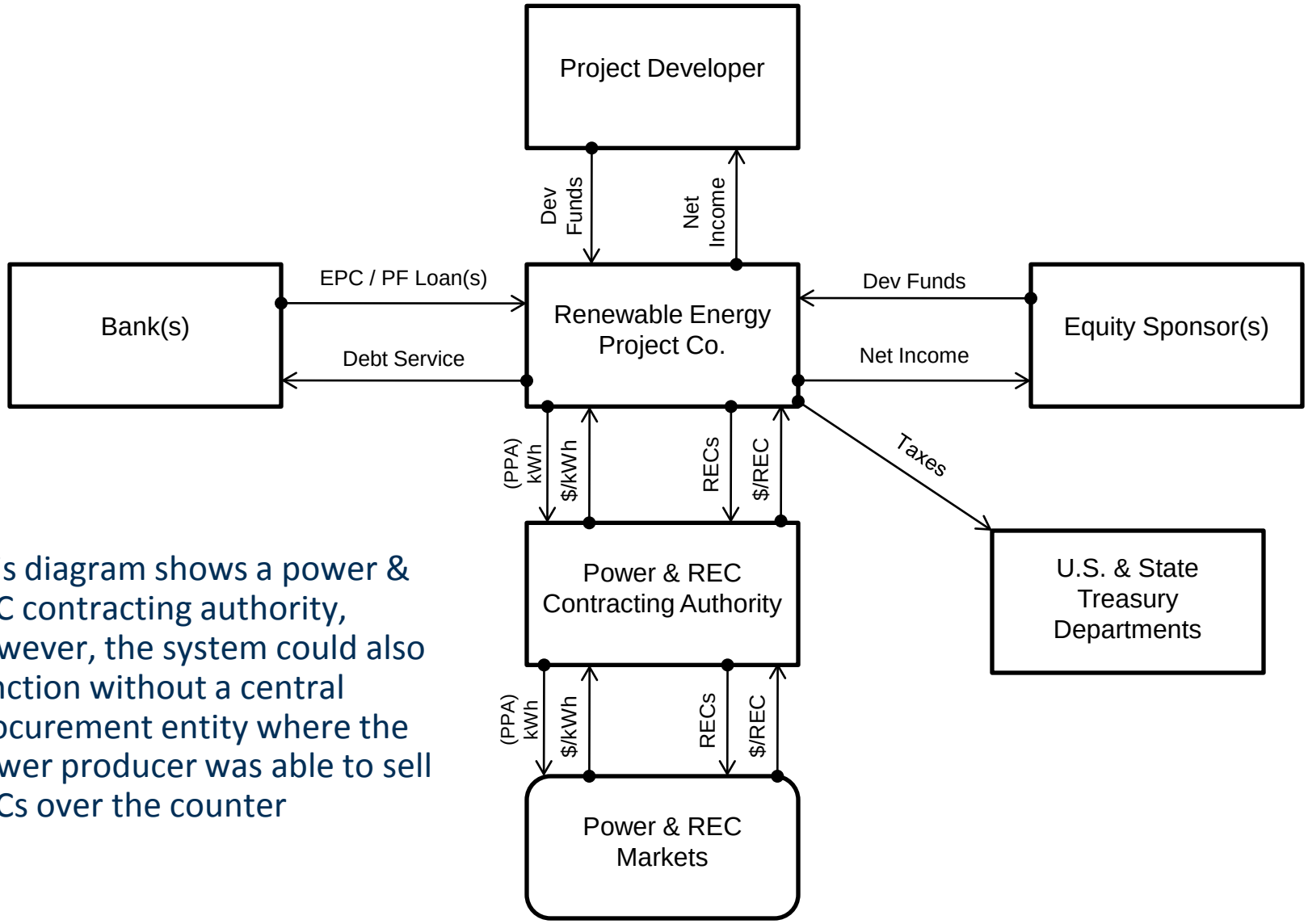
- **Italy**
  - New FiT will be awarded to the least cost power producer using a reverse auction. This policy is being phased in as the country's poorly designed REC program is phased out because of the runaway liabilities that the government had to take on after its REC market crashed in 2007.

