



# System market power

Department of Market Monitoring

Amelia Blanke, Manager, Monitoring and Reporting

Market Surveillance Committee Meeting

General Session

June 7, 2018

# Annual report recommendation

*DMM has recommended that the ISO begin to consider various actions that might be taken to reduce the likelihood of conditions in which system market power may exist and to mitigate the impacts of system market power ...*

## 2017

- Tight system conditions in real-time
- Day-ahead market showed signs of being less competitive
  - Not structurally competitive in some hours; record high prices

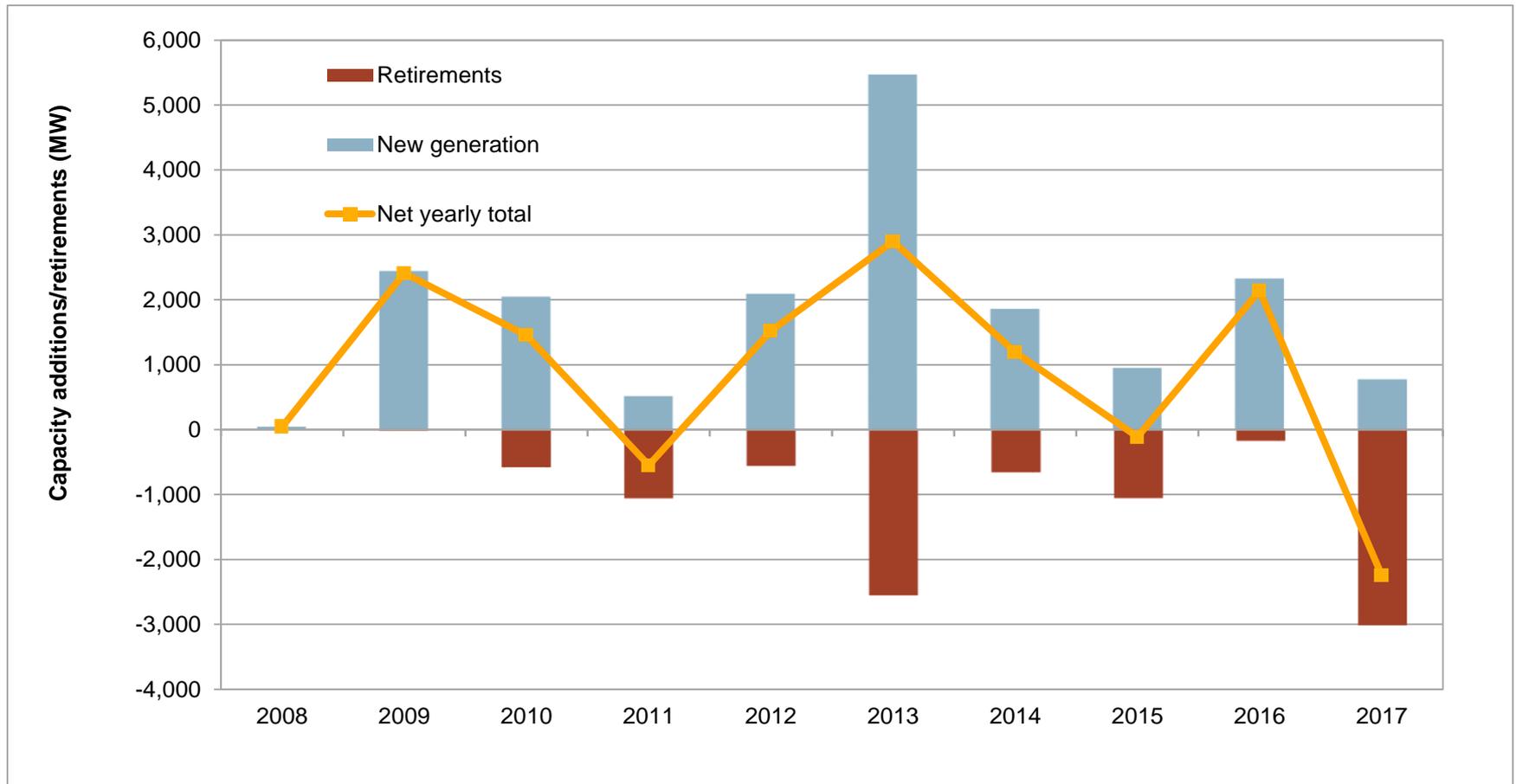
## 2018

- Conditions likely to allow for additional potential for system market power
  - lower hydro
  - less gas generation (~800 MW compared to summer 2017)
  - more generation controlled by net sellers (>3,750 MW)

