



California ISO

# **Draft Flexible Capacity Needs Assessment for 2026**

April 28, 2025

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## **1.0 INTRODUCTION**

Each year, the ISO conducts an annual flexible capacity technical study to determine the flexible capacity needs of the system for up to three years into the future. This helps to ensure the ISO maintains system reliability as specified in the ISO Tariff section 40.10.1. The ISO developed and evolved the study process in the ISO's Flexible Resource Adequacy Criteria and Must-Offer Obligation ("FRAC-MOO") stakeholder initiative and in conjunction with the CPUC annual Resource Adequacy proceeding (R.11-10-023). This report presents the ISO's flexible capacity needs assessment specifying the ISO's forecast monthly flexible capacity needs in year 2026.

The ISO calculates the overall flexible capacity need of the ISO system and the relative contributions to this need attributable to the load serving entities (LSEs) under each local regulatory authority (LRA). This report details the system-level flexible capacity needs and the aggregate flexible capacity need attributable to CPUC jurisdictional load serving entities (LSEs). This report does not break-out the flexible capacity need by LSE attributable to individual local regulatory authorities (LRAs) other than the CPUC.

The ISO will use the results from the study to allocate shares of the system flexible capacity needs to each LRA with LSEs responsible for load in the ISO Balancing Authority area consistent with the allocation methodology set forth in the ISO's Tariff section 40.10.2. Based on that allocation, the ISO will advise each LRA of its MW share of the ISO's flexible capacity needs.

Also as a part of the annual Flex RA process, the ISO calculates the annual Availability Assessment Hours (AAH). The AAH are used to determine the hours of greatest need to maximize the effectiveness of the RA Availability Incentive Mechanism (RAAIM), rewarding resources for being available during these hours. The AAH are updated annually and published in the Reliability Requirements BPM.

## **2.0 SUMMARY OF OVERALL PROCESS**

The ISO determines the quantity of flexible capacity needed each month to reliably address its flexibility and ramping needs for the upcoming resource adequacy year and publishes its findings in this flexible capacity needs assessment. The ISO calculates flexible capacity needs using the calculation method codified in the ISO Tariff. This methodology includes calculating the seasonal amounts of three flexible capacity categories and determining seasonal must-offer obligations for two of these flexible capacity categories. The key results of the ISO's flexible capacity needs assessment for 2026 are based on the California Energy Commission's (CEC) 1-

in-2 hourly IEPR forecast Managed Total Energy for Load<sup>1</sup>, which looks at the following components provided by the CEC for 2026:

- a. Baseline Consumption Load
  - i. Unadjusted consumption
  - ii. Data center
  - iii. Agricultural and water pumping
  - iv. Electric vehicle (EV) charging
- b. Behind the meter (BTM) photo voltaic (PV)
- c. BTM storage residential (RES) and non-residential (NONRES)
- d. Additional achievable (Varying Scenarios)
  - i. Energy efficiency (AAEE)
  - ii. Transportation electrification
  - iii. Fuel substitution

The CEC Demand Forecast does not contain battery charging load for market and in front of the meter battery resources.

In addition to the flexible capacity and ramping needs, the calculation of the annual availability assessment hours (AAH) are also completed as a part of the Flex RA study process using the IEPR data described above, as well as the most recent year of actuals.

## 2.1 Summary of Overall Results

- i. The expected system-wide flexible capacity needs for 2026 are greatest in June with 27,559 MW, and lowest in December at 23,386 MW.
- ii. The calculated flexible capacity needed from the “base flexibility” category is 40 percent of the total amount of installed or available flexible capacity in the summer months (May – September) and 27percent of the total amount of flexible capacity for the non-summer months (October – April). See Section 6 for detailed description of the method used.
- iii. The “peak flexibility” categories are stable for both seasons, with 2026 summer 55% and winter 68%.
- iv. The ISO established in this year’s assessment for 2026 the time period of the must-offer obligation for resources counted in the “Peak” and “Super-Peak” flexible capacity categories as the five-hour periods of hour ending HE15 to HE19 for October through February and HE17 to HE21 for May through August, and the shoulder months March,

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<sup>1</sup> <https://efiling.energy.ca.gov/GetDocument.aspx?tn=262289&DocumentContentId=98796>

April, and September hours HE16-HE20. Section 8.0 discusses the monthly pattern of the must-offer obligation hours in 2026.

- v. The ISO also published advisory requirements for two additional years (2027 and 2028) following the upcoming Resource Adequacy (RA) year at the ISO system total levels is shown in Figure 5b.
- vi. The determined draft AAH for 2026 are HE17-21 for the summer months (June – October), HE18-22 for the winter months (January – February, and November – December), and lastly, HE18-H22 for spring months (March – May).

### 3.0 CALCULATION OF THE ISO SYSTEM-WIDE FLEXIBILITY CAPACITY NEED

Based on the methodology described in the ISO’s Tariff and the business practice manual<sup>2</sup>, the ISO calculated the ISO system-wide flexible capacity needs as follows:

$$Flexibility\ Need_{MTH,y} = Max\left[\left(3RR_{HRx}\right)_{MTH,y}\right] + Max\left(MSSC, 3.5\% * E\left(PL_{MTH,y}\right)\right) + \epsilon$$

Where:

$Max\left[\left(3RR_{HRx}\right)_{MTH,y}\right]$  = Largest three hour contiguous ramp starting in hour x for month y

$E(PL)$  = Expected peak load

$MTHy$  = Month y

$MSSC$  = Most Severe Single Contingency<sup>3</sup>

$\epsilon$  = Annually adjustable error term to account for load forecast errors and variability methodology

For the 2026 RA compliance year, the ISO will continue to set epsilon ( $\epsilon$ ) equal to zero.

In order to determine the flexible capacity needs, including the quantities needed in each of the defined flexible capacity categories, the ISO conducted a six-step assessment process:

- i. Generated one minute Net load forecast for years 2026 through 2028 using all expected<sup>4</sup> and existing grid connected wind and solar resources and the CEC (CED 2023 Hourly Forecast – CAISO – Planning Scenario) hourly IEPH load forecast. The

<sup>2</sup> Reliability Requirements Business practice manual Section 10. Available at <https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Reliability%20Requirements>

<sup>3</sup> For the 2026 flex assessment, the ISO assumed its MSSC is the loss of one Diablo Unit, which is consistent with what was done in past assessments. Also, for this analysis the ISO continues to use 3.5% of its peak monthly load forecast to estimate the spinning reserve requirement of its contingency reserve obligation.

<sup>4</sup> Expected wind and solar resources also included monthly incremental renewable resources that are dynamically scheduled into the ISO.

ISO used the most recent year of one-minute actual load without batteries charging (2024) data to formulate a shaped and smoothed one-minute 2026-2028 load forecast.<sup>5</sup>

- ii. Calculated the forecast monthly system-level three-hour upward net load ramp plus either the greater of the most severe single contingency or approximately 50% of the contingency reserves requirement of the system. Further, classify the monthly three-hour upward net load ramp into three categories and then calculate the percentages of each category relative to the three-hour upward net load ramp in each month. For the definition of each of the three categories and the relevant percentage, please refer to Section 6.0 below.
- iii. Applied the calculated percentages in Step (ii) to the contingency reserve requirements for each month, so that each category has the appropriate amount of contingency reserve as well the three-hour net load ramp component. For each category, the ISO uses the sum of these two quantities as the monthly flexible capacity need.
- iv. Analyzed the distributions of both the largest three-hour net load ramps for the primary and secondary net load ramps to determine the appropriate seasonal demarcations<sup>6</sup>.
- v. Calculated a simple average of the percent of base flexibility needs for all months within a season; and
- vi. Determined each LRA's contribution to the flexible capacity need.

#### **4.0 FORECASTING ONE-MINUTE NET LOAD**

The first step in developing the flexible capacity needs assessment was to forecast the net load. To produce this forecast, the ISO collected through surveys the requisite information regarding the existing build-out in 2024 and the expected build-out in 2026 through 2028 of the grid-connected wind and solar resources. After obtaining this data from all LSEs, the ISO constructed the forecast one-minute load, grid connected solar and wind resources before calculating the net load curves for 2026 through 2028.

#### **4.1 Building the Forecasted Variable Energy Resource Portfolio**

To collect the necessary data, the ISO sent a data request in December 2024 to the scheduling

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<sup>5</sup> See the Draft 2026 Flexible Capacity Needs Assessment at <https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/Flexible-capacity-needs-assessment-2026> for more information on the shifting and smoothing methodology

<sup>6</sup> The three-hour primary ramp in each day is the largest three-hour ramp in that day, while the secondary three-hour ramp is the largest three-hour ramp outside the range of the primary three-hour ramp.

coordinators for all LSEs representing load within the ISO Balancing Area<sup>7</sup>. To assist with common questions regarding the survey, the ISO updated the FAQ document which is available on the stakeholder page.<sup>8</sup> The deadline for submitting the data request was January 15, 2025. At the time of the stakeholder call in February, the ISO had received data from all LSEs. The data request asked for information on each grid connected wind and solar resource that is connected within the ISO's footprint, in whole or in part, in addition to external wind/solar resources that are under contractual commitment to the LSE for all or a portion of its capacity that is expected to be dynamically imported into the ISO. Since the CEC's load forecast accounted for the expected behind-the-meter production, there was no need for the ISO to include the behind-the-meter production in the net load calculation.

The ISO also requested LSEs to provide data on existing and expected Hybrid and Co-Located resources in order to quantify the contribution of the renewable component. The Co-Located resource type went live in December 2021 as part of Phase 1 of the hybrid resources initiative<sup>9</sup>, and phase 2 went live February 1, 2023 and included the addition of the new Hybrid fuel type and the ability to identify Hybrid components by fuel type within the ISO's Master File. The submittals showed a total of about 9,361 MW of existing and expected Co-Located renewable resources (excluding storage) in the 2026 timeframe, which were factored into the flexible needs assessment. The survey submittals of Hybrid resources showed a total of 1,488 MW of expected renewable Hybrid components in 2026. Flexible RA study, Co-Located renewables and renewable components of Hybrid resources were also included in calculating the flexible capacity needs.

The ISO anticipates a large increase in Co-located and Hybrid resources with renewable components on the system throughout 2025-2028. Co-located resources have the ability to produce as capable and with their treatment in the market being nearly identical to those of a traditional Variable Energy Resource (VER). Co-located resources were included in the 2023 and 2024 three-hour ramp forecast and flexible capacity study. In regards to Hybrid resources, although the Hybrid resources as a whole are expected to follow their dispatch operating targets (DOTs), the individual renewable components will contribute to the three-hour net load ramp. Renewable components of Hybrid resources must be considered in the flexible needs assessment because all variable resources contribute to the three-hour ramp. Variable resources, whether it be a standalone or the variable component of a Hybrid, contribute to the flexibility requirement of the system, thus the ISO incorporates forecasts to estimate the flexible needs associated with these resources. The ISO allows the storage component for Co-

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<sup>7</sup> A reminder notice was also sent out in early January 2025

<sup>8</sup> <http://www.caiso.com/InitiativeDocuments/Flexible-Capacity-Requirement-Assessment-Survey-FAQ.pdf>

<sup>9</sup> <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Hybrid-resources>

located and Hybrid resources to count towards flexible capacity requirement.

