



Informational Stakeholder Call

- *2020 California ISO Summer Assessment*
- *COVID-19 Impacts on ISO Load & Markets*
- *GMC Rate and EIM Administrative Fee Adjustments*

May 27, 2020

Time:	Topic:	Presenter:
2:00 – 2:05	Welcome/introductions	Kristina Osborne
2:05 – 2:30	2020 Summer Loads and Resources Assessment Results	Bob Emmert
2:30 – 3:00	COVID-19 Impacts to California ISO Load & Markets	Amber Motley
3:00 – 3:25	Adjustments to GMC Rates and EIM Administrative Fee	Ryan Seghesio
3:30	Meeting adjourns	

Note: There will be an opportunity to ask questions after each presentation.

2020 Summer Loads and Resources Assessment Results

Bob Emmert
Sr. Manager, Interconnection Resources

Simulations performed and key issues

- The Summer Assessment report presents results from 2 stochastic model runs.
 1. Base case (historical import limit)
 2. Moderate sensitivity case (more conservative import limit)
- Rooftop solar continues to offset load growth and has pushed the system peak to evening hours when solar is no longer available.
 - Adequacy levels are most challenged in the post-solar window, as reductions in the gas fleet have not yet been offset by sufficient storage to offset the loss of capacity available in that window.
- Reliance on imports climbs late summer when the impacts of below-normal hydro conditions are more pronounced.

Input assumptions

- 2020 load forecast relatively unchanged from 2019
- Hydro generation:
 - CA Hydro: close to 2018 conditions – peaked on April 7, 2020,
 - Snowpack: 63% of average, Reservoirs: 101% of average, NW Hydro: 95% of average
- Generation
 - System capacity (peak): July: 48,555 MW, Aug: 46,903 MW, Sept: 44,543 MW
 - Retirements: 1,952 MW, Additions: 1,990 MW (based on Sept. NQC/ELCC)
- Net Imports capped
 - Off Peak (HE 1 - 15, 22 - 24): 2019 actual maximum of 11,666 MW
 - On Peak (HE 16 - 21): Nomogram
 - Base case imports: set to capture most historical import levels
 - Conservative imports: set to levels considered more realistic for 2020 conditions

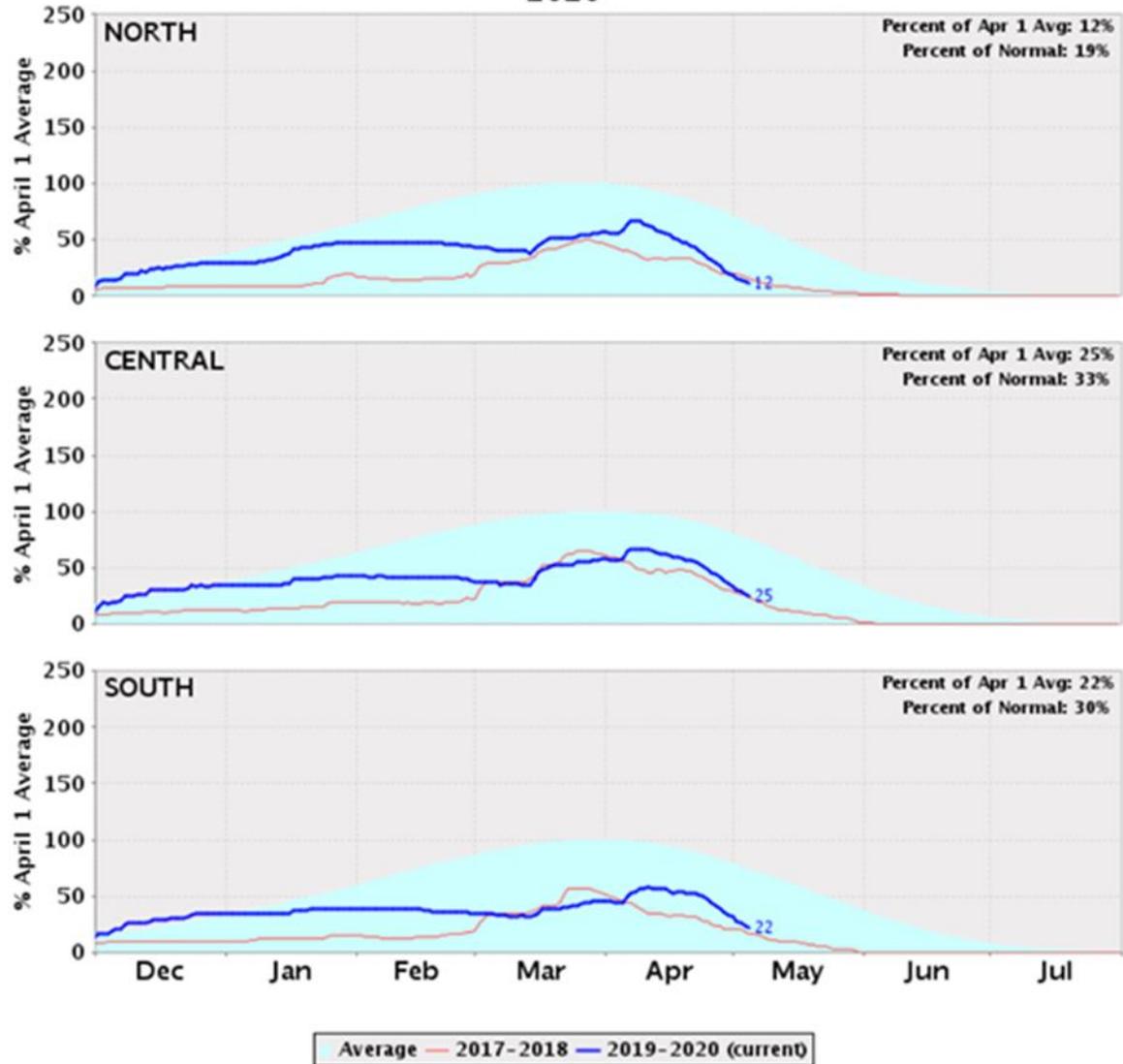
Impacts to loads due to COVID-19

- No attempt was made to predict potential ongoing impacts to loads due to COVID-19 through the summer period.
- Too many unknowns existed to produce a viable and meaningful COVID-19 load impact scenario for inclusion in Summer Assessment
- 2020 summer weather has yet to materialize across the CAISO balancing authority area to provide an indication of the levels of load reduction during periods of heavy air conditioning driven loads.
- While the CAISO does recognize there are likely to be lasting effects from COVID-19 throughout the 2020 summer period, there is not enough data to forecast the magnitude and hourly profile of those impacts.

Hydro conditions

- The statewide snow water content for the California mountain regions peaked at 63% of the average
- The Dalles Dam April to August reservoir storage projected to be 95 percent of average

