

WIRAB Monthly Meeting

November 3, 2022



Introductions



Outline



- **WECC Activities:**
 - WECC Update
 - WIRAB Advice on WECC's State of the Interconnection Report
 - Modeling Long Duration Energy Storage Discussion

- **Upcoming WIRAB Meetings**



WECC Update

November 3, 2022

Victoria Ravenscroft
Senior Policy and External
Affairs Manager

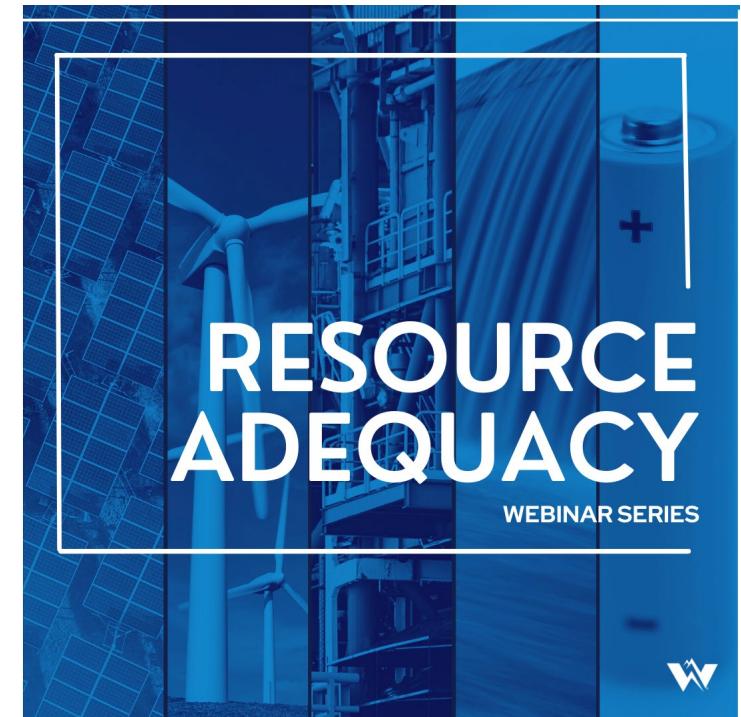
Western Assessment of Resource Adequacy

- Report released
- Report and other materials available on [WECC.org](https://www.wecc.org)
- High-level overview webinar
 - November 9, 2022, 10:00–11:00 a.m. MST
- Technical deep-dive webinar
 - November 16, 2022 from 10:00–11:00 a.m. MST



Resource Adequacy Webinar Series

- First Wednesday of the month, July through November
 - Held last webinar on November 2, 2022
 - Recordings are available on [WECC.org](https://www.wecc.org)
- Seeking feedback on the future of the series
 - Survey available [here](#)



Board of Directors Meeting

- December 6–7, 2022
- Hybrid meeting
 - Salt Lake City and by webinar
- Information available at [WECC.org](https://www.wecc.org)

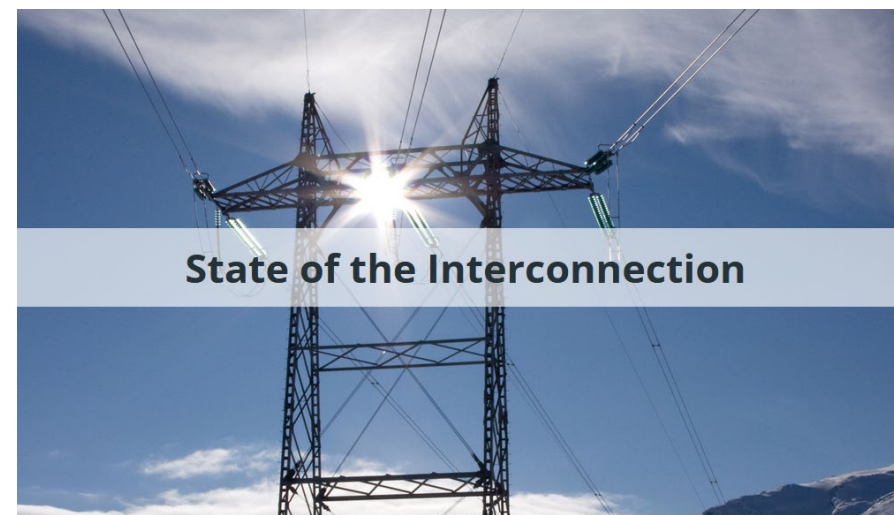


WECC Committee Restructure

- Committee restructure work almost complete
- Committee Structure
 - Proposed reduction of committees will remove one-third of groups
 - Approval at JGC meeting November 4, 2022, 9:30–11:00 a.m. MST
- Committee Work Alignment
 - Met with committee leadership in October to discuss work alignment
 - Present workplans to the WECC Board for acknowledgement in December

