



Analysis of system level market power

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General Session
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DMM analysis of structural market power

Hours with RSI < 1 (2018)

	A/S bids without energy removed	
	With virtual supply	Without virtual supply
Input bids	✓	✓
Transmission losses	✓	✓
Self-scheduled exports	✓	✓
A/S bids without energy bids	No	No
Virtual supply	✓	No
RSI 1 < 1	5	34
RSI 2 < 1	18	100
RSI 3 < 1	45	305

Comments on CAISO's Analysis of Structural System-Level Competiveness,
Department of Market Monitoring, May 20, 2019

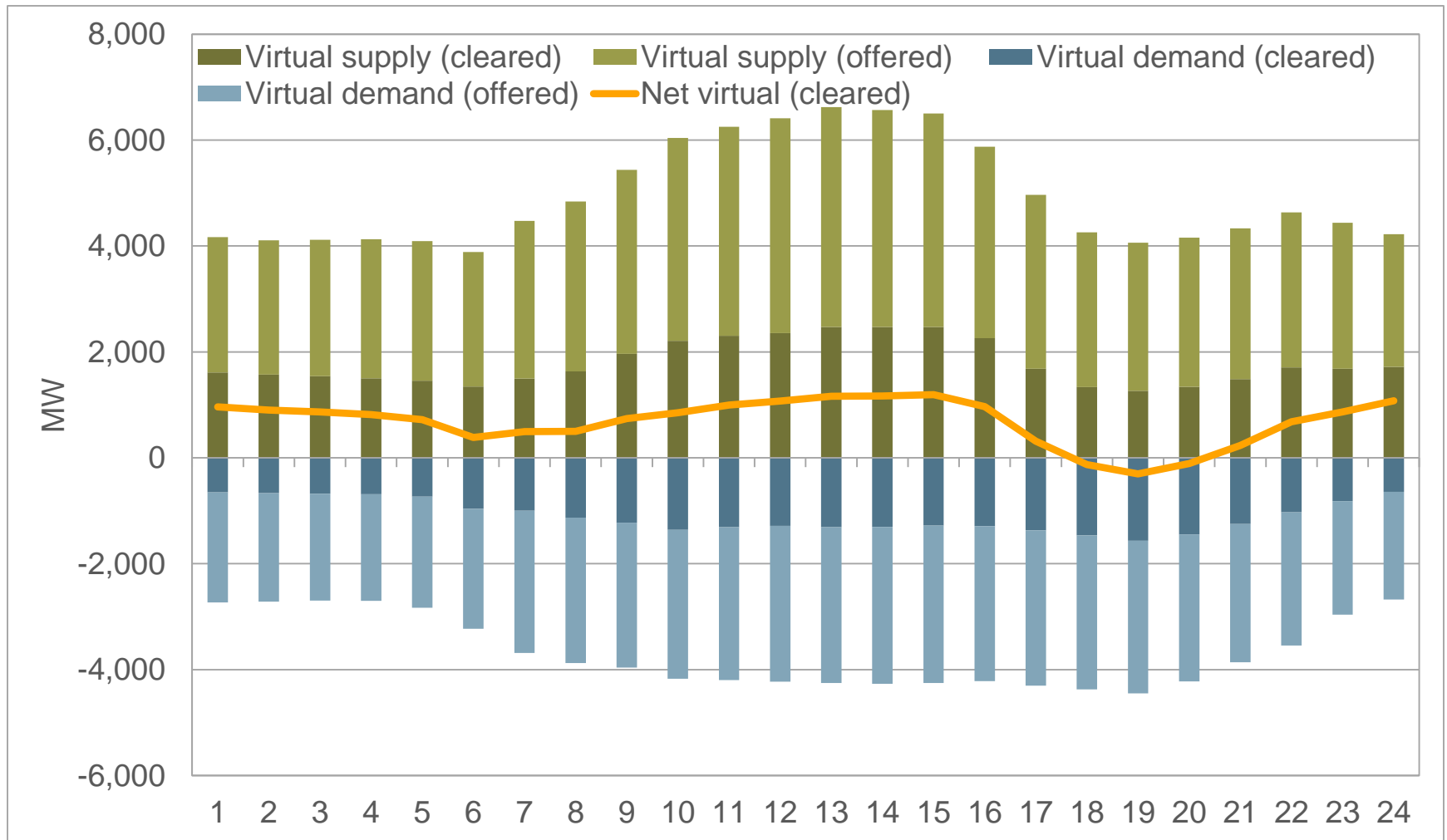
<http://www.caiso.com/Documents/DMMComments-SystemMarketPowerAnalysis.pdf>

DMM analysis of structural market power updated to include ancillary service bid segments without overlapping energy bids.

