IMM Quarterly Markets Performance Report

Summer 2023 Report Highlights

June 2023 – August 2023 outcomes

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Summary for Summer 2023

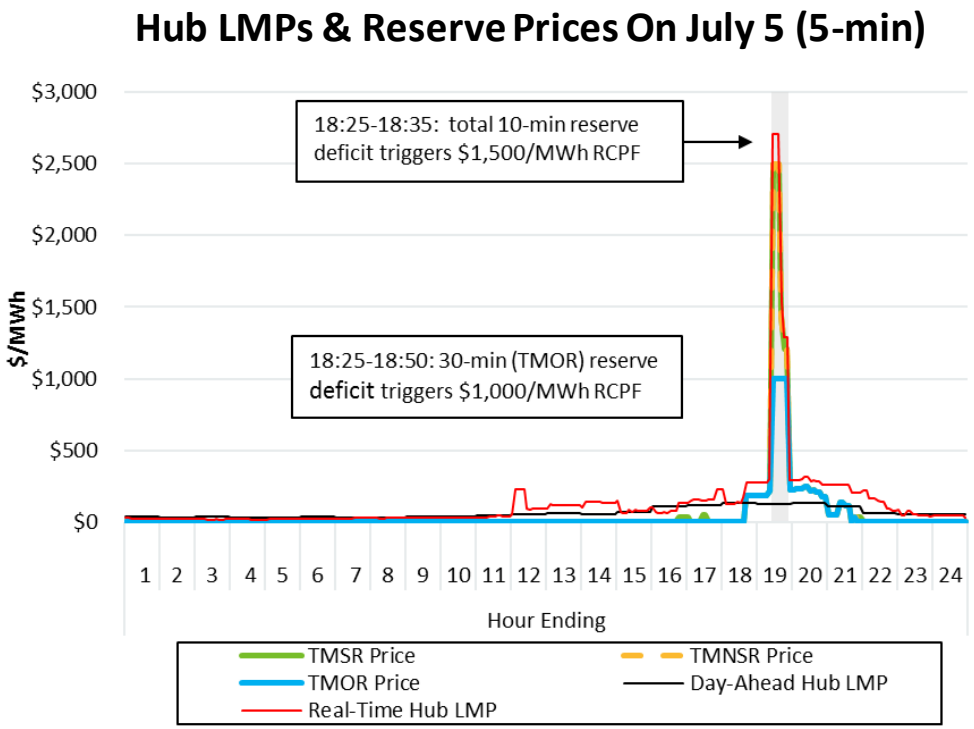
- **Wholesale market costs** totaled $1.59bn, a 60% decrease (down $2.39bn) on Summer 2022 costs of $3.98bn, driven by lower energy and capacity costs
  - Energy market costs made up 77% of total wholesale costs; capacity costs made up 16%
- Substantial decrease in **energy costs** (totaled $1.23bn, down by $2.19bn or 64%), driven by a large decrease in natural gas prices
  - Avg. day-ahead and real-time **Hub LMPs** were $34.27/MWh and $34.33/MWh; 60% lower than in Summer 2022
  - Avg. **natural gas price** was $2.30/MMBtu, down 71% on the Summer 2022 price of $7.81/MMBtu, reflecting lower national prices and higher storage levels
  - Smaller share of nuclear generation (down by 750 MW) in the supply mix due to planned and unplanned outages
  - Capacity scarcity conditions occurred on July 5 when Phase II tripped during evening peak
    - RT LMPs peaked at $2,707/MWh; pay-for-performance credits/charges totaled $10.9m
- **Capacity market costs** were down by 39% (totaled $257m, down by $166m) on Summer 2022
  - Summer 2023 was the first quarter of the FCA 14 commitment period, with a clearing price of $2.00/kw-month for rest-of-system, lower than the FCA 13 price of $3.80/kW-month

Summary for Summer 2023 (cont.)

- **Real-time reserve payments** were $3.7m, down $9.7m from $13.4 million in Summer 2022
  - Non-spinning reserve (10- and 30-min offline products) payments totaled $1.3m, down $4.9m on prior summer
    - 5.4 hours of 10-min non-zero pricing (avg. price of $270/MWh) and 3.5 hours of 30-min (avg. price of $275/MWh) pricing throughout the quarter; most notable pricing occurred during the capacity scarcity conditions on July 5
  - Spinning reserve (10-min) payments totaled $2.4m, down $4.7m on prior summer
    - 178 hours (8% of total hours) of non-zero spinning pricing, lower than in Summer 2022 due to a smaller first contingency; avg. non-zero price of $13.30/MWh, down from $19.98/MWh, consistent with lower natural gas and real-time energy prices
- Total **regulation payments** were $6.4m, down by $2.9m (31%) compared to Summer 2022
  - Decrease reflected lower energy market opportunity costs due to lower energy prices for generators providing regulation
- Uplift or **Net Commitment Period Compensation** (NCPC) costs totaled $6.8m, down by 63% (or $11.8m) on the prior summer, consistent with lower energy prices
  - Uplift costs were relatively low, representing just 0.6% of the total energy costs
  - Uplift to economically committed and dispatched resources made up 88% ($5.9m in "economic" uplift) of the total, with most local reliability payments at the distribution level
- **Forward Reserve Auction** for winter 2023/24 was structurally uncompetitive, primarily due to lower offered capacity; clearing prices were high relative to prior winter auctions but well short of the offer cap of $9,000/kW-mo