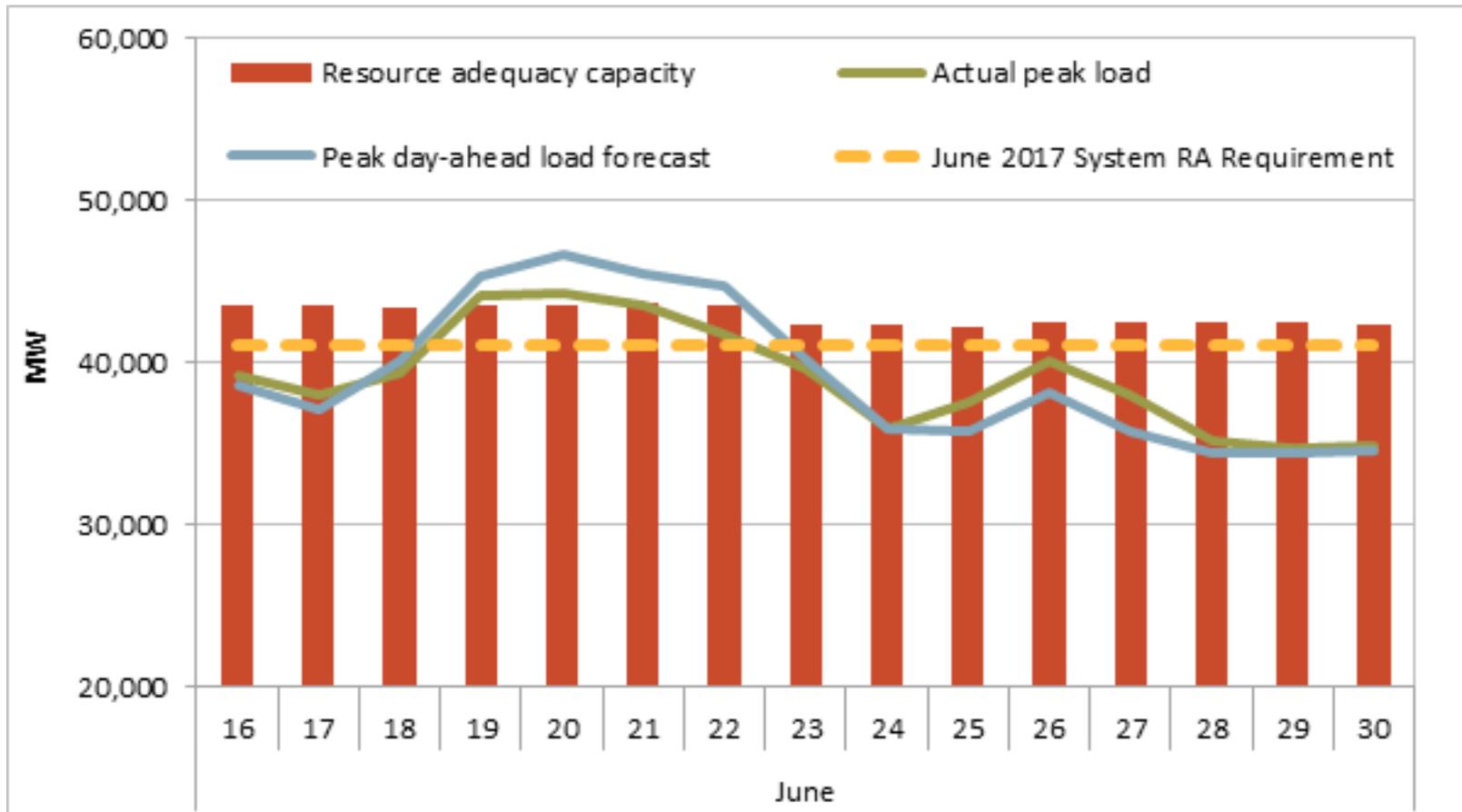
## 2019

- Conditions exacerbated by FERC Order 831 compliance and ISO proposals to increase bid caps

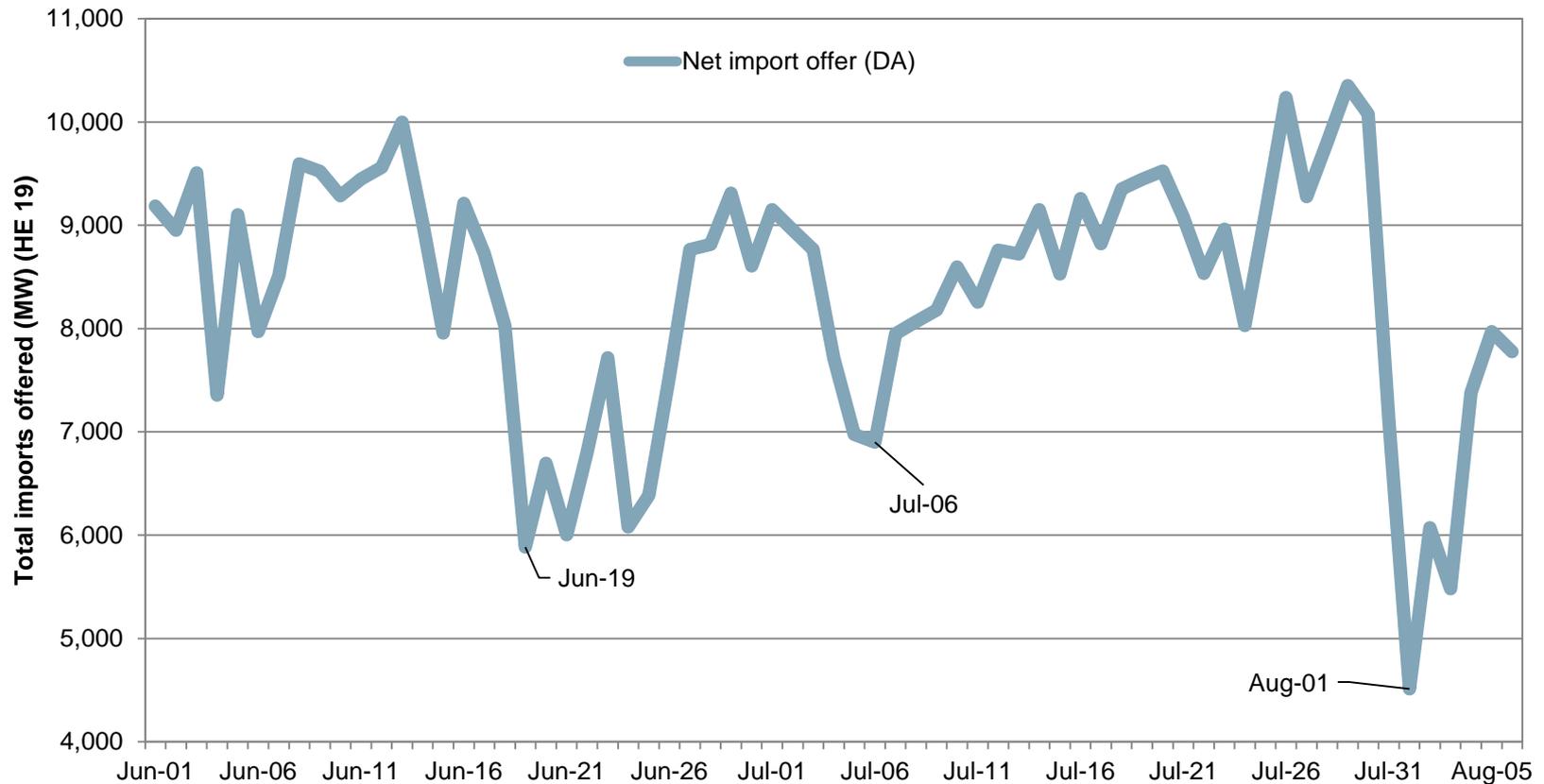
# Significant amounts of gas generation being retired, while most new generation is from solar.



