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CEC IEPR WORKSHOP:
ACCELERATING
INTERCONNECTION
TO THE BULK GRID

MAY 4, 2023

The Foundational Role of Transmission and Timely Interconnection for Achieving Climate Targets

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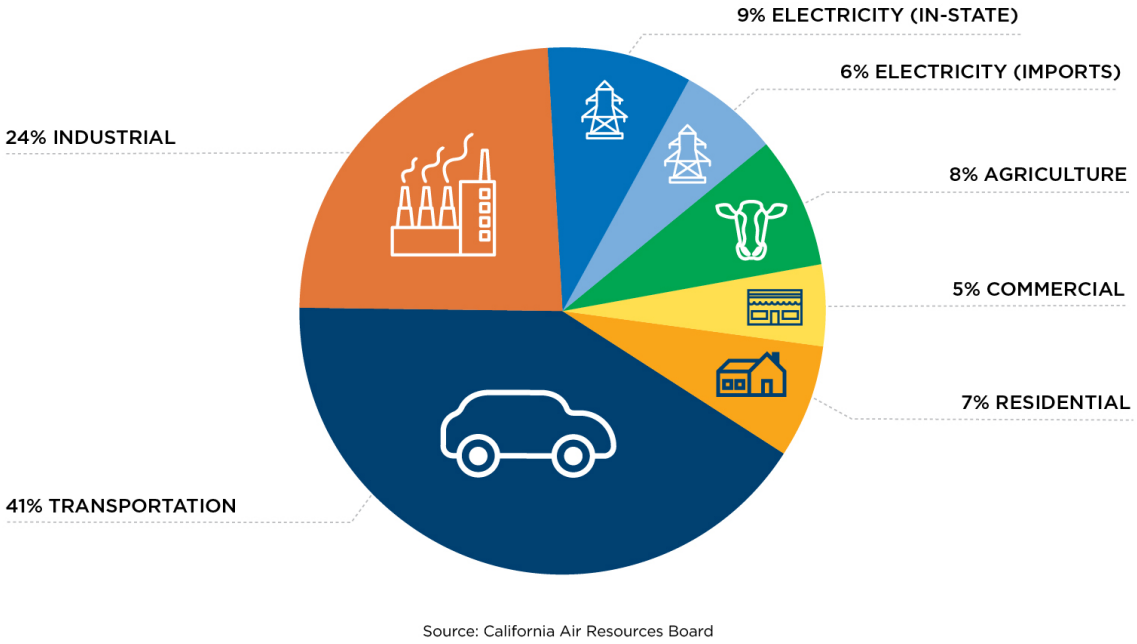
California Climate Targets

- AB 32 (Pavley) - reduce climate emissions to 40% below 1990 levels by 2030
- SB 100 (DeLeon) - decarbonize the grid by 2045
- AB 1279 (Muratsuchi, C. Garcia) Reach carbon neutrality by 2045
- SB 1020 - reduce grid carbon emissions by 90% by 2035, and 95% by 2040.



Source: CARB Emissions Inventory

Transmission Planning Process - Portfolios

	Portfolios for 2020-2021 Plan (2030)	Portfolios for 2021-2022 Plan (2031)	*Authorized near and mid term (2025) procurement*	*Preferred System Plan (2025)*	Preferred System Plan (2032)	30 MMT High Electrification Sensitivity Portfolio (2035)
Solar	6,763	13,044	*12,800 **	*11,000*	17,506	40,879
Wind	992	4,005		*3,531 in state 0 OOS 0 offshore*	3,531 in state 1,500 OOS 1,708 offshore	3,797 in state 4,828 OOS 4,707 offshore
Battery storage	1,376	9,368		*11,317*	13,571	28,402
Gas-fired						
Biomass				*107*	134	134
Geothermal	0	651	*1,000 likely beyond 2026*	*114*	1,160	1,786
Pumped Hydro / Long Duration	1,256	627	*1,000 likely beyond 2026*		1,000	2,000
Total	**10,387**	**27,695**	***14,800***	***26,069***	**40,110**	**86,535**
Gas retirements	0	0			~1,000	-1,000