Capacity scarcity conditions occurred on July 5

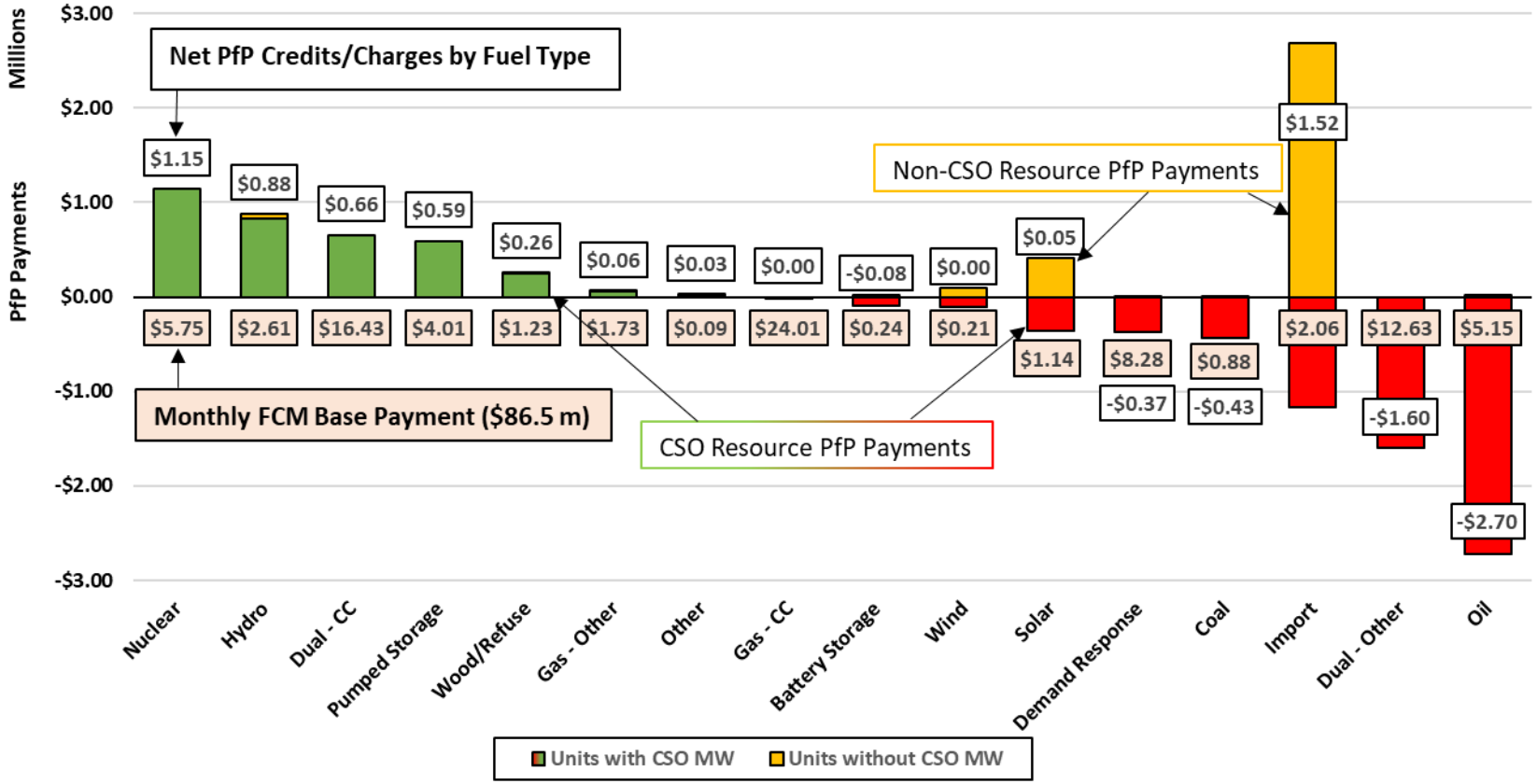
- Tight conditions caused by Phase II trip during the evening peak due to Quebec forest fires
  - Net energy imports into NE were 1,095 MW lower than the day-ahead schedule during HE 19
- Control room declared M/LCC2 and initiated OP-4 procedures
- Reserve deficiency but sufficient energy supply to meet load: TMOR Penalty Factor ($1,000/MWh) in effect during 18:25-18:50 intervals, TMNSR RCPF ($1,500) in effect during 18:25-18:35 intervals
- Generator outages minimal during event
- Real-time Hub LMP peaked at $2,707/MWh during the 18:25-18:35 intervals



Reserve Acronyms:
TMSR: ten-minute spinning reserve
TMNSR: ten-minute non-spinning reserve
TMOR: thirty-minute operating reserve