- **Brazil**
  - Contracted power under Brazil's previous feed-in tariff incentive policy, PROINFA, averaged $136/MWh. One year later, under the initial one and three year tenders, wind power prices came down precipitously to an average of $74.4/MWh, over 40% lower than under the previous feed-in tariff regime. The subsequent five year tender yielded even greater price reductions at $56/MWh.

- **Other LATAM countries**
  - BNEF reports that other LATAM countries such as Argentina, Mexico, Peru, Honduras, Uruguay, in addition to Canada, China, Morocco, and Egypt, all developing markets with an interest to displace more expensive fossil generation, have conducted reverse auction tenders for wind power. These countries are finding that reverse auctions are particularly attractive because they offer price discovery through competitive bidding that often leads to dramatic price reductions.

Sources: Bloomberg New Energy Finance; California Public Utilities Commission; Hudson Interviews with US General Service Administration

Reverse Auction Flow Diagram



- This diagram shows a power & REC contracting authority, however, the system could also function without a central procurement entity where the power producer was able to sell RECs over the counter

Sources: Hudson Analysis

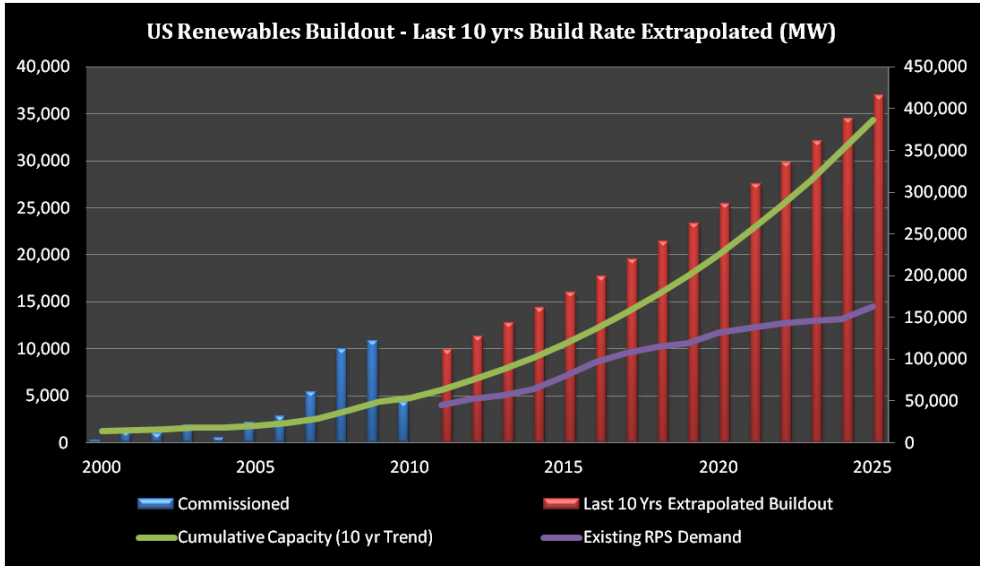
Good Policy

Why should states consider implementing Reverse Auction Mechanisms for renewable power procurement?

1. Market driven procurement tool that encourages efficient development of domestic renewable energy resources
2. Compliments existing State Renewable Portfolio Standards and REC markets
3. Cost effective for rate payers
4. Creates competitive bidding for support mechanisms such as production-based cash grants, feed-in tariffs, etc.
5. Promotes competition and further cost reduction, driving renewable technologies closer to grid parity

Potential Driver of Renewables Demand

- Renewable Portfolio Standards in 29 US States are the primary driver for new renewable energy capacity development
- Total installed renewable capacity in the US at the end of 2010 was ~54GW, and many REC markets are in oversupply, suggesting that the rate of new build will slow under existing RPS mandates
- Implementing Reverse Auctions Mechanisms in States with RPSs could help drive further cost reductions and facilitate faster build rates

