Draft 2025 Flexible Capacity Needs and Availability Assessment Hours Technical Study

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- These meeting are intended to stimulate open dialogue and engage different perspectives.
- Please keep comments professional and respectful.
- Please try and be brief and refrain from repeating what has already been said so that we can manage the time efficiently.
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- If you are connected to audio through your computer or used the “call me” option, select the raise hand icon  located on the bottom of your screen.
  - **Note**: #2 only works if you dialed into the meeting

- Please remember to state your name and affiliation before making your comment.

Objective

Discuss the assumptions, methodology, and draft results of the monthly flexible capacity requirement and Availability Assessment Hours Technical Study.

Specifically

Calculating monthly flexible capacity requirements for all LRAs within the ISO footprint for RA compliance year 2025 and advisory requirements for compliance years 2026 and 2027

Agenda / Overview

- Background
- Process review
  - Expected build out from all LSEs (CPUC jurisdictional and non-jurisdictional)
  - Load, wind and solar profiles
  - Calculate three-hour net load upward ramps
  - Add the larger of either the spinning reserve portion of contingency reserves or the most severe contingency
  - Calculate monthly Flexible Capacity requirement
- Overview of methodology used for system/local availability assessment hours
  - 2025 availability assessment hours
  - 2026-2027 draft availability assessment hours

Each LSE Scheduling Coordinator shall make a year-ahead and month-ahead showing of flexible capacity for each month of the compliance year

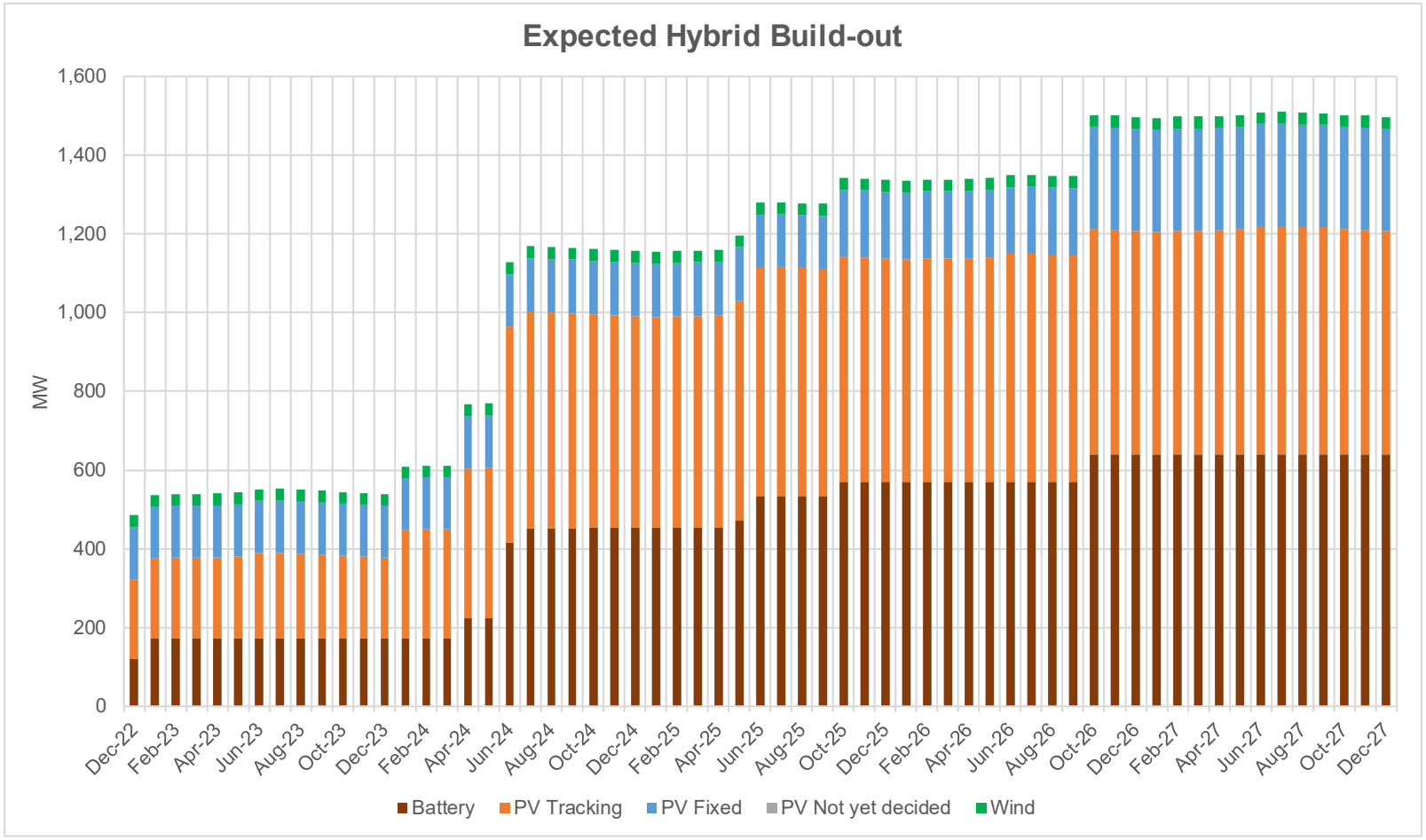
Resource Adequacy (RA)

- Ensure LSEs contract for adequate capacity to meet expected flexible capacity needs
- Year ahead: LSEs need to secure a minimum of 90% of the next years monthly needs
- Month ahead: LSEs need to secure adequate net qualified capacity to serve their peak load including a planning reserve margin and flexible capacity to address largest three-hour net load ramps plus contingency reserves
- All resources participating in the ISO markets under an RA contract will have an RA must-offer-obligation
- Required to submit economic bids into the ISO's real-time market consistent with the category of flexible capacity

The ISO used the following data to determine the flexible capacity needs

- CEC's IEPR demand forecast for 2025 through 2027
- LSE SCs updated renewable build-out for 2023 through 2027
- The Analysis of Flex Capacity Needs included:
  - Existing VERs capacity
  - Expected installed capacity by technology and expected operating date (e.g. Solar thermal, solar PV tracking, solar PV non-tracking, estimate of behind-the-meter solar PV, co-located and renewable components of hybrids) for all variable energy resources under contract
  - Operational date or expected on-line date
  - Dynamically scheduled resources located outside ISO's BAA

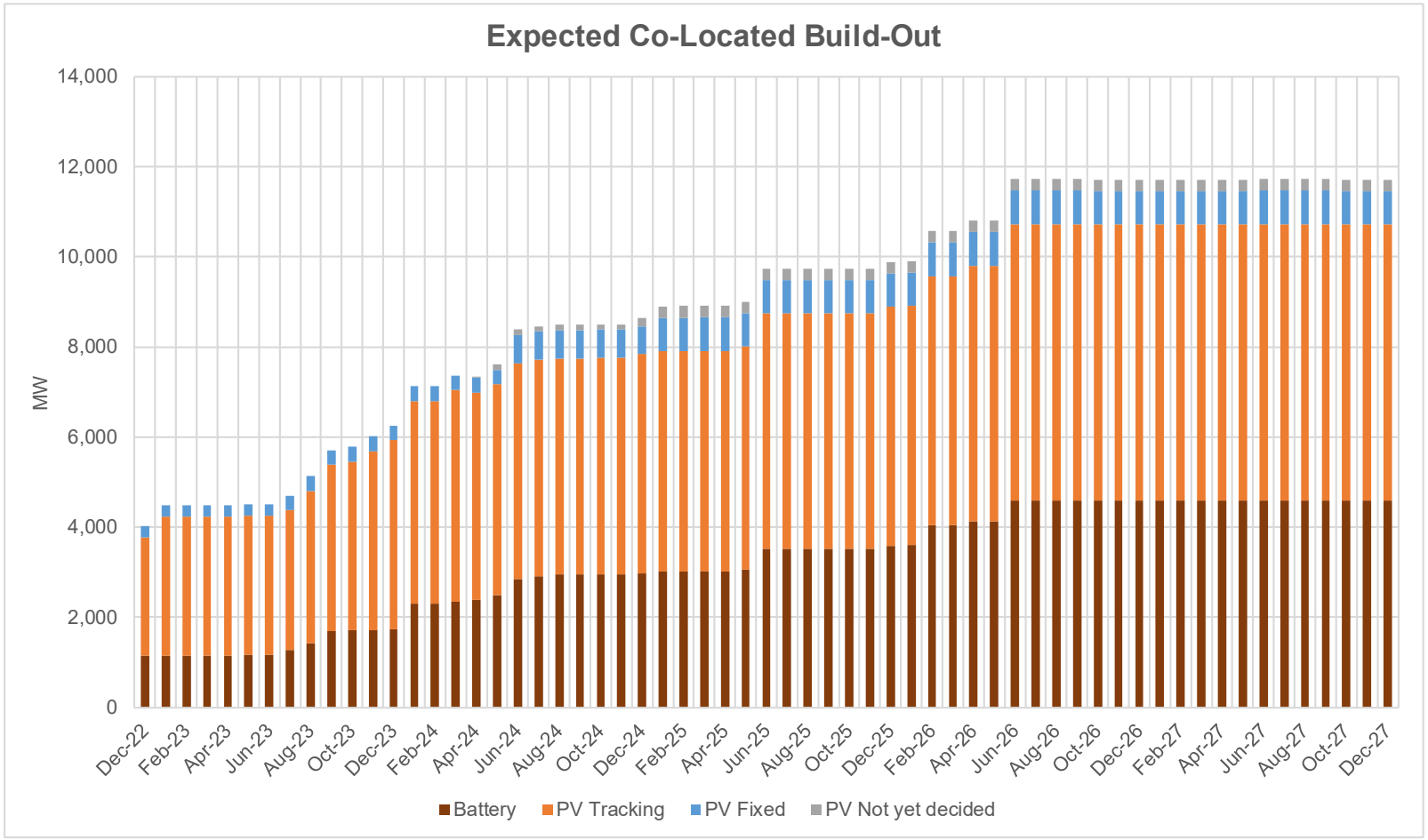
Expected hybrid renewable buildout through December 2027 based on LSE's submittal



Hybrid resources were included in the flexible needs assessment

For more details on hybrid and co-located resources, visit the stakeholder page: https://stakeholdercenter.caiso.com/StakeholderInitiatives/Hybrid-resources

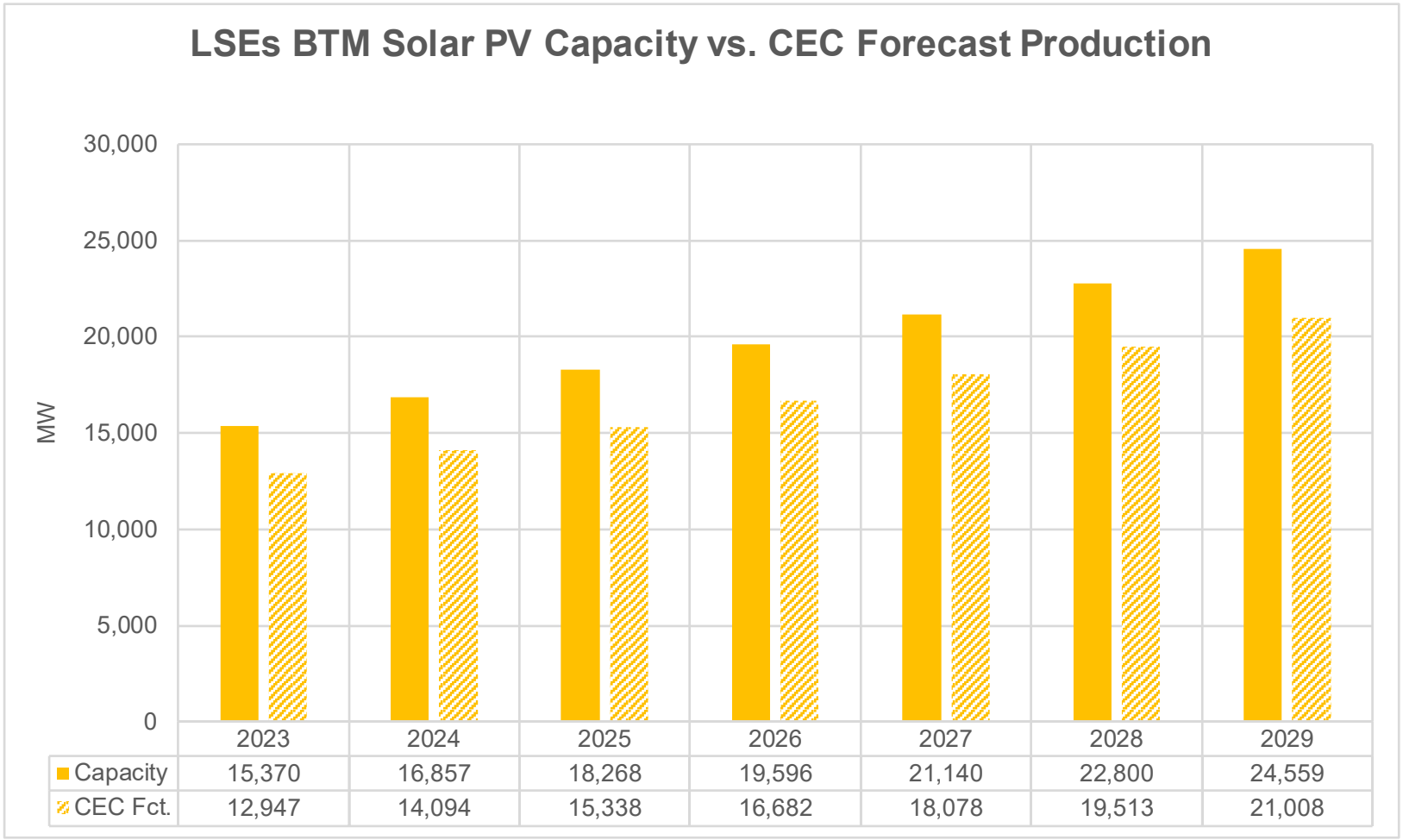
Expected co-located renewable buildout through December 2027 based on LSE's submittal



Co-Located resources were included in the flexible needs assessment

For more details on hybrid and co-located resources, visit the stakeholder page: https://stakeholdercenter.caiso.com/StakeholderInitiatives/Hybrid-resources

Expected LSEs rooftop solar PV capacity vs. CEC's estimated production



	2023	2024	2025	2026	2027	2028	2029
Capacity	15,370	16,857	18,268	19,596	21,140	22,800	24,559
CEC Fct.	12,947	14,094	15,338	16,682	18,078	19,513	21,008

Summary of LSEs submittal showing the expected capacity at the end of each year

Resource Type	Existing 2023	Expected 2024	Expected 2025
ISO Solar PV	11,757	11,800	11,966
ISO Solar Thermal	860	858	858
ISO Wind	4,626	4,663	4,870
Co-Located Resources (Wind)	0	0	0
Co-Located Resources (Solar)	4,524	5,676	6,314
Hybrid Resources (Wind)	30	30	30
Hybrid Resources (Solar)	337	672	738
Total Variable Energy Resource Capacity within the ISO	***22,133***	***23,698***	***24,775***
Cumulative Non ISO Wind/Solar Resources that's Dynamically Scheduled into the ISO	1,770	1,907	1,950
Total Internal and Dynamically Scheduled VERs in Flexible Capacity Needs Assessment	***23,903***	***25,606***	***26,725***
Incremental New VERs Additions Each Year (Included in Flexible Capacity Needs Assessment)		***1,703***	***1,119***
Maximum Expected BTM Solar PV Production in the CEC's Forecast		14,094	15,338
Cumulative behind-the-meter Solar PV Capacity reported by LSEs	15,370	16,857	18,268

The ISO is comparing the data submitted by the LSEs below to data in the interconnection que and current capacity to ensure alignment. The ISO may perform additional outreach to LSEs based on the data submitted to ensure all resources are being included.

