



Aliso Canyon Gas Electric Coordination Discussion

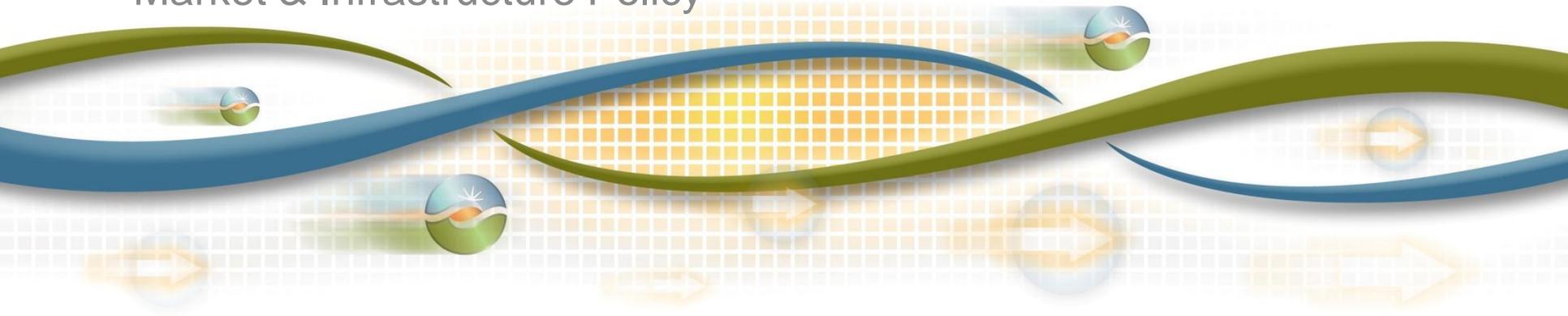
Draft Final Proposal Stakeholder Call

April 27, 2016

Cathleen Colbert

Senior Market Design and Policy Developer

Market & Infrastructure Policy



April 27 stakeholder call agenda

Time	Topic	Presenter
12:00 – 12:05	Introduction	Kim Perez
12:05 – 12:10	Updated schedule	Kim Perez
12:10 – 2:00	Review draft final proposal	Cathleen Colbert

ISO Policy Initiative Stakeholder Process



We are here

Plan for stakeholder engagement

Milestone	Date
Issue Paper Posted	3/17/16
Stakeholder Call	3/23/2016
Stakeholder Written Comments Due	3/30/2016
Working Group Stakeholder Meeting	4/06/2016
Straw Proposal Posted	4/15/2016
Market Surveillance Meeting discussion item	4/19/2016
Stakeholder Written Comments Due	4/21/2016
Draft Final Proposal	4/26/2016
Stakeholder Call	4/27/2016
Stakeholder Written Comments Due	4/28/2016
Post Draft Tariff Language	4/28/2016
Board of Governors Meeting	5/4/2016



Policy objectives

- Accurate price signals to mitigate the risk that ISO dispatch could adversely impact gas operators efforts to manage reliability
- Operational tools used at operators discretion if needed to mitigate the risk of limited operability of Aliso Canyon leading to electric service interruptions.

Proposal elements - Operational tools used at operators discretion if needed

- Could modify ancillary service (AS) procurement from resources in Southern California Gas or San Diego Gas & Electric's area to prevent procuring non-deliverable AS
- Could reserve internal transfer capability into Southern California in the DA and/or RT markets
 - Would ensure deliverability of reserves and incremental energy to Southern California
 - Would establish amount reserved, if any, based on anticipated gas and electric conditions

Proposal elements - Operational tools used at operators discretion if needed

- Enforce a maximum gas availability constraint
 - Used to limit maximum gas burn in DA and/or RT
 - When gas company notifies ISO of a concern of gas burn limitation in MMcf
- Notifications could include and reflect these limitations:
 - Expected in the future from anticipated gas market conditions such as outages to storage or pipelines
 - Preventative action in advance of issuing curtailments
 - Issued curtailments (or Emergency Flow Orders)

Proposal elements - Operational tools used at operators discretion if needed

- Cost of honoring constraint reflected in market prices
 - The generators' price will reflect the lower price signal as result of market honoring constraint
 - The price paid or received through CRR, virtuals or by load should reflect the higher price signal reflecting gas supply
- LMPM would not adequately capture the interaction of this constraint on internal transmission paths' counter flows
 - ISO proposes to deem Path 26 non-competitive when gas availability constraint is enforced

Proposal elements - Accurate price signals

- Publish 2DA results to better inform market of electric needs
- Increase real-time market gas price component for determining commitment cost bid cap and DEB for generators in Southern California
 - Objectives are to only dispatch Southern California generators for local needs
 - Gas price initially scaled by amount needed to only dispatch for local needs and future adjustments based on either observed prices, frequent dispatches to respond to system needs, or other market signals
- Allow rebidding of commitment costs in the RT market
 - Enable resources to reflect RT gas prices in commitment cost bids for hours without DA schedules or RT commitments
 - Modify restriction that generators cannot rebid if they have DA schedule