As part of the data request, the ISO also asked for behind-the-meter solar existing and expected capacity within each LSEs portfolio. For resources that are external to the ISO, the ISO requested additional information as to whether the resource would be either fixed or dynamically scheduled into the ISO. The ISO only included incremental external resources in the flexible capacity requirements assessment if they were identified to be dynamically scheduled to the ISO.

Using the LSE’s submitted renewable resources data and the CEC’s hourly load forecast, the ISO simulated the net load<sup>10</sup> output for 2026, 2027 and 2028 using actual one-minute load, wind and solar data for 2024. A breakdown of the LSEs submittal is shown in Table 1. The ISO is comparing the data submitted by the LSEs below to data in the interconnection queue and current capacity to ensure alignment, during review the ISO observes survey submittals are lower than current capacity for hybrid resources. The ISO may perform additional outreach to LSEs based on the data submitted to ensure all resources are being included.

*Table 1: Total ISO System Variable Energy Resource Capacity for Year End Based on LSE Survey Data (Net Dependable Capacity-MW)<sup>11</sup>*

Resource Type	Existing 2024	Expected 2025	Expected 2026
ISO Solar PV	12,516	12,646	12,901
ISO Solar Thermal	860	858	617
ISO Wind	5,064	4,987	5,970
Co-Located Resources (Wind)	0	0	148
Co-Located Resources (Solar)	6,289	7,628	9,213
Hybrid Resources (Wind)	0	0	0
Hybrid Resources (Solar)	818	818	1,488
<b>Total Variable Energy Resource Capacity within the ISO</b>	<b>25,547</b>	<b>26,936</b>	<b>30,337</b>
Cumulative Non ISO Wind/Solar Resources that's Dynamically Scheduled into the ISO	1,009	1,009	1,259
<b>Total Internal and Dynamically Scheduled VERs in Flexible Capacity Needs Assessment</b>	<b>26,556</b>	<b>27,945</b>	<b>31,596</b>
Incremental New VERs Additions Each Year (Included in Flexible Capacity Needs Assessment)		<b>1,389</b>	<b>3,651</b>
Maximum Expected BTM Solar PV Production in the CEC's Forecast		14,433	14,931
Cumulative behind-the-meter Solar PV Capacity reported by LSEs	16,884	18,062	19,305

<sup>10</sup> Net Load is defined as load minus wind production minus solar production.

Table 1 aggregates the system-wide variable energy resources output by year. Additionally, for existing solar and wind resources, the ISO used the most recent full year of actual solar output data available, which was 2024.

Figures 1a, 1b below show the expected buildout by month and year for Hybrid and Co-Located resources with renewable components, broken down by fuel type. For this study, both Co-Located renewables and the renewable components of Hybrid resources were considered.

Figure 1a: Expected buildout of Hybrid Resources for 2024 through 2028

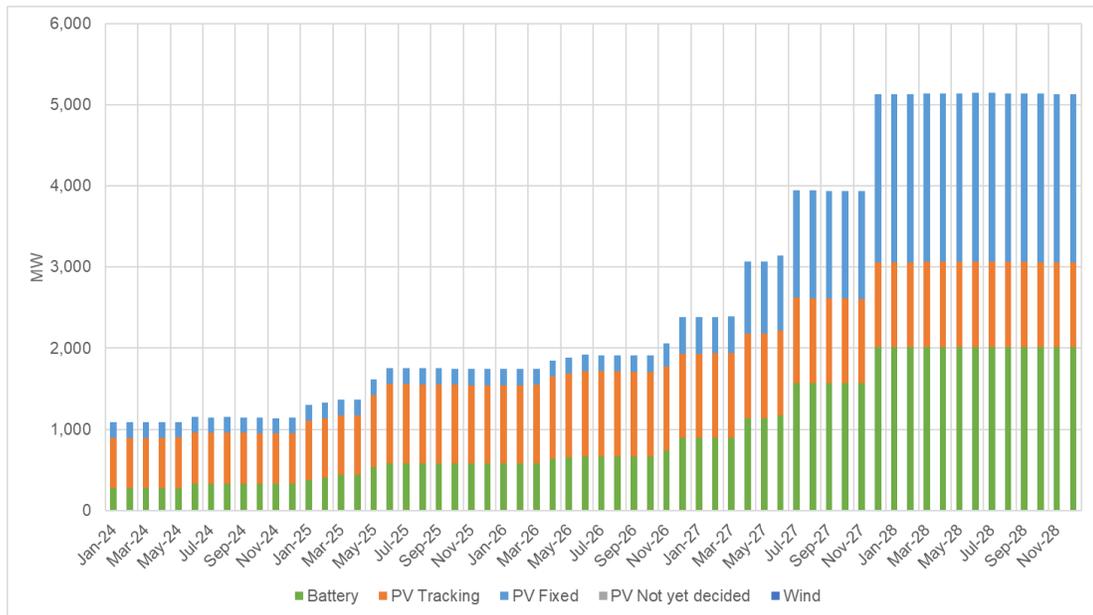
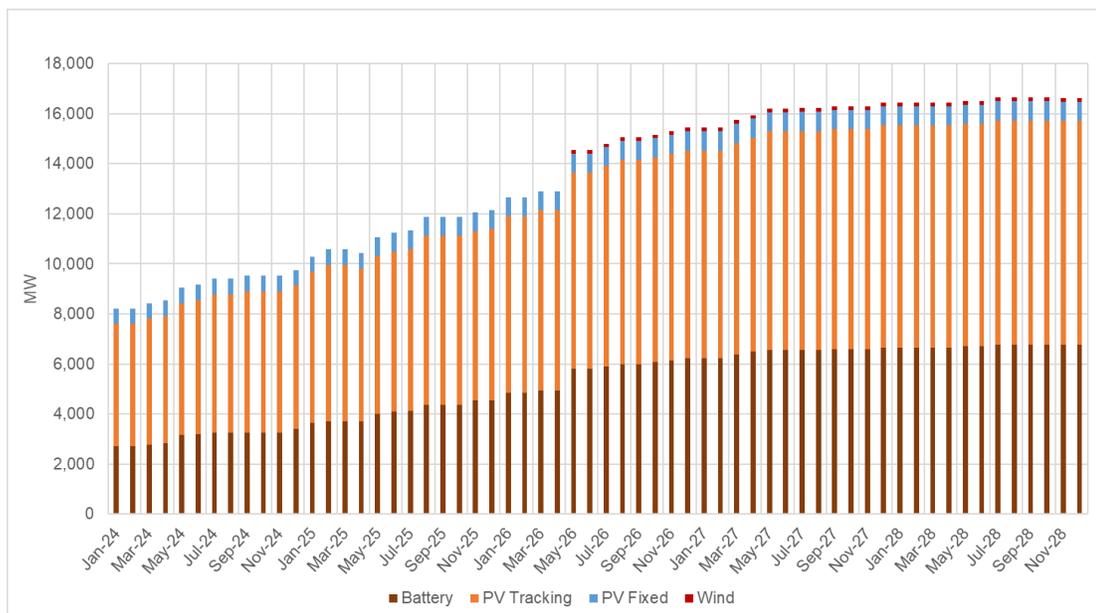


Figure 1b: Expected buildout of Co-Located Resources for 2024 through 2028



For future wind resources, the ISO scaled the overall one-minute wind production for each month of the most recent year by the expected future capacity divided by the installed wind capacity for the same month of the most recent year. Specifically, to develop the one-minute wind profiles for 2026, the ISO used the actual one-minute wind profile for 2024 using the following formula:

$$2026W_{Mth\_Sim\_1min} = 2024W_{Act\_1min} * \frac{2026W_{Mth\ Capacity}}{2024W_{Mth\ Capacity}}$$

Similarly, to develop one-minute transmission connected solar profiles for 2025, the ISO used the actual one-minute solar profiles for 2023 using the following formula:

$$2026S_{Mth\_Sim\_1min} = 2024S_{Act\_1min} * \frac{2026S_{Mth\ Capacity}}{2024S_{Mth\ Capacity}}$$

Given the amount of incremental wind and solar resources expected to come on line, this approach simply scales the one-minute production with respect to capacity.

#### 4.2 Building One-Minute Load Profile

The ISO used the CEC 2024 Integrated Energy Policy Report (IEPR) 1-in-2 hourly managed net load forecast (CED 2024 Hourly Forecast – CAISO – Planning Scenario) to develop one-minute load forecasts for each month<sup>12</sup>. The ISO first adjusted the actual load for each minute of each hour of 2024 using an expected CEC’s forecast for the corresponding hour.

$$2026L_{Mth,Day,Hour\_Sim\_1min} = 2024L_{Mth,Day,Hour\_Act\_1min} + X$$

*X = Interpolated 1 min profile from the difference*

#### 4.3 Building One-Minute Net Load Profile

Using this load forecast and the expected wind and solar profiles developed in Sections 4.1 and 4.2, the ISO then developed the one-minute net load profiles for subsequent years by adding the load, wind and solar components.

### 5.0 CALCULATING THE MONTHLY MAXIMUM THREE-HOUR NET LOAD RAMPS PLUS RESERVE

#### 5.1 CEC IEPR Demand Forecast

In 2023 Flex RA study using the 2022 IEPR forecast, the ISO has made adjustments to account for a high bias observed in the CEC IEPR forecast for the CAISO load ramp forecast. For the 2024 and 2025 study, the ISO did not make any changes or apply any correction metrics to the three-

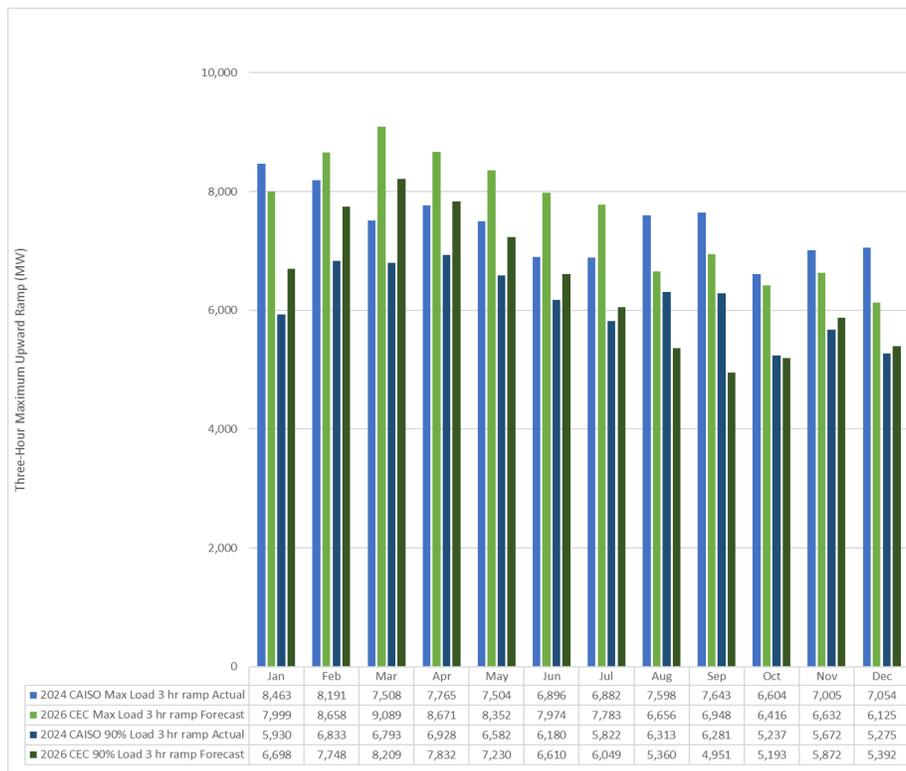
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<sup>12</sup> <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-IEPR-03>

hour ramp forecast. This is because the 2023 IEPR forecast used in calculating the 2024 study requirements had improvements made to the incorporation of BTM solar based on historical data<sup>13</sup>. Additionally, further steps were taken to improve self-generation estimates for the 2024 IEPR forecast<sup>14</sup>.