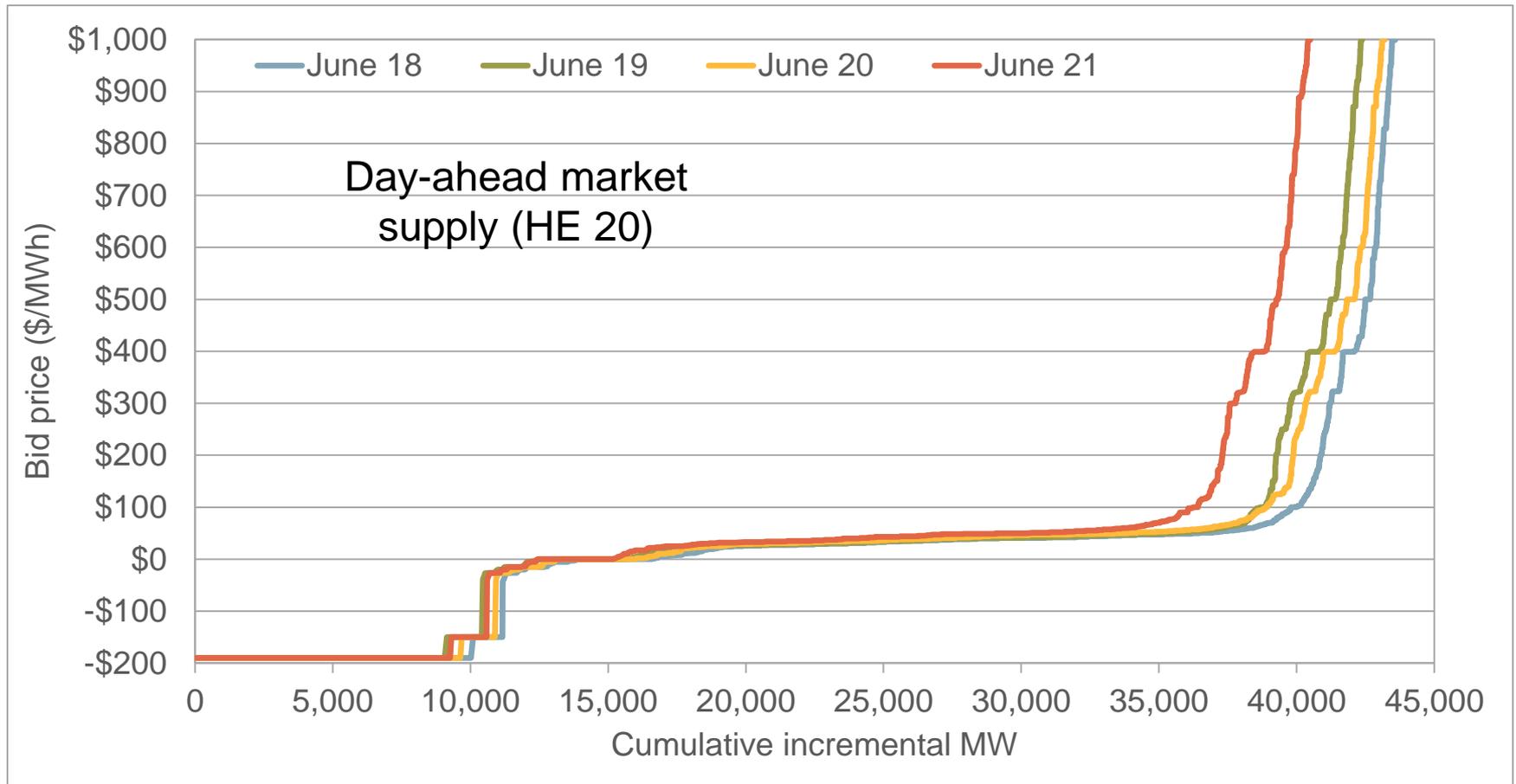
# Resource adequacy requirements sometimes falling short of actual operational demand in key hours.



# Imports offered into CAISO day-ahead and real-time market declining sharply during high loads.



# Competitively priced system level supply limited on high load days in 2017.



# Indicators of market power

- Structure
  - Pivotal suppliers
  - System residual supply index (RSI)
- Conduct
  - Supply bids
    - Bid price vs. marginal cost
    - Hockey stick bidding
- Impact
  - Market prices vs. marginal costs

# Structural measures of market power

- **Pivotal supplier test:** If supply is insufficient to meet demand with the supply of any individual supplier removed, then this supplier is pivotal.
- **Residual supply index.** The residual supply index is the ratio of supply from non-pivotal suppliers to demand. A residual supply index less than 1.0 indicates an uncompetitive level of supply.

## Example:

Demand = 100 MW

Total Supply = 120 MW (30 MW pivotal supplier)

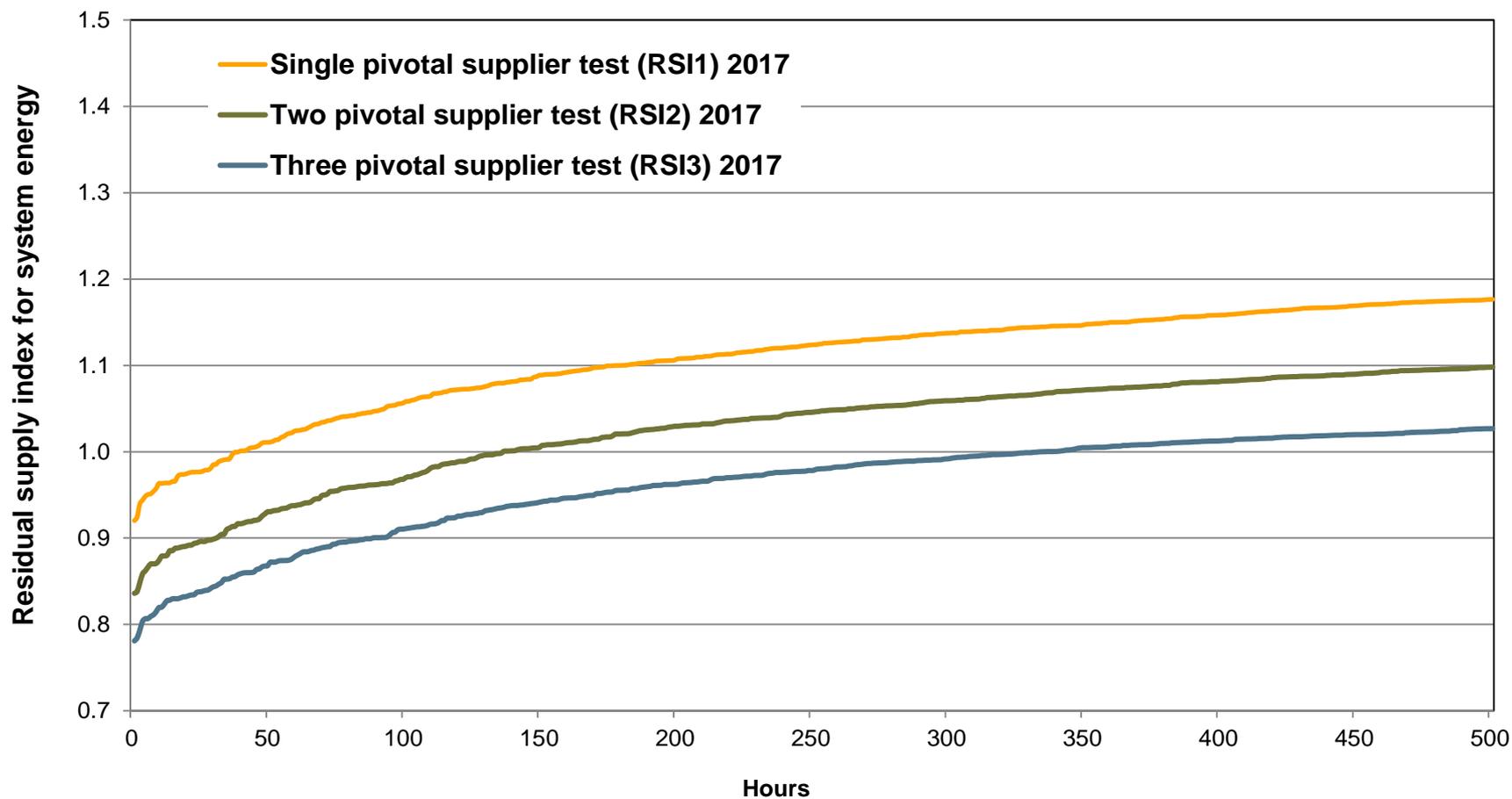
$RSI = (120 \text{ MW} - 30 \text{ MW}) / 100 \text{ MW} = .9$