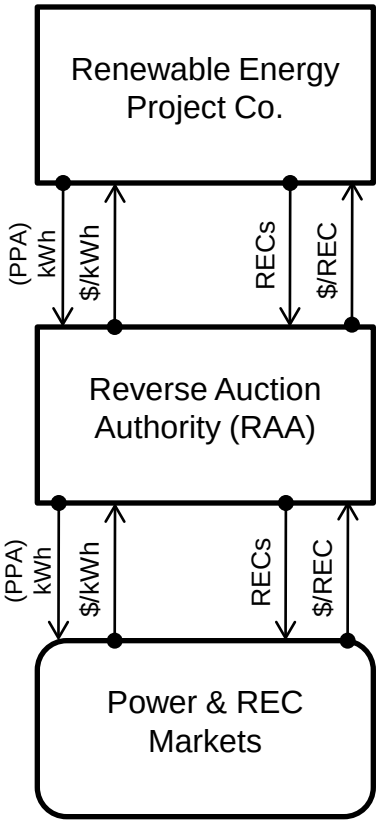


Sources: Bloomberg New Energy Finance; Hudson Analysis

Proposed Federal Reverse Auction

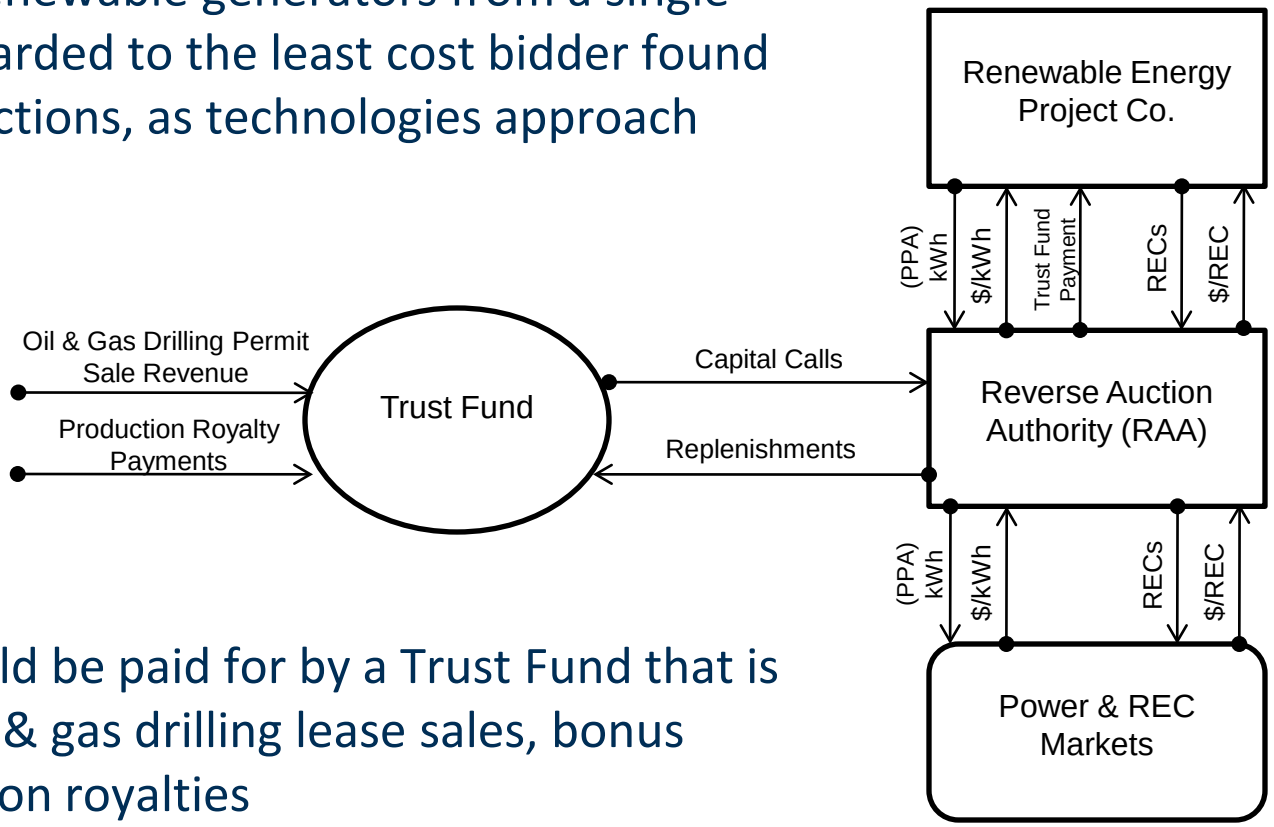
- Members of Congress have considered implementing a reverse auction at the Federal level
  - In the 112th Congress, Representative Devin Nunes proposed Bill (H.R. 909), which received support from 73 co-sponsors, that called for the establishment of a federal Reverse Auction mechanism

