



California ISO
Shaping a Renewed Future

Impact of Convergence Bidding on Real-Time Imbalance Energy Offset

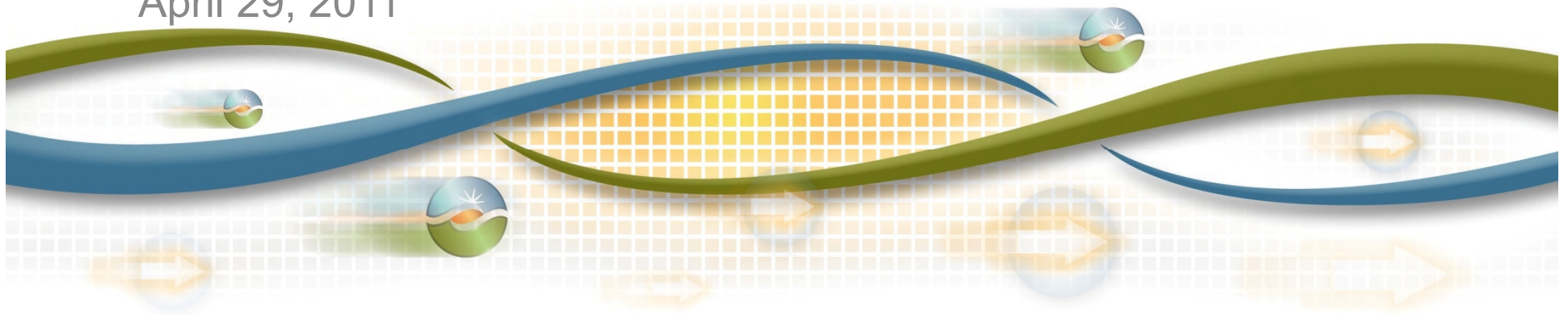
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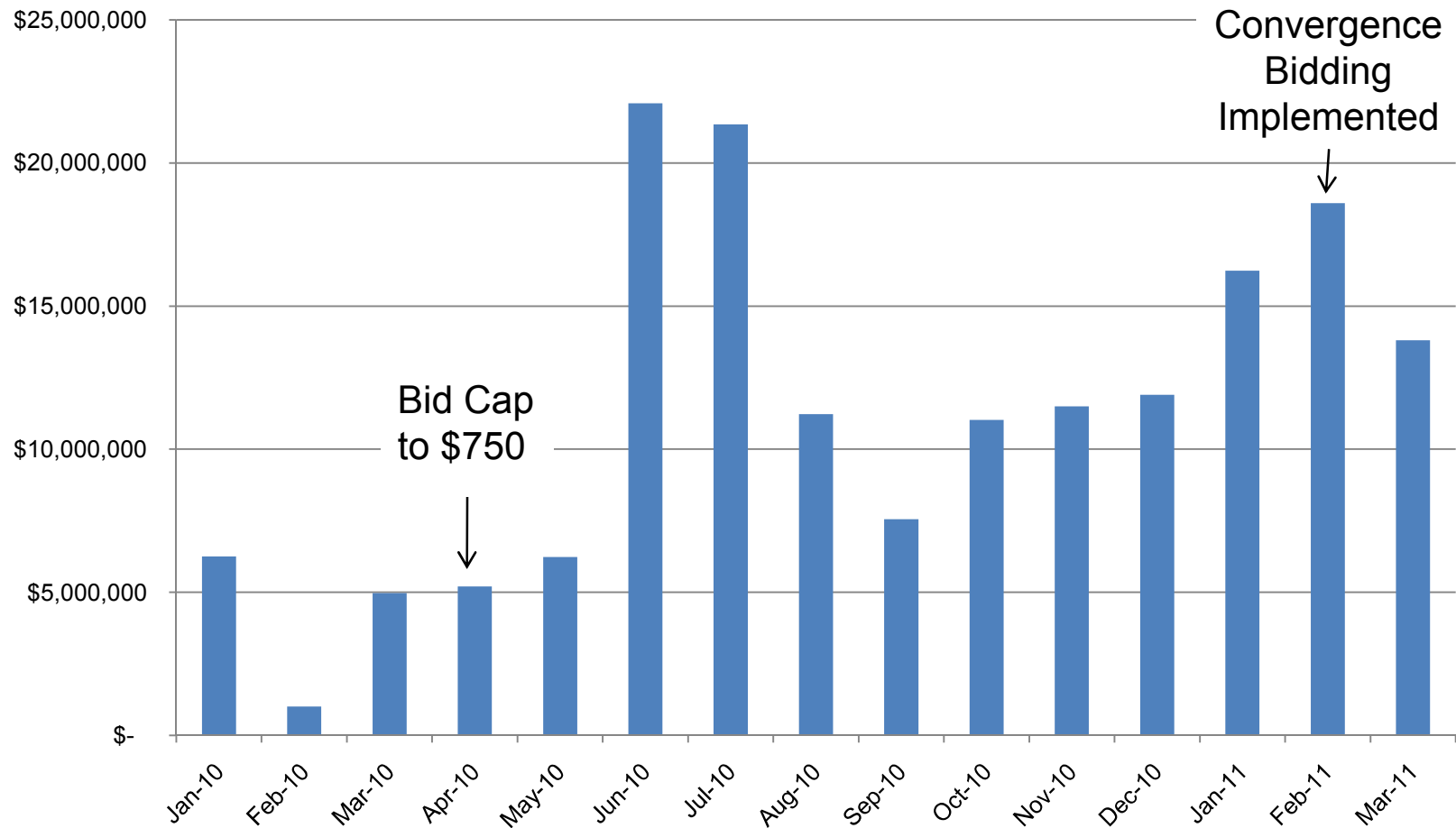
Market Surveillance Committee Meeting

