



# Briefing on system and market performance under Aliso Canyon unavailability

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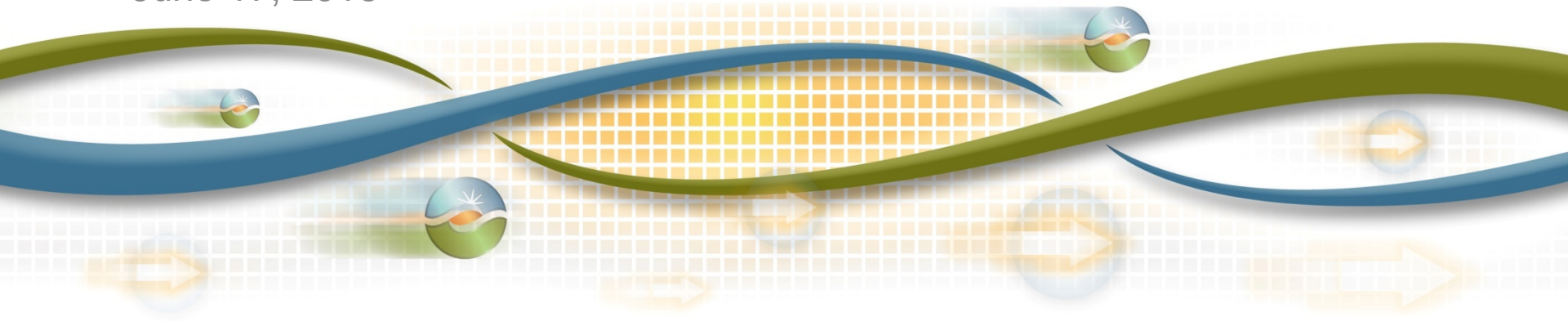
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Market Design and Regulatory Policy

Market Surveillance Committee Meeting

General Session

June 17, 2016



## Aliso Canyon update

- To enforce a zonal maximum total gas burn limit in day-ahead or real-time for capacity or deliverability limitations, 6 gas burn nomograms have been defined based on the 6 gas forecast zones :
  - MAXBURN\_ALISO\_INLAND (only total burn limit),
  - MAXBURN\_ALISO\_COASTAL (only total burn limit),
  - MAXBURN\_ALISO\_EMO (only total burn limit), ,
  - MAXBURN\_ALISO\_LABASIN (only total burn limit),
  - MAXBURN\_ALISO\_SDGE (only total burn limit),
  - MAXBURN\_ALISO\_SJV (only total burn limit),

