

# Resource Adequacy Availability Incentive Mechanism (RAAIM)

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Energy Division



California Public  
Utilities Commission

# Overview

- RAIM purpose and mechanics
- Reliability concerns with current RAIM construct
- Improvements to consider to address reliability concerns

# Purpose of Resource Adequacy Availability Incentive Mechanism

- The purpose of the Resource Adequacy (RA) program is to ensure sufficient resources are available for CAISO to reliability serve load in the CAISO system.
- The purpose of the RA Availability Incentive Mechanism, or RAAIM, is to provide “incentives” or “disincentives” to ensure that these resources are available for CAISO to meet those reliability needs.

# RAAIM Mechanics

- “Incentive Payments” are provided for availability above 98.5% and “Non-Availability Charges” are assessed for availability below 94.5%. These levels are set at 2% above and below the 96.5% availability standard.
- The penalty and incentive levels are set at \$3.79/kW-month, which is 60% of the current “Capacity Procurement Mechanism Soft-Cap Price” of \$6.31/kW-month.
- Applicable to availability assessment hours set in CAISO’s annual flex studies:
  - System resources – see availability assessment hours on following page
  - Flexible resources – see availability assessment hours on following page
- These incentives and penalties are assessed across all applicable hours of the month, not during a subset of hours (e.g., stressed system hours).

# 2025 Availability Assessment Hours

## 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
<b>January – February November – December</b>			
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*
<b>March – August</b>			
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*
<b>September – October</b>			
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*

# Illustrative System RAIM Penalty Calculation

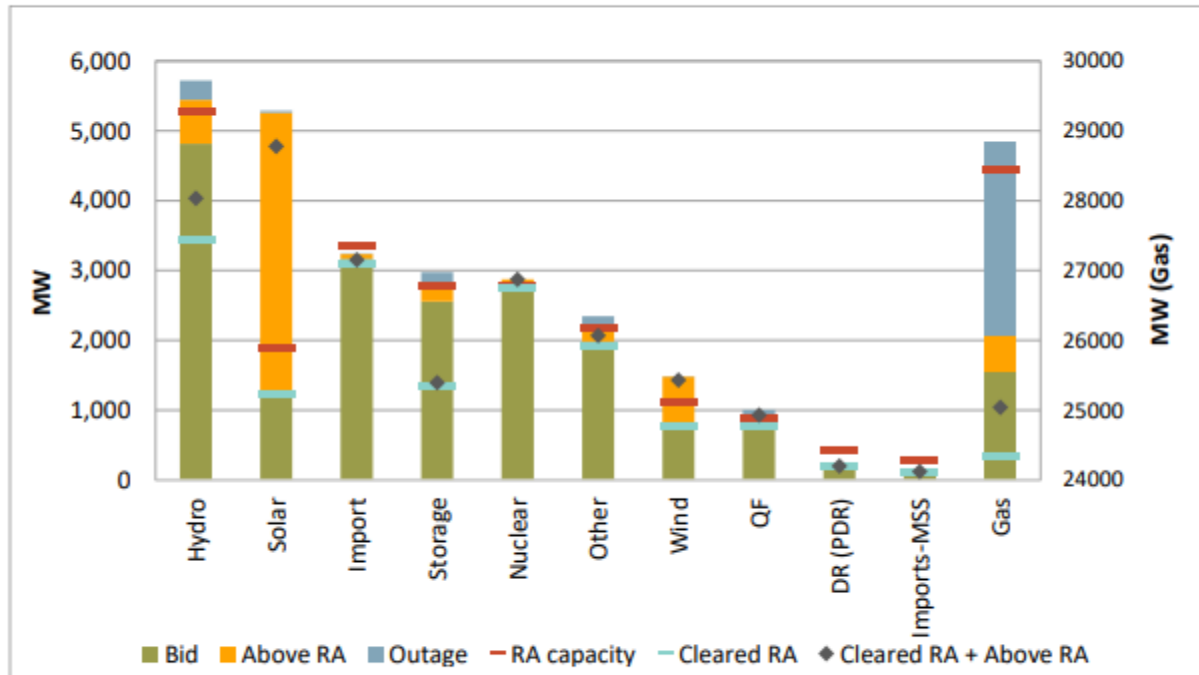
- September 2022 – 100 MW resource, not available on 9/5 and 9/6 (2 of the 3 EEA2 and EEA3 days)
- Total non-weekend, non-holiday hours = 105 hours (21 days x 5 hours)
  - Available hours = 95
  - Non-available hours = 10
- Availability = 90.5% (95/105)
- Non-availability assessment
  - $(94.50\% - 90.50\%) = 4\%$
  - $4\% \times 3.79/\text{kW-month} \times 100,000 \text{ kW} = \$15,160$
- Capacity payment, assuming  $\$6.31/\text{kW-month} = \$631,000$
- Capacity payment, assuming  $\$30/\text{kW-month} = \$3,000,000$