Proposal elements - other

- Use current ICE information to establish day-ahead gas price index for the day-ahead market
 - Interim measure to use current information only when gas price changes by > 25 percent (current procedure) until full automation is implemented
- Propose to include incremental energy costs in after-the-fact cost recovery for marginal procurement costs as a result of ISO instruction not recovered through market revenues

QUESTIONS & NEXT STEPS

Next Steps

Milestone	Date
Issue Paper Posted	3/17/16
Stakeholder Call	3/23/2016
Stakeholder Written Comments Due	3/30/2016
Working Group Stakeholder Meeting	4/06/2016
Straw Proposal Posted	4/15/2016
Market Surveillance Meeting discussion item	4/19/2016
Stakeholder Written Comments Due	4/21/2016
Draft Final Proposal	4/26/2016
Stakeholder Call	4/27/2016
Post tariff language	4/28/2016
Stakeholder Written Comments Due	4/28/2016
Board of Governors Meeting	5/4/2016



Please submit comments to initiativecomments@caiso.com

REFERENCE MATERIALS – ISSUE PAPER BACKGROUND AND WORKING GROUP SLIDES

Background – Aliso Canyon Impact

Oct. 2015, discovered Aliso Canyon leak

Jan. 2016, Gov. Brown issued proclamation of state of emergency

- Continue prohibition on injecting gas into the storage facility
- Direct CPUC, CEC an ISO to coordinate to ensure continued reliability

Jan. 2016, multi-agency technical working group looking at short-term reliability risks associated with summer and peak winter operations due to limited operations of Aliso Canyon facility

Feb. 2016, State regulators confirmed gas leak sealed but continued moratorium on new injections until Division of Oil, Gas, and Geothermal Resources complete inspections

Mar. 2016, SoCalGas and SDG&E filed motion to establish interim daily balancing requirements effective May 1, 2016 (5% tolerance band / 150% of gas daily penalty)

Aliso Supports ~9,800 MW: 40% LADWP/ 60% in CAISO; Critical for Peak Day and Contingency Reserve Situations



Capacity of Pipe and Other Storage Indicates General Risk

Supply/Demand	System Design (Bcf/day)	Actual Experience (Bcf/day)
Pipeline Capacity Supply	3.8	3.0
Other Storage Supply (without Aliso)	1.7	1.0
TOTAL SUPPLY	5.5	4.0
Peak Winter Gas Demand	-5.0	-5.0
RESERVE MARGIN	0.5	(1.0)

- Typical outages can reduce capacity 0.5-1.0 Bcf/day
- Electric generation typically requires 1.0-2.0 Bcf/day

Analysis Verified Risks to Reliability

1. Scheduled flowing gas can fail to meet actual demand
2. Planned and unplanned outages on gas system often limit pipeline and other storage availability
3. Rapid ramping of electric generation can exceed dynamic capability of gas system
 - i.e. contingency recovery, renewable generation following
4. Cold weather to east can reduce gas supplies for California

Analysis Assessed Actual Operations on 4 Key Days

DATE	CONDITION	TOTAL DEMAND (Bcf per Day)
9/16/14	LADWP Peak Day	3.5
7/30/15	Large Electric Generation Ramp	3.2
9/9/15	CAISO – Large Difference between Day Ahead and Real Time actual + LADWP 2015 Peak	3.2
12/15/15	Winter Day and High Electric Generation	3.3

Key Findings:

- Gas system unable to tolerate mismatches between scheduled gas and actual flows if Aliso gas is not used
- Situation is worse if planned or unplanned outages occur