State of the Interconnection

- Splitting the data dashboard and report into separate products
 - Based on stakeholder input
- Opportunities to participate in improving the data dashboard coming soon
- Seeking input from WIRAB, MAC, and JGC to scope the new report





Contact:

Victoria Ravenscroft

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Proposed Scope: State of the Western Interconnection Report



- Audience
 - Policymakers, entity decision-makers, and state and provincial regulators.
- Timing
 - Quarter 1 each year
- Themes and Framework
 - Themes: Reliability Risks; Framework: Hurdles and Look Ahead
- Contents
 - (1) Background; (2) Previous Year; (3) Year Ahead; (4) Conclusions & Recommendations
- Related Products
 - Data Dashboard; WARA; WECC Studies; Reliability and Security Indicator Dashboard; WECC Analysis; other Third-party Analysis

WIRAB Advice: Reimagining the State of the Interconnection Report



- **Audience**

- Ensure it is a strategic written document targeted to utility CEOs, regulators, policymakers, and decision-makers in the West.

- **Timing**

- Support Q1 timing
- Engage stakeholders including MAC & WIRAB in Q4.
- Request Reliability Coordinators to report on operational metrics.

WIRAB Advice: Reimagining the State of the Interconnection Report



- **Themes and Framework**

- Recommend treating the State of the Western Interconnection Report like a health assessment
 - Collect the technical reliability data (including CEII), analyze events, and review other information,
 - Provide information on how WECC's work will address the risks.

- **Related Products**

- Recommend creating an additional work product that leverages WECC's event analysis expertise, like NERC's recently released Reliability Vignettes.

WIRAB Advice: Next Steps



- **Nov. 3** – Send for WIRAB Review
- **Nov. 3** – Discuss at WIRAB Monthly Meeting
- **Nov. 10** – WIRAB Comments on Draft Advice
- **Nov. 11** – Send to WECC
- **Dec. 7** – WECC Board of Directors Meeting

Long Duration Energy Storage Modeling



- **2022 WIRAB Strategic Initiative:** Advise WECC to conduct a reliability assessment, identifying the services and capabilities that long-duration energy storage could provide to support ongoing system reliability in the Western Interconnection.
- **WECC LDES Study – Began Spring 2022**
 - WECC LDES Advisory Group – WECC stakeholders advise WECC Staff
 - Western Green Hydrogen Initiative – Exploring modeling needs
 - Preliminary results and challenges identified