In order to isolate the impact of CEC IEPR forecast input into the ISO Flex RA methodology, the ISO derived the three hour ramps from CEC IEPR 2026 vs. the three hour ramps from CAISO load actuals for 2024 (Figure 2). Specifically, monthly maximum and 90<sup>th</sup> percentile values are reported in order to mitigate extreme observations in CAISO’s load. The impact is further refined by only considering load ramps beginning between 3:00 p.m. and 5:00 p.m. (e.g., 2024 observed net-load ramp maximums only begin in these hours). Most importantly, the results display no systematic bias, such as what was cited in the 2023 study. The three hour ramp for CEC 2026 forecast tends to be slightly higher, but that is consistent with a general increase of load ramp year on year. Additionally, the monthly values tend to only diverge by 100s of MW in either direction, with some exception.

Figure 2: Three Hour Load Ramp CAISO Actuals vs. CEC (Maximum Values and 90<sup>th</sup> Percentile Values)



<sup>13</sup> [https://www.energy.ca.gov/sites/default/files/2024-05/2023\\_Integrated\\_Energy\\_Policy\\_Report\\_Highlights\\_ADA.pdf](https://www.energy.ca.gov/sites/default/files/2024-05/2023_Integrated_Energy_Policy_Report_Highlights_ADA.pdf)

<sup>14</sup> [https://www.energy.ca.gov/sites/default/files/2024-11/2024\\_California\\_Energy\\_Demand\\_Preliminary\\_Annual\\_Consumption\\_and\\_Sales\\_Forecast\\_Results\\_ada.pdf](https://www.energy.ca.gov/sites/default/files/2024-11/2024_California_Energy_Demand_Preliminary_Annual_Consumption_and_Sales_Forecast_Results_ada.pdf)

An interesting result is the seasonal variation in load ramp percentiles, alternatively put, months in which CEC and CAISO have greater departures. First, CEC showed significantly higher values in March for the max and 90<sup>th</sup> percentile ~1400-1600 MW, suggesting a more systematic seasonal deviation. Second, the reverse is observed in late summer, where the CEC shows values 700-1300 MW lower than the CAISO load ramp. These accentuated deviations may simply be the result of modeling assumptions between 2024 and 2026 (e.g., increased PV self-generation), regardless, CAISO will continue to monitor in future years.

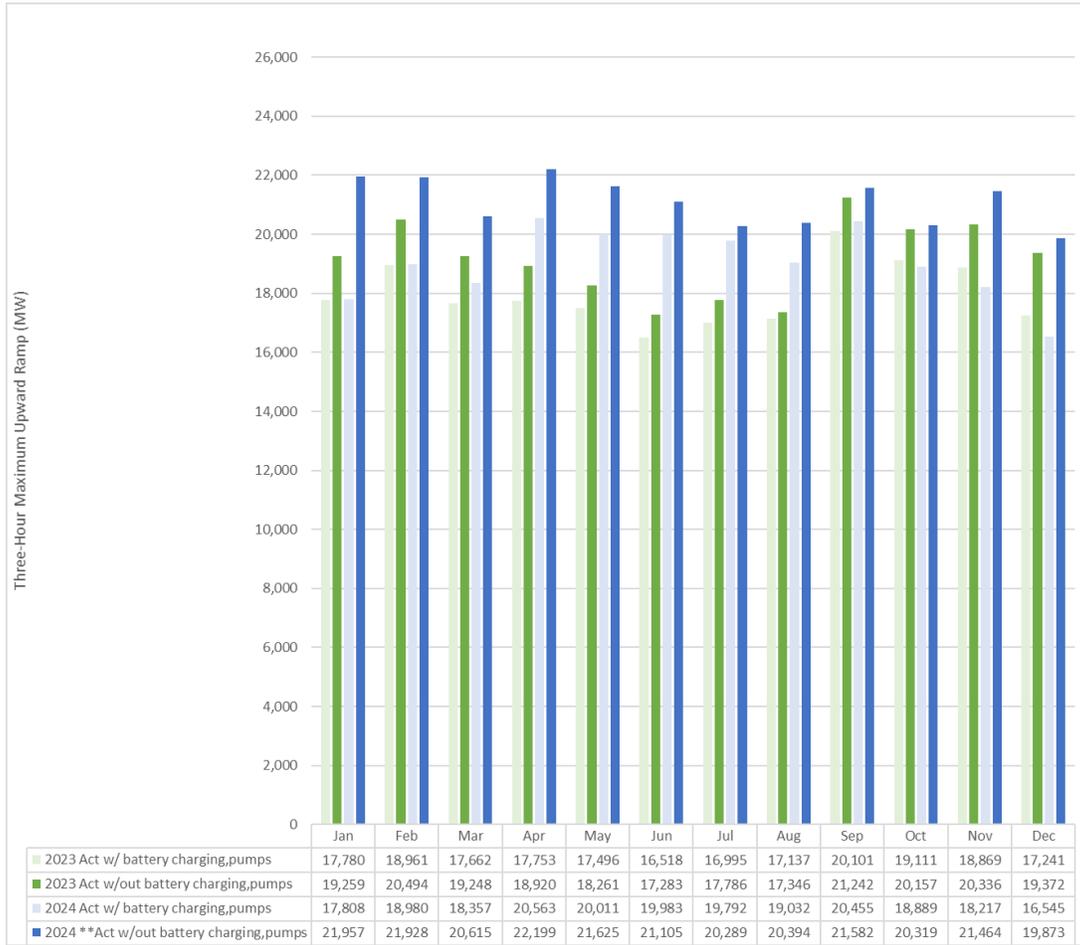
However, an important element to highlight from previous Flex RA studies is how battery charging load is treated. The CEC IEPR forecast does not include the impact of grid-scale battery charging in its hourly forecast out to 2040. Previously the ISO has utilized a load actual tag that includes grid-scale battery charging and discretionary pumps. As a result, the ISO will leverage a new demand actual tag for the purpose of (1) performing shifting and smoothing operation to develop 1-min profile of 2026-28 demand and (2) to measure the accuracy of the binding forecast in future years. This will be discussed further in the next section.

## **5.2 Treatment of Batteries in CAISO's Actual Three Hour ramp**

The ISO will leverage a new actual demand tag for the purpose of (1) performing shifting and smoothing operation to develop 1-min profile of 2026-28 demand and (2) to measure the accuracy of the binding forecast in future years. This change was made due to battery resources receiving Effective Flexible Capacity (EFC) for the charge and discharge range, in addition to better align the actual utilized with the CEC IEPR Forecast.

The methodology of deriving the 1-min load profiles for future years, described in section 4.2, is highly sensitive to the CEC IEPR forecast. This particular fact can be observed by applying the ISO's methodology against both the load actuals historically used, and the load actuals that reduce load by the magnitude of battery charging and discretionary pumps. Despite the spread, particularly in Winter months, of the historical load actual definitions (Figure 3), the methodology utilized shows little change to the forecasted three hour ramps (Figure 4a).

Figure 3: Three Hour net load Ramp Actuals with Battery Impacts 2023-2024



For 2026, the maximum three-hour upward ramp is expected to be approximately 26,198 MW in April and the minimum three-hour upward ramp of approximately 22,236 MW is expected to occur in December (Figure 4b). This is consistent with actual ramps observed in 2024, the largest observed three-hour ramp occurred in April with a change of 22,199 MW over three hours, and the smallest ramp in December 19,873 MW. When considering the reserve criteria, the max flex capacity requirement for 2026 is 27,559 MW occurring in June.

Figure 4a: Expected ISO System Maximum Monthly Three-Hour Net Load Ramps with Varying Inputs

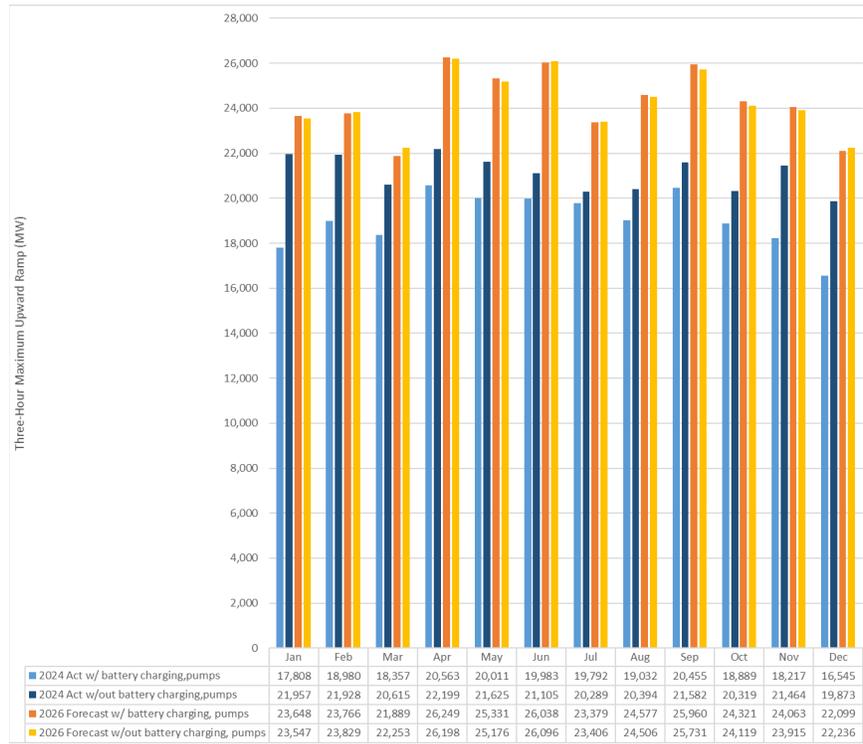
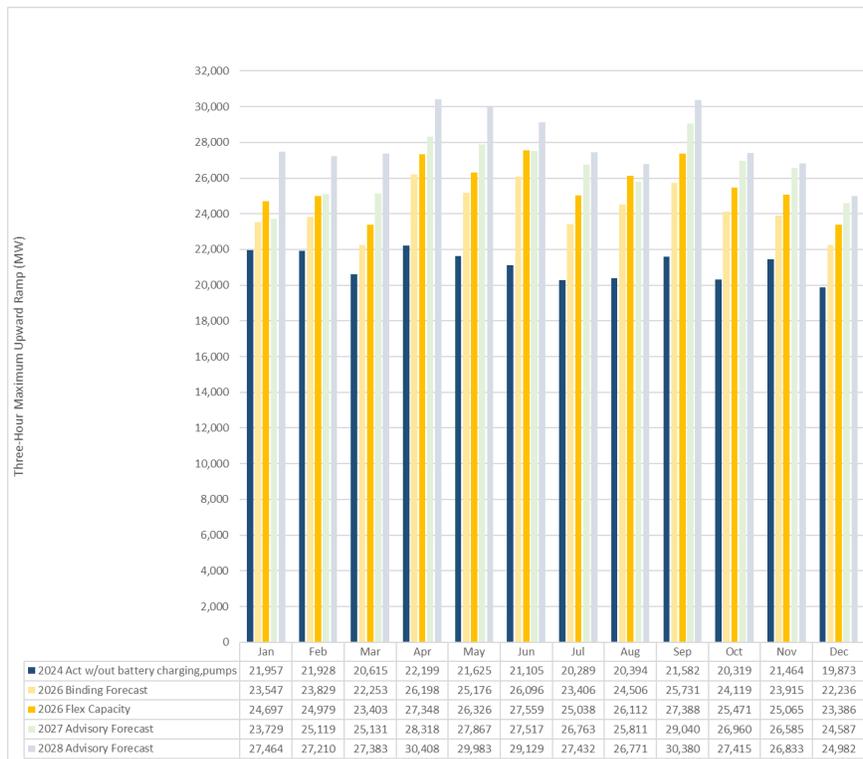


