Bidding rules enhancements

Straw proposal discussion

April 29, 2015

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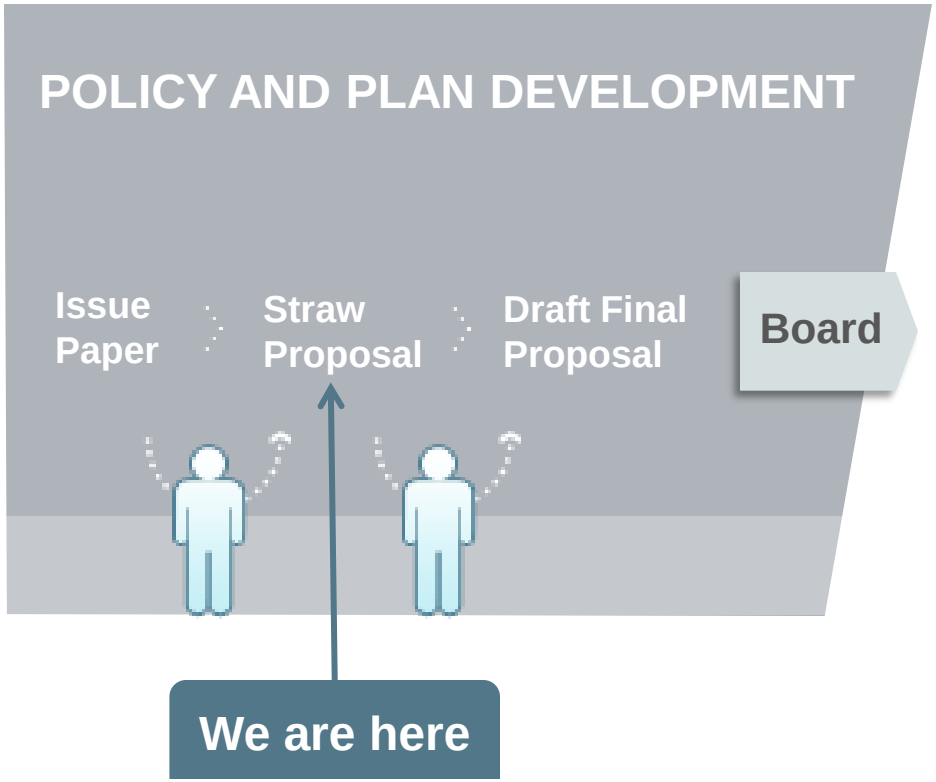
Lead Market Design and Regulatory Policy Developer

Agenda

Time	Topic	Presenter
10:00 – 10:05	Introduction	Kim Perez
10:05 – 10:30	Energy bidding proposals	Delphine Hou
10:30 – 12:00	Commitment cost bidding proposals	Delphine Hou
12:00 – 1:00	Lunch break	Delphine Hou
1:00 – 1:45	FERC Order 809	Delphine Hou
1:45 – 3:00	Commitment cost parameters proposals	Delphine Hou
3:00 – 3:45	Resource characteristics proposal	Delphine Hou
3:45 – 4:00	Next steps	Kim Perez

ISO Policy Initiative Stakeholder Process



Summary of proposals

Section	Topic	Proposal	Type of change
5.3.1	Changing bids after a commitment decision during an inter-temporal constraint	Settle on bid that led to the binding commitment	Tariff
5.3.2	Changing bids after a commitment decision without an inter-temporal constraint	Monitor	None
6.2.1	Commitment cost mitigation	Survey other ISO and RTO mitigation methodologies	TBD
6.2.3	FERC Order 809	Work with stakeholders to determine day-ahead market close	Section 206 filing (and tariff?)
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Energy bidding flexibility

- ISO proposes to retain current energy bidding flexibility (real-time energy bids accepted up to T-75)
  - Will be needed to encourage economic bids during overgeneration and other real-time system conditions
- During an inter-temporal constraint
  - Settle for bid cost recovery purposes on the bid used to make the commitment
- No inter-temporal constraint
  - Monitor

