



GRID RELIABILITY AND HYDROPOWER NASEO 2023 ENERGY POLICY OUTLOOK

NATIONAL HYDROPOWER ASSOCIATION




*National Association of
State Energy Officials*

The New York Times

California Leaders Credit Cellphone Alert for Sudden Conservation

The jarring message warned millions of residents that blackouts could occur without immediate action.

 Give this article



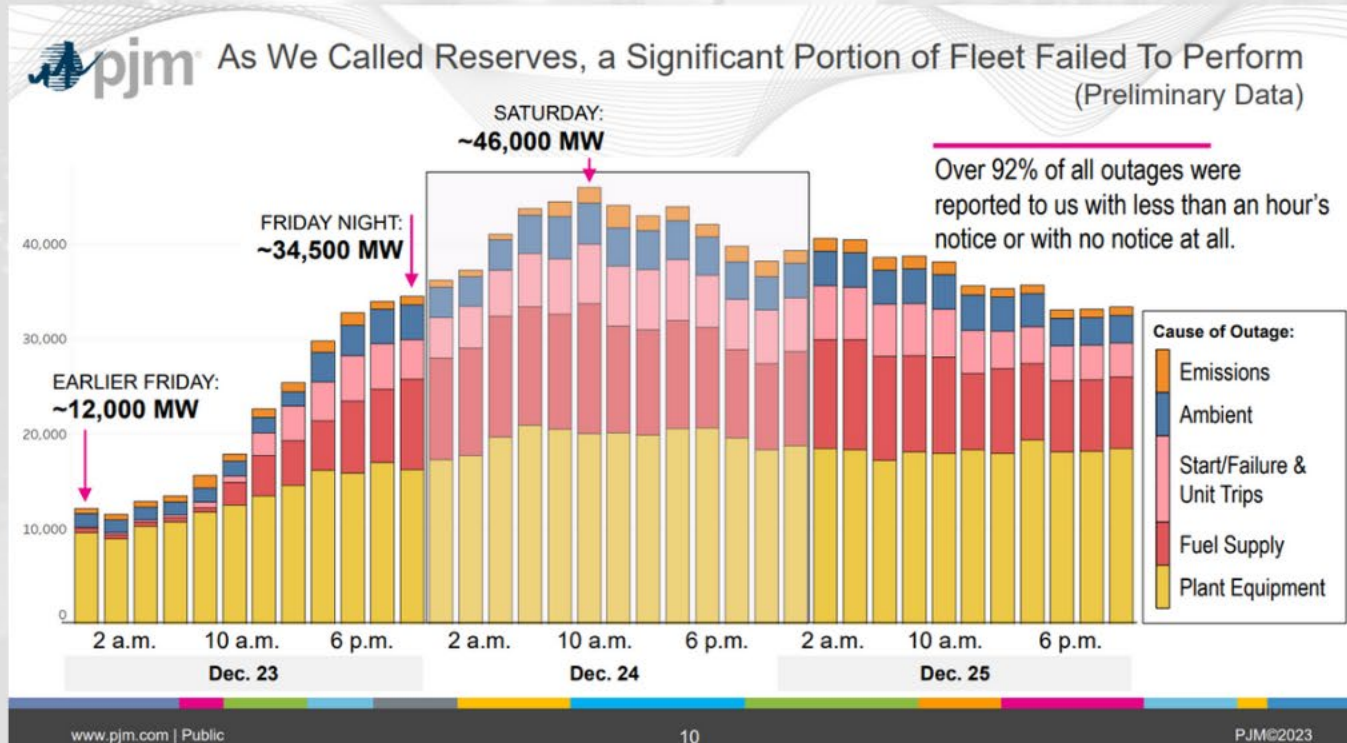
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Power lines in Cathedral City, Calif., during the heat wave on Tuesday. Alex Welsh for The New York Times

CASE STUDY 1: CALIFORNIA'S ENERGY GRID CRISIS

CASE STUDY 2: PJM & THE POLAR VORTEX



- **PJM – Dec 24th: Polar Vortex**
- **PJM lost 46,000 MWs of generation**
- **Hydro asked to keep generating past midnight**
- **Moreover, PSH asked not to pump water to reduce load**
- **To my knowledge, little or none of 45 GW were hydro**