The ISO flexibility capacity assessment is based on current LSE's RPS build-out data

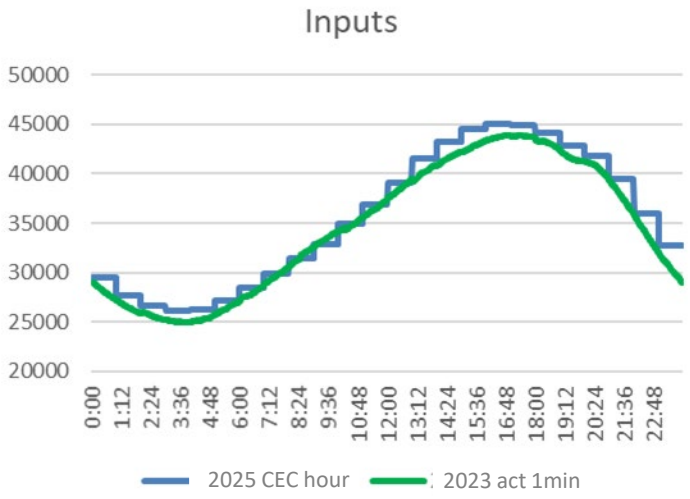
- Uses the most current data available for renewable build-out obtained from all LSE SCs
  - The SC for each *LSE* in the CAISO BAA [to identify] each *wind and solar resource*… that is owned, in whole or in part, by the LSE, or under contractual commitment to the LSE or the Load-following MSS LSE, for all or a portion of its capacity
- For new renewable installation, scale 2023 actual production data based on the expected installed capacity in subsequent years
- Generate net-load profiles for 2025 through 2027
  - Generate load profiles for 2025 through 2027
  - Generate solar profiles for 2025 through 2027
  - Generate wind profiles for 2025 through 2027

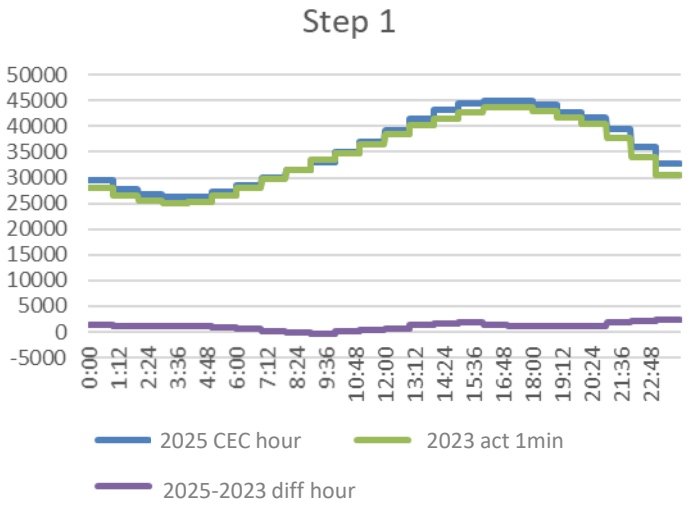
The ISO will use the CEC's 1-in-2 IEPR forecast to develop the monthly flexible capacity

- CEC IEPR Load Forecast
  - California Energy Commission : Docket Log
  - Title of File: "CED 2023 Hourly Forecast – CAISO – Planning Scenario"
    - CAISO will be using Managed Net Load (column T) within the spreadsheet
      - **Managed Net Load (col T)** = Baseline Net Load (col O)
        + AAEE (col P)
        + AAFS (col Q)
        + AATE_LDV (col R)
        + AATE_MDHD (col S)
      - Baseline Net Load (col O) = Baseline Consumption (col K)
        - BTM PV (col L)
        - BTM Storage Res (col M)
        - BTM Storage NonRes (col N)
      - Baseline Consumption (col K) = unadjusted consumption (col E)
        + Pumping (col F)
        + climate change (col G)
        + light EV (col H)
        + medium heavy EV (col I)
        + other adjustments (col J)

Building expected one-minute load profile requires actual 2023 hourly and one-minute data and CEC's hourly forecast

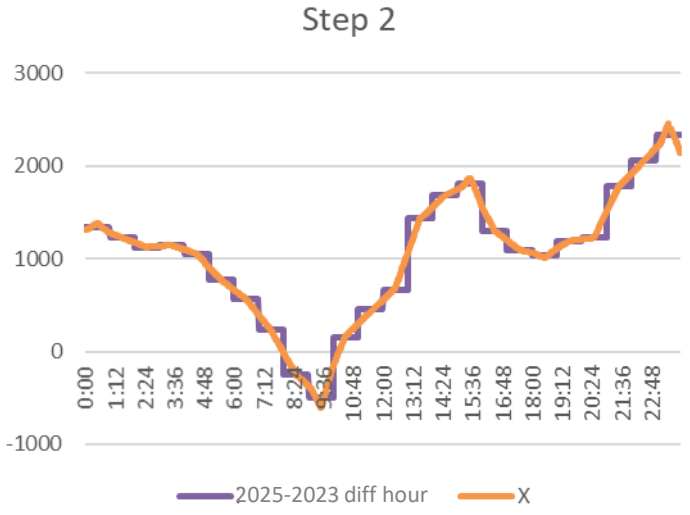
Using the 2025 CEC hourly forecast and the 2023 1-min actuals, we will create the estimated 2025 1-min forecast

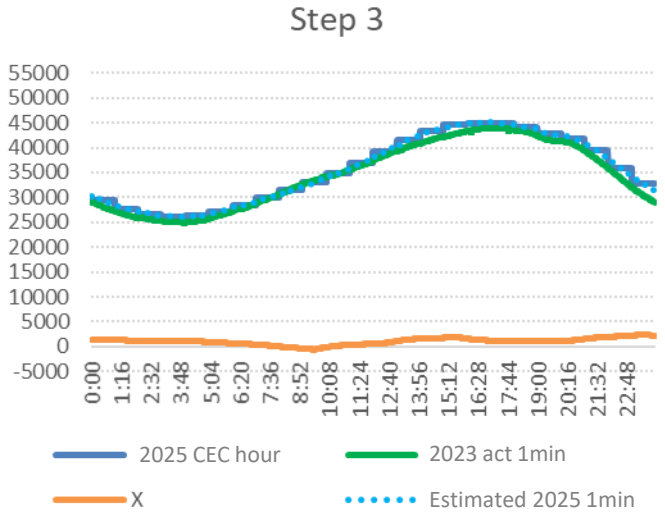




Take the hourly average of the 1-min data and find the difference between the hourly 2023 actuals and 2025 forecast

Smooth the hourly 2025-2023 difference from Step 1 to a 1-min granularity





Add the 1-min data from Step 1 to the 2023 1-min actuals to get a smoothed 2025 forecast

Hourly load forecast to one-minute load forecast

- Used 2023 actual one-minute load data to build one-minute load profiles for subsequent years
- Scaled the hourly CEC load forecast value of each hour into one-minute forecast data using a smoothing equation looking at the differences between the forecasted year and the 2023 one-minute actuals.

2025 Load One-Minute Forecast

- **2025 $L_{CECfcst\_1\text{-}min}$ = 2023 $L_{Act\_1\text{-}min}$ + X**
  - **Where X = Interpolated 1-min profile from the difference**

    (2025 $L_{CECfcst\_hourly}$ - 2023 L_{actual_hourly})

2026 Load One-Minute Forecast

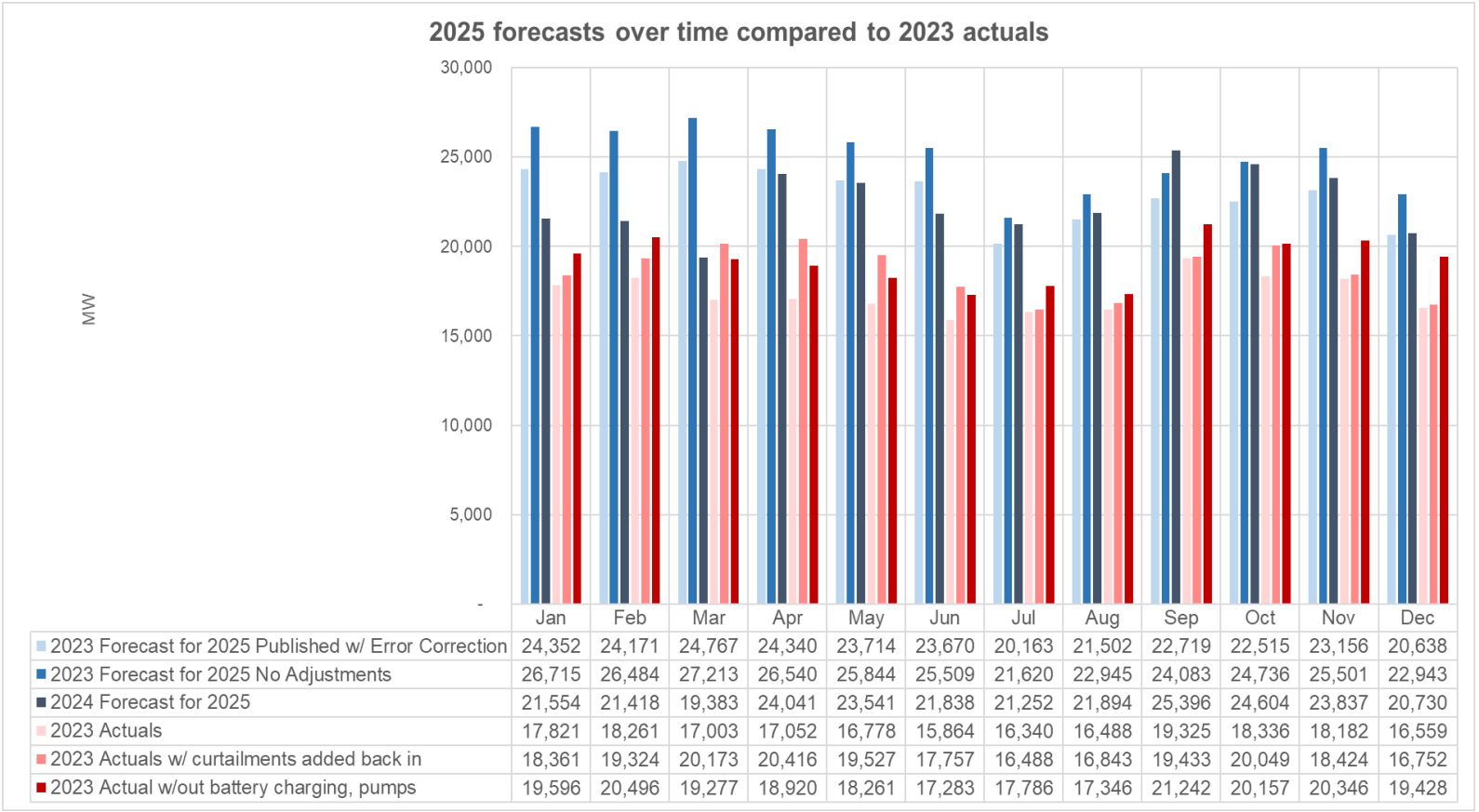
- **2026 $L_{CECfcst\_1\text{-}min}$ = 2023 $L_{Act\_1\text{-}min}$ + X**
  - **Where X = Interpolated 1-min profile from the difference**

    (2026 $L_{CECfcst\_hourly}$ - 2023 L_{actual_hourly})

*See slide 8 for more graphs showing steps to calculate

For this year's study, no changes were made to the CEC load forecast or 3-hour ramp forecast

- The CEC made updates to the IEPR methodology for the demand forecast used in this study



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023 Forecast for 2025 Published w/ Error Correction	24,352	24,171	24,767	24,340	23,714	23,670	20,163	21,502	22,719	22,515	23,156	20,638
2023 Forecast for 2025 No Adjustments	26,715	26,484	27,213	26,540	25,844	25,509	21,620	22,945	24,083	24,736	25,501	22,943
2024 Forecast for 2025	21,554	21,418	19,383	24,041	23,541	21,838	21,252	21,894	25,396	24,604	23,837	20,730
2023 Actuals	17,821	18,261	17,003	17,052	16,778	15,864	16,340	16,488	19,325	18,336	18,182	16,559
2023 Actuals w/ curtailments added back in	18,361	19,324	20,173	20,416	19,527	17,757	16,488	16,843	19,433	20,049	18,424	16,752
2023 Actual w/out battery charging, pumps	19,596	20,496	19,277	18,920	18,261	17,283	17,786	17,346	21,242	20,157	20,346	19,428

Net-load is a NERC accepted metric[1] for evaluating additional flexibility needs to accommodate VERs

- Net load is defined as load minus wind and solar power production
- Net load variability increases as more and more wind and solar resources are integrated into the system
- The monthly three-hour flexible capacity need equates to the largest upward change in net load when looking across a rolling three-hour evaluation window
- The ISO dispatches flexible resources (including renewable resources with energy bids) to meet net load

