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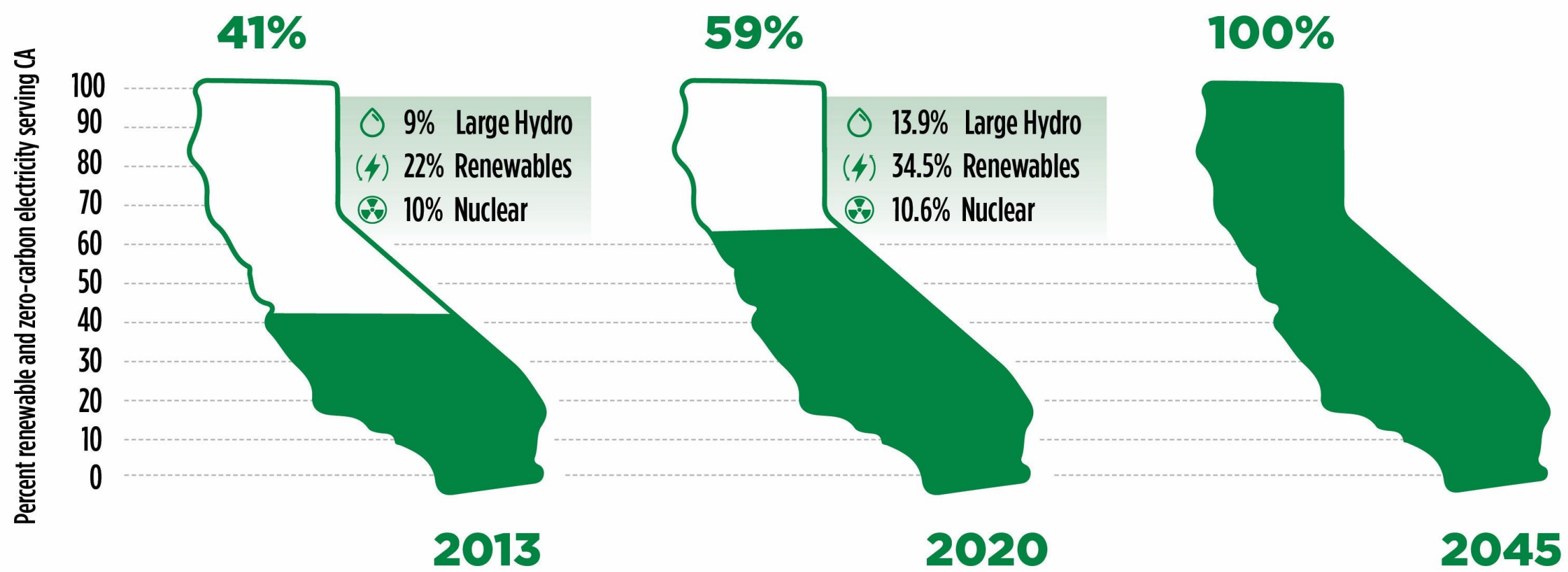
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Description:	Transitioning to a Clean Energy Future: Electric Reliability Outlook
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Transitioning to a Clean Energy Future: Electric Reliability Outlook



California ISO

Progress to 100% Clean Electricity



California Energy Entities

- Develops and adopts long term electricity forecasts used for long term planning and resource adequacy
- Provides assessments of reliability outlook
- Siting of thermal power plants and now opt-in permitting for clean energy projects

California
Energy
Commission



- Sets resource adequacy requirements for its jurisdictional load serving entities, including IOUs, CCAs and ESPs
- Authorizes procurement for IOUs.

