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"Recent Electricity Auctions and Applicability for Italy"

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Agenda

- Electricity restructuring, auctions and new markets
- The Italian Single Buyer (Acquirente Unico)
- Key factors for successful introduction of markets
  - Coordination across regions
  - Importance of long term contracts
  - Auction design
- New Jersey Basic Generation Service auction –
  - Simultaneous descending clock auction developed for electricity contract procurement
  - Possible model of Single Buyer process
- Parallels to Italy

Auctions and Regulation

- Auctions have been used increasingly to replace regulatory processes
- Spectrum auctions replaced beauty contests and lotteries
- Default Service Auctions
  - Customers who are not being served by a competitive "third party" supplier must be served by the electricity distribution company at regulated rates
  - Auctions now have been used for utility energy purchases to serve these consumers
  - RFPs tend to be followed by bilateral negotiations, providing more scope for regulators to question the results.
- Entitlements and PPAs
  - Utilities required to divest assets
  - Rather than sell off entire assets, auctions now are used to sell entitlements, strips, PPAs, as in Texas and Alberta

New Types of Electricity Auctions

- Simultaneous clock auctions
  - Used for buying or selling multiple units of a few types of lots or products, such as system slices or energy entitlements.
  - First application for default service procurement was Simultaneous Descending Clock Auction (SDCA) which NERA developed for New Jersey.
  - Variations of clock auctions have been used to sell energy entitlements in Texas capacity auctions and French VPPs.
  - Clock auctions are well suit for interconnection capacity.
- Simultaneous multiple round auctions has been used on one occasion for selling PPAs in Alberta.
- Other, more traditional, auctions such as Yankee auctions and English auctions used for energy entitlements in Alberta and for interconnection in Netherlands did not work well.

The Italian Single Buyer: Acquirente Unico

The Role

- Centralized purchases of electricity positively affect
  - Consumers, in that they reduce both the price level and its volatility, and
  - Producers, in that they guarantee a flow of revenues that can be employed to increase production capacity
- The Single Buyer can serve both
  - Captive customers, which cannot choose their supplier autonomously
  - Eligible customers, who do not choose to purchase electricity from a competitive supplier

Key Issues

- The issue is not whether the Single Buyer has a role, but rather addressing the following questions
  - Who is supposed to make purchases? Three options
    - Public institution
    - Distributors or marketing firms
    - A private company
  - Who is the contracts owner responsible for payments? Two options
    - Distributors
    - Single Buyer
  - What is the best electricity purchasing process? Three options
    - Auctions
    - Bilateral contracts
    - Day-before contracts

The Auction

- The experience of the state of New Jersey in the USA suggests that auctions have been efficient in that resulted in
  - Competitive allocation prices
  - Effective competition among producers

- It is more efficient to organize a single auction at national level rather than several auctions at regional level

Planning for Default Service Procurement

Auction Design Objectives

- **Auction design adopted should best match objectives**
  - Simultaneous multiple round/clock auctions are appropriate for efficiently allocating multiple lots, with value interdependencies, such as energy entitlements, capacity and spectrum licenses
  - Theory suggests that simultaneous auctions will result in economically efficient assignments assuming substitutes and "straightforward" bidding
  - Simultaneous auctions work adequately when bidders have similar views about complements
  - Clock auctions are well suited for dividing shares of load.

  - Simultaneous auctions can create some incentives for bidders to withhold supply, but these incentives can be mitigated with volume adjustments
  - Simultaneous auctions work less well with strong, overlapping complements

The Role of a Market

- A single nationwide auction is a type of market
- Auction can include contract for different systems
- Prices in well designed auction will
  - Provide transparent means of determining costs of electricity needs, and
  - Price differentials will reflect competition view of cost differences
- Absent coordination and a well designed auction, prices will not always reflect costs