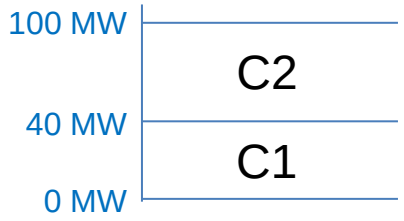
Energy bidding flexibility (cont'd)

- Inter-temporal constraints: minimum up time, minimum down time, configuration hold times, transition times, start-up time, ramp rate

Example 1: configuration hold in C1

Similar to a min down time for C2 or min up time for C1

DA schedule = 100 MW (in C2)
RT schedule = 40 MW (in C1)



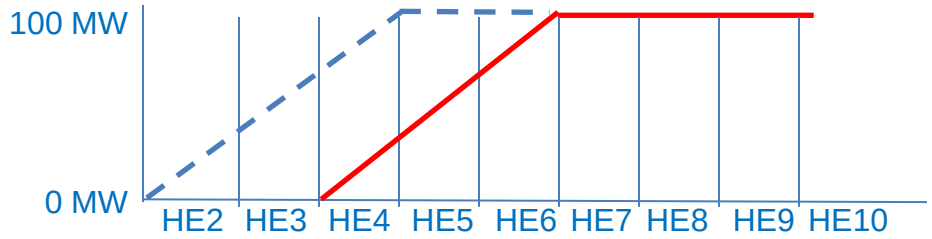
Configuration hold in C1 of 6 hours.
Current: RT buy back of 60 MW at RTM bid in C2.
Proposed: RT buy back of 60 MW at bid cost of RTM LMP (neutralizes BCR).

Energy bidding flexibility (cont'd)

Example 2: start-up time

DA schedule = Start-up time is 4 hours. Start-up at HE2 and reach 100 MW (non-MSG) by HE4.
RT schedule = Revised start-up at HE4.

Current: RT buy back of DA schedule at RTM bid.
Proposed: RT buy back of DA schedule at bid cost of RTM LMP (neutralizes BCR).



Energy bidding flexibility (cont'd)

- When an MSG transitions, the BCR is based on the "from" configuration.
  - Propose to settle bid cost on RT LMP.
- Bid in ramp rates continue to be a concern as more products and services in the ISO rely on the ramp rate.
  - Propose to remove functionality (this was already proposed in Contingency Modeling Enhancements initiative but better to discuss in this initiative).

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Commitment cost mitigation methodology

- ISO will conduct a survey of other ISO/RTO commitment cost mitigation methodologies
- ISO will include this survey in next draft of proposal
- Points to consider:
  - Are differences in approach caused by market difference?
  - Does the optimization outlook impact what solutions are feasible?
  - How do the methodologies handle transmission and contingency constraints, operation action, etc?
  - How is bid cost recovery affected?

Commitment cost-related proposals: Pmin rerate

- Issue: When Pmin is rerated, the minimum load cost stays the same, leading to an inefficient outcome.

Proposed solution 1

Reproduced from Table 7

	Data	*Formula*	Resource A	Resource B	Resource A w/ Pmin rerate - no scaling	Resource A w/ Pmin rerate & scaling
[A]	Pmin		100 MW	100 MW	185 MW	185 MW
[B]	Pmax		300 MW	300 MW	300 MW	300 MW
[C]	Capacity above Pmin	*[B] - [C]*	200 MW	200 MW	115 MW	115 MW
[D]	Min load cost		$1,000 per hour	$1,000 per hour	$1,000 per hour	$1,850 per hour
[E]	Bid cost		$30 per MWh	$50 per MWh	$50 per MWh	$50 per MWh
[F]	Min load cost / MWh	*[D / [A]*	$10 per MWh	$10 per MWh	$5 per MWh	$10 per MWh
[G]	Min load cost / hour		$1,000	$1,000	$1,000	$1,850
[H]	Total bid cost / hour	*[C] x [E]*	$6,000	$10,000	$5,750	$5,750
[I]	Total cost	*[G] + [I]*	$7,000	$11,000	$6,750	$7,600

- Proposed solution 2: calculate the actual costs based on the heat rate of the resource

Commitment cost-related proposals: Rebidding

- Issue: If a resource bids in the day-ahead but does not receive a day-ahead or RUC award, the ISO market will not accept a new bid in the real-time.
- Proposal: If a resource does not receive a day-ahead or RUC award, it may rebid its commitment costs for the real-time market.
  - Deadline is T-75 before the start of the trade date because the ISO optimization cannot handle multiple bids
  - In practice applies to units that can start based on STUC

Capacity versus marginal fuel costs

- CAISO comments in *Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators*, Docket No. AD14-14, pp 5-6.

