California Electric System Planning

State Energy Institution Coordination to Meet Our Clean Energy Goals

Assembly Committee on Utilities and Energy

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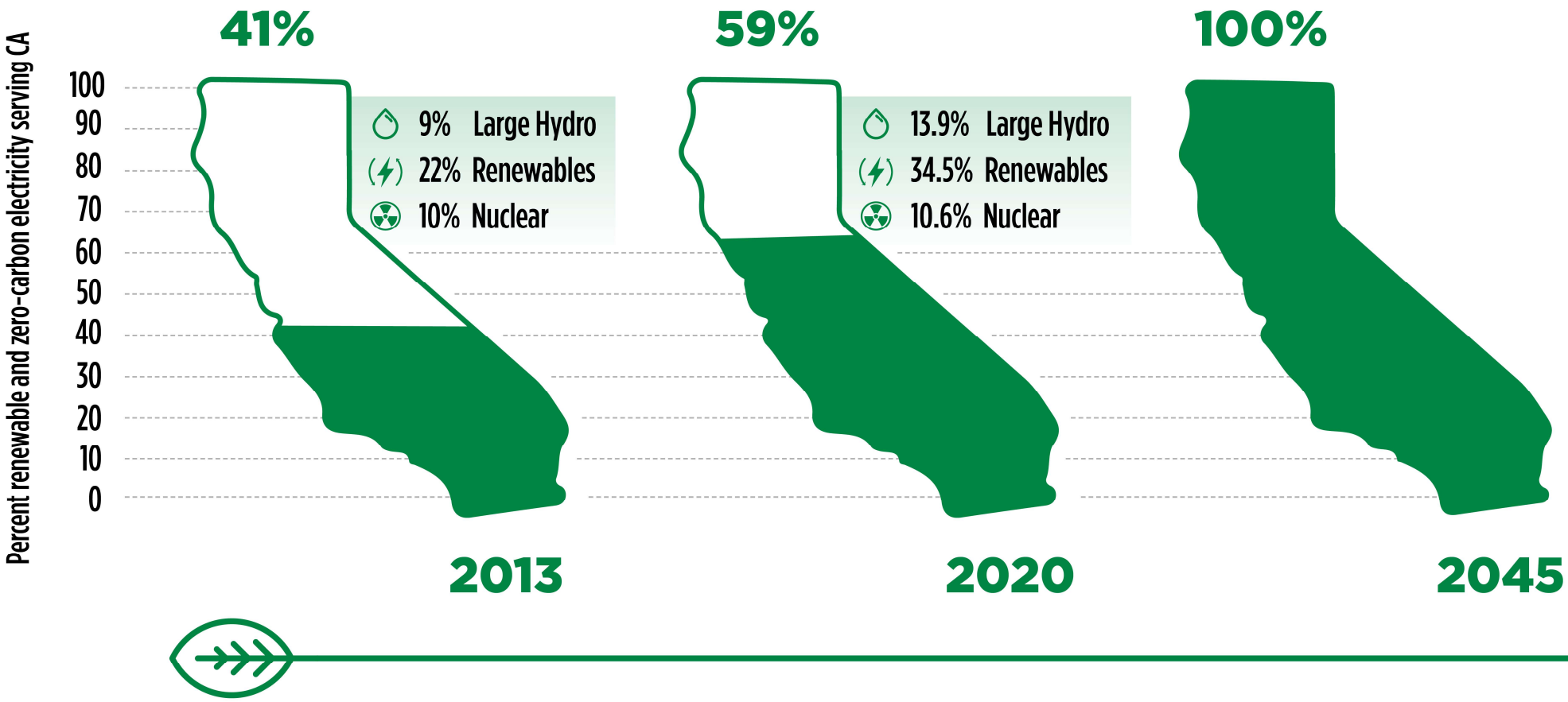
Progress to 100% Clean Electricity



ewide Electric System Planning

Electric system planning is a multi-year, highly collaborative effort with responsibilities shared amongst the states three energy institutions -

Lead for developing the statewide 10-year electric demand forecast including in the Integrated Energy Policy Report (IEPR). Coordinate with POUs on Renewables Portfolio Standard (RPS) compliance, Integrated Resource Plan development, & Reliability planning.

Lead for load-serving entity energy resource planning & procurement through primarily the IRP, RPS, and Resource Adequacy (RA) programs.

Lead on managing the annual Transmission Planning Process (TPP).