California Snow Water Content - Percent of April 1 Average For: 05-May-2020

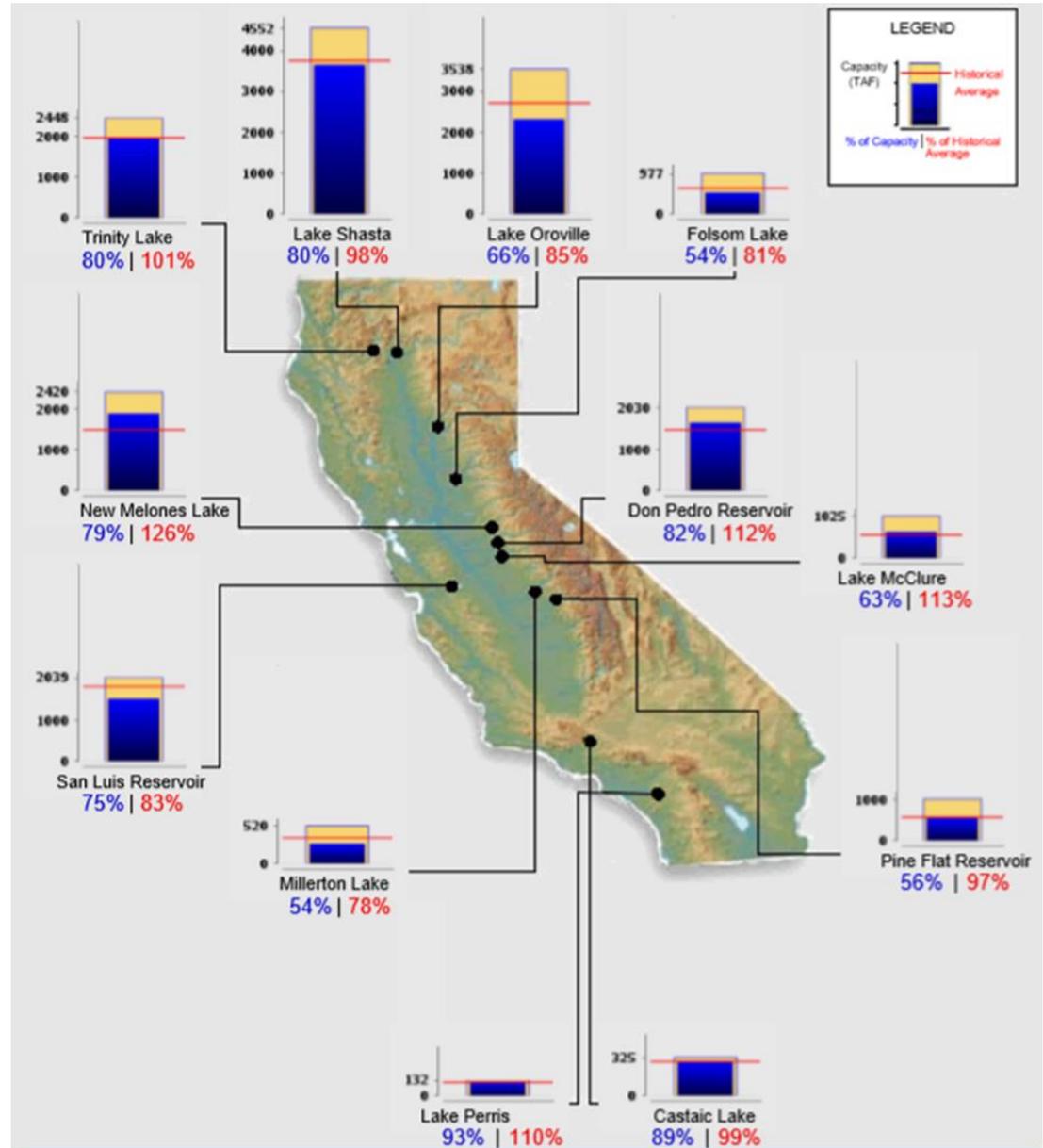


Statewide Percent of average to date

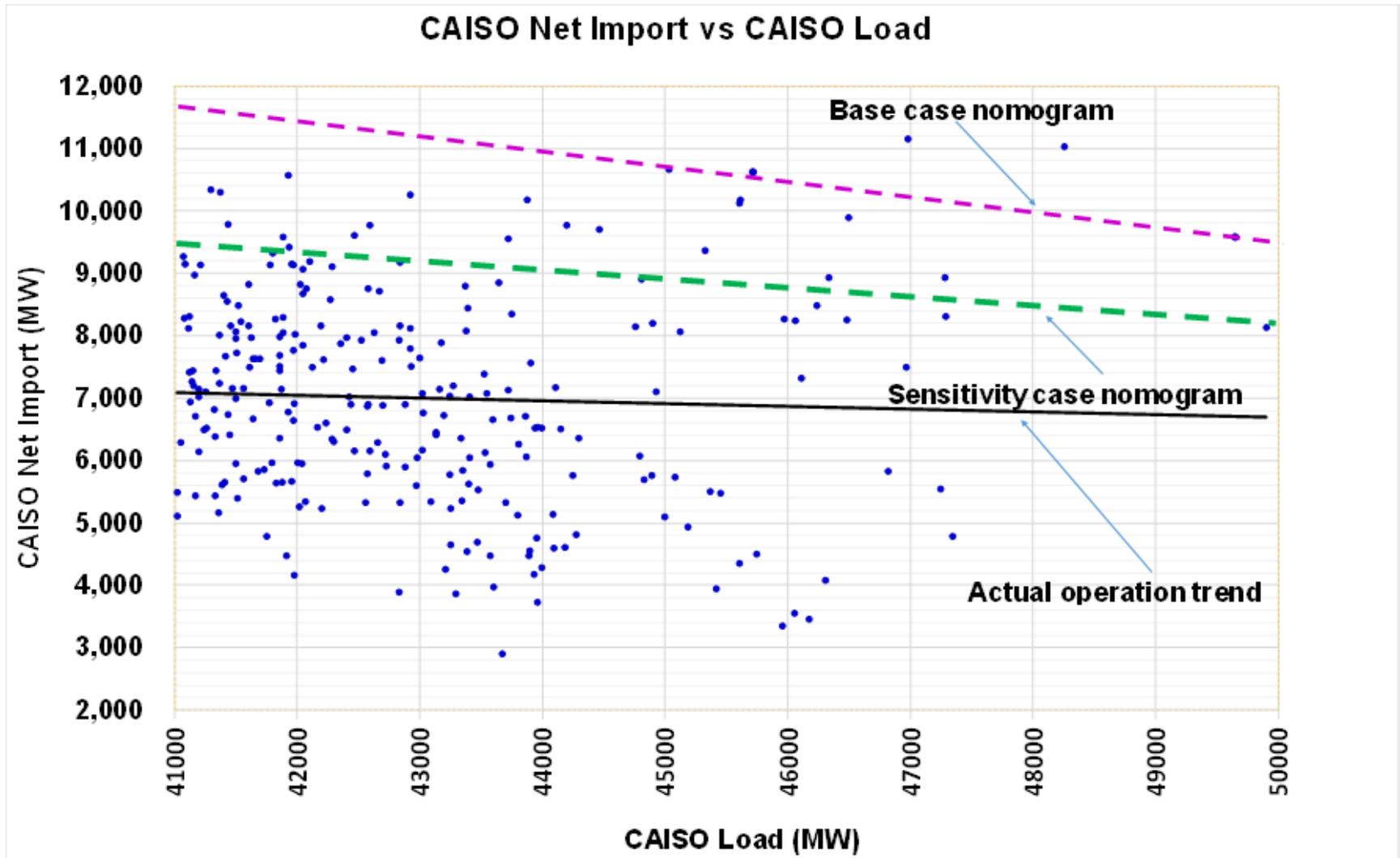
29.0%

Reservoir conditions on April 6, 2020

- California major reservoir storage levels peaked at 101 percent of average.



On-peak net import cap nomograms for base case and conservative imports sensitivity

