California Reliability Outlook

SMUD Strategic Development Committee Meeting

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Clean Energy Progress

Renewable Energy Generation Growing in California

Source: California Energy Commission, Total System Electric Generation | August 2023
Ramping Resources Needed to Support Net Demand

While the gross load peak on a typical day occurs in the late afternoon, the early evening net load peak is becoming increasingly critical during hot weather, as solar production ends and demand remains high.
Changing Grid Conditions

Planning
- Historic conditions
- Average climate change trends
- Begin incorporating climate change uncertainty
- Unprecedented procurement
- Increase effective planning reserve margin
- Identify contingency measures
- Re-assessing PRM
- Identified need for a strategic reserve
- AB 205: Strategic Reliability Reserve
- SB 846: Diablo Canyon Extension

Events
- Extreme heat
- Extreme heat
- Mild Heat
- Wildfire
- Wildfire
- Wildfire
- Supply chain
- Supply chain
- Tariff issues
- Tariff issues
- Inflation
- Inflation

2020
2021
2022
2023
2024+
Extreme Temps Events Projected to be More Frequent

Extreme Temperature Projections — Sacramento Region

Length of heat waves: Maximum # consecutive days reaching 100°F

Dark purple is heat wave with each day reaching 110°F+. Full height of bar is heat wave with each day reaching 100°F+.
Natural gas generation still needed during peak-demand hours and months to maintain grid reliability.

Load flexibility and deployment of diverse clean energy resources will help reduce reliance on natural gas generation over time.
Grid Reliability & Clean Energy Transition

• Improving Grid Planning Processes
  • Improvements to forecasting for climate change-induced weather variability and electrification
  • Ordering sufficient and diverse procurement
  • Improve Resource Adequacy process

• Scaling Supply & Demand-Side Clean Energy Resources
  • Track procurement
  • Improve interconnection & permitting process
  • SB 846 requirements, including demand flexibility goal and Clean Energy Reliability Investment Plan

• Preparing for Extreme Events (Contingencies)
  • Retain existing and construct new assets & procure imports to backstop uncertainties
  • Create emergency demand flexibility opportunities
# Long Term Need for Contingencies

<table>
<thead>
<tr>
<th>Planning Standards</th>
<th>2025 MW Projection</th>
<th>2026 MW Projection</th>
<th>2027 MW Projection</th>
<th>2028 MW Projection</th>
<th>2029 MW Projection</th>
<th>2030 MW Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Shortfalls Projected</td>
<td>Up to 1,000</td>
<td>Up to 500</td>
<td>Up to 1,000</td>
<td>Up to 700</td>
<td>Up to 600</td>
<td>Up to 1,500</td>
</tr>
<tr>
<td>2020 Equivalent Event</td>
<td>Up to 2,600</td>
<td>Up to 2,000</td>
<td>Up to 2,500</td>
<td>Up to 2,000</td>
<td>Up to 2,000</td>
<td>Up to 3,000</td>
</tr>
</tbody>
</table>

*Does not include catastrophic coincident fire event*

Source: Diablo Canyon Power Plant Extension – CEC Analysis of Need to Support Reliability, March 2023
## Summary of Contingencies – ~ 5GW

<table>
<thead>
<tr>
<th>Type</th>
<th>Contingency Resource</th>
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<tbody>
<tr>
<td><strong>Strategic Reliability Reserve (AB 205)</strong></td>
<td>DWR Resources (Long start, short start)</td>
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<tr>
<td></td>
<td>Demand Side Grid Support</td>
</tr>
<tr>
<td></td>
<td>Distribute Energy Backup Assets (under development)</td>
</tr>
<tr>
<td><strong>CPUC Ratepayer Programs</strong></td>
<td>Ratepayer Programs (ELRP, Smart Thermostats, etc.)</td>
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<tr>
<td></td>
<td>Capacity at Co-gen or Gas Units Above Resource Adequacy</td>
</tr>
<tr>
<td><strong>Non-Program</strong></td>
<td>Balancing Authority Emergency Transfers</td>
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<tr>
<td></td>
<td>DWR State Water Project</td>
</tr>
<tr>
<td></td>
<td>Thermal Resources Beyond Limits: Gen Limits</td>
</tr>
<tr>
<td></td>
<td>Thermal Resources Beyond Limits: Gen Limits Needing 202c</td>
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</tbody>
</table>
### CEC Strategic Reliability Reserve

<table>
<thead>
<tr>
<th></th>
<th>Demand Side Grid Support (DSGS)</th>
<th>Distributed Electricity Backup Assets (DEBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funding</strong></td>
<td>$314 Million (Over 5 Years)</td>
<td>$595 Million (Over 5 Years)</td>
</tr>
<tr>
<td><strong>Incentivized Activities</strong></td>
<td>Use of load reduction resources during extreme events</td>
<td>Purchase of cleaner and more efficient distributed energy assets that would serve as on-call emergency supply or load reduction</td>
</tr>
<tr>
<td><strong>Eligibility</strong></td>
<td>Statewide</td>
<td>Statewide</td>
</tr>
<tr>
<td><strong>Program Status</strong></td>
<td>Launched Aug 2022</td>
<td>Launching 2024</td>
</tr>
<tr>
<td></td>
<td>Now accepting applications and incorporation lessons learns</td>
<td></td>
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</table>
Key Takeaways

• California is increasingly powering its economy with clean energy resources BUT we face challenges with scaling up clean energy resources, while retiring fossil fueled resources and maintaining grid reliability during climate induced extreme events.

• However, California has new investments, tools and mechanisms in place that is enabling a comprehensive, focused and multi-pronged electric supply and demand approach to ensure grid reliability during peak-demand summer months.

• We need to SUSTAIN our existing efforts, while considering new policy and investment approaches, constructs and options that place the state in a position to proactively address our challenges now and going forward.
Thank You!