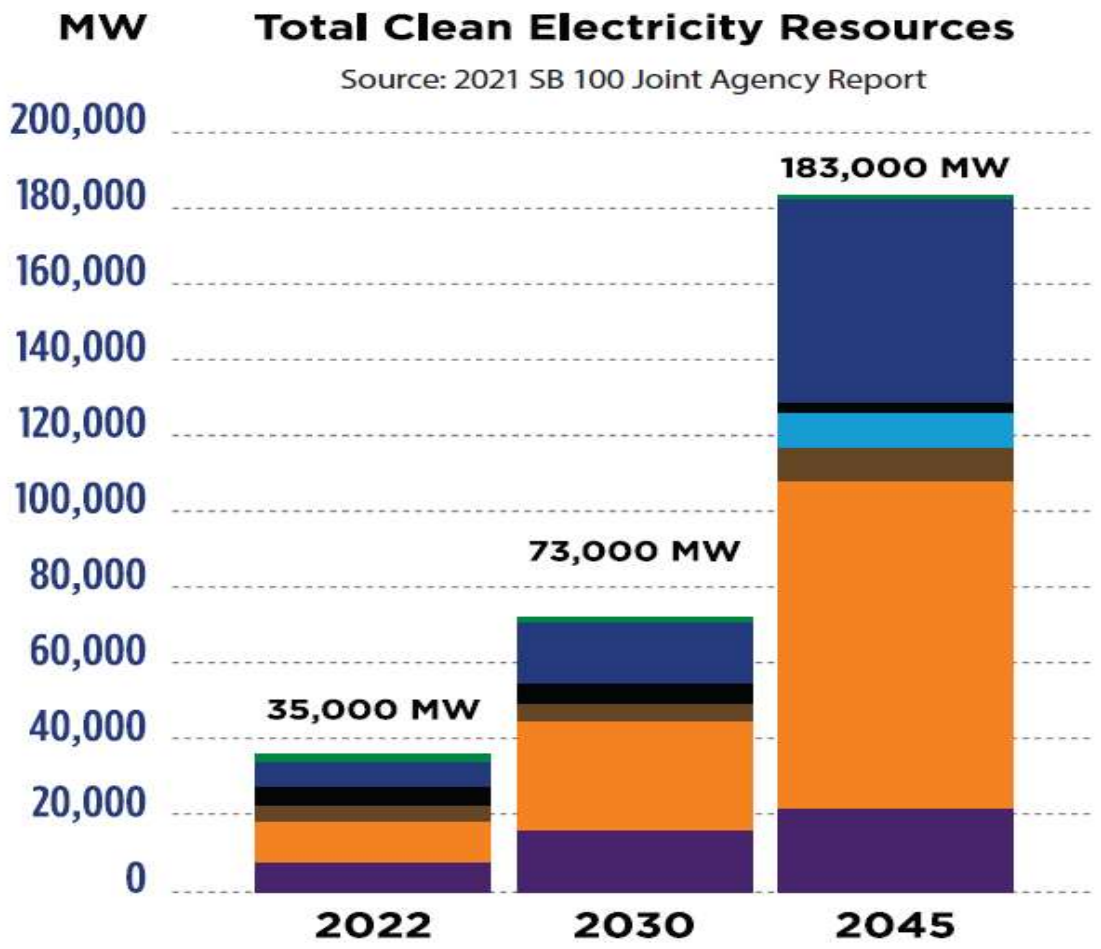
To provide 100% clean electricity by 2045,

California will build an unprecedented amount of new utility-scale clean energy resources

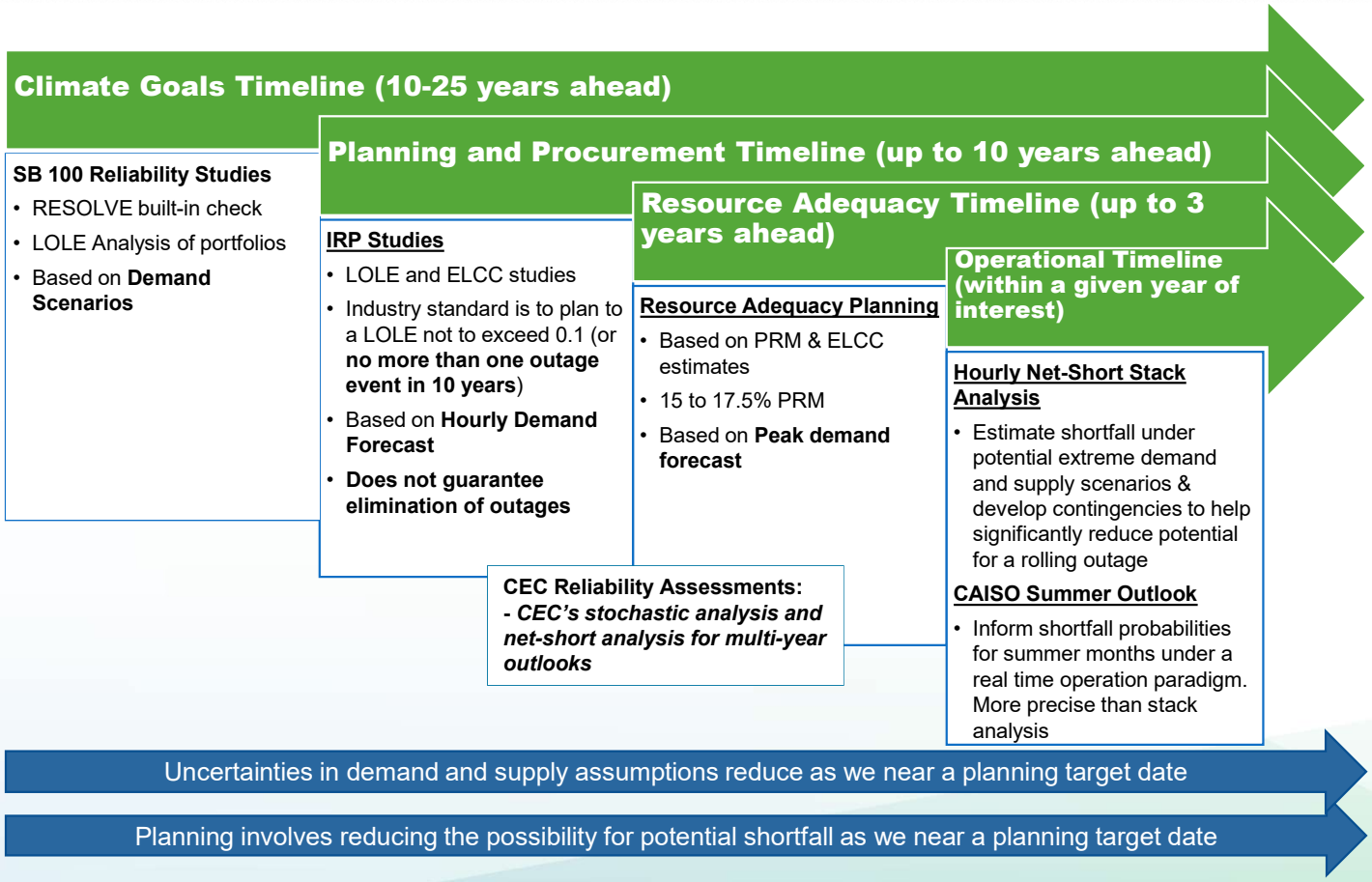
Totals represent new and existing resources. The 2021 SB 100 Joint Agency Report projects the need for 148,000 MW of new resources by 2045.