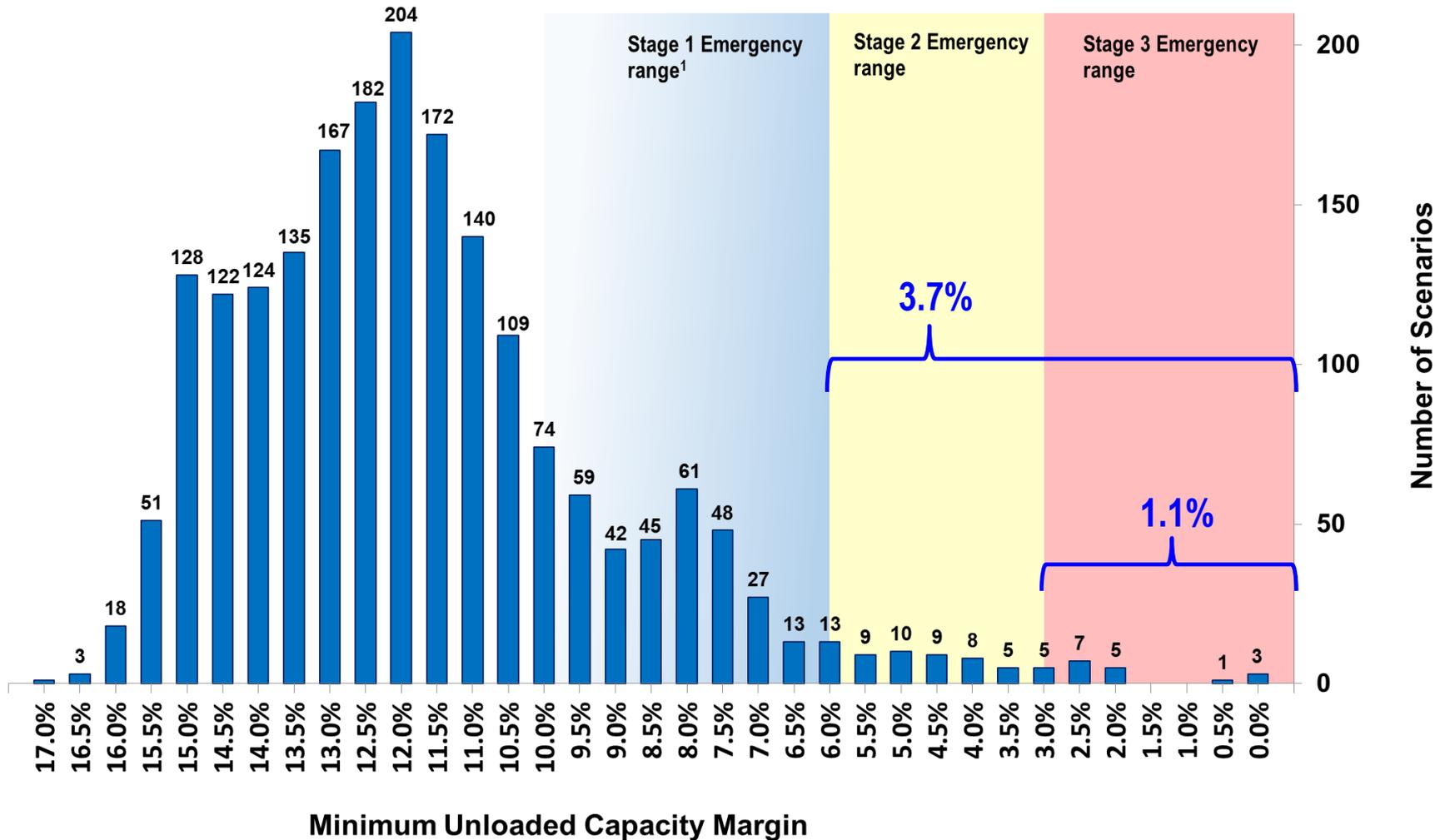


Import limit impacts the probability of system capacity shortfall

Probability of CAISO system capacity shortfall

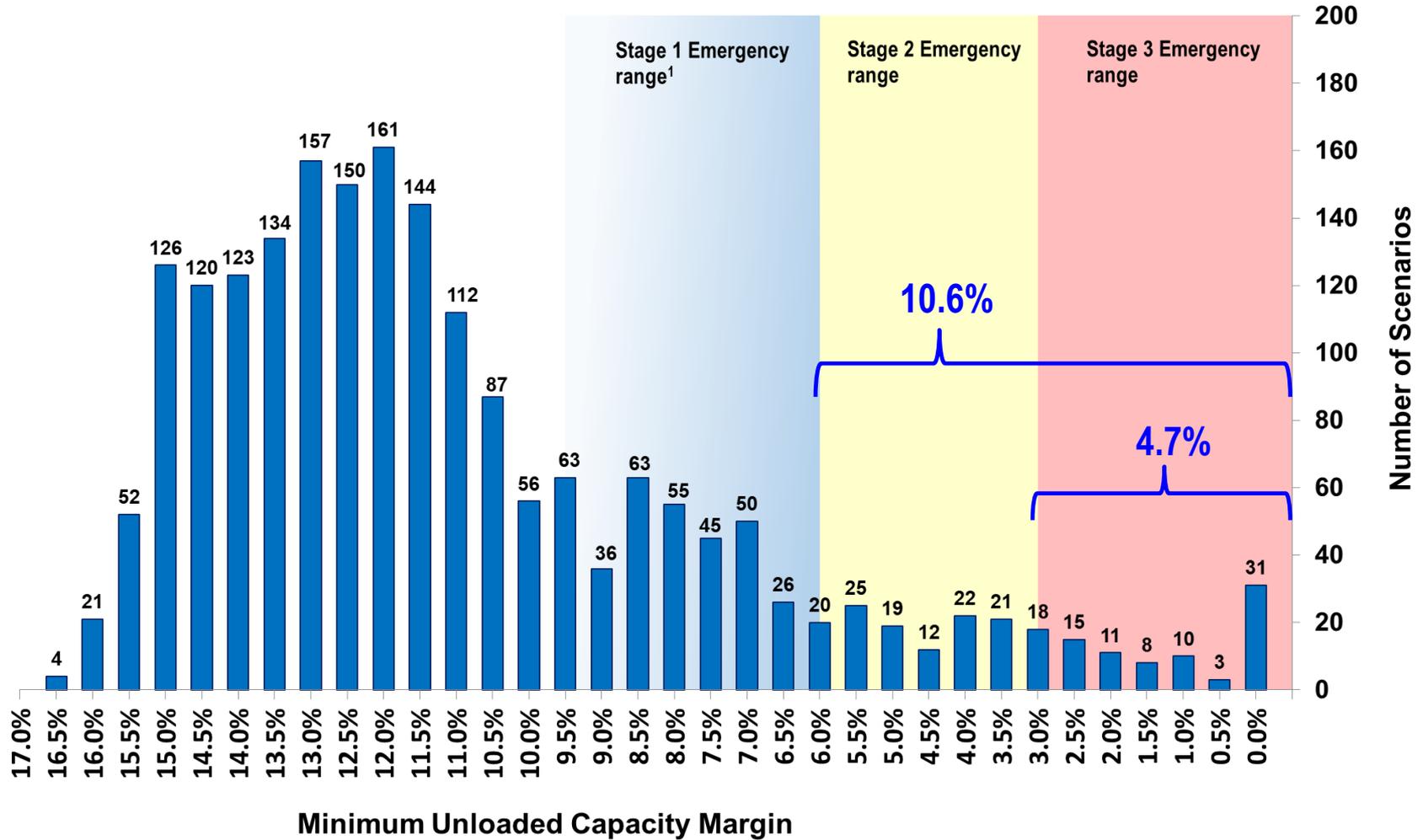
Result	Base Case	Sensitivity Case
Stage 2	3.7%	10.6%
Stage 3	1.1%	4.7%
Unserved energy	0.2%	1.6%

Base case: minimum unloaded capacity margins



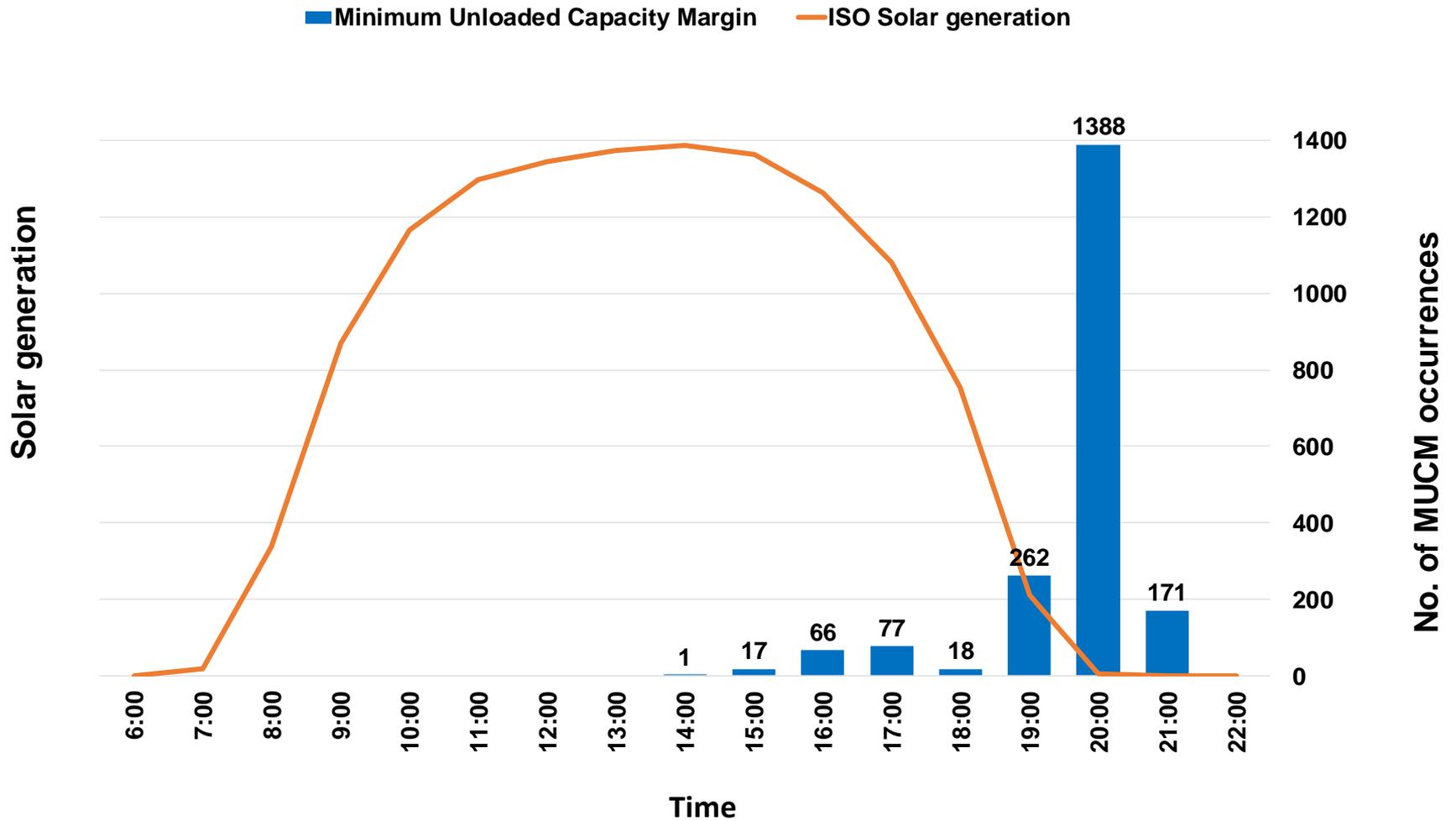
¹Stage 1 range is approximate

Conservative import sensitivity: minimum unloaded capacity margins

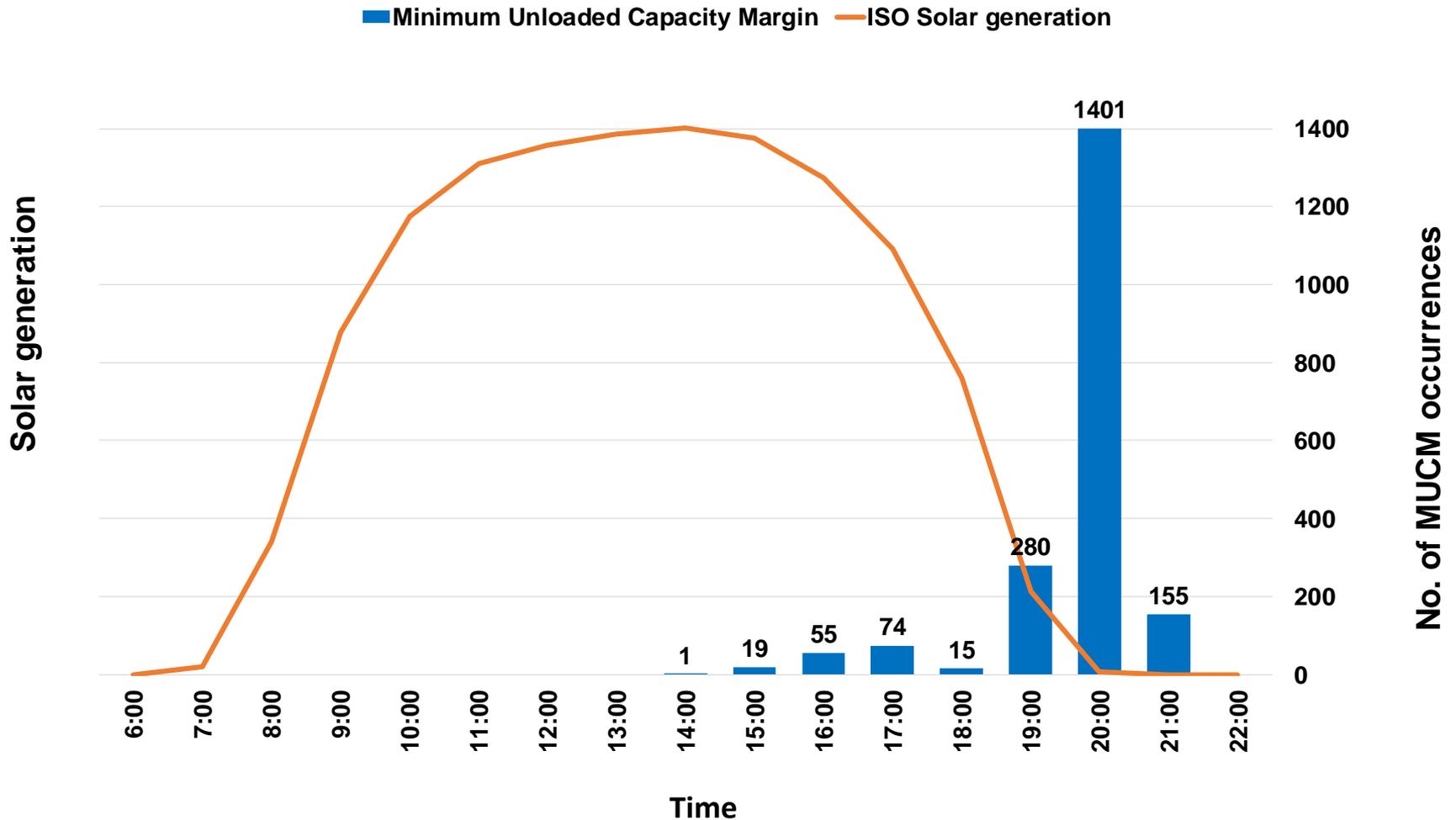


¹ Stage 1 range is approximate

Base case – hours of minimum unloaded capacity margins (showing solar profile)