# Historic RAAIM Penalties v. Capacity Payments

<b>Generic RA and CPM(1)</b>	22-Jan	22-Feb	22-Mar	22-Apr	22-May	22-Jun	22-Jul	22-Aug	22-Sep	22-Oct	22-Nov	22-Dec	
Average Actual Availability	97.64%	98.14%	97.28%	97.09%	96.05%	97.05%	97.33%	97.30%	96.95%	96.78%	96.78%	98.01%	
Non-Availability Charges	1,221,661	794,979	1,018,764	1,279,396	2,203,209	1,492,977	1,502,311	1,261,096	2,442,173	1,244,510	1,094,446	386,036	15,941,558
Incentives Payments Paid	-1,221,661	-794,979	-1,018,764	-1,130,383	-1,473,694	-1,698,253	-2,134,746	-1,306,906	-1,872,765	-1,447,546	-1,247,167	-599,687	-15,946,551
<b>Flex RA and CPM(1)</b>													
Average Actual Availability	98.15%	97.90%	96.94%	96.22%	93.45%	96.47%	96.64%	96.77%	95.07%	97.26%	96.82%	97.97%	
Non-Availability Charges	607,222	1,200,201	2,404,897	2,083,243	4,950,458	1,588,737	1,188,662	876,715	1,682,547	1,312,179	951,939	448,456	19,295,256
Incentive Payments Paid	-607,222	-1,200,201	-1,034,777	-1,025,184	-1,220,743	-1,282,144	-1,375,582	-1,009,996	633,078	-1,296,707	-1,119,083	-1,640,702	-12,179,263
RA Resources MW(2)					40,050	46,911	50,728	50,154	49,201	41,199			
Payments at \$6.31/kW-month					252,717,078	296,007,464	320,093,869	316,470,036	310,459,951	259,965,690			1,755,714,087
(1) CAISO 2022 RAAIM Annual Report													
(2) CAISO Historical Resource Adequacy Aggregate Data													

# Historic Availability on Stressed System Days

Figure 3.13 Average system RA capacity and availability in the real-time market by fuel type during EEA 2 and EEA 3 hours



- In September, 2022, real-time market, gas resources during the EEA 3 and EEA 3 hours were at approximately 91.2% availability (26,000 MW/28,500 MW)
- This compares to the September RAIM system capacity availability in September of 96.95% and the flexible capacity availability of 95.07%, from the previous page.



# Concerns and Potential Solutions

- RAAIM set at \$3.79/kW-month does not sufficiently incentivize behavior to ensure availability during stressed system conditions
  - Increase the RAAIM penalty amount
  - Increase the penalty amount in the summer
  - Target the penalty and incentives to stressed system days
  - Consider a stand-alone penalty mechanism
- System RAAIM hours do not include weekends or holidays and, as a result, miss reliability events
  - Include weekends and holidays in the system RAAIM hours
- RAAIM does not apply to resources less than 1 MW and it appears that some resources are registered under this threshold intentionally
  - Expand RAAIM to include more resources

# Why consider as a standalone initiative

- Critical to ensure reliability
- Targeted solutions that do not require revamp of entire program or reconsideration as part of more comprehensive resource adequacy reform
- We are aware that CAISO has an on-going initiative addressing resource adequacy issues and RAAIM is scoped into that initiative, but we are concerned about the scope and timing of that initiative and believe that these targeted solutions could address existing reliability concerns and could be implemented expeditiously.

# Questions?