Structural system-level competitiveness analysis discussion

Perry Servedio
Lead Market Design Policy Developer

Guillermo Bautista Alderete, Ph.D.
Director, Market Analysis & Forecasting

Jiankang Wang
Engineering Specialist Lead

Market Surveillance Committee Meeting
General Session
June 7, 2019

Background

- In June 2018 the DMM recommended that the ISO consider actions to be taken to reduce the conditions in which market power may exist
- DMM tracks a system-level residual supply index metric that shows growing structural uncompetitive conditions
- ISO completed its analysis and received stakeholder feedback
- ISO seeks a well-rounded observation of system-level market power conditions in its energy markets to inform its policy decisions

Agenda

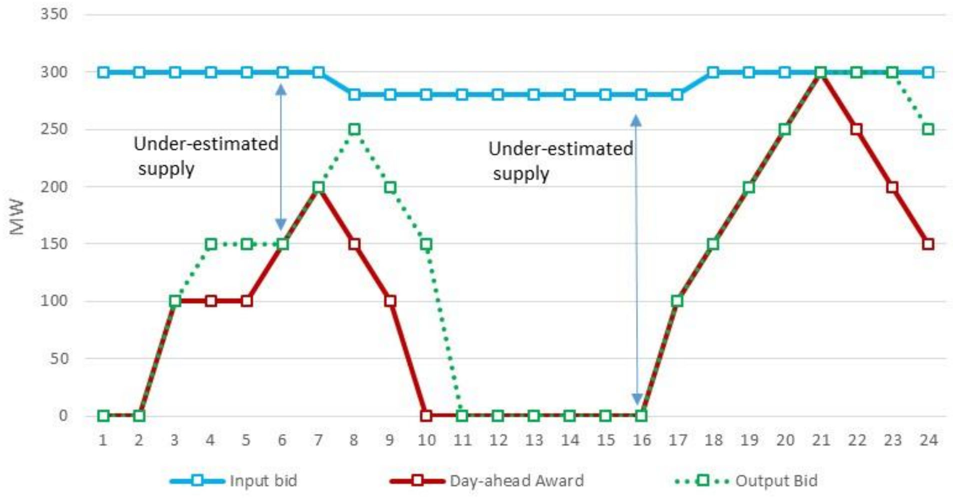
- Structural competitiveness analysis
  - Various supply and demand input assumptions and results
  - Inclusion of virtual supply
  - Accounting for market trends going forward
- Other considerations
  - Supply scarcity
  - Gas costs
  - Resource adequacy
- Policy options

STRUCTURAL COMPETITIVENESS ANALYSIS

ISO's analysis shows system-level structurally uncompetitive conditions likely in 55 hours in 2018

Demand assumptions

- Day-ahead demand forecast
- Ancillary services requirements
- Self-scheduled exports
  - DMM did not originally include
- Losses
  - DMM did not originally include



Supply assumptions

- Available physical supply bid-in to the day-ahead market
  - DMM originally used supply available from *market-committed* generation
- Gross virtual supply bid-in to the day-ahead market
  - DMM did not include virtual supply

Analysis used gross virtual supply although it may be reasonable to use net virtual supply

$$RSI_n = \frac{P_S - \sum_{i=1}^{n} P_i}{P_D}$$

- Analysis included all bid-in virtual supply in P_S
  - Bid-in virtual supply competes with physical supply
  - Virtual supply limits the price impact of market power

- Intend to try to capture unscheduled supply that will be available in the market
  - It may be reasonable to evaluate ***net*** virtual supply offered into the market (virtual supply minus virtual demand)

Potential refinements to the methodology and likely results

- DMM has adopted our additional demand assumptions
- DMM agrees that using bid-in physical supply may be a better representation but notes it may tend to over-estimate supply
- ISO intended to represent unscheduled supply using virtual supply offers. To this end, it may be reasonable to adjust the methodology to use ***net*** virtual supply offered
- Supply should include ancillary service offers that are not overlapping energy offers