Conservative scenario – hours of minimum unloaded capacity margins (showing solar profile)



Conclusions

- This summer poses somewhat increased risk of encountering operating conditions that could result in operating reserve shortfalls than was projected for 2019.
- Overall, adequacy levels are similar to the summer of 2018, with similar hydro conditions.
 - Adequate imports may be critical in late summer when the impacts of below-normal hydro conditions are more pronounced.
 - A late summer heat wave, especially if wide spread and impacting imports, would be particularly challenging.
- Adequacy levels are most challenged in the post-solar window, as reductions in the gas fleet have not yet been offset by sufficient storage to offset the loss of capacity available in that window.
- Full Report:
<http://www.caiso.com/Documents/2020SummerLoadsandResourcesAssessment.pdf>

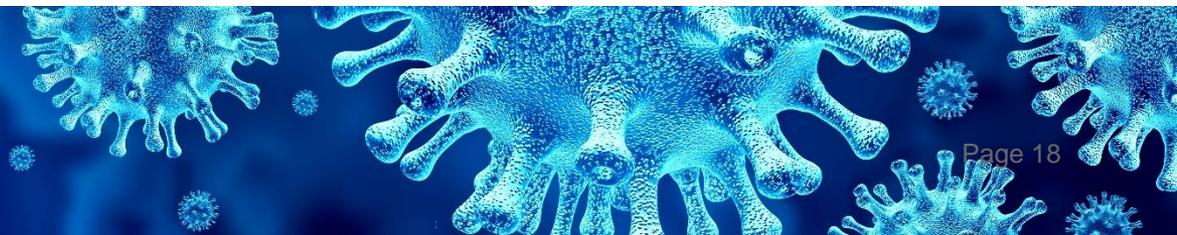
Questions?

COVID-19 Impacts to California ISO Load & Markets: March 17 – May 10, 2020

Amber Motley
Manager, Short Term Forecasting

Background

- Between March 17-19, various California counties started requiring non-essential businesses to close or limit activity, including restaurants and some commercial stores, and directed companies to have their employees work from home if possible.
- Beginning Friday, March 20, the state implemented an executive order for all individuals living in California to stay home except as needed to maintain continuity of operations of critical infrastructure sectors, along with other exceptions such as leaving home to obtain food, prescriptions, and health care.



Summary

- Since the first full week of the statewide stay-at-home order, the ISO has observed:
 - **Weekday** average load reductions of **4.5%**, and up to **7.4%** reductions during peak hours.
 - hourly average load reductions range from **2.6% to 12%**, with the highest percent reductions observed during HE 7 through HE 18
 - **Weekend** average load reductions of **1.3%**, and up to **3.8%** reductions during peak hours.
- Because ISO's forecasting process allows us to perform a backcast analysis given the underlying weather conditions and type of day, these reductions compare actual load to expected loads if no order were in place.
- While the sophisticated load forecast models could not have anticipated the stay-at-home order, the ISO continues to fine-tune its models to improve forecast accuracy in day-ahead and real-time markets as conditions evolve.
- Energy prices have declined by \$9 and \$10 in the day-ahead and real-time markets, respectively.
- There have been no impacts to grid reliability from the stay-at-home order.

System load impact

Partial Stay-at-Home

(March 17-19)

Weekday: **2.7-5.8%**
Weekend: 0-1%

Full Stay-at-Home

(March 23 – May 10)

Weekday: **4.5-7.4%**
Weekend: 1.3-3.8%

Note: Largest hourly reductions occur during HE 7 through HE 18.