Hours with RSI < 1 (2018)

	A/S bids without energy removed		A/S bids without energy <u>not</u> removed	
	With virtual supply	Without virtual supply	With virtual supply	Without virtual supply
Input bids	✓	✓	✓	✓
Transmission losses	✓	✓	✓	✓
Self-scheduled exports	✓	✓	✓	✓
A/S bids without energy bids	No	No	✓	✓
Virtual supply	✓	No	✓	No
RSI 1 < 1	5	34	5	31
RSI 2 < 1	18	100	17	91
RSI 3 < 1	45	305	43	272

Average net cleared virtual bids in 2018



Analysis of uncompetitively high priced supply and “almost” self-scheduled exports.

Average hourly MW of high price supply and exports during 272 hours with RSI3 < 1

Bid price range	High priced supply (MW)					High priced exports (MW)	Total high priced supply + exports
	Import energy	Gas	PDR/RDR	Import AS	Total supply		
\$1000 to \$990	404	67	58	17	545	198	744
\$1000 to \$750	614	137	71	17	839	232	1,071
\$1000 to \$590	665	146	118	17	946	264	1,210

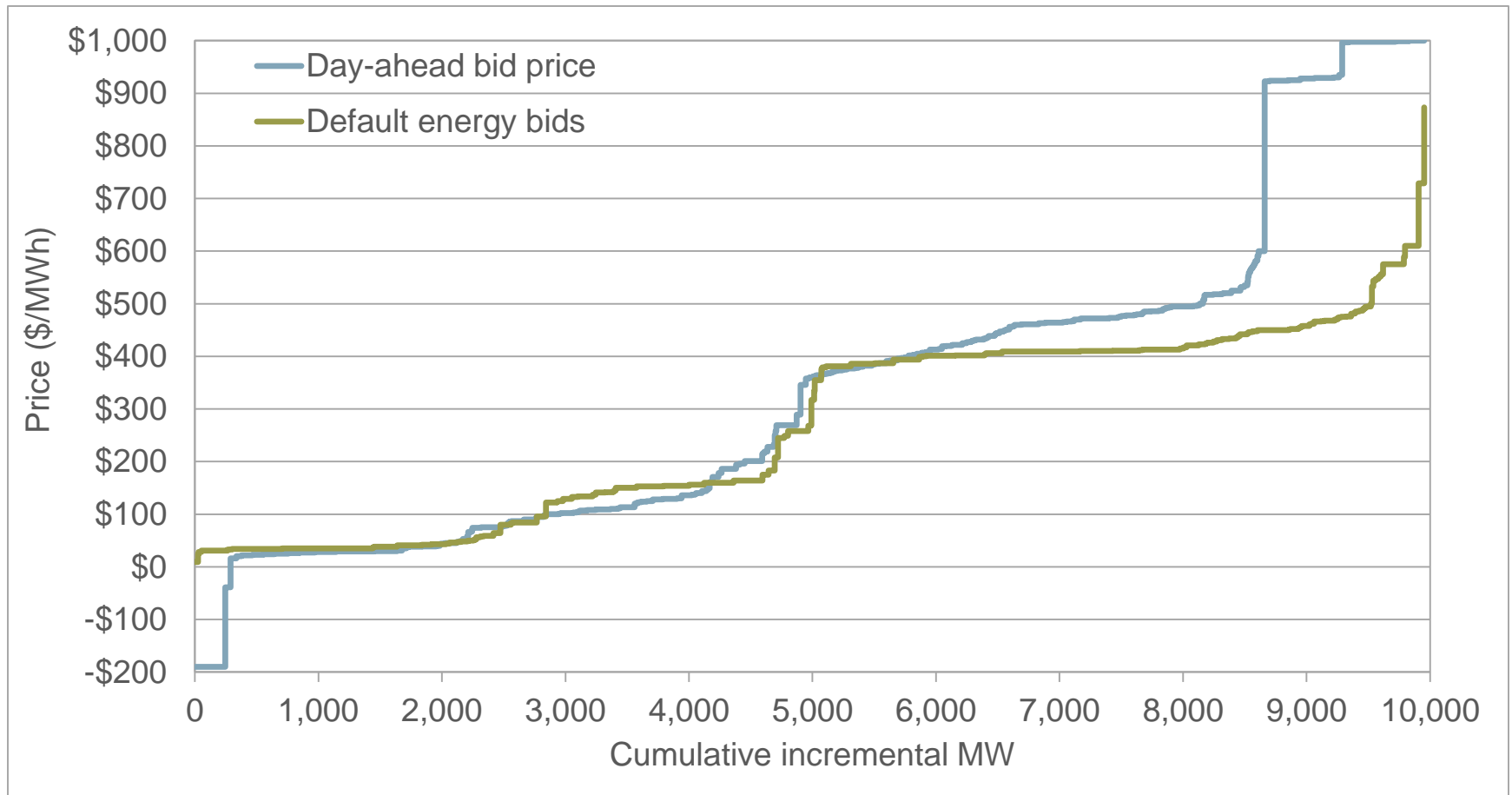
Market competitiveness – 2018 Annual Report