- **Oligopoly:** Consider degree to which 2 or 3 suppliers are jointly pivotal.

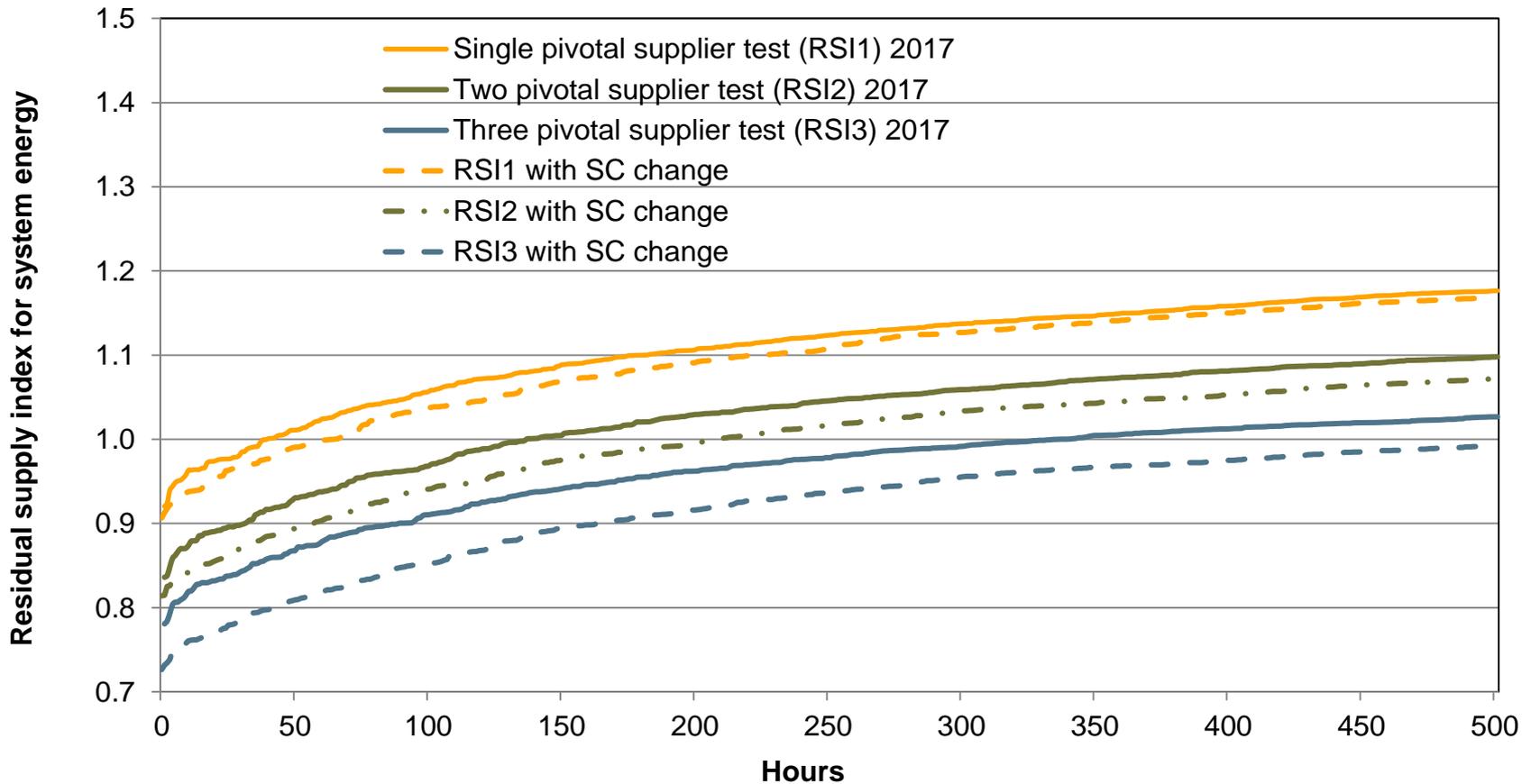
## DMM's System RSI calculation (day-ahead)

- Supply
  - All internal supply bid into the day-ahead market
  - Imports scheduled/bid into the day-ahead market
- Demand
  - Actual system load, plus
  - Ancillary services requirements
- Virtual supply/demand bids are excluded