California
Public Utilities
Commission



- Operates energy market and transmission for 80% of California

California ISO



Reliability Planning is Essential

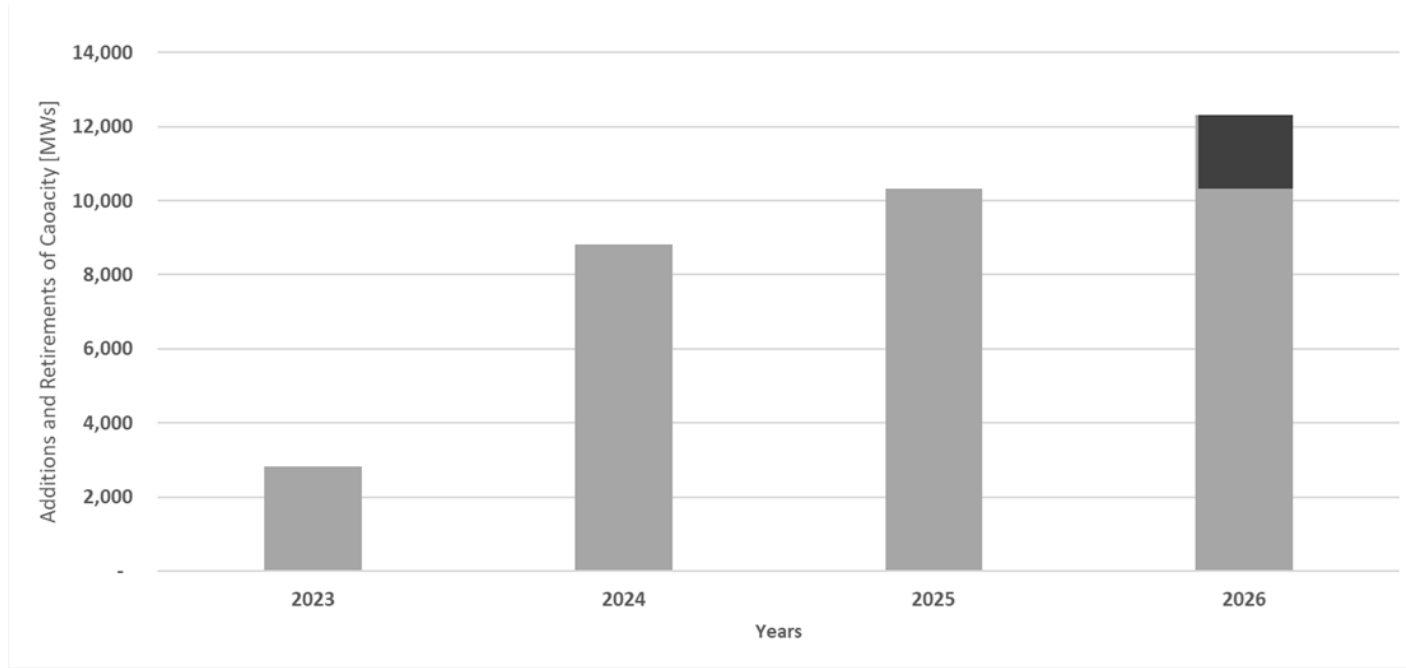
Before 2030

- Experiencing effects of climate extremes
- Procurement deficit and delay
- Emergency measures to maintain reliability
- Understanding uncertainties and adapting planning to climate extremes
- “Catching up” clean energy procurement to meet reliability needs

2030 and Beyond

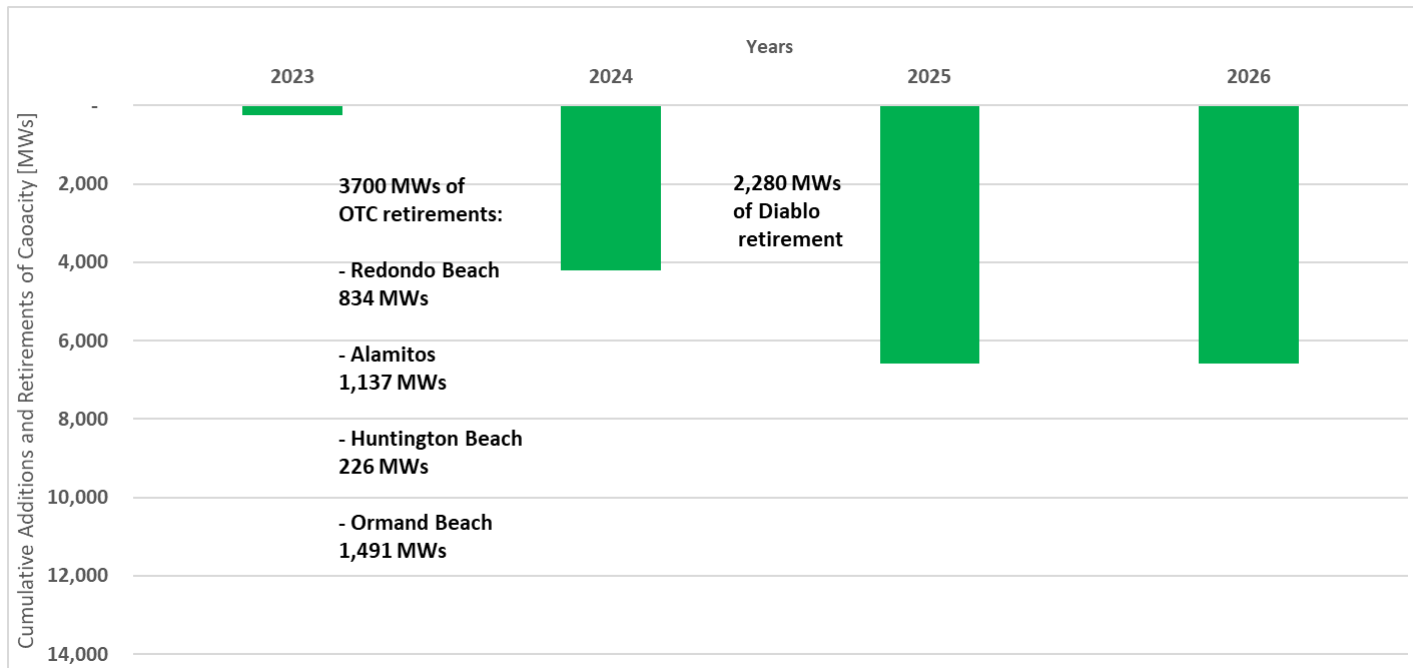
- Achieve SB 100 and climate neutrality goals while maintaining reliability and affordability with clean energy resources