Figure 4b: Actual Ramp 2024, Flex Capacity 2026, Forecasted Ramps 2026-2028

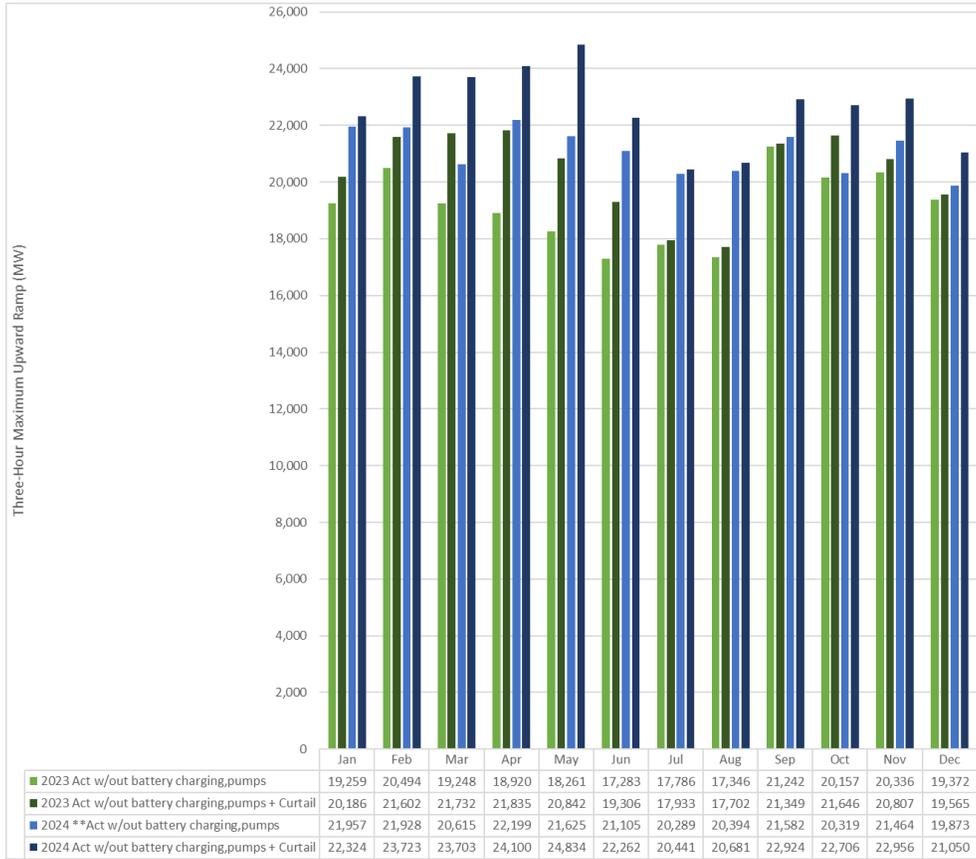


The other consideration for changing the load actual is to have a reasonable residual to assess the need for methodology changes or otherwise track performance. As shown previously, the use of varying actuals definitions had little bearing on the forecast, however, the definition is important when isolating for the sake of performance evaluation. In assessing the bias of the ramp forecasts over the last 5 years, there has been a commensurate uptick with the amount of battery capacity when measuring against the prior load actual definition that included battery charging. A sizeable portion of the bias can be attributed to the selection of load actual definition, about 50-80% increased bias. That said, the better-aligned actual definition will better provide guidance in the future as to whether or not there are major gaps overall or seasonally in the existing forecast methodology.

### **5.3 Consideration of Curtailments in the ISO's Actual Three Hour ramp**

Curtailments have increased in the last 5 years and therefore have played an increasing role in the actual ramps. Depending on the time of day the curtailments occur, they tend to reduce the three hour ramps by raising the mid-day net load. The impact of curtailments on the three-hour ramp is shown more clearly when curtailments are added back into the wind and solar actuals, respectively (Figure 5). The impact of curtailments is highly seasonal, specifically the impact on the ramps are most pronounced March-June, correlating to when curtailment activity typically peaks. Due to curtailments being market optimized, in addition to behaviors changing on curtailments due to other market conditions, the ISO is considering amending actual and forecast to better align with curtailment action taken in future study years.

Figure 5: Three Hour net load Ramp Actuals with Curtailment Impacts 2023-2024



## 6.0 CALCULATING THE SEASONAL PERCENTAGES NEEDED IN EACH CATEGORY

As described in the ISO Tariff sections 40.10.3.2 and 40.10.3.3, the ISO divided its flexible capacity needs into various categories based on the system’s operational needs. These categories are based on the characteristics of the system’s net load ramps and the mix of resources that can be used to meet the system’s flexible capacity needs. Certain use-limited resources may not qualify to be counted towards the flexible capacity needs under the base flexibility category and may only be counted under the peak flexibility or super-peak flexibility categories, depending on their characteristics. Although there is no limit to the amount of flexible capacity that can come from resources meeting the base flexibility criteria, there is a maximum amount of flexible capacity that can come from resources that only meet the criteria to be counted under the peak flexibility or super-peak flexibility categories.

The ISO structured the flexible capacity categories to meet the following needs:

**Base Flexibility:** Operational needs determined by the magnitude of the largest three-hour secondary net load<sup>15</sup> ramp.

**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.

**Super-Peak Flexibility:** Operational need determined by five percent of the maximum three-hour net load ramp of the month.

These categories include different minimum flexible capacity operating characteristics and different limits on the total quantity of flexible capacity within each category. In order to calculate the quantities needed in each flexible capacity category, the ISO conducted a three-step assessment process as follows:

- i. Calculated the forecast percentages needed in each category in each month;
- ii. Analyzed the distributions of both the largest three-hour net load ramps for the primary and secondary net load ramps to determine appropriate seasonal demarcations; and
- iii. Calculated a simple average of the percent of base flexibility needs from all months within a season.

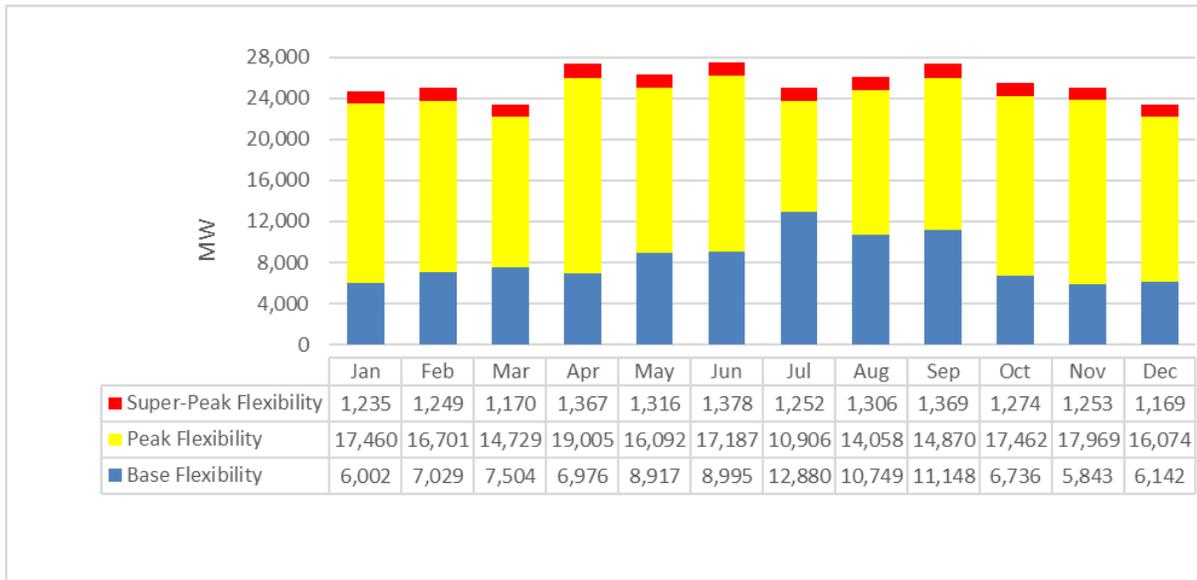
### **6.1 Calculating the Forecast Percentages Needed in Each Category in Each Month**

Based on the categories defined above, the system level needs for 2026 were calculated based only on the maximum monthly three-hour net load calculation. Then the quantity needed in each category in each month was calculated based on the above descriptions. The secondary net load ramps were then calculated to eliminate the possibility of over-lapping time intervals between the primary and secondary net load ramps. Finally, the contingency reserve requirements were added to the different categories proportional to the percentages established by the maximum three-hour net load ramp. The calculation of flexible capacity needs for each category for 2026 is shown in Figure 6.

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<sup>15</sup> The largest daily secondary three-hour net load ramp is calculated as the largest net load ramp that does not correspond with the daily maximum net load ramp. For example, if the daily maximum three-hour net load ramp occurs between 5:00 p.m. and 8:00 p.m., then the largest secondary ramp would not overlap with the 5:00 p.m. - 8:00 p.m. period

Figure 6: ISO System-Wide Flexible Capacity Monthly Calculation by Category for 2026



## 6.2 Analyzing Ramp Distributions to Determine Appropriate Seasonal Demarcations

To determine the seasonal percentages for each flexible capacity category, the ISO analyzed the distributions of the largest three-hour net load ramps for the primary and secondary net load ramps to determine appropriate seasonal demarcations for the base flexibility category. The secondary net load ramps provide the ISO with the frequency and magnitude of secondary net load ramps. Assessing these distributions helps the ISO identify seasonal differences that are needed for the final determination of percent of each category of flexible capacity. The primary and secondary net load ramp distributions are shown for each month in Figure 7 and Figure 8, respectively.