- CAISO's energy markets were generally competitive in 2018.
- Prices in the day-ahead market were significantly in excess of competitive levels in some hours when net load that must be met by gas-fired units is highest.
- Market for capacity needed to meet local requirements is structurally uncompetitive in all local areas.

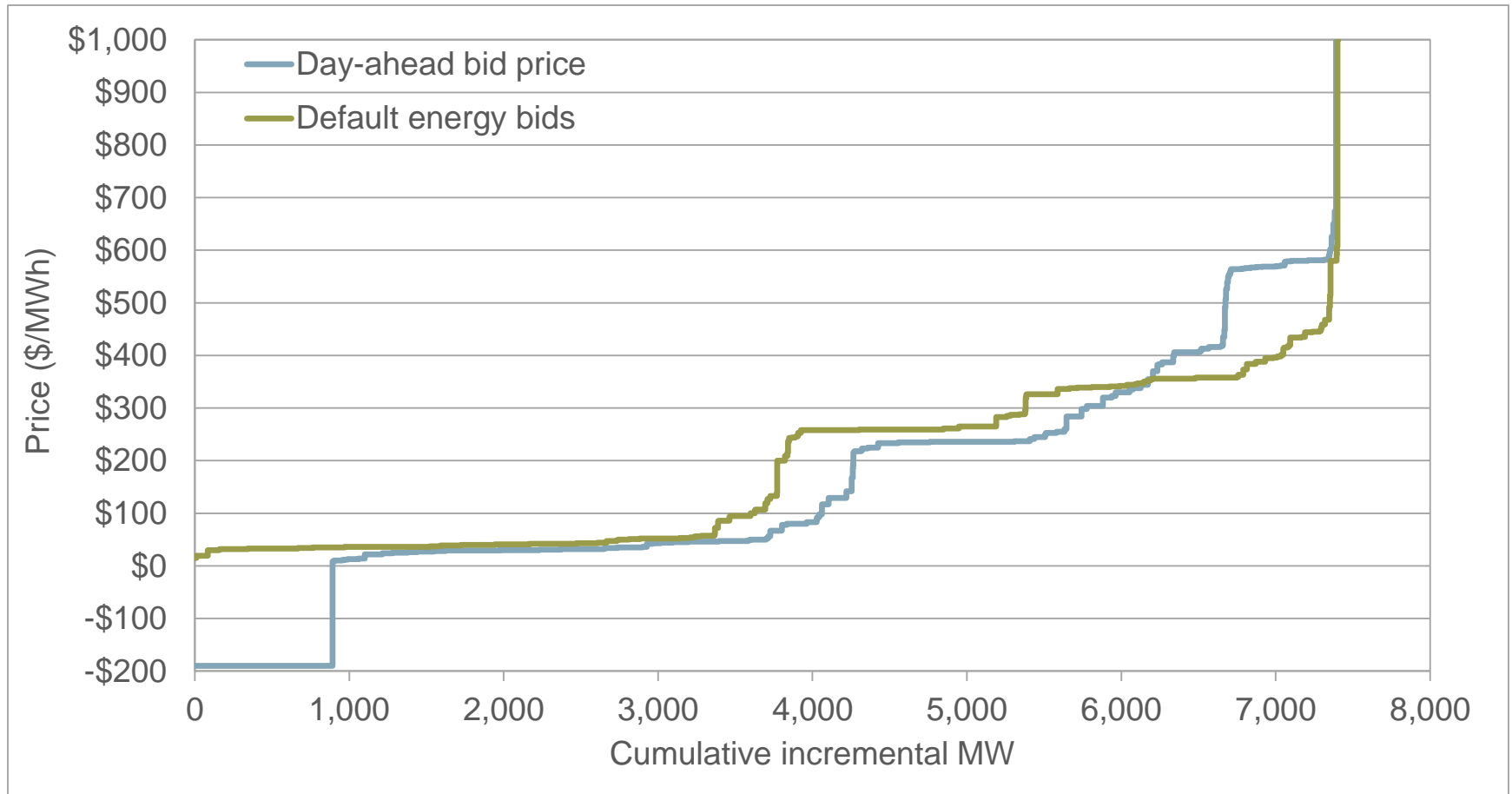
2018 Annual Report on Market Issues and Performance, DMM.

