

**DOCKETED**

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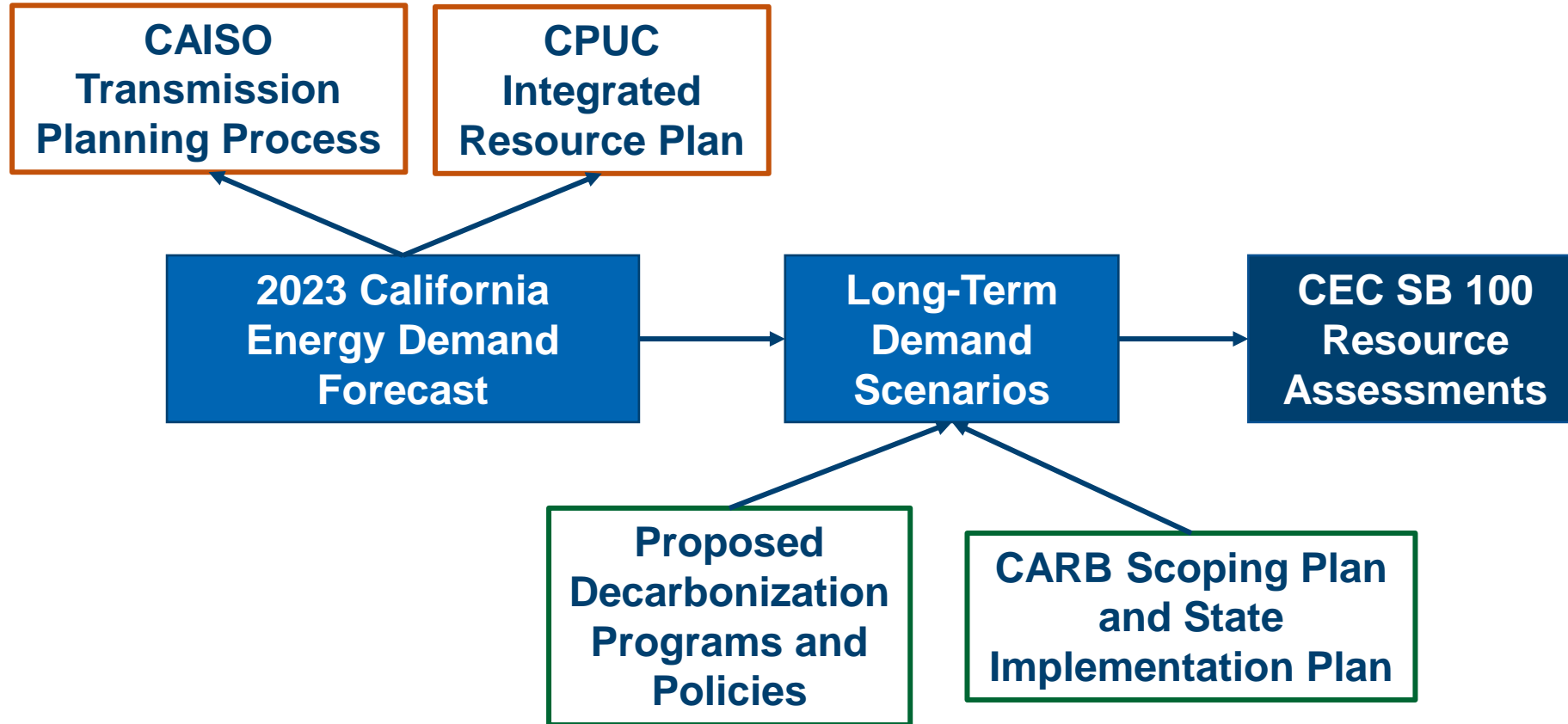
# **Demand Forecast and Scenarios: Role in SB 100 Assessments**

