

# LSE Plan Aggregation Deck

October 5, 2023



California Public  
Utilities Commission

# IRP Background

# Statutory Basis of IRP: SB 350 (De León, 2015)

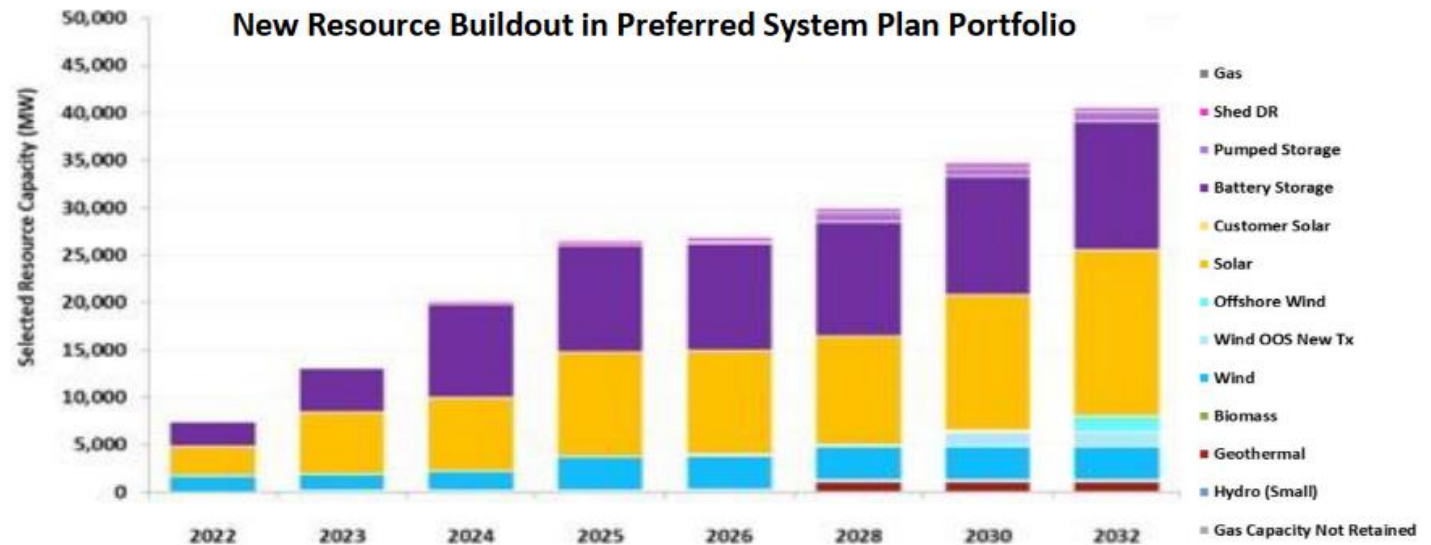
- The Commission shall...
  - PU Code Section 454.51
    - **Identify a diverse and balanced portfolio of resources... that provides optimal integration of renewable energy in a cost-effective manner**
- PU Code Section 454.52
  - **...adopt a process for each load-serving entity...to file an integrated resource plan...to ensure that load-serving entities do the following...**
    - Meet statewide GHG emission reduction targets
    - Comply with state RPS target
    - Ensure just and reasonable rates for customers of electrical corporations
    - Minimize impacts on ratepayer bills
    - Ensure system and local reliability
    - Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities
    - Enhance distribution system and demand-side energy management
    - Minimize air pollutants with early priority on disadvantaged communities

# Integrated Resource Planning (IRP) in California Today

- The objective of IRP is to reduce the cost of achieving greenhouse gas (GHG) reductions and other policy goals by looking across individual Load Serving Entity (LSE) boundaries and resource types to identify solutions to reliability, cost, or other concerns that might not otherwise be found
- Goal of the 2022-23 IRP cycle is to ensure that the electric sector is on track, between now and 2035, to support California's economy-wide GHG reduction goals and achieve the SB 100 target of 100% renewable and carbon-free electricity by 2045
- The IRP process has two parts:
  - First, it identifies an optimal portfolio for meeting state policy objectives and encourages the LSEs to procure towards that future
  - Second, it collects and aggregates the LSEs collective efforts for planned and contracted resources, compares those aggregated resources to the identified optimal system, and adopts a "Preferred System Plan" (PSP) detailing California's preferred mix of resources to achieve 100% clean electricity at least cost while maintaining reliability
    - The CPUC considers a variety of interventions to ensure LSEs are progressing towards procuring the PSP Portfolio
    - The CPUC has never ordered procurement in a PSP Decision, but retains the ability to do so