1 NERC Special Report
Flexibility Requirements and Metrics for Variable Generation: Implications for System Planning Studies, August 2010. https://www.nerc.com/files/IVGTF_Task_1_4_Final.pdf

The flexible capacity methodology is expected to provide the ISO with sufficient flexible capacity

Methodology

Flexible $Req_{MTHy} = Max[(3RR_{HRx})_{MTHy}] + Max(MSSC, 3.5\%*E(PL_{MTHy})) + \varepsilon$

Where:

$Max[(3RR_{HRx})_{MTHy}]$ = Largest three-hour contiguous ramp starting in hour x for month y

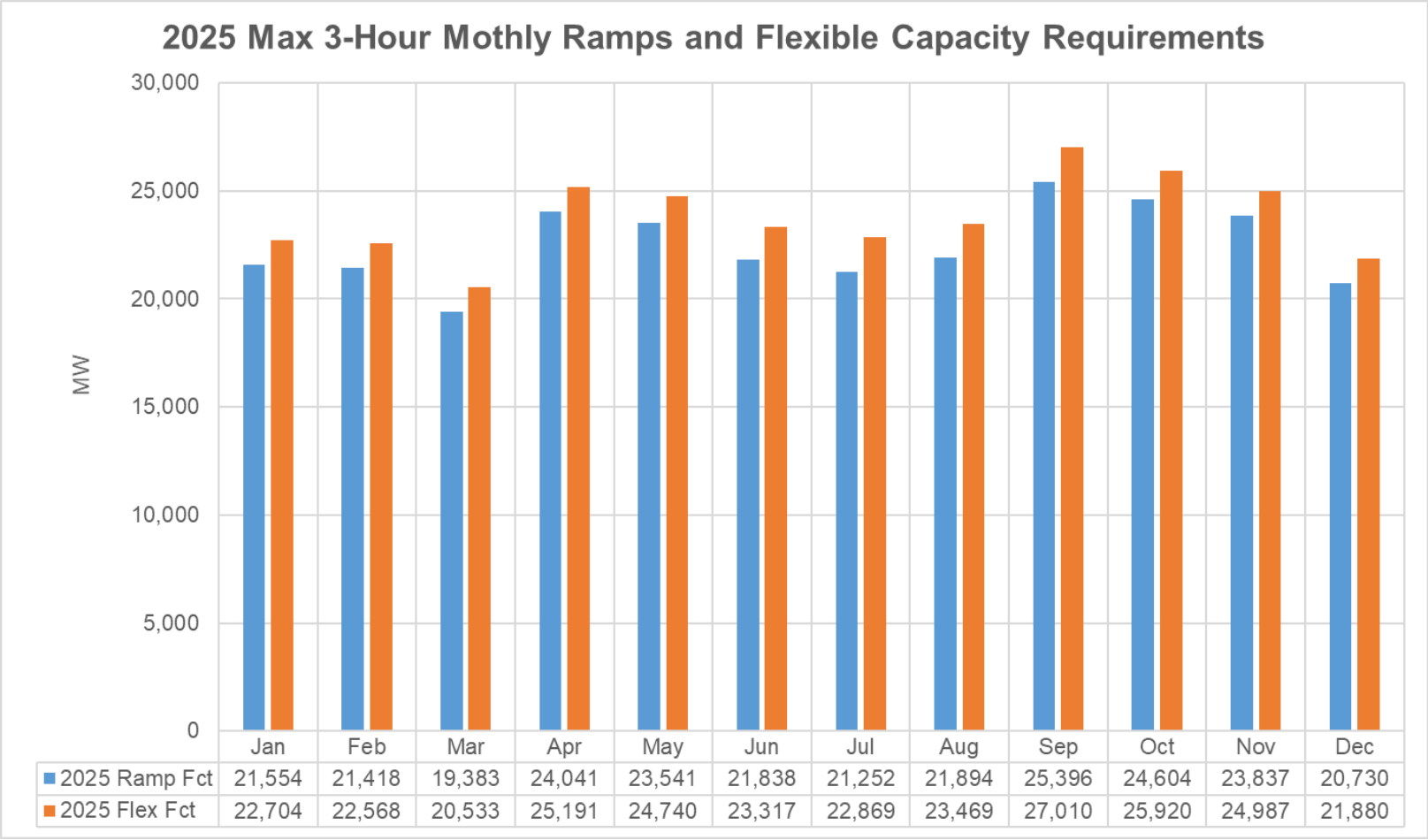
E(PL) = Expected peak load

MTH_y = Month $_y$

MSSC = Most Severe Single Contingency

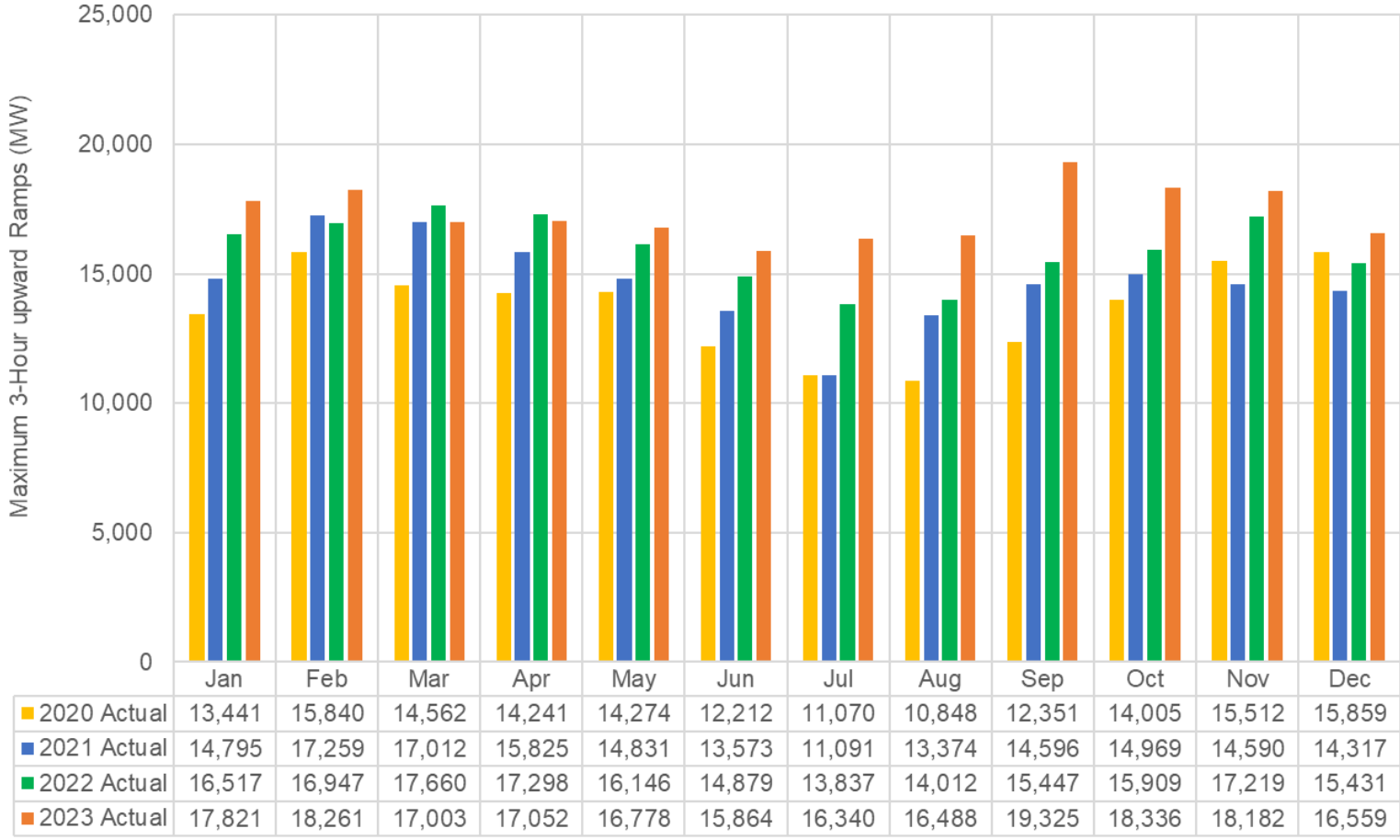
ε = Annually adjustable error term to account for load forecast errors and variability. ε is currently set at zero

Monthly Three-Hour upward ramps and total flexible capacity requirements for 2025



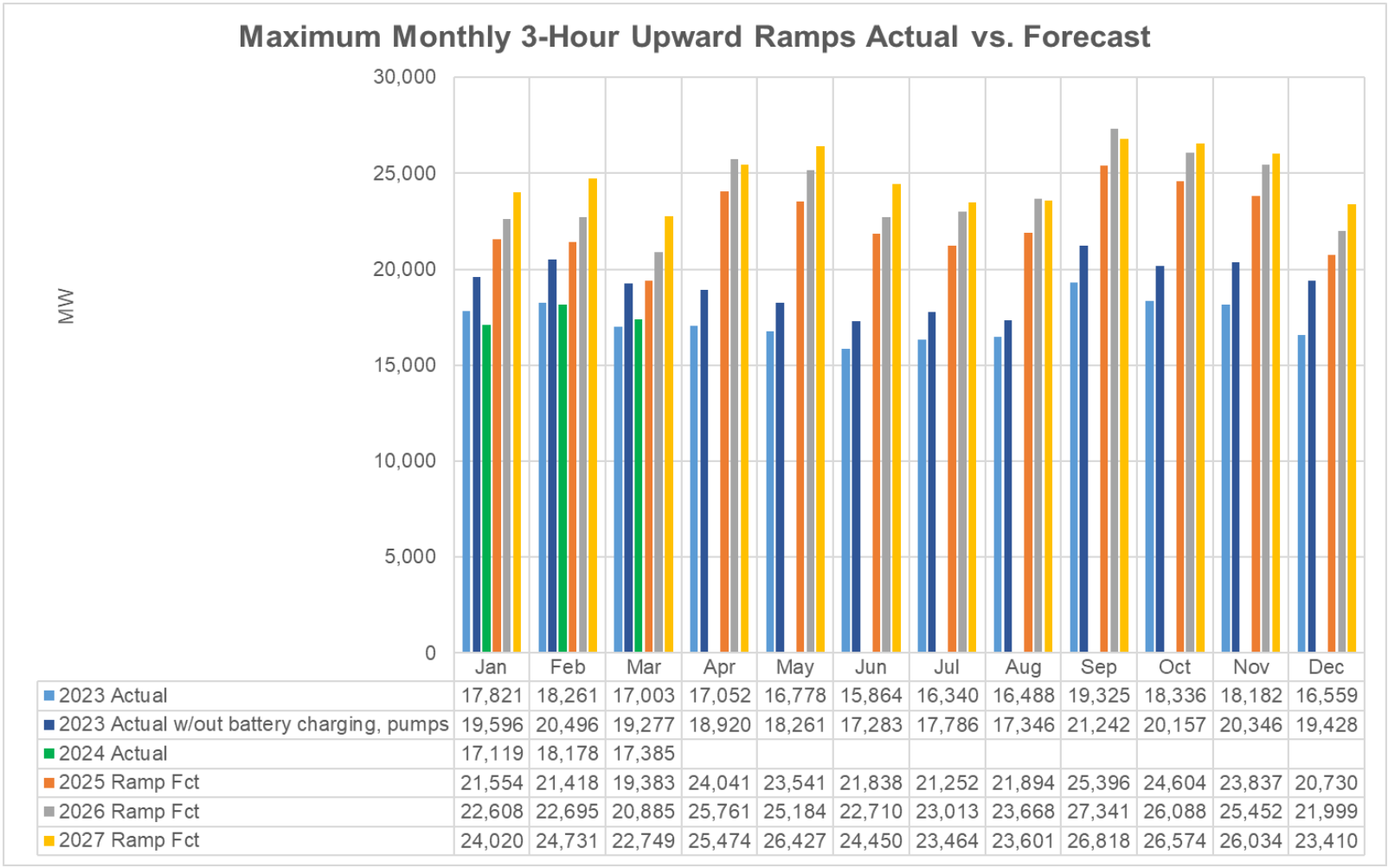
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2025 Ramp Fct	21,554	21,418	19,383	24,041	23,541	21,838	21,252	21,894	25,396	24,604	23,837	20,730
2025 Flex Fct	22,704	22,568	20,533	25,191	24,740	23,317	22,869	23,469	27,010	25,920	24,987	21,880