Likely result will be between 55 and 272 hours with RSI3 < 1

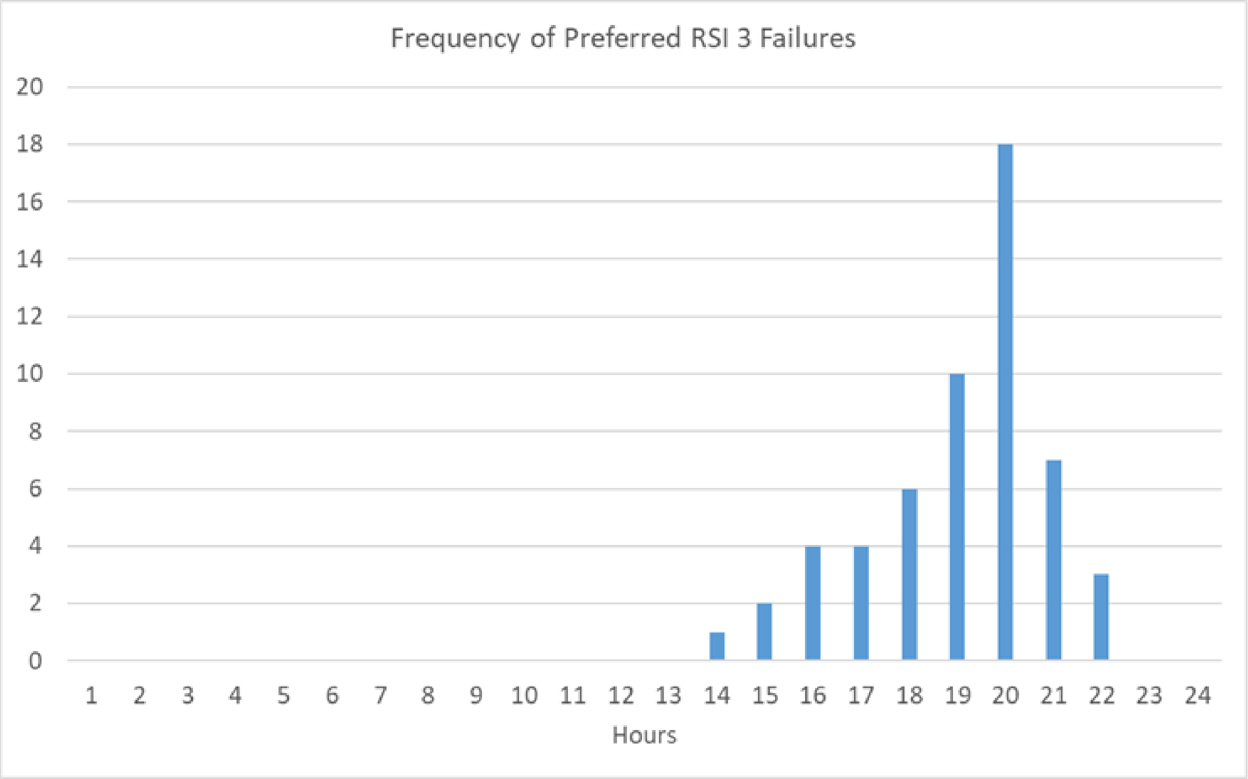
The analysis did not attempt to project the residual supply index going-forward