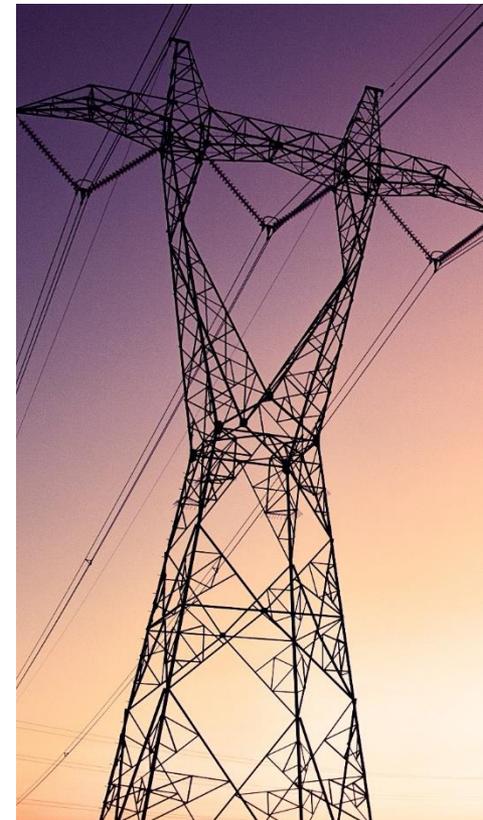


Removing weather errors to isolate stay-at-home order's impact

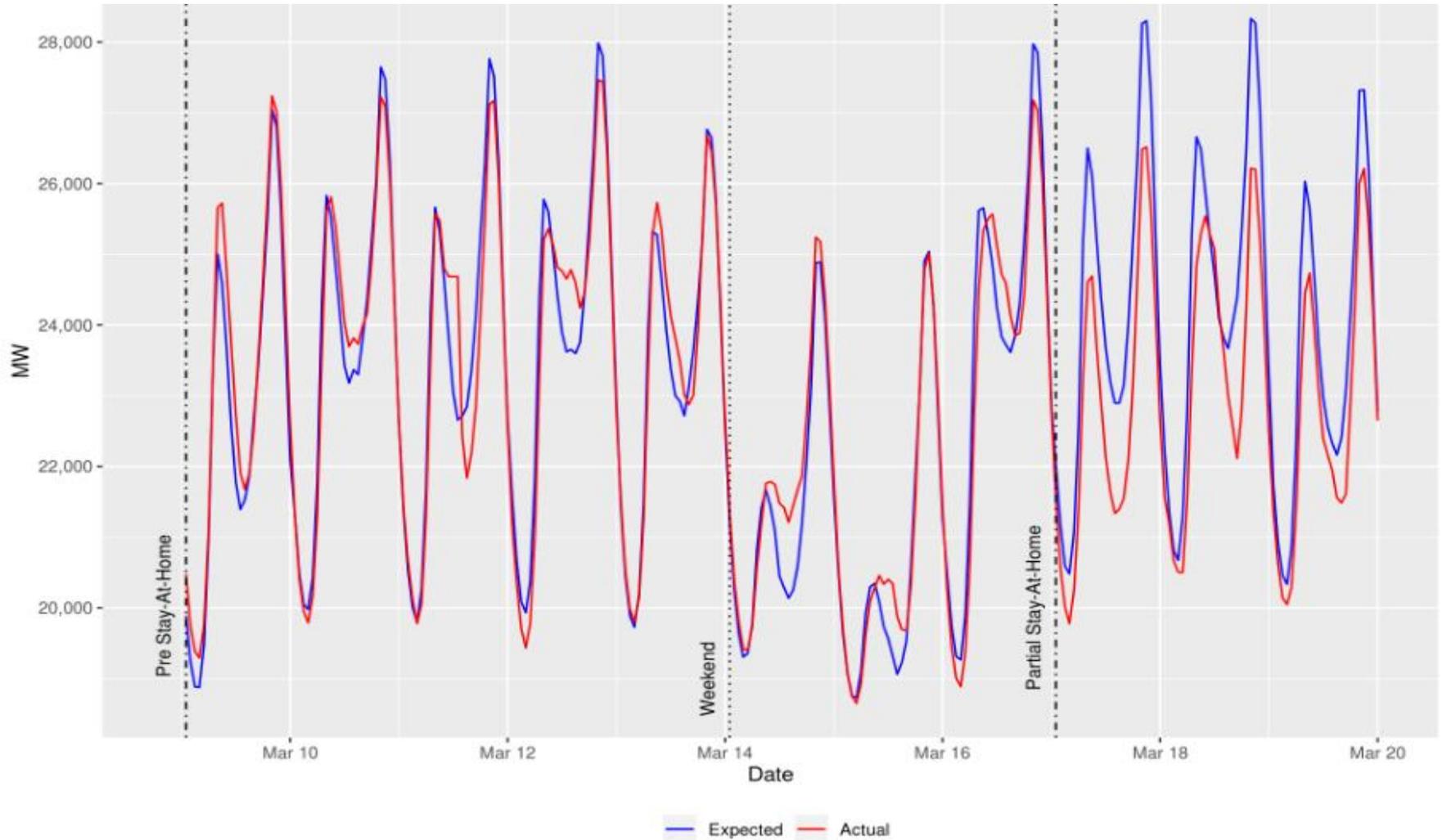
Backcast Analysis

Methodology for removing weather errors to isolate stay-at-home order's impact

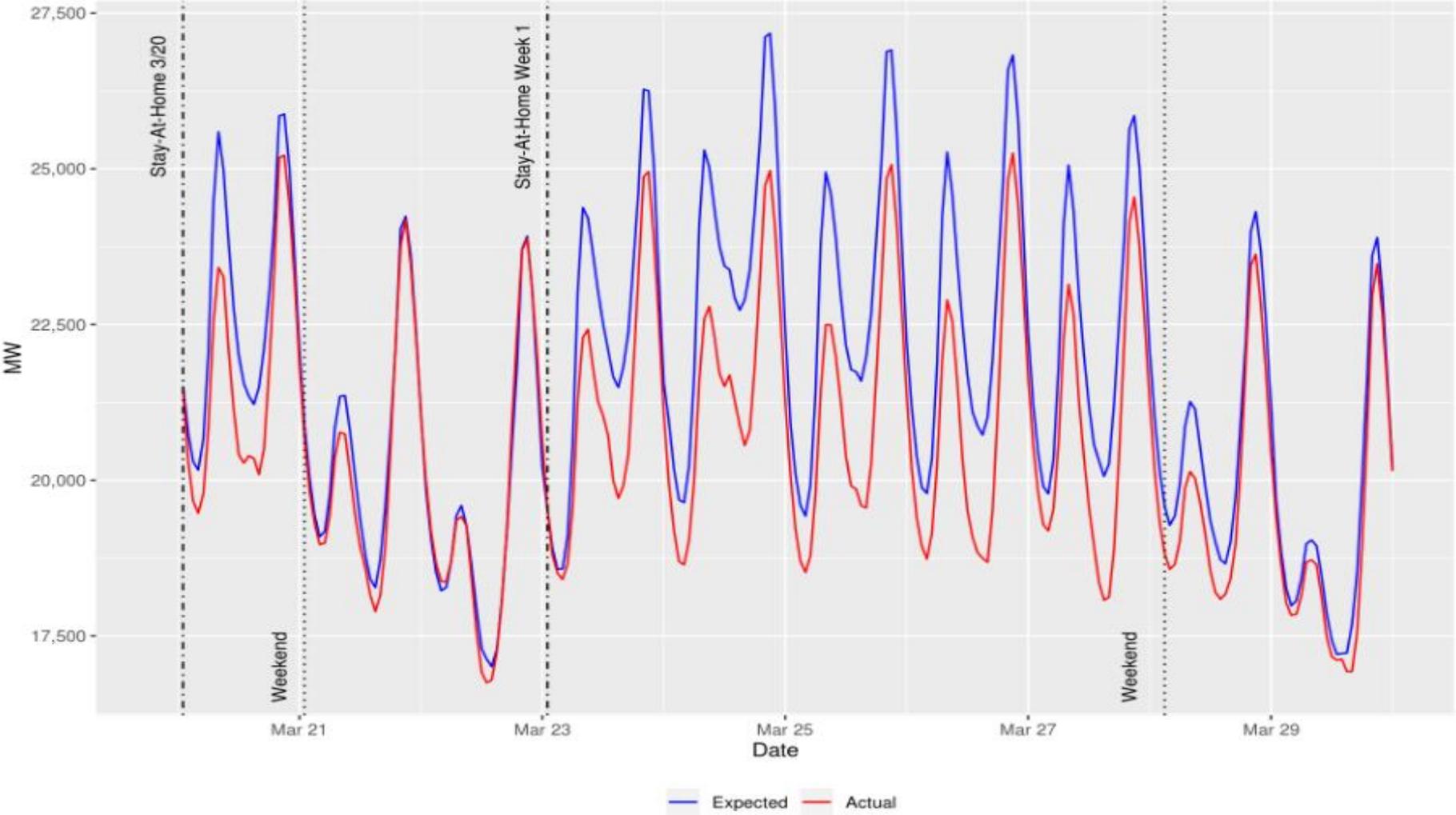
- CAISO is using a backcast model, which removes the largest known sources of weather error to isolate the stay-at-home order's impact.
- The difference between the expected load model and what actually occurred is referred to as model error.
 - COVID-19 is a component of model error. There is a normal range for model errors and what is seen in this analysis is outside the normal range, allowing the ability to isolate the COVID-19 Impact.



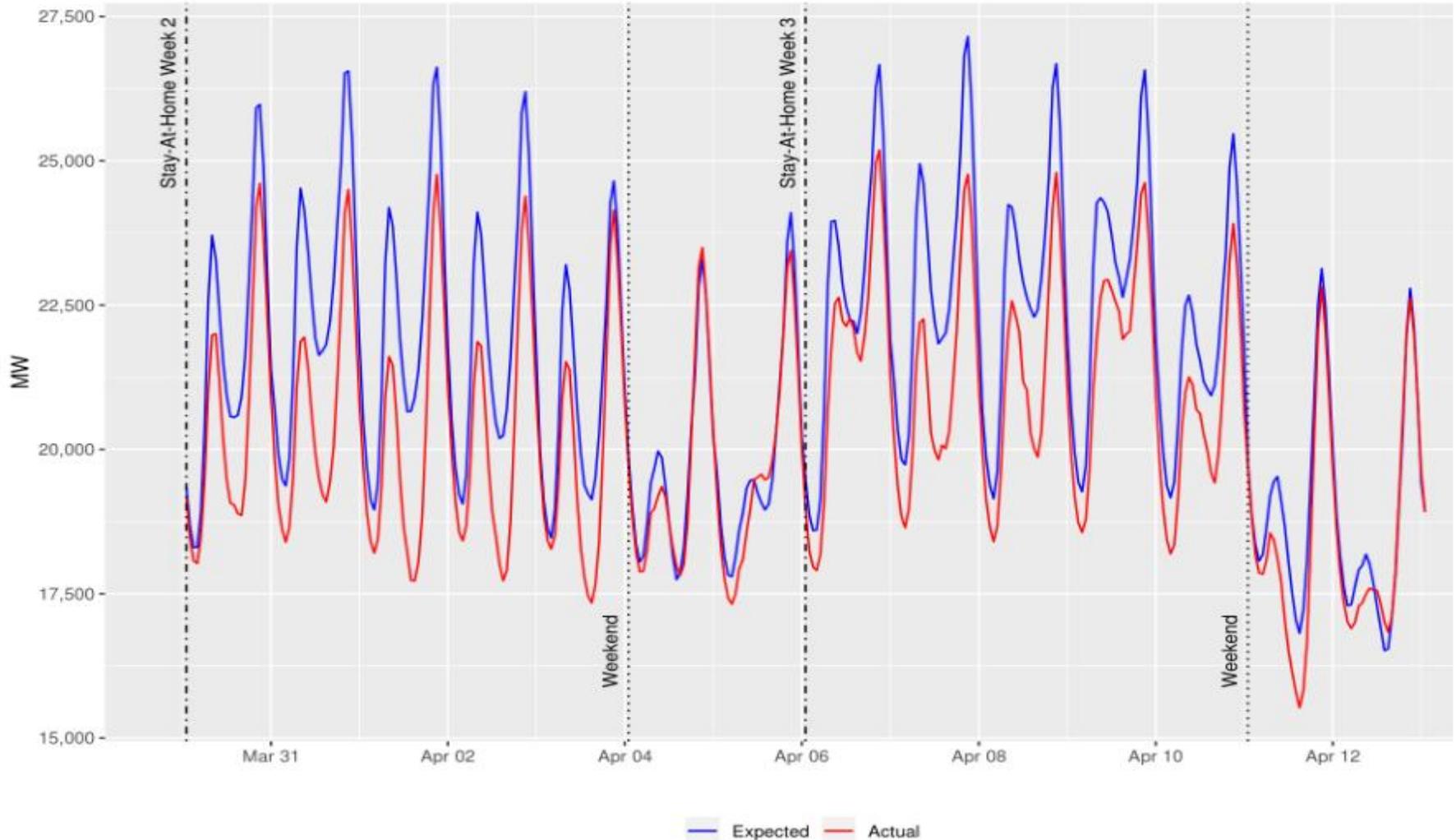
Weather Adjusted: System impact March 9 - March 19



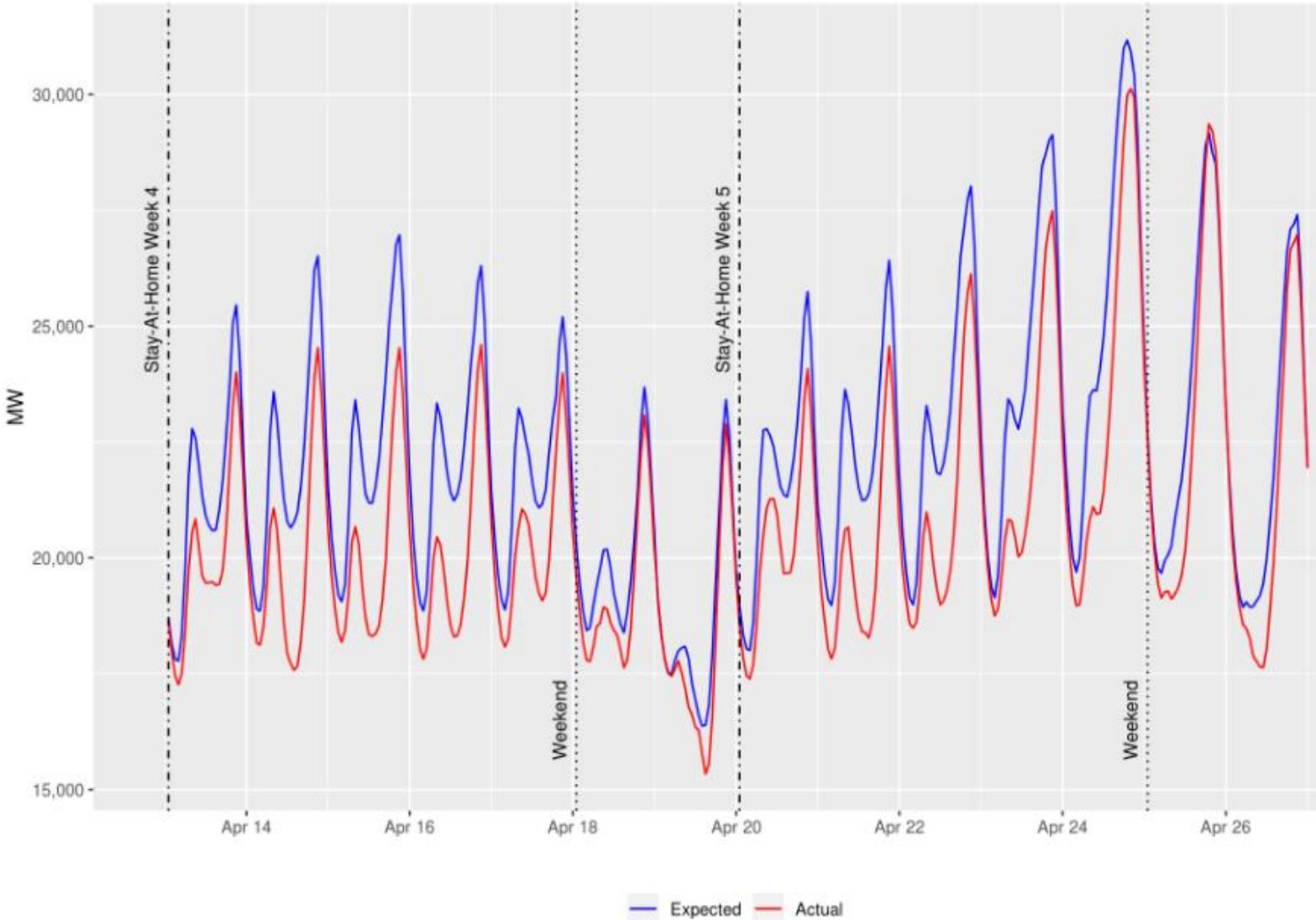
Weather Adjusted: System impact March 20 - March 29