In addition, California also expects new capacity from energy efficiency, customer solar and demand response.

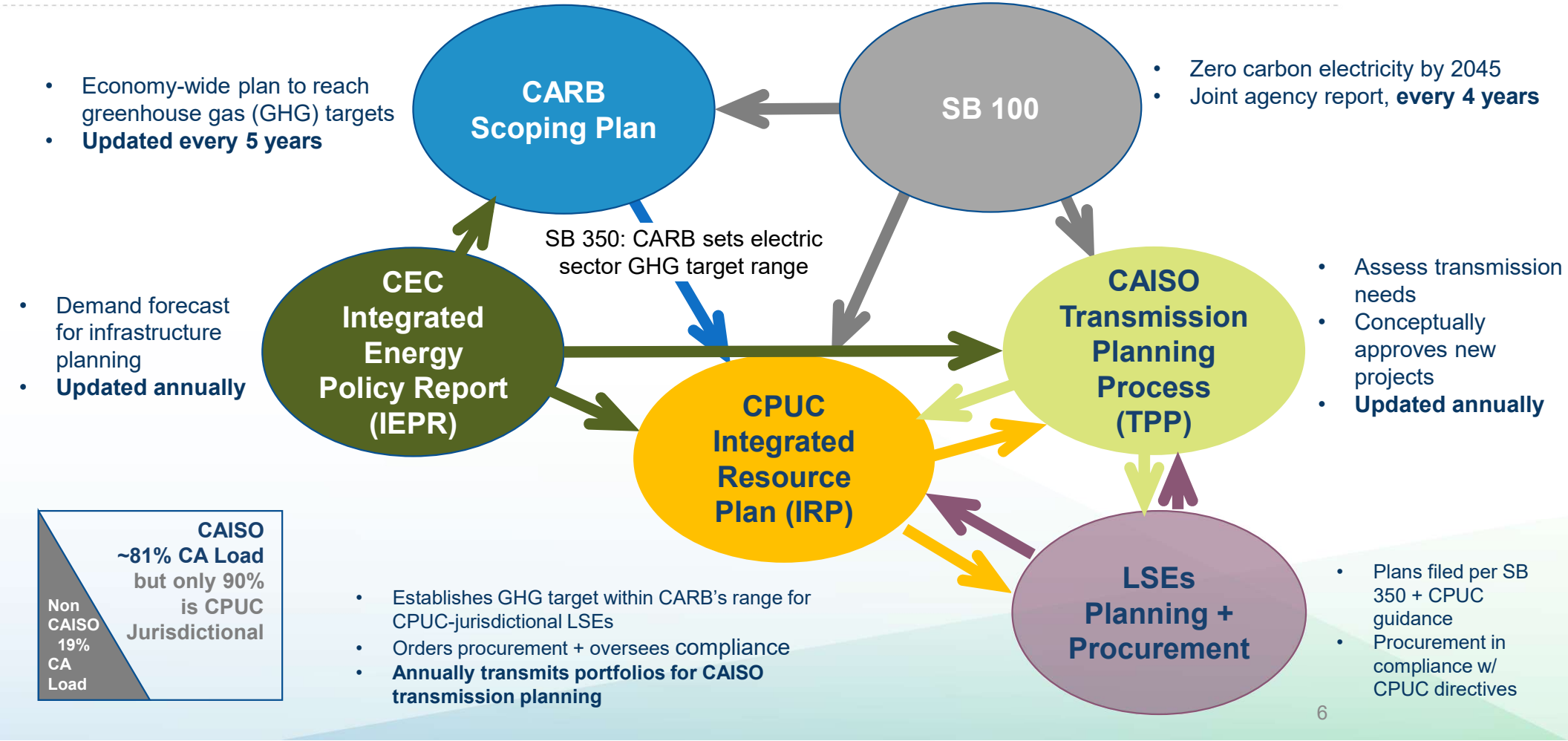
- Biomass
- Battery Storage
- Geothermal
- Offshore Wind
- Long Duration Energy Storage
- Utility-Scale Solar
- Wind



Electric System Planning – *Layered Planning Horizons*



California's Electric Planning – *A Complex Ecosystem*



- Economy-wide plan to reach greenhouse gas (GHG) targets
- **Updated every 5 years**

- Zero carbon electricity by 2045
- Joint agency report, **every 4 years**

- Demand forecast for infrastructure planning
- **Updated annually**

- Assess transmission needs
- Conceptually approves new projects
- **Updated annually**