General Session

April 29, 2011



Monthly Real Time Imbalance Energy Offset



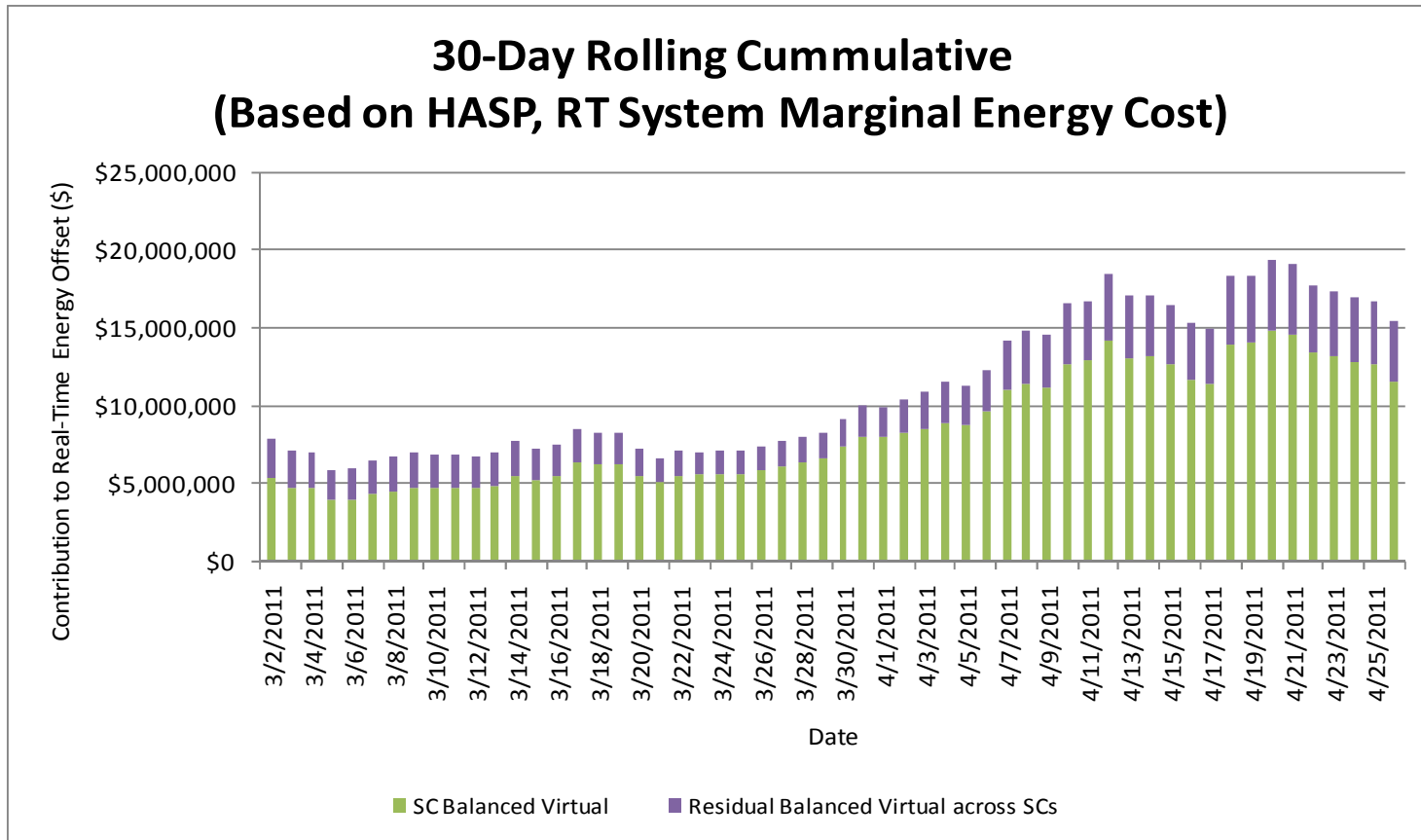
- Neutrality account charged/credited to metered demand and exports