Default Service and Captive Customers

- All consumers are due to become eligible by 2007 to purchase a competitive service
- Not all consumers will necessarily elect to purchase a competitive service. In UK, 65% of consumers are still on default service
- Some consumers who elect to purchase competitive service may choose to return to default service
  - Competitive service providers can discontinue service
  - Other circumstances, such as credit or seasonal price differences can induce migration
- Default service will probably continue past 2007

US Experience with Liberalization

Customer Participation in Retail Access

State	Population	Customers of Competitive Suppliers	Total Customers Eligible for Retail Choice	Migration Rate	Report Date	Competitive Residential Load	Competitive Commercial Load	Both C&I Load	Competitive Industrial Load	Total Competitive Load	Report Date
Arizona	5,456,453	n/a	n/a	n/a	n/a	0.00%	0		0.00%	0.00%	2-Oct
California	35,116,033	72,422	10,580,906	0.68%	2-Dec	0.80%	1.4*/13.9#		35.70%	13.30%	2-Aug
Connecticut	3,460,503	n/a	n/a	n/a	n/a	1.30%		0.20%		1.20%	2-Sep
District of Columbia	570,898	25,115	197,359	12.73%	2-Sep	11.10%		59.60%		49.40%	2-Aug
Delaware	807,385	n/a	n/a	n/a	n/a	n/a		n/a		n/a	2-Sep
Illinois	12,600,620	27,896	687,980	4.06%	2-Oct	0.00%	26.90%		50.10%	25.80%	2-Jul
Maine	1,294,464	8,713			3-Jan	1.60%	30.40%		72.10%	34.80%	2-Sep
Maryland	5,458,137	74,870	2,074,243	3.61%	2-Dec	3.90%			29.10%	17.20%	2-Aug
Massachusetts	6,427,801	84,532	2,544,495	3.32%	2-Nov	2.20%	11.4*/17.4#		43.50%	21.60%	2-Aug
Michigan	10,050,446	n/a	n/a	n/a	n/a	n/a	n/a		n/a	7.30%	2-Jul
New Jersey	8,590,300	2,573	3,651,148	0.07%	2-Dec	n/a		n/a		1.80%	Jun/02-Aug/02
New York	19,157,532	388,308	7,279,618	5.33%	2-Nov	5.50%		26.20%		18.90%	2-May
Ohio	11,421,267	747,951	4,681,053	15.98%	2-Sep	13.90%	15.20%		11.70%	12.90%	2-Jun
Oregon	3,521,515	36,503	1,213,858	3.01%	2-Dec	n/a		0.00%		0.00%	2-Sep
Pennsylvania	12,335,091	278,429	n/a	n/a	3-Jan	5.60%	10.70%		11.00%	8.70%	2-Oct
Rhode Island	1,069,725	2,132	468,015	0.46%	2-Dec	n/a	n/a		n/a	12.90%	2-Jun
Texas	21,779,893	469,106	n/a	n/a	2-Sep	4.80%	27.20%		81.10%	38.20%	2-Jul
Virginia	7,293,542	2,584	1,300,763	0.20%	2-Aug	n/a	n/a	n/a	n/a	n/a	n/a

#Large Commercial; *Small Commercial; n/a = Not Available; n/o = Not Open

Long Term Contracts

- Long term contracts play a number of essential roles
  - Hedging against future price increases
  - Smoothing variations in spot prices
  - Attenuate impact of concentration
- Market power cannot be legislated away
  - However, measures can be taken to mitigate its impact
  - One is to put in load caps
  - However, if in an auction, auction manager has ability to limit purchases of long term contract and revert to shorter term purchases, strategic advantage shifts in negotiation from seller to buyer

The New Jersey BGS Auction

The New Jersey BGS Auction

- Four utilities were under legislative mandate to purchase energy in a competitive bidding process.
  - NJ EDCs needed to secure one-year forward supplies for approximately 17,000 MW of forecast peak load
  - Auction was for one year forward contracts.
- The auction outome
  - Prices appeared to be competitive, between 4.87¢ and 5.82 ¢ for entire year.
  - Over 20 bidders competed to *sell* and there were 15 winners.
  - in first ever simultaneous descending price clock auction.
- New Jersey Board rendered decision on auction results within 48 hours of the close of the auction