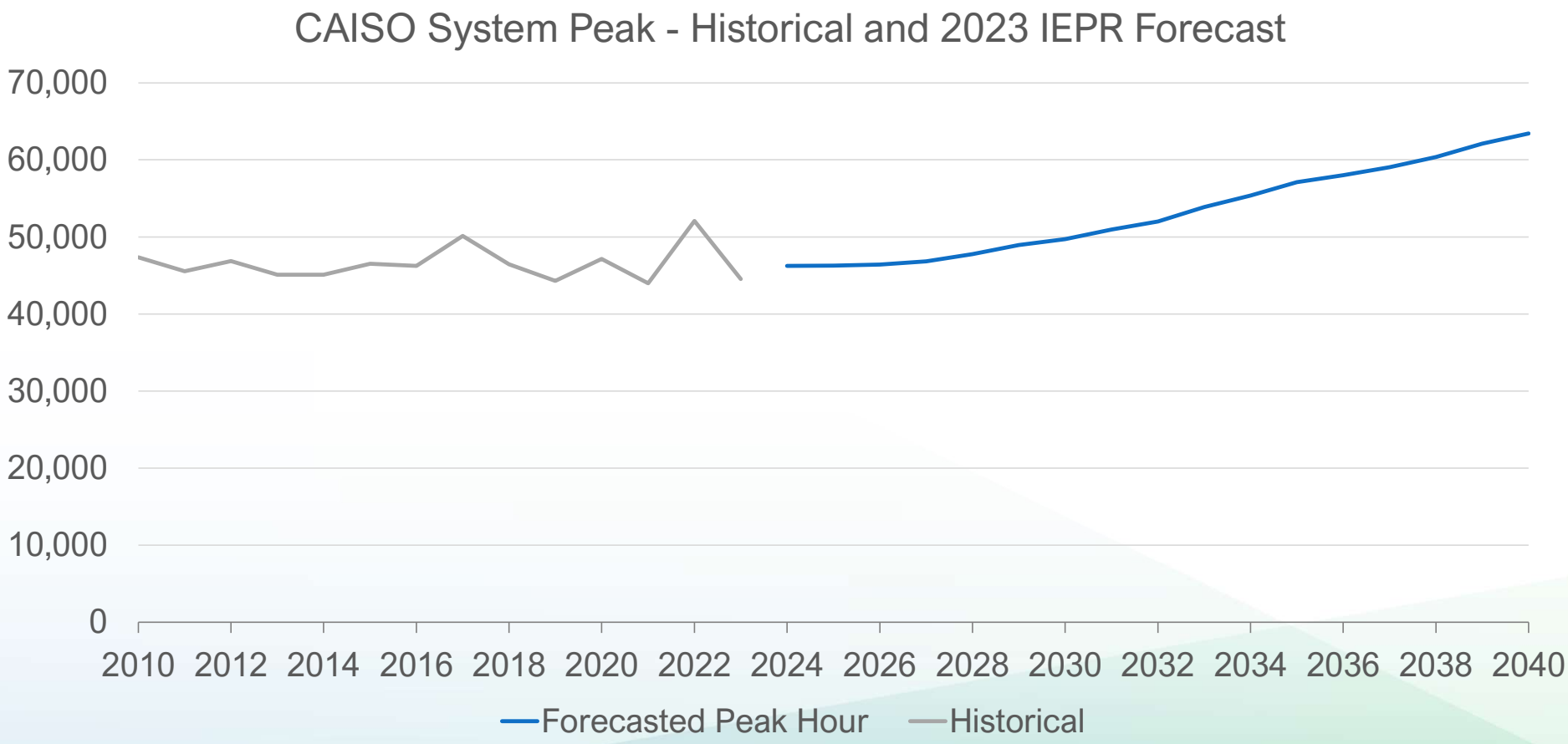
CAISO ~81% CA Load but only 90% is CPUC Jurisdictional

Non CAISO 19% CA Load

- Establishes GHG target within CARB's range for CPUC-jurisdictional LSEs
- Orders procurement + oversees compliance
- **Annually transmits portfolios for CAISO transmission planning**