- The Bill called for the creation of a Reverse Auction Authority (RAA), a private sector non-profit entity to be overseen by the US DOE



Creative Ideas to Pay for Future Support

- H.R. 909 proposed to have the RAA issue production-based support payments to renewable generators from a single-purpose trust fund, awarded to the least cost bidder found through the reverse auctions, as technologies approach grid parity



- Support payments would be paid for by a Trust Fund that is seeded by off-shore oil & gas drilling lease sales, bonus payments and production royalties

Sources: Hudson Analysis

Critiques of the Federal Proposal as Written

There are limitations with the reverse auction language in H.R. 909 that could prevent it from successfully promoting renewable generation in the U.S.

- Reverse Auction would be limited only to financial support from the Trust Fund
  - Limits the value of the reverse auction
- Renewable generator would need to identify a purchaser for the electricity
  - Given the current economic climate and oversupplied gas market, this is a challenge
- In order to participate in the reverse auction, a bidder would have to secure a PPA
  - Developers typically enter into PPAs only after they know the extent of the financial support
  - Requiring a bidder to secure a PPA before it can submit a bid would likely prevent that bidder's participation
- Provides that monies from the Trust Fund would be subject to appropriations Acts
  - Subjecting the amounts of money in the Trust Fund to annual appropriations may have the same chilling effect on renewable development as the cycles of expirations and extensions of tax-based support (PTC and ITC)

Proposed Edits to the Language of H.R. 909 as Written

There are also solutions to these limitations that would allow this policy to successfully promote renewable generation in the U.S.

- Alter language to assure that the Trust Fund has a steady source of support without the need for Congressional appropriations

- Allow the Reverse Auction Authority to purchase the power under long-term PPA
  - Creates the PPAs contracts needed to finance and grow the renewables industry
  - Using a reverse auction to purchase electric energy in addition to distributing support monies from the Trust Fund would challenge the renewable developers to lower their costs in order to successfully compete in the auctions and deliver more competitively priced renewable energy… driving costs down

- Allow the Reverse Auction Authority to purchase RECs and resell them in their respective markets
  - Inclusion of RECs in the reverse auction would have the effect of lowering REC prices, thereby benefiting ratepayers in states with renewable portfolio standards
  - In effect, inclusion of REC trading within the mandate of the RAA would immediately bring many of the benefits of a national renewable energy standard without imposing a Federal mandate

Proposed Edits to the Language of H.R. 909 as Written (Cont'd)

- Require all Federal agencies to purchase all their REC needs through the Federal Reverse Auctions
  - Creates the PPAs contracts needed to finance and grow the renewables industry
  - Using a reverse auction to purchase electric energy in addition to distributing support monies from the Trust Fund would challenge the renewable developers to lower their costs in order to successfully compete in the auctions and deliver more competitively priced renewable energy… driving costs down

- Require each State regulatory authority in States that have an RPS to conduct a proceeding to consider permitting utilities in their state to purchase "Federal RECs" to satisfy, in whole or in part, their utilities' State REC obligations under their RPS
  - Inclusion of RECs in the reverse auction would have the effect of lowering REC prices, thereby benefiting ratepayers in states with renewable portfolio standards
  - In effect, inclusion of REC trading within the mandate of the RAA would immediately bring many of the benefits of a national renewable energy standard without imposing a Federal mandate
  - While States are engaging in such proceedings, the RAA would be permitted to sell "regional RECs" in addition to Federal RECs

Thank you!