Expected Additions



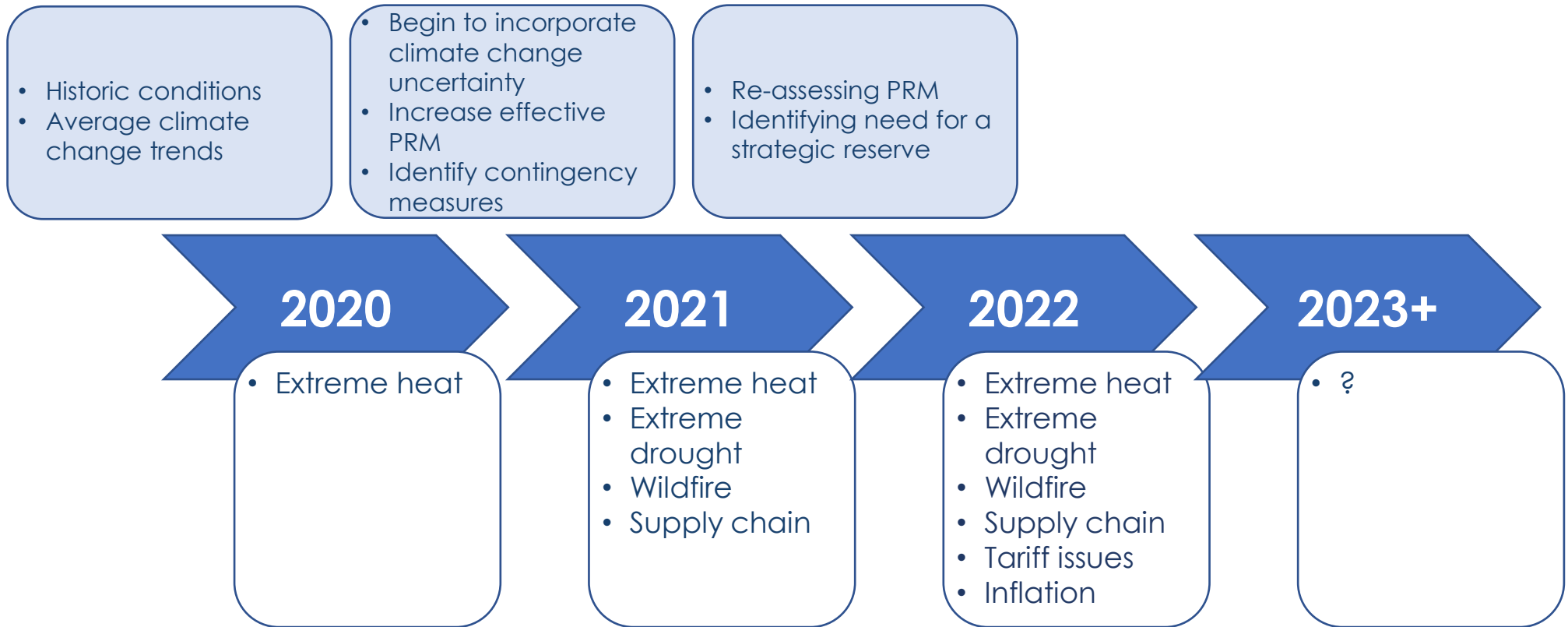
- Authorized Procurement of Long Lead Time Resources
- Authorized Procurement
- Planned Retirements