- Physical aspects
  - Planned retirements
  - Planned interconnections

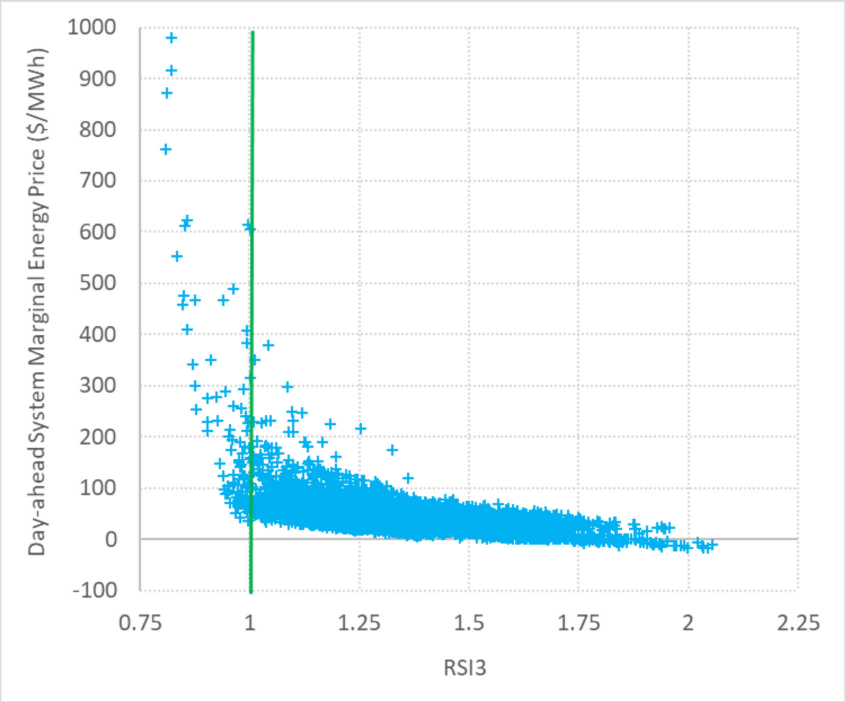
- Ownership and participation aspects
  - Resource ownership transitions
  - Assumptions about total import supply available in the future
  - Assumptions about the quantity of supply that each particular affiliates would offer each hour

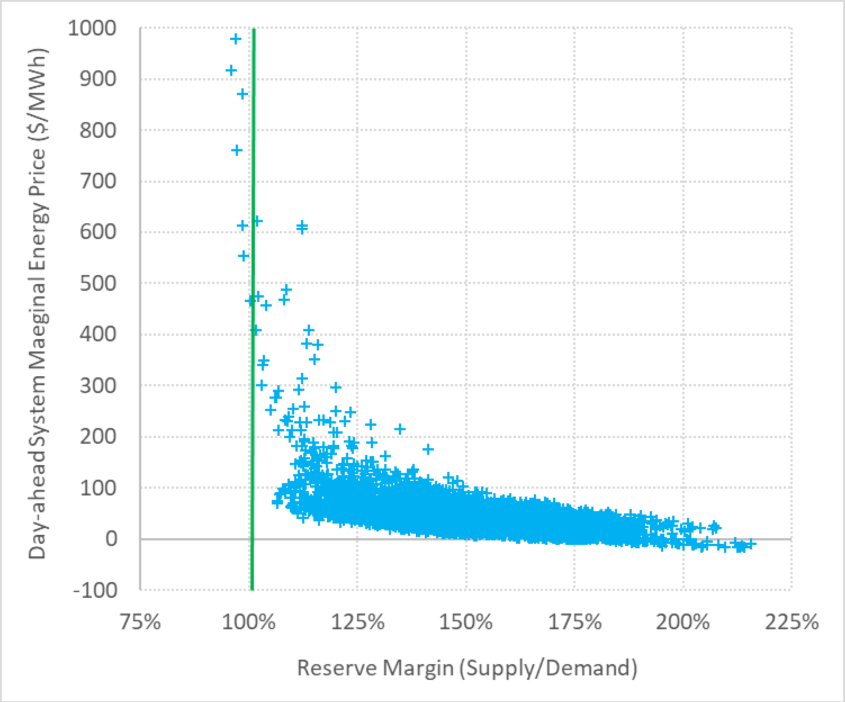
OTHER CONSIDERATIONS

Residual supply index failures generally occur during the net load peak hours when supply is extremely tight