Neil Auerbach

Managing Partner
Hudson Clean Energy

Additional Resources:

- Testimony of Neil Z. Auerbach Before the United States House Committee on Ways and Means, Sept. 22, 2011
- Testimony of Neil Z. Auerbach Before the United States House Committee on Energy and Commerce, June 3, 2011
- Which Direction is Energy Policy Headed?, Nov. 17, 2011
- Is Grid Parity Always Down the Road?, Nov. 17, 2011
- Hudson's Regional Overview, Nov. 17, 2011

Renewable Auction Mechanism (RAM):

New Procurement Tool for Distributed Renewable Generation

CESA Webinar

Presented by Jaclyn Marks

Senior Analyst, Renewable Procurement and Market Development

California Public Utilities Commission

January 27, 2012

Presentation Overview

- Overview of the CA Renewables Portfolio Standard (RPS)
- Status of RPS procurement
- RPS DG procurement strategy
- RAM program overview
- RAM implementation

California's 33% RPS Program

RPS requires all retail energy sellers to procure 33% of retail sales from renewable energy by 2020

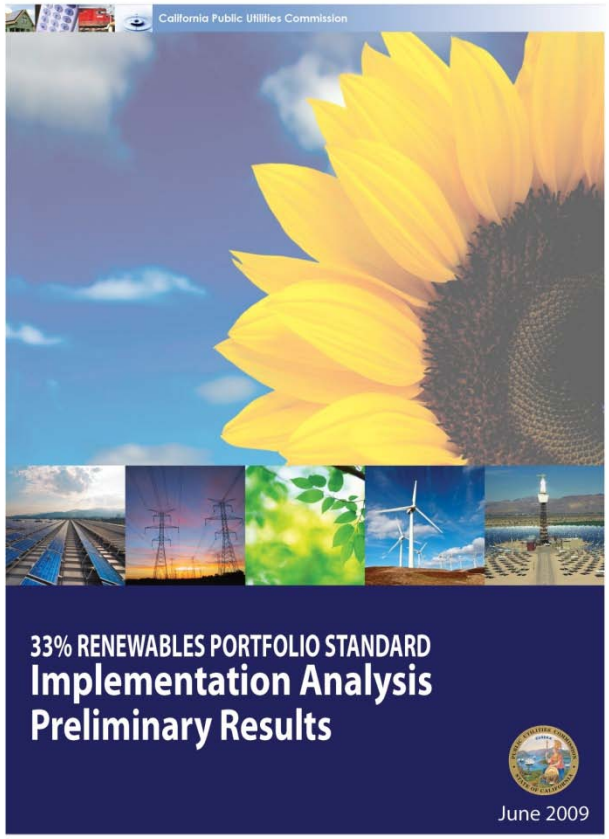
- Program instituted in 2002
- Target increased from 20% to 33% in 2011
- RPS compliance is measured in terms of electricity deliveries, **not signed contracts**
- Governor Brown has set a goal for 12,000 MW of distributed renewable generation (DG)

Status of RPS Procurement

Contract Status	Number of Contracts	Minimum MW
Approved and Online	100	7,259
Approved and in development	89	10,006
Subtotal	**189**	**17,264**
Pending review	55	3,964
Withdrawn/Terminated	37	2,605
Total	**281**	**23,833**

- 2,541 MW of new capacity is online due to the RPS program
- IOUs are on track to meet 20% RPS requirements for Compliance Period 1 (2011-2013)
- IOU self-reported 2010 procurement
  - PG&E: 15.9%
  - SCE: 19.3%
  - SDG&E: 11.9%

Diversify RPS Procurement Strategy?



- In June 2009, CPUC staff issued an implementation assessment of the 33% by 2020 RPS goal
- Concluded that it will be challenging to permit and construct the generation and transmission needed to achieve 33% by 2020
- Noted that CA might need to diversify its current procurement strategy, which is largely dependent on large utility-scale projects

Link to report - http://www.cpuc.ca.gov/PUC/energy/Renewables/hot/33implementation.htm

Why Pursue DG Procurement Strategy?