Planned Retirements

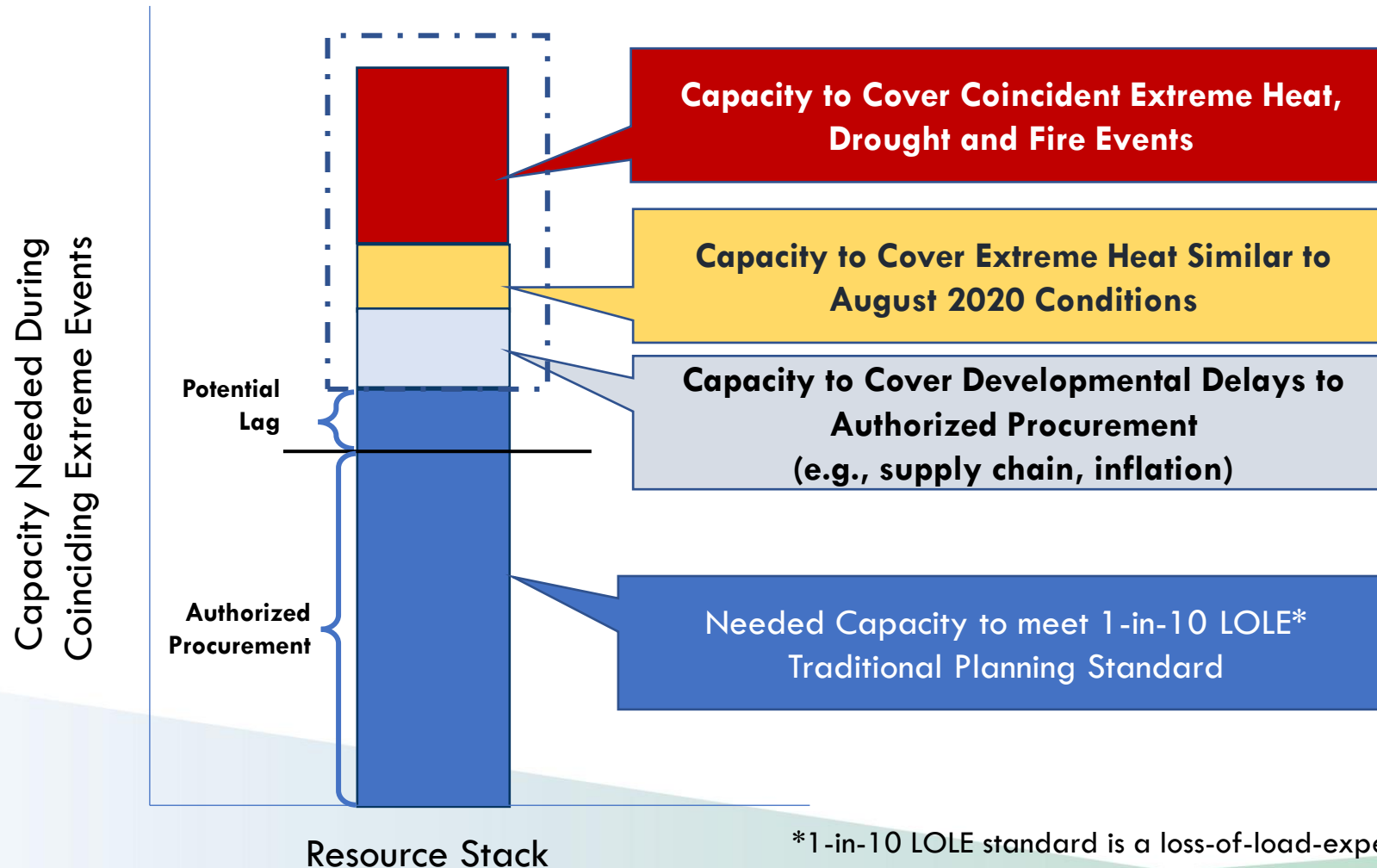


Compounding Reliability Risks

Planning



Reliability Impacts



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

Meeting Reliability Challenges

Near Term Extraordinary Measures

- Emergency Measures
 - Contingency Measures
 - 2020 & 2021 Emergency Proclamations
- AB 205
 - Strategic Reliability Reserve
 - Demand Side Grid Support
 - Distributed Electricity Backup Assets

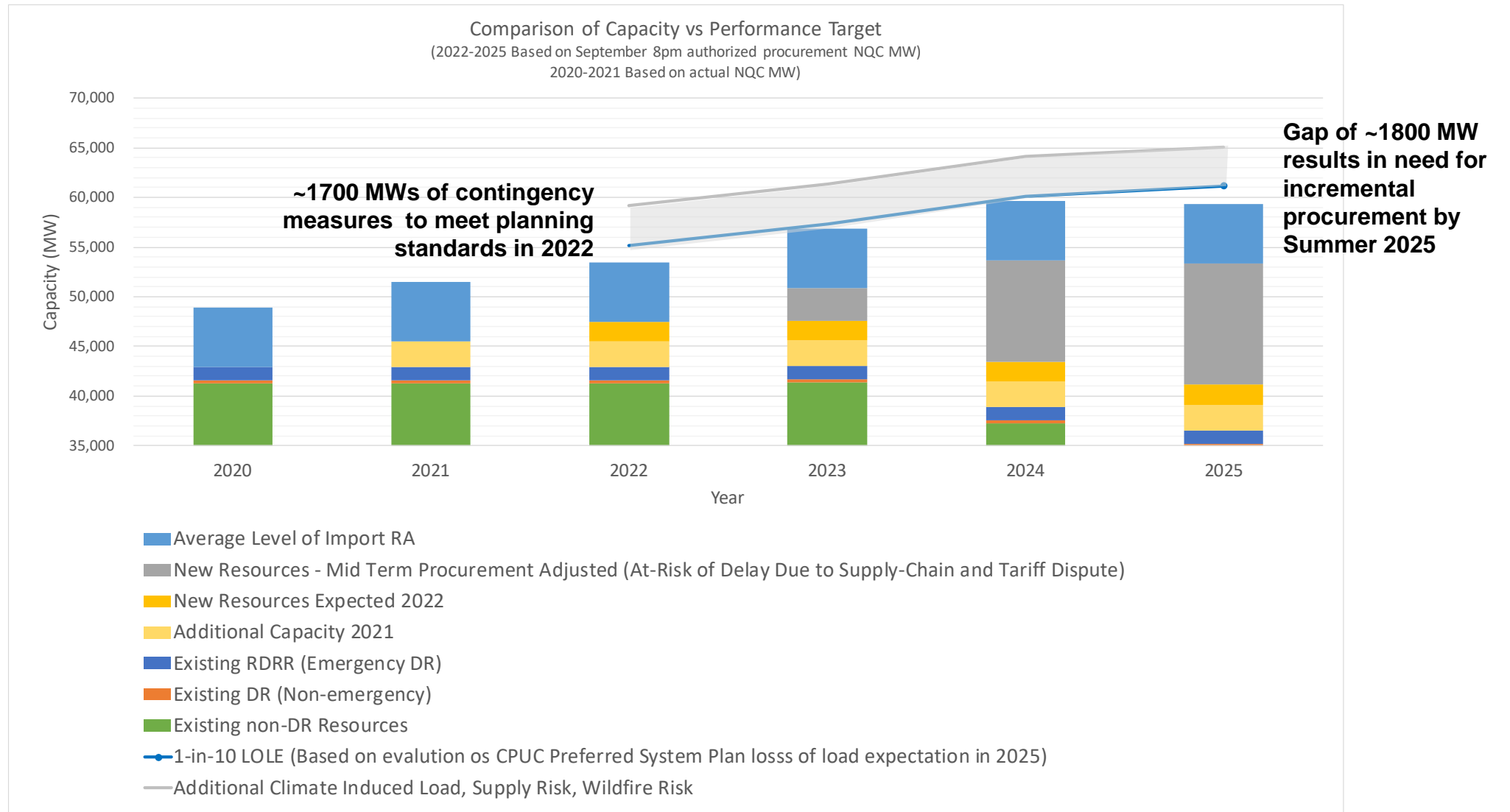
Long Term Measures

- Adapting Planning and Procurement
 - Fully incorporate climate change uncertainty
 - Increase effective Planning Reserve Margin (PRM) and authorize additional procurement
- Transitioning to a Clean and Dependable Reserve