LDES Study Update

11/2/2022

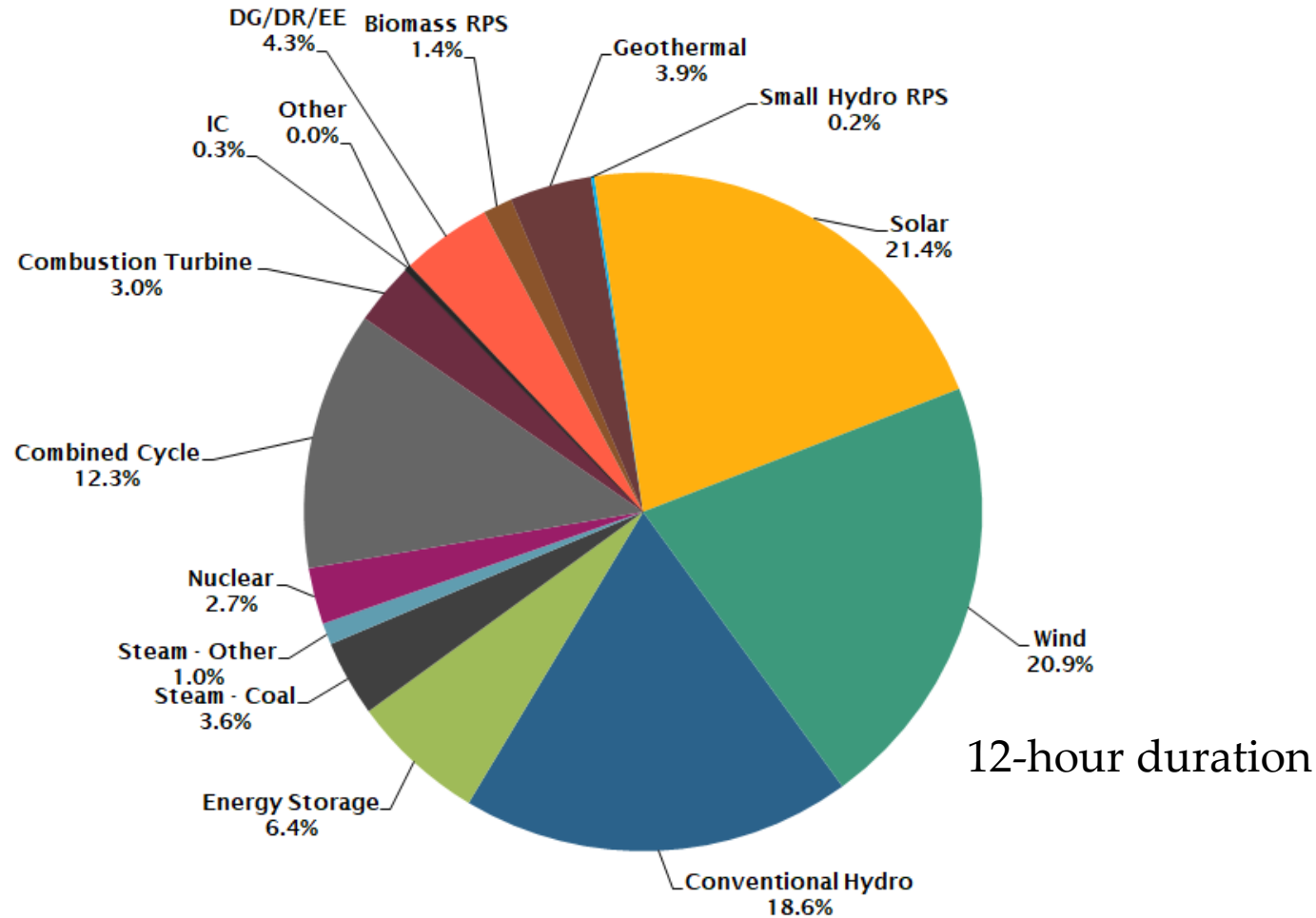
BK Ketineni
Bhavana Katyal

80% clean case(s) setup

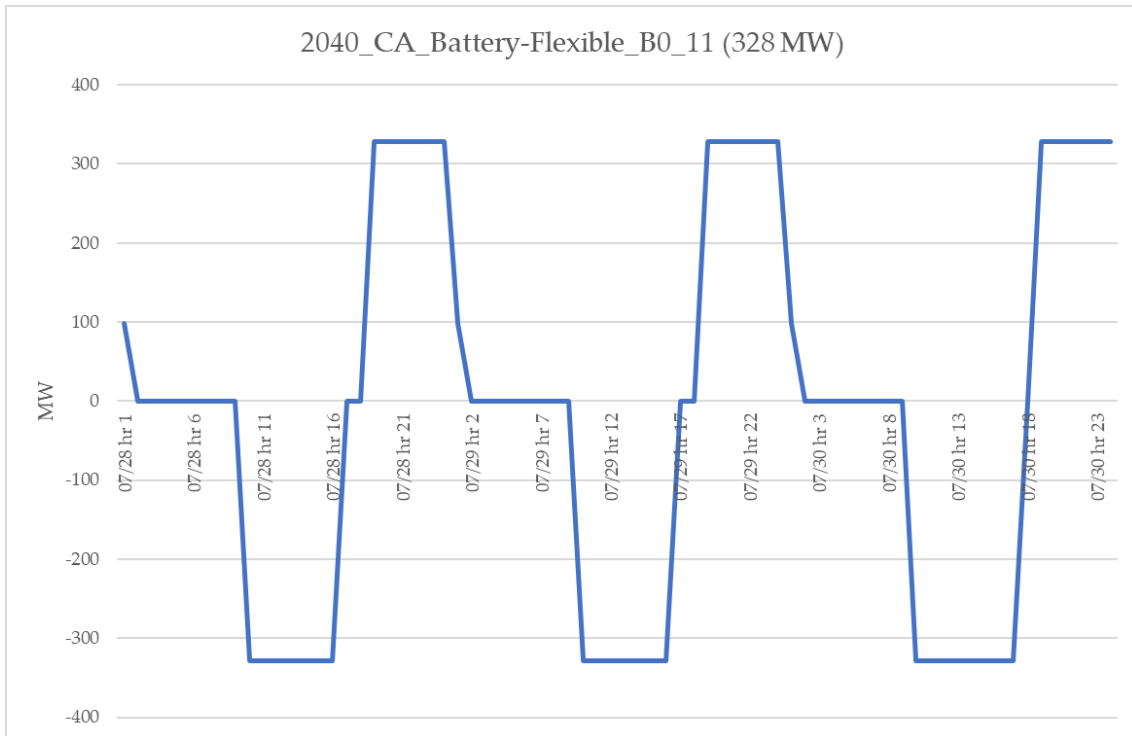
- Durations tested – 12 hr, 24 hr, 48 hr, 168 hr, 336 hr
- Cases were run with all the paths ratings increased to 9999 and -9999 to address unserved energy.
- Other Case changes :
 - For 2040 hourly resources - Solar profiles updated to 2030 profiles
 - Reduced size of 2040 Thermal units to below 300 MW
 - Updated heat rates for 2040 Thermal units
 - Update maintenance for 2040 thermal units
 - Recorded all the major path flows
 - Updated some reverse path ratings as per 2032 ADS case
 - Turn monitoring off for BCHA Internal branches
 - Add generation in CFE - increase the capacity of added units