Figure 7: Percentile Distribution of Daily Primary Three-hour Net Load Ramps for 2026

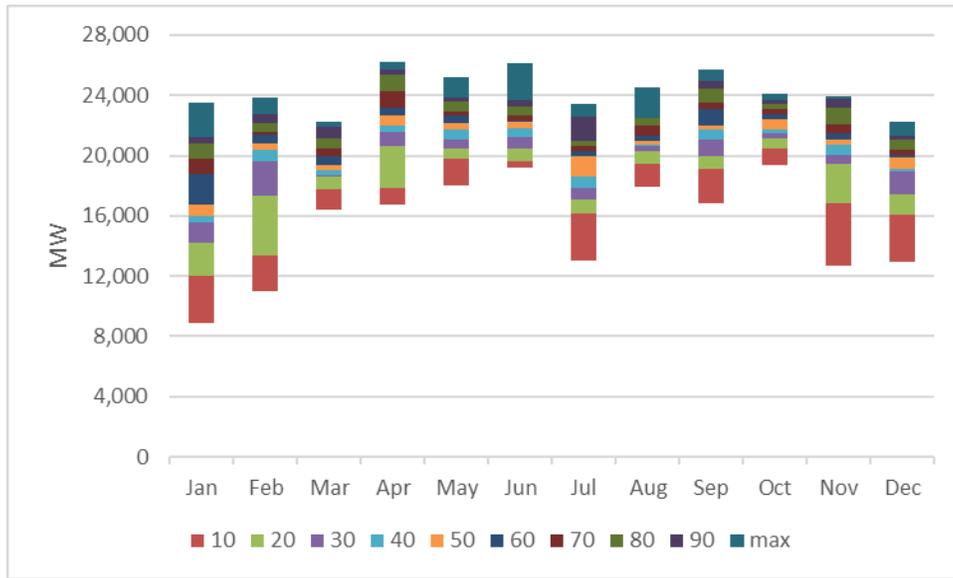
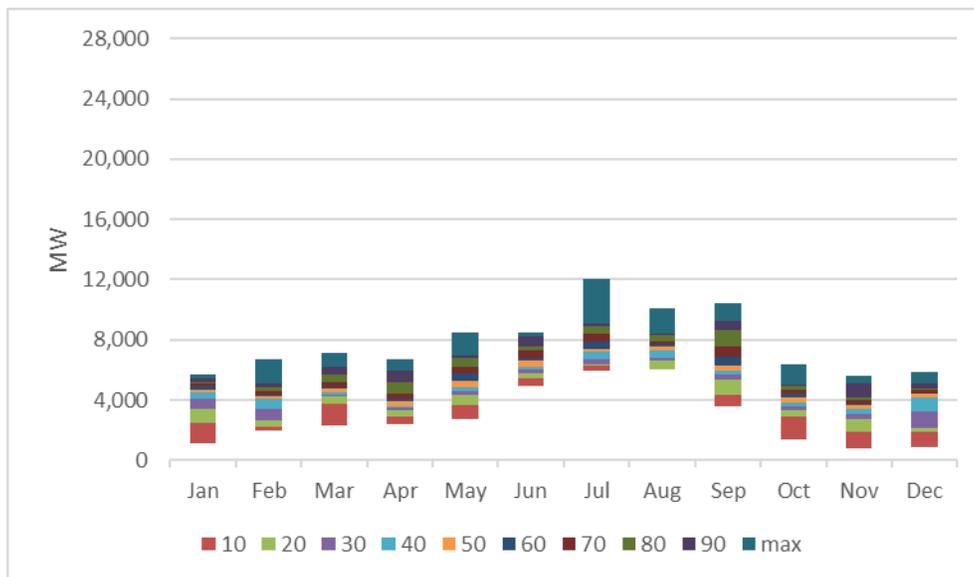


Figure 8: Percentile Distribution of Secondary Three-hour Net load Ramps for 2026



As shown in Figure 7 and Figure 8, there are certain variations for the primary and the secondary ramps over the months. These variations may have some impact on the ratios of maximum secondary ramp over maximum of primary ramp in each month. To reduce the potential impact of these ratios, which defines the values of base category in the flexible requirement, the ISO substitutes the seasonal averages of the ratios into the ratio in each months. Here, summer is May through September, and winter is October to February. Table 2 shows the unadjusted and adjusted percentages used in calculating the base category over the months.

Table 2: Unadjusted Monthly Ratio and Adjusted Seasonal Ratio

	Actual Contributions			Seasonal Contribution		
	Unadjusted			Adjusted		
Month	Base Flexibility	Peak Flexibility	Super-Peak Flexibility	Base Flexibility	Peak Flexibility	Super-Peak Flexibility
January	24%	71%	5%	27%	68%	5%
February	28%	67%	5%	27%	68%	5%
March	32%	63%	5%	27%	68%	5%
April	26%	69%	5%	27%	68%	5%
May	34%	61%	5%	40%	55%	5%
June	33%	62%	5%	40%	55%	5%
July	51%	44%	5%	40%	55%	5%
August	41%	54%	5%	40%	55%	5%
September	41%	54%	5%	40%	55%	5%
October	26%	69%	5%	27%	68%	5%
November	23%	72%	5%	27%	68%	5%
December	26%	69%	5%	27%	68%	5%

As shown in Figure 7, the distribution (i.e. the height of the distribution for each month) of the daily maximum three-hour net load ramps are smaller during the summer months. The base flexibility resources were designed to address days with two separate net load ramps. The distributions of these secondary net load ramps indicates that the ISO does not need to set seasonal percentages in the base flexibility category at the percentage of the higher month within that season. Accordingly, the ISO must ensure there is sufficient base ramping for all days of the month. Furthermore, particularly for summer months, the ISO did not identify two distinct ramps each day. Instead, the secondary net load ramp may be a part of single long net load ramp.

The distributions of the primary and secondary ramps provide additional support for the summer/non-summer split. Accordingly, the ISO proposes to maintain two flexible capacity needs seasons that mirror the existing summer season (May through September) and non-summer season (January through April and October through December) used for resource adequacy. This approach has two benefits.

First, it mitigates the impact that variations in the net load ramp in any given month can have on determining the amounts for the various flexible capacity categories for a given season. For example, a month may have either very high or low secondary ramps that are simply the result

of the weather in the year. However, because differences in the characteristics of net load ramps are largely due to variations in the output of variable energy resources, and these variations are predominantly due to weather and seasonal conditions, it is reasonable to break out the flexibility categories by season. Because the main differences in weather in the ISO system are between summer and non-summer months, the ISO proposes to use this as the basis for the seasonal breakout of the needs for the flexible capacity categories.

Second, adding flexible capacity procurement to the RA program will increase the process and information requirements. Maintaining a seasonal demarcation that is consistent with the current RA program will reduce the potential for errors in resource adequacy showings.

With more penetration of renewable energy in the ISO market, the daily net load shape shows gradual dominance of primary ramp over years, see Table 3. The ISO continues to show an increase in the need of peak category resources, due to the increasing growth of the primary ramp during sunset. In 2026, the percentages of peak category are increased from their counterparts in 2025, in winter from 66.43% to 68.42%, and from 54.29% up to 55.04% in summer.

*Table 3: Change in peak category weighting over the past four years*

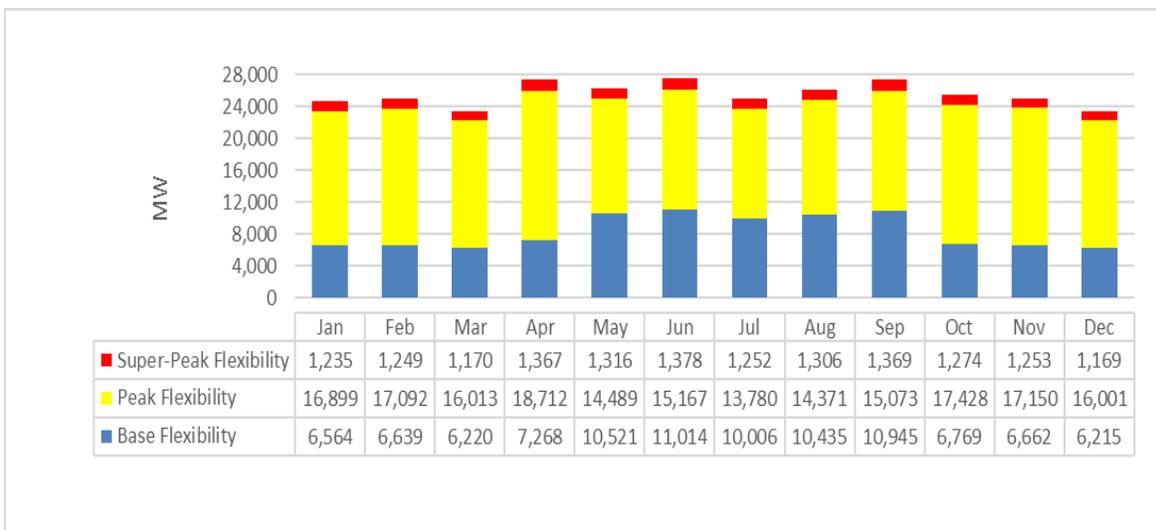
Month	2021	2022	2023	2024	2025	2026
January	57.30%	55.06%	62.74%	68.11%	66.43%	68.42%
February	57.30%	55.06%	62.74%	68.11%	66.43%	68.42%
March	57.30%	55.06%	62.74%	68.11%	66.43%	68.42%
April	57.30%	55.06%	62.74%	68.11%	66.43%	68.42%
May	45.62%	45.39%	49.28%	57.75%	54.29%	55.04%
June	45.62%	45.39%	49.28%	57.75%	54.29%	55.04%
July	45.62%	45.39%	49.28%	57.75%	54.29%	55.04%
August	45.62%	45.39%	49.28%	57.75%	54.29%	55.04%
September	45.62%	45.39%	49.28%	57.75%	54.29%	55.04%
October	57.30%	55.06%	62.74%	68.11%	66.43%	68.42%
November	57.30%	55.06%	62.74%	68.11%	66.43%	68.42%
December	57.30%	55.06%	62.74%	68.11%	66.43%	68.42%

### 6.3 Calculate a Simple Average of the Percent of Base Flexibility Needs

The ISO calculated the percentage of base flexibility needed using a simple average of the percent of base flexibility needs from all months within a season. Based on that calculation, the ISO proposes that flexible capacity meeting the base-flexibility category criteria comprise 29 percent of the ISO system flexible capacity need for the non-summer months and 41 percent for the summer months. Peak flexible capacity resources could be used to fulfill 68 percent of

non-summer flexibility needs and 55 percent of summer flexible capacity needs. The super-peak flexibility category is fixed at a maximum five percent across the year. We have observed over the years that the base flexibility category percentages continue to lower where the peak flexible capacity percentages continue to rise. As with the increase in the flexible capacity need, the change is largely attributable to the continued growth of both grid connected and behind-the-meter solar. As the grid connected solar and the incremental behind-the-meter solar continue to grow we are seeing an increase in the down-ramp associated with sunrise, especially during the shoulder months where there is minimal heating or cooling load. The ISO’s proposed system-wide flexible capacity categories are provided in Figure 9.

Figure 9: System-wide Flexible Capacity Need in Each Category for 2026-Adjusted



## 7.0 ALLOCATING THE FLEXIBLE CAPACITY NEEDS TO LOCAL REGULATORY AUTHORITIES

The ISO’s allocation methodology is based on the contribution of a local regulatory authority’s LSEs to the maximum three-hour net load ramp.