California Independent System Operator (CAISO)

- The CAISO is an independent public benefits corporation responsible for reliably operating the high voltage transmission system pursuant to CAISO, local, and national standards to:
 - Balance supply and demand
 - Maintain sufficient reserves
 - Manage reliable electricity flows
- Serves 80% of the electricity demand in California
- The CAISO independently:
 - Manages the flow of electricity but does not own any generation - relies on load serving entities (*e.g.*, utilities) to procure generation
 - Oversees transmission planning and operations but does not own any transmission assets – relies on transmission owners (*e.g.*, PG&E)
 - Operates wholesale electricity market to minimize cost to consumers independent of technology

September peak day conditions: 2022- 2025



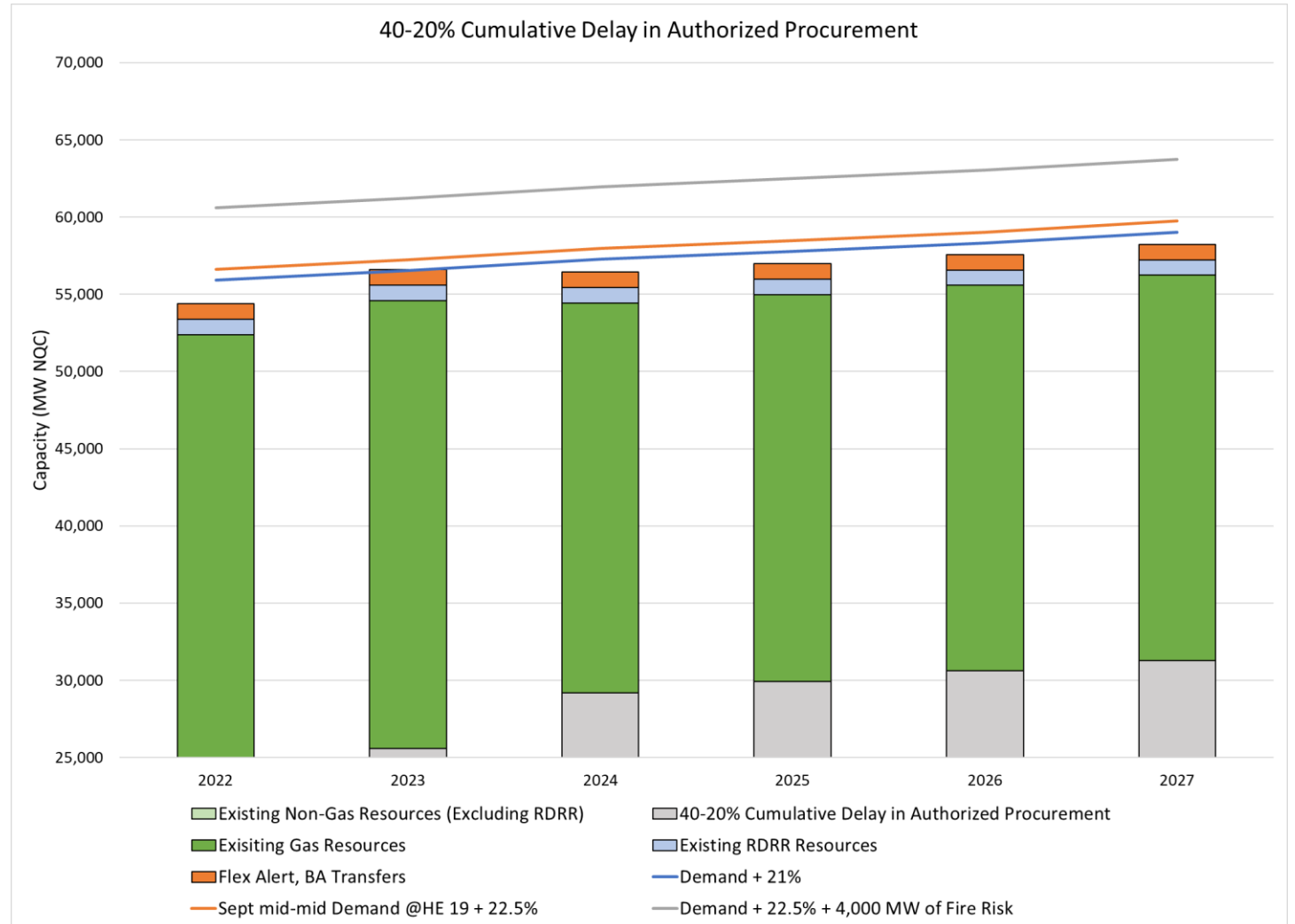
Midterm: Significant Procurement Underway, but Challenges Undermine Reliability

11,500 MW NQC
New Procurement

Challenges:

- Procurement delays
- Load growth uncertainty
- Climate-driven extreme weather events

Net Qualifying Capacity (NQC) is the total capacity contribution of a resource that counts towards meeting resource adequacy obligations.