HASP price has historically been lower than the RTD price. Encourages bidding pattern increasing offset.

	Day Ahead Market			HASP			Real Time Market		
	Quantity (MW)	Price	Revenue	Quantity (MW)	Price	Revenue	Quantity (MW)	Price	Revenue
Intertie Virtual Supply	100	\$ 35.00	\$ 3,500	100	\$ (40.00)	\$ (4,000)	N/A	N/A	N/A
Internal Virtual Demand	100	\$ (35.00)	\$ (3,500)	N/A	N/A	N/A	100	\$ 45.00	\$ 4,500
Total by Market			\$ -			\$ (4,000)			\$ 4,500
Total for Bidding Strategy			\$ 500						

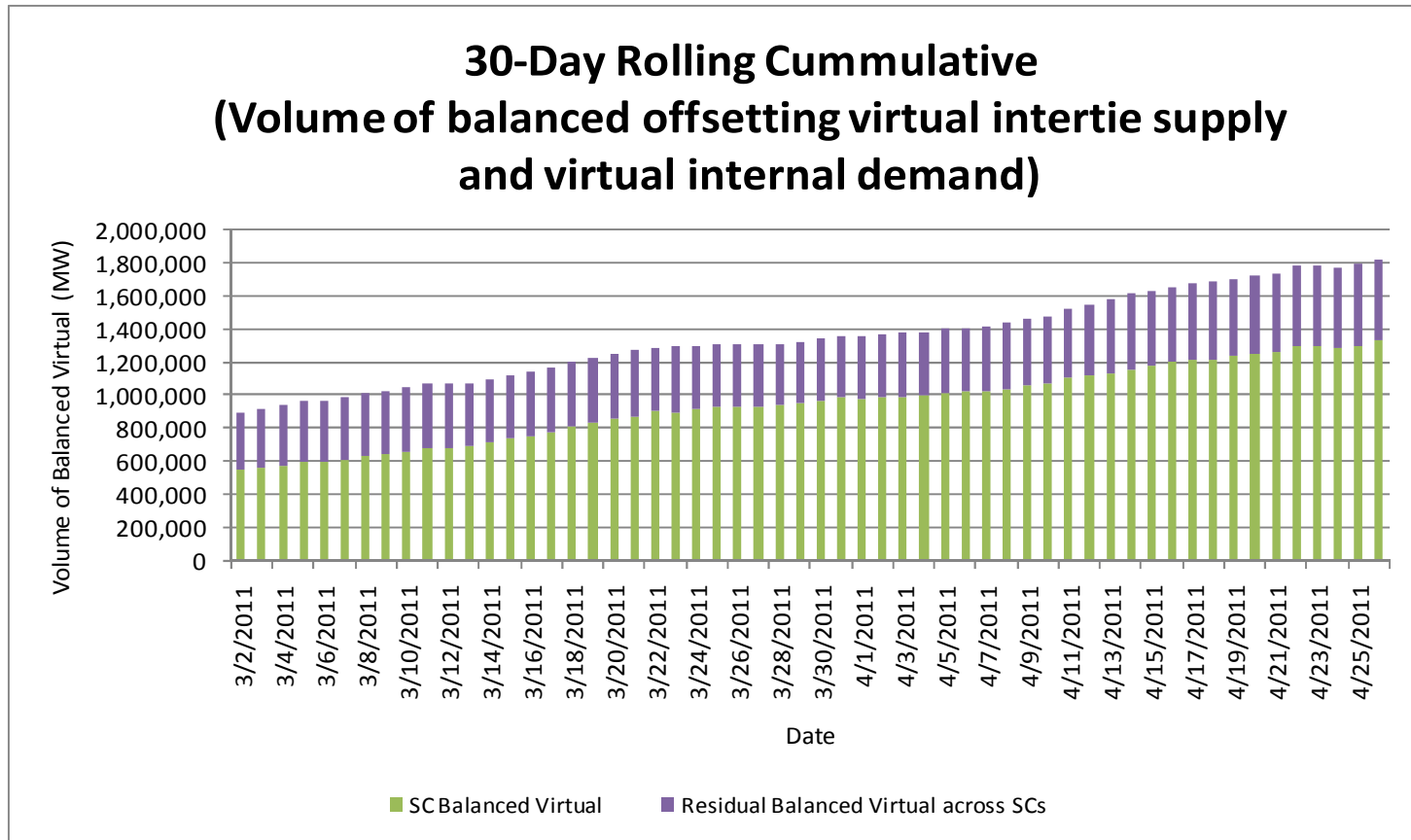
- Balanced position is profitable if HASP price < RT price
- Physical import reduced in HASP should be included in calculation of balanced position
- Balanced position does not result in greater market efficiency