80% clean case results

Annual Generation Breakdown By Category - 2040 LDES 80%

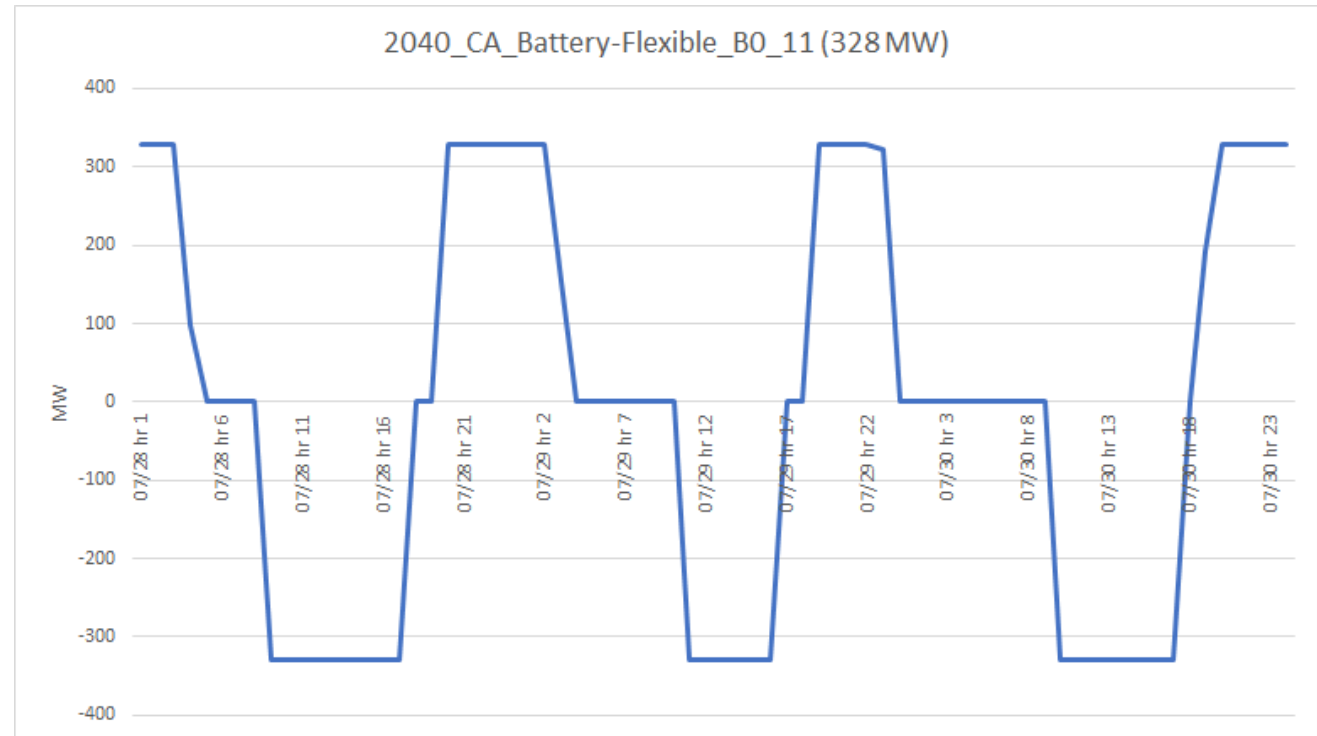


Battery Operation



12-hour duration

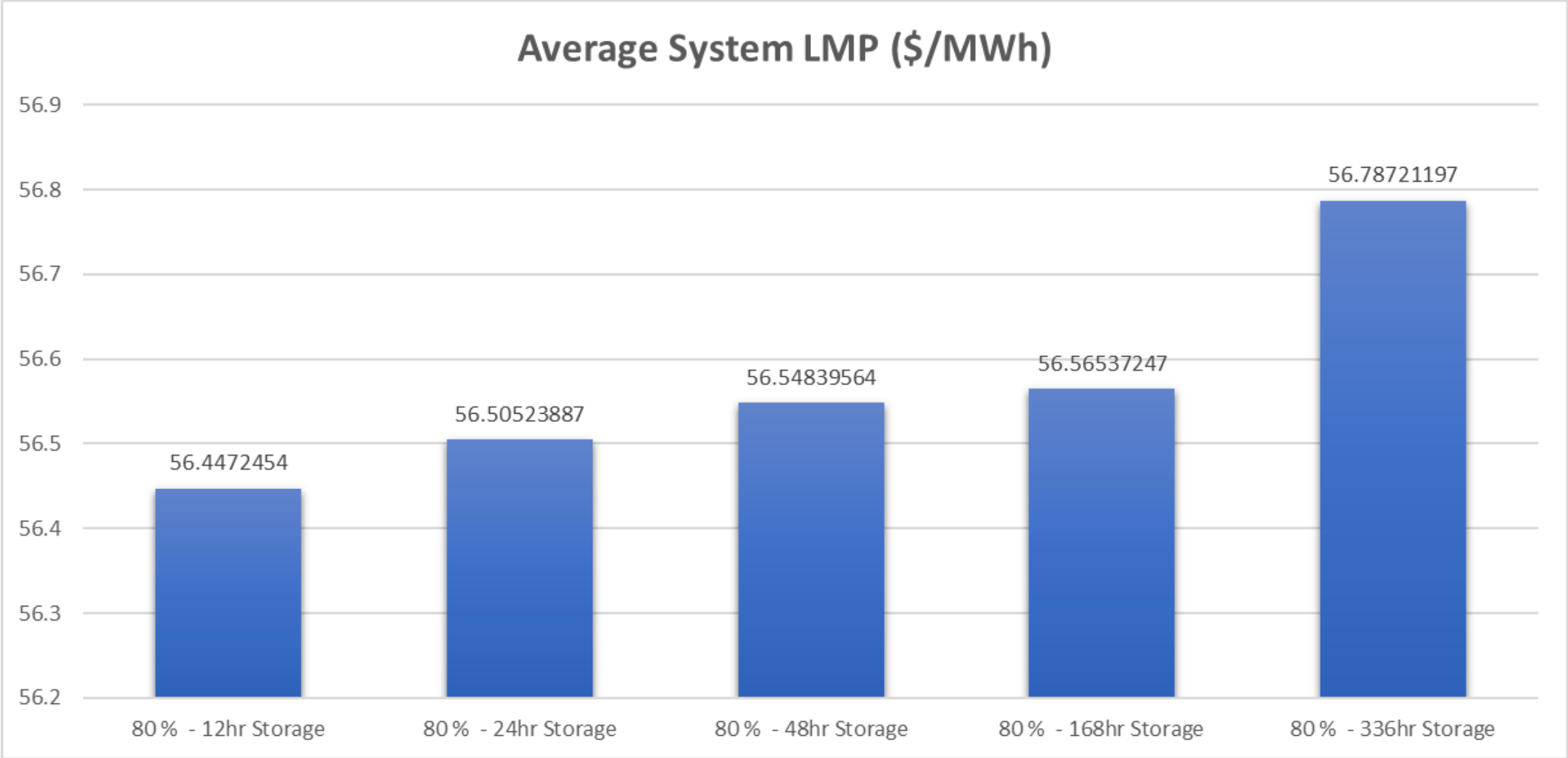
7-hour charge (10am-5pm) and 7-hour discharge (7pm-1am) operation