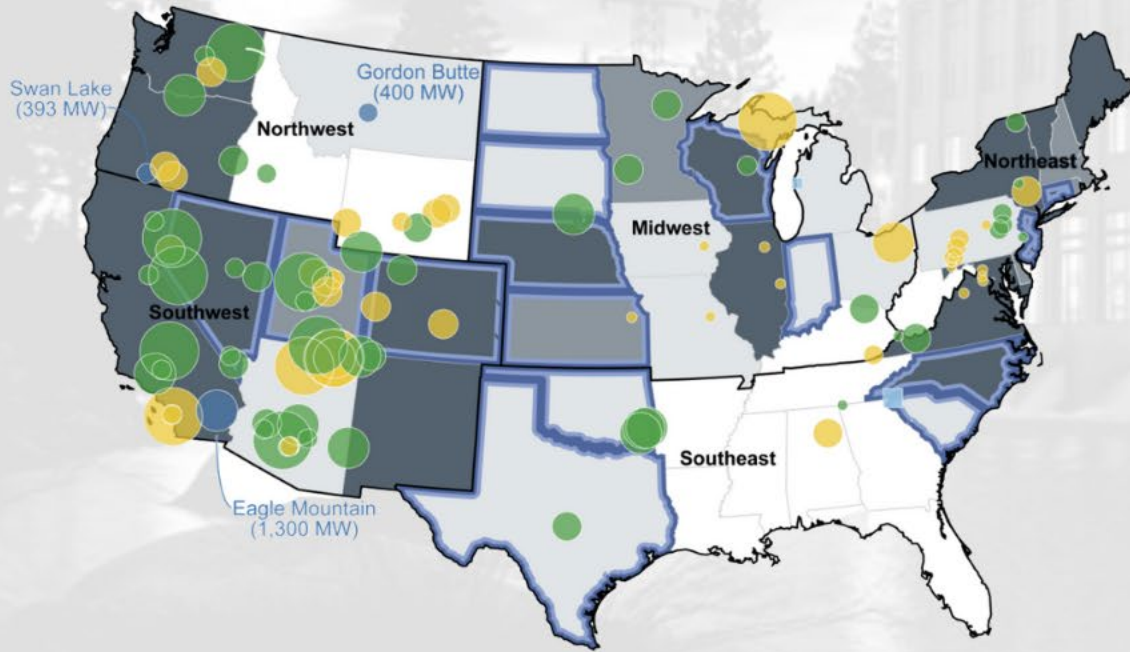


STATE OF THE U.S. HYDROPOWER INDUSTRY IS STRONG

- **Over 6% of all electricity generated**
- **31% of U.S. renewable energy**
- **94% of current U.S. electricity storage capacity**
- **80 GW of hydropower capacity**
- **22 GW of pumped storage hydropower capacity**

HYDROPOWER IS POISED FOR GROWTH

US Pumped Storage Development Pipeline 2022



Stage of PSH Development

- Pending Preliminary Permit*
- Issued Preliminary Permit*
- Pending License**
- Issued License**
- Under Construction

- 3 Pumped Storage Hydropower projects fully licensed for construction
- At the end of 2021, 130 new hydropower projects with a combined capacity of 1,500 MW were in the development pipeline; non-powered dam retrofits accounted for 96%

WHY HYDROPOWER?