- *Resources critical to the reliability in the CAISO's system receive compensation for capacity obligations under resource adequacy provisions. These capacity obligations include fuel costs associated with the resources' obligations to ensure they have fuel and are available to the market as required by resource adequacy obligations. The CAISO believes, if it were to provide reimbursement for fuel costs above the bid cap, these costs should only include incremental fuel costs supporting the resource's offer as opposed to other costs related to a resource's capacity obligation such as natural gas pooling arrangement costs, imbalance penalties, or risk premiums to cover the cost of selling natural gas at a loss when a resource procures gas and then is not dispatched by the CAISO. The CAISO believes these costs are more appropriately recovered through compensation the resource receives for providing capacity as a resource adequacy resource as opposed to through the CAISO's energy markets.*

Proposed guidelines for real-time consideration of gas purchases above the gas price index

- Considerations to balance:
  - This approach is being considered if a more robust commitment cost mitigation methodology is not adopted.
  - Based on conversations with other ISOs, “real-time” approval of natural gas price changes requires additional resource and staff commitment.
  - Given the limited natural gas issues in the California market, an “after-the-fact” approach may be more appropriate for CAISO.
  - Real-time consideration may be needed even if the manual gas price spike process is initiated.

Proposed guidelines for real-time consideration of gas purchases above the gas price index

1. Used when procuring incremental natural gas in intra-day nomination cycle at a price above the gas price index plus the natural gas headroom.
2. The process will be an after-the-fact validation subject to documentation and verification and based on a threshold.
3. Documentation may include receipts and the ISO may verify each document provided.
4. The ISO will reimburse scheduling coordinators for higher gas price purchases if the purchases are within a threshold. The ISO will establish a threshold based on historical natural gas trades for the appropriate day and market. The threshold should be based on several sources, similar to how the current gas price index is calculated. If the sources indicate that gas trades for that particular day and market were thin, an alternative threshold may be used. The threshold may be based on a statistical analysis, percentile rankings, or other analysis as appropriate.
5. Any allowed increase in natural gas costs will be included in bid cost recovery.

Example of real-time consideration of gas purchases above the gas price index

- SC receives real-time market award for 22:00 to 24:00 on April 22, 2016.
- This market award does not overlap with any day-ahead award.
- SC procures gas at a price that is above the real-time gas price index plus the headroom.
- After the fact, SC provides documentation to ISO.
- ISO verifies and applies threshold. Threshold may approve or cap the SC's allowed natural gas price.
- SC will have its costs resettled and included in the ISO's bid cost recovery calculations.

Issues to consider

- What does “documentation” look like?
- What are the most liquid indices to consider?
- Developing a threshold:
  - Historical look-back will consider the same day and time period. However, this day and period may be very thinly traded.
  - If, for example, intra-day 3 gas is thinly traded, is it appropriate to look at the other intra-day markets?
- Keep in mind potential impact from FERC Order 809