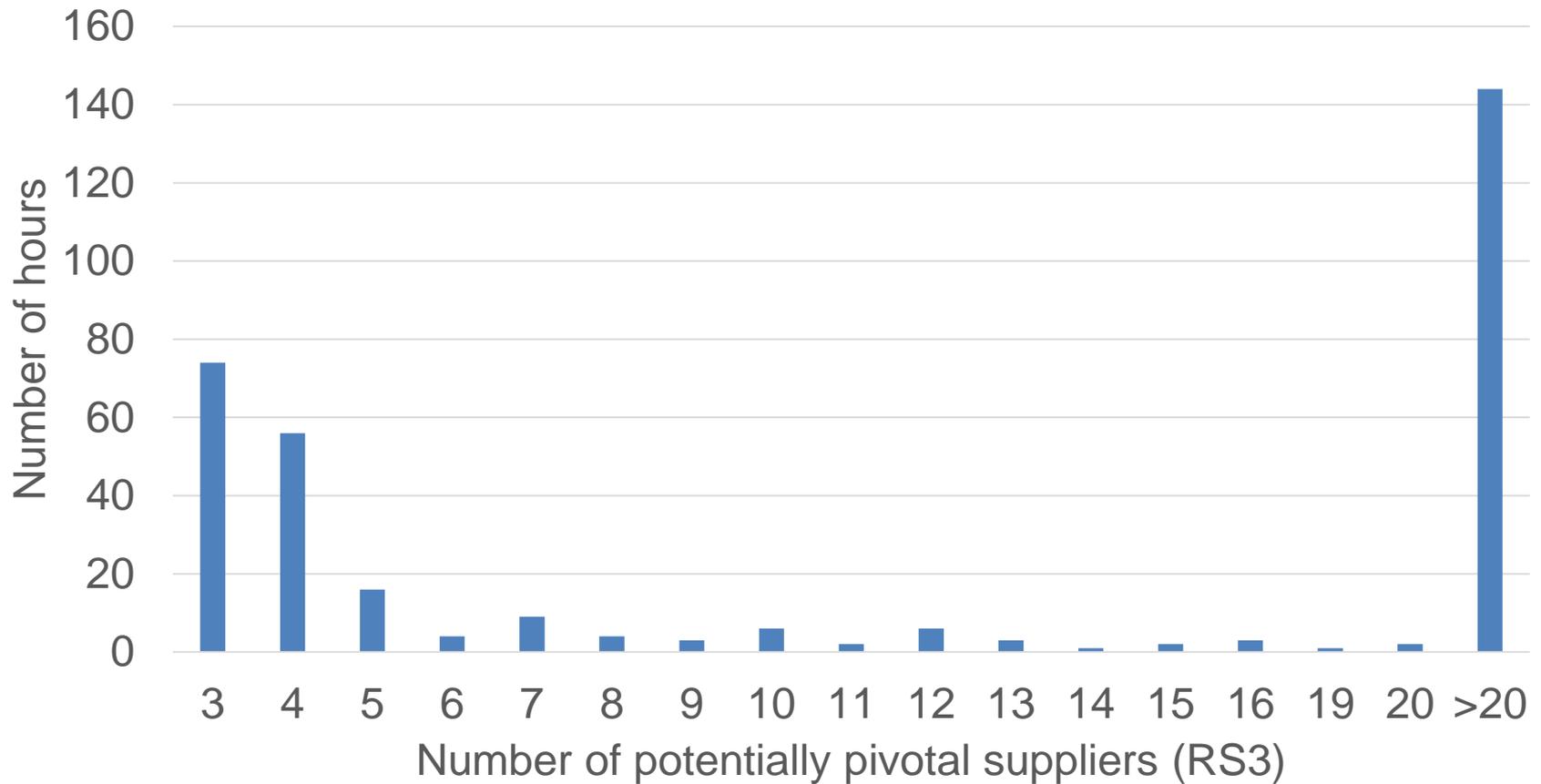
# System RSI calculation for day-ahead market (2017)