- In between the RPS program and the customer-side DG programs (e.g., California Solar Initiative) is a potentially vast, untapped market segment for system-side renewable DG. Benefits of this market segment include:
  - Quick project development timelines
  - Avoidance of new transmission
  - Declining technology prices
  - Insurance for riskier, large-scale renewable projects

RPS DG Procurement Options

- AB 1969 Feed-in Tariff – started 2008
  - 1.5 MW – up to 3 MW when amendments to 399.20 are implemented
  - Standard contract and fixed price
- Utility Solar PV Programs – started 2010
  - Solar PV, 1- 20 or 1 -2 MW in size – program specific
  - Standard contract and pay as bid
- SCE Voluntary Program – started 2007 and cancelled 2010
  - All technologies, 1 – 20 MW in size
  - Standard contract and pay as bid
- Renewable Auction Mechanism (RAM) – first auction in November 2011
  - All technologies, 1 - 20 MW in size
  - Standard contract and pay as bid
- RPS Annual Solicitations and Bilateral Contracts - ongoing
  - All technologies, min size 1 MW
  - Negotiate price and contract terms and conditions

RAM Guiding Principles

Operating Assumptions:

- Sufficient number of developers in the DG market segment to ensure competition
- Projects greater than 20 MW would participate in RPS solicitations

Guiding Principles:

- Identifies least-cost viable projects that can interconnect quickly
- Creates a sustainable and long-term market for system-side renewable DG projects
- Provides sufficient payment to simulate untapped market segments at the distribution level while preserving competition
- Minimizes the transaction costs for the seller, buyer, and the regulator
- Equitably allocates risk between the buyer and the seller
- Adequately addresses project viability

RAM Program Overview

- On December 16, 2010, the Commission adopted RAM via Decision 10-12-048
  - Initial 1000 MW procurement cap over 2 years
  - Projects up to 20 MW in size and any RPS renewable technology
  - Projects located in the IOU service territories
  - Projects can interconnect at the distribution or transmission level
  - Projects must achieve commercial operation within 18 months of executed contract (with one 6-month extension for regulatory delays)
  - Each IOU must hold 2 auctions per year

Link to RAM decision: http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/128432.pdf

Key Program Design Elements of RAM

- Project viability screens
- Market-based pricing
- Standard, non-negotiable contract
- Cost containment mechanism
- Preferred distribution interconnection sites
- Process for modifying program

Project Viability Screens

- Seller must meet minimum criteria to participate in the auction in order to lower risk of project failure
  - **Site Control**: 100% site control through (a) direct ownership, (b) lease or (c) an option to lease or purchase that may be exercised upon award of a RAM contract
  - **Development Experience**: One member of the development team has (a) completed at least one project of similar technology and capacity or (b) begun construction of at least one other similar project
  - **Commercialized Technology**: Project is based on commercialized technology
  - **Interconnection Study**: Bidder must have received results from its first interconnection study (system impact study or phase I cluster study)

Market-Based Pricing

- Seller develops bid price that reflects cost to build a project and provide a return on investment
- Bids are selected on price plus transmission upgrade costs
- Products with similar characteristics are compared to each other
  - Baseload, peaking intermittent, and off-peak intermittent product categories
- Lowest cost projects are selected until the auction capacity cap or revenue requirement cap is reached
- Bid price is not negotiable and is paid as bid

Standard Contract

- CPUC approved standard, non-negotiable contracts for each IOU through an open stakeholder process
- Decision requires certain terms to ensure there is “skin in the game:”
  - 18 month online date plus one six month extension for regulatory delays
  - Project development deposit
  - Performance deposit

Cost Containment

- Interim approach for containing program costs - 1000 MW program cap
- Decision orders staff to develop a methodology for establishing a revenue requirement that would be used to cap RAM procurement
  - Methodology should capture the IOUs' need for RAM projects relative to other RPS procurement options
- IOUs have discretion to reject bids
  - Evidence of market manipulation
  - Prices are not competitive with other RPS procurement options
  - If IOU wishes to utilize this discretion, it will need to publicly state why bids were rejected