168-hour duration

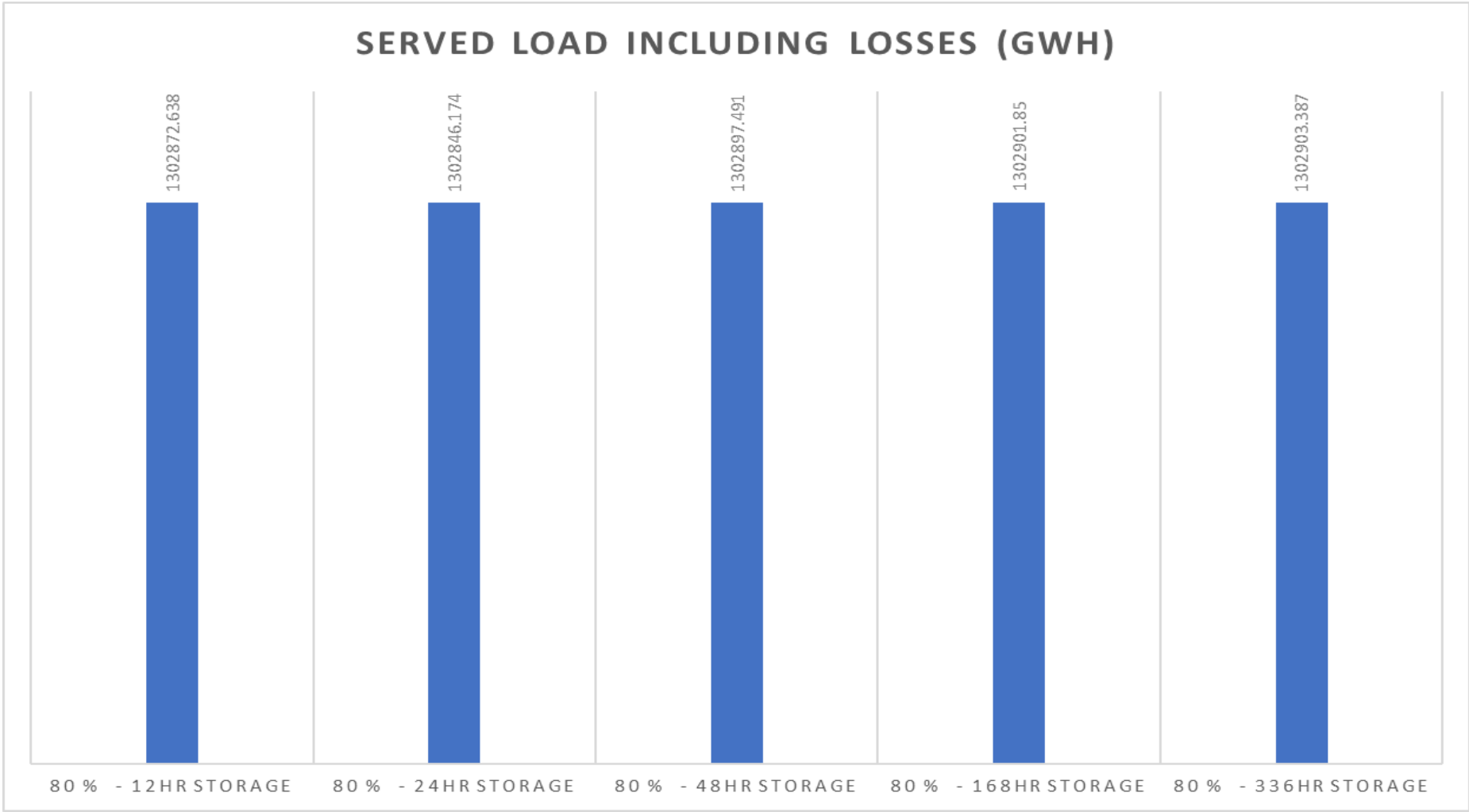
6-8-hours charge (9am-5pm) and 5-8 hours discharge (7pm-4am) operation