Specifically, the ISO calculated the LSEs under each local regulatory authority’s contribution to the flexible capacity needs using the following inputs:

- 1) The maximum of the most severe single contingency or 3.5 percent of forecasted peak load for each LRA based on its jurisdictional LSEs’ peak load ratio share
- 2)  $\Delta$  Load – LRA’s average contribution to load change during the top five daily maximum three-hour net load ramps within a given month from the previous year times total change in ISO load

- 3)  $\Delta$  Wind Output – LRA’s average percent contribution to changes in wind output during the five greatest forecasted three-hour net load changes times ISO total change in wind output during the largest three-hour net load change
- 4)  $\Delta$  Solar PV – LRA’s average percent contribution to changes in solar PV output during the five greatest forecasted three-hour net load changes times total change in solar PV output during the largest three-hour net load change

These amounts are combined using the equation below to determine the contribution of each LRA, including the CPUC and its jurisdictional load serving entities, to the flexible capacity need.

$$\text{Flexible Capacity Need} = \Delta \text{ Load} - \Delta \text{ Wind Output} - \Delta \text{ Solar PV} +$$

$$\text{Max}(\text{MSSC}, 3.5\% * \text{Expected Peak} * \text{Peak Load Ratio Share})$$

The above equation can be simply expressed as

$$\begin{aligned} \text{Flex Requirement} &= \Delta NL_{2026} + R_{2026} \\ &= \Delta L_{2026} - \Delta W_{2026} - \Delta S_{2026} + R_{2026} \end{aligned}$$

The ISO uses the following symbols to illustrate the evolution of allocation formula:

$L$  (load),  $W$  (wind),  $S$  (solar), and  $NL$  (net load),  $R$  (reserve) =  $\text{max}(\text{MSCC}, 3.5 * \text{peak load})$ ,

$$NL = L - W - S,$$

$$\Delta NL = \Delta L - \Delta W - \Delta S,$$

Where

$\Delta$  Is denoted as ramp,

$\Delta NL_{2026}$  Net load ramp requirement in 2026,

$\Delta NL_{sc,2026}$  Net load ramp allocation for LSC in 2026,

$pl_{lsc}$  CEC peak load ratio, and finally,

$\Sigma$  The summation of all LSC. In 2023, the ISO has forecasts from CEC  $L_{2026}$ , where survey results from  $W_{2026} = \Sigma W_{lsc,2026}$ ,  $S_{2026} = \Sigma S_{lsc,2026}$ , and all the estimated ramps are  $\Delta L_{2026}$ ,  $\Delta W_{2026}$ ,  $\Delta S_{2026}$ , plus  $R_{2026}$ . Moreover, the ISO has the peak load ratio list from CEC which totals to 100 percent,  $\Sigma pl_{lsc} = 1$ .

Based the above information, the allocation for wind, solar, and reserve portion of flexible need is straight forward as follows

$$\begin{aligned} Flex\ Need &= \Delta NL_{2026} + \Sigma pl_{r_{lsc}} * R_{2026} \\ &= \Delta L_{2026} - \frac{\Sigma W_{lsc, 2026}}{W_{2026}} * \Delta W_{2026} - \frac{\Sigma S_{lsc, 2026}}{S_{2026}} * \Delta S_{2026} + \Sigma pl_{r_{lsc}} * R_{2026} \end{aligned}$$

Since the ISO has no pre-knowledge of,  $\Delta L_{lsc, y+2}$ , the load ramp at LSE level in future year  $y + 2$  at the current year  $y = 2024$ , the allocation of  $\Delta L_{2026}$  to SC has been more challenging. Over the years, the ISO has used different approaches to meet the challenge.

In year 2014-2016, the ISO used an intuitive formula as

$$\frac{\Delta L_{lsc, y}}{\Delta L_y} \Delta L_{y+2},$$

Where  $\Delta L_y = \Sigma \Delta L_{lsc, y}$  is the summation of metered load ramp available at LSC level in year  $y$ . Later, the ISO realized this approach had a risk to unstable allocation, since the divider  $\Delta L_y$ , the system load ramp can be zero or negative.

In year 2017-2018, the ISO employed the following formula

$$\Delta L_{lsc, y+2} = L_{lsc, y}^E \left( \frac{L_{y+2}^E}{L_y^E} \right) - L_{lsc, y}^S \left( \frac{L_{y+2}^S}{L_y^S} \right),$$

Where  $S$  = ramping start time,  $E$  =ramping end time.

The above seemingly a bit more complicated formula carefully avoided the potential zero divider  $\Delta L_y$ , but later the ISO found out that it had a material drawback. Unlike the original formula used in 2014-2016, the revised formula carried little scalability for each SC, that is, the historical load ramp  $\Delta L_{lsc, y}$  has no explicit impact on future  $y + 2$  allocation  $\Delta L_{lsc, y+2}$ .

Starting from year 2019, the ISO proposed a new formula which best utilizes  $\Delta L_{sc, y}$  while the system  $\Delta L_y$  is not in the denominator,

$$\begin{aligned} \Delta L_{y+2} &= \Delta L_y + (\Delta L_{y+2} - \Delta L_y) \\ &= \Sigma \Delta L_{lsc, y} + \frac{\Sigma L_{lsc, y}^M}{L_y^M} * (\Delta L_{y+2} - \Delta L_y), \end{aligned}$$

where  $\Delta L_y$  is the average load portion of top 5 maximum  $y=2024$  three-hour ramps and  $L_y^M$  is the average load at beginning and the end of points during those top 5 ramps. In  $y+2 = 2026$ , each LSC will receive:

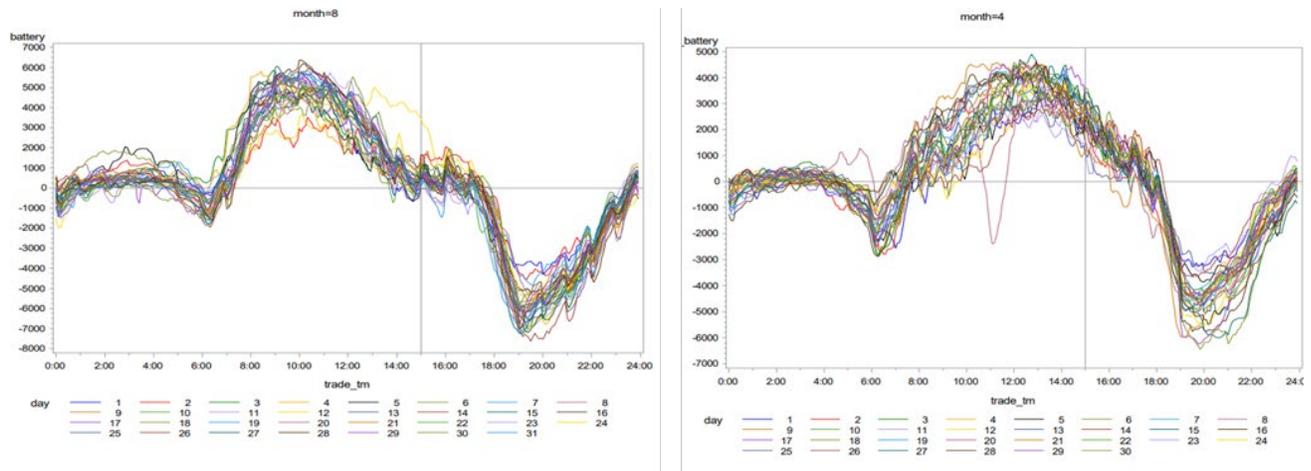
$$\Delta L_{lsc,y} + \frac{L_{lsc,y}^M}{L_y^M} * (\Delta L_{y+2} - \Delta L_y)$$

Therefore each LSC's contribution  $\Delta L_{lsc,y}$  will be explicitly projected into future year 2026, and any additional increase of differences of average load portions ( $\Delta L_{y+2} - \Delta L_y$ ) will be allocated by a load ratio share. The new calculation provides stable allocation for the load proportion.

Any LRA with a negative contribution to the flexible capacity need is limited to a zero megawatt allocation, not a negative contribution. As such, the total allocable share of all LRAs may sum to a number that is slightly larger than the flexible capacity need. The ISO does not currently have a process by which a negative contribution could be reallocated or used as a credit for another LRA or LSE.

As observed in section 5 of the paper, as battery capacities increase it plays a significant role in the load ramp. Battery resources receive Effective Flexible Capacity (EFC) accreditation from Pmin to Pmax, so it is important to consider when looking at the formulation of the requirement in addition to the allocation. In the ISO's flexible 3 hour ramp hours, batteries generally transition from charging to discharging as shown in the following graphs in Figure 10. In Figure 10, positive values indicate battery charging as this is a representation of load, where negative values indicated battery discharging. It can be seen for most months outside spring season battery resources are typically in transition from charging to discharging, limiting the impact to the allocation time period.

Figure 10: Battery Charging Profile for April and August



For this year’s allocation the ISO will not change the allocation formula to remove battery charging due to the needing further information from LRA’s on Battery Resource mapping

Next year, the ISO will work to gather further information to assess potential modifications needed to load components of allocation.

The ISO will make all non-confidential working papers available and data that the ISO relied on for the Final Flexible Capacity Needs Assessment for 2026. Specifically, the ISO will post materials and data used to determine the monthly flexible capacity needs, the contribution of CPUC jurisdictional load serving entities to the change in load, and seasonal needs for each flexible capacity category. This data is available for download as a large Excel file named “2026 Flexible Capacity Needs Assessment–Net Load Data”

<https://stakeholdercenter.caiso.com/InitiativeDocuments/2026-Flexible-Capacity-Needs-Assessment-Net-Load-Data.xlsx>

The file above is the one-minute forecast. Table 4 shows the final calculations of the individual contributions, of each of the inputs to the calculation of the maximum three-hour continuous net load ramp at a system level.

*Table 4: Individual Contributions of each Input into the Net Load*

Month	Load contribution 2026	Wind contribution 2026	Solar contribution 2026	Total percent 2026
January	30.09%	-0.96%	-68.95%	100%
February	33.69%	-1.52%	-64.79%	100%
March	32.41%	-0.55%	-67.04%	100%
April	33.31%	3.50%	-70.19%	100%
May	30.09%	1.18%	-71.09%	100%
June	23.60%	-2.14%	-74.26%	100%
July	14.60%	-1.22%	-84.18%	100%
August	22.40%	1.93%	-79.54%	100%
September	26.88%	1.62%	-74.74%	100%
October	25.44%	1.70%	-76.26%	100%
November	22.94%	-0.94%	-76.12%	100%
December	26.52%	1.97%	-75.45%	100%

When looking at the contribution to the maximum three-hour continuous net load ramp shown in Table 4, the above total percentage is calculated as Load – Wind – Solar. For example, when looking at March 100 percent contribution is determined by:

$$\text{Total Contribution} = 32.41\% - (-0.55\%) - (-67.04\%) = 100\%$$

As Table 4 shows,  $\Delta$  Load is not the largest contributor to the net load ramp because the incremental solar PV mitigates morning net load ramps. The solar resources are leading to maximum three-hour net load ramps during summer months that occur in the afternoon. This is particularly evident during July, August, and December. This implies that the maximum three-hour net load ramp typically occurs during sunset. The contribution of solar PV resources has increased relative to last year’s study and remains a significant driver of the three-hour net load ramps. Since the CEC has behind meter solar embedded in its 2026 hourly load forecast, the interplay between load and solar contributions will depend on the scales of future expansion of utility base solar PV and future installation of behind meter solar panels. The ISO anticipates more solar dominance in the ISO flexible needs in the coming years.

Figure 11 illustrates the behavior of load, wind, and solar when the net load reaches its maximum. In this example, the load ramp has a negative contribution to the net load ramp.