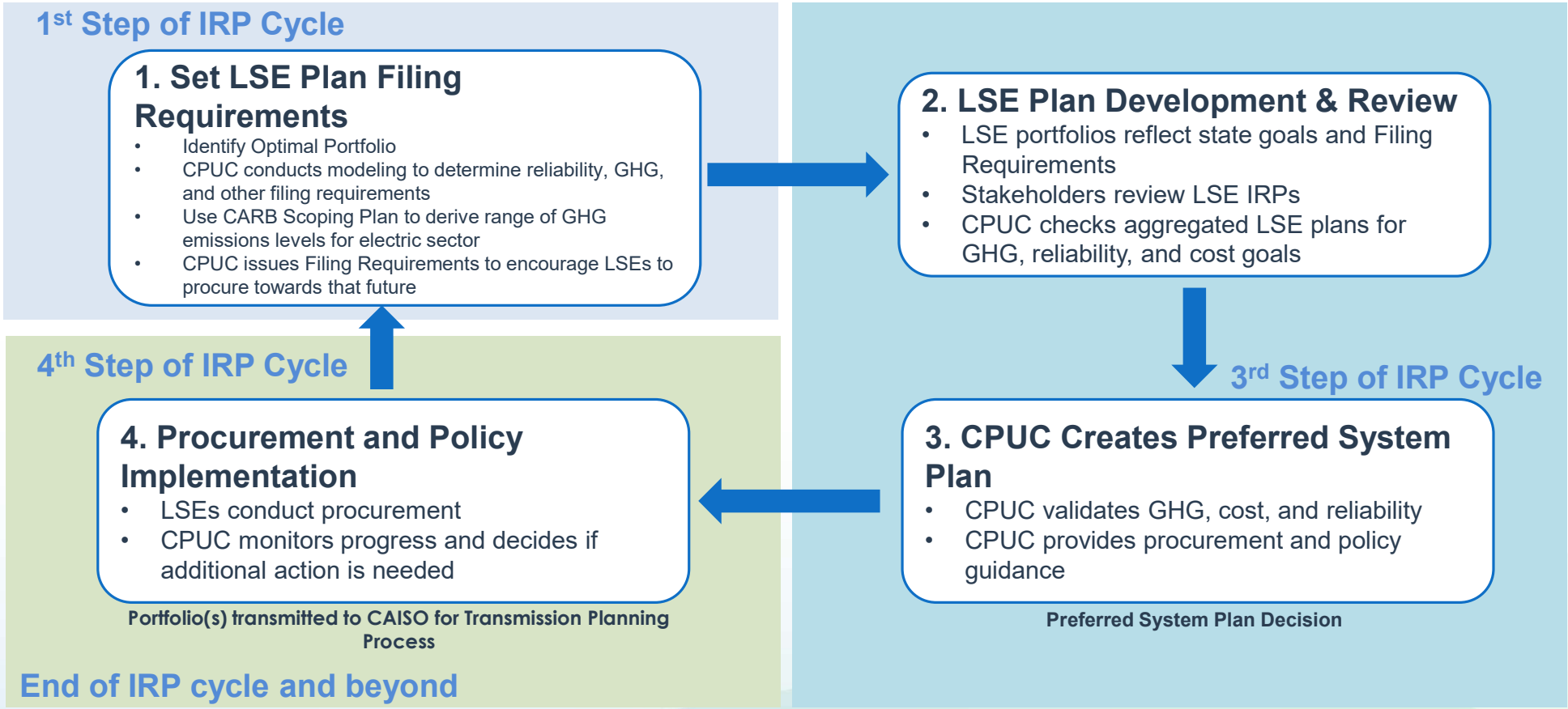
- Plans filed per SB 350 + CPUC guidance
- Procurement in compliance w/ CPUC directives