SB 100 2025 Joint Agency Report Kickoff Workshop

August 22, 2023



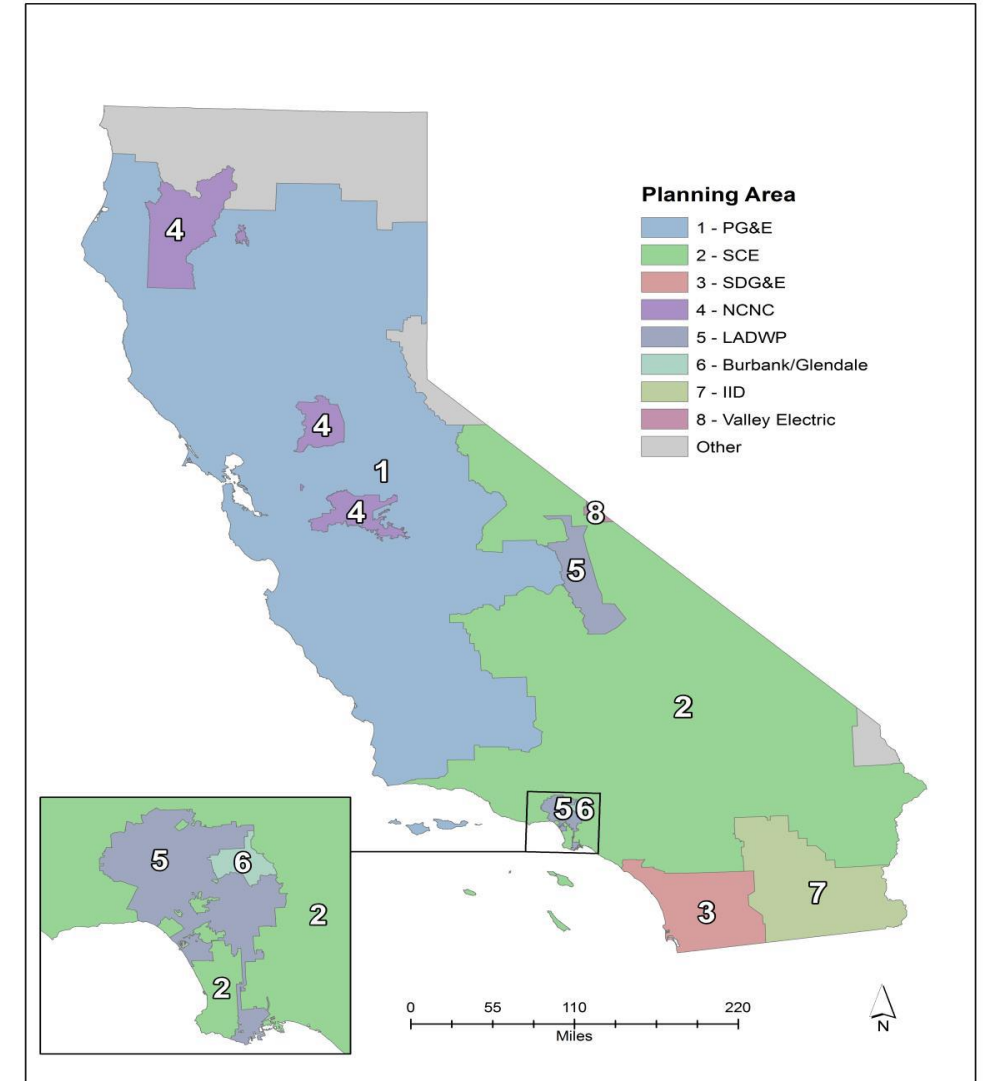
# CEC's SB 100 Process for the 2025 Report





# CA Energy Demand Forecast (CED)

- Updated annually
- Foundational for procurement and system planning
- Used by:
  - CPUC for Integrated Resource Planning
  - CAISO for transmission system planning
  - CPUC / utilities for resource adequacy requirements
  - IOUs for planning
- 15+ year system-level forecast
  - Annual electricity and gas demand
  - Hourly electricity loads
  - Scenarios for energy efficiency, building electrification, and transportation electrification
  - 1-in-2, 1-in-5, 1-in-10, and 1-in-20-year net electricity peak





# Climate Change

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## Improving incorporation of climate change in the forecast

- Incremental updates, with full implementation for 2025 IEPR
- Shift from using historical weather data to using climate projections
- Use of new variables such as heat index
- Probabilistic hourly forecast