Actual 3-hour ramps 2020 through 2023



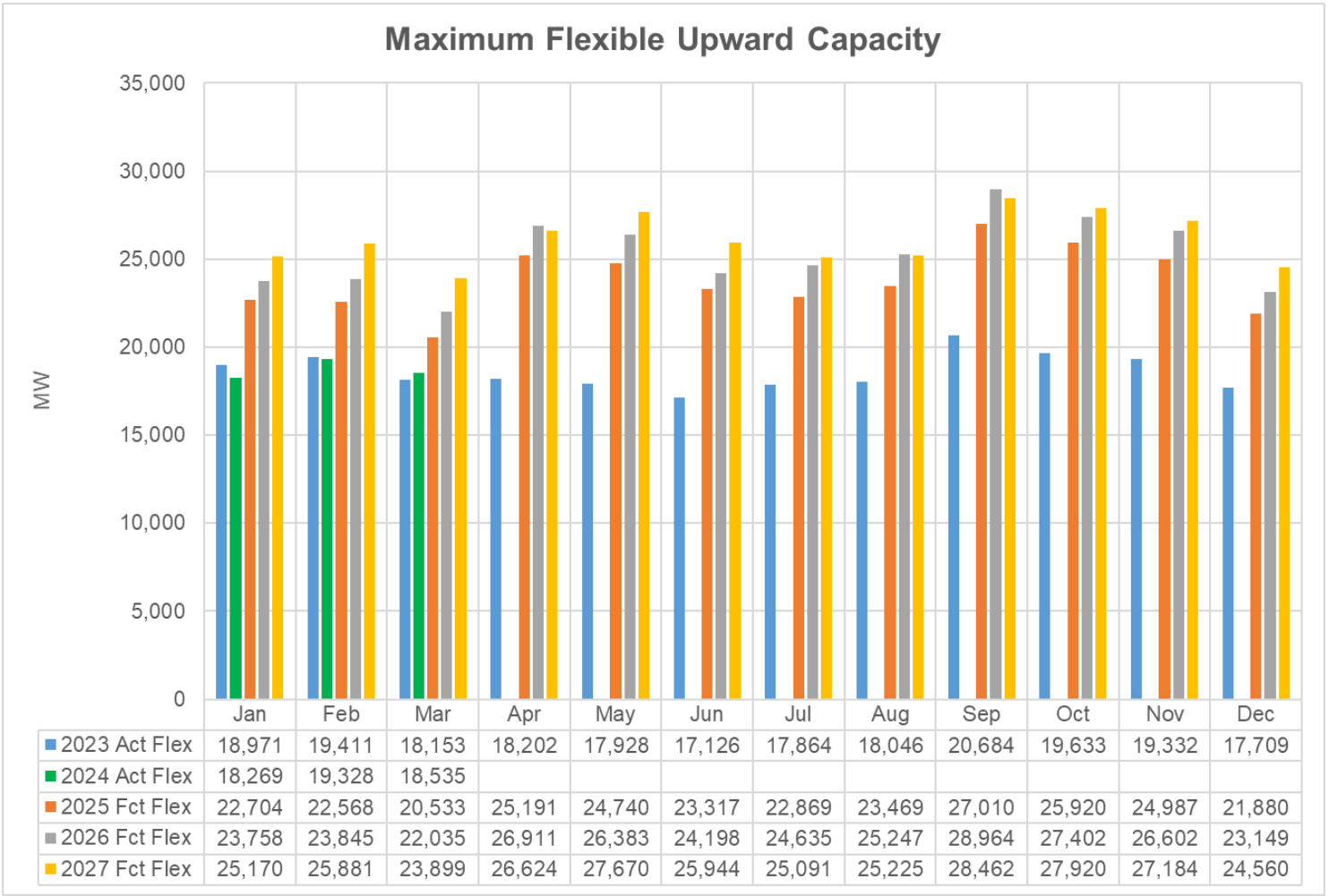
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020 Actual	13,441	15,840	14,562	14,241	14,274	12,212	11,070	10,848	12,351	14,005	15,512	15,859
2021 Actual	14,795	17,259	17,012	15,825	14,831	13,573	11,091	13,374	14,596	14,969	14,590	14,317
2022 Actual	16,517	16,947	17,660	17,298	16,146	14,879	13,837	14,012	15,447	15,909	17,219	15,431
2023 Actual	17,821	18,261	17,003	17,052	16,778	15,864	16,340	16,488	19,325	18,336	18,182	16,559

Actual maximum monthly ramps for 2023 and 2024 vs. forecast ramp capacity for 2025 through 2027



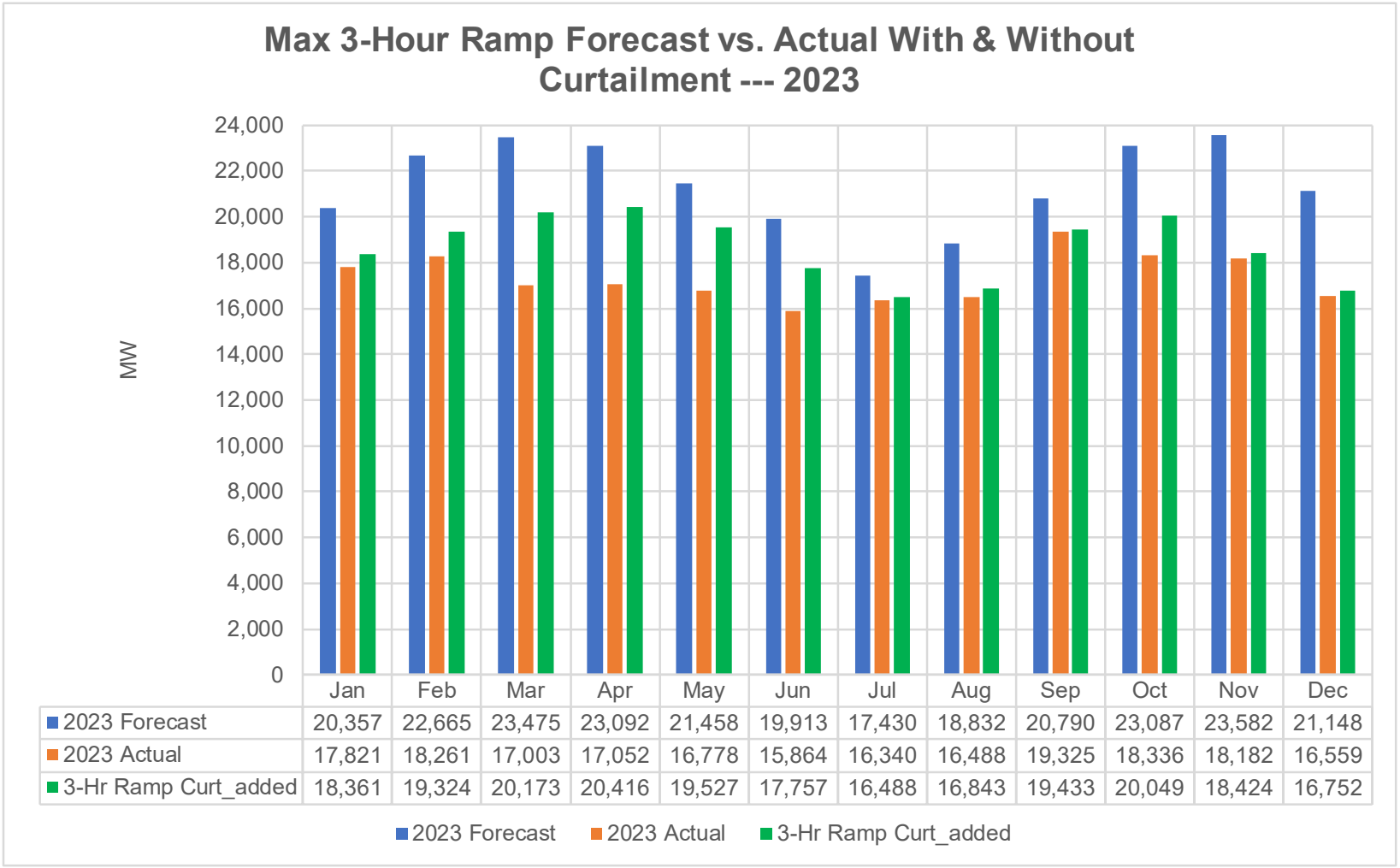
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023 Actual	17,821	18,261	17,003	17,052	16,778	15,864	16,340	16,488	19,325	18,336	18,182	16,559
2023 Actual w/out battery charging, pumps	19,596	20,496	19,277	18,920	18,261	17,283	17,786	17,346	21,242	20,157	20,346	19,428
2024 Actual	17,119	18,178	17,385									
2025 Ramp Fct	21,554	21,418	19,383	24,041	23,541	21,838	21,252	21,894	25,396	24,604	23,837	20,730
2026 Ramp Fct	22,608	22,695	20,885	25,761	25,184	22,710	23,013	23,668	27,341	26,088	25,452	21,999
2027 Ramp Fct	24,020	24,731	22,749	25,474	26,427	24,450	23,464	23,601	26,818	26,574	26,034	23,410

Actual maximum monthly flexible capacity for 2023 and 2024 vs. forecast flexible capacity for 2025 through 2027



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023 Act Flex	18,971	19,411	18,153	18,202	17,928	17,126	17,864	18,046	20,684	19,633	19,332	17,709
2024 Act Flex	18,269	19,328	18,535									
2025 Fct Flex	22,704	22,568	20,533	25,191	24,740	23,317	22,869	23,469	27,010	25,920	24,987	21,880
2026 Fct Flex	23,758	23,845	22,035	26,911	26,383	24,198	24,635	25,247	28,964	27,402	26,602	23,149
2027 Fct Flex	25,170	25,881	23,899	26,624	27,670	25,944	25,091	25,225	28,462	27,920	27,184	24,560

ISO continues to consider how we account for curtailments in Flex RA Study

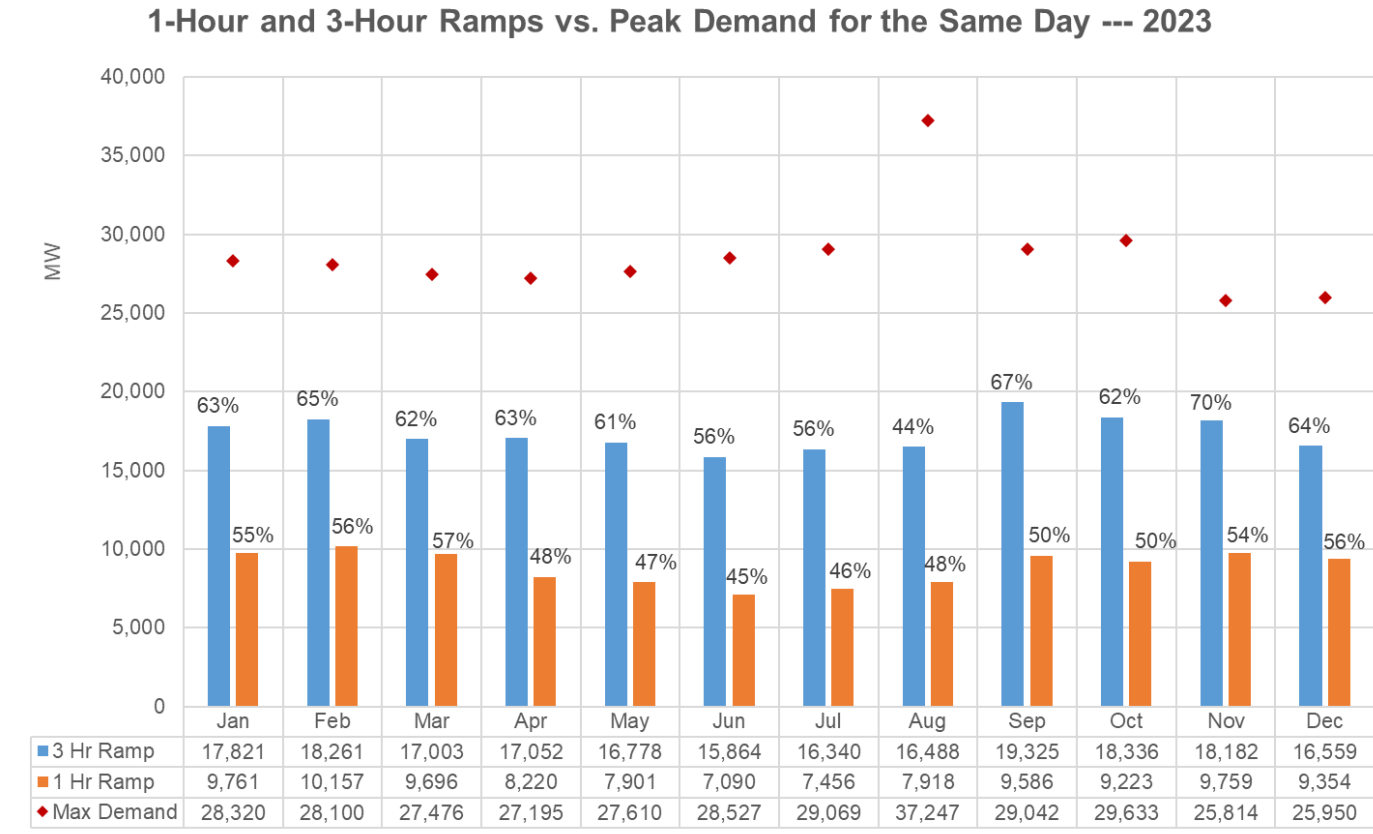


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023 Forecast	20,357	22,665	23,475	23,092	21,458	19,913	17,430	18,832	20,790	23,087	23,582	21,148
2023 Actual	17,821	18,261	17,003	17,052	16,778	15,864	16,340	16,488	19,325	18,336	18,182	16,559
3-Hr Ramp Curt_added	18,361	19,324	20,173	20,416	19,527	17,757	16,488	16,843	19,433	20,049	18,424	16,752

2023 forecast 3-Hour ramps were derived from the 2021 flex-analysis study using 2020 actual 1-minute data

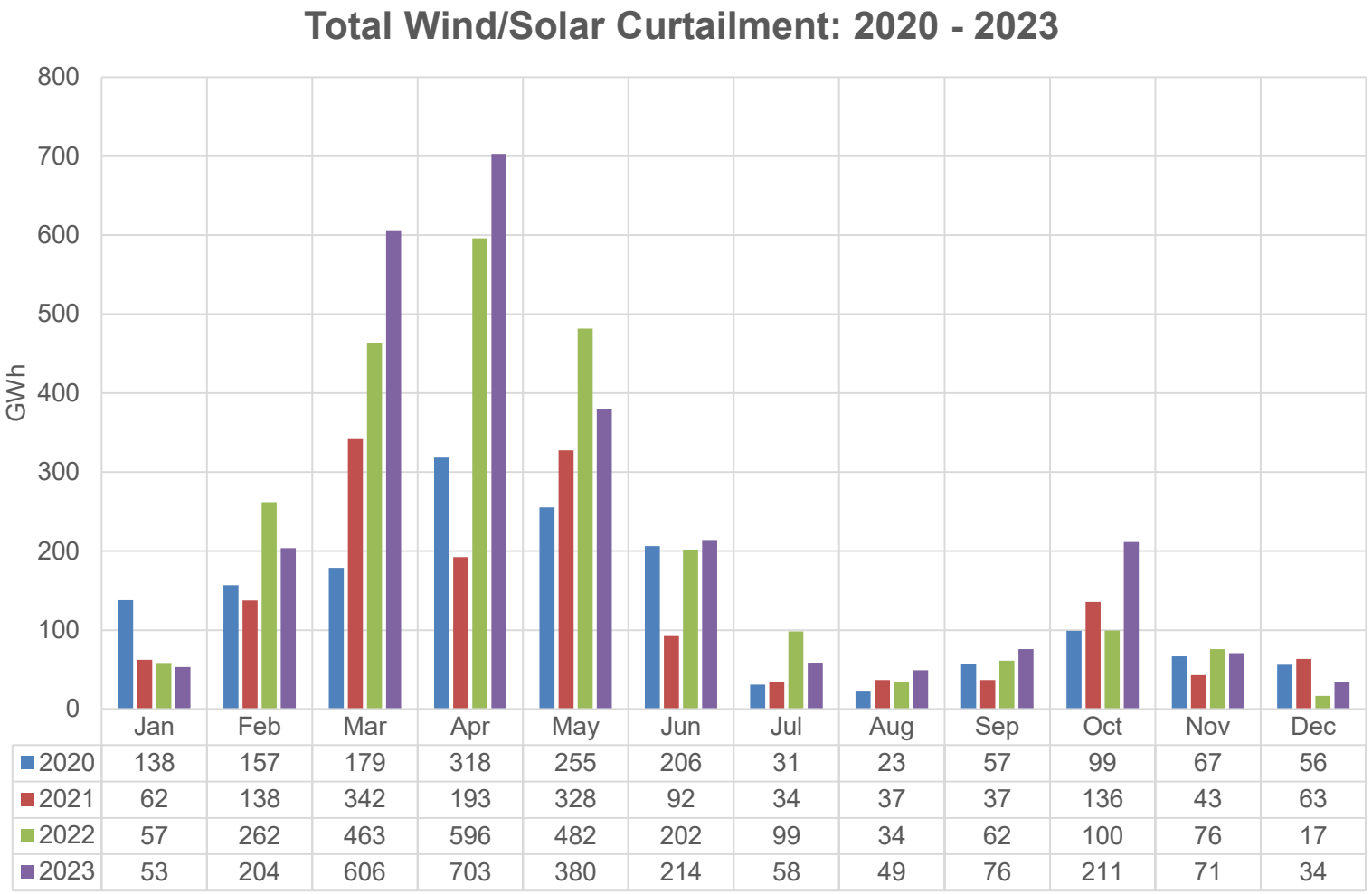
Maximum 3-Hour upward ramps are not evenly distributed each hour demonstrating the need for faster ramping capability