Figure 11: Examples of Load Contribution to Net Load Ramp

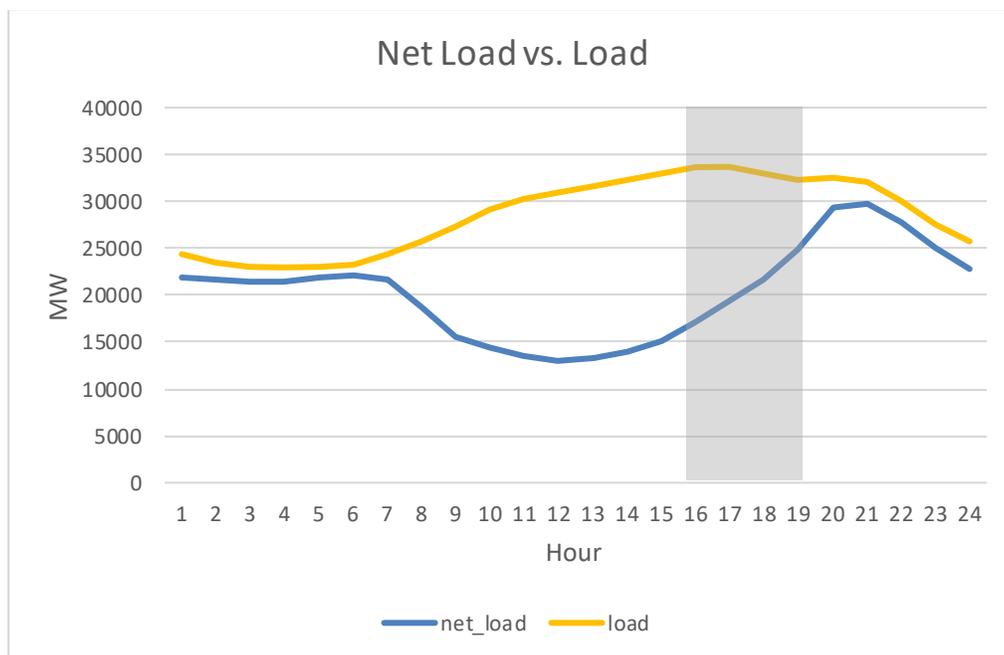
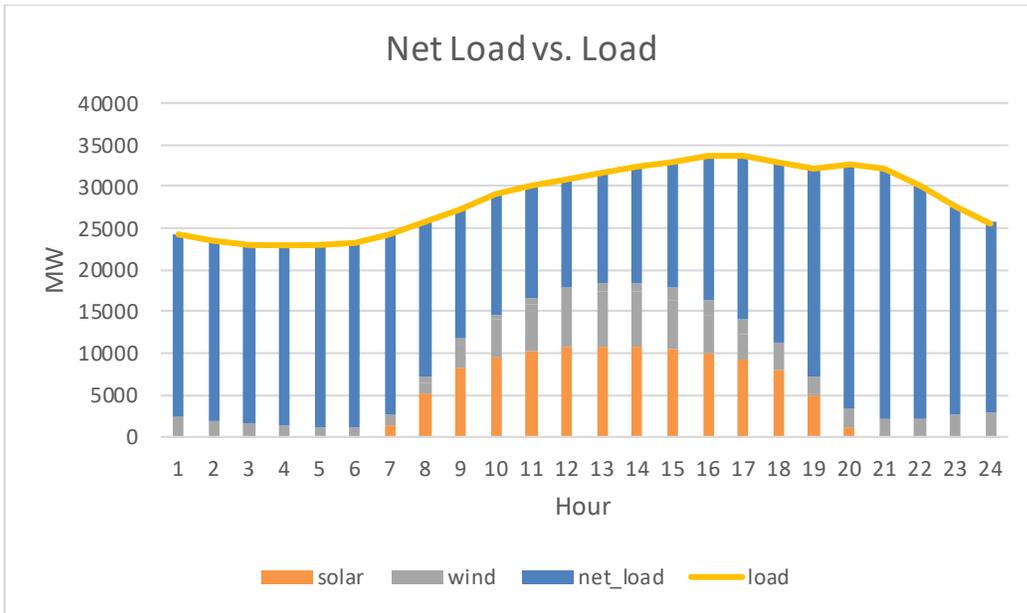


Figure 12:



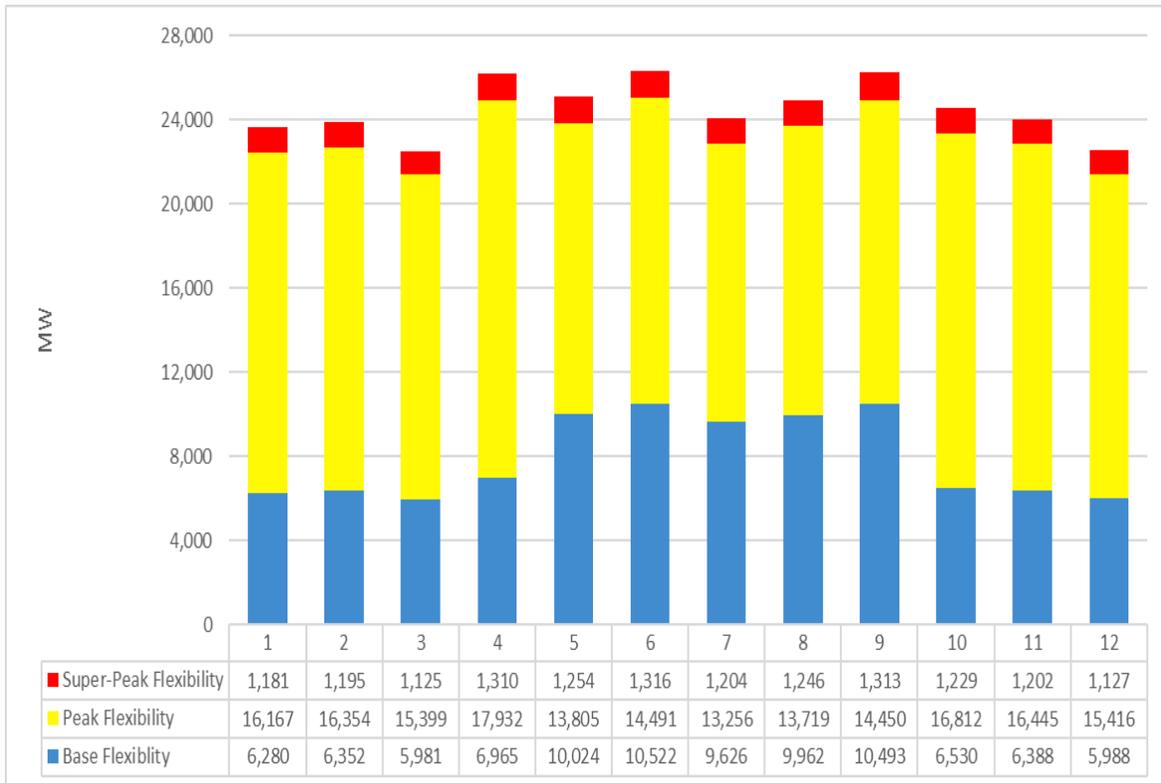
The CPUC allocations are shown in Table 5 and Figure 12. The contributions calculated for other LRAs will only be provided to show the contribution of its jurisdictional LRA as per section 40.10.2.1 of the ISO tariff.

Table 5: CPUC Jurisdictional LSEs' Contribution to Flexible Capacity Needs

Month	Load	Wind	Solar	reserve	Total Allocation
January	6,947	-214	-15,428	1,039	23,629
February	7,845	-342	-14,676	1,039	23,901
March	7,195	-115	-14,156	1,039	22,505
April	8,526	807	-17,450	1,039	26,207
May	7,335	262	-16,972	1,039	25,083
June	6,117	-493	-18,397	1,322	26,329
July	3,645	-253	-18,713	1,474	24,086
August	5,371	419	-18,525	1,450	24,927
September	6,836	372	-18,295	1,496	26,256
October	6,202	369	-17,517	1,221	24,571
November	5,433	-201	-17,361	1,039	24,034
December	5,869	394	-16,016	1,039	22,531

Finally, the ISO applied the seasonal percentage established in Section 6 to the contribution of CPUC jurisdictional load serving entities to determine the expected flexible capacity needed in each flexible capacity category. These results are detailed in Figure 13.

Figure 12: CPUC Flexible Capacity Need in Each Category for 2026



## 8.0 DETERMINING THE SEASONAL MUST-OFFER OBLIGATION PERIOD

Under ISO Tariff Sections 40.10.3.3 and 40.10.3.4, the ISO establishes the specific five-hour period during which flexible capacity counted in the peak and super-peak categories will be required to submit economic energy bids into the ISO’s market (*i.e.*, have an economic bid must-offer obligation). The average net load curves for each month provide the most reliable assessment of whether a flexible capacity resource would provide the greatest benefit. The ISO analyzes the starting time of the calculated daily net load ramp to ensure the must-offer obligation hours line up with daily maximum three hour net load ramp and support the continuous net load need thereafter, which is typically correlated to the solar ramp down during sunset. Table 6 shows the frequency of forecasted starting hour for the three-hour net load ramp, the starting hours are following a stable trend over the years, this is due to solar being the largest contributor to three hour net load ramp.

Table 6: Frequency of forecasted Starting Hour of the Maximum Three-Hour Net Load Ramp for 2026

Month	Three Hour Net Load Ramp Start Hour (Hour Ending)				
	14:00	15:00	16:00	17:00	18:00
January	8	23			
February	1	26	1		
March		6	10	15	
April			1	29	
May				31	
June				28	2
July				31	
August			8	23	
September		1	27	2	
October		20	11		
November	17	13			
December	7	24			

Table 7 below shows an early (HE15), start of the three-hour ramp pattern for October through February. For the months of May through August, the majority of days likely have a HE17 starting time of the three hour net load ramp. The shoulder months, March, April, and September, have the starting time concentrated on HE16.

Table 7: Summary of MOO Hours Proposed by the ISO for 2026

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

In summary, based on the data for all daily maximum three hour net load ramps, the ISO believes that the appropriate flexible capacity must-offer obligation for peak and super-peak

flexible capacity categories is HE 15 through HE 19 for January and February, and October through December; HE 16 to HE 20 for March, April, and September, HE 17 through HE 21 for May through August.

The ISO reviewed the timing of the top five net load ramps to confirm that the intervals captured the largest net load ramps. As shown above, the proposed intervals do, in fact, capture the intervals of the largest ramps. Both of these changes are consistent with continued solar growth and reflect the fact that the initial solar drop-off is a primary driver of the three-hour net load ramp. This is further supported by the contributing factors shown in Table 2, above.

## **9.0 AVAILABILITY ASSESSMENT HOURS**

The availability assessment hours (AAH) were originally developed as part of the ISO standard capacity product and are maintained as part of the Reliability Service Initiative. This includes the RA Availability Incentive Mechanism (RAAIM). The goal of calculating the AAH is to determine the hours of greatest need to maximize the effectiveness of RAAIM by rewarding resources for being available during hours of greatest need.

To calculate the AAH, the ISO does the following:

- a. Uses the CEC hourly IEPR forecast
- b. Calculate the hourly average load by hour for each month for years 2026-2028
- c. Calculate the top 5 percent of load hours within each month using the hourly load distribution in step b

For this annual study, the draft recommendation for 2026 will be published and the estimated for years 2027 and 2028.

The ISO continues to have three seasons for the formulation of AAH. As solar penetration grows on the system we see top load hours move outside of sunshine hours. For the 2026 forecast alignment between the hours within the Spring and Winter season is observed. The ISO will continue to monitor these seasons especially the morning peaking time period for future years.

The 2026 draft recommendation for AAH is HE 18 through HE 22 for January through February, March through May, and November through December; HE 17 to HE 21 for June through October.

Historical actuals and trends in the IEPR forecast are the data to support this proposal which can be found in Table 8 below. Table 8a below shows the number of times each hour is

within the top 5 percent of load hours using the 2024 actual ISO load while Table 8b shows the CEC IEPR forecast for 2026.