<http://www.caiso.com/Documents/2018AnnualReportonMarketIssuesandPerformance.pdf>

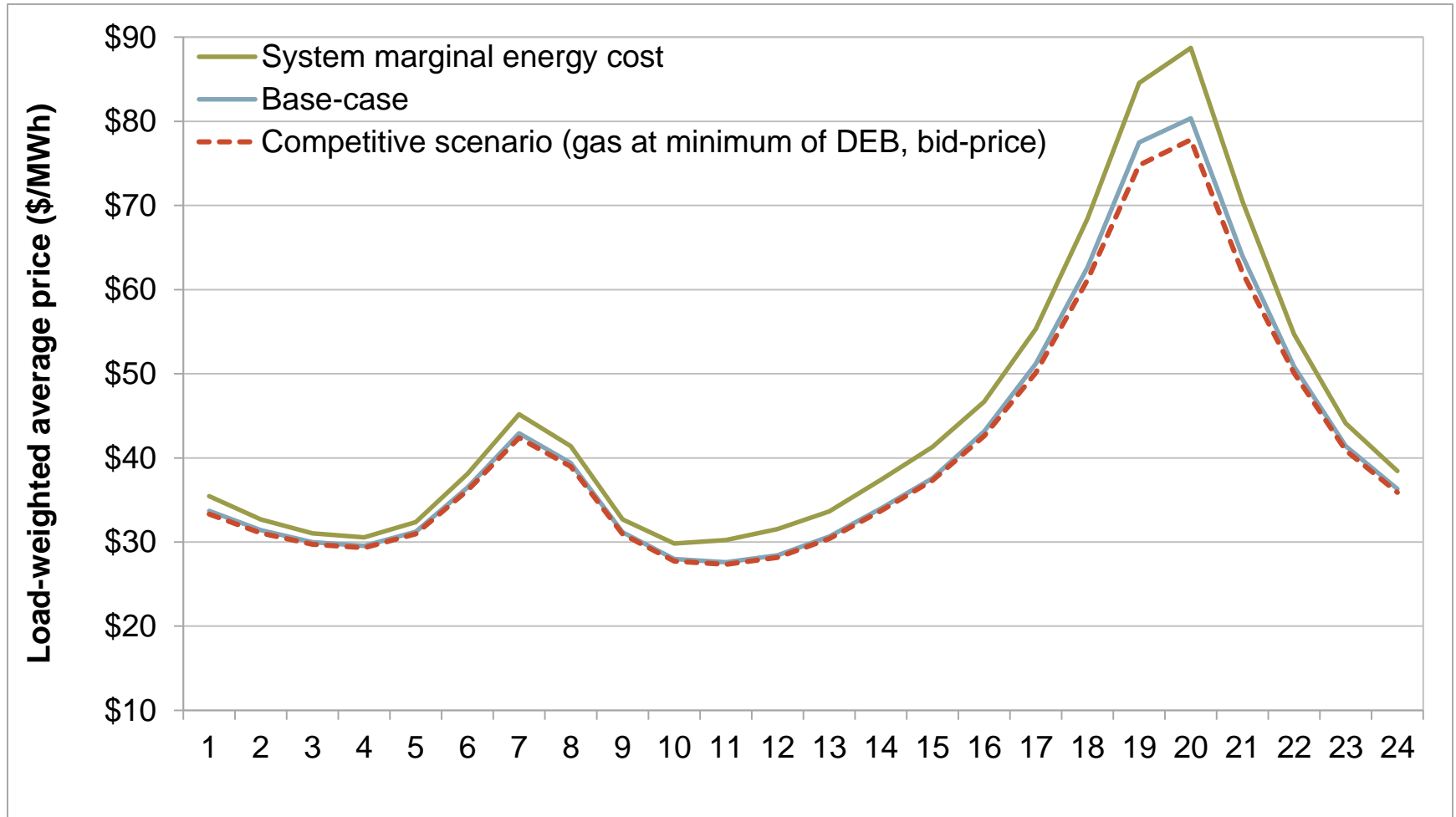
Net sellers supply bids vs. default energy bids for gas units (July 24, 2018 hour 20).



