

Joint Capacity Adequacy Group

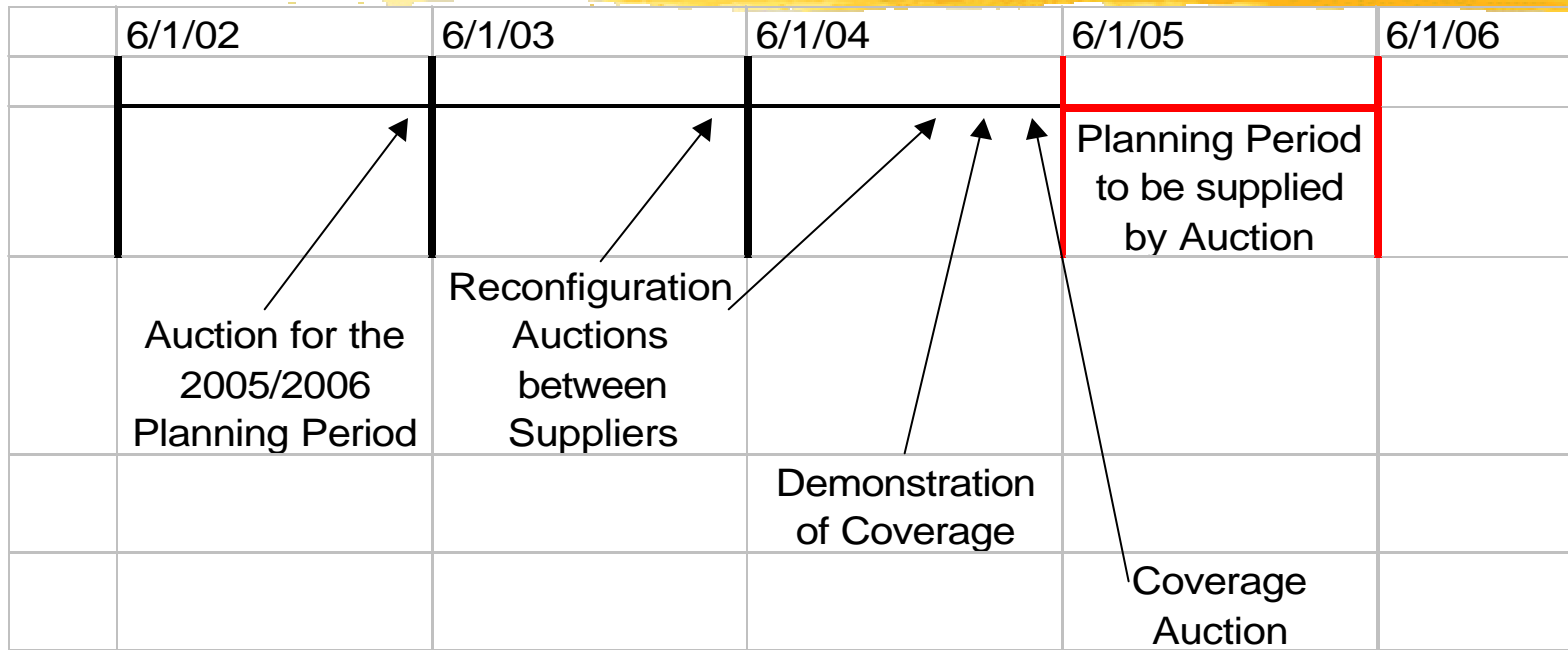


# Centralized Capacity Market Model

CCMP Working Group

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# Market Time Line



- Auction could be for interval or annual period.
- At some point in time commitments to actually be available would need to be demonstrated.

# Initial Resource Offering



- Reliability resources would be qualified for the auction 2 years before the Planning Period.
- The resources would only be known to the ISO.
- All resources to meet the UCAP obligation must be bid into the auction.
- ISO would establish criteria for qualified resources.

# Initial Resource Offering

ISO Forecast Load (MW)	929						
Forecast Pool Requirement (1+IRM)(1-EFORd)	1.077						
ISO Forecast Reliability Obligation (MW)	1000						
	<b>Reliability Resource Owners</b>						
<b>Qualified Reliability Resources</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>Total</b>	
- Installed Generation (MW)	200	200			100	500	
- Capacity Credits (MW)		100			50	150	
- Planned Generation (MW)		100	400		50	550	
- Planned ALM (MW)				100	100	200	
<b>Total (MW)</b>	<b>200</b>	<b>400</b>	<b>400</b>	<b>100</b>	<b>300</b>	<b>1400</b>	

# Descending Clock Auction

- Market Rules: Capacity Offered in each round can not be more that that offered in the previous higher priced round.

	Offer	Reliability Resource Owners					Total	Excess	Total Cost
	Price	A	B	C	D	E			
Round 1	\$300	200	400	400	100	300	1400	400	\$153,300,000
Round 2	\$150	200	400	275	100	300	1275	275	\$69,806,250
Round 3	\$80	200	350	225	100	300	1175	175	\$34,310,000
Round 4	\$70	200	350	225	100	200	1075	75	\$27,466,250
Round 5	\$65	200	325	225	100	200	1050	50	\$24,911,250
Round 6	\$63	200	325	200	100	200	1025	25	\$23,569,875
Round 7	\$60	200	315	200	100	200	1015	15	\$22,228,500
Round 8	\$58	200	315	195	100	200	1010	10	\$21,381,700
<b>Round 9</b>	<b>\$55</b>	<b>200</b>	<b>311</b>	<b>190</b>	<b>100</b>	<b>200</b>	<b>1001</b>	<b>1</b>	<b>\$20,095,075</b>
Round 10	\$53	200	307	190	100	200	997	-3	\$19,286,965

# Descending Clock Auction

- It may be appropriate to assume the market has cleared if offer resources fall into a set bandwidth of the obligation.
- It may be necessary to start the market only if a defined portfolio of reliability resources is available:
  - Reasonable excess (to prime the pump),
  - Certain mix of resources (only  $x\%$  can be speculative),
  - Maximum import from neighboring region,
  - etc.
- Open issue: How would you handle a market that is deficient at the start?
- We recommend that we seek input from a consultant familiar with market design to avoid gaming and market power issues.