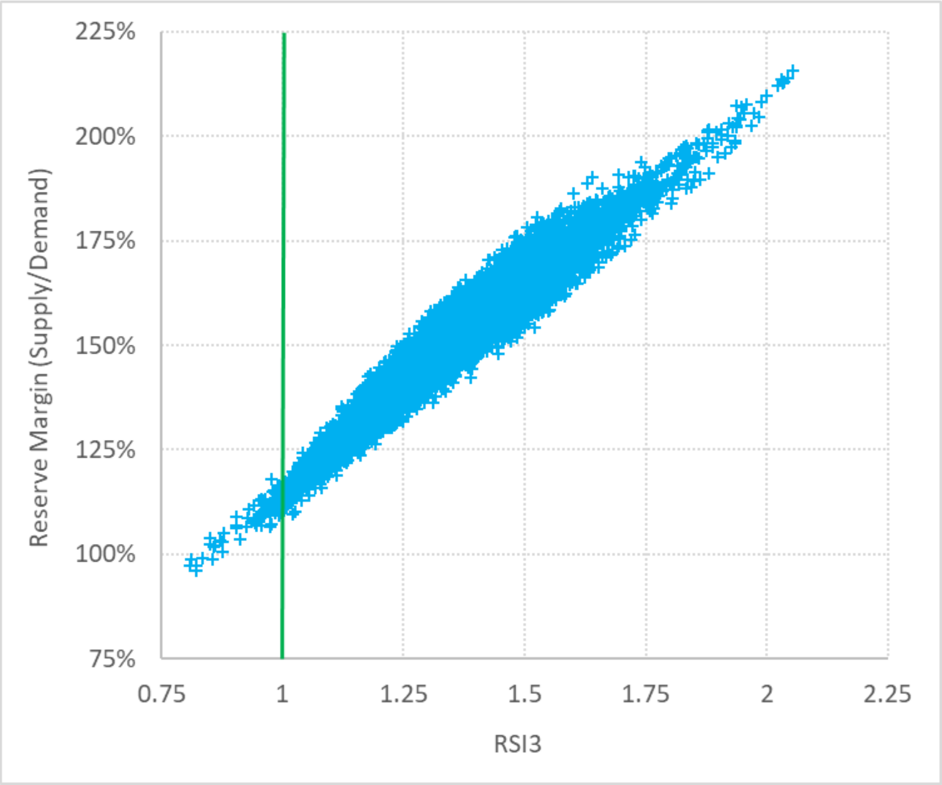


Relatively high prices and low prices occur regardless when RSI<1 and our highest prices occur when supply reserves are extremely low