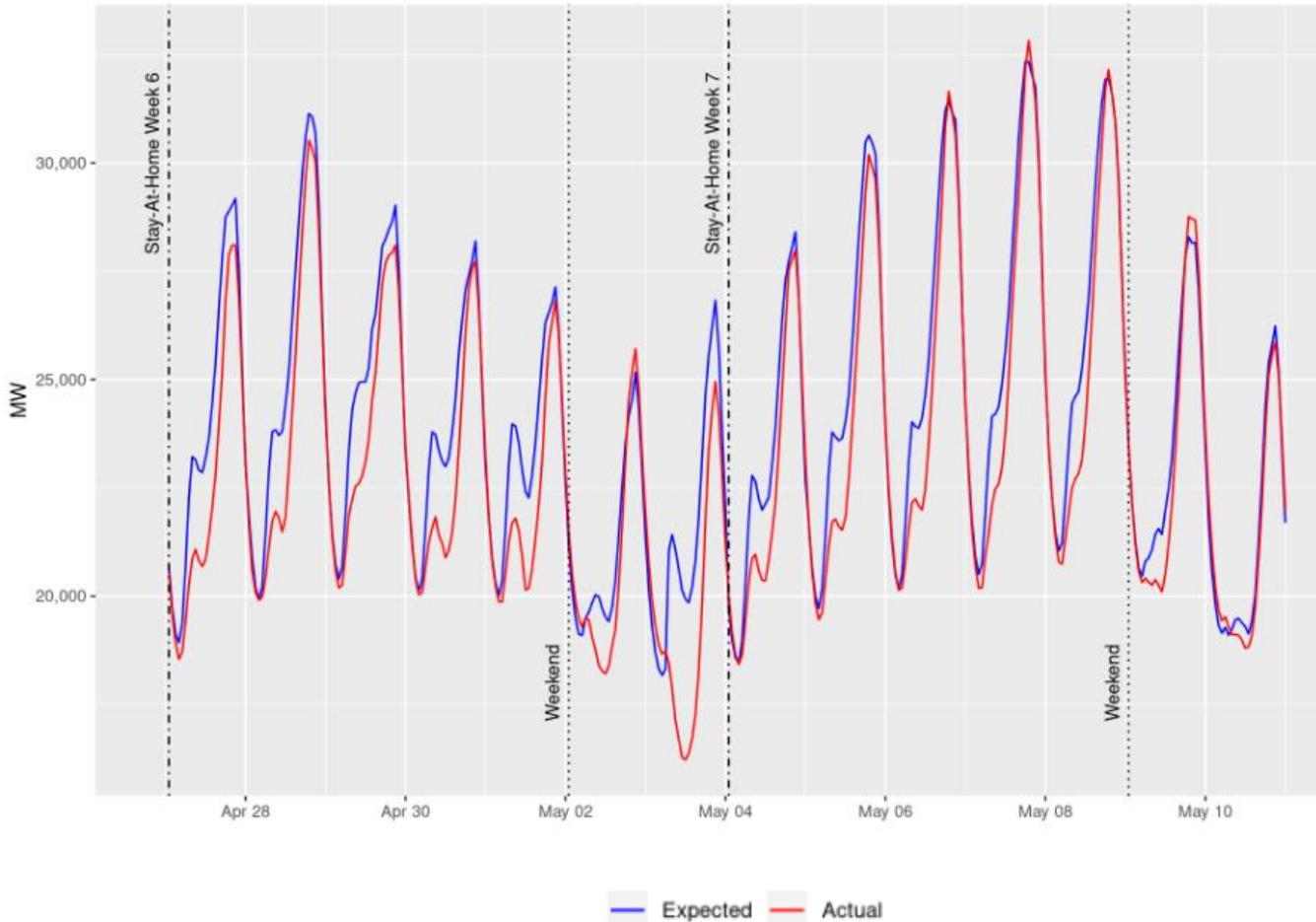
Weather Adjusted: System impact March 30 – April 12



Weather Adjusted: System impact April 13 – April 26



Weather Adjusted: System impact April 27 – May 10



Above-normal temperatures were experienced system-wide May 4 – 10. During the heat, minimal to no load reductions were observed for the evening peak, compared to pre-COVID-19 orders.

The ISO continues to see the most significant reductions to load during the morning and mid-day hours.

Summary of system impact: March 23 – May 11

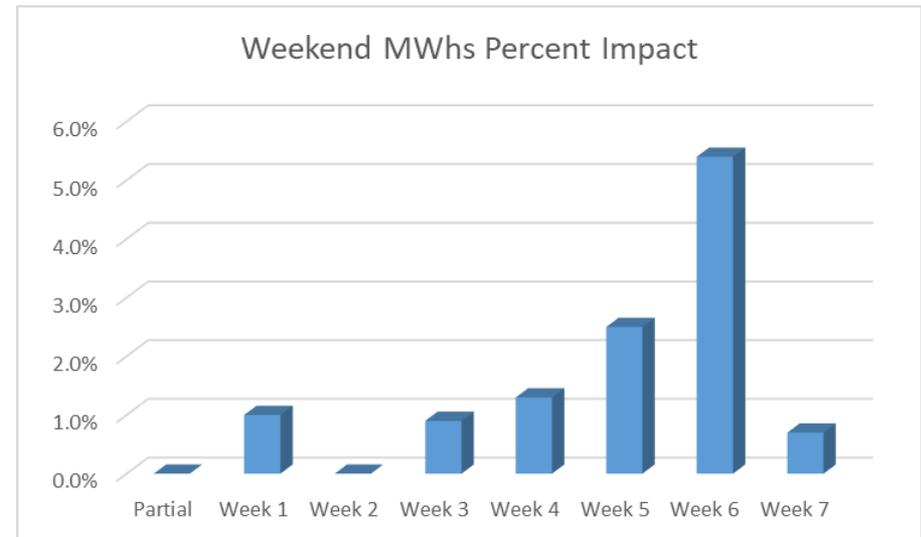
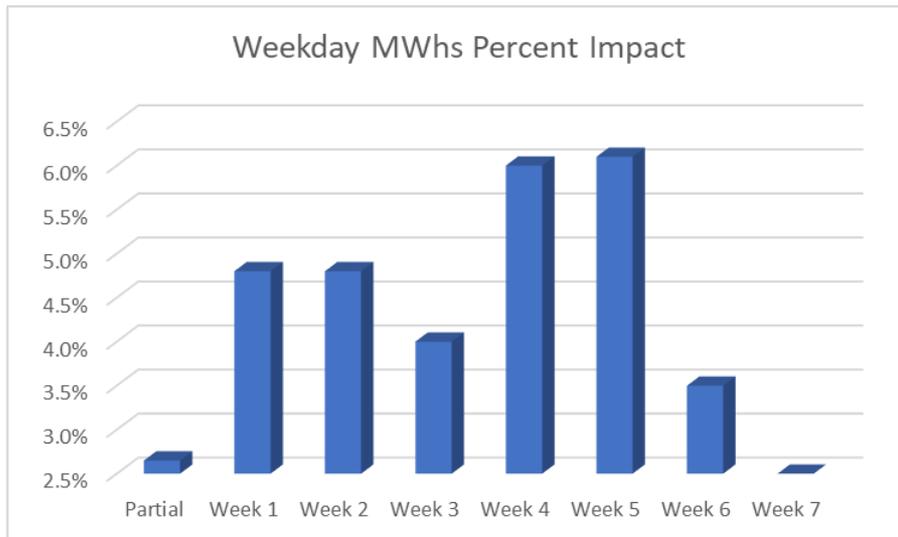
Day Type	Peak	MW Impact	MW Percent Impact
Weekday	Morning	1,878	7.4%
Weekday	Evening	1,408	5.7%
Weekend	Morning	793	3.8%
Weekend	Evening	287	1.3%

Day Type	MWhs Impact	MWhs Percent Impact
Weekday	25,511	4.5%
Weekend	8,529	1.7%

Numbers Show an Overall Reduction

The stay-at-home order began on Friday, March 20; our summary begins at the first full week beginning Monday, March 23. For details of impact during the partial stay-at-home orders, see slide 29.

