CEC Reliability Assessments

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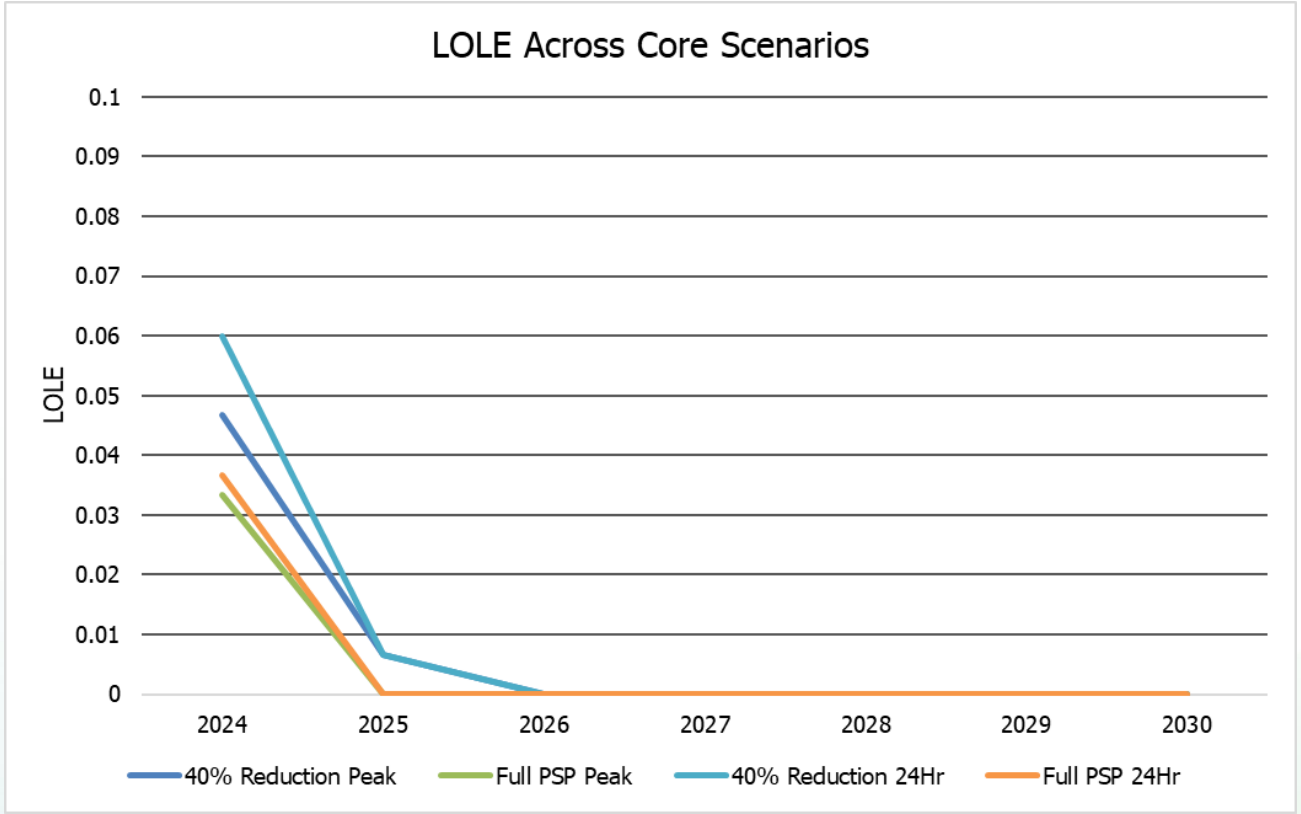
Reliability Model Overview

- CEC has a stochastic reliability model that looks at reliability under multiple weather years
- Model represents all of California and reports results for the whole state.
- Purpose is to study LOLE for policy analysis.
- Reliability model has been incorporated into many different projects evaluating both near and long-term reliability.