- Three hour-upward ramps have been steadily increasing over the years
- Ramps are not evenly distributed across three hours
- One hour upward ramp is now over 50% of the three hour ramps in some months



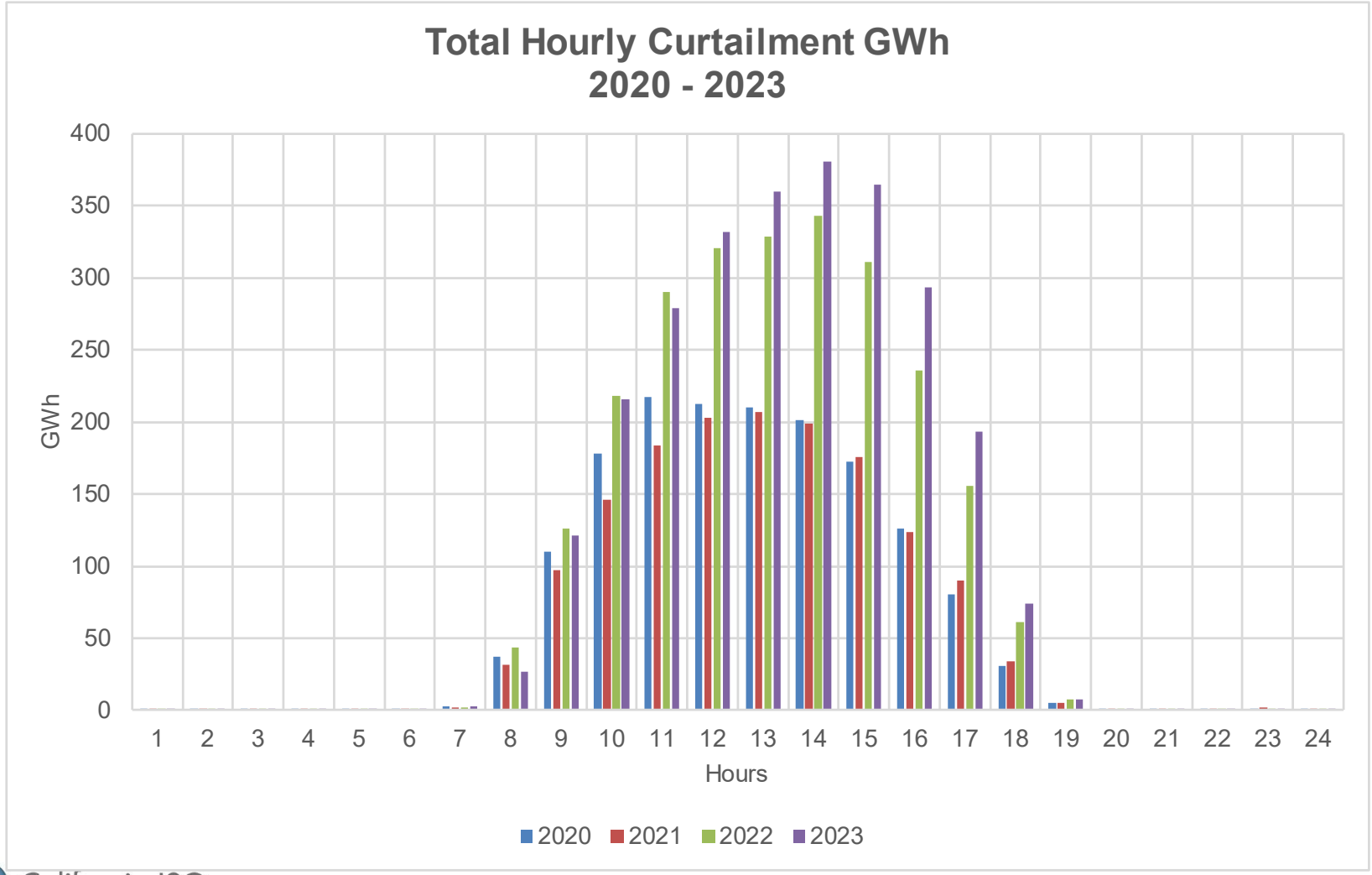
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3 Hr Ramp	17,821	18,261	17,003	17,052	16,778	15,864	16,340	16,488	19,325	18,336	18,182	16,559
1 Hr Ramp	9,761	10,157	9,696	8,220	7,901	7,090	7,456	7,918	9,586	9,223	9,759	9,354
Max Demand	28,320	28,100	27,476	27,195	27,610	28,527	29,069	37,247	29,042	29,633	25,814	25,950

2020-2023: Highest levels of curtailments typically occur during the spring months

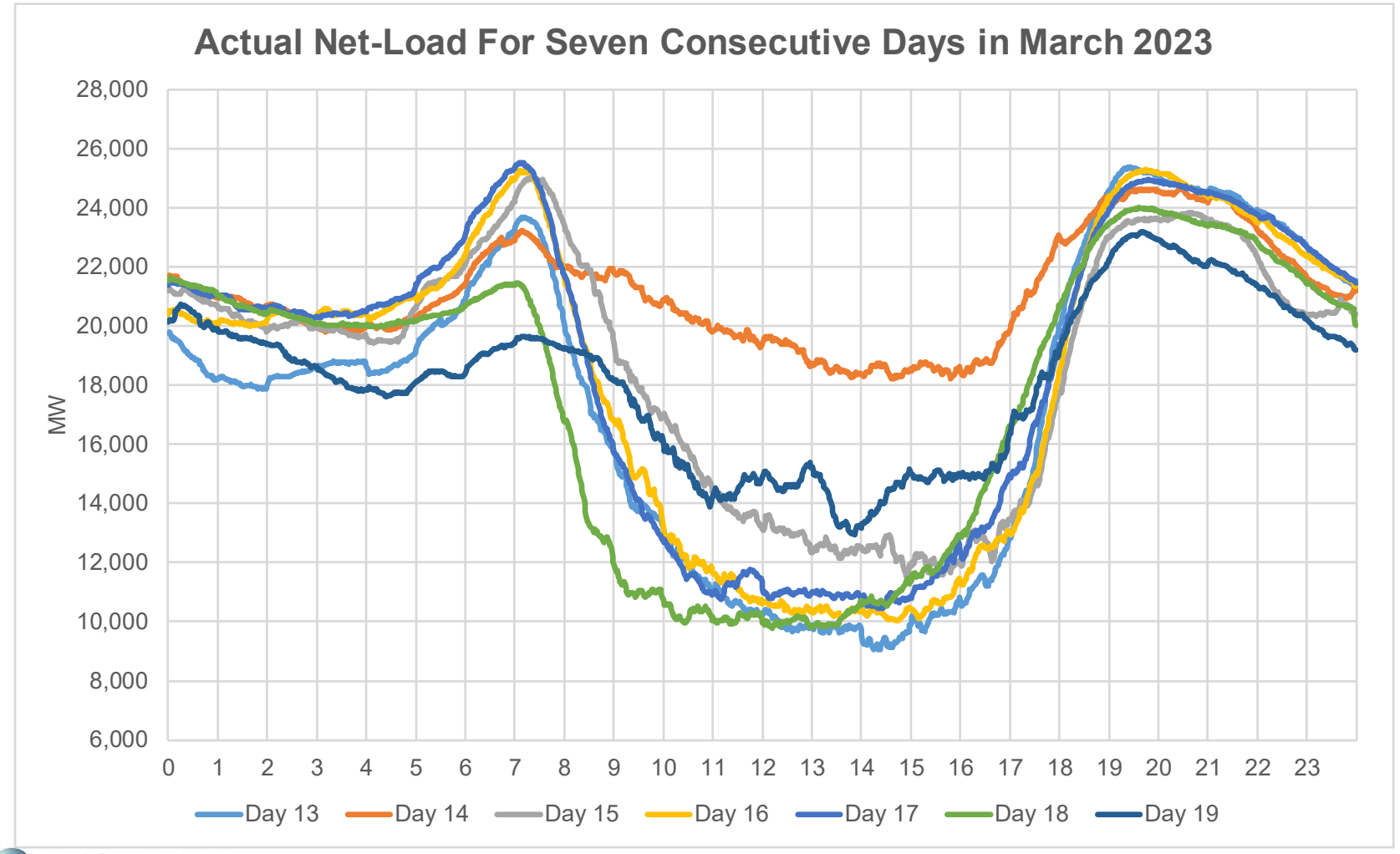


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	138	157	179	318	255	206	31	23	57	99	67	56
2021	62	138	342	193	328	92	34	37	37	136	43	63
2022	57	262	463	596	482	202	99	34	62	100	76	17
2023	53	204	606	703	380	214	58	49	76	211	71	34

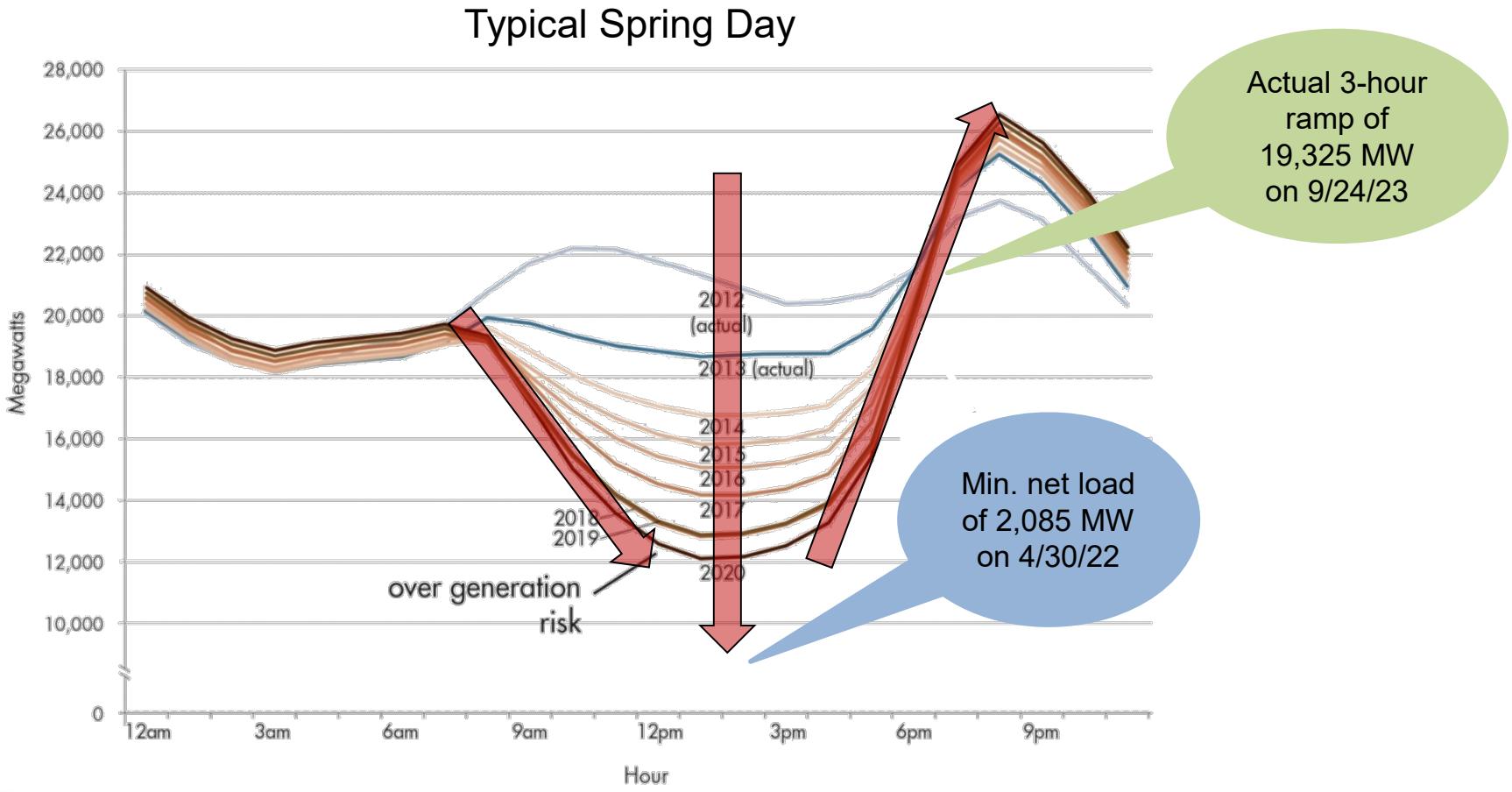
2020-2023: Higher levels of curtailments occur between sunrise and sunset