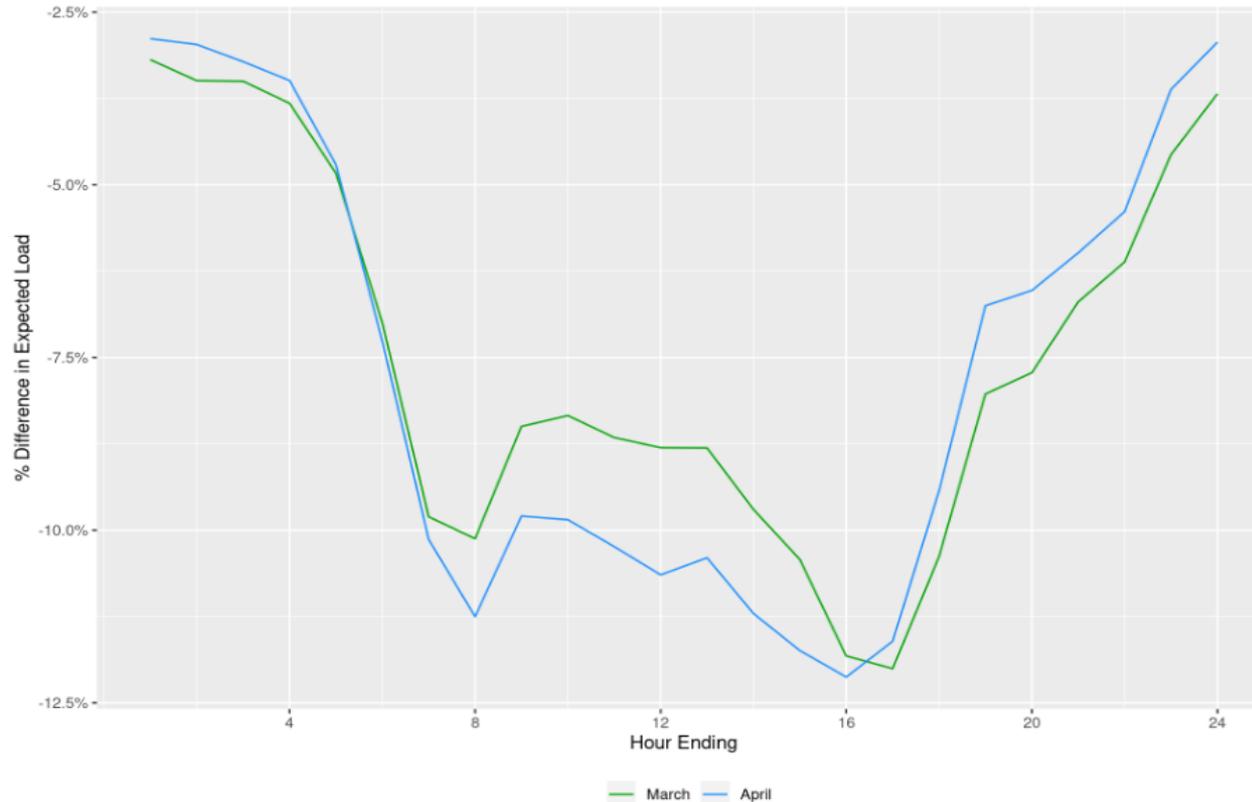
Average daily energy system impact due to COVID-19



Numbers Show an Overall Reduction

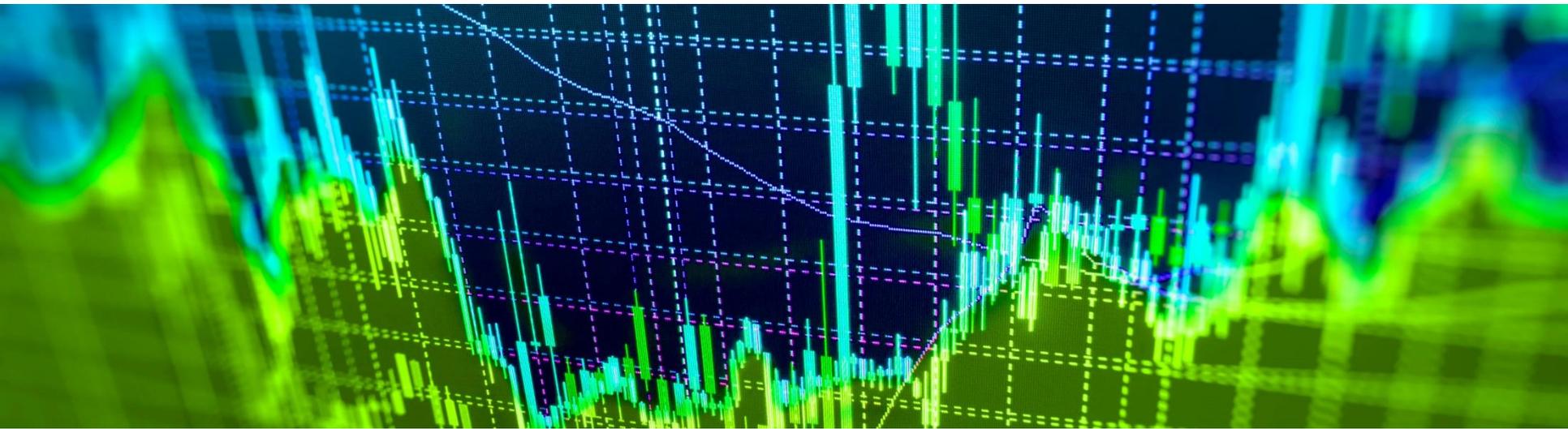
The stay-at-home order began on Friday, March 20; our summary begins at the first full week beginning Monday, March 23.

Average weekday hourly percent difference in expected load due to COVID-19



Numbers Show an Overall Reduction

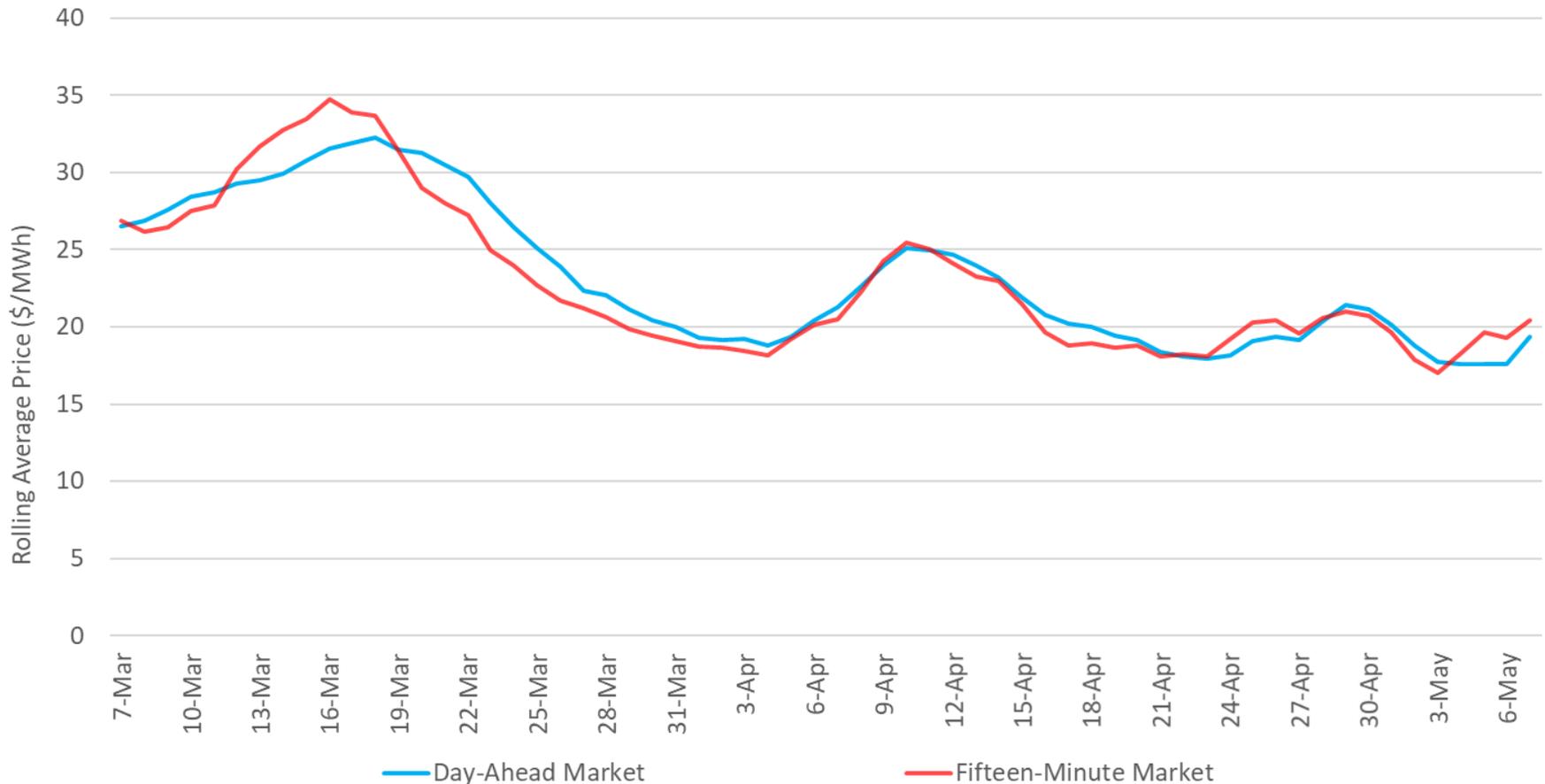
The stay-at-home order began on Friday, March 20; our analysis begins at the first full week beginning Monday, March 23.