Market Background

- NJ EDCs BGS requirements of nearly 17,000 MWs represented over 95% of all NJ energy consumption
- Total native capacity of approximately 20,000 MW including some NUGs (although 29,600 MW showed up at the start of the auction)
  - PS Power controlled 57% of native resources
  - The top four firm concentration, CR_4 = 76%
  - Limited import capacity from South and West through PJM
  - Energy prices North and East in NYISO tends to be higher than in NJ
- PJM structure facilitated competition in the auction
  - FTR allocation coordinated with BGS contract
  - PJM spot market provided options for both buyers and sellers

Italy vs. New Jersey

New Jersey

- Multiple regional distribution companies
- Largest domestic generator has 57% of domestic capacity
- CR_4 = 76%
- Transmission import capacity < one third load requirements
- Initial offers exceeded 50% of needs, and 20% more than combined generation + import capacity

Italy

- Multiple regional distribution companies
- Largest domestic generator has 56% of domestic capacity
- CR_4 = 77%
- Transmission import capacity < one third load requirements
- Initial offers can exceed combined generation + import capacity

New Jersey Winning Bidders

	BGS Winning Bidders for Year 4 Winning Bidder Number of Tranches Won per EDC territory			
	PSE&G 5.112 ¢/kWh	JCP&L 4.865 ¢/kWh	Conectiv 5.117 ¢/kWh	RECO 5.819 ¢/kWh
ALLEGHENY ENERGY SUPPLY	15			
AMERADA HESS CORPORATION	9	1		
AQUILA ENERGY MARKETING	15	5		
CONECTIV ENERGY SUPPLY INC				1
CONSOLIDATED EDISON ENERGY		3		
DTE ENERGY TRADING INC	20			
DUKE ENERGY TRADING		5		
FIRSTENERGY SOLUTIONS CORP	10	2	5	
MIECO	1			
NRG ENERGY			5	
PPL ENERGY PLUS CORP				3
SELECT ENERGY INC	1	15	5	
SEMPRA ENERGY TRADING CORP	6	9	4	
TXU ENERGY TRADING	7	3		
WILLIAMS ENERGY MARKETING & TRADING	12	8		

Design of the New Jersey BGS Auction

BGS Auction Rules—Overview

- The standard Simultaneous Multiple Round (SMR) auction format —*b*idding in rounds
- *Reverse auctions—the sellers bid*
- Uniform pricing
- Form of bids—*quantities instead of prices*
- Activity rules—total bids cannot increase
- *Switching*—suppliers can switch between EDCs during auction
- *Auction volume adjustments* —limit exposure to market power, can supplement unmet needs in auction with subsequent market purchases
- Ending the auction

Forward vs. Reverse Auctions

- The BGS is a reverse auction—the sellers are bidding
- In a standard, or *forward*, auction, buyers outbid each other, and prices increase until demand drops to the point where prices cannot be increased further without leaving inadequate demand
- In a reverse auction, prices decrease until there is insufficient competition among sellers to decrease them further

Types of Auctions

- One shot vs. multi-round, simultaneous vs. sequential, open vs. sealed bid, 1st price vs. 2nd, Dutch, English, Yankee, Japanese, supply functions.
- Simultaneous multiple round, such as SDCA
  - ***Simultaneous***: Multiple lots (tranches) of different products auctioned at once
  - ***Multiple Round***: After each round of bidding, results are posted, and bidders can improve offers in the next round
  - ***Descending Clock***: Prices decrease ("tick down") until supply just enough to meet load to be procured for each product
- SDCA auction
  - Appropriate for BGS load as can achieve efficient outcomes when tranches are substitutes, and are effective in dividing a shares of substitute lots among competing bidders.
  - Volume adjustments were instrument in auction designed to mitigate EDC exposure to limited competition.

