



## Economic Assessment Assumption Update for 2021-2022 Planning Cycle

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*2021-2022 Transmission Planning Process Stakeholder Meeting  
September 27-28, 2021*

# Key assumptions and inputs for the ISO PCM development in 2021-2022 cycle

- Starting PCM databases
  - ADS PCM 2030 v2.3
  - CAISO 2020-2021 final Planning PCM
- ISO TPP 2031 summer peak bulk power flow case
  - Transmission network model of the CAISO system
  - Load allocation
- CEC 2031 load forecast mid-AAEE
  - AAEE and BTM PV are modeled as resource
- CPUC portfolios
  - Base portfolio for economic and policy assessments
  - Sensitivity 1 and Sensitivity 2 portfolios for policy

# Major changes in PCM modeling assumptions from previous TPP cycles

- Model co-located resource model for batteries and other resources (already discussed in the stakeholder meeting in July)
- Remove conditionally credible N-2 contingencies in the PCM, and remove the nomograms that were established to protect such contingencies, such as Path 15 and Path 26 IRAS nomograms
- Consider to model the 5000 MW CAISO net export limit
  - To replace the previously modeled 2000 MW CAISO net export limit

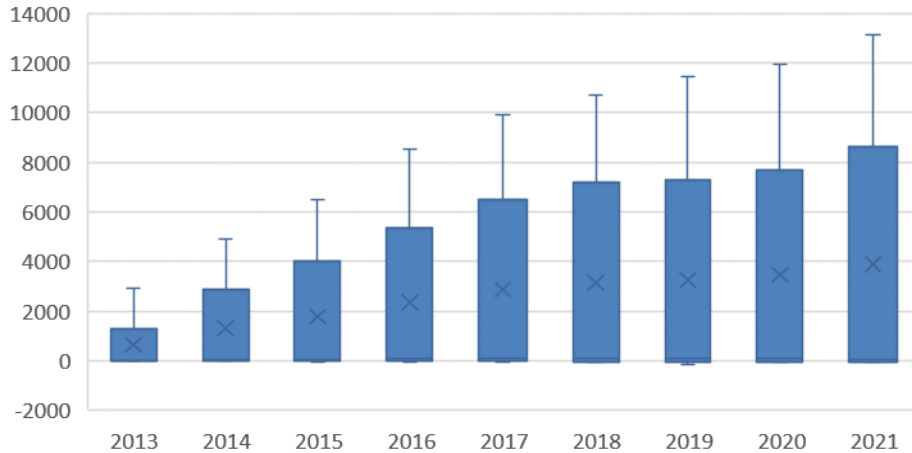
# CAISO Net Export Limit

# Model net export limit for the CAISO system in PCM

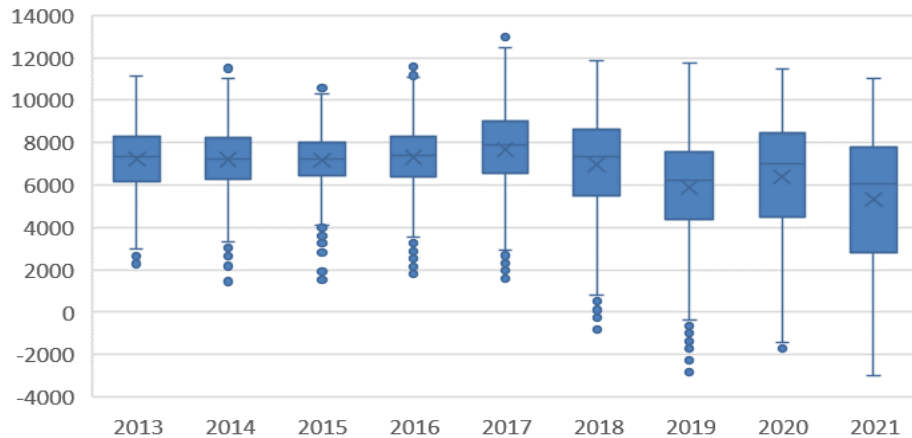
- The net export limit for the CAISO system is considered in CAISO's production cost simulation studies and in CPUC's IRP studies
- The net export limit is neither a transmission constraint, nor a market constraint imposed by the CAISO in operation
- The limit was modeled to reflect historical market operation
  - Other BAA's willingness to import from the CAISO's system for economic or other reasons
  - BAA's operation requirements or obligations may impact the economic exchanges
- Future renewable development and market evolution require consideration as well

# Trend of ISO solar generation and net import (negative is export)

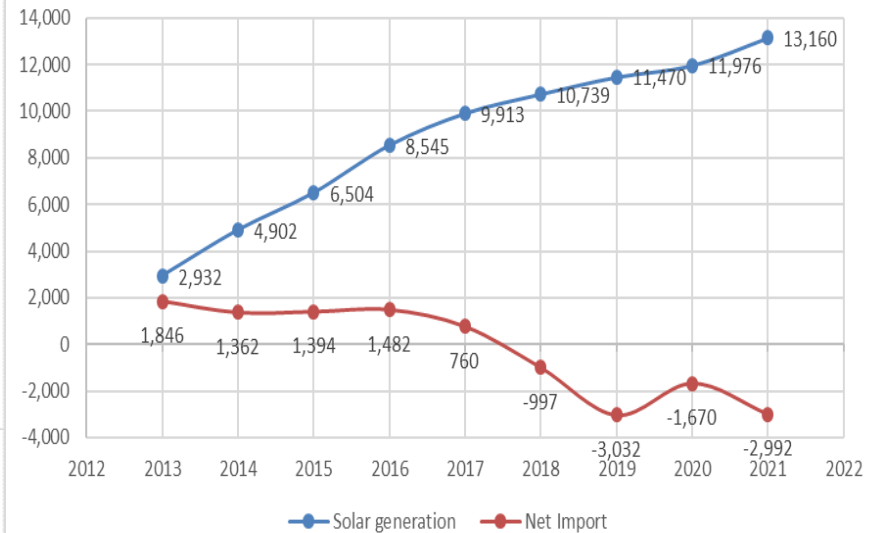
ISO solar generation output (MWh)