# Reconfiguration Auctions



- Allows suppliers whose resources have changed to cover their commitments to the ISO.
- Auctions should be run periodically for all future periods for which the ISO has already procured supply.
- These commitment deficiencies can also be covered by bilateral transactions.

# Demonstration of Coverage

- Suppliers must demonstrate their ability to cover their commitments before the start of the planning period.

	Reliability Resource Owners					
Resource Demonstrated to be available by LSE	A	B	C	D	E	Total
- Installed Generation (MW)	100	200			100	400
- Capacity Credits (MW)	100	111			50	261
- Planned Generation (MW)			140			140
- Planned ALM (MW)				100	50	150
<b>Total (MW)</b>	<b>200</b>	<b>311</b>	<b>140</b>	<b>100</b>	<b>200</b>	<b>951</b>
Commitment to ISO through Auction (MW)	200	311	190	100	200	1001
Deficiency (MW)	0	0	-50	0	0	-50



# Coverage Auction

<b>Deficiency Charge @ 2X the Original Clearing Price</b>	<b>\$ 2,007,500</b>
(2)(\$55 per MWD) (50 MW Deficiency)(365 Days)	
<b>Payments from LSEs to cover their UCAP Obligation</b>	<b>\$ 20,075,000</b>
(\$55 per MWD) (1000 MW UCAP Obligation)(365 Days)	
<b>Payments to Resource Suppliers who provided UCAP</b>	<b>\$ (19,091,325)</b>
(\$55 per MWD) (951 MW Available Resources)(365 Days)	
<b>Funds Available for Purchasing Replacement Resources</b>	<b>\$ 2,991,175</b>
<b>Price Cap for Purchasing Replacement Resources (\$/MWD)</b>	<b>\$ 149</b>
(\$3,011,250 / \$55 per MWD / 365 Days )	

- ISO can only pay up to what it receives from deficiency payments and excess receipts from LSEs.
- Price Cap establishes the price the ISO cannot exceed in the Coverage Auction.

# Coverage Auction

- Deficiency Charge of two times the original clearing price may be insufficient to get last minute reliability resource to come to the table.
  - This value may need to be reviewed after we have some experience with the market.
- Excess revenues remaining after the ISO secured the needed resources can be used to offset the cost of emergency energy. (Or all excess revenues if we don't do a coverage auction.)
- If insufficient resources can be purchased to meet the ISO obligation with the available funds then an assumed reduction in the desired level of reliability must be accepted and the cost of emergency energy may go up.

# LSE Payments

	Load Serving Entity					Total
	V	W	X	Y	Z	
6/1 to 8/31						
Unforced Capacity Obligation (MW)	400	200	150	100	150	1000
Unforced Capacity Obligation Charge (\$)	\$ 2,024,000	\$ 1,012,000	\$ 759,000	\$ 506,000	\$ 759,000	\$ 5,060,000
9/1 to 11/30						
Unforced Capacity Obligation (MW)	375	225	150	100	150	1000
Unforced Capacity Obligation Charge (\$)	\$ 1,876,875	\$ 1,126,125	\$ 750,750	\$ 500,500	\$ 750,750	\$ 5,005,000
12/1 to 2/28						
Unforced Capacity Obligation (MW)	425	175	200	0	200	1000
Unforced Capacity Obligation Charge (\$)	\$ 2,103,750	\$ 866,250	\$ 990,000	\$ -	\$ 990,000	\$ 4,950,000
3/1 to 5/31						
Unforced Capacity Obligation (MW)	400	200	150		250	1000
Unforced Capacity Obligation Charge (\$)	\$ 2,024,000	\$ 1,012,000	\$ 759,000	\$ -	\$ 1,265,000	\$ 5,060,000
<b>Total Unforced Capacity Obligation Charge (\$)</b>	<b>\$ 8,028,625</b>	<b>\$ 4,016,375</b>	<b>\$ 3,258,750</b>	<b>\$ 1,006,500</b>	<b>\$ 3,764,750</b>	<b>\$ 20,075,000</b>

- Load can shift daily (assumed quarterly for this example).
- Payments based on \$55/MWD clearing price in the 2 year forward auction.

# Contract for Differences

- **A LSE can hedge their position either by:**
  - making bilateral purchases from a supplier and offer their own resource into the auction, or
  - purchasing a contract for differences from a supplier who will offer capacity into the auction.
- **Contract for Differences:**
  - **LSE Purchases Contract for \$50 /MWD**
    - After market cleared the supplier would pay LSE \$5/MWD for difference between market clearing price (\$55/MWD) and contract price.
  - **LSE Purchases Contract for \$60 /MWD**
    - After market cleared the LSE would pay supplier \$5/MWD for difference between market clearing price (\$55/MWD) and contract price.

# Remaining Issues



- ALM treatment?
- Credit issues?
- How to deal with a short market?
- Qualification of reliability resources?
- Can we cover the 04/05 Planning Period with this proposal?

# Next Steps



- Having the model reviewed by market design expert for recommendations on:
  - Auction process,
  - Deficiency penalty,
  - Ceiling prices if needed, and
  - Minimizing market power and game planning issues.
- Work out:
  - seam issues,
  - market monitoring concerns.

# The End



■..... Until Next Time