## State goal to achieve economywide carbon neutrality by 2045

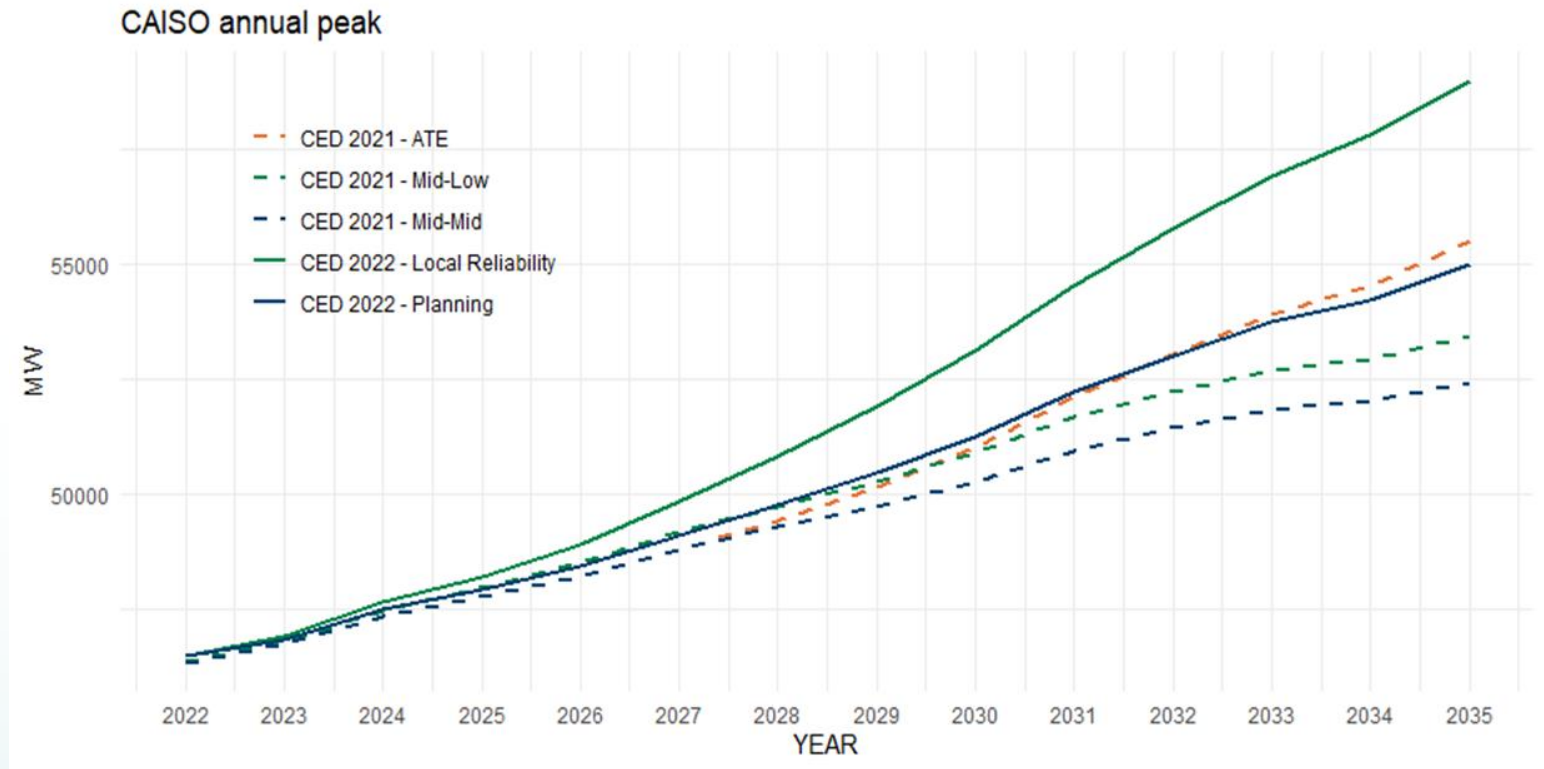
- Strategies to achieve this goal that impact energy demand include:
  - Energy efficiency
  - Building electrification
  - Transportation electrification
  - Renewable energy
  - Load flexibility
- As relevant regulations and programs are developed, these must be incorporated into the forecast