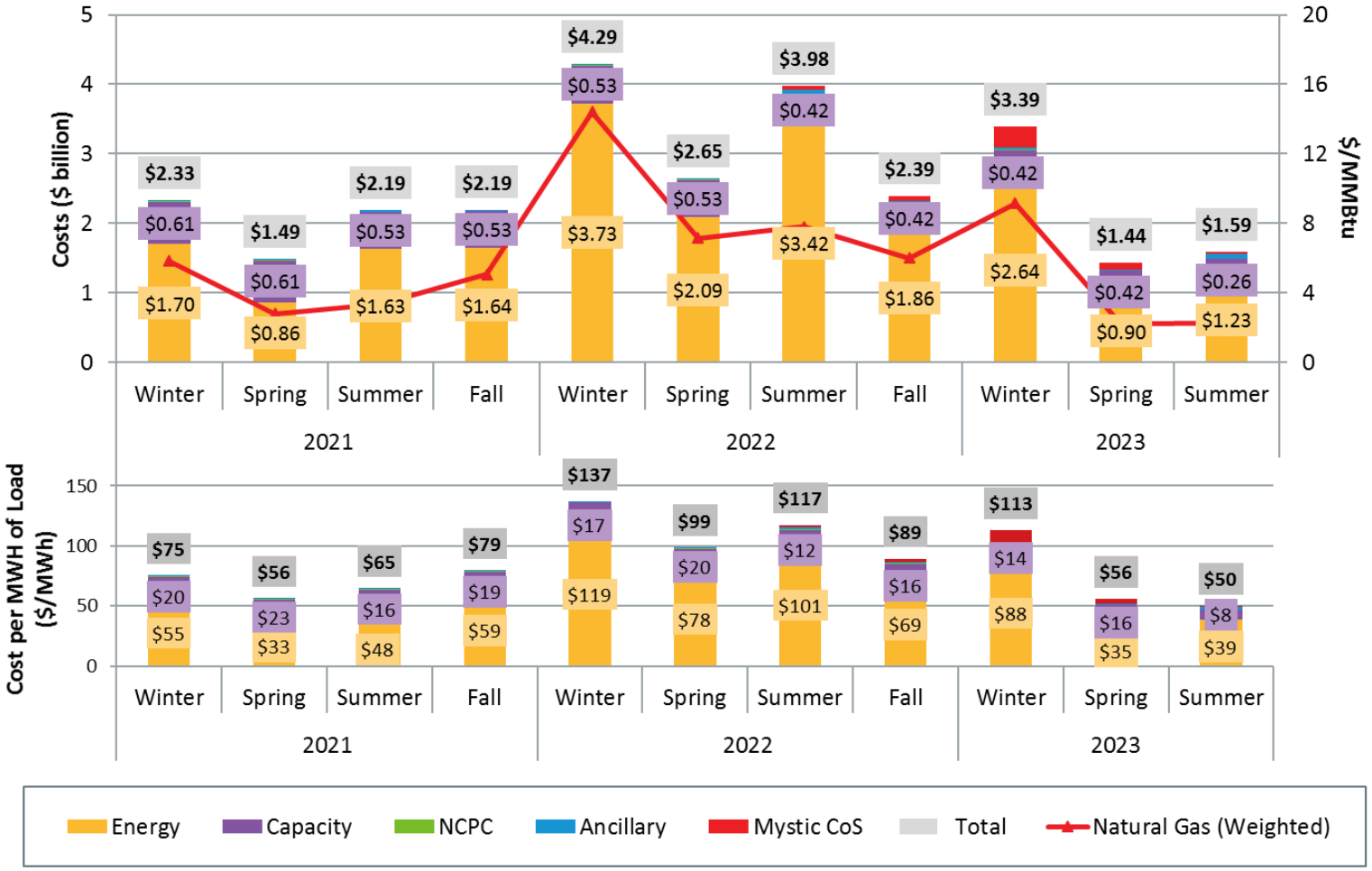
Seasons: Winter: Dec-Feb Spring: Mar-May **Summer: Jun-Aug** Fall: Sep-Nov

Pay For Performance credits and charges totaled $10.9m during the scarcity conditions



- Balancing ratio was 79%, meaning capacity resources were obligated to provide 79% of contracted capacity in energy or reserves
- Deviations from financial obligation assessed at performance payment rate of $3,500/MWh

Wholesale electricity cost down ~60% on prior summer driven by lower natural gas prices



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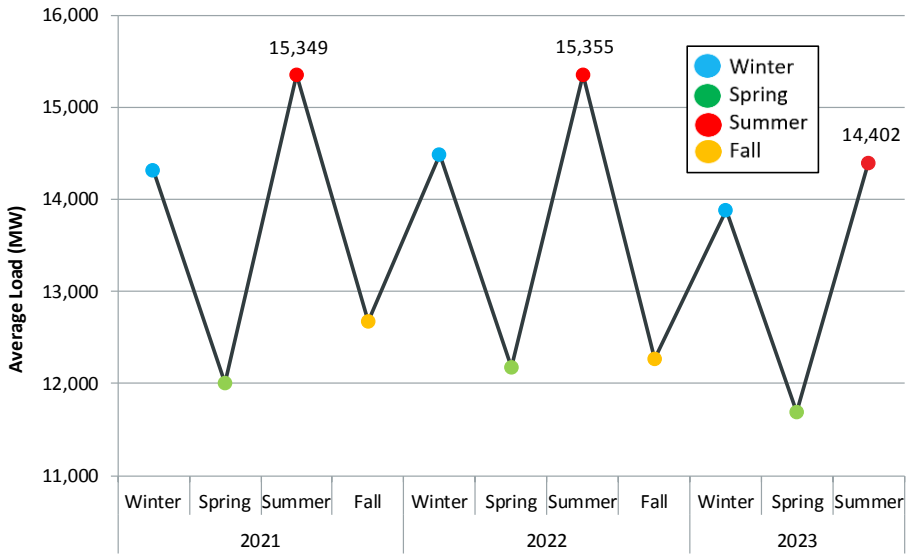
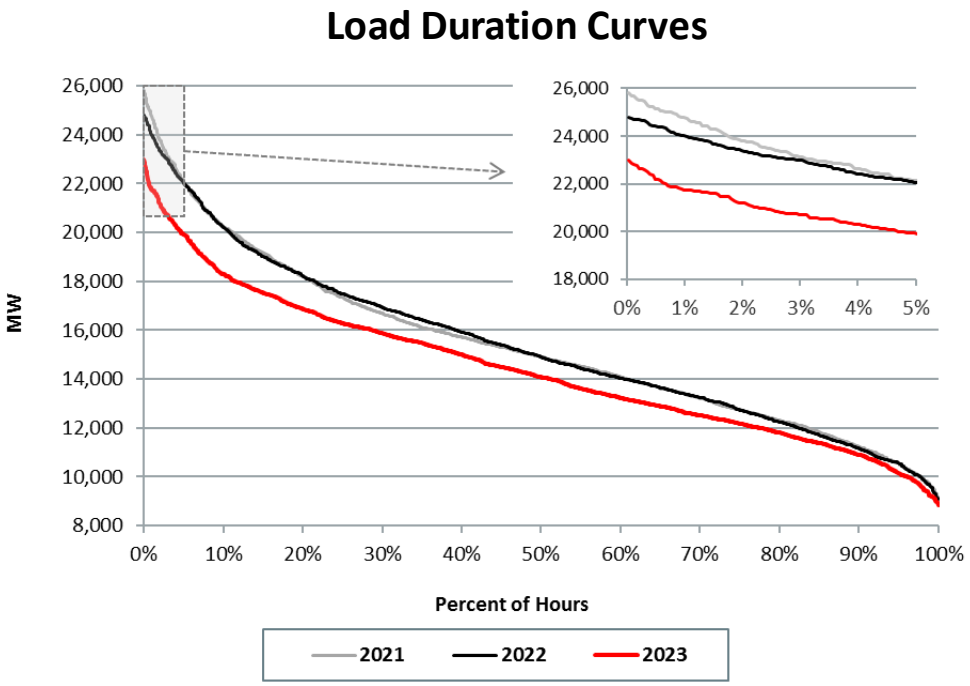
Lower average and peak loads compared to previous summer due to cooler temps in August