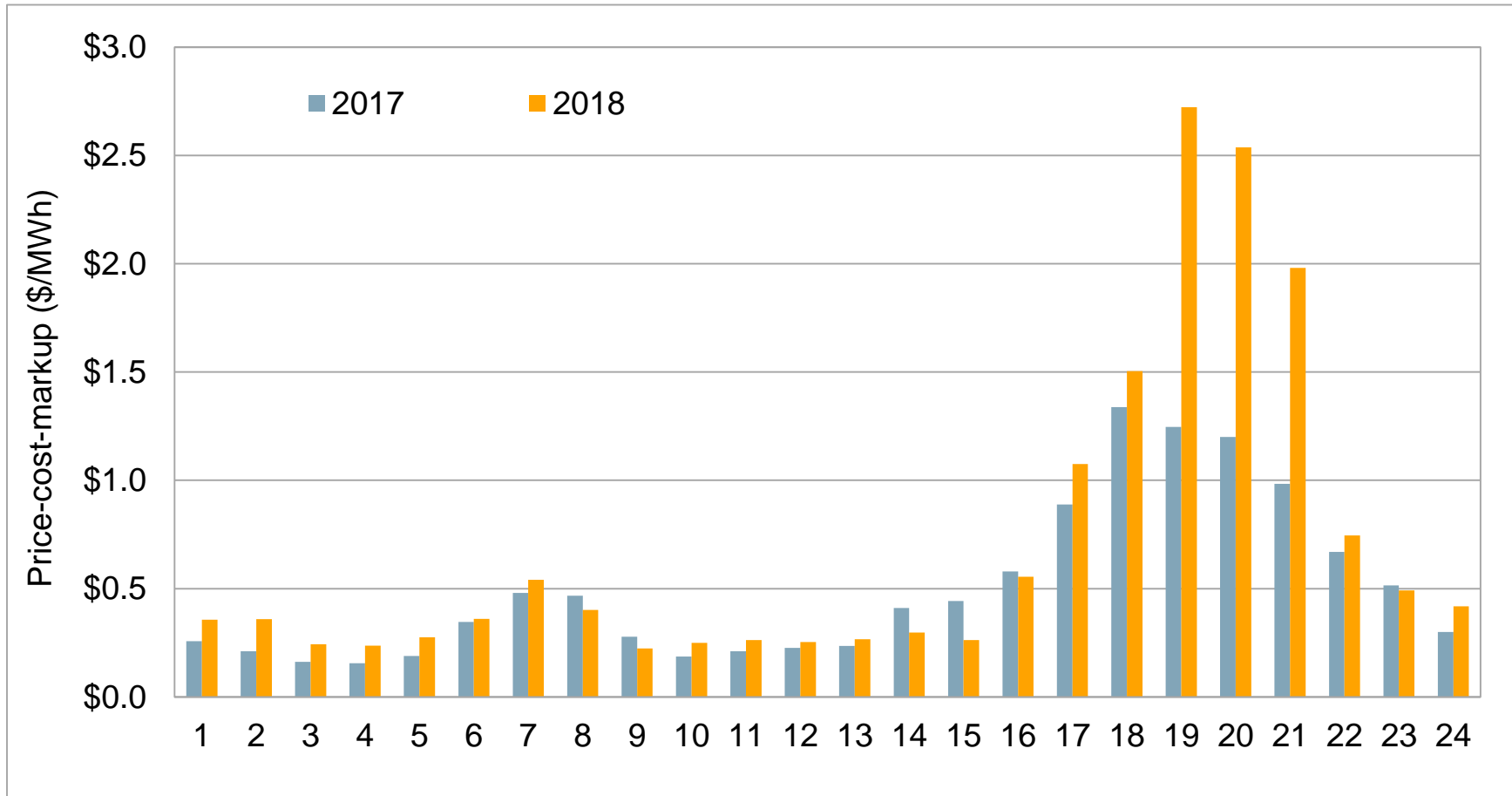
Net buyers supply bids vs. default energy bids for gas units (July 24, 2018 hour 20).