ISO net import (MWh)



Solar installed capacity, Maximum solar generation output, and Minimum net import (MW)



Note: the maximum solar output and the maximum export may not occur in the same hour, but both normally happen in early afternoon in April or May

# Hours when the CAISO net export exceeds the 2000 MW level

Year	CAISO Grid-connected Solar maximum output (MW)*	Hours when CAISO net export exceeds 2000 MW	CAISO Maximum net export (MW)
2018	10739	0	997
2019	11,470	8	3,032
2021 (Jan 1-Sept 1)	13,160	29	2,992

\* According to the CPUC's base portfolio and the CAISO's 2031 power flow case, the projected capacity of the grid-connected solar generators in 2031 is about 32,000 MW

# Observations and discussion

- The CAISO's net export was observed to exceed the 2000 MW level starting since 2019
  - In more hours in 2021 than in 2019 the export exceeded the 2000 MW level
- The CAISO net export may not increase monotonously
  - Battery storage can help to reduce solar energy surplus
  - Renewable development outside the California picks up as well
  - Some of the market hurdles existing today may still be effective in future years
- 5000 MW limit has been used in CPUC's IRP and the CAISO's renewable integration studies



# Considerations of the net export limit in planning PCM

- The CAISO considers to use the 5000 MW ISO net export limit in the 2031 planning PCM for the 2021-2022 transmission planning study



## Increasing procurement and capacity in portfolios

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2021-2022 Transmission Planning Process Stakeholder Meeting  
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# The need for grid connected resources needs in the 5 to 10 year planning horizon has escalated quickly:

	Portfolios for 2020-2021 Plan (2030)	Portfolios for 2021-2022 Plan (2031)	Authorized near and mid term (2025) procurement	Draft Preferred System Plan (2025)	Draft Preferred System Plan (2032)	SB 100 Starting Point Scenario (2040)
Solar	6,763	13,044	12,800 *	11,000	18,833	53,212
Wind	992	4,005		3,553 in state 0 OOS 0 offshore	3,553 in state 1,500 OOS 1,708 offshore	2,237 in state 12,000 OOS 10,000 offshore
Battery storage	1,376	9,368		12,553	14,751	37,000
Gas-fired					1	
Biomass				107	134	
Geothermal	0	651	1,000 likely beyond 2026	114	1,160	2,332
Pumped Hydro / Long Duration	1,256	627	1,000 likely beyond 2026	196	1,000	4,000
<b>Total</b>	<b>10,387</b>	<b>27,695</b>	<b>14,800</b>	<b>27,287</b>	<b>42,690</b>	<b>120,781</b>
Gas retirements	0	0			~950	-15,000



# Transmission needs with the increasing procurement and future portfolios

- The CAISO is intending to consider additional upgrades beyond those identified through in the analysis in this planning cycle using the base portfolio that could:
  - Reflect the increase in resource procurement
  - Provide flexibility for commercial interest resources that may not be in the current base portfolio or the mapping of portfolio does not align with commercial interest

# Transmission projects identified in the CAISO transmission capability estimates<sup>1</sup>

Transmission project	Incremental FCDS with upgrade (MW)	Estimated time to construct (months)	Estimated Cost (\$ million)
Antelope - Vincent 500kV line rating increase	2,700	18	15
Laguna Bell - Mesa line upgrade	470	27	21
New Colorado River 500/230kV No. 3 transformer	1,000	42	74
New Lugo 500/230kV No. 3 transformer	980	42	70
New Eldorado 500/230 transformer	400	42	70
Silvergate - Bay Blvd 230kV 3-ohm Series Reactor	2,067	72	31
Woodland-Davis 115 kV Lines	96	60	11
Gates Transformer Bank # 13	4,453	48	\$40

# Stakeholder input

- Comments or potential other transmission projects to be considered for advancement are to be submitted with comments to be submitted by October 12



## *Day 2 - Wrap-up* Reliability Assessment and Study Updates

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# Request Window Submissions for Reliability Assessment

- Request Window closes October 15
  - Request Window is for alternatives in the reliability assessment
  - Stakeholders requested to submit comments to:  
[requestwindow@caiso.com](mailto:requestwindow@caiso.com)
  - ISO will post Request Window submission on the market participant portal



# Comments

- Comments due by end of day October 12, 2021
- Submit comments through the ISO's commenting tool, using the template provided on the process webpage:
- <https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/2021-2022-Transmission-planning-process>

# Comments will be submitted to the ISO using the online stakeholder commenting tool

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

## NOTE

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

- ▶ Find a [video](#) on how to use the commenting tool on the Recurring Stakeholder Processes [landing page](#).