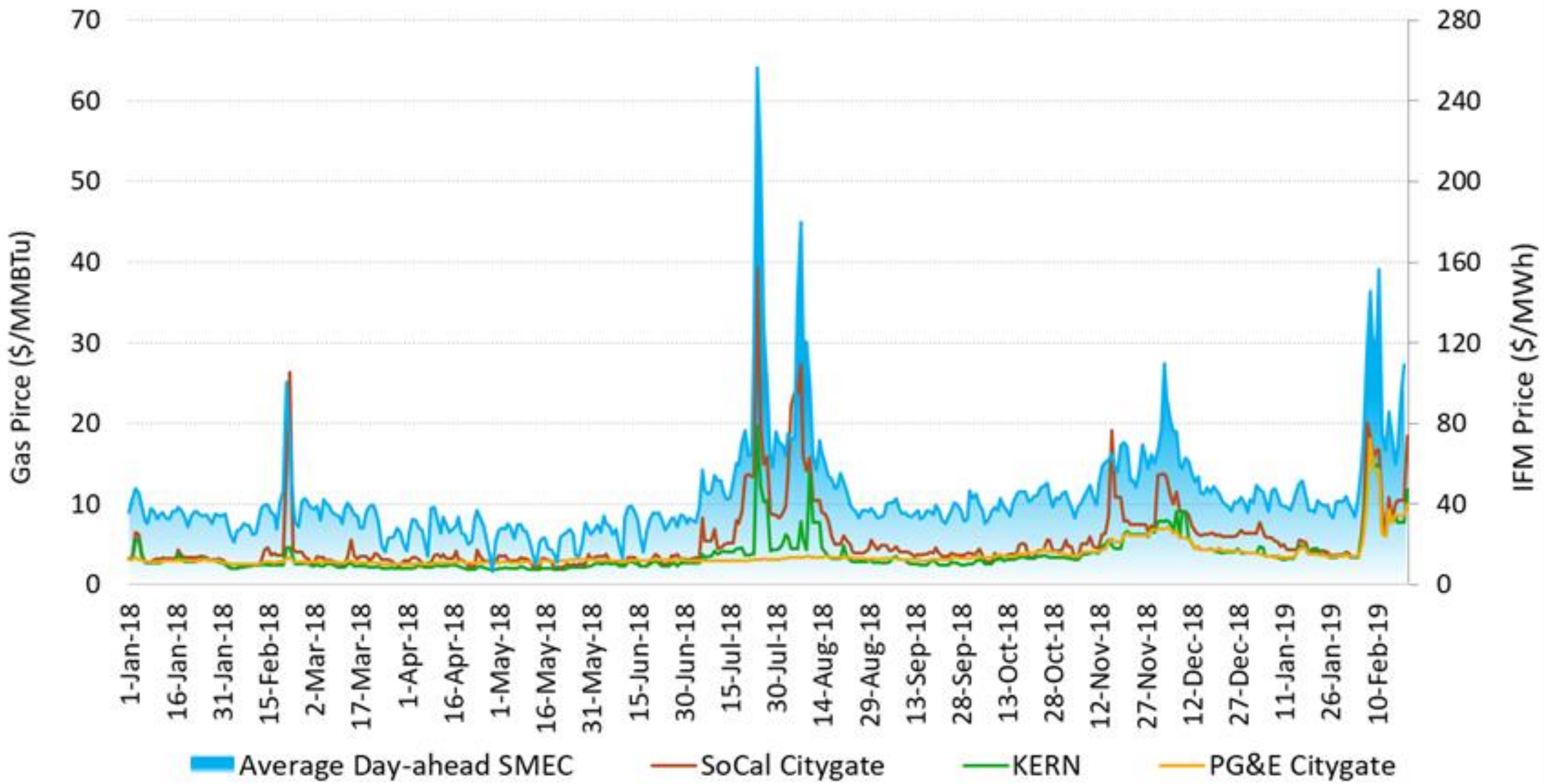




Structural uncompetitive conditions observed when supply reserves are lowest

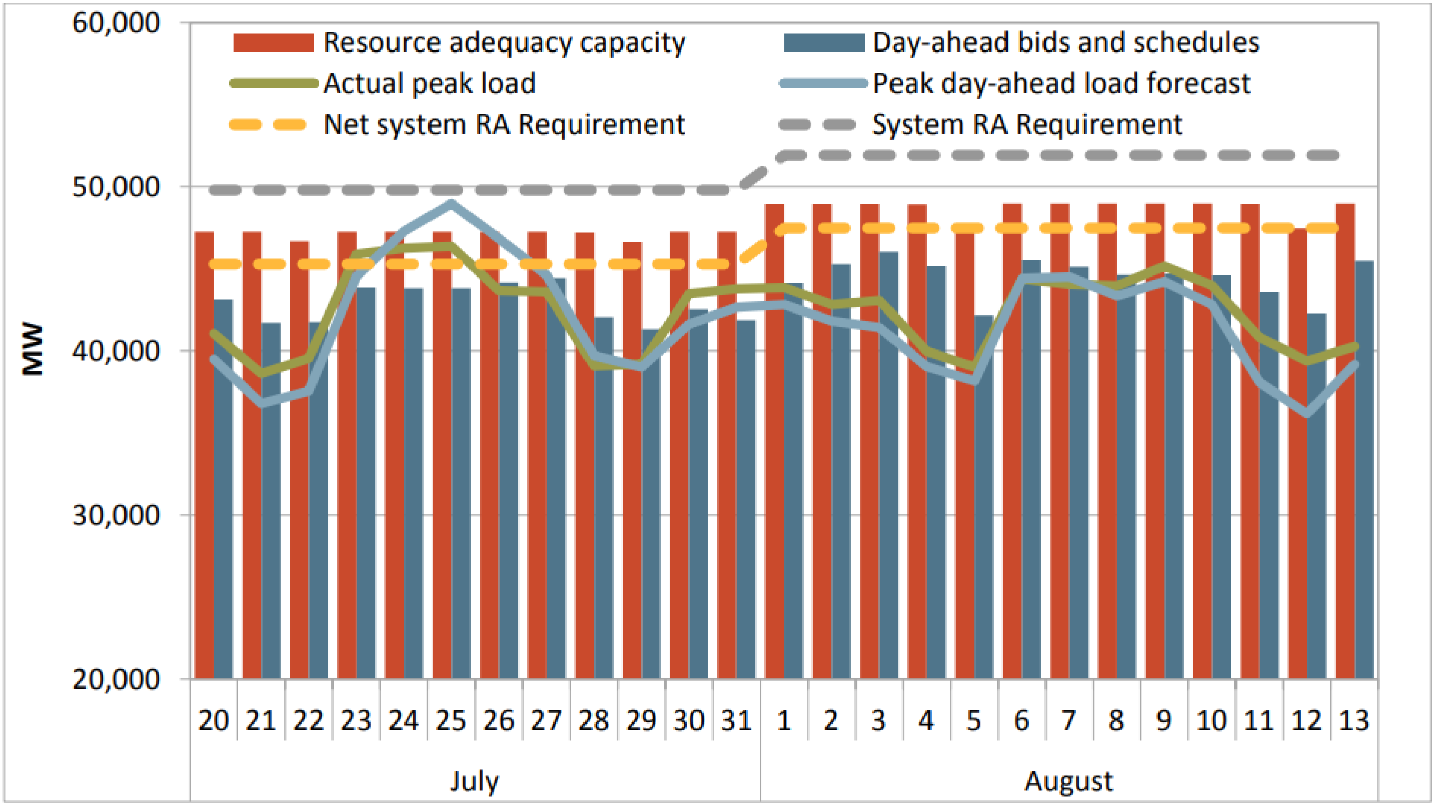


Relatively high prices occur on days where gas prices are high



Available RA capacity falls short of load forecast on many days

Figure 10.3 Daily peak load, resource adequacy capacity, and planning forecast



Several thousand MW shortfall of available RA capacity to meet actual peak load plus contingency reserves in most summer months

		CEC 1-in-2 Forecast Peak[1] (MW)	*plus* 15% PRM (MW)	**RA Target[2] (MW)**	Actual Peak Hourly Load[3] (MW)	Required Contingency Reserve[4] (MW)	**Total Capacity Required (MW)**	RA Surplus (Deficiency) (MW)	Unit Outages[5] (MW)	**Resource Adequate?**
2016	June	39,625	5,944	**45,568**	44,454	2,590	**47,044**	(1,476)	(7,152)	**No**
	July	44,364	6,655	**51,018**	45,981	2,716	**48,697**	2,322	(6,222)	**No**
	August	46,848	7,027	**53,875**	43,812	2,548	**46,360**	7,515	(5,944)	**Yes**
	September	42,388	6,358	**48,747**	42,810	2,460	**45,270**	3,477	(7,309)	**No**