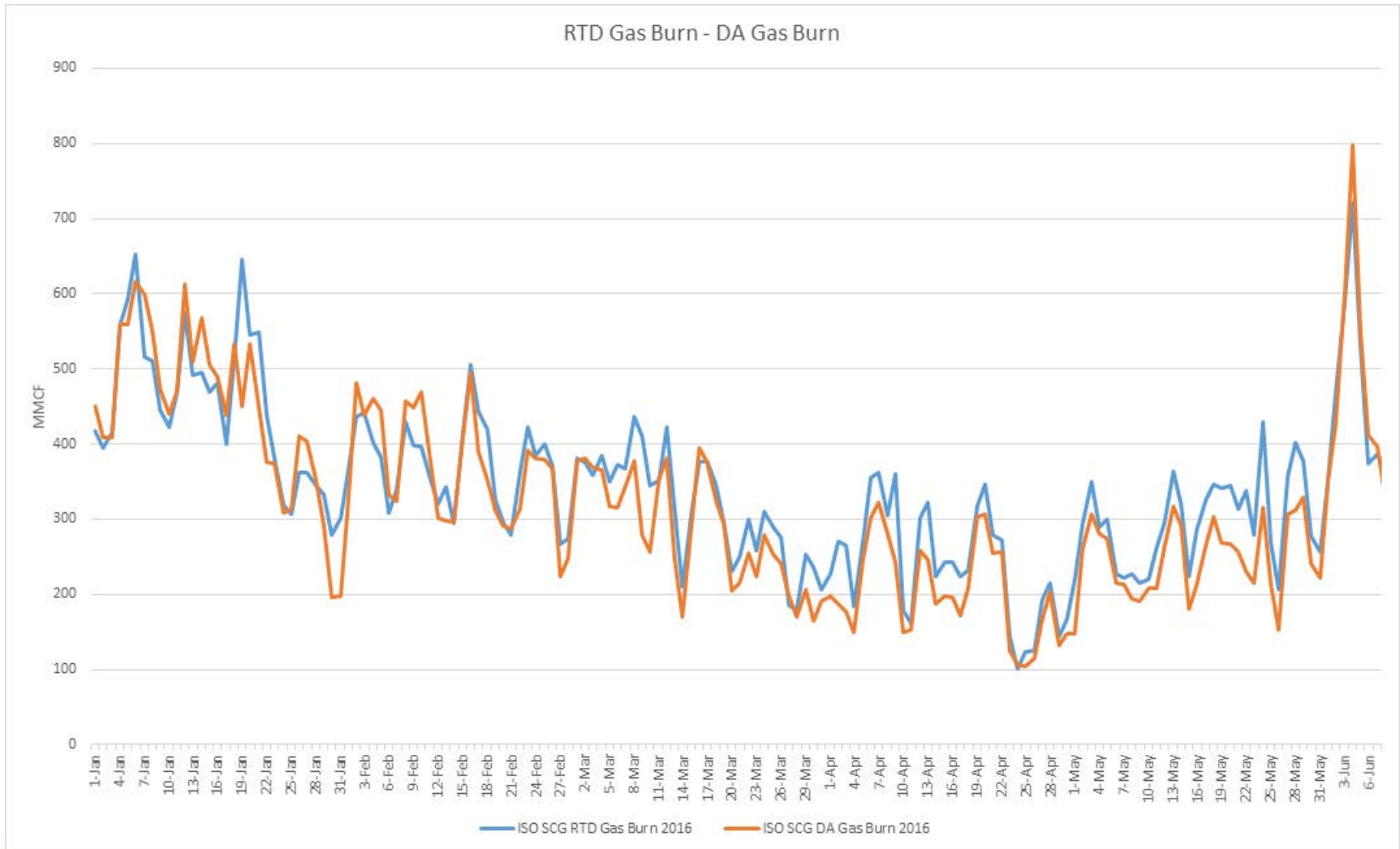
## Aliso Canyon update

- 1 gas burn nomogram has been defined based on all resources within the SoCalGas and SDG&E system, to implement either the maximum incremental or total gas burn limit (MAXBURN\_ALISO\_TOTAL)
  - System-wide max total gas burn limit in day-ahead or real-time for capacity or deliverability limitations
  - System-wide max incremental gas burn limit only in real-time for imbalance limitations or load forecast error concerns
- 1 gas burn nomogram has been defined based on all resources within the SoCalGas and SDG&E system, to implement minimum incremental gas burn limit only in real-time for imbalance limitations (MINBURN\_ALISO\_TOTAL)

## Aliso Canyon update (cont.)

- The Aliso Canyon gas burn constraints are available for use in the market but there have not been conditions necessary to use them.
- There will be a market message sent via Market Notification System when a gas burn constraint has been activated specifying affected area, hours and limit type.
- If they are used and happen to bind, they will follow the same logic as other nomograms where you will see shadow prices on OASIS and can see the definition on the Market Participant Portal.
- The price spikes on June 2 are not related to Aliso Canyon changes. There were some telemetry and state estimator problems in HE 20 that resulted in invalid prices and these will be corrected.