Real-Time Imbalance Energy Offset Impact (\$)



- Threshold to consider emergency filing if green bar > \$25M

Quantity of Balanced Intertie/Internal Positions



Proposal

- Settlement rule which reverses HASP-RTD energy price differential for SC's balanced positions
 - Can result in a charge or credit
- Addresses both $RTD > HASP$ and $RTD < HASP$
- Plan to bring proposal to the Board in June
- \$25M cumulative impact threshold would trigger emergency filing

Settlement rule to address HASP-RT price differences under convergence bidding (1 of 2)

- P_{int} is the net position internal to the ISO
- P_{tie} is the net position at the interties
- V_d is virtual demand
- V_s is virtual supply
- R_i is the quantity of day ahead physical imports which have been reduced in HASP
- R_e is the quantity of day ahead physical exports which have been reduced in HASP
- Q is the quantity of MW of the balanced internal/external supply and demand
- S is the settlement amount charged/credited to Scheduling Coordinator

Settlement rule to address HASP-RT price differences under convergence bidding (2 of 2)

- Calculate the internal net position

$$P_{int} = V_d - V_s$$

- Calculate the external net position

$$P_{tie} = V_s + R_i - V_d - R_e$$

- Determine the balanced MW quantity

$$\text{If } P_{int} * P_{tie} > 0$$

$$\text{Then If } P_{int} > 0$$

$$\text{Then } Q = \text{MIN} (P_{int}, P_{tie})$$

$$\text{Else } Q = \text{MAX} (P_{int}, P_{tie})$$

$$\text{Else } Q = 0$$

- Calculate the settlement amount

$$S = Q * (\text{RTD SMEC} - \text{HASP SMEC})$$

Summary

- Settlement rule addresses gains from HASP-RTD price differential
- Stakeholder conference call on May 4
- Draft Final Proposal to be posted May 18
- June Board for approval
- If threshold reached, consider an emergency filing

Appendix

Examples of Settlement Rule when RT > HASP

	Example 1	Example 2	Example 3	Example 4	Example 5
HASP SMEC	\$ 30.00	\$ 30.00	\$ 30.00	\$ 30.00	\$ 30.00
RT SMEC	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00
Internal Virtual Demand (MW)	100	100	100	100	100
Intertie Virtual Supply (MW)	50	100	50	100	150
DA Import - HASP Import (MW)	0	0	50	50	50
Balance Amount (MW)	50	100	100	100	100
Charge to Entity	\$ 250.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00

Examples of Settlement Rule when HASP < RT

	Example 1	Example 2	Example 3	Example 4	Example 5
HASP SMEC	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00
RT SMEC	\$ 30.00	\$ 30.00	\$ 30.00	\$ 30.00	\$ 30.00
Internal Virtual Supply (MW)	100	100	100	100	100
Intertie Virtual Demand (MW)	50	100	50	100	150
DA Export - HASP Export (MW)	0	0	50	50	50
Balanced Amount (MW)	50	100	100	100	100
Charge to Entity	\$ 250.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00