# Results for 2017 with more than 3,750 MW of gas generation reassigned to different suppliers as reported in June 2018.

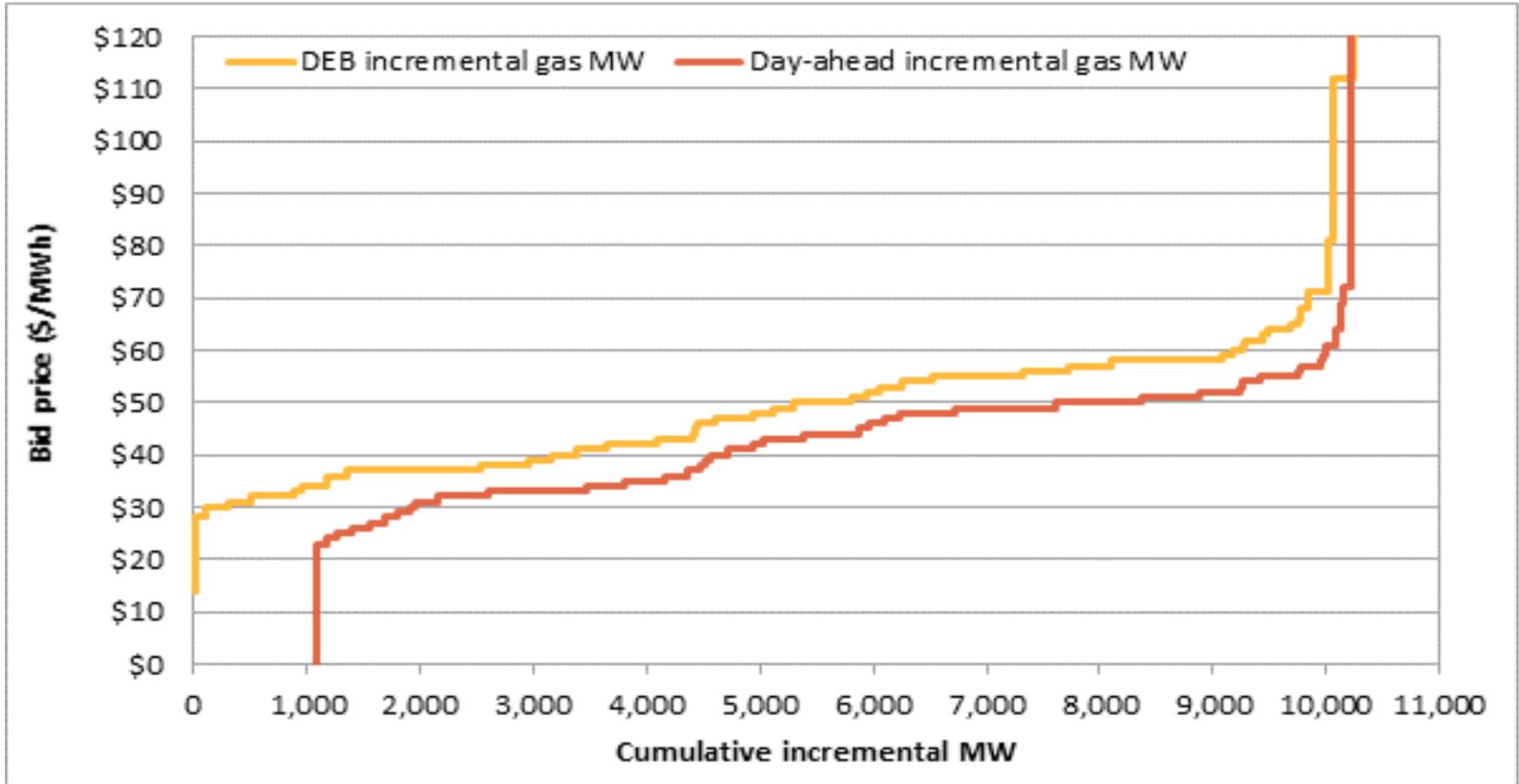


# Potentially pivotal suppliers (2017 results)



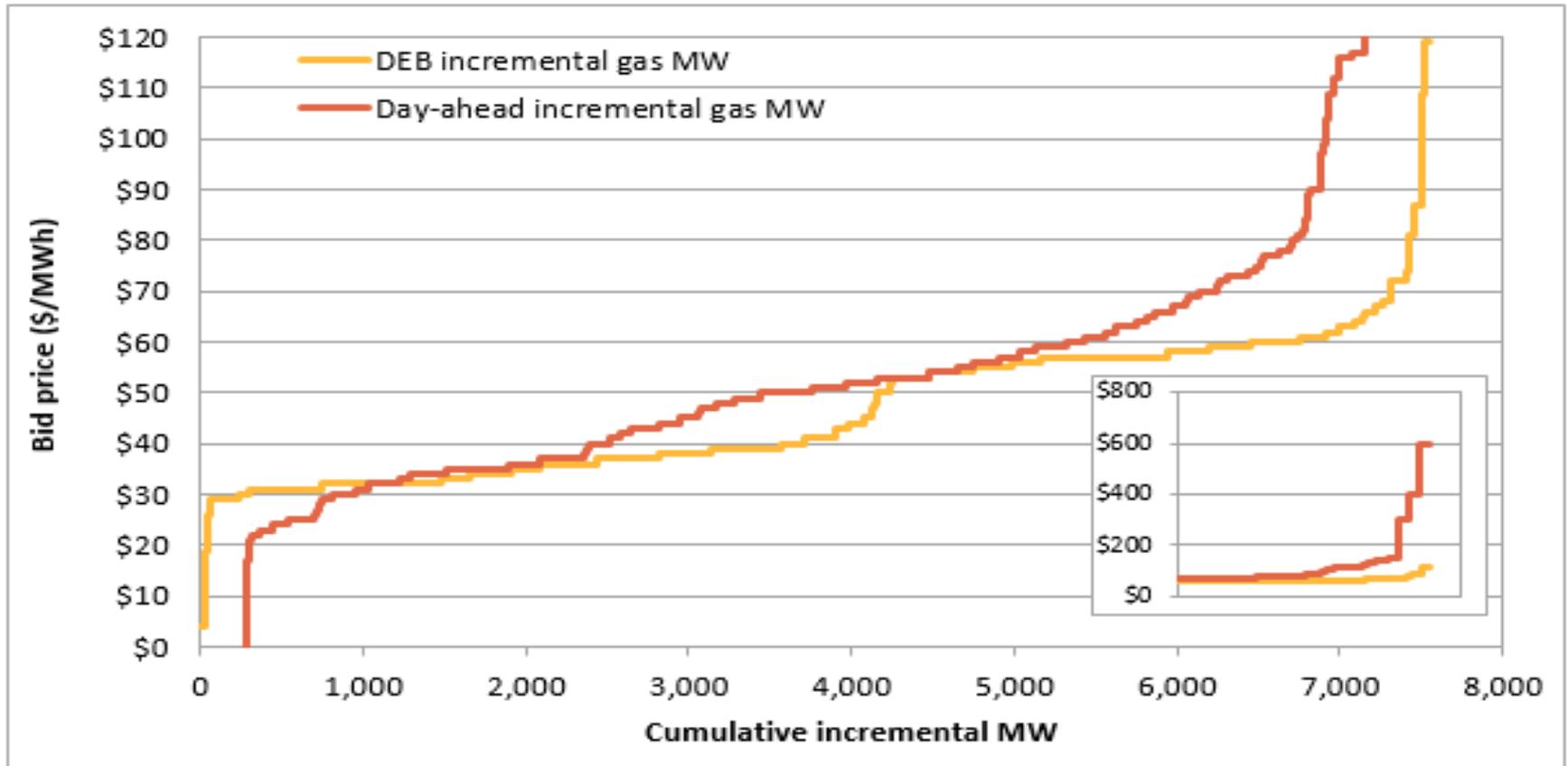
# Bid price vs default energy bids for gas resources