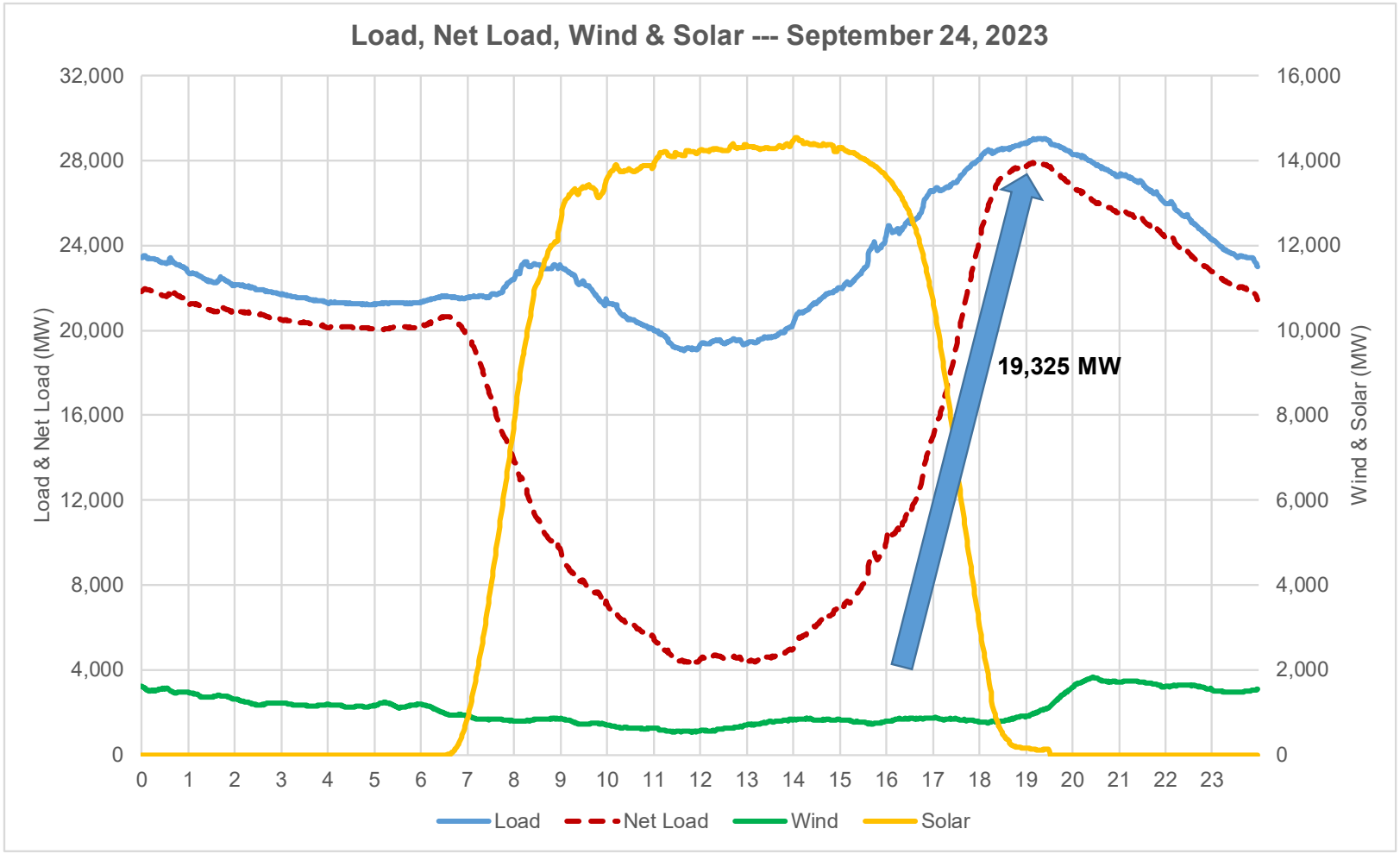
Example of actual net-load variability for seven consecutive days in March 2023



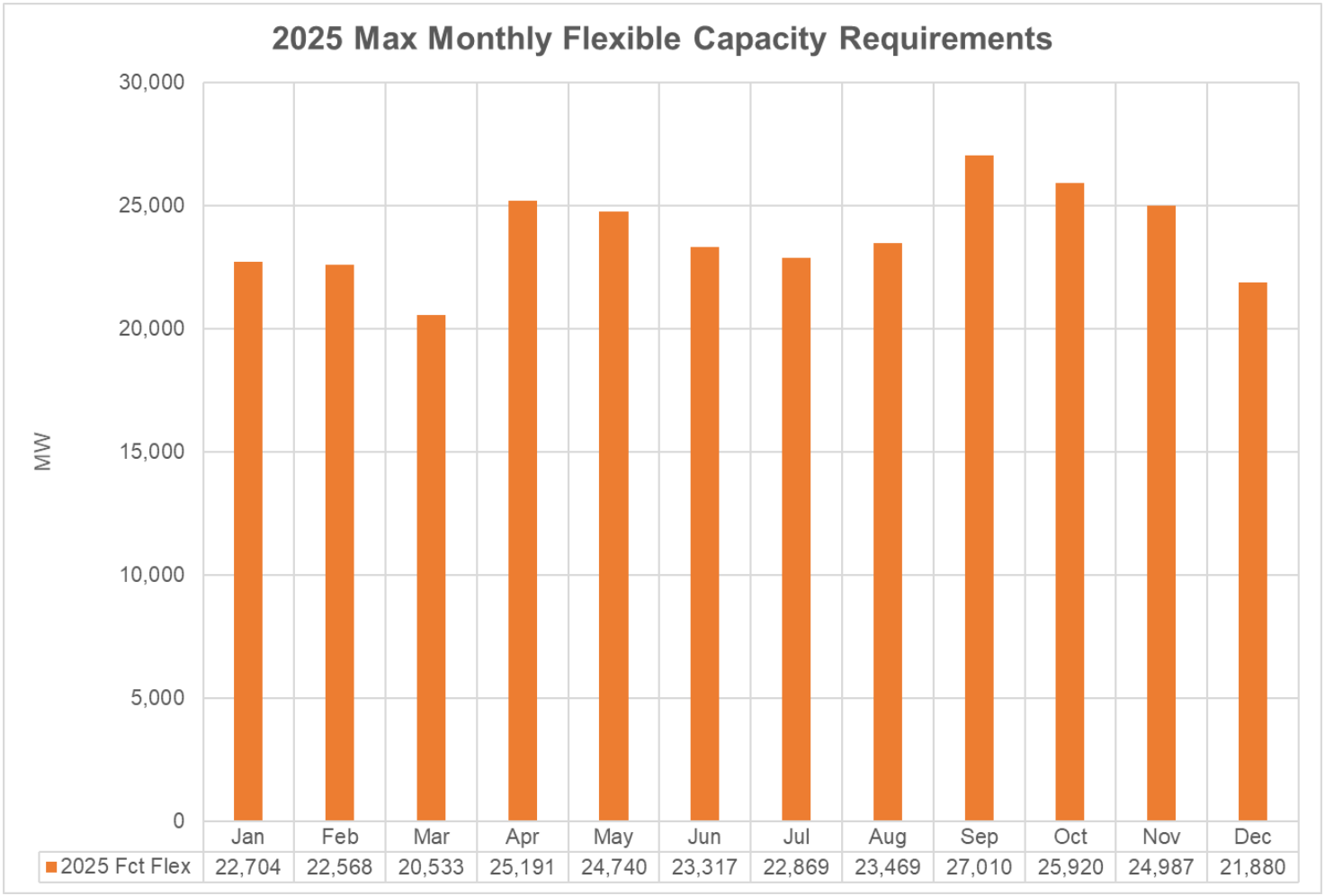
The actual net-load and 3-hour ramps are years ahead of the ISO's original estimate primarily due to under forecasting rooftop solar PV installation



Maximum net-load 3-hour upward ramp in 2023 occurred on September 24



Forecasted monthly 2025 ISO system-wide flexible capacity needs



CAISO RA working group is evaluating potential changes to Flex RA process

- RA working group was developed to review RA program health and make recommendations for changes within the RA program
  - Any changes will be through a stakeholder initiative
- As the resource fleet has evolved, the group will evaluate the overall need for Flex RA, including:
  - If the current process provides reliability benefits
  - Potential enhancements to the design
  - Where the process may need to be altered to obtain reliability objectives

California ISO

Preliminary Results

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Lead Market Development Analyst, Short-Term Forecasting

Jessica Stewart
Senior Energy Meteorologist, Short-Term Forecasting

Components of the flexible capacity needs

Month	Load contribution 2025	Wind contribution 2025	Solar contribution 2025	Total percent 2025
January	33.21%	-2.71%	-64.08%	100%
February	38.03%	0.76%	-62.73%	100%
March	44.09%	0.95%	-56.86%	100%
April	37.56%	-0.58%	-61.86%	100%
May	33.27%	-2.70%	-64.02%	100%
June	34.36%	2.67%	-68.31%	100%
July	28.41%	3.27%	-74.86%	100%
August	28.95%	0.38%	-71.43%	100%
September	34.23%	0.06%	-65.83%	100%
October	35.74%	-0.21%	-64.05%	100%
November	34.69%	-0.04%	-65.27%	100%
December	28.29%	-0.30%	-71.41%	100%

Δ Load – Δ Wind – Δ Solar = 100

Flexible capacity categories allow a wide variety of resources to provide flexible capacity

- Category 1 (Base Flexibility): Operational needs determined by the magnitude of the largest three-hour secondary net load ramp
- Category 2 (Peak Flexibility): Operational need determined by the difference between 95 percent of the maximum three-hour net load ramp and the largest three-hour secondary net load ramp
- Category 3 (Super-Peak Flexibility): Operational need determined by five percent of the maximum three-hour net load ramp of the month

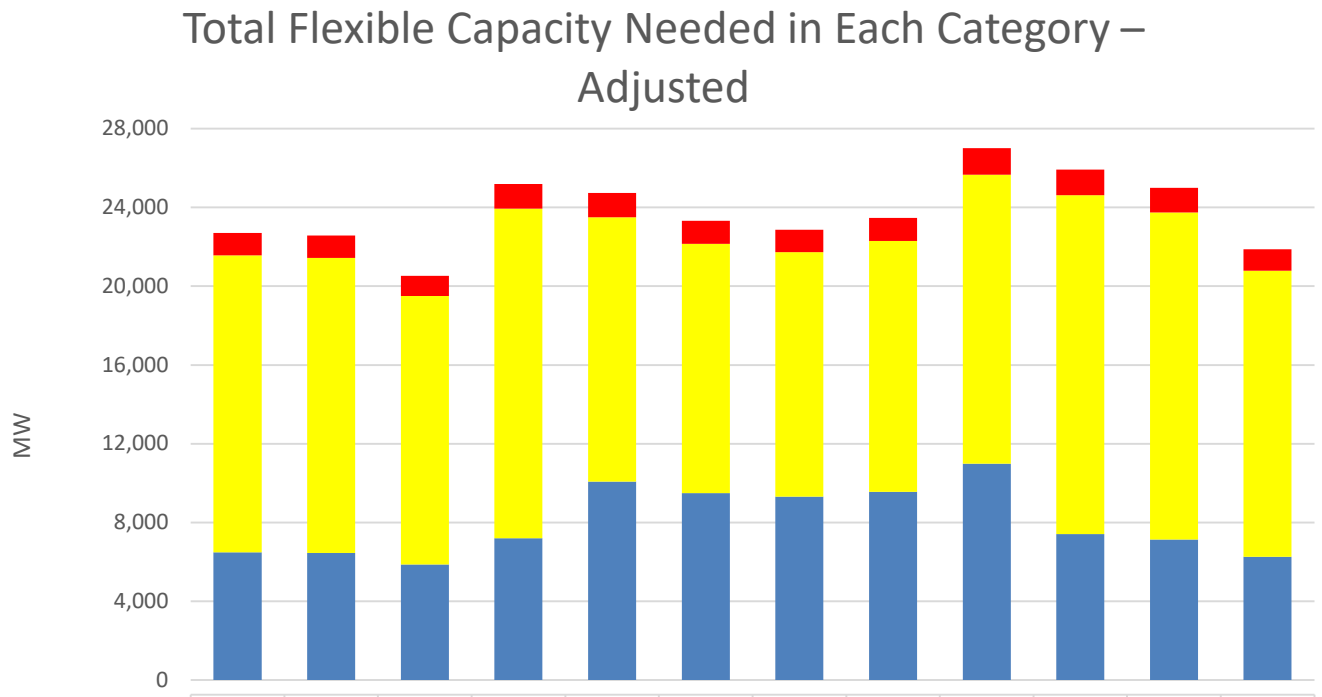
Seasonal breakout of flexible capacity needs

	Actual Contributions			Seasonal Contribution		
	Unadjusted			Adjusted		
Month	Base Flexibility	Peak Flexibility	Super-Peak Flexibility	Base Flexibility	Peak Flexibility	Super-Peak Flexibility
January	27%	68%	5%	29%	66%	5%
February	31%	64%	5%	29%	66%	5%
March	42%	53%	5%	29%	66%	5%
April	29%	66%	5%	29%	66%	5%
May	30%	65%	5%	41%	54%	5%
June	39%	56%	5%	41%	54%	5%
July	43%	52%	5%	41%	54%	5%
August	53%	42%	5%	41%	54%	5%
September	39%	56%	5%	41%	54%	5%
October	24%	71%	5%	29%	66%	5%
November	20%	75%	5%	29%	66%	5%
December	28%	67%	5%	29%	66%	5%