2017	June	41,834	6,275	**48,109**	44,184	2,659	**46,843**	1,266	(9,454)	**No**
	July	45,259	6,789	**52,048**	45,374	2,627	**48,001**	4,047	(7,088)	**No**
	August	45,967	6,895	**52,862**	47,297	2,778	**50,075**	2,787	(6,151)	**No**
	September	45,489	6,823	**52,312**	49,909	2,871	**52,780**	(468)	(5,885)	**No**
2018	June	37,596	5,639	**43,235**	37,803	2,594	**40,397**	2,838	(7,228)	**No**
	July	43,080	6,462	**49,542**	46,487	3,026	**49,513**	29	(4,780)	**No**
	August	44,923	6,738	**51,661**	45,021	2,734	**47,755**	3,907	(6,181)	**No**
	September	42,579	6,387	**48,966**	38,536	2,374	**40,910**	8,056	(5,275)	**Yes**

Policy implications for the CAISO, CPUC, and LSEs to consider

- Load-serving entity energy procurement and hedging
  - Fixed price forward energy contracts
  - Community choice aggregators
- Resource adequacy provisions
  - Capacity only contracts versus capacity plus energy
  - Counting rules and time of need
  - Bidding rules and supply availability
  - Import RA rules and supply availability
- System-level market power mitigation process
  - Implementation considerations
  - Related consequences