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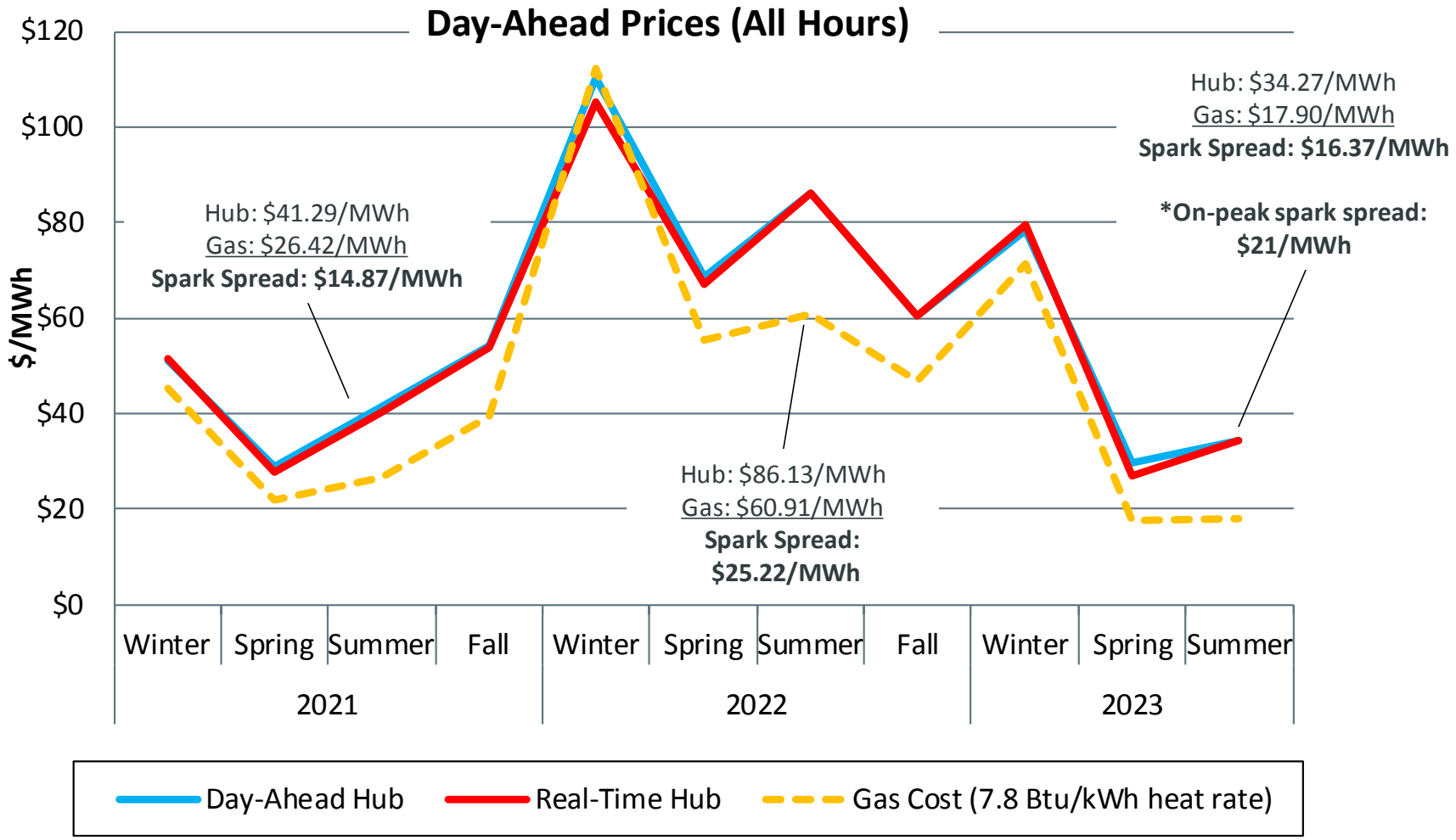
Lower gas prices drove lower energy prices; decreased nuclear gen. and net imports offset some downward pressure on LMPs



