



Basic Elements of Auctions

Mexico National Forum on Renewable Energy Regulation: An Approach to Auctions

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Topics

- I. RE support mechanisms**
 - Minimum requirements
 - Regulatory vs. non-regulatory
- II. Auctions**
 - Objectives
 - Open vs. closed
 - Design considerations
- III. California's Renewable Auction Mechanism (RAM)**



Renewable Energy Support Mechanisms

- Minimum requirements
- Regulatory vs. non-regulatory

RE Support Mechanisms: Minimum Requirements

- Access to the grid (interconnection)

USA	PURPA (Public Utility Regulatory Policy Act) of 1978
California	Renewable Auction Mechanism (RAM)- Utilities must provide maps and availability of interconnection sites
Mexico	Interconnection Contract for Renewable Energy (Contrato de Interconexión para Fuentes de Energías Renovables)
Brazil	Utilities should purchase from qualified facilities with no more than 10% of the utilities' load (Decree 5.163/2004)
Peru	Promotion of Electricity Generation from Renewable Resources (Decree 1002/2008)

Examples

RE Support Mechanisms: Minimum Requirements

- Priced for potential profitability

Examples

USA	Avoided costs, feed-in tariff, request for proposals
California	RAM auction market price
Mexico	Market price by competitive bidding (Ex. Oaxaca II, III & IV wind farms)
Brazil	Market price by auction
Peru	Market price by auction



RE Support Mechanisms

- Regulatory mechanisms
- Non-regulatory mechanisms

RE Support Mechanisms: Regulatory Mechanisms

Class	Quota Systems	Minimum Price Systems
Examples	<ul style="list-style-type: none">• Renewable portfolio standards (RPS)• Auctions• Renewable obligation systems	<ul style="list-style-type: none">• Feed-in tariff (renewable tariff)
Who determines amount of RE generation?	Regulator/government	Market forces
Who determines RE prices?	Market forces	Regulator/government



RE Support Mechanisms: Non-Regulatory Mechanisms

- Capital subsidies
(investment tax credit/deduction)
 - **Mexico:** Income Tax Law: 100% deduction of RE investment in one fiscal year
- Production subsidies
(production tax credit)
 - **EEUU:** Production Tax Credit: 2.2¢/kWh (\$22/MWh) for wind and geothermal



Renewable Energy Auctions

- Objectives
- Open vs. closed
- Design considerations



Clarification of Terminology

- Auction
- Bidding
- Competitive bidding
- Tender
- Request for tender
- Request for proposal
- Competitive solicitations



Auction

- **Auction** = sale of property to the highest bidder; a market clearance mechanism to equate demand and supply
 - Elicit information (bids) from potential buyers regarding their willingness to pay
 - The outcome (winner & amount paid) is based solely on the information received
 - The price-formation process is explicit (the rules are well-understood by all participants)



Auction Objectives

- Primary objective: To maximize revenue
 - Seller wants to maximize revenues or sell at the highest price
 - Buyer wants to minimize expenses or buy at the lowest price
- Additional objective: To maximize efficiency (social welfare)
 - Efficient auctions put goods into the hands of the buyers who value them the most



Open Auctions

All bids are publicly observable

- **Ascending auction** (English auction)
 - Price starts low & rises in small increments
 - The auction ends when only one bidder remains (“sold to the highest bidder”)
- **Descending auction** (Dutch auction)
 - Price starts high and is gradually lowered
 - The auction ends when the first bidder expresses interest in the price and thereby wins



Closed (Vickrey) Auctions

Sealed bids, not publicly observable

- Sealed-bid first-price auction
 - Highest bidder wins and pays the amount of his/her bid
 - Most straightforward
 - Common way to procure energy resources
- Sealed-bid second-price auction
 - Highest bidder wins and pays the amount of the second-highest bid



Auction Design Considerations

- Avoid collusion
- Avoid entry deterrence
- Avoid predation
- Set appropriate reserve price
- Navigate political obstacles



Auction Design Considerations: Avoid Collusion

- **Collusion** = secret agreement or cooperation, especially for an illegal or deceitful purpose
- Bidders acting in collusion interfere with the auction's goals of revenue maximization and efficiency



Auction Design Considerations: Avoid Entry Deterrence

- **Entry deterrence** = the reduction of competition by preventing other firms from entering the market
- Fewer bidders could undermine the revenue maximization objective (expense minimization)
- Presumption that ascending auctions discourage some bidders from entering (auction seeks to attract bidders)



Auction Design Considerations: Avoid Predation

- **Predatory pricing** = the act of setting prices low in an attempt to eliminate the competition
- Predatory pricing is illegal under anti-trust laws in some countries, as it makes markets more vulnerable to a monopoly
- Presumption that ascending auctions may produce this