Preferred Interconnection Sites

- IOUs are required to provide maps to assist developers in identifying good interconnection sites:
  - Interconnection is one of the most expensive and uncertain steps in project development for system-side DG
  - Greater transparency of the distribution system will allow project developers to identify good sites to interconnect in order to lower interconnection costs
  - IOUs must provide available capacity at the substation and circuit level for their distribution and transmission systems
- Anyone can access the maps, which are available on the IOU RAM websites

Process for Modifying Program

- RAM program has been designed so that it can be quickly modified and improved based on IOU and developer feedback
- IOUs are required to hold a program forum each year to solicit feedback from participants
  - IOUs can request program changes based on feedback
  - CPUC staff can recommend program changes based on feedback from program forums and utility annual RAM reports

Program Status

- First auction closed on November 15, 2011
- IOUs will submit executed contracts to CPUC in March/April for 30 day CPUC review/approval
- In order to increase program transparency, filing will also include solicitation data
  - Names of participating companies and number of bids per company
  - Number of bids received and shortlisted
  - Distribution of projects sizes bid into auction
  - Participating technologies
  - Quantitative summary of how many projects passed each project viability screen
  - Location of bids by county provided in a map format
  - Information on the achievement of project development milestones for all executed RAM contracts
  - Will not include price data, which is confidential

RAM Results

- Very robust participation and pricing from solar PV of all project sizes
- Minimal response from other technologies
- Bids submitted in all project sizes and short-listed bids range from small to large
- Short-listed bids have a combination of low-price and zero to low transmission costs
- Next Steps
  - IOUs will hold program forums to discuss lessons learned and proposed program modifications
  - Second auction will close May 31, 2012

Preliminary Conclusions

- First auction functioned as expected
- Contracting process is streamlined and efficient
  - Program could be expanded to larger project sizes in order to further streamline the RPS contracting
- Competition in peaking intermittent category was very robust; anticipate greater competition in the next auction
- Ground-mount solar PV between 3 – 20 MW was the most competitive
- Streamlined process to modify the program is very important in order to learn from experience

More Information

CPUC RPS Website:

- www.cpuc.ca.gov/renewables

CPUC RPS RAM Website (with links to IOU RAM websites and maps):

- http://www.cpuc.ca.gov/RAM

CPUC Feed-in Tariff Website:

- http://www.cpuc.ca.gov/PUC/energy/Renewables/feedintariffssum.htm

Questions:

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Reverse Auctions: Procuring Clean Energy Effectively and Efficiently

CESA and RPS Collaborative

January 27, 2012

NORTHBRIDGE

WHAT AND WHEN

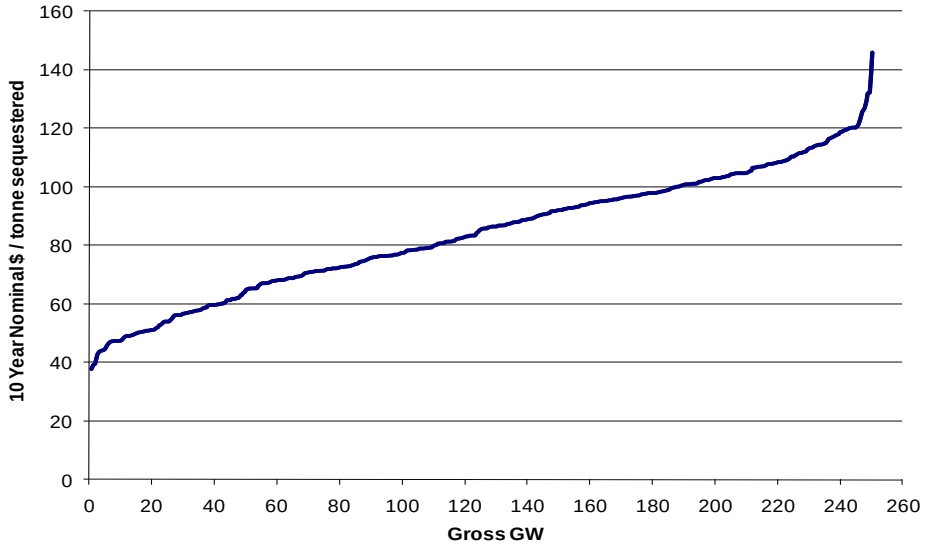
- Unfamiliar term but common practice
  - Procurement of commodity supplies throughout the private sector
  - Procurement of electric supplies for default service
  - Rather than a seller selling, a buyer buying - aka “procurement auction”