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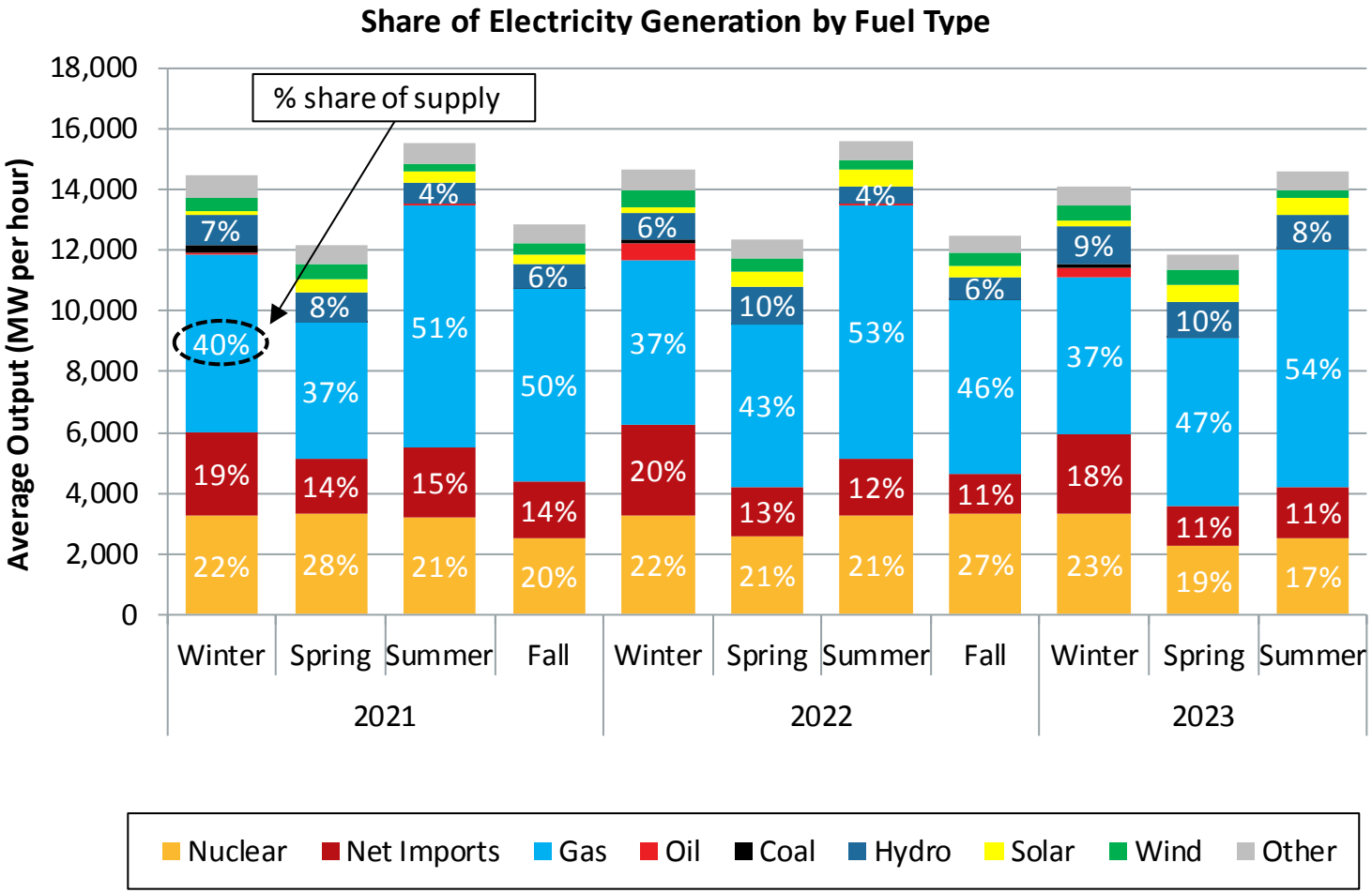
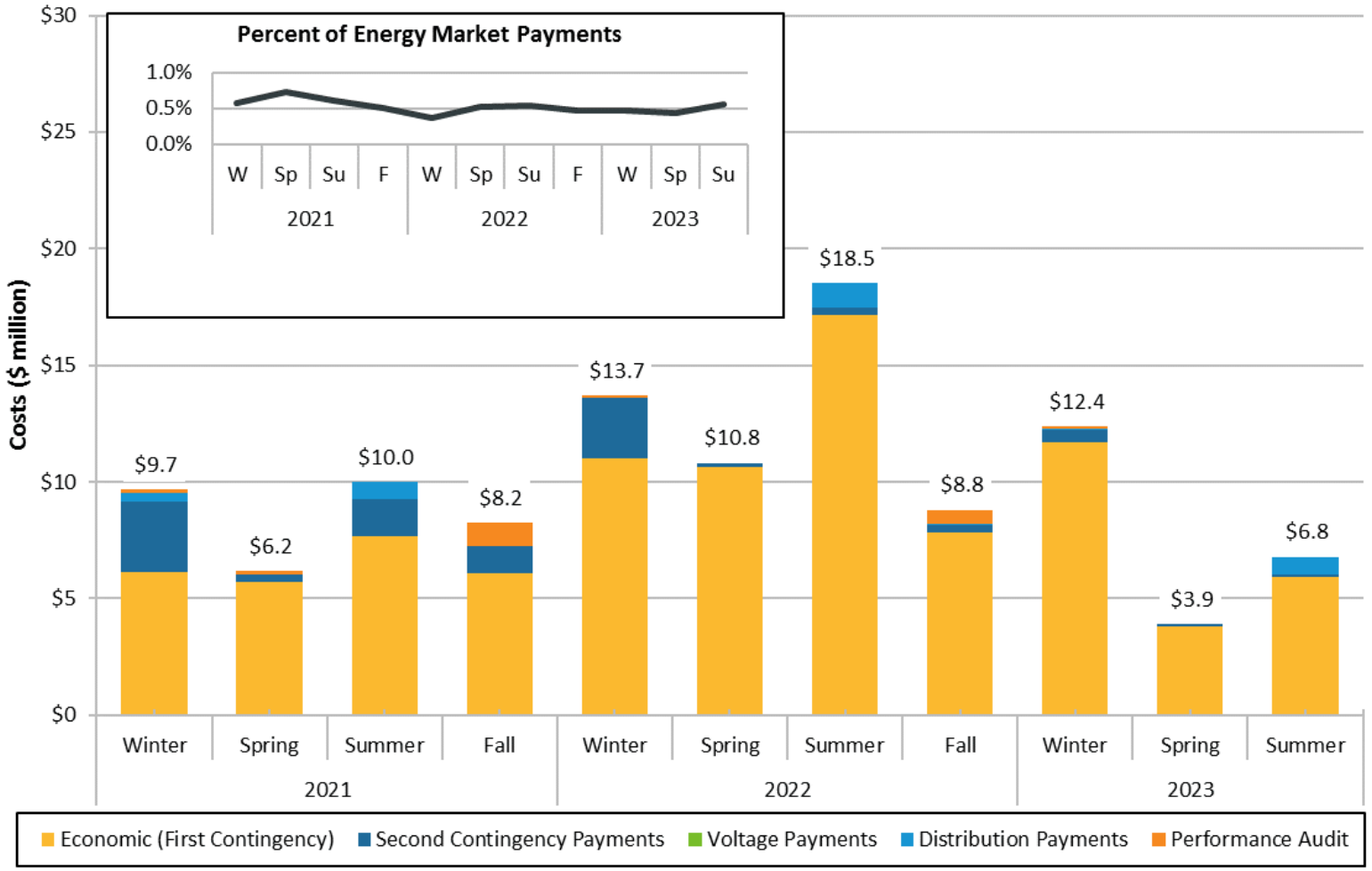
Lower loads in Summer 2023; decrease in nuclear generation due to planned & forced outages