*Table 8a: Count of the number of times each hour is in the top 5% of load hours for each month of the 2024 ISO actual load*

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

*Table 8b: Count of the number of times each hour is in the top 5% of load hours for each month of CEC 2026 forecasted load*

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

Table 8b, and Figure 13 look at the distribution of the top 5 percent of load hours by month for the 2026 forecast which is used to form the draft AAH. Figure 13 is a graphic display of the Table 8b and illustrates the highest frequency of the top 5 percent of forecasted load hours for all months in 2026.

Looking further in the CEC IEPR forecast for 2027 and 2028, it is observed the morning ramps gradually show up in the top 5% of load hours for HE 8 in 2027, and HE 8 and HE 9 in

2028. This ISO continues to monitor the morning time period with potential AAH changes coming in future years.

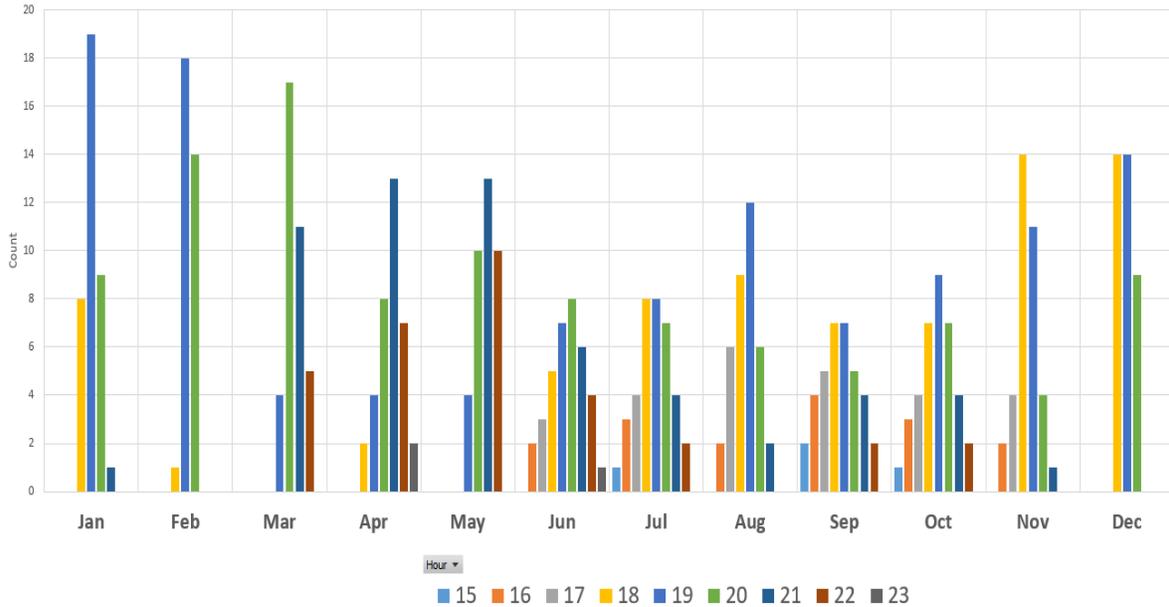
Table 8c: Count of the number of times each hour is in the top 5% of load hours for each month of CEC 2027 forecasted load

Hour	8	15	16	17	18	19	20	21	22	23	
MONTH	Jan	4				9	13	7	4		
	Feb					6	14	10	3		
	Mar	1				2	6	15	13		
	Apr	1					2	10	16	7	
	May					1	4	11	13	7	1
	Jun		1	2	2	6	8	8	6	3	
	Jul			2	4	8	10	8	5		
	Aug			1	4	7	17	6	2		
	Sep		2	4	6	7	7	6	3	1	
	Oct		1	5	8	8	8	6	1		
	Nov					16	13	5	2		
	Dec	1			2	10	10	9	4	1	
Grand Total	7	4	15	26	76	128	97	58	28	4	

Table 8d: Count of the number of times each hour is in the top 5% of load hours for each month of CEC 2028 forecasted load

Hour	8	9	15	16	17	18	19	20	21	22	23	24	
MONTH	Jan	11	3				1	15	7				
	Feb	6						16	11				
	Mar	1						4	13	10	9		
	Apr						1	4	7	10	9	4	1
	May							4	7	13	12	1	
	Jun				1	2	4	7	8	7	5	2	
	Jul			1	3	4	6	8	7	5	3		
	Aug				1	5	8	13	7	3			
	Sep			1	4	5	7	7	6	4	2		
	Oct				2	4	7	9	7	5	3		
	Nov					2	11	13	5	2	2	1	
	Dec	2	1				12	12	10				
Grand Total	20	4	2	11	22	57	112	95	59	45	8	1	

Figure 14: The frequency of the top 5% of load hours for the 2026 forecast



When analyzing the AAH, it is also beneficial to view the maximum observed and forecasted load for each month to visualize the forecasted load shape compared to recent actuals. The timing and shape of the load peak, as well as the magnitude and timing of the ramps into and out of load peak can all be impacted by weather events such as extreme heat for the given month or heavy rainfall. The most recent three years of actuals along with the CEC forecast for 2026 and 2027 are shown in Figure 14 and show how much the load actuals can vary by year for selected months. The rest of the months are included in the draft allocation presentation on the 2025 Flex RA stakeholder page.<sup>16</sup>

As previously mentioned in last year’s study the ISO continues to see a shift in the winter months (January – February, October – December) to later AAH of HE 18-22. This can be observed in Figure 15 below for the month of November, where the 2026 and 2027 forecasts from the CEC show an increase in the evening load hours.

<sup>16</sup> <https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/Flexible-capacity-needs-assessment-2025>

Figure 15: The April (top), August (middle) and November (bottom) maximum load actuals from 2021-2023 and maximum CEC forecast for 2025 and 2027

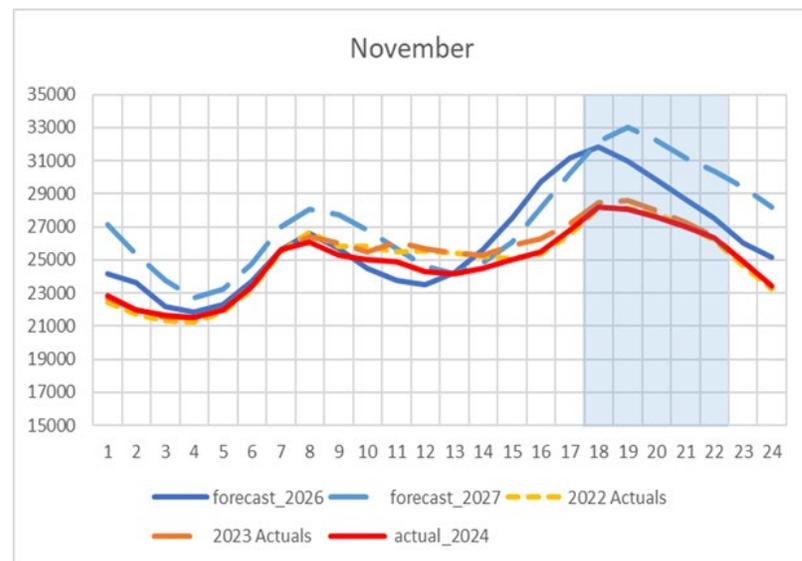
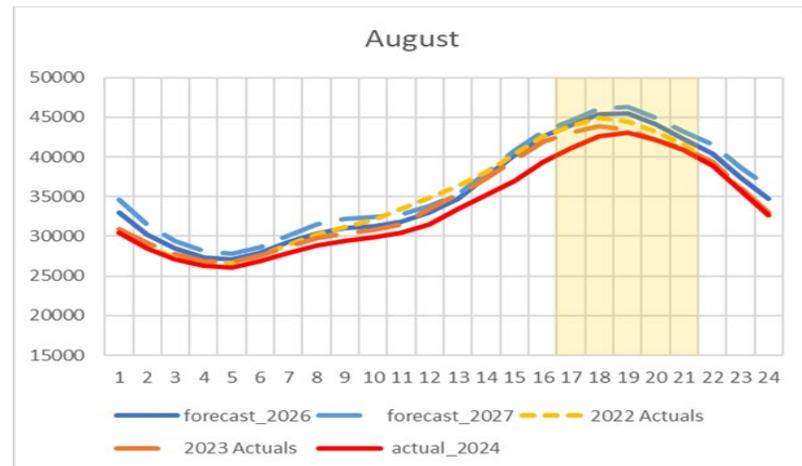
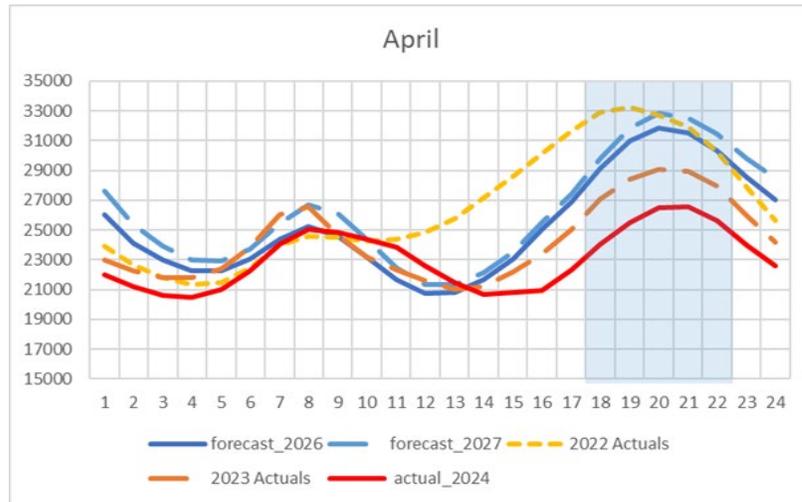


Table 9 below shows the draft recommendation for the winter and summer seasons.

*Table 9: The AAH draft recommendation*

Winter and Spring Season			Summer Season		
Nov, Dec, Jan, Feb, Mar, Apr, May			Jun, Jul, Aug, Sep, Oct		
Year	Start	End	Year	Start	End
2026	HE18	HE22	2026	HE17	HE21
2027	HE18	HE22	2027	HE17	HE21
2028	HE18	HE22	2028	HE17	HE21

Taking the above information into account the ISO draft recommendation for the 2026 AAH is to have the winter and spring season aligned with HE18-22. In addition the summer season will continue to be HE 17-21 with October remaining in the summer season. The ISO understands this is a change in AAH for the winter season and welcomes stakeholder feedback during the comment period prior to the final publication.

**10.0 NEXT STEPS**

Comments on the 2026 Draft Flexible Capacity Needs Assessment and AAH are due on Monday May 5, 2025. The ISO plans to publish the final Flexible Capacity Needs Assessment paper and final AAH for 2025 by May 16, 2026.

The ISO has also established an internal RA working group which is evaluating potential changes to the Flex RA process. As a part of the ISO’s Resource Adequacy Working group process, the ISO and stakeholders have identified the need to reexamine Flex RA. Particularly, as the resource fleet has evolved, we will evaluate the overall need for a Flex RA product, including whether the currently designed Flexible RA provides reliability benefits commensurate to the administrative burden on stakeholders and the ISO. Additionally, we will look at potential enhancements to the Flex RA design, where the processes may need to be altered to better obtain our reliability objectives.