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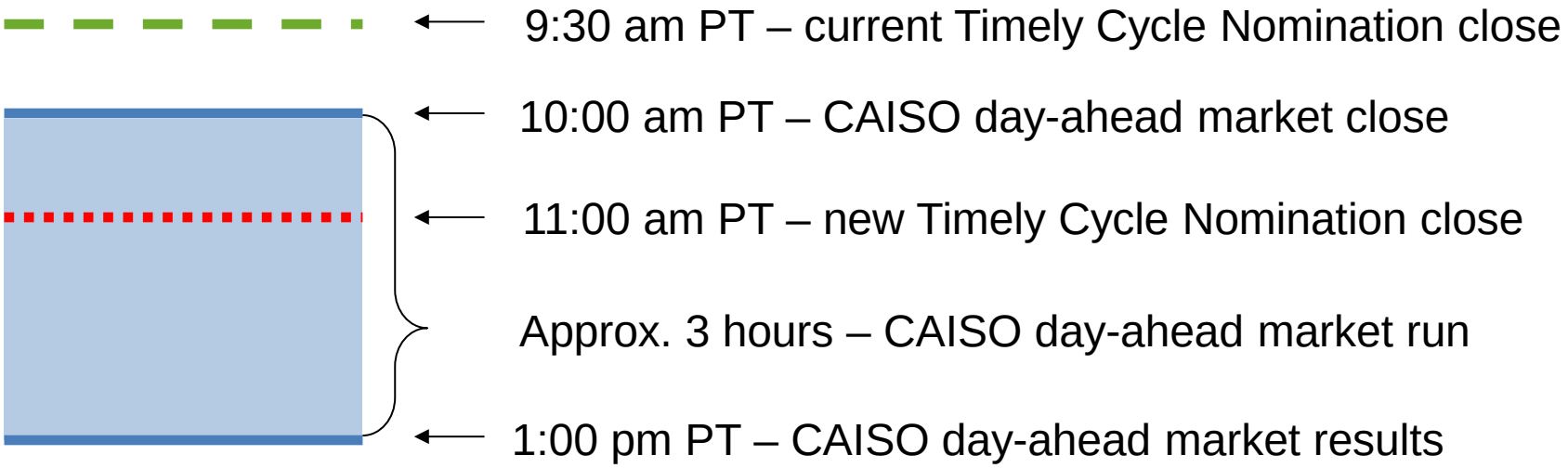
FERC Order 809

- Main impact is change in timely cycle nomination close to “provide generators more time to acquire natural gas supply and pipeline transportation after learning their electric dispatch obligations”
- Interstate pipeline compliance by April 1, 2016