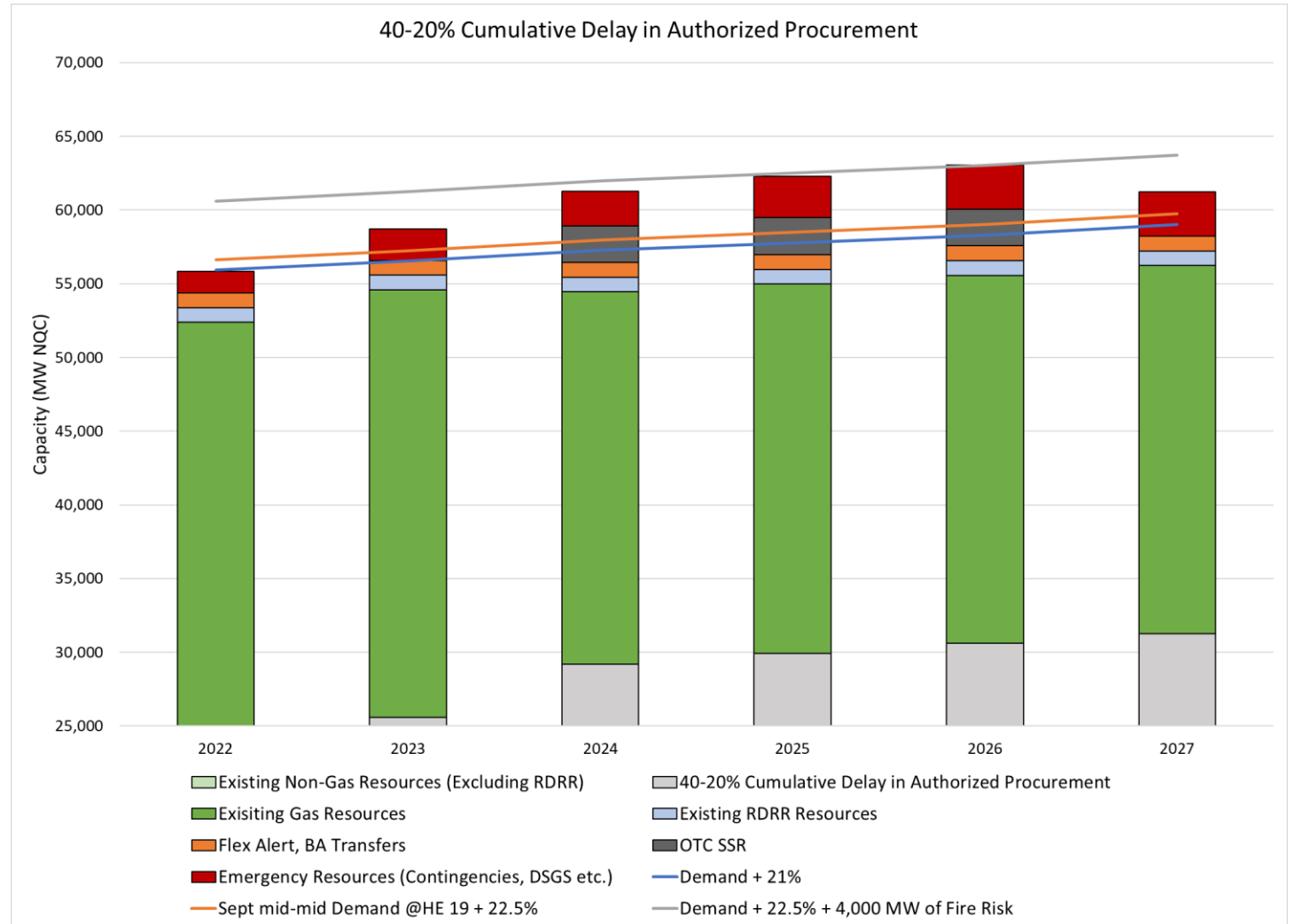
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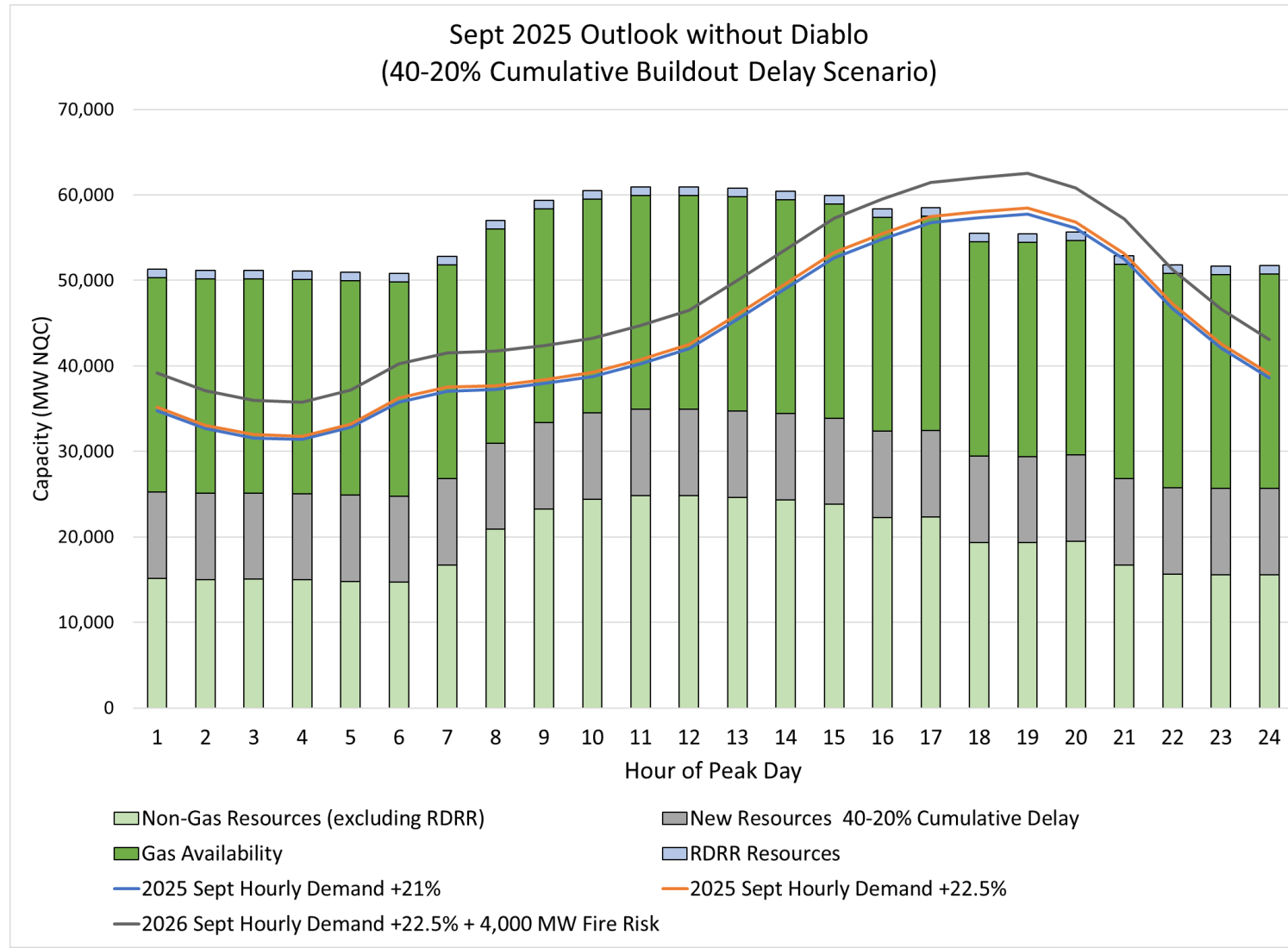
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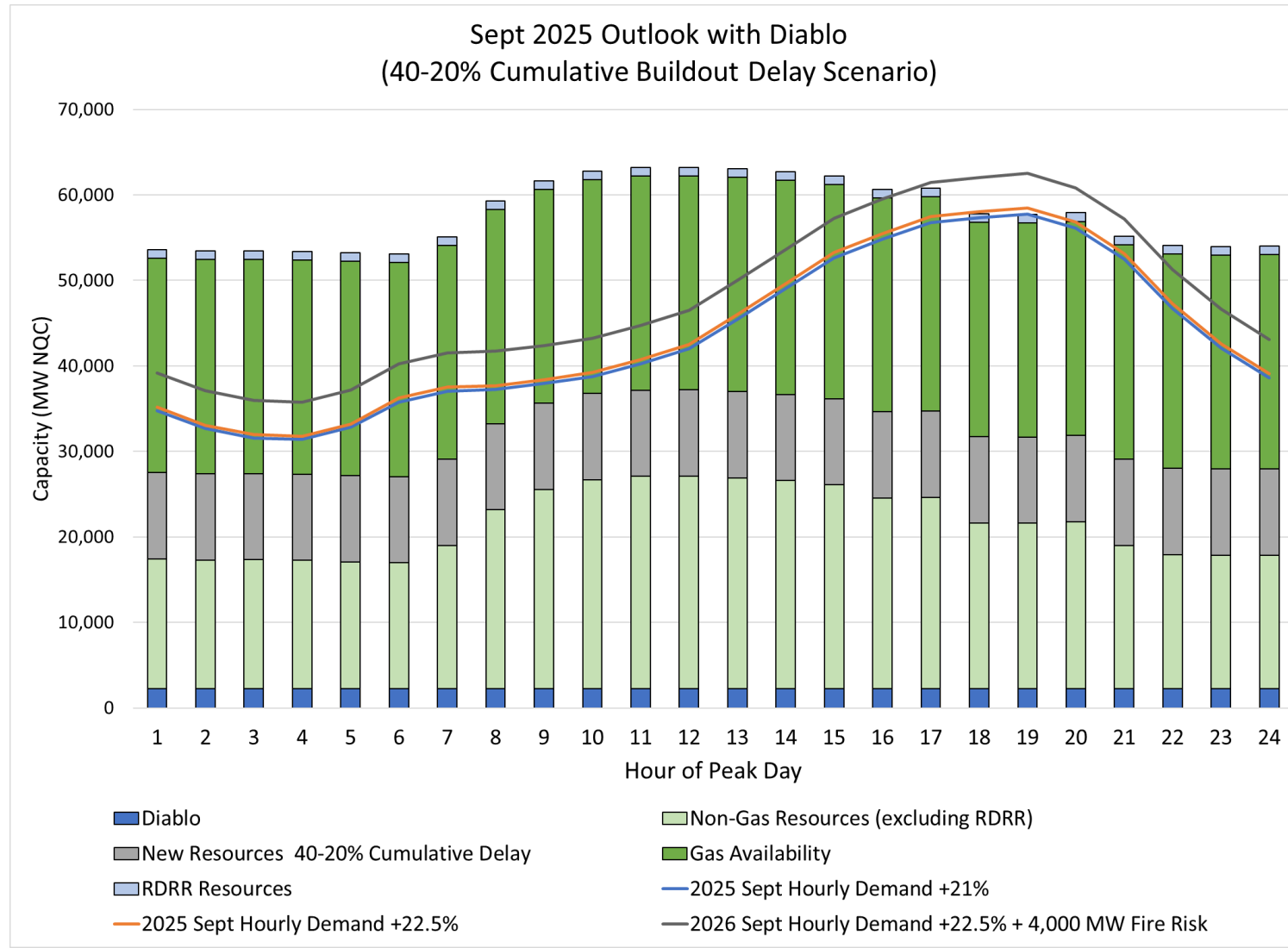
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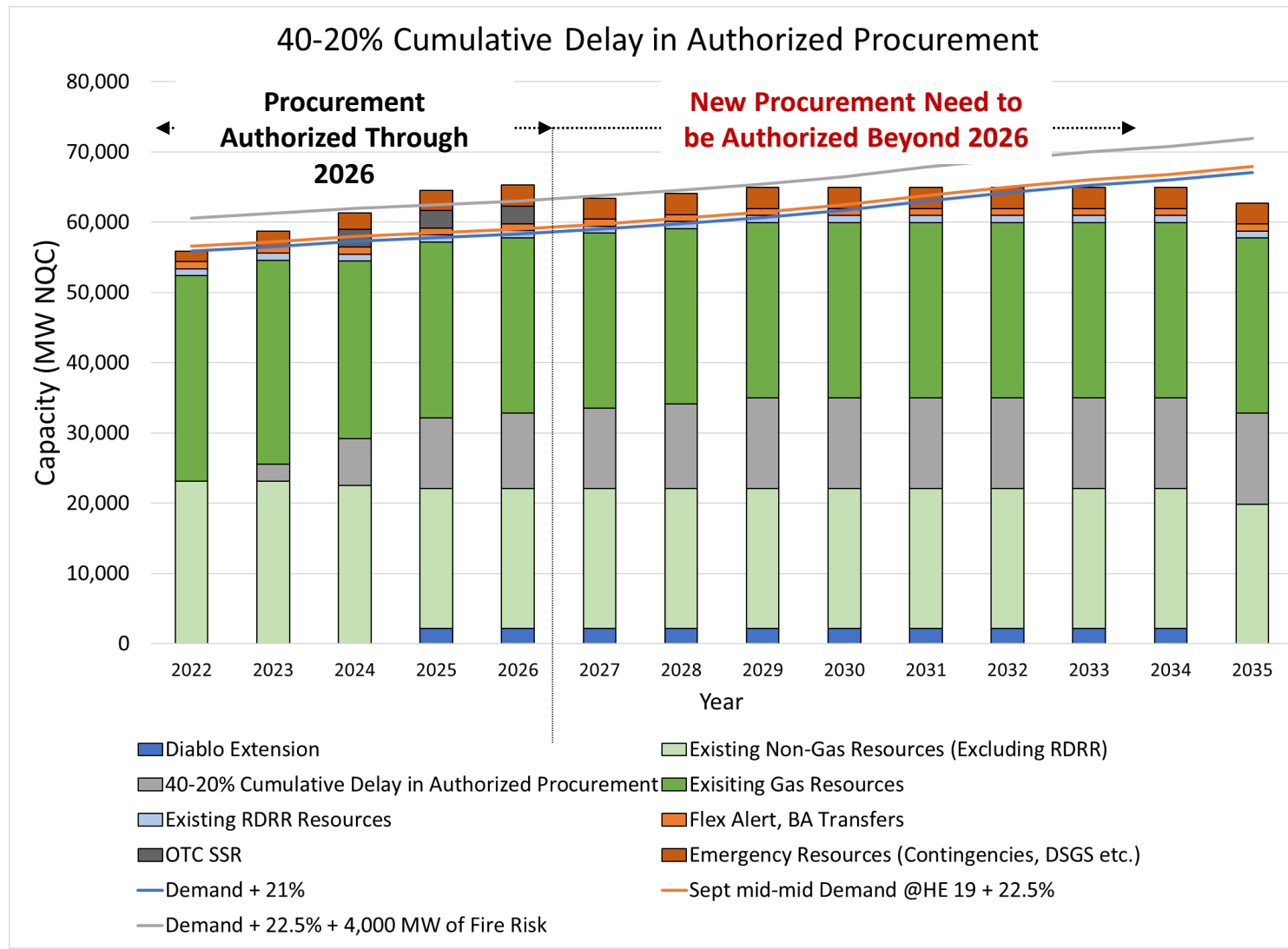
Need for Peak Capacity in 2025



Diablo Canyon Can Fill Capacity Need and Reduce Gas Burn



Certainty for OTC Gas Retirements and Reduced Risk for Load Growth



Steps to Address California's Electricity System Challenges and Meet SB 100

- **Project build rates will catch up with authorized procurement**
 - Over 14,000 MW of new resources ordered by the CPUC to come online through 2028
 - Additional procurement needed, to meet the traditional planning standards
- **Enhancing Planning and Diversification of Resources**
 - Opportunity to consider longer time periods in planning and procurement
 - Fully considering climate and extreme impacts in electricity planning
 - Considering uncertainty in load growth
 - SB 100 build out coordination
 - AB 525 for offshore wind
 - Proposed I-bank transmission financing to unlock geothermal
 - Technology innovation and deployment (LDES, etc)
- **Accelerating clean energy** through permitting and project tracking and facilitation