Note: the "Other" category includes energy storage, landfill gas, methane, refuse, steam, and wood

Seasons: Winter: Dec-Feb Spring: Mar-May **Summer: Jun-Aug** Fall: Sep-Nov

Uplift payments remained relatively low; 88% of payments covered economic commitments and dispatch



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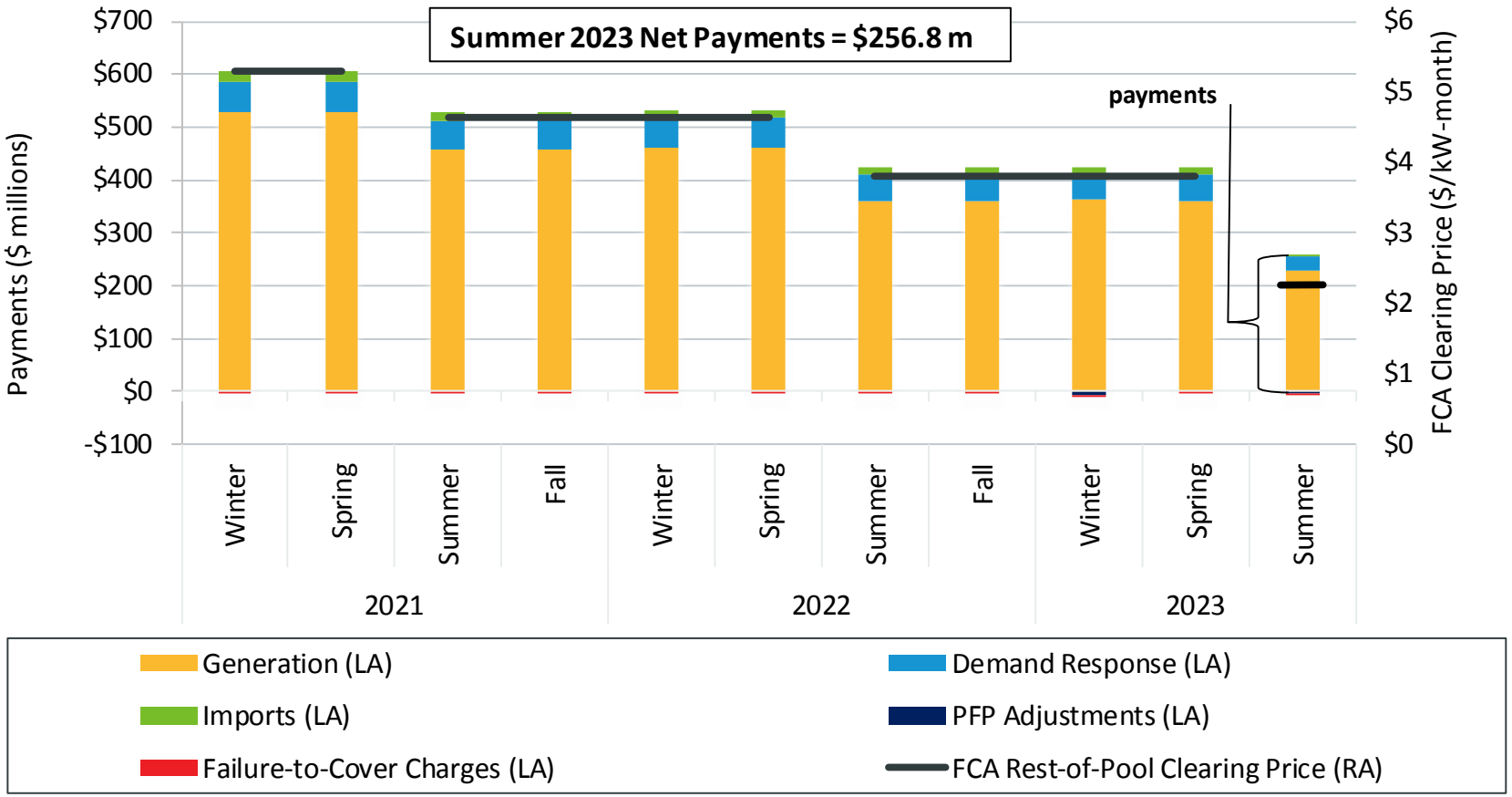
First quarter of FCA14; lower clearing prices