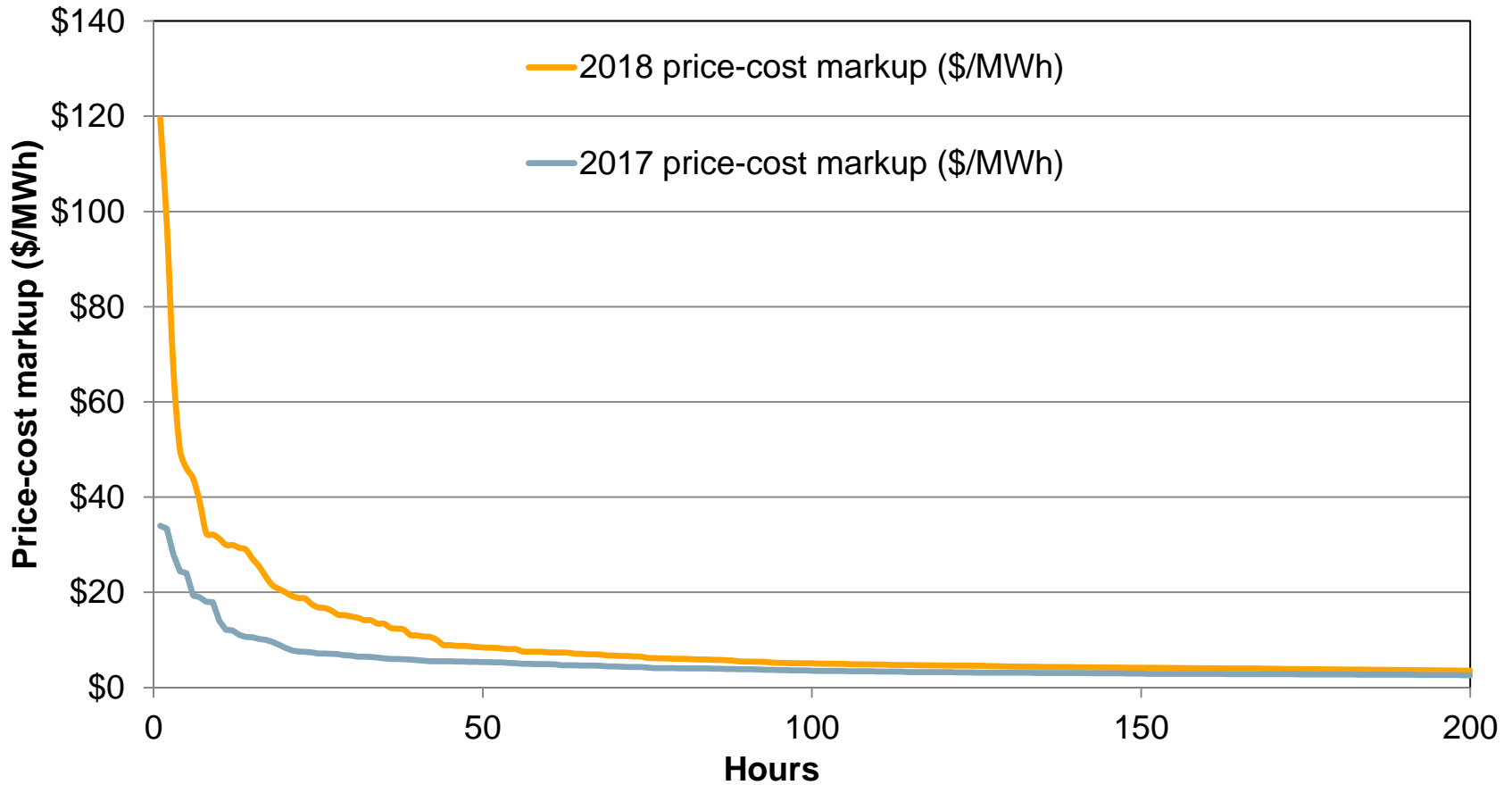
Price-cost markup based on system marginal prices with cost-based bids for gas units (2018)