2024 CERRO Results



CEC Reliability Assessments

- **SB846 Quarterly Report**
  - Provide regular updates on reliability
  - Typically perform LOLE analysis for first report
- **CERRO**
  - More in-depth analysis of system reliability
  - Additional scenarios to 846
- **SB100 Report**
  - Full system reliability assessment of all 100% clean portfolios
  - Used to inform resource build and calibrate capacity expansion model
- **SB423 Reliability Analysis**
  - Compare reliability performance of firm resources vs renewables
  - Evaluate reliability during multi-day stress situations in all seasons

2023 Multi-Day Reliability Results for SB 423

	Winter Stress Tests					
	2023			2033 Full PSP		
Imports Sensitivities	High Load Energy	High Load Peak	Low VRE Event	High Load Energy	High Load Peak	Low VRE Event
Default Imports	0%	0%	0%	0%	0%	0%
Contracted + Economic Imports (daytime only):	0%	0%	0%	0%	0.4%	0%
Contracted RA Imports only	0%	0%	0%	0%	0%	0%
No Imports	0%	0%	0%	0%	22%	0%

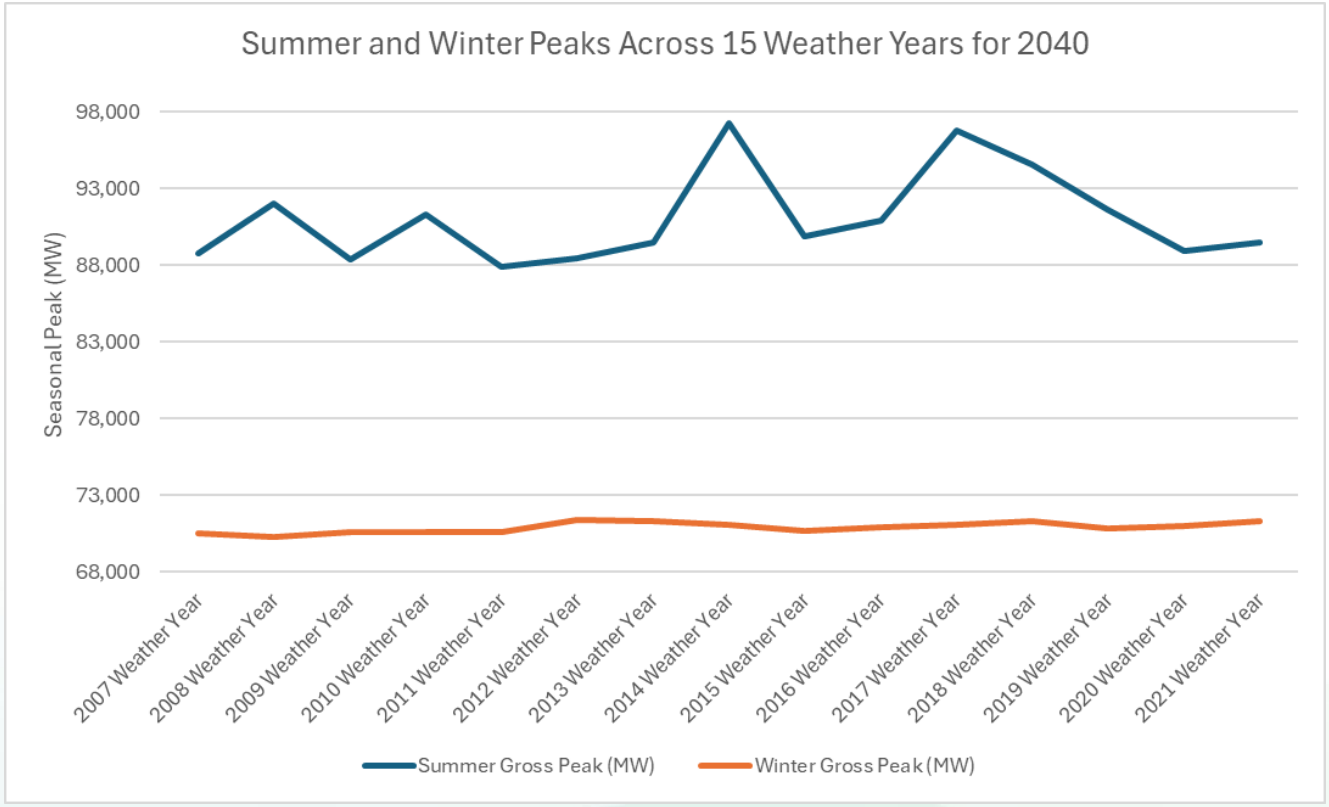
Probability of experiencing unserved energy in the sample

Current Demand Approach

- Model runs 15 weather years for load, wind, solar, and hydro.
  - Using CPUC demand samples for base load accounting for weather across 15 years.
  - CPUC demands vary the base load, while load modifiers are sourced from the hourly CED.
- Benefits of this approach:
  - CPUC demands provide weather-dependent load that links with wind and solar samples.
  - Adding in load modifiers incorporates the advanced forecasting work done by CEC demand team.
- Challenges with this approach:
  - Difficult to evaluate winter reliability with high electrification.
  - Load modifiers affect the peak inconsistently.
  - Timing of inputs does not align.