Bid Quantities and *Not* Prices

- In many auctions, the item being auctioned is fixed, and a "bid" is an offer of a specific price for the item
- The uniform pricing mechanism of the BGS auction sets the prices in each round for each tranche
- So instead of bidding a price, each bidder bids the quantity of tranches it is willing to supply at the stated prices
- As prices decrease, bidders collectively lower the total quantity that they are willing to offer

Bidding in Rounds

- All bids are submitted during specific time-windows called “rounds”
- During a round, all bids are confidential
  - The auctioneer does not reveal any bid information during the round
  - Bidders are not permitted to communicate with each other
- At the end of each round, all bids are collected and processed for the next round
- Round lengths in the BGS auction are expected to be short—perhaps only a few minutes

Sample Results – Start of Auction

	Round				
EDC	1	# Bid	# Available	Ratio	Price %Δ
PSEG	$65.00	142	96	1.48	2.40%
JCP&L	$65.00	84	51	1.65	3.24%
Conectiv	$70.00	55	19	2.89	9.47%
RECO	$62.00	6	4	1.50	2.50%
Totals		287	170	1.6882	
	Round				
EDC	2	# Bid	# Available	Ratio	P rice %Δ
PSEG	$63.44	162	96	1.69	3.44%
JCP&L	$62.90	86	51	1.69	3.43%
Conectiv	$63.37	31	19	1.63	3.16%
RECO	$60.45	6	4	1.50	2.50%
Totals		285	170	1.6765	

Sample Results – Near Auction End

	Round				
EDC	42	# Bid	# Available	Ratio	Price % Δ
PSEG	$52.10	102	96	1.06	0.31%
JCP&L	$53.10	62	51	1.22	1.08%
Conectiv	$49.50	20	19	1.05	0.26%
RECO	$56.40	4	4	1.00	0.00%
Totals		188	170	1.1059	
	Round				
EDC	43	# Bid	# Available	Ratio	Price %Δ
PSEG	$51.94	100	96	1.04	0.21%
JCP&L	$52.53	63	51	1.24	1.18%
Conectiv	$49.37	20	19	1.05	0.26%
RECO	$56.40	4	4	1.00	0.00%
Totals		187	170	1.1	

Exit Bids

- The following situation is possible:

	Round 44 price /kWh	Tranches bid	Round 45 price /kWh	Tranches bid
PSE&G (20)	5.2¢	97	5.175¢	94
JCP&L (12)	5.1¢	51	5.1¢	51
Conectiv (5)	5.05¢	19	5.05¢	19
RECO (1)	6.2¢	4	6.2¢	4

Applicability of SDCA in Italy

Division of Load and Contract Terms

- Many options for dividing up load
  - Uniform slices of system
  - Division by customer segment
  - Firm and non-firm tranches
  - Metered vs. non-metered customer segments
- Contract terms
  - Wholesale vs. resale
  - Fixed price service vs. variable (market) price
  - Seasonal adjustments
  - Duration
    - Uniform vs. non-uniform
    - Length

Contract Duration

- SDCA can permit contracts of different durations – e.g., Texas capacity auctions
- Some longer term contracts can facilitate bidder financing
- Some shorter term contracts can allow bidders to adjust portfolios, and can be especially useful for bidders with plants coming on or going off line.

Minimum Stay Requirements

- Minimum stay requirements/switching rules between POLR and competitive service would be an important consideration for bidders.
  - Without minimum stay requirements, load uncertainty is higher, and bidders would therefore likely require higher prices to bear risks
  - With minimum stay requirements, load uncertainty is reduced, and bidders should be willing to accept lower prices
- NJ rules now require that customers that return to BGS service, stay on BGS service for one year. This was a negotiated part of the BPU Order.