FERC Order 809: 206 filing

- P 19 of 146 FERC ¶ 61,202

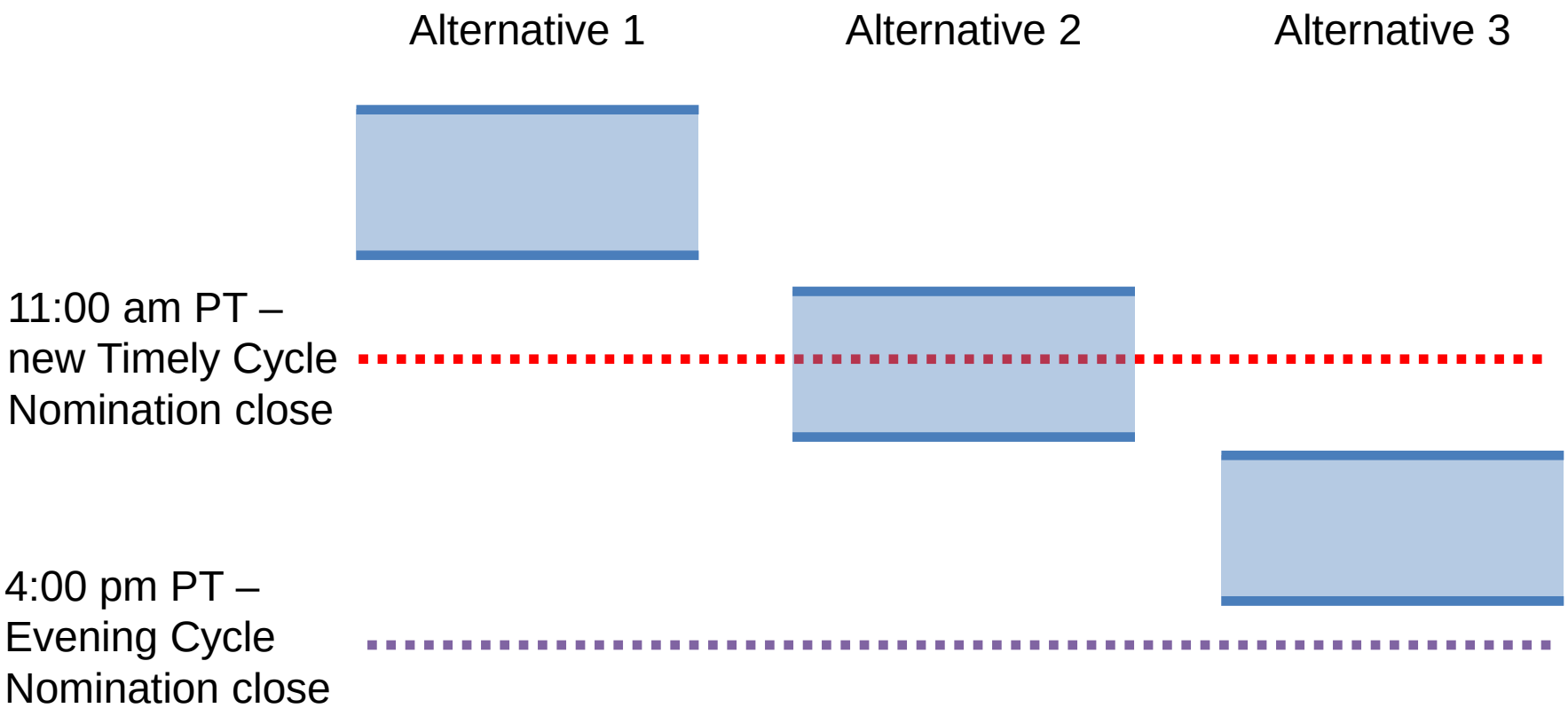
  Accordingly, in light of our concerns stated above, we institute section 206 proceedings with respect to each ISO and RTO that will examine whether the ISO's or RTO's day-ahead scheduling is just and reasonable. Ninety days after publication of a Final Rule in Docket No. RM14-2-000 in the Federal Register, each ISO and RTO is required (1) to make a filing that proposes tariff changes to adjust the time at which the results of its day-ahead energy market and reliability unit commitment process (or equivalent) are posted to a time that is sufficiently in advance of the Timely and Evening Nomination Cycles, respectively, to allow gas-fired generators to procure natural gas supply and pipeline transportation capacity to serve their obligations, 13 or (2) to show cause why such changes are not necessary. In their responses, each ISO and RTO must explain how its proposed scheduling modifications are sufficient for gas-fired generators to secure natural gas pipeline capacity prior to the Timely and Evening Nomination Cycles.

FERC Order 809: 206 filing (cont'd)

- Due July 23, 2015.
- ISO will need to (at minimum) brief the ISO Board at July 16-17 Board meeting.
- ISO is requesting written feedback from stakeholders on a "fast track" schedule for this issue only.
  - 2 rounds of comments
    - May 6 – first round of comments due
    - May 15 – stakeholder call for this issue only
    - May 27 – second round of comments due

FERC Order 809: three main alternatives

- Each alternative needs to be carefully considered



FERC Order 809: round one questions for stakeholders

- ISO requests written comments on this issue only by **5/6/15**.
  1. How much gas do you procure through the Timely market? How would that change with the new nomination deadline? Does the deadline impact operations (*e.g.,* leads to more self-scheduling or less economic bidding in the real-time)?
  2. Are the 3 alternatives appropriate and viable for market participants? Are there more alternatives?
  3. What are the benefits and concerns for each alternative? Please be explicit and describe both operational and financial impacts.
  4. Is CAISO differently situated than other organized markets? How so?

- In round 2, the ISO may ask additional questions or seek clarification from stakeholders

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Differentiated bidding headroom

- Under CCE1, ISO did not have time to consider differentiated headroom.
- We assume opportunity costs have been developed and the registered option no longer exists (bid cap on opportunity cost to be determined in CCE3)

Reproduced from Table 8

	Current	Proposed
Natural gas	125%	125%
Greenhouse gas	125%	110%
GMC	125%	100%
Major maintenance adder	125%	100%
Non-fuel related costs	125%	110%
Default VOM	125%	100%
Auxiliary energy	125%	110%

Greenhouse gas compliance for natural gas suppliers

- Issue still pending at CPUC but proposed decision is expected June 2015
- In the meantime, how are greenhouse gas costs treated?
- How should ISO view/address greenhouse gas rebates currently available to covered entities?
- What are the implementation impacts to consider?