# Demand Forecast Scenarios

- 2023 IEPR forecast includes:
  - Baseline
  - 6 scenarios for energy efficiency (added for 2019 CED)
  - 6 scenarios for building electrification (added for 2021 CED)
  - 2 scenarios for transportation electrification (added for 2022 CEDU)

2022 and 2021 Forecast Results





# Forecast Framework

Name →	Planning Forecast	Local Reliability Scenario
Example Use Cases →	Resource Adequacy CPUC IRP	CAISO TPP
Economic, Demographic, and Price Scenarios	Baseline	Baseline
Additional Achievable Energy Efficiency Scenario	Scenario 3	Scenario 2
Additional Achievable Fuel Substitution Scenario	Scenario 3	Scenario 4
Additional Achievable Transportation Electrification Scenario	Scenario 3	Scenario 3



# 2023 CED Updates

- Forecast through 2040
- Refurbished residential end-use model
- Climate change
  - Climate simulation data
  - Recharacterize normal and extreme peak events
- BTM PV and Storage Updates
  - Historical capacity
  - New adoption models
  - Net Billing Tariff (NBT) and Federal Investment Tax Credit (ITC)
  - PV generation profiles
- Efficiency and Fuel Substitution
  - Improve characterization of CARB's proposed zero-emission appliance standard
- Transportation Electrification
  - Account for Clean Miles Standard (eVMT)





# 2023 CED Timeline

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- Aug 15: Inputs and Assumptions Workshop
- Aug 18: Load Modifier Inputs and Assumptions Workshop
- Nov 15: Load Modifier Results Workshop
- Dec 6: Final Forecast Workshop
- Jan 2024: Forecast adoption



# Long-Term Energy Demand Scenarios

Explores the long-term energy impacts of strategies to reach the state's GHG emission reduction goals

- CEC's first round of scenarios were adopted in May 2022
  - Internal capability developed to inform future SB 100 assessments
  - CEC analyses used where feasible
  - E3 PATHWAYS modeling filled in other sectors/fuel types
- Consistent with forecast inputs, assumptions, and methods
  - Reference Scenario extends the Planning Forecast out to 2050
  - Additional Achievable scenarios extended out to 2050
- Economywide



# Approach for 2025 Assessments

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- Currently scoping the next round
- Building from the 2023 IEPR demand forecast
  - Expanding CEC analyses
  - Relying on contractor modeling to fill in other sectors/fuel types
  - Scenario-specific 8760 hourly loads by electric planning area through 2050
- Aiming for draft results in Spring 2024 for use in the 2025 SB 100 Assessments



# Scenario Types

- **Reference Scenario**
  - Extends the Planning Forecast to 2050
  - Assumes continuation of the same set of standards, programs, and policies with the same degree of compliance
- **Policy-Compliance Scenario**
  - The degrees of compliance are varied with the same set of standards, programs, and policies as in the Reference Scenario
  - Some impacts from new programs in the regulatory pipeline are added
- **Enhanced Programmatic Scenario (Not Goal Constrained)**
  - Additional standards, programs, policies beyond those already included in the Policy-Compliance Scenario



# Demand Scenarios & Sensitivities

No.	Demand Scenario	Sensitivity
1	Reference Scenario	Reference Scenario
2	Policy - Compliance Scenario	High Electrification (HE)
3	Policy – Compliance (Sensitivity)	HE augmented by Biofuels
4		HE augmented by Hydrogen
5		HE augmented by DER
6		HE augmented by Load Flexibility
7	Enhanced Programmatic Scenario	High Electrification (HE)
8	Enhanced Programmatic (Sensitivity)	HE augmented by Biofuels
9		HE augmented by Hydrogen
10		HE augmented by DER
11		HE augmented by Load Flexibility
12	2022 CARB Scoping Plan Scenario	TBD
13	2023 CPUC Integrated Resource Plan Scenario	TBD

A subset of these scenarios will be used in SB 100 assessments



# Thank you