FCA 14 prices: $2.00/kW-month; was 47% lower than the previous year



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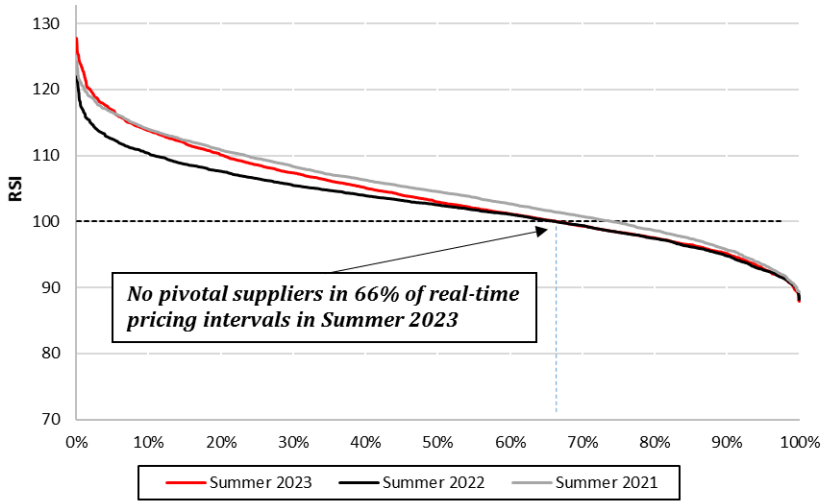
Energy Market Competitiveness

- Presence of structural market power similar to previous summer
- At least one pivotal supplier present in the real-time market for 34% of 5-minute intervals in Summer 2023
- The residual supply index for the real-time market in Summer 2023 was 103.8, indicating that on average, the ISO could meet load and the reserve requirement without energy and reserves from the largest supplier

Residual Supply Index and Intervals w/Pivotal Suppliers (RT)

Quarter	RSI	% of Intervals With At Least 1 Pivotal Supplier
Winter 2021	107.9	8%
Spring 2021	106.6	14%
Summer 2021	104.7	27%
Fall 2021	105.0	24%
Winter 2022	106.5	12%
Spring 2022	106.7	19%
Summer 2022	102.6	34%
Fall 2022	104.0	28%
Winter 2023	105.2	20%
Spring 2023	107.7	22%
Summer 2023	103.8	34%