g-Term Demand Forecast – *Peak Electric Load*

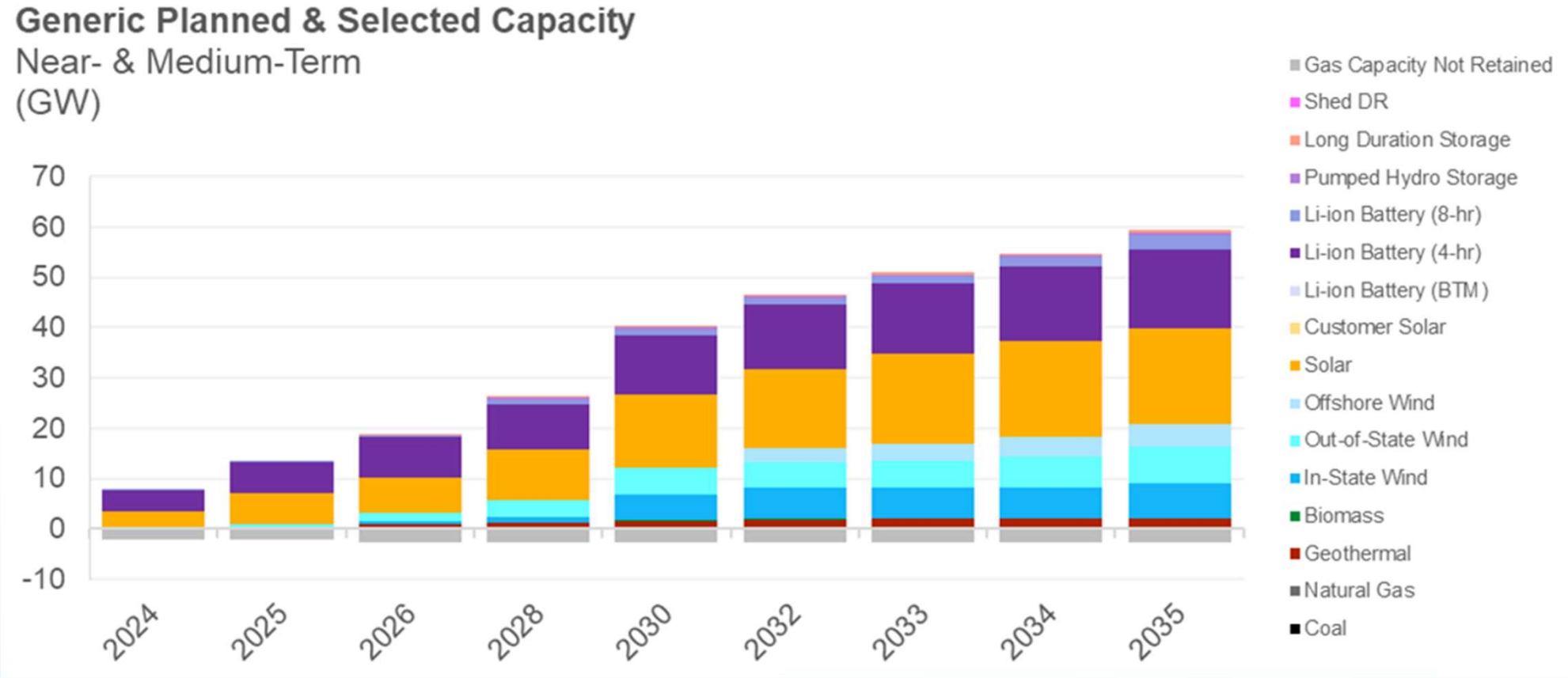


Source: CAISO and CEC Staff

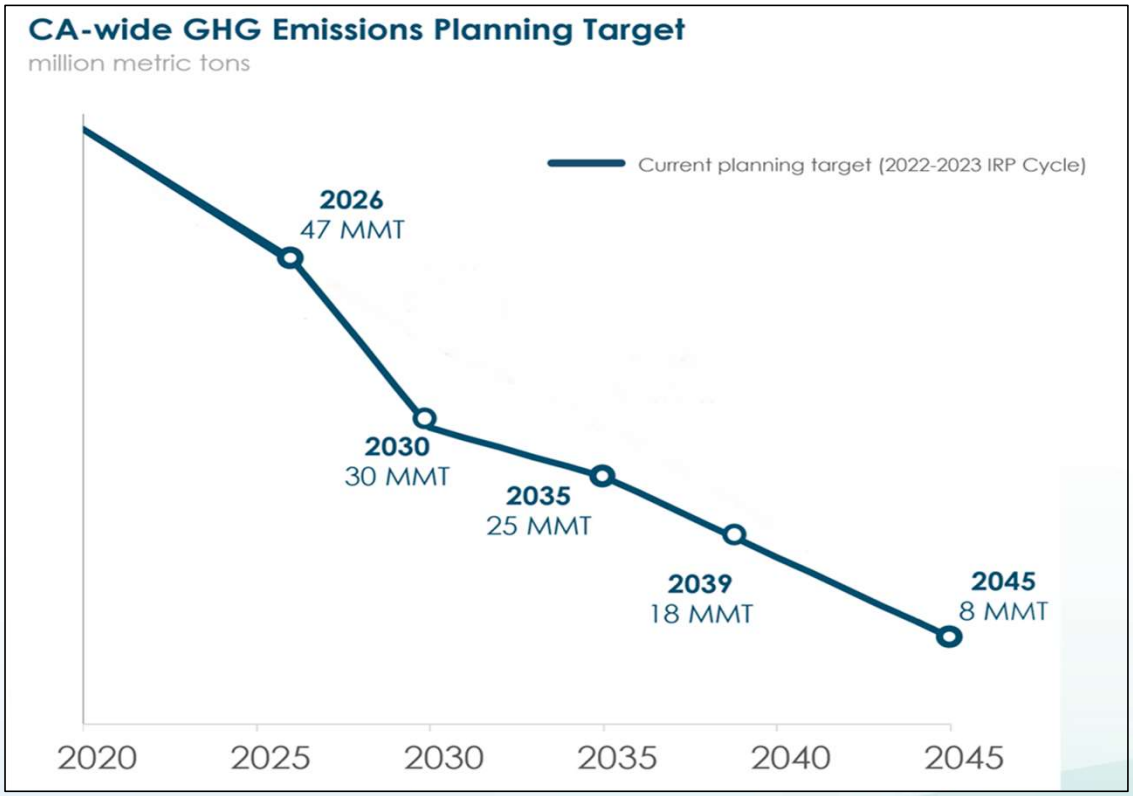
Integrated Resource Planning – *A Rolling Cycle*



Planned Resource Development – *Growing Capacity*

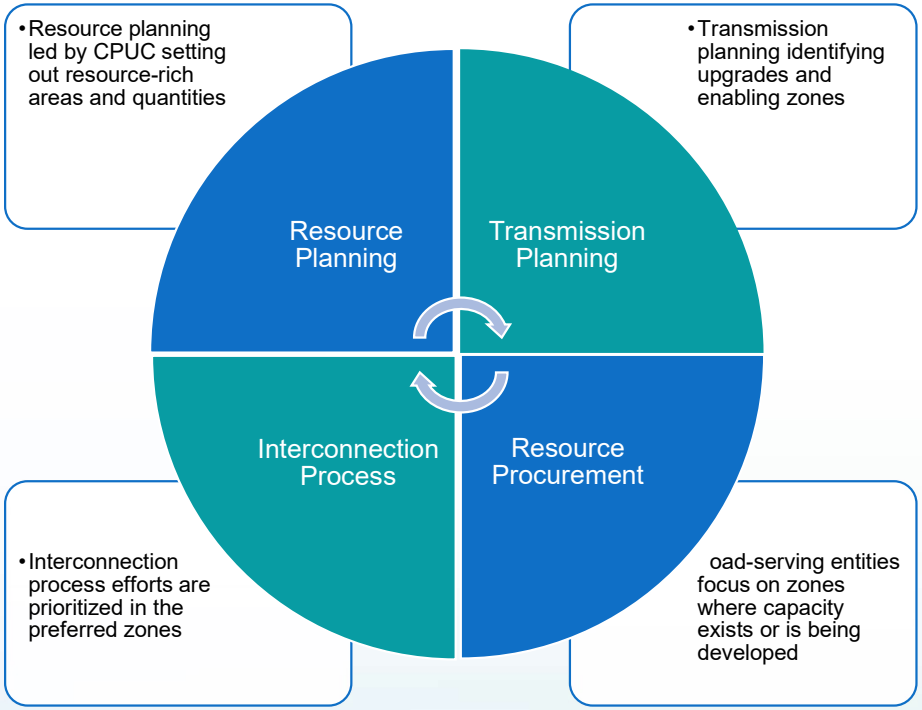


Resource Planning – *Driven by GHG Emission Reductions*



- The states Scoping Plan guides IRP greenhouse gas (GHG) emission reduction targets.
- The recent CPUC approved Integrated Resource Plan would reduce load-serving entity jurisdictional-electric sector GHG emissions by 58% in 2035, compared to 2020 levels.
- Modeling indicates that by 2039 natural gas electric generation will decrease by 90% as compared to modeled 2024 usage in jurisdictional territories.