## Net buyers (June 21, 2017)

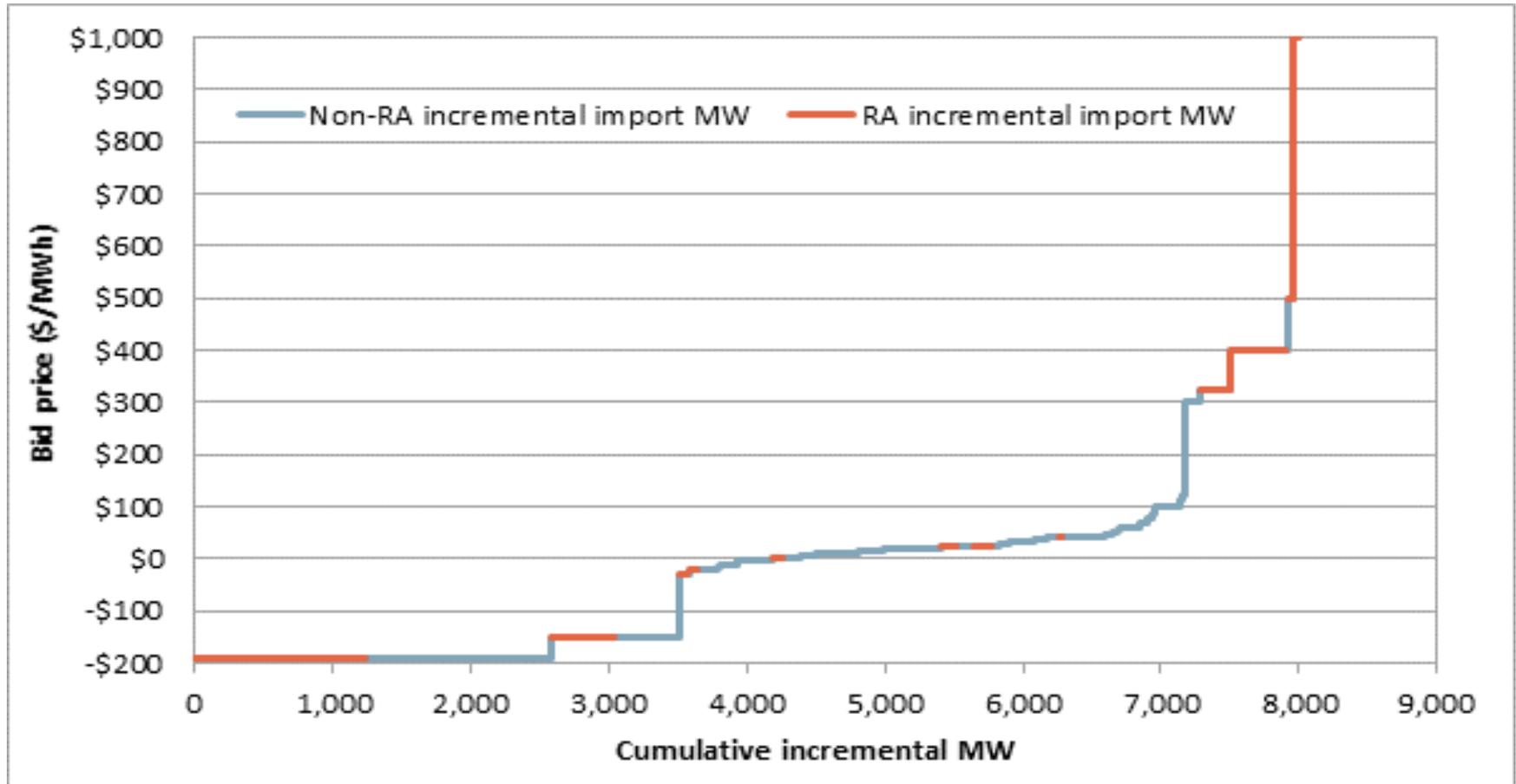


# Bid price vs default energy bids for gas resources

## Net sellers (June 21, 2017)



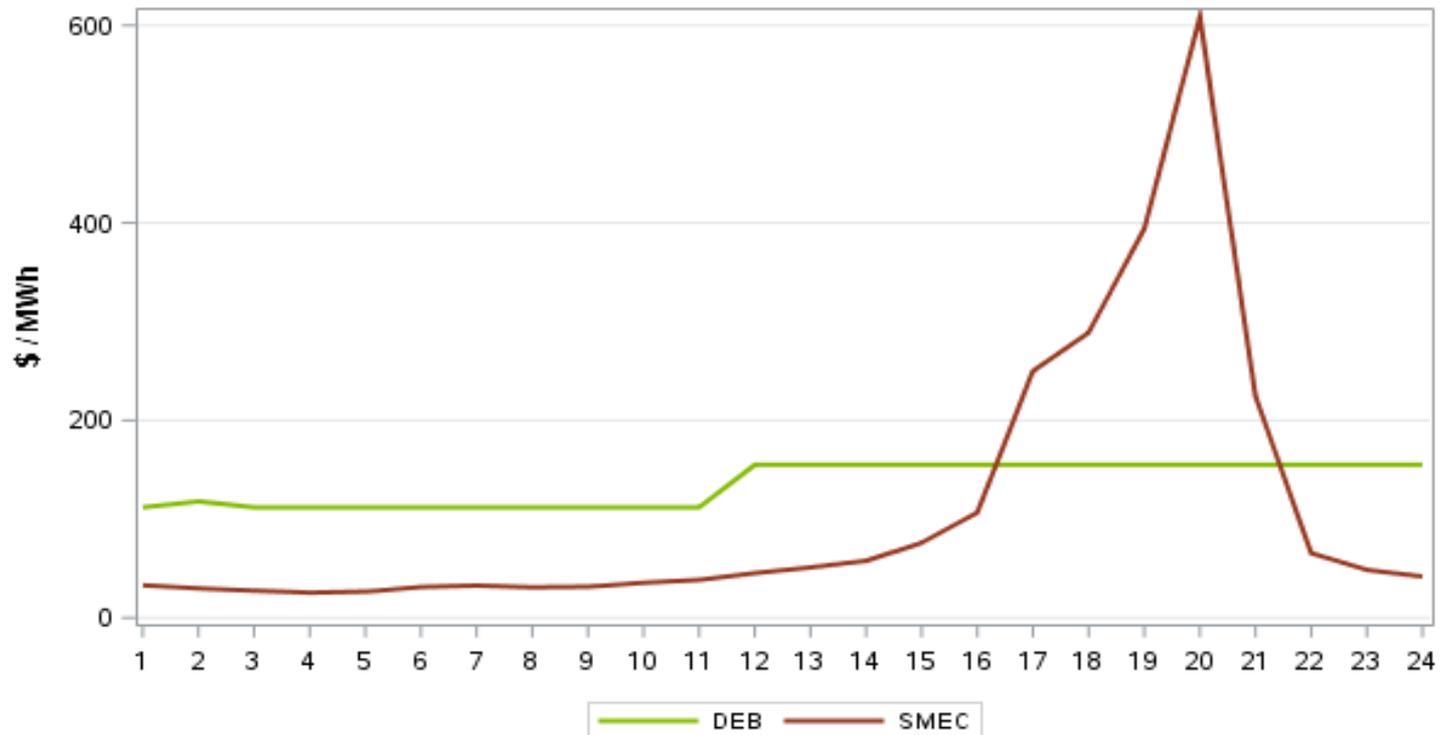
# Import bids – June 21, 2017



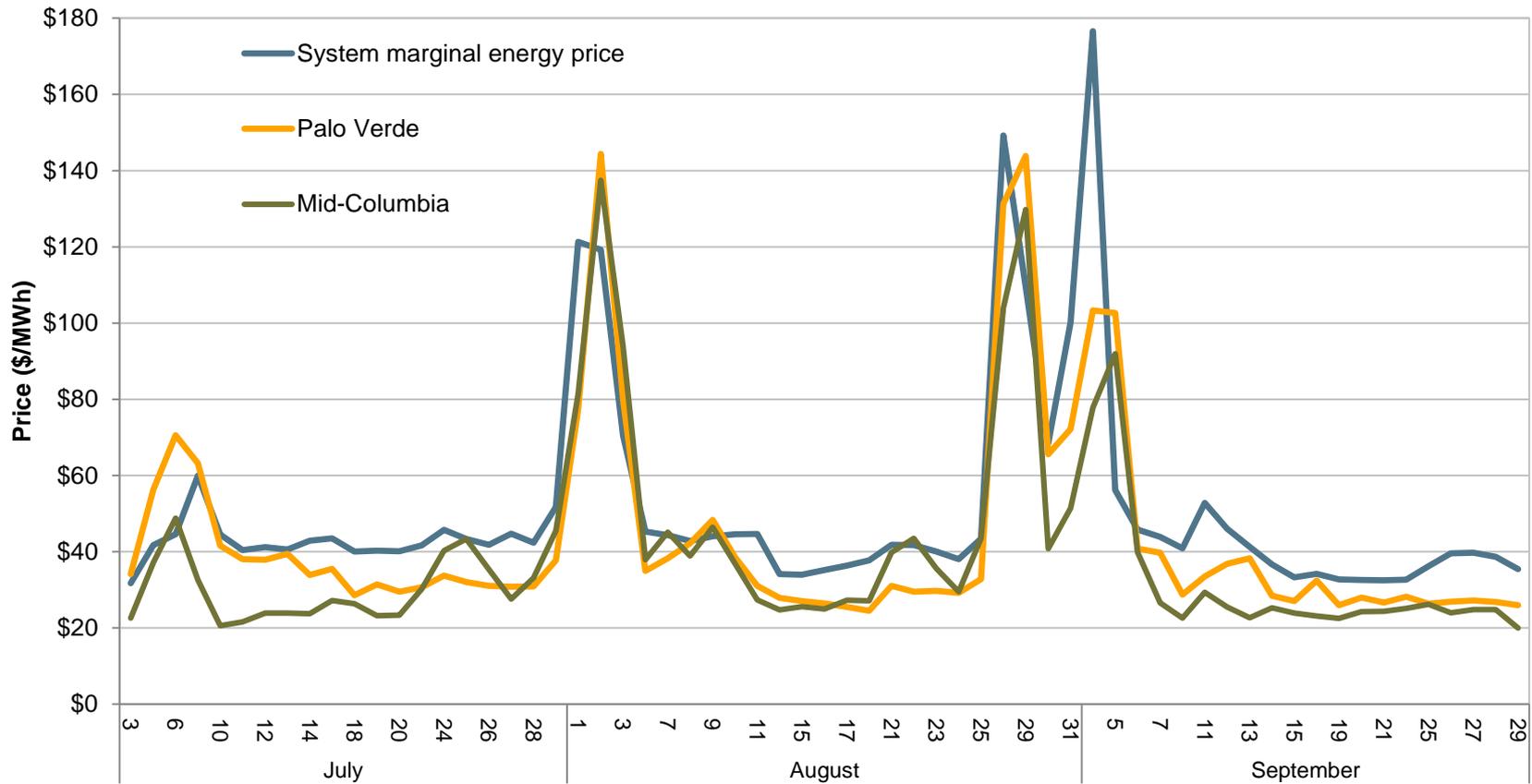
# Comparison of system marginal energy cost to highest cleared default energy bid segment

Day-ahead hourly system marginal price vs highest DEB of gas resource