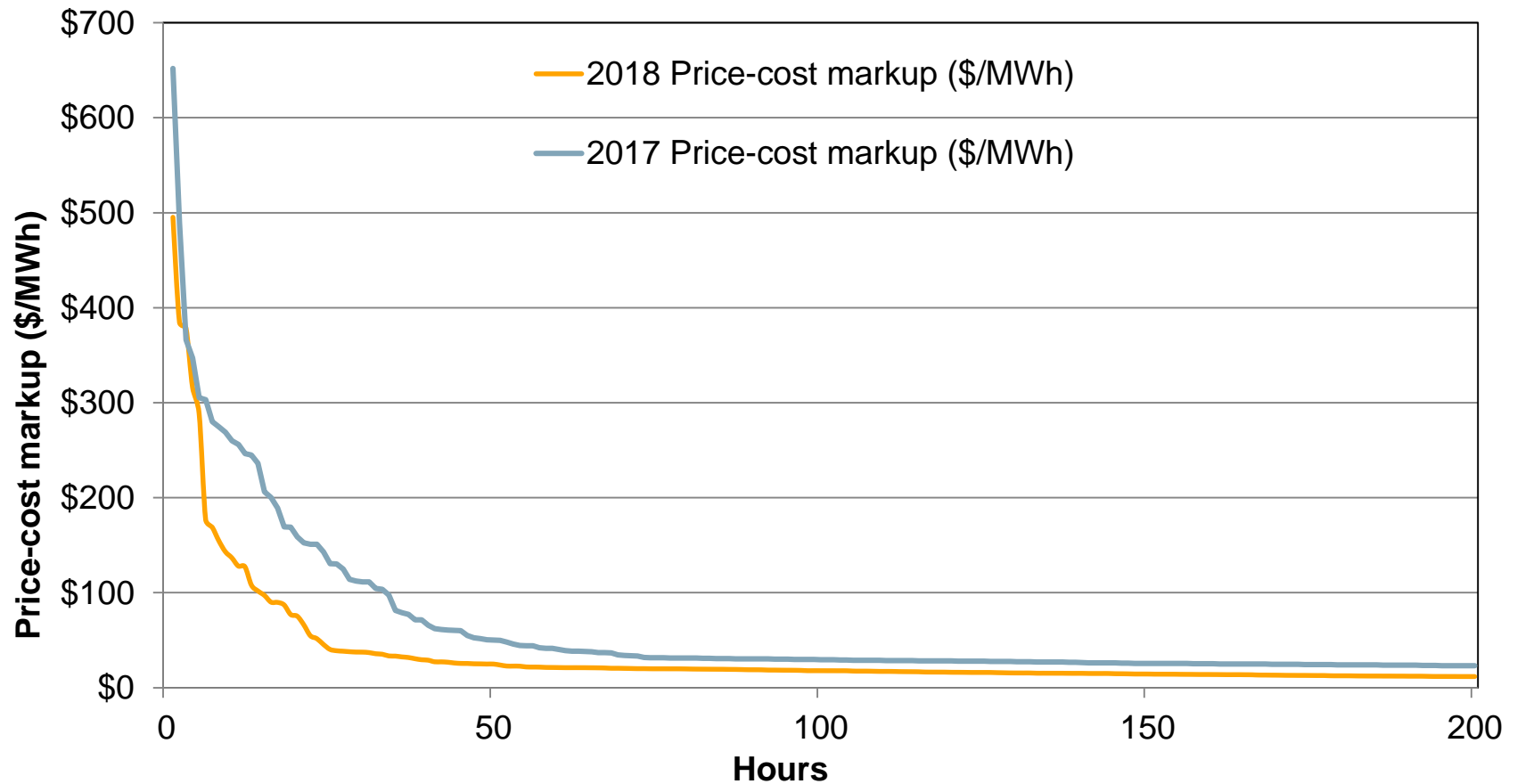
Average hourly price-cost markup is highest in evening ramping hours (HE 17-21).