* NQC value as opposed to installed capacity

Table does not include behind-the-meter resources and supply-side demand response

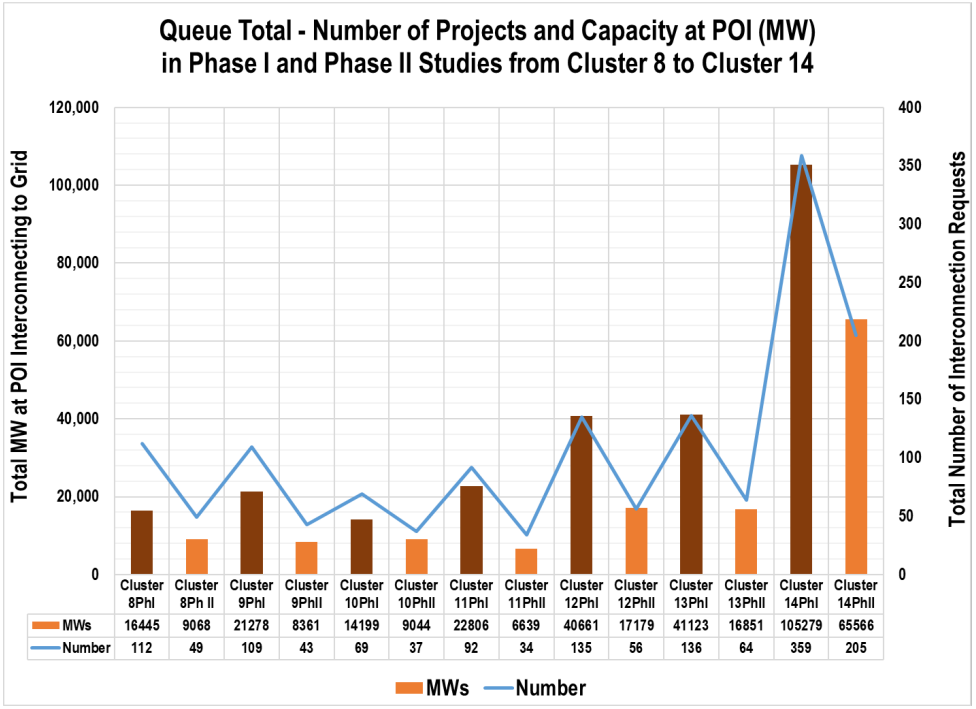
Today's Interconnection Queue

Clusters 8-14

- Number of Projects, Phase I & II Studies: 1,500
  - Phase II only: 488
- Number of MWs, Phase I & II: 394,499MWs
  - Phase II only: 132,708MWs

Cluster 15 (2023)

- Total Interconnection Requests – 541
- Total GWs – 354GWs



Source: IPE White Paper 2023

Transmission Challenges & Solutions

Challenges

1. Transmission Network Upgrade Delays
2. An 'overheated' queue too many MWs vying for limited transmission capacity
3. Insufficient transmission planning horizons
4. Unknown transmission delivery capacity based on older queued projects
5. Shortage of engineering experts in the regulatory and utility environs
6. Transmission Cost Concerns