Decreased weighting observed in Peak Category

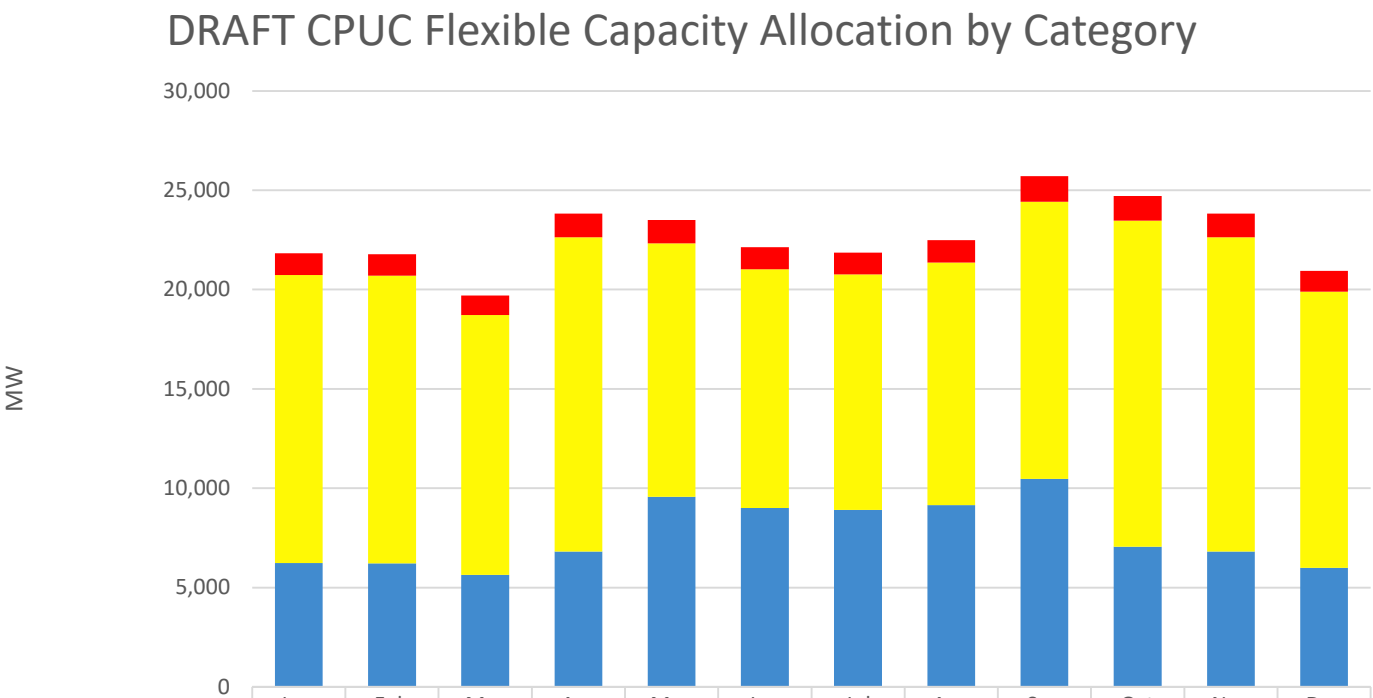
Month	2021	2022	2023	2024	2025
January	57.30%	55.06%	62.74%	68.11%	66.43%
February	57.30%	55.06%	62.74%	68.11%	66.43%
March	57.30%	55.06%	62.74%	68.11%	66.43%
April	57.30%	55.06%	62.74%	68.11%	66.43%
May	45.62%	45.39%	49.28%	57.75%	54.29%
June	45.62%	45.39%	49.28%	57.75%	54.29%
July	45.62%	45.39%	49.28%	57.75%	54.29%
August	45.62%	45.39%	49.28%	57.75%	54.29%
September	45.62%	45.39%	49.28%	57.75%	54.29%
October	57.30%	55.06%	62.74%	68.11%	66.43%
November	57.30%	55.06%	62.74%	68.11%	66.43%
December	57.30%	55.06%	62.74%	68.11%	66.43%

Total flexible capacity needed in each category – seasonally adjusted



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Super-Peak Flexibility	1,135	1,128	1,027	1,260	1,237	1,166	1,143	1,173	1,350	1,296	1,249	1,094
Peak Flexibility	15,081	14,991	13,639	16,733	13,431	12,658	12,415	12,741	14,663	17,217	16,597	14,534
Base Flexibility	6,488	6,449	5,867	7,198	10,072	9,492	9,310	9,555	10,996	7,407	7,140	6,252

CPUC jurisdictional flexible capacity allocation - by flexible capacity category



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Super-Peak Flexibility	1,091	1,089	985	1,191	1,175	1,106	1,093	1,125	1,285	1,235	1,192	1,047
Peak Flexibility	14,500	14,469	13,091	15,821	12,759	12,013	11,869	12,211	13,957	16,412	15,830	13,913
Base Flexiblity	6,238	6,224	5,631	6,806	9,568	9,009	8,901	9,157	10,466	7,060	6,810	5,985

Start time of three-hour net load ramp to evaluate seasonal must offer obligations

	Three Hour Net Load Ramp Start Hour (Hour Ending)				
Month	14:00	15:00	16:00	17:00	18:00
January	2	27	2		
February		17	11		
March		3	11	17	
April			1	29	
May				31	
June			3	27	
July			1	30	
August		2	9	18	2
September		1	29		
October		10	21		
November	7	22	1		
December	4	27			

Seasonal must-offer obligations for peak and super-peak flexible capacity

- Recommended must-offer obligation hours in hour ending

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HE15-HE19	x	x									x	x
HE16-HE20									x	x		
HE17-HE21			x	x	x	x	x	x				

Review of preliminary assessment results

- Flexible Capacity need is largest in January through June
  - Flexible capacity makes up a greater percentage of resource adequacy needs during the off-peak months
  - Increase almost exclusively caused by three-hour ramp, not increase in peak load
- Peak category has heavier weight this year
- The CEC IEPR hourly demand forecast, growth of behind-the-meter solar PV, and PV contributes to the larger flexible capacity requirements
- Using the ISO flexible capacity contribution calculation majority of three-hour net load ramps are attributable to CPUC jurisdictional LSEs
- The Peak and Super-Peak MOO hours have not changed from the 2022 study (information below is in Hour Ending)
  - November through February: HE 15- HE 19 (2:00 p.m. to 7:00 p.m.)
  - March through August: HE 17 – HE 21 (4:00 p.m. to 9:00 p.m.)
  - September through October: HE 16- HE 20 (3:00 p.m. to 8:00 p.m.)

AVAILABILITY ASSESSMENT HOURS

Availability assessment hours: Background and purpose

- Concept originally developed as part of the ISO standard capacity product (SCP)
  - Maintained as part of Reliability Service Initiative – Phase 1 (i.e. RA Availability Incentive Mechanism, or RAAIM)
- Determine the hours of greatest need to maximize the effectiveness of the availability incentive structure
  - Resources are rewarded for availability during hours of greatest need
  - Hours determined annually by ISO and published in the BPM
    - See section 40.9 of the ISO Tariff

Methodology overview of system/local availability assessment hours

- Used CEC IEPR data accounting for DST shift
  - Hourly average load
    - By hour, by month
    - Years 2024-2027
  - Top 5% of load hours within each month using an hourly load distribution

- For 2025, the ISO proposes no changes to the AAH from last year with a three season approach

The ISO proposes continued use of three seasons for AAH

- For 2025, the ISO proposes three seasons for AAH:
  - HE17-HE21 for winter: Jan – Feb, Nov – Dec
  - HE18-HE22 for spring: Mar – May
  - HE17-HE21 for summer: Jun – Oct
  - Watching winter months for shift to HE18-22 for 2026 and 2027

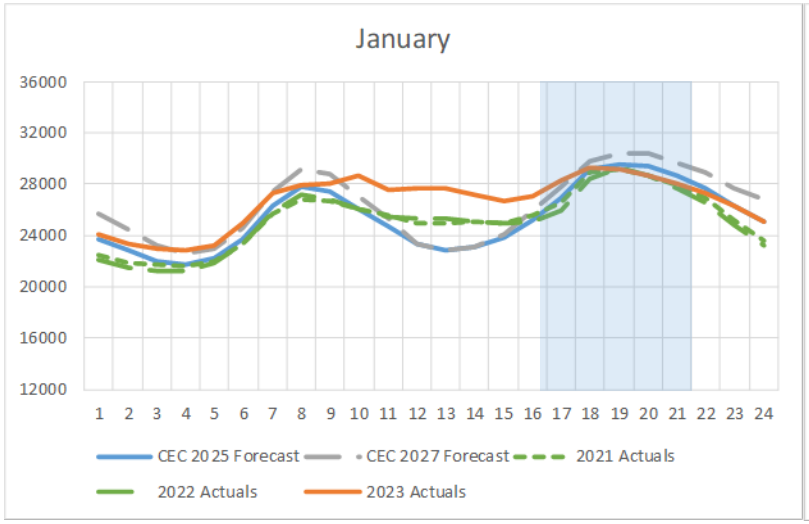
2023 actual frequency of top 5% of load hours

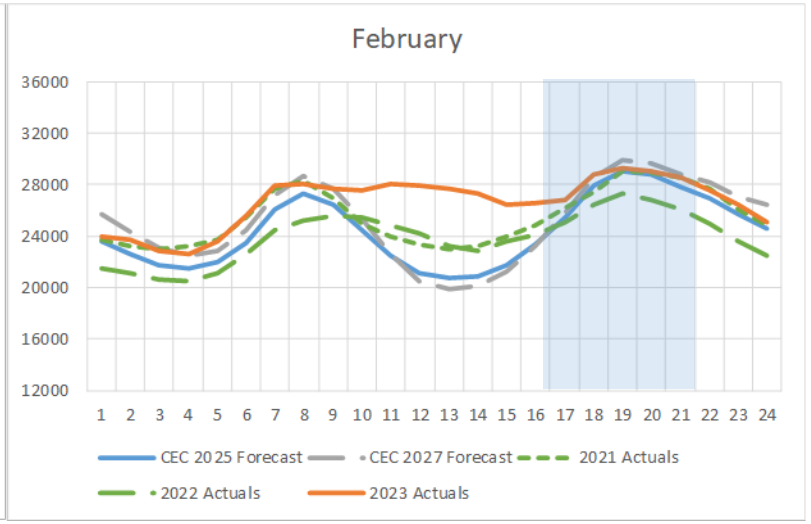
	Hour	15	16	17	18	19	20	21	22	23	Season
MONTH	Jan			2	12	13	6	2			Winter
	Feb				7	8	8	5			Winter
	Mar				2	7	10	8	2		Spring
	Apr				3	3	10	9	5	2	Spring
	May			2	4	5	7	10	6	3	Spring
	Jun	1	1	2	2	4	8	8	8	2	Summer
	Jul		3	5	9	9	8	3			Summer
	Aug	1	3	7	8	8	7	3			Summer
	Sep		3	4	9	8	6	5	1		Summer
	Oct	1	4	7	8	8	6	2	1		Summer
	Nov			5	16	9	6				Winter
	Dec			6	11	10	6	3			Winter
	Total	3	14	40	91	92	88	58	23	7	

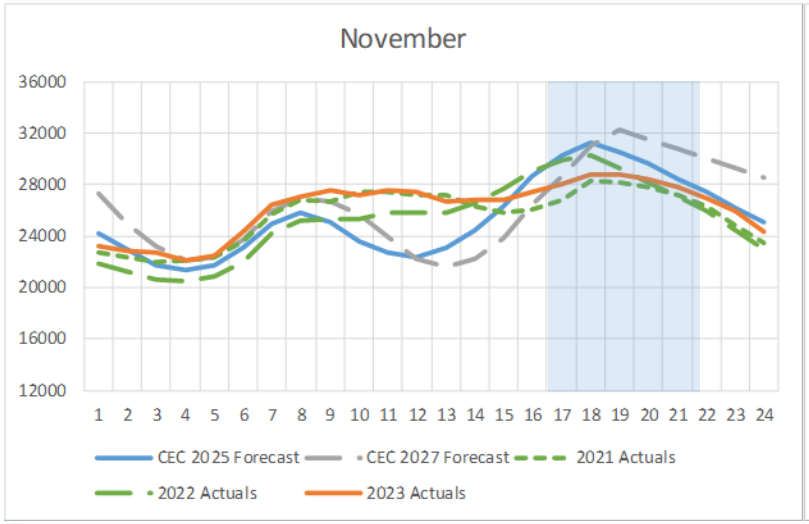
2025 forecast frequency of top 5% of load hours

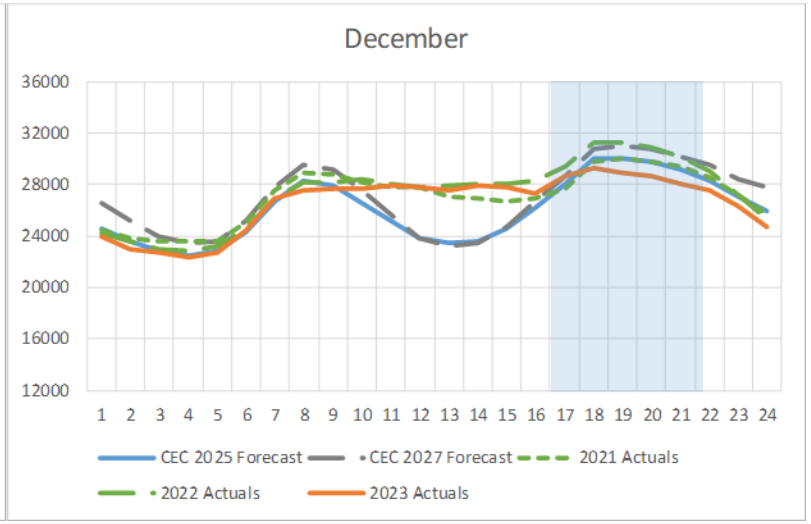
	Hour	15	16	17	18	19	20	21	22	23	Season	Recommendation
MONTH	Jan				8	17	10	2			Winter	HE17-HE21
	Feb				1	18	12	2			Winter	HE17-HE21
	Mar					5	15	13	4		Spring	HE18-HE22
	Apr				2	5	8	11	8	2	Spring	HE18-HE22
	May		1	2	3	6	8	9	6	2	Spring	HE18-HE22
	Jun	1	2	3	5	8	7	6	4		Summer	HE17-HE21
	Jul	1	3	4	7	9	7	4	2		Summer	HE17-HE21
	Aug		3	5	10	11	7	1			Summer	HE17-HE21
	Sep	2	3	5	7	8	6	3	2		Summer	HE17-HE21
	Oct		2	4	7	10	7	5	2		Summer	HE18-HE22
	Nov		1	3	13	14	4	1			Winter	HE17-HE21
	Dec				13	17	6	1			Winter	HE17-HE21
	Total	4	15	26	76	128	97	58	28	4		