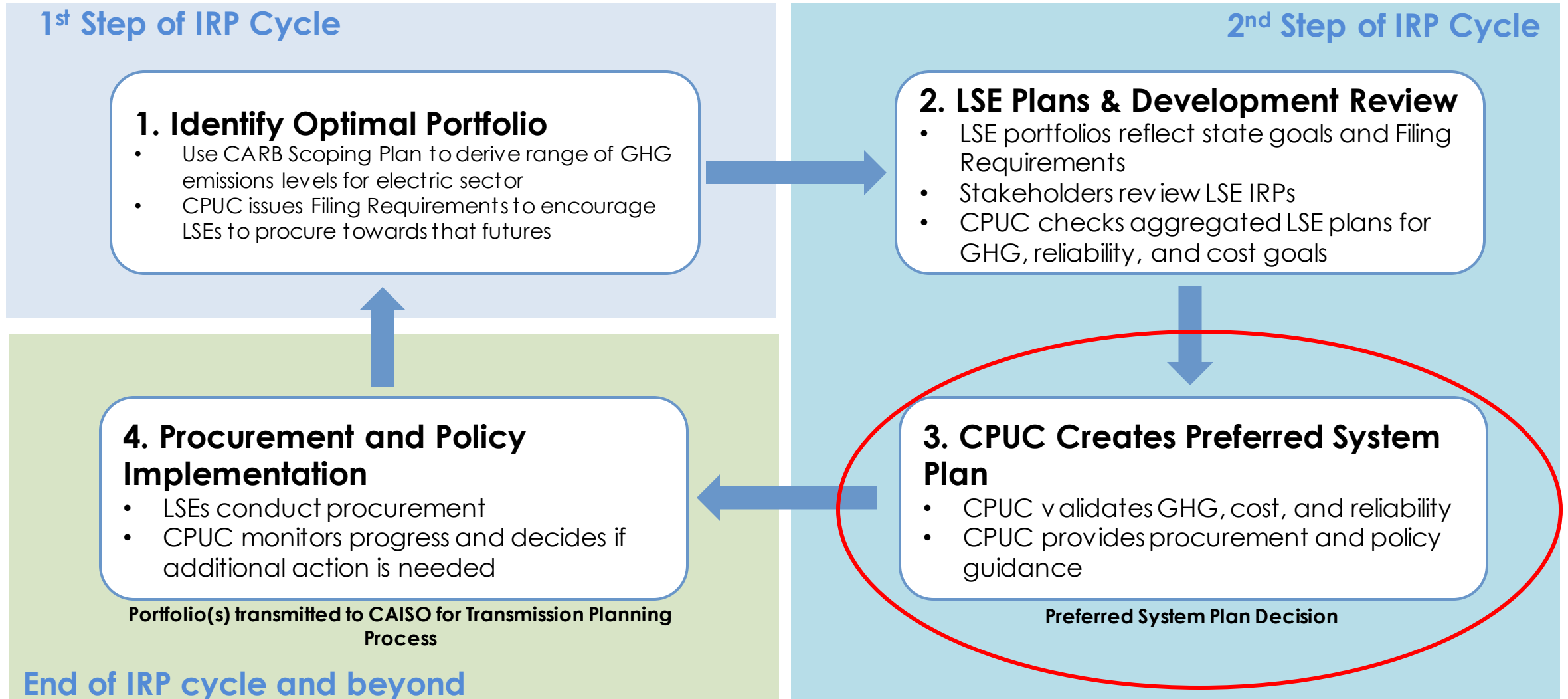
# Previous (2021) Preferred System Plan

- In February 2022, the Commission adopted D.22-02-040, which approved a preferred resource portfolio for use in planning and procurement, and was studied by the CAISO in the 2022-2023 Transmission Planning Process (TPP)
- Decision adopted a 38 MMT 2030 electric sector GHG planning target, which drops to 35 MMT by 2032
- It included the following new resource additions (nameplate):
  - ~25,500 MW of supply-side renewables
  - ~15,000 MW of new storage and demand response resources



2021 Preferred System Plan (38 MMT)

# Where we are in the current IRP Process



# Aggregation of LSE Portfolios

# What the PSP Informs

- **LSE planning:** In the 2019-21 IRP cycle, the 2021 Preferred System Plan (PSP) was used as the basis for developing LSE IRP filing requirements for the 2022-23 IRP cycle.
- **CAISO Transmission Planning Process (TPP):** The PSP is typically adopted and transmitted to CAISO for assessing transmission needs as a TPP base case. Other portfolios may also be transmitted for study as sensitivities in TPP.
- **Avoided Cost Calculator (ACC):** The PSP will likely be used as the basis for the 2024 ACC update. This update may also inform the NEM proceeding.
- **Gas forecasting:** The PSP is the basis for the gas forecasts used in other proceeding, such as the Aliso Proceeding (I.17-02-002).
- **SB 100:** The PSP serves as a foundation upon which SB 100 analysis and findings build.