# ISO Gas Resources in SoCalGas system Day-Ahead and Real-Time.



## Potential additional analysis and tracking to identify potential refinements to new market features

### **Gas constraint design translating daily limit to hourly**

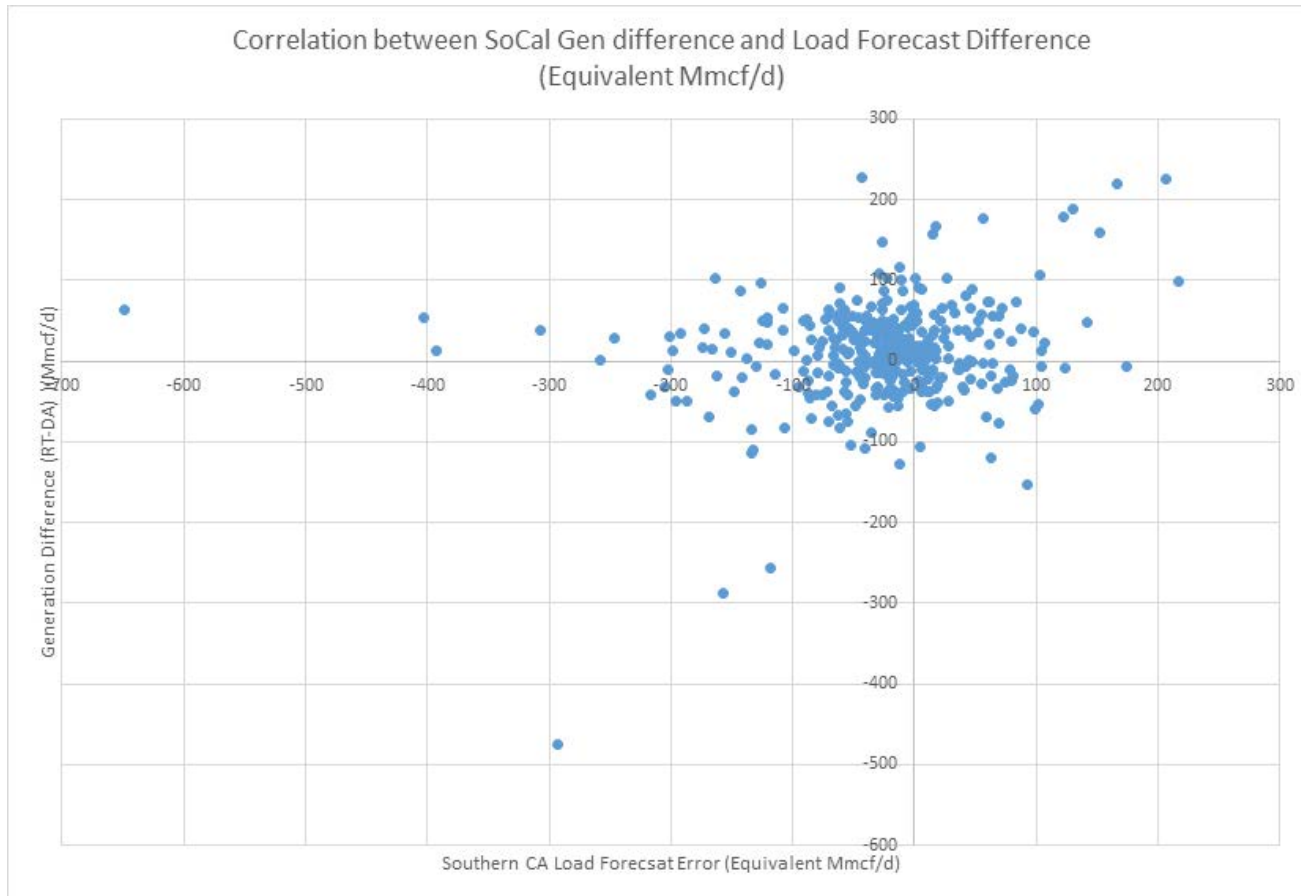
- Allocation method must ensure adequate flexibility needed by ISO to re-dispatch in real-time to serve load
- Current design distributes daily limitation in MMCF/d across electric day's hours based on hourly share of daily load forecast
  - Ratio of the load forecast of a given hour to the total daily load forecast
- Questions raised as to whether hourly share of daily load forecast is the best design for shaping a daily gas burn limitation to an hourly limit.

Further market design analysis and tracking to identify potential refinements to new market features

## **Historical Distribution Analysis of explanatory factors**

- Perform historical distribution analysis categorized by hour 1-24 of the difference between:
  - RTM load versus DAM load forecast
  - RTM net load and IFM cleared net load
  - RTM dispatch and IFM cleared generation
  - RTM and DAM (IFM&RUC) received start-up instructions
- Capture this information in boxplot charts categorized by hour and provide underlying numbers in tabular format.

# Analysis of 2015 load forecast error correlation to day-ahead and real-time gas burn difference patterns



Sorted by Largest Gen Difference

Row Labels	ISO Day-Ahead Daily Forecast Error-Southern California (in Equivalent Mmcf/d)	ISO Gas Resource Difference Between DA and RT
7/20/2015	-44	226
8/13/2015	207	225
9/7/2015	166	220
6/8/2015	130	188
9/20/2015	122	178
8/28/2015	57	177
8/15/2015	18	166
9/8/2015	152	160
7/21/2015	15	156
6/28/2015	-27	148
7/23/2015	-13	116
7/24/2015	-28	108
9/9/2015	103	106
2/20/2015	27	102
7/4/2015	-163	102

Sorted by Largest Forecast Difference

Row Labels	ISO Day-Ahead Daily Forecast Error-Southern California (in Equivalent Mmcf/d)	ISO Gas Resource Difference Between DA and RT
10/13/2015	217	98
8/13/2015	207	225
12/28/2015	174	-6
9/7/2015	166	220
9/8/2015	152	160
9/13/2015	142	48
6/8/2015	130	188
10/10/2015	124	-9
9/20/2015	122	178
3/15/2015	106	23
10/11/2015	104	12
8/24/2015	104	-8
9/9/2015	103	106
4/29/2015	102	-53
12/30/2015	99	-59



## Potential additional analysis and tracking to identify potential refinements to new market features

### **Causal analysis of extreme observations**

- For the largest observed variance of the below bullets, examine a small sampling of hours (e.g. 5) to evaluate and isolate the causes of the largest variations.
  - RTM dispatch and IFM cleared generation
  - RTM and DAM (IFM&RUC) received start-up instructions
- The impact of transmission system being constrained and/or ramping/cycling periods are of particular interest as potential drivers.