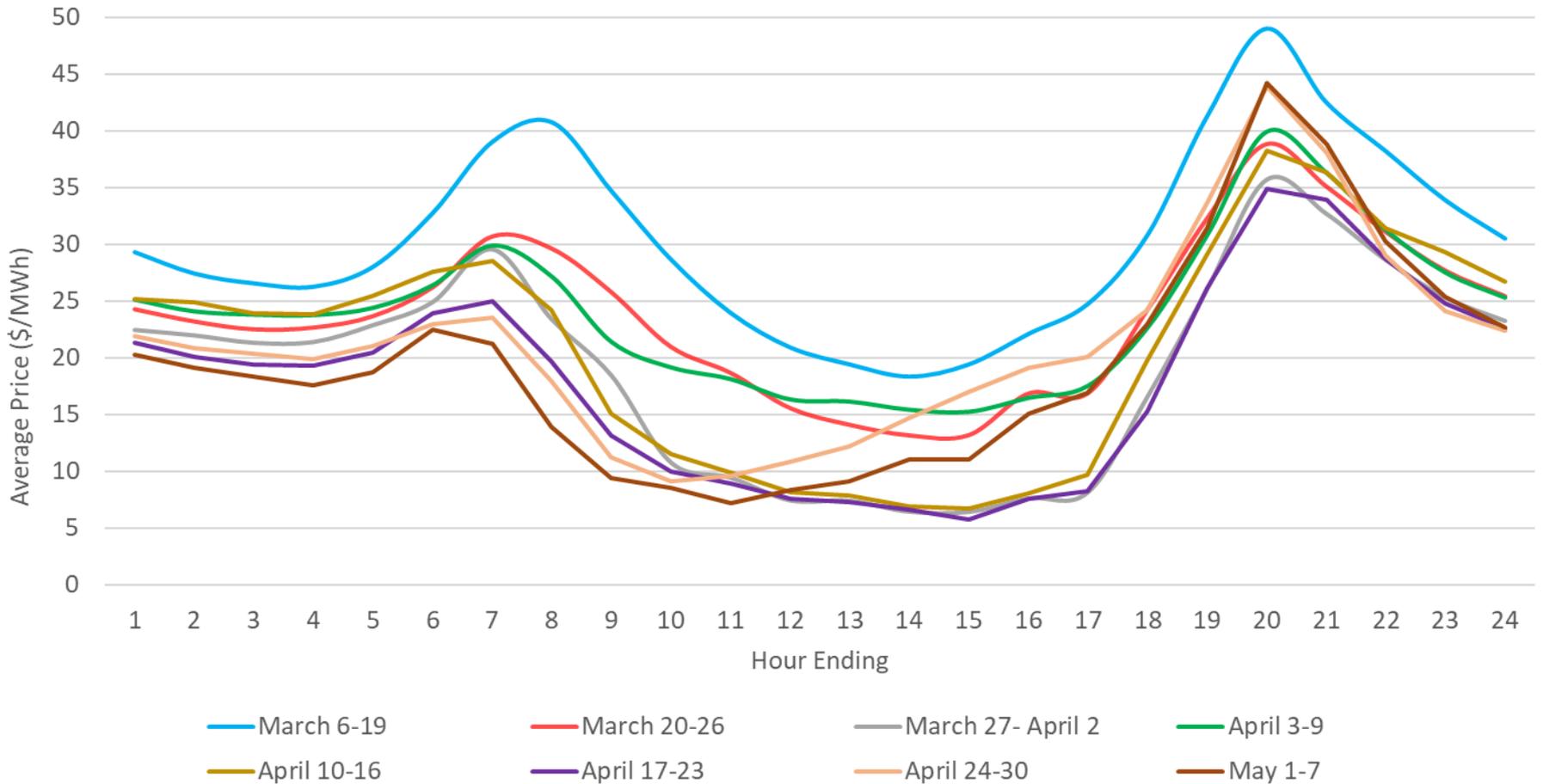
Market analysis and forecasting

Price impact: COVID-19

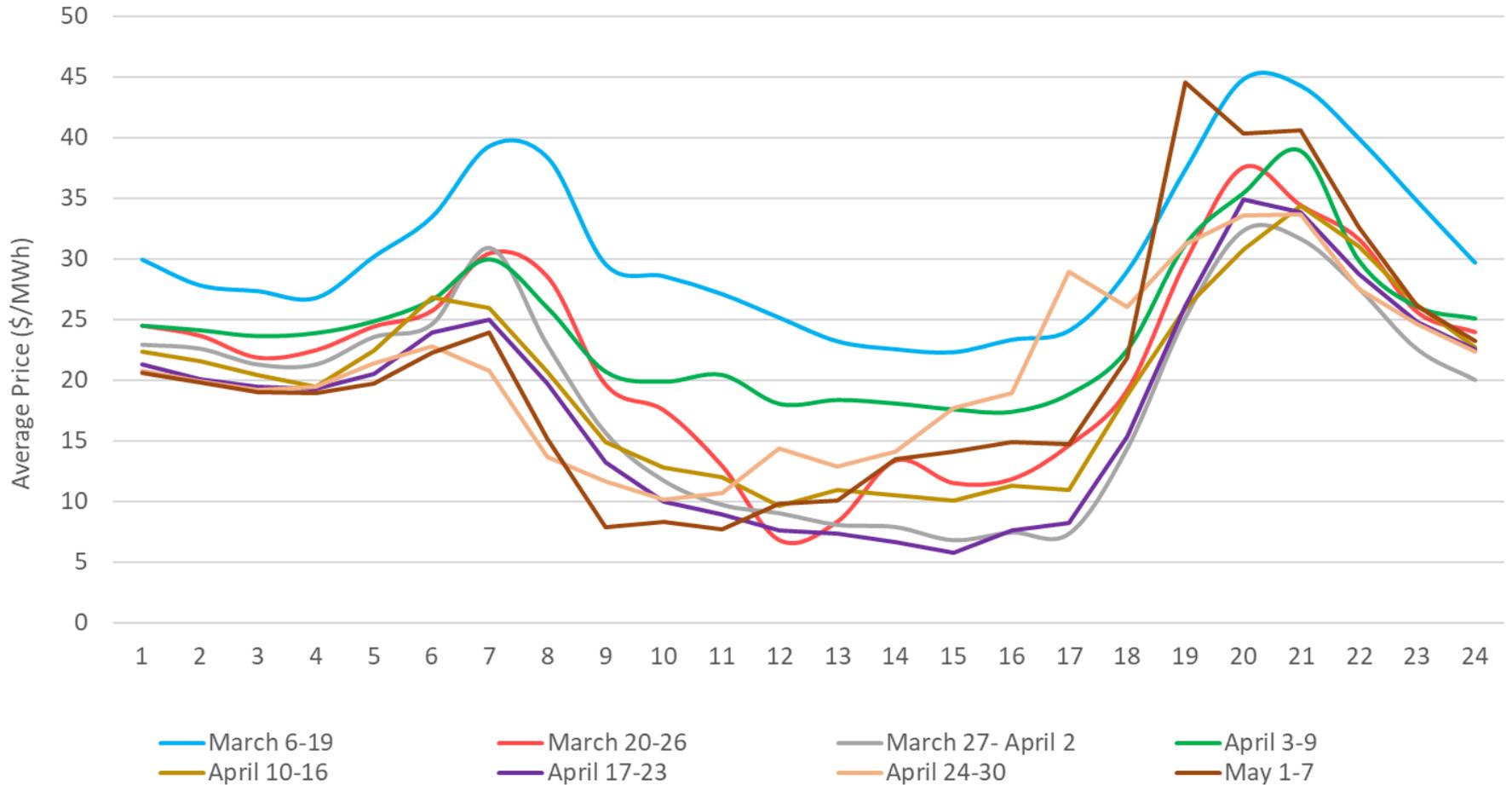
Energy prices trended downward in the first two weeks of the shelter-in-place provisions



Day-ahead energy prices reduced on average about \$9/MWh in the period of the shelter-in-place provisions



Fifteen-minute energy prices reduced on average about \$10/MWh in the period of the shelter-in-place provisions



Questions?

GMC Rate and EIM Administrative Fee Adjustments

Ryan Seghesio
Vice President, Chief Financial Officer and Treasurer

The ISO adjusted grid management charge (GMC) and energy imbalance market (EIM) rates effective on June 1.

- COVID-19 pandemic has significantly changed energy consumption patterns
- Forecasted GMC collections over 3% short of budget - EIM volumes are also down
- Shortfall is outside of tariff tolerance levels

Charge Code	New Rate per MWh	Difference
GMC – Market Services	\$0.1044	+ \$0.0050
GMC – System Operations	\$0.2938	+ \$0.0150
EIM – Market Services	\$0.0825	+ \$0.0040
EIM – System Operations	\$0.1146	+ \$0.0059

Tariff requires adjustment of rates if actual revenue plus remaining forecast exceeds tolerance levels.

- Appendix F, Schedule 1, Part B
- Difference must be the greater of 2% or \$1 million
- Applies to each service category independently
- No more than once per calendar quarter

The ISO adjusts rates infrequently and only to correct volume forecast variances.

- No adjustment for expense variances
- Ensures ISO can collect budgeted revenue
- Lessens the impact of large adjustments on future revenue requirements
 - Over or under collections ultimately flow through the operating cost reserve adjustment in future years

Questions?

New online stakeholder commenting tool coming soon

- Ability to view all comments with a single click.
- Ability to filter comments by question or by entity.
- Login, add your comments directly into the template and submit.
 - You can save and return to your entry anytime during the open comment period.

NOTE

Submitting comments in the new tool will require a one-time registration.

Resources

2020 Summer Loads and Resources Assessment

<http://www.caiso.com/informed/Pages/BulletinsReportsStudies/Default.aspx>

2020 GMC Rates and Other Fees

<http://www.caiso.com/Documents/GridManagementChargeRates-2004-2020EffectiveJun1-2020.pdf>