# Filing Requirements

- LSE IRP filings are the vehicle by which the CPUC and stakeholders gain insight into individual LSEs' plans for meeting state goals
- To facilitate the filing of useful, appropriate, and complete information by LSEs, IRP staff provide LSEs with standardized tools, instructions, and templates (aka, IRP "filing requirements documents")
- The November 1, 2022 filing included LSE information on:
  - GHG reductions
  - reliability
  - imports/exports
  - impacts on disadvantaged communities
  - costs
  - other elements of long-term resource planning

# Filing Requirements Documents: Purpose

- **Narrative Template**: To describe how LSEs approached the process of developing its plan, present the result of analytical work, and demonstrate to the Commission and the stakeholders the LSE's action plans
- **Resource Data Template (RDT)**: To collect planned and existing monthly LSE contracting data, including for future resources which do not exist yet. Provides a snapshot of the LSE contracted and planned monthly total energy and capacity forecast positions over a ten year look ahead period. Also used to verify that LSE portfolios achieve assigned reliability planning standard
- **Clean System Power (CSP) Calculator**: To use in estimating the GHG and criteria pollutant emissions of LSE portfolios and verify that LSE portfolios achieve assigned GHG planning benchmarks

# Aggregation of Non-Jurisdictional LSE Resources

- IRP staff worked with the California Energy Commission (CEC) to develop RDTs for in-CAISO Publicly Owned Utilities (POUs)
- These POU RDTs contain existing contracts held by the POU's for online and in-development resources located in or deliverable to the CAISO
- These POU RDTs do not contain "planned" resources to meet reliability and GHG targets, and so do not contain the same magnitude of new resources as the RDTs of CPUC-jurisdictional LSEs
- These resources were aggregated with other CPUC jurisdictional LSEs' resources to provide a richer picture of resource planning across the CAISO BAA

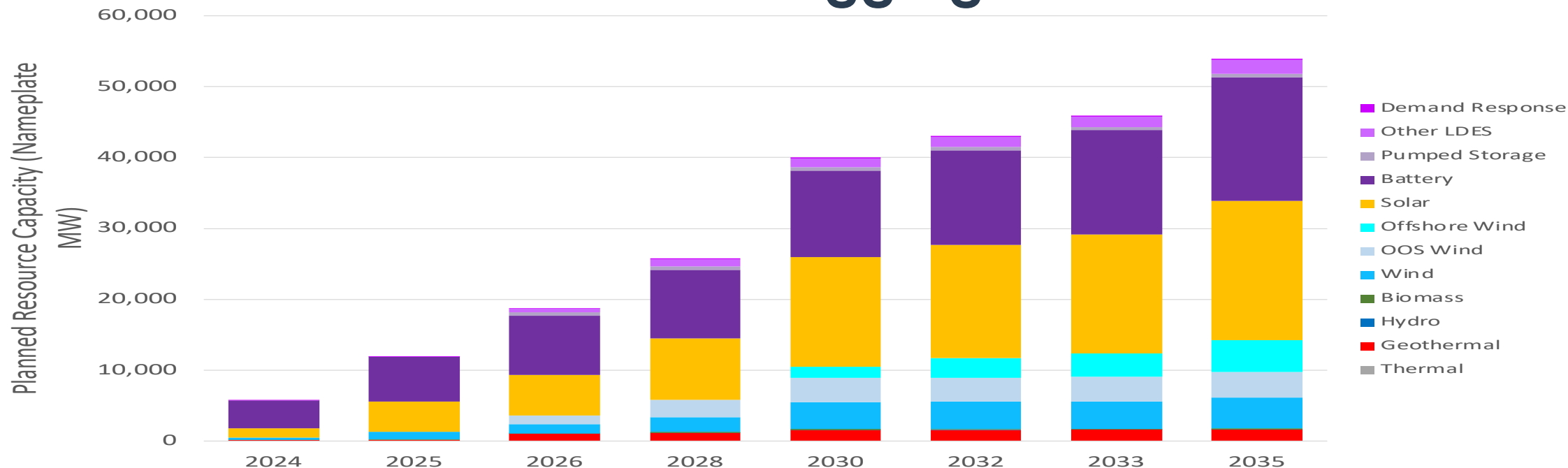
# Evaluation of LSE Resource Data Templates

- Staff developed aggregated LSE plans using the data submitted in the LSEs' RDTs, which had to be evaluated for completeness and internal consistency by staff to ensure that they accurately reflected LSE planning
- Staff used the RDT Error Checking, Aggregation and Reallocation Tool (RECART) to aggregate, error check, and analyze LSE RDT filings
- RECART compiled energy and capacity under contract, contracted resources by technology type and LSE, and aggregated new resources that were in development or planned future purchases
- LSEs were contacted when errors were found in RECART and re-submitted RDT filings, where necessary