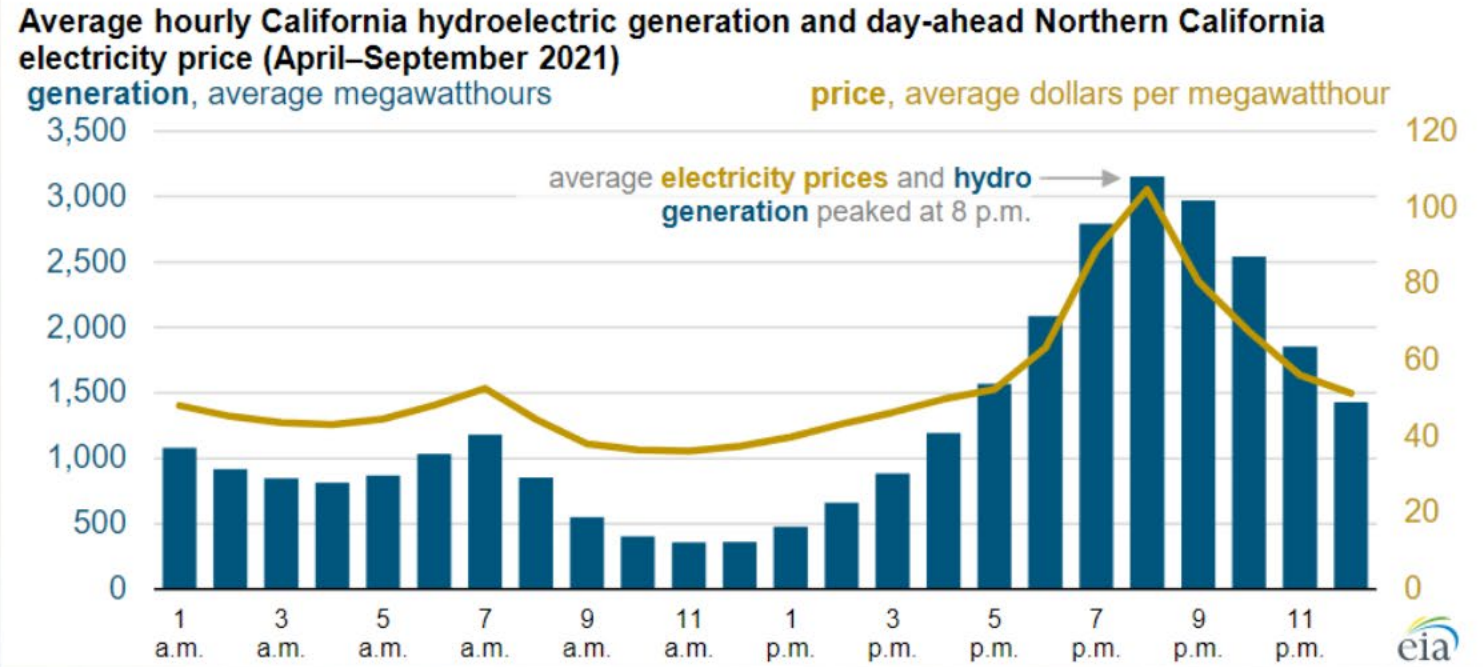
- **NEED FOR FLEXIBILITY, FAST RAMPING, CAPACITY**
- **NEED FOR LONG DURATION ENERGY STORAGE**
- **INTERGRATING VARIABLE RENEWABLE RESOURCES**



HYDROPOWER & RELIABILITY

Even during drought, hydro is still there when we need it the most.

The overall western hydropower fleet sustains about four-fifths of the average power generation during severe droughts.





Environmental And Energy Industry Groups Commit To Working Together On (Some) Hydro Projects

By Courtney Flatt | October 12, 2020

The New York Times

Environmentalists and Dam Operators, at War for Years, Start Making Peace

Facing a climate crisis, environmental groups and industry agree to work together to bolster hydropower while reducing harm from dams.

ENERGYWIRE

RENEWABLE ENERGY

DOE-backed hydro group launches to cut CO2

David Iaconangelo, E&E News reporter

Published: Wednesday, October 14, 2020

UNCOMMON DIALOGUE

“U.S. **Hydropower**: Climate Solution and Conservation Challenge”

Los Angeles Times



CLIMATE & ENVIRONMENT

Can hydropower help solve the climate crisis? This \$63-billion plan is banking on it



HYDROPOWER + RIVER + CLIMATE

CLEAN ENERGY GRID AT RISK DUE TO POTENTIAL WAVE OF RETIREMENTS

- **Licenses for 459 hydropower facilities, representing 17 GWs, are set to expire by 2035.**
- **Relicensing takes, on average, 7.6 years to complete**
- **Projects of greater than 10 MW reporting licensing costs exceeding \$1M, and projects more than 100 MW reporting cost around \$10M or more**
- **Survey: 36.4% of hydropower industry asset owners said that they were "actively considering" decommissioning a facility**





CURRENT CHALLENGES

**Lack of Support for
Existing Hydropower**

**Antiquated Licensing
Process**

**Market Design
Failures**





QUESTIONS?