80% Clean Case(s) results - Average LMP (\$/MWh)



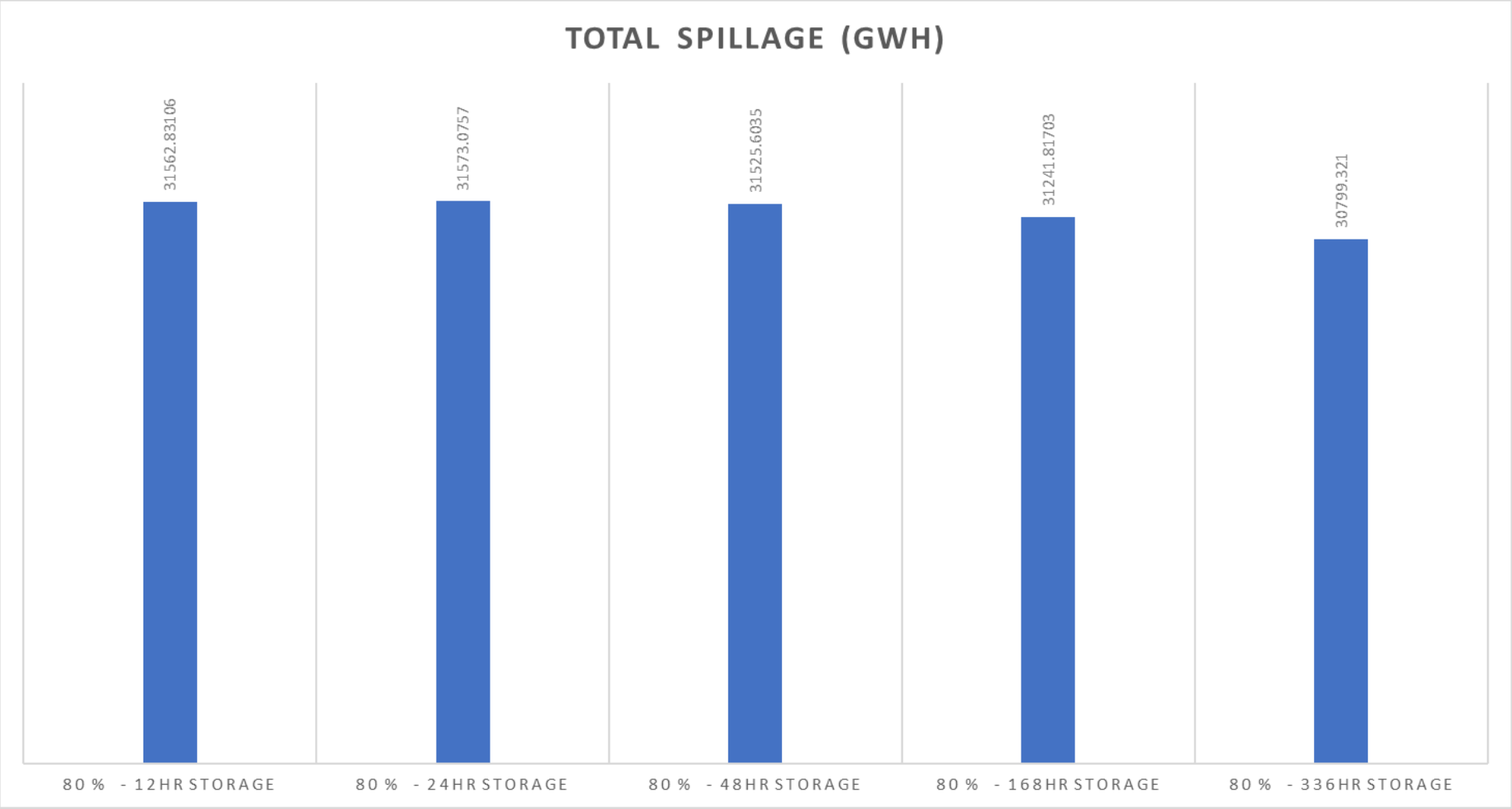
% increase in LMP between 12hr and 336hr is 0.602%