# Use of Aggregated LSE plans in PSP development

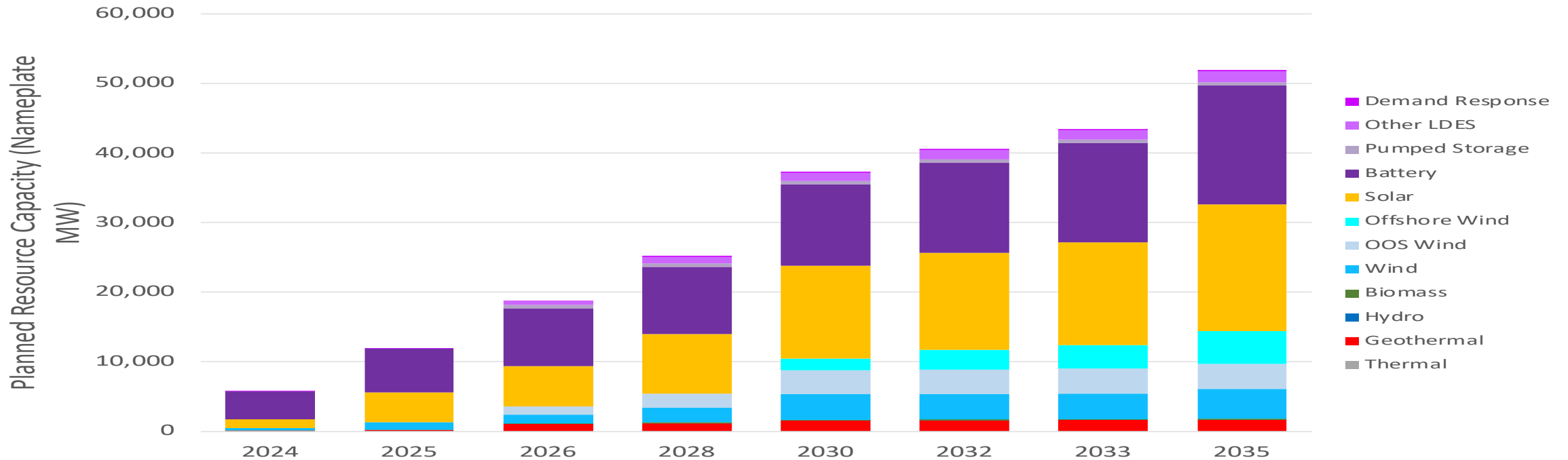
- CPUC staff take individual LSE plans, aggregate them, and evaluate aggregated portfolio against overall electric system needs
- This aggregated portfolio is evaluated against reliability and GHG constraints, while seeking to meet these constraints at the lowest reasonable cost to ratepayers
- The aggregation of the individual LSE portfolios also serves to determine if there are gaps in the collective portfolio that will require action by the Commission to address

# Planned Resource Additions -- Aggregated 25 MMT Plans



- CPUC Jurisdictional LSEs were required to submit plans on 11/1/2022 to collectively plan for GHG emissions targets of 18.6 MMT and 15.0 MMT in 2030 and 2035 respectively, which represents the CPUC-jurisdictional share of the statewide 30 MMT by 2030 and 25 MMT by 2035 statewide electric sector targets.
- All LSEs met their assigned GHG benchmarks, with some achieving emissions well below their assigned benchmarks:
  - LSE Emissions in 2030, per aggregated LSE CSP results: **15.1 MMT**
  - LSE Emissions in 2035, per aggregated LSE CSP results: **12.2 MMT**
- When aggregated, CPUC Jurisdictional LSEs demonstrated collective intentions to exceed their proportional GHG requirements. Their aggregated 25 MMT Portfolios reduced GHG emissions by ~3 MMT below their GHG emissions targets

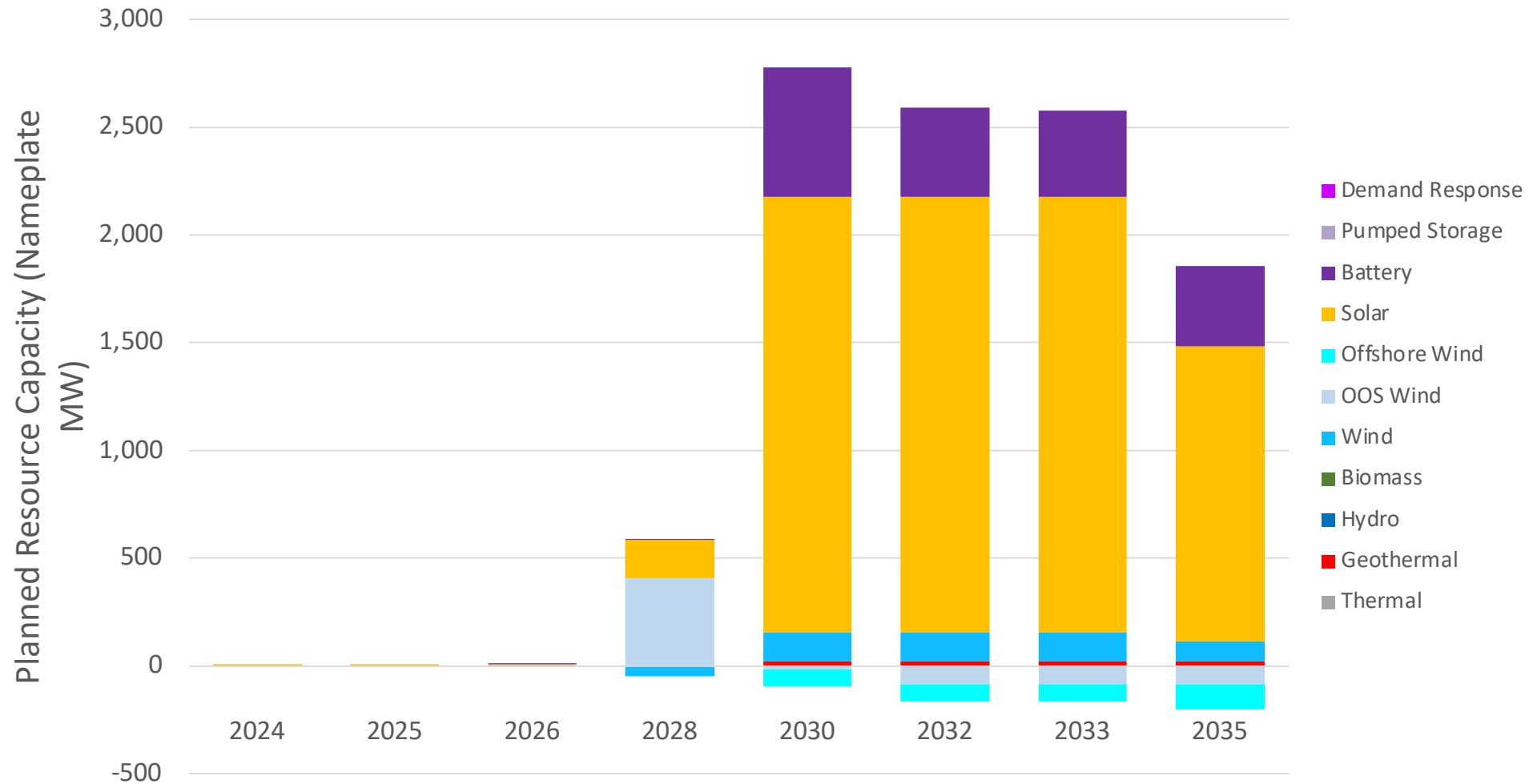
# Planned Resource Additions -- Aggregated 30 MMT Plans