- Fundamental conditions
  1. Multiple sellers – for effective competitive pressure
  2. Reasonably standard non-price product qualities
     - » Allows for competition on the basis of price
     - » Less suitable for technology demonstration where learning is primary goal
  3. Range of supply costs – allows bids to be distinguished

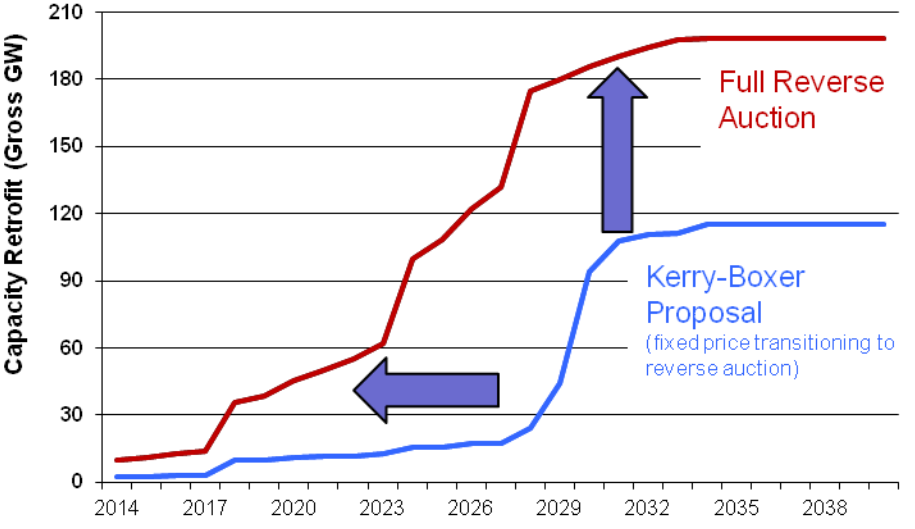
BENEFITS

Under Kerry-Boxer, CCS deployment relying exclusively on reverse auctions would have accelerated and roughly doubled the capacity expected to be deployed.

10 Year $/Tonne Incentive Required to Deploy CCS (2014 In-Service, Nth Unit, $25/Tonne CO2 Price)



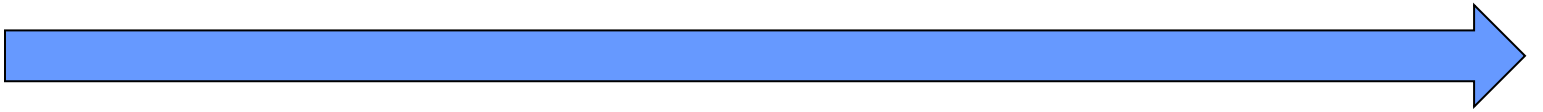
Capacity Deployed under Kerry-Boxer as Proposed and with Full Reverse Auction Process



WHO ARE THE WINNERS?

1. Taxpayers
2. Low cost generators
3. Technology innovators and investors
4. Project development innovators
5. Clean energy supporters

MAJOR DESIGN ELEMENTS



Establish Auction Processes	Conduct Auctions			Assess and Revise
	Bidder Qualification	Auction	Execution	
❖ Product definition – Technologies – Timing – Delivery – Term – Pricing structure – Contract language ❖ Auction design – Timing – Size – Number – Frequency – Independent administrator	❖ Creditworthiness ❖ Security requirement ❖ Contractual obligations ❖ Indicative bids	❖ Type: multiple round, descending clock? ❖ Min and max prices? ❖ Single price? ❖ Share limits?	❖ Approve results ❖ Execute contracts ❖ Post security ❖ Monitor development and delivery	❖ Review outcomes ❖ Assess process ❖ Identify lessons ❖ Independent review ❖ Revise as appropriate