Transmission Planning Process – *A Zonal Approach*



The strategic process alignment to manage the transformational change was established in the CPUC/CEC/ISO Memorandum of Understanding signed in December 2022 to:

- Tighten the linkage between:
  - Resource and transmission planning,
  - Procurement direction, and
  - ISO interconnection process.
- Create formal linkages between CEC SB 100/IEPR activities and the CAISO and CPUC processes
- Reaffirm the existing state agency and single forecast set coordination

Transmission Planning Process –
Informed by Demand Forecast & Resource Planning

- Annual 10-Year transmission plan is the formal approval document for expansion planning in CAISO footprint
  - Ramped from 10-year average of $650 million per year to $3 billion in 2021-2022 plan, and $7.3 billion in 2022-2023 plan
  - Responded to accelerating load growth and escalating renewable energy needs
  - Focuses on most efficient and effective long-term solutions – including Grid Enhancing Technologies and non-wires solutions
  - Also initiates competitive procurement for eligible transmission projects

- 20-Year Outlook assesses longer term needs
  - First prepared in 2022, being updated in 2024
  - Establishes a longer-term direction and strategy
  - Provides context for nearer term decision
  - Informs going forward resource planning decisions

Additional Transmission Planning Initiatives

- **The CAISO conditionally approved participation in the "SWIP North" Nevada-Idaho transmission project**
  - Joint effort with Idaho Power
  - Providing access to over 1000 MW of Idaho resources to California
- **The CAISO developed a subscriber participating transmission owner framework**
  - Facilitates merchant transmission to bring renewable energy to the California border
  - Transmission costs included in power purchase agreements instead of Transmission Access Charge
  - Two major projects have applied to join the ISO using this framework – TransWest Express and Sunzia
- **The CAISO is finalizing the 2023-2024 transmission planning process:**
  - 19 to 20 reliability projects, with a total cost of $1.2 to $2 billion
  - Policy-driven analysis will advance the first tranche of transmission to access north coast offshore wind

Transmission Development -

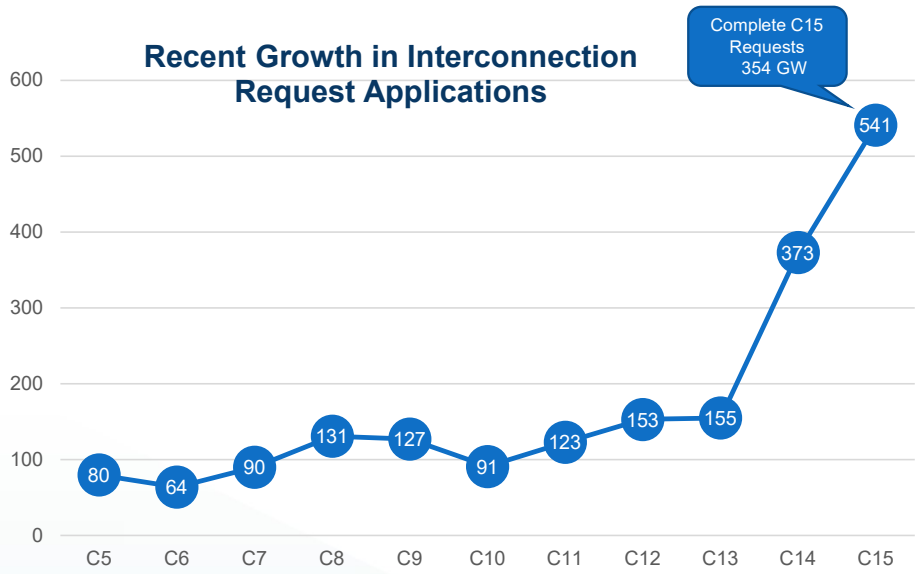
Capacity Exists & More is Developed Each Year

- **Approximately 17,000 MW of new resource capacity has been added over the last 4 years – primarily solar and battery storage**
  - In 2023, 5,660 MW reached commercial operation, & an additional 1,134 MW began operating in the market in final testing

- **The CAISO is tracking over 200 transmission projects initiated and under development through the Transmission Development Forum cohosted with the CPUC**
  - Over **45 GW** of deliverability has been awarded to resource interconnections in the CAISO queue based on approved upgrades
    - The resources' interconnections & local upgrades also need to be built
  - More allocations will be made this summer through the CASO's annual process, reflecting latest queue cluster & transmission plan