Auction Design Considerations: Set Appropriate Reserve Price

- **Reserve price** = maximum amount the buyer is willing to pay (minimum amount the seller is willing to accept)
 - Example: Switzerland' auction of four 3G licenses
 - Reserve price too low (1/30 of other countries)
 - Allowed last minute joint-bidding agreement (officially sanctioned collusion)
 - Pool of bidders shrank from 9 to 4
 - No bidder was allowed to get more than 1 license
 - The sale price was determined at 1/30 of other countries



Auction Design Considerations: Navigate Political Obstacles

- In government procurement, if the good/service is not purchased, the auction could be seen by the public as a “failure” for officials
- First-price sealed-bid auctions, bids could be embarrassing for bidders
 - Example: BSCH purchase of Banespa, 2000



Real-World Applications

- RE auction usage by country
- California's Renewable Auction Mechanism (RAM)
 - Design
 - How it works
 - Results



RE Auction Usage by Country/State

Sealed-bid first-price auctions

- **Mexico:** Large scale projects $\geq 100\text{MW}$; independent power producers
- **Peru:** No minimum MWs (only hydro $\leq 20\text{MW}$)
- **Oregon:** Large scale projects $\geq 100\text{MW}$; through RFP \approx auction (price + other factors)
- **California:** For projects $\leq 20\text{MW}$ with **Renewable Auction Mechanism (RAM)**



Renewable Auction Mechanism (RAM)

- Simplified market-based mechanism to procure RE
- Targeted to **distributed generation** (DG) projects $\leq 20\text{MW}$
- Streamlines the procurement process for developers, utilities and regulators
- Bidders set their own price
- Provides simple standard contracts



Renewable Auction Mechanism (RAM)

Objectives

- To promote competition
- To elicit the lowest cost for ratepayers
- To encourage use of existing transmission and distribution infrastructure



Renewable Auction Mechanism (RAM)

- Marked-based pricing
- Possible interconnection sites
- Viability
- Auction design
- Standard contract
- Flexibility
- Cost containment
- Transparency



RAM: Market-based pricing

- Sellers compete for a contract
- Bids are selected by least-cost price first (**sealed-bid first-price**) until auction capacity is reached
- Price is not negotiable and is paid as bid



RAM: Interconnection Sites

- Interconnection = one of the most expensive and uncertain steps in project development for system-side DG
 - Utilities must provide maps (publicly available online) to identify interconnection sites
 - Utilities must indicate available capacity at the substation and circuit level for their distribution and transmission systems
 - Greater transparency allows project developers to identify good sites and lower interconnection costs



RAM: Viability

- Site control: 100% through ownership, lease, or option to own/lease
- Team members' development experience:
 - Completed at least one project of similar technology and capacity, or
 - Begun construction of at least one other similar project
- Based on commercialized technology
- Filed interconnection application



RAM: Auction Design

- Program capacity: 1,000 MW for the first 2 years
- Frequency of auctions: Each utility will hold two auctions per year
- Products: Projects will be compared against similar product type (baseload, peaking, intermittent)



RAM: Standard Contract

- Project online within 18 months, one 6-month extension for regulatory delays
- Development deposit
 - ≤ 5 MW \rightarrow \$20/kW
 - 5-20 MW \rightarrow \$60/\$90/kW
- Performance deposit
 - < 5 MW \rightarrow conversion of development deposit to performance deposit
 - ≥ 5 MW \rightarrow 5% of expected total project revenues



RAM: Flexibility

- Designed for quick modification based on utility and developer feedback
- Utilities must hold a program forum each year to solicit feedback
 - Utilities can request program changes based on feedback
 - CPUC staff can recommend program changes based on feedback from program forums and utilities' annual RAM reports



RAM: Cost Containment

- 1,000 MW cap in two years
- Utilities have discretion to reject bids
 - Evidence of market manipulation
 - Prices not competitive with other RPS procurement options
 - Utility must state publicly why bids were rejected



RAM: Transparency

- Utilities submit executed contracts for CPUC review/approval
 - Names of participating companies
 - Number of bids received and shortlisted
 - Distribution of projects sizes bid into auction
 - Participating technologies



RAM: Program Status

- First auction closed November 15, 2011
 - Robust participation & pricing in Solar PV
 - Good variety of project sizes
 - Bids have low-price and zero-to-low transmission costs
 - Streamlined and efficient contracting: good potential for larger project in the future.
- Utilities will submit executed contracts to CPUC in March/April
- Second auction will close May 31, 2012



Review

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- III. California's RAM**



Thank you!

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