The Auction Process

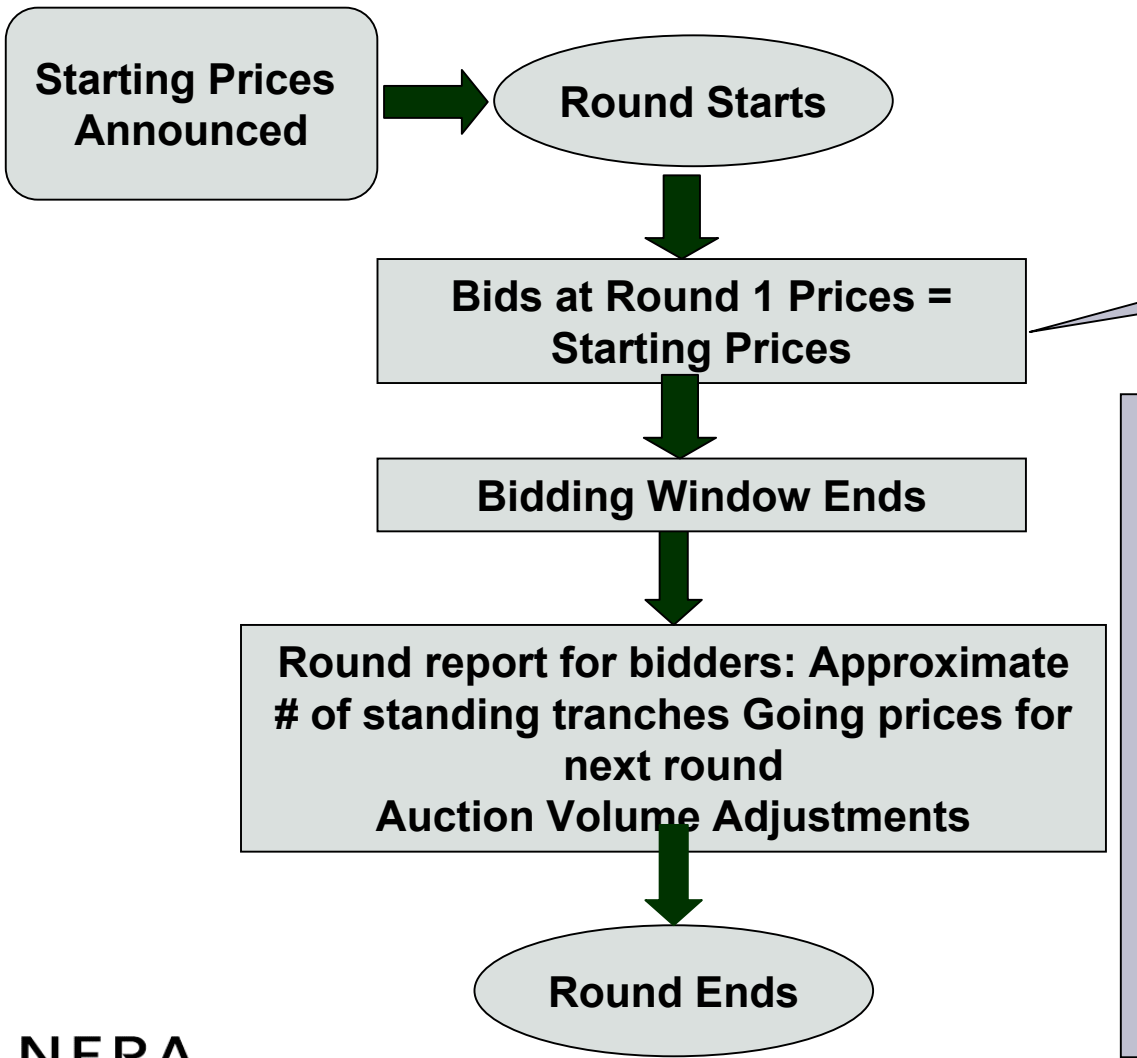
Switching

- Although a bidder may not increase the total number of tranches bid, they may increase the number bid on one or more EDCs while reducing the number bid on one or more other EDCs
- This type of bidding is called a “switch”
- Switches are allowed as long as they don’t result in an EDC with insufficient bids
- By switching between EDCs, bidders maintain the appropriate price difference equilibrium between EDCs