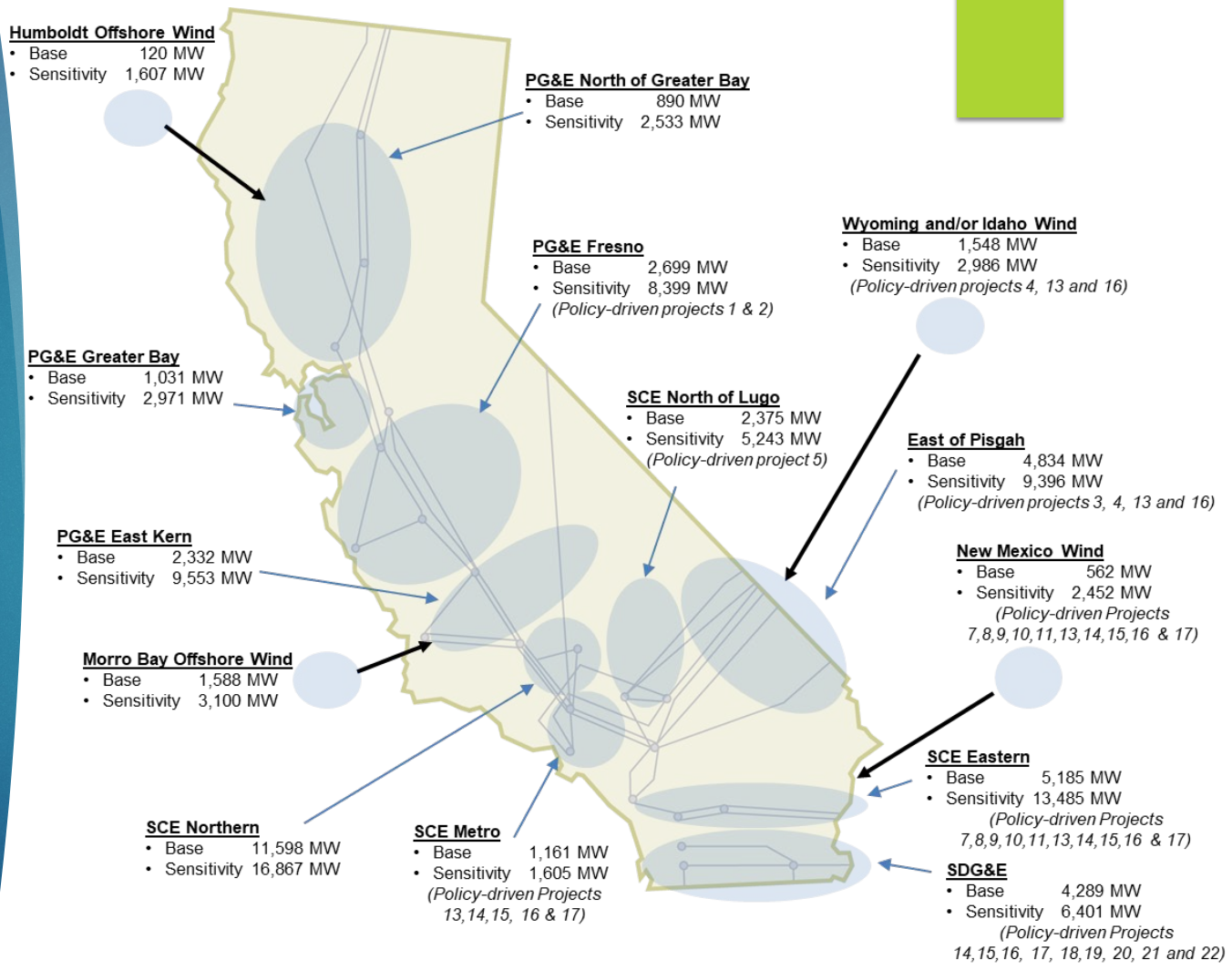
Solutions Underway

1. Searching for solutions to accelerate approved Network Upgrades
2. Interconnection Process Enhancements 2023 White Paper Proposals
3. CAISO 20-Year Transmission Study
4. New 15-year Transmission Planning horizon
5. New engineer training programs – e.g. UC Davis
6. Recent alignment with Proper Planning Metrics (TPP Portfolios)
7. Refreshed MOU among state Commissions and CAISO

New Resources Needed by 2035

- Base: New MWs needed to meet 38 MMT GHG target by 2035
  - 40GWs by 2032
- Sensitivity: New MWs needed to meet 30 MMT GHG target by 2035
  - 86GW by 2035
- *What's Missing: How many viable MWs are in the queue at each location?*

Figure ES-1: Transmission Planning Zones and Capacity



Source: Presentation-2022-2023-Transmission-Planning-Process-Apr112023.pdf (caiso.com) (slide 81/226)

New Resources Needed by 2035 – *Case Study*

- SCE Northern
  - MW Needed by 2035 (Base) 11,598 MW
  - MW Needed by 2035 (Sensitivity) 16,867 MW