Adjusting gas transportation adders

- ISO can consider backbone versus local gas transmission interconnection.
- Should the ISO revisit current methodology for establishing SCE and SDGE gas regions?
- If so, how?
- Other improvements to gas transportation adders?

Improvements to the energy price index

Current approach	Questions
Retail electricity rates are assigned based on the fuel region	Are the regions always aligned?
Pay the higher of retail electricity rate or LMP	Does the "higher of" approach need to be reviewed? Can the ISO establish what the resource actually pays? Should the retail rates be updated more frequently or are the rates relatively static?
Forward wholesale monthly price projections are based on five minute RDT prices. On-peak hours are calculated for each season as the average of the top 8 peak hours within each day and multiplied by a future price conversion factor. Off-peak hours are averaged over the entire year multiplied by a future price conversion factor. Future price conversion factors are between 100% and 150%.	Should the LMP be based on the appropriate commitment period prices instead of the RDT? Should there be different approaches for calculating on-peak and off-peak prices? Should the future price conversion factors be adjusted?
Currently SDG&E resources use the SCE rate	Should resources in the SDG&E territory use different retail rates?

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Proposal for resource characteristics: issue statement and guidelines

- Issue statement:
  - The tariff currently requires resource characteristics to reflect the physical capability of the resource.
  - However, characteristics may legitimately require both technical and economic judgment to balance excessive wear and tear.
- Guidelines:
  - Resource characteristics should not vary frequently.
  - Resource characteristics may vary within a reasonable range for each generation type and vintage.
  - Resource characteristics should support the operation of the resource and its obligations in the market.

Proposal for resource characteristics

- The ISO proposes to keep all of the current resource characteristics and refer to them as “physical.”
- The ISO proposes to have an additional subset of resource characteristics to support market operations, noting that these characteristics reflect a mix of economic and engineering judgment. These will be referred to as “market” characteristics.

Reproduced from Table 10

Illustrative Resource A providing flexible RA category 1			
Characteristic	**Physical value**	**Market value**	**Notes**
Daily start	4 starts per day	2 starts per day	• Physical value should change rarely • Physical value may be used for reliability • Market value should only decrease with RA showing • Market value may increase up to physical value
Minimum up time	60 min	60 min	*Same as above*
Minimum down time	60 min	*Same as above*	*Same as above*

Proposal for resource characteristics: considerations

- Aside from exceptional dispatches, are there other instances when the physical characteristics should be required?
- Should non-resource adequacy resources provide market resource characteristics?
- What other characteristics should be considered for “market” consideration and why?
- Guidelines are not established for non-flexible resource adequacy capacity. How should they be established (*e.g.*, minimum of 1 start per day but the minimum up and down times remain physical)?

Next steps

Date	Event
Wednesday, December 3	Issue paper posted
Wednesday, December 10	Stakeholder call
Tuesday, December 30	Stakeholder comments due
Wednesday, April 22	Straw proposal posted
Wednesday, April 29	Stakeholder meeting
Wednesday, May 6	**FERC 809 comments due**
Wednesday, May 13	Stakeholder comments due
Friday, May 15	**Stakeholder call on FERC 809 only**
Wednesday, May 27	**FERC 809 comments due**
Friday, June 19	Revised straw proposal posted
Friday, June 26	Stakeholder call
Friday, July 10	Stakeholder comments due
Tuesday, August 11	Second revised straw proposal posted
Tuesday, August 18	Stakeholder call
Tuesday, September 1	Stakeholder comments due
Tuesday, October 6	Draft final proposal posted
Tuesday, October 13	Stakeholder call
Tuesday, October 27	Stakeholder comments due
Thu/Fri 12/17-12/18/15	Board of Governors meeting

Dates in red are for the FERC 809 filing discussion only and are not in the straw proposal.

Please submit comments to initiativecomments@caiso.com