Exit Bids

- When bidders reduce their quantity, they can elect to submit an exit price
- An exit price is a final price for a slice on which a bidder will no longer be bidding.
- Exit prices are
  - EDC specific
  - Required to be below the previous round's going price and above the current round's price e.g., between 5.2¢ and 5.175¢
- If auction ends, slices would be allocated at the exit price of the slice that just fills the load for the product

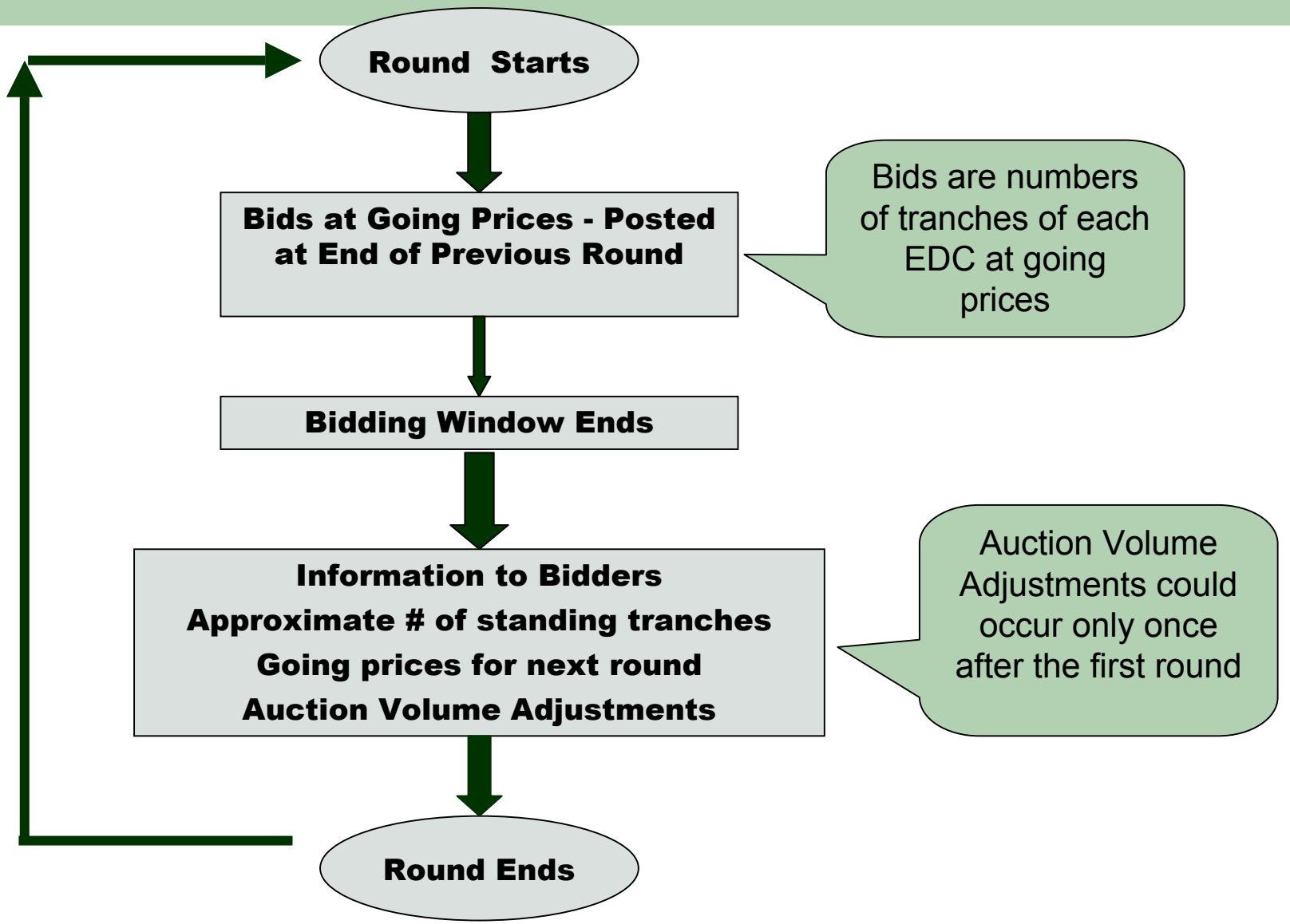
Round 1 Bidding Process



Bids are numbers of tranches of each EDC at going prices

- All bids are submitted during specific time-windows called "rounds."
- During a round, all bids are confidential and No information provided to bidders during a round
- Information on round results is provided to bidders (type of information varies from auction to auction)
- Round lengths can be fairly short

Bidding Process After Round 1



Overview of Process: Round 2, 3…

Round 2 and subsequent rounds

- In response to reduced prices, bidders
  - Leave bids unchanged, or
  - Switch from one product to another, or
  - Reduce total number of slices they wish to provide
- Bidders cannot increase the total number of slices on which they bid

The New Jersey Year 5 BGS Auction

Changes to the BGS Auction in Y5

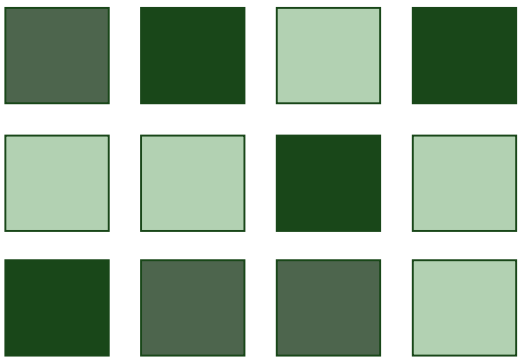
- BGS Load Split into two groups:
  - Hourly Electric Price (CIEP/HEP) for large corporate and industrial customers