Forecast vs. actual in winter months

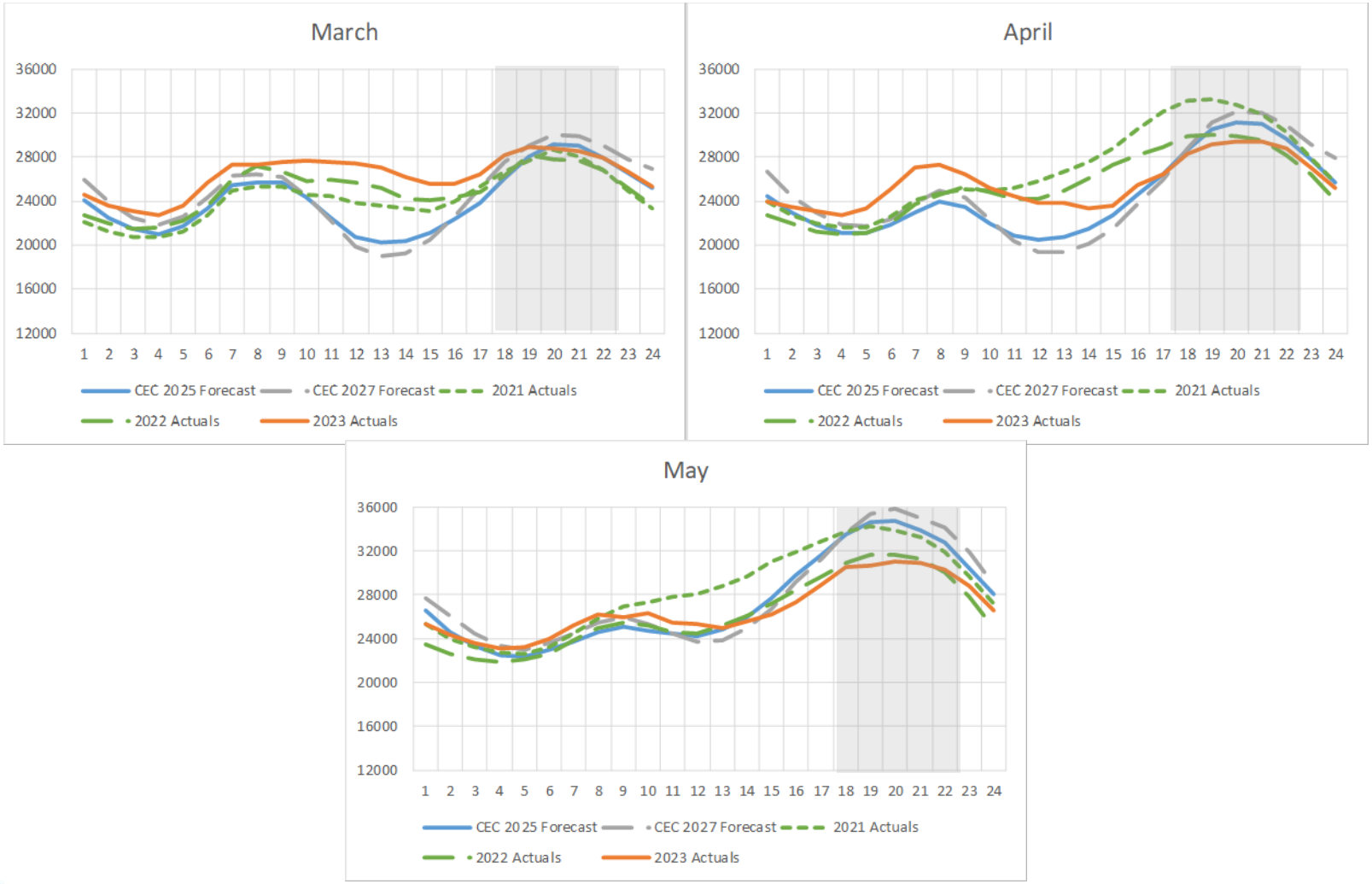




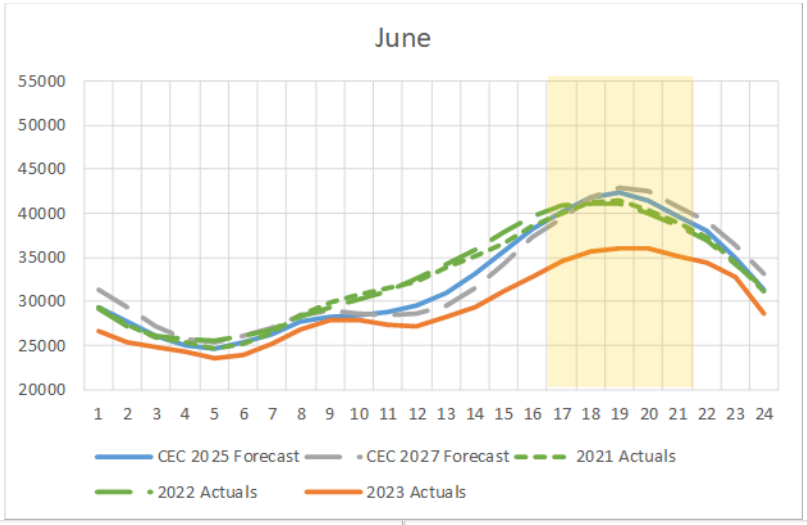


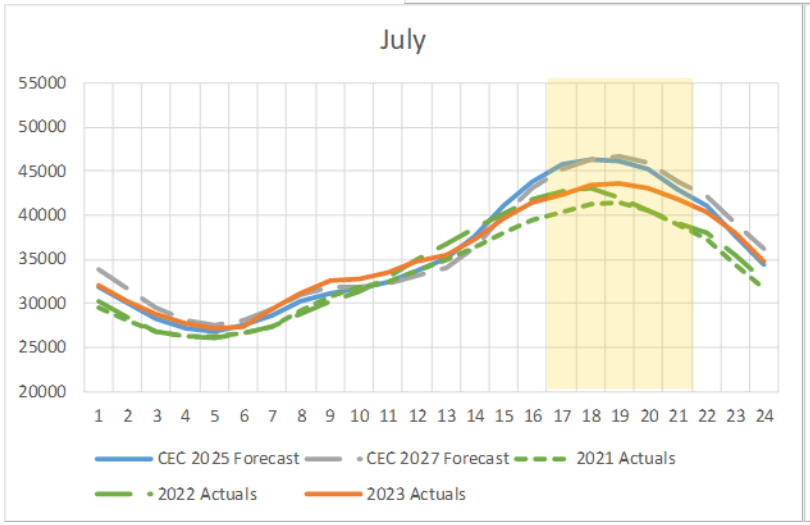


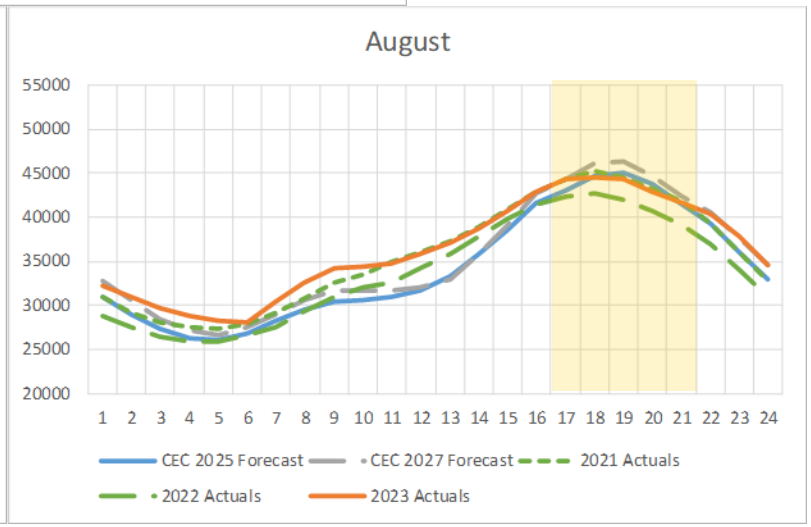
Forecast vs. actual in spring months



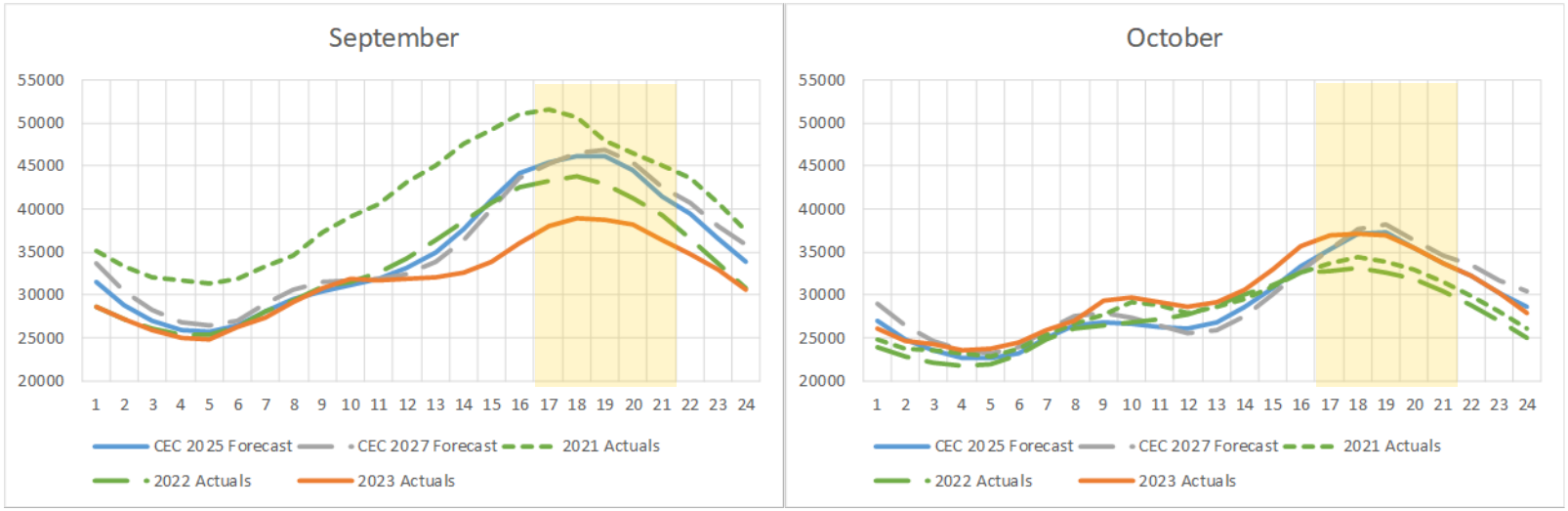
Forecast vs. actual in summer months







Forecast vs. actual in summer months



Availability assessment hours draft recommendation

Summer and Winter Season Draft Recommendation

January – February, June - December

Year	Start	End
2024 (Final)	HE 17	HE 21
2025 (Draft)	HE 17	HE 21

Spring Season Draft Recommendation

March – May

Year	Start	End
2024 (Final)	HE 18	HE 22
2025 (Draft)	HE 18	HE 22

Availability assessment hours advisory recommendation

Summer Season Draft Recommendation

June - November

Year	Start	End
2026 (Estimate)	HE 17	HE 21
2027 (Estimate)	HE 17	HE 21

Spring and Winter Season Draft Recommendation

January – May, December

Year	Start	End
2026 (Estimate)	HE 18	HE 22
2027 (Estimate)	HE 18	HE 22

- Estimates for 2026, 2027 include a shift of January, February, and December to HE18-22 for based on CEC forecast
  - November remains in summer season estimate

Reliability Requirements; Section 7 – BPM Updates Needed

2025 System and Local Resource Adequacy Availability Assessment Hours

Analysis employed: Top 5% of load hours using average hourly load

Spring: March 1 – May 31

Availability Assessment Hours: 5pm – 10pm (HE18 – HE22)

Summer: June 1 - October 31

Availability Assessment Hours: 4pm – 9pm (HE17 – HE21)

Winter: January 1 – February 28, November 1 – December 31

Availability Assessment Hours: 4pm – 9pm (HE17 – HE21)

2025 Flexible Resource Adequacy Availability Assessment Hours and must offer obligation hours

Flexible RA Capacity Type	Category Designation	Required Bidding Hours	Required Bidding Days
January – February November – December			
Base Ramping	Category 1	5:00am to 10:00pm (HE6-HE22)	All days
Peak Ramping	Category 2	2:00pm to 7:00pm (HE15-HE19)	All days
Super-Peak Ramping	Category 3	2:00pm to 7:00pm (HE15-HE19)	Non-Holiday Weekdays*
March – August			
Base Ramping	Category 1	5:00am to 10:00pm (HE6-HE22)	All days
Peak Ramping	Category 2	4:00pm to 9:00pm (HE17-HE21)	All days
Super-Peak Ramping	Category 3	4:00pm to 9:00pm (HE17-HE21)	Non-Holiday Weekdays*
September – October			
Base Ramping	Category 1	5:00am to 10:00pm (HE6-HE22)	All days
Peak Ramping	Category 2	3:00pm to 8:00pm (HE16-HE20)	All days
Super-Peak Ramping	Category 3	3:00pm to 8:00pm (HE16-HE20)	Non-Holiday Weekdays*

Next steps

- Draft Flexible Capacity Needs Assessment and Draft AAH for 2024 published on April 11, 2024
- Comments due by end of day April 29, 2024

  Submit comments through the ISO's commenting tool, using the template provided on the process webpage:

  https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/Flexible-capacity-needs-assessment-2025

- Publish Final Flexible Capacity Needs Assessment and AAH for 2025 on May 17th, 2024

Save the Date - California New Resource Implementation

We will host a hybrid California New Resource Implementation (NRI) stakeholder meeting on May 1, 2024.

We aim to bolster collaboration with our stakeholder community in preparation for the upcoming summer operations. Our objective is to improve transparency surrounding the NRI process and outline expectations.

If you plan to attend the working group in person, please **register** by end of day April 26, 2024.

The final agenda and a presentation will be available prior to the meeting on the **public forums webpage**.

The California ISO Stakeholder Symposium will be held on Oct. 30, 2024 at the Safe Credit Union Convention Center in Sacramento, California.

A welcome reception for all attendees will be held the evening of Oct. 29.

Additional information, including event registration and sponsorship opportunities, will be provided in a future notice and on the ISO's website.

Please contact Symposium Registration at **symposiumreg@caiso.com** with any questions.

Questions

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