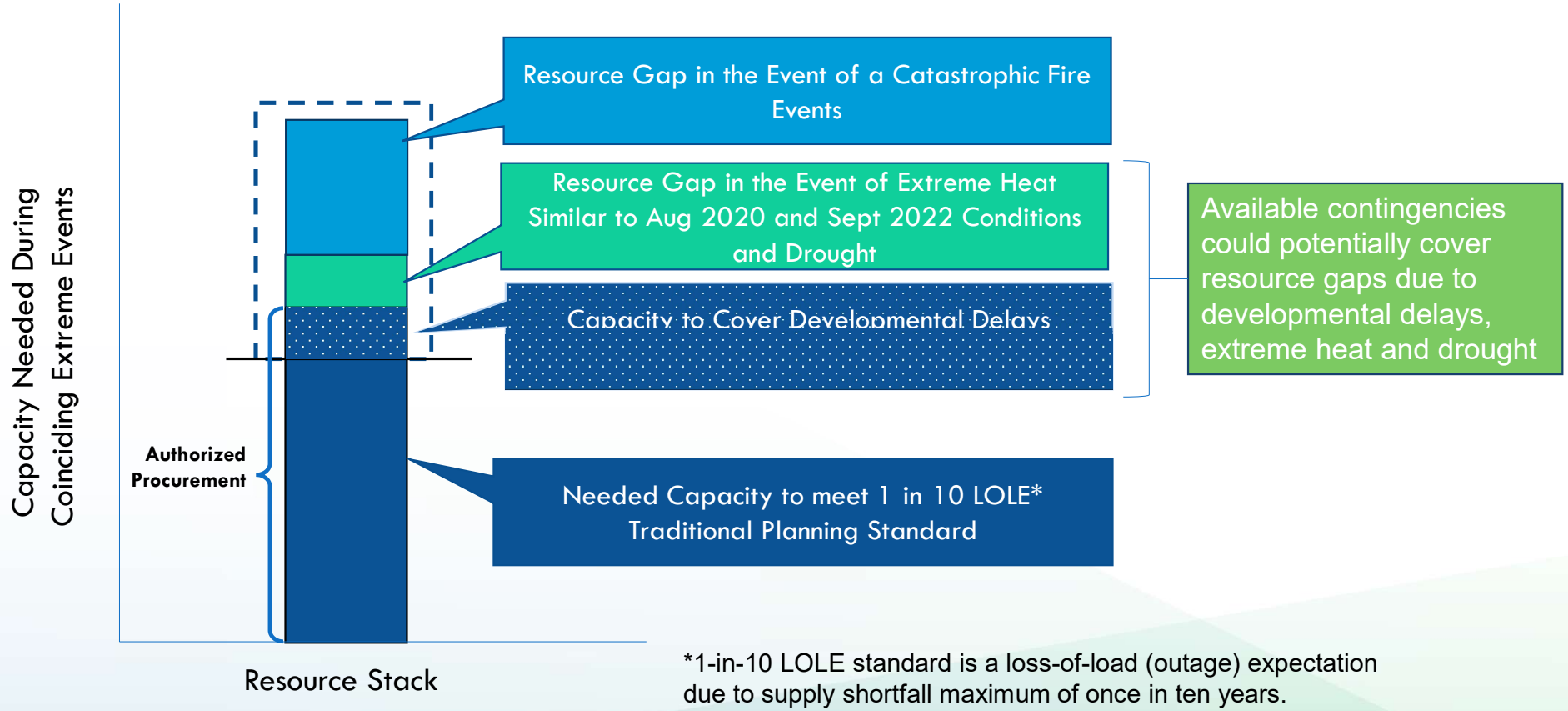
Transmission Generator Interconnection – *Process Improvements*

- The CAISO is conducting an open stakeholder initiative to identify & explore solutions.
- The reformed process will focus on most viable resource projects &manage overheated competition in the queue.
- The zonal approach to analysis, tied to scoring criteria & a backstop auction will ensure viable projects are studied.
- Will ensure better alignment with planning & resource procurement activities
- Builds on recent Federal Energy Regulatory Commission (FERC) Order 2023 impacting all regulated transmission providers



These volumes are above the already existing ~185 GW in the ISO queue

Electric System Reliability – *Need for Contingencies*



*1-in-10 LOLE standard is a loss-of-load (outage) expectation due to supply shortfall maximum of once in ten years.

ctric System Reliability - *Available Contingencies*

Type	Contingency Resource
Strategic Reliability Reserve (AB 205)	Electricity Supply Strategic Reliability Reserve Program (ESSRRP) (Long start, short start, imports)
	Demand Side Grid Support (DSGS)
	Distribute Energy Backup Assets (DEBA)
CPUC Ratepayer Programs	Demand Flexibility (Emergency Load Reduction Program, Smart Thermostats, etc.)
	Capacity at Co-gen or Gas Units Above Resource Adequacy
Non-Program	Balancing Authority Emergency Transfers
	State Water Project
	Thermal Resources Beyond Limits: Gen Limits
	Thermal Resources Beyond Limits: Gen Limits Needing 202c

Energy Institution Collaboration –
Enhanced Coordination & Communication

- **2022 MOU:** formalizes coordination between the CAISO, CPUC and CEC on resource planning, including interactions between the CEC's demand forecast, the CPUC's Integrated Resource Planning process, the CAISO's Transmisson Planning Process & interconnection processes, & the Joint Agency SB 100 (2018) Report.

- **Tracking Energy Development Task Force:** Comprised of representatives from the GO-Biz, CEC, CPUC, & CAISO. Focused on tracking near term, new clean energy projects under development to help overcome barriers to their completion.

- **Transmission Development Forums:** CAISO & CPUC initiated to provide status updates on transmission projects previously approved through the transmission planning process & network upgrades identified as dependencies to the generation interconnection process.

ieving Our Clean Energy Goals –
A Multi-Year, Multi-Pronged Strategy

- **Improve Grid Planning Processes**
  - Modernize demand forecasting for climate change-induced weather variability & electrification
  - Order sufficient & diverse resource procurement
  - Improve Resource Adequacy process

- **Scale Supply & Demand-Side Clean Energy Resources**
  - Track resource procurement
  - Improve interconnection & permitting processes
  - Scale demand flexibility goal & Clean Energy Reliability Investment Plan

- **Prepare for Extreme Events (Contingencies)**
  - Retain existing resources, such as the Diablo Canyon Power Plant, construct new resources & procure imports to backstop uncertainties
  - Create emergency demand flexibility opportunities

Thank You!