Confirmed: Serious Risk to Gas/Electric Reliability this Summer

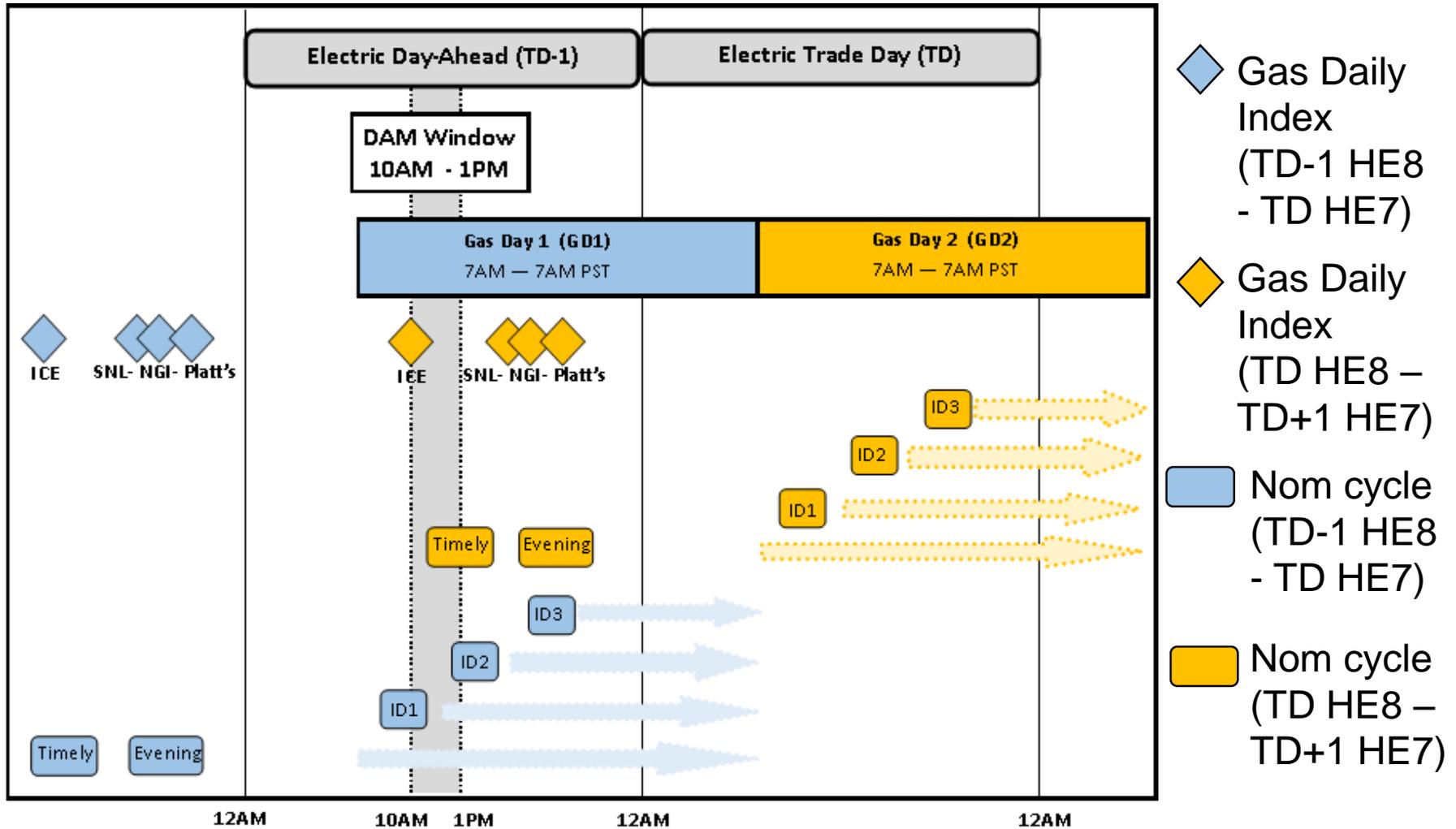
- If Aliso is not used, the LA Basin can expect 16 summer days of gas curtailment in 2016
 - electric generators are first to be curtailed
- Up to 14 summer days may require electric service interruption, potentially to millions of customers

	Scenario	Gas Quantity Curtailed (8 peak hours HE14-HE21)	Days of Gas Curtailment Risk for Electric Generators (Summer)	Gas Curtailment Interrupts Electricity Service (Summer)
A	150 MMcf mismatch between scheduled gas and actual demand	84 Mmcf	2	Not Likely
B	Mismatch plus outage at other storage field	224 Mmcf	2	Likely
C	Mismatch plus pipeline outage	280 Mmcf	9	Yes
D	Mismatch plus outage both on other storage and pipeline	513 Mmcf	3	Yes

Background – FERC Order 809

Nomination Cycle	Nomination Deadline (PST)	Notification of Nominate (PST)	Nomination Effective (PST)	Bumping of interruptible transportation
Timely	9:30 a.m. 11:00 a.m.	2:30 p.m. 3:00 p.m.	7:00 a.m. Next Day	N/A
Evening	4:00 p.m.	8:00 p.m. 7:00 p.m.	7:00 a.m. Next Day	Yes Yes
Intra-day 1	8:00 a.m.	12:00 p.m. 11:00 a.m.	3:00 p.m. Current Day 12:00 p.m. effective	Yes Yes
Intra-day 2	3:00 p.m. 12:30 p.m.	7:00 p.m. 3:30 p.m.	7:00 p.m. Current Day 4:00 p.m. effective	No Yes
Intra-day 3	5:00 p.m.	8:00 p.m.	8:00 p.m. effective	No

Background - Alignment natural gas & electric markets



Propose **gas availability constraint** to reflect limited supply to affected generators

$$\sum_{i \in S} \alpha_i (P_{i,t}) \leq RHS_t$$

Where limit is set as:

$$RHS_t = R_h$$

S	Set of generators in affected area
P	Power output (MW)
α_i	Energy (MW) to million cubic feet (<u>MMcf</u>) gas conversion factor (Masterfile heat rate value at given MW output * unit conversion factor)
RHS_t	Right hand side limit enforcing upper bound constraint which is an hourly value in <u>MMcf</u> provided by gas company
R_h	Daily upper bound deviation allowance relative to day-ahead market schedule