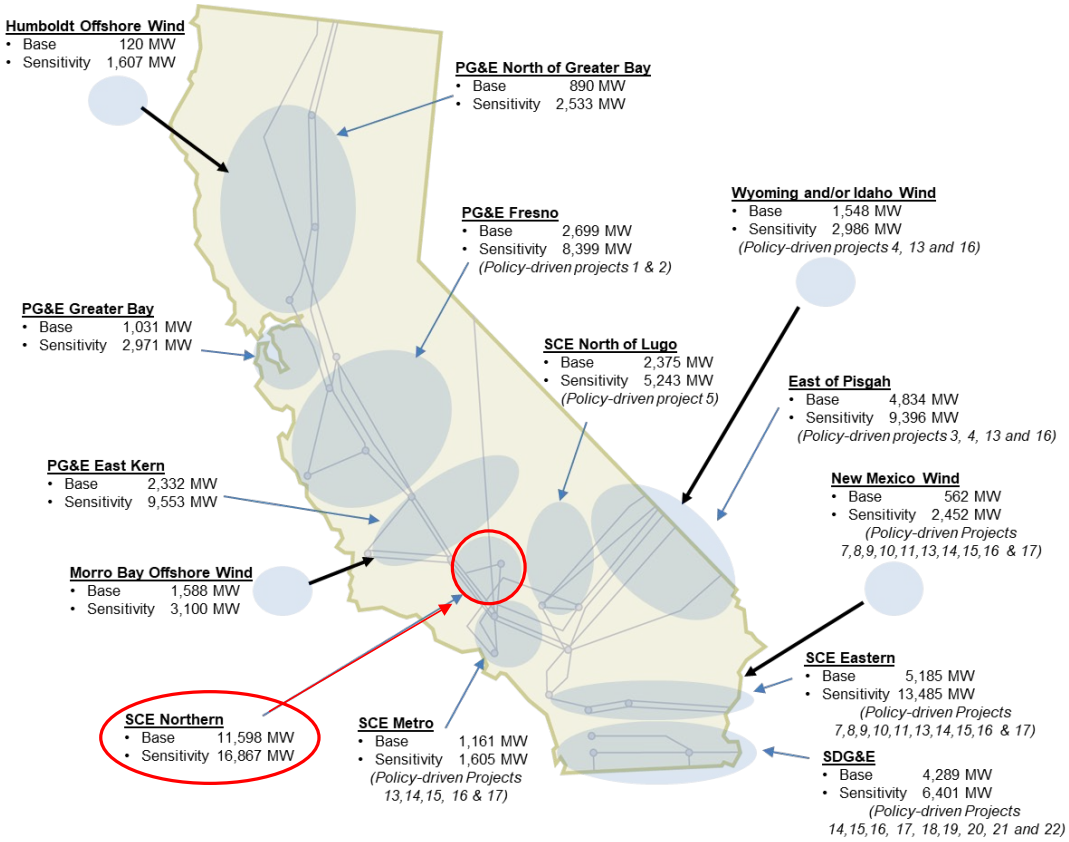
Current Queue Data

- **MWs in CAISO Queue (w/C14) 27,000 MW**
- **MW in CAISO Queue w/Phase II Studies (no C14) 14,500 MW**

Data needed

- **MWs in Queue by zone w/deliverability**
- **New IC Applications by zone needed**

Figure ES-1: Transmission Planning Zones and Capacity



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….A Word About Timing

- Transmission takes time to permit and construct – historically 8-12 years.
- For renewable energy projects to be built in time to interconnect and deliver electricity, transmission upgrades must be completed *before* projects are finished.
- Meeting our climate targets requires an unprecedented buildout of new infrastructure - both the utility-scale and DERs.

Recommendations:

- *Educate the public about the benefits of the transition to less expensive, clean energy, and engage their support for the buildout.*
- *Accelerate state regulatory decisions regarding transmission and interconnection to allow time for on-the-ground siting processes that include robust public engagement.*

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Thank you

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