- CPUC Jurisdictional LSEs were required to submit plans on 11/1/2022 to collectively for GHG emissions targets of 24.7 MMT and 18.8 MMT in 2030 and 2035 respectively, which represents the CPUC-jurisdictional share of the statewide 38 MMT by 2030 and 30 MMT by 2035 statewide electric sector targets.
- All LSEs met their assigned GHG benchmarks, with some achieving emissions results well below their assigned benchmarks:
  - LSE Emissions in 2030, per aggregated LSE CSP results: **18.3 MMT**
  - LSE Emissions in 2035, per aggregated LSE CSP results: **14.1 MMT**
- When aggregated, CPUC Jurisdictional LSEs demonstrated collective intentions to exceed their proportional GHG requirements. Their aggregated 30 MMT Portfolios reduced GHG emissions by ~5-6 MMT below their GHG emissions targets

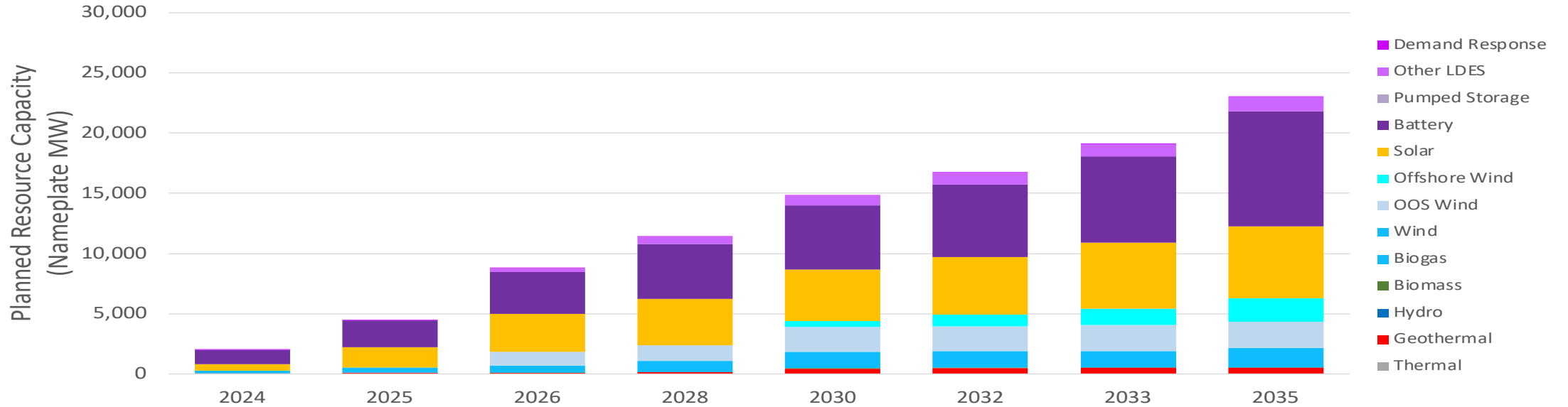
# New Resource Additions: Growth from 30 MMT to 25 MMT Plans

- This chart shows the marginal differences between the two sets of LSE submitted plans
- LSEs relied largely on solar and storage resources to close the emissions gap between their 30 and 25 MMT plans
- Some LSEs planned to contract with existing GHG-free resources, which are counted in the baseline and not included in the PSP portfolio