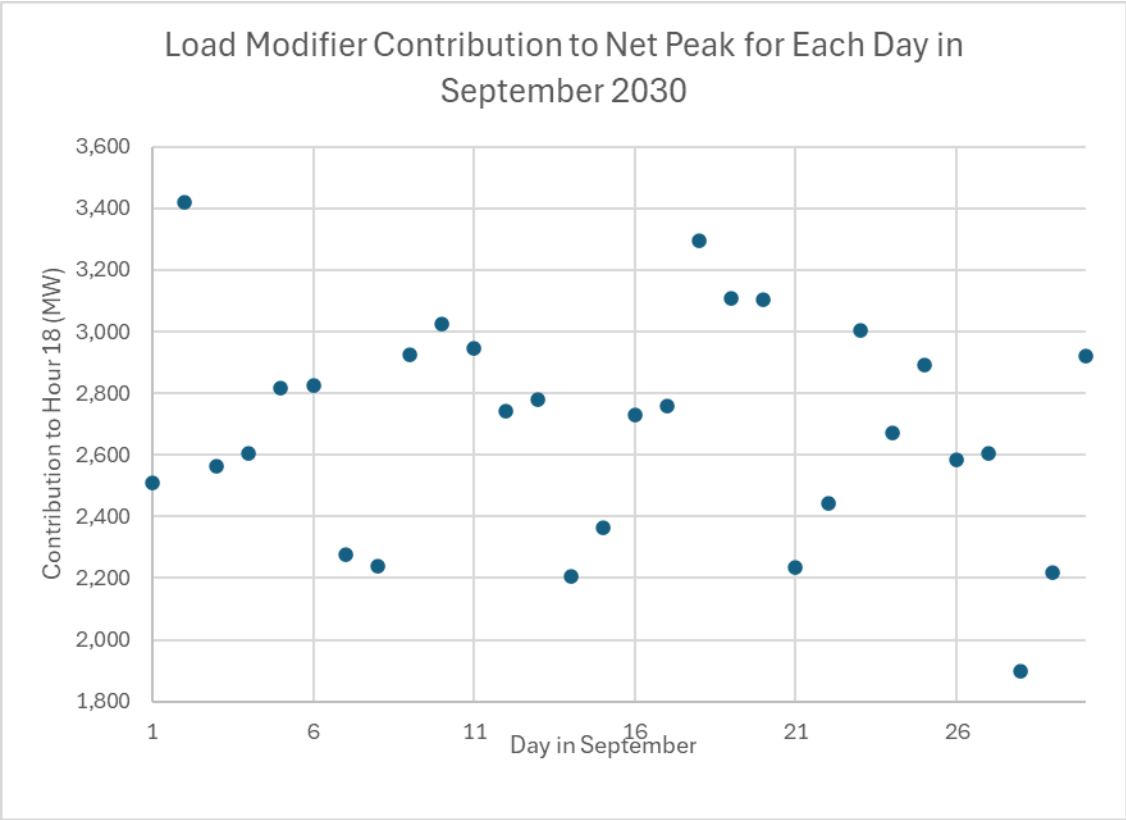
Winter Weather Variability

- The state anticipates a significant amount of building electrification and a double-peaking system in future years.
- Winter reliability is more of a challenge for a system dependent on renewables and short-duration storage.
- Fuel substitution that varies stochastically will improve reliability analysis for future years.



Load Modifiers and Peak

- Modifiers like Climate change, AAEE, BTM Storage etc are heavily affected by weather and should change by weather year.
- The load modifiers can vary by GWs in critical hours depending on the day.
- This will, for example, intensify a peak that occurs on 9/2 more heavily than 9/3.



Future Recommendations

- Stochastic demands including stochastic variation in load modifiers will improve our ability to study reliability, especially outside summer.
- All our electricity system models are statewide and benefit from hourly loads across the state.
- Both improvements will be incorporated into the demand forecast for the 2025 IEPR cycle.

Thank You!