  - Fixed Price (FP) for small and residential customers
- Separate but concurrent SDCAs will be held:
  - HEP Auction is for capacity ($/MW-day)
  - FP Auction is for all-inclusive price (¢/kWh, same as Y4)
- Regulatory approval for each auction's result is separate.
  - Winning Bidders sign different contracts; BGS-HEP Supplier Master Agreement and BGS-FP Supplier Master Agreement differ.

BGS FP Auction

- Two contract terms: 10 months and 34 months
  - Therefore there are 8 products (= 4 EDCs x 2 terms).
  - The 10-month contracts will supply 2/3s of the BGS FP load; the remainder (1/3), will be supplied with 34-month contracts.
- Rate design converts the weighted average of 10-month and 34-month prices into rates.
  - EDC specific seasonal factors.
- Jersey Central Power & Light (GPUE) will hold Green Retail Pilot for 200 MW of residential load.

BGS HEP Auction

- Capacity Auction.
- There are 4 products (one for each EDC).
  - Single contract term: 10 months.
  - Tranches are about 25 MW of peak HEP eligible load.
- DSSAC—option payment
  - Paid by all BGS HEP eligible customers.
  - 0.015¢/kWh (@ retail meter).
- Customers using BGS HEP pay an additional retail margin
  - 0.5¢/kWh for 34 months.
  - Not paid to BGS HEP Suppliers.



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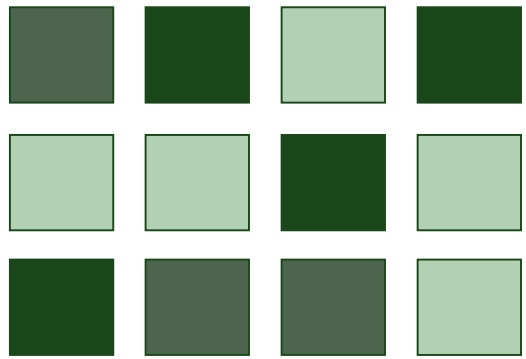

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