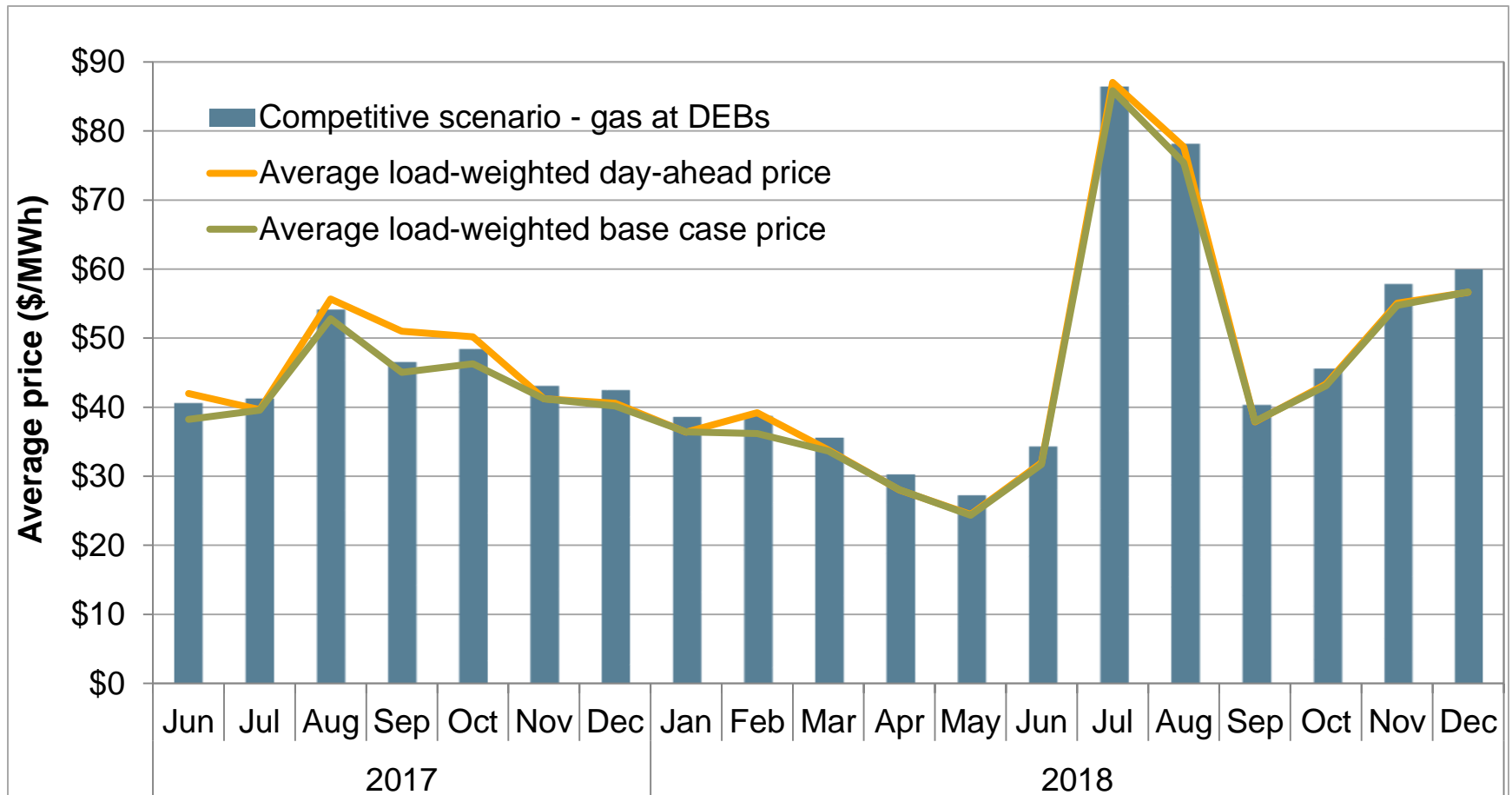
Duration curve of highest hourly price-cost markups



Markup based on highest cost gas-fired unit dispatched each hour in day-ahead market (2017-2018).



Comparison of competitive baseline price with day-ahead prices (using day-ahead market software).



System market power recommendations (2017 – 2018)

- ISO should begin to consider various actions that might be taken to reduce/mitigate potential system market power.
- DMM recognizes that this recommendation involves major market design and policy issues, including the possible development of new market design options to mitigate potential system market power.
- DMM recognizes that the competitiveness of the ISO's markets is heavily affected by the procurement decisions of the state's load-serving entities and policies of their local regulatory authorities.
- Because of the potential severity of the impact of market power, DMM made this recommendation at this time so that the ISO, stakeholders and regulatory entities can give thorough consideration to this issue and potential options to address it.

Potential measures to reduce the potential for or mitigate the effect of system market power:

- Begin consideration of options for system market power mitigation.
- Set local and system resource adequacy requirements sufficiently high to ensure reliability (which may also reduced likelihood of non-competitive market outcomes).
- Reexamine resource adequacy provisions relating to imports (e.g. must offer obligation in day-ahead only, resource or system backing RA imports, etc.)
- Strengthen the penalties and the enforcement of the penalties for must-offer obligations.
- Carefully track and seek to limit out-of-market purchases of imports at above-market prices, which can encourage economic and physical withholding of available imports.
- Closely monitor for potential errors or software issues affecting market power mitigation.