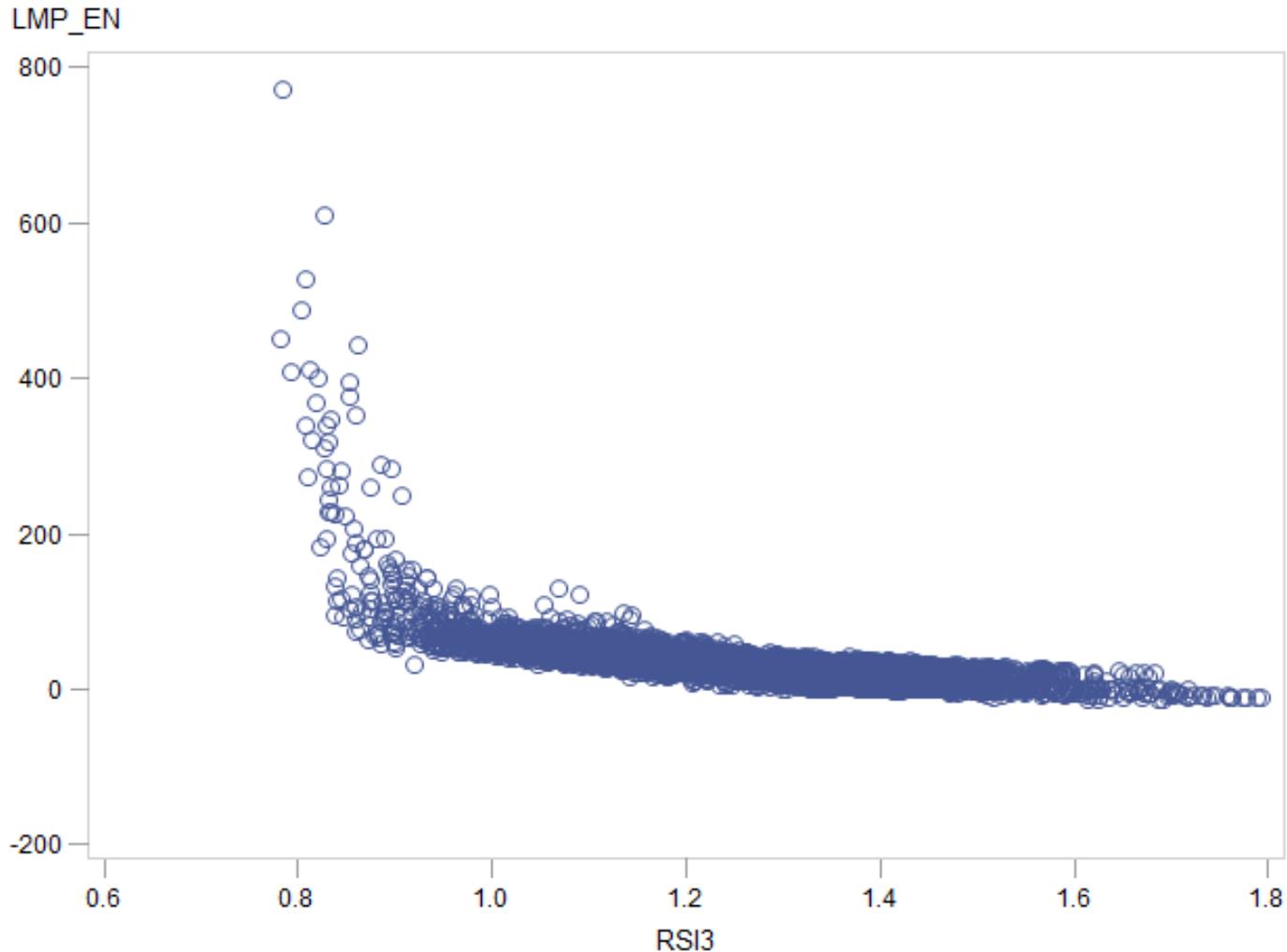
Trade date=21JUN2017



# Comparison of CAISO day-ahead prices with bi-lateral day-ahead prices (peak hours)



# Correlation of system marginal energy price with RSI3



# Discussion

- Additional metrics or analysis?
- MSC recommendations for mitigation?
- Impact on proposed market changes?
- Other ideas?