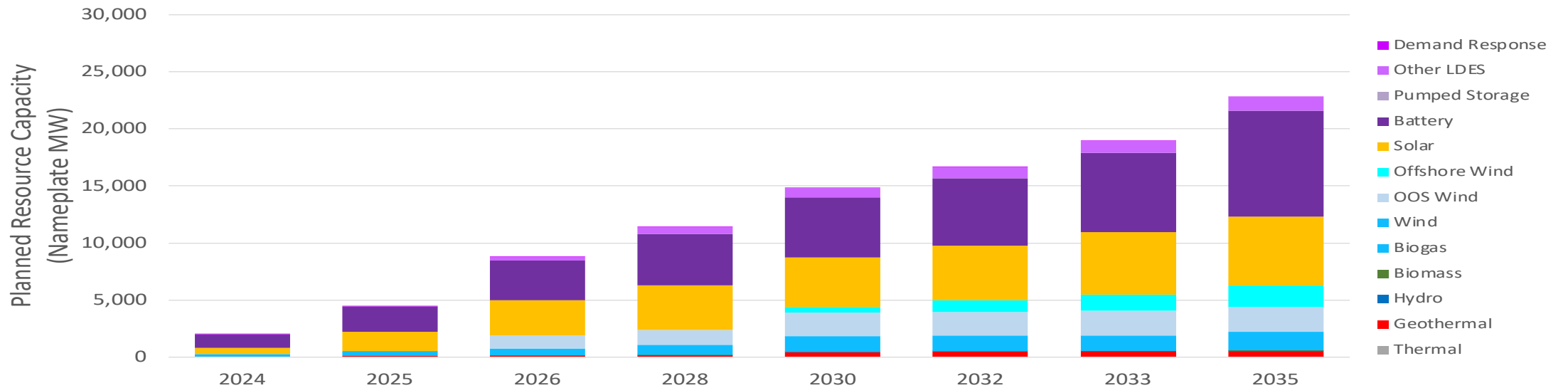




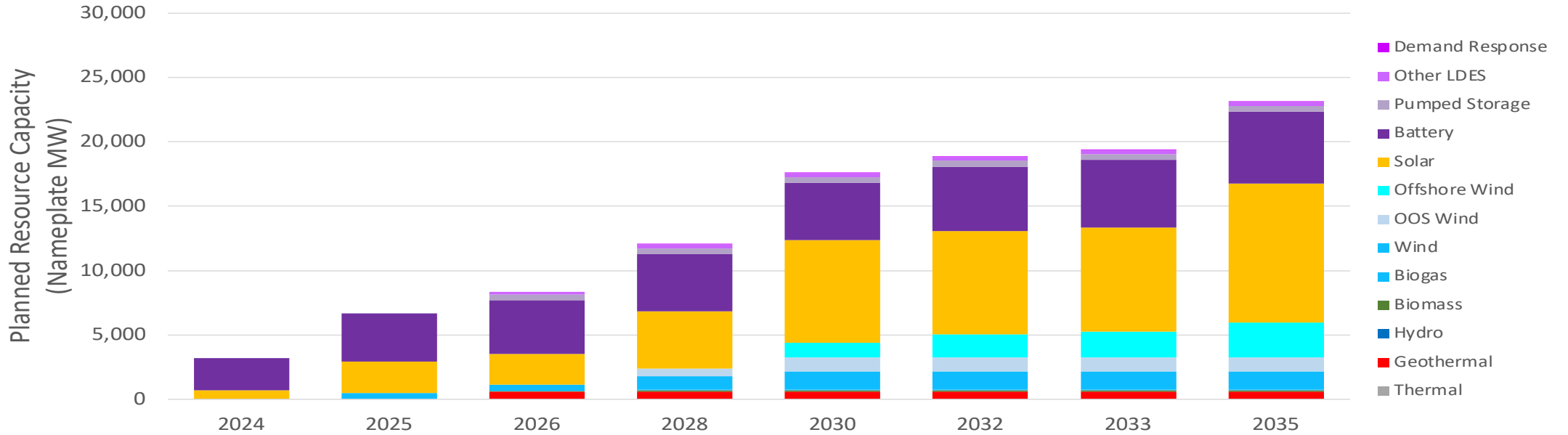
## New Resource Additions: Aggregated 30 MMT Plans - CCAs