System-Wide Residual Supply Index Duration Curves



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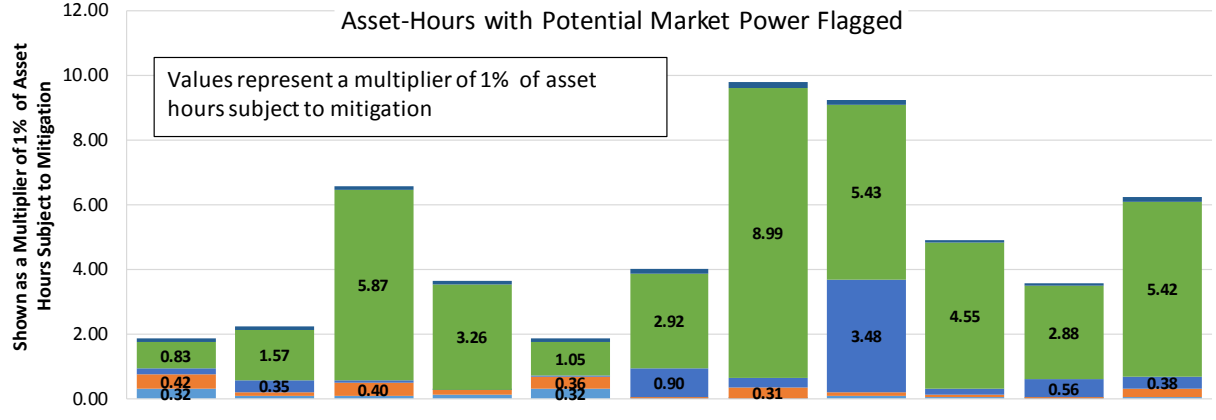
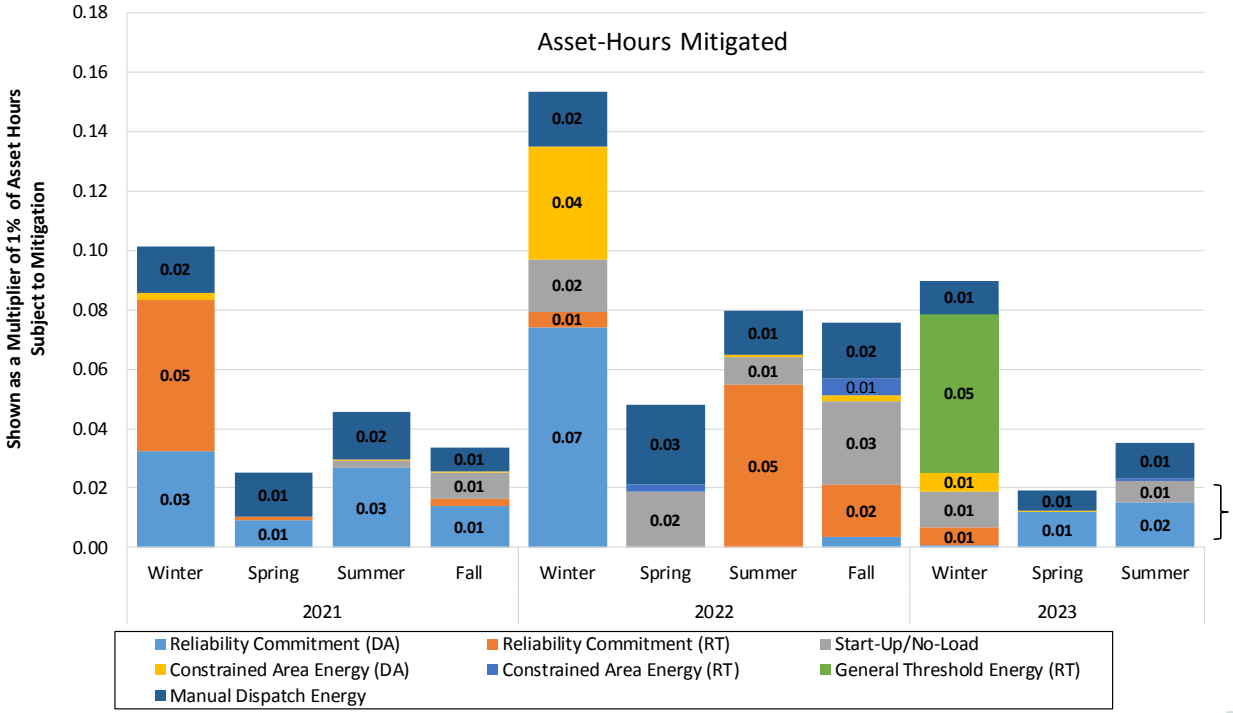
Market Power Mitigation in the Energy Market

- In general, mitigation occurs very infrequently relative to the structural test failures



6.3% of total asset-hours flagged for market power, mostly at the system level (green bar)

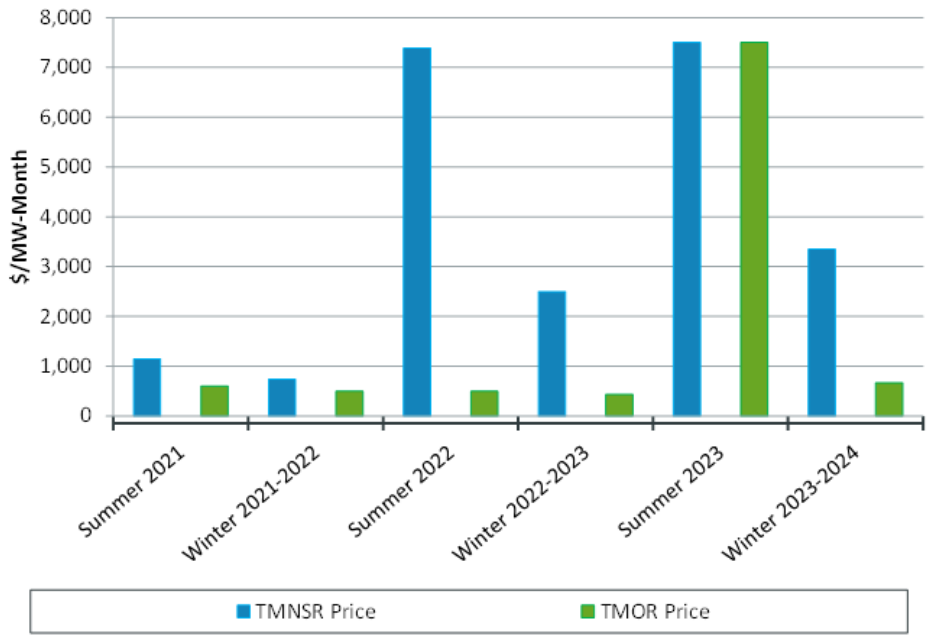


Just 0.04% (or 115 asset-hours) of total asset-hours were mitigated

Forward Reserve Auction for winter was not structurally competitive; higher offer and clearing prices but well short of $9,000 cap

FRM Auctions, RSI and Clearing Prices for TMNSR and TMOR

Procurement Period	Offer RSI TMNSR	TMNSR Auction Clearing Price	Offer RSI Total Thirty	TMOR Auction Clearing Price
Summer 2021	92	$1,150	108	$600
Winter 2021-2022	110	$740	116	$499
Summer 2022	78	$7,386	90	$499
Winter 2022-2023	109	$2,500	112	$439
Summer 2023	81	$7,499	86	$7,499
Winter 2023-2024	82	$3,350	88	$671



Questions