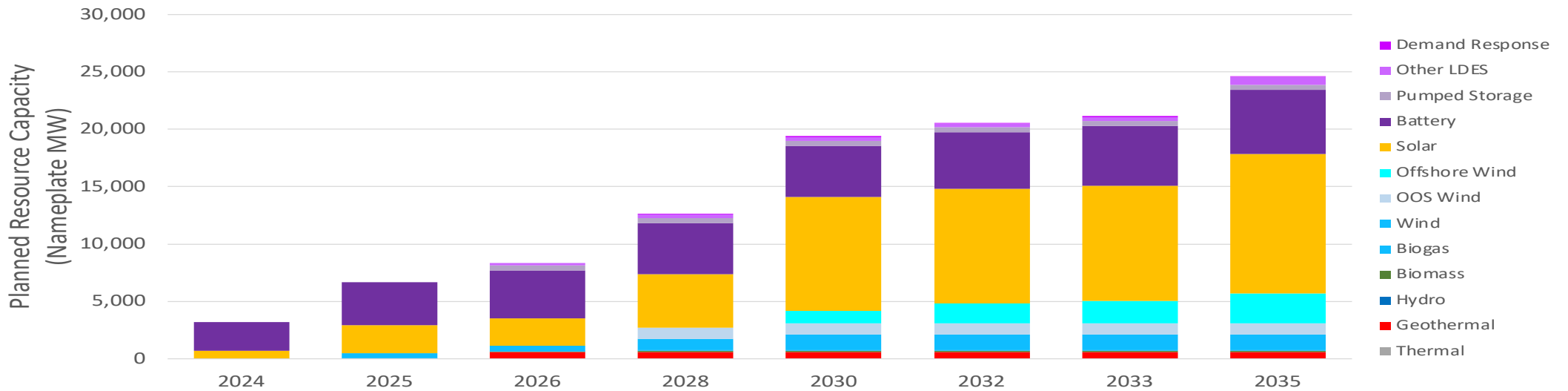
## New Resource Additions: Aggregated 25 MMT Plans - CCAs



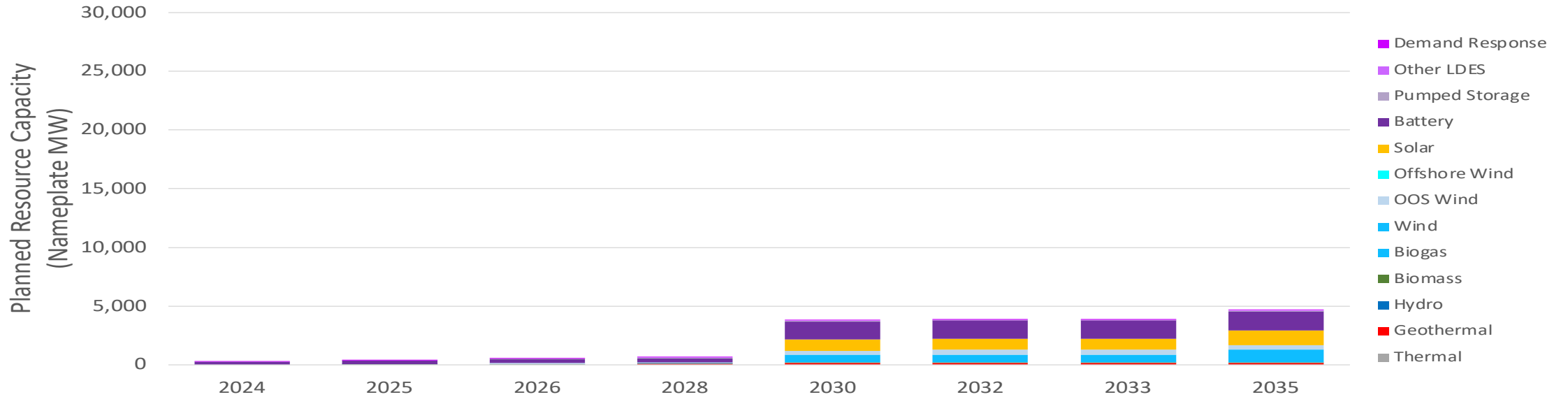
## New Resource Additions: Aggregated 30 MMT Plans - IOUs



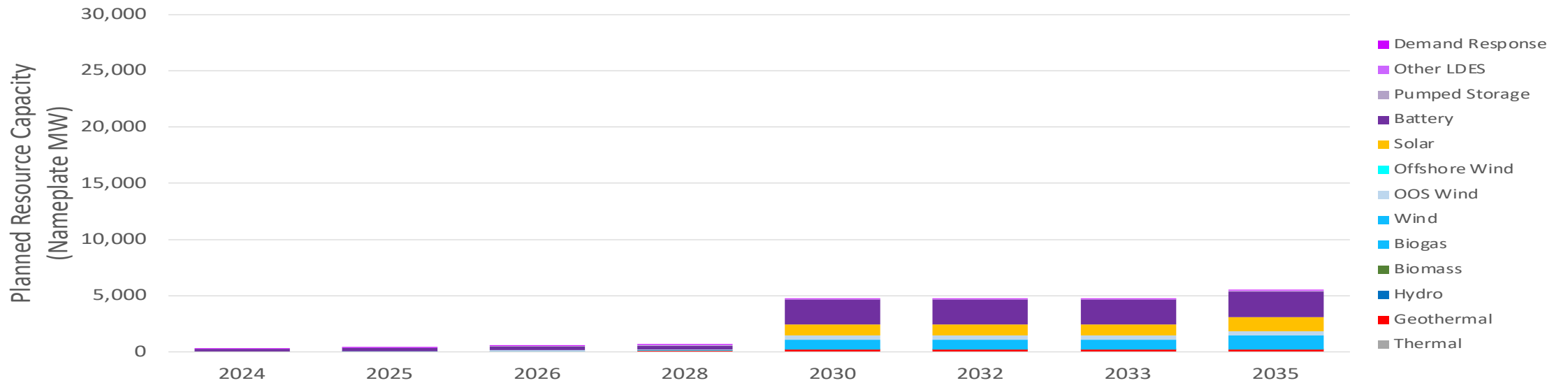
## New Resource Additions: Aggregated 25 MMT Plans - IOUs



## New Resource Additions: Aggregated 30 MMT Plans - ESPs



## New Resource Additions: Aggregated 25 MMT Plans - ESPs



# Aggregated Plans vs. 2021 PSP

25 MMT LSE Planned Resources vs.  
30 MMT by 2030 PSP Sensitivity

	2024	2025	2026	2028	2030	2032	2033	2035
Thermal	8	8	8	8	8	8	8	8
Nuclear	0	0	0	0	0	0	0	0
Geothermal	23	75	240	7	407	457	477	503
Hydro	0	0	8	8	8	8	8	8
Small Hydro	0	0	0	0	0	0	0	0
Biomass	-72	-66	-54	-2	-2	-2	-2	-2
Biogas	0	28	39	39	39	39	39	39
Wind	-2,257	-3,225	-2,995	-2,168	-480	-480	-480	124
OOS Wind	0	0	1,220	-1,817	-1,405	-1,405	-1,305	-1,275
Offshore Wind	0	0	-120	-195	1,380	-364	231	-176
Solar	-6,462	-6,681	-5,238	-2,647	-4,790	-4,246	-4,357	-2,155
Battery	-5,949	-5,231	-3,160	-2,030	-1,223	-1,328	-1,274	-281
Pumped Storage	0	0	261	-531	-531	-531	-531	-531
Other LDES	0	6	511	968	1,194	1,364	1,414	1,929
Demand Response	-583	-669	-667	-597	-595	-595	-595	-595
Load Modifier	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Total	-15,293	-15,755	-9,948	-8,957	-5,989	-7,074	-6,366	-2,402

30 MMT LSE Planned Resources vs.  
38 MMT by 2030 PSP

	2024	2025	2026	2028	2030	2032	2033	2035
Thermal	8	8	8	8	8	8	8	8
Nuclear	0	0	0	0	0	0	0	0
Geothermal	23	75	847	5	388	438	458	484
Hydro	0	0	8	8	8	8	8	8
Small Hydro	0	0	0	0	0	0	0	0
Biomass	-72	-54	-54	-2	-2	-2	-2	-2
Biogas	0	28	39	39	39	39	39	39
Wind	-2,257	-2,517	-2,287	-1,411	89	89	89	738
OOS Wind	0	0	1,220	1,671	1,637	1,010	-347	-996
Offshore Wind	0	0	-120	-195	1,464	313	908	-59
Solar	-6,468	-6,687	-5,244	-2,825	-4,003	-3,459	-2,686	849
Battery	-5,474	-4,868	-2,799	-3,342	-2,781	-2,676	-2,010	-261
Pumped Storage	0	0	261	-531	-531	-531	-531	-531
Other LDES	0	6	512	970	1,169	1,339	1,389	1,541
Demand Response	-793	-879	-877	-807	-805	-805	-805	-805
Load Modifier	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Total	-15,034	-14,887	-8,486	-6,413	-3,321	-4,229	-3,481	1,013

- Relative to the 2021 38 MMT PSP Portfolio and 30 MMT PSP Sensitivity, Aggregated LSE Plans are slightly smaller overall with some differences in terms of resource composition
- Smaller size of portfolios likely due to:
  - Some early year “new” resources included in the 2021 PSP Portfolios have become part of the baseline due to LSE contracting
  - LSE Plans cover only the CPUC-jurisdictional share of CAISO load (~86%) while the PSP Portfolios cover the full CAISO load
  - A slight preference by LSEs for higher capacity factor/duration resources like geothermal and long-duration storage

# Conclusions

- All LSEs met their filing requirements, and the LSE Plan review process required fewer re-submission requests by IRP staff compared to last cycle, likely reflecting filing template improvements and greater LSE familiarity with the templates
- This was the first IRP cycle for which LSEs were assigned reliability filing requirements
  - All LSEs met their reliability filing requirements, with some LSEs planning for reliability levels in excess of their assigned requirements
- All LSEs met their assigned GHG benchmarks, with some achieving emissions results well below their assigned benchmarks
- Portfolio size and composition is broadly similar between the aggregated 30 MMT and 25 MMT (by 2035) plans, reflecting the desire of many LSEs to submit portfolios for both sets of targets achieving emissions less than or equal to their 25 MMT benchmarks
- Aggregated portfolio sizes are similar to the 2021 PSP Portfolios, although they are slightly smaller due to CPUC-jurisdictional LSE load equaling less than 100% of CAISO, near-term contracting since PSP adoption becoming part of the baseline, and a slight preference by LSEs for higher capacity factor/duration resources like geothermal and long-duration storage