80% Clean Case(s) results - Served Load with losses(GWh)



% increase in served load including losses between 12hr and 336hr is 0.002%

80% Clean Case(s) results –Total Spillage(GWh)



% decrease in Spillage between 12hr and 336hr is 2%

Challenges In Modeling

- Looks ahead logic for battery modeling not in the GridView software

The screenshot shows the 'Battery' configuration window with the following fields and values:

- Generator Name: 2040_CA_Battery-File
- Long Name: BS
- Long ID: NA
- Bus ID: 30060
- Generator ID: Y9
- Initial Dispatch: 0
- Commission Date: 1 / 1 / 2025
- Retirement Date: 12/31/2050
- In service
- Save To Binary
- Use Charge and Discharge Price for MID
- Max Energy: 3938.572 MWh
- Yearly Max Energy Deteriorate Rate: 99.99 %
- Initial Energy: 1969.286 MWh
- Charge Mode**
 - Max Recharge Load: 328.2143 MW
 - Charge Ramping Rate: 328.2143 MW/minute
 - Max Charge Price: 10 \$/MWh
 - Charge Efficiency: 0.9
- Discharge Mode**
 - Max Depth Of Discharge: 5 %
 - Max Discharge: 328.2143 MW
 - Min Discharge Price: 50 \$/MWh
 - Discharge Ramping Rate: 328.2143 MW/minute

Buttons: OK, Cancel

The screenshot shows the 'Simulation Control' window with the following sections and options:

- General Options**
 - Commit All
 - Generator Reserve Distribution
 - Generator Exempt
 - Generator Development Status: Future-Conceptual
 - Ramp Rate Enforced
 - In Unit Commitment
 - 30 Min Spin Reserve
 - Quick Start Commitment
 - Fuel Switching Logic
 - Ramping Rate Penalty
 - Enable Spillage
 - Bank Hydro
- Ancillary Services**
 - AS Ramping Setting
 - AS Selection Control
 - Use Global AS Ramp and Penalty
 - Use Global Generator AS Selection
- Pumped Storage**
 - 4-Daily Schedule on Price
 - 1-Enable Dispatch
 - 2-Fixed Weekly Energy Pattern
 - 3-Daily Peak Shaving
 - 4-Daily Schedule on Price
 - 5-User Defined Prices
 - 6-Maximize Utilization
- Emission**
 - Calculated Emission Cost Model
 - Group Option: Customized
 - Max. Iter. # (>=1): 1
 - Calc Marginal Emission Rate
 - GHG Model**
 - Enable
 - GHG CO2 Rate(Ton/MWh): 0.428
- Generator Bid Markup**
 - Enable
 - Setting
- Hydro Dispatch Option**
 - 2 - Region Load - Wind - Solar
- Hydro Modeling**
 - Automatically Calculate K and p Factors
 - Adjacent Hours For PLF: 1
- Hydro Thermal Coordination**
 - Enable
 - Setting

Buttons: Go, Cancel



Contact:

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Bhavana Katyal (bkatyal@wecc.org)

In consultation with WGHI stakeholders, Strategen proposes to undertake a scan of modeling and planning tools that can assess long-duration storage

Modeling Tools

- ABB GridView
- Energy Exemplar PLEXOS
- GE MAPS
- EnCompass
- GridPath
- E3 RESOLVE

Tool Attributes

- Capacity expansion versus production costs
- Dataset availability and shareability
- Optimization horizons
- Storage Technology options
- Open-source and/or stakeholder access
- Customer support services

LDES Modeling: Next Steps



- **WECC to continue working on its LDES modeling effort**
- **WGHI (with technical support from Strategen) will research and discuss modeling and planning tools that can assess LDES**
- **GHI CatalystH2 Conference Nov 14-16 panel to discuss the opportunities and challenges of LDES for maintaining electric system reliability in a low carbon future.**

California Energy Commission Invite: Workshop on Western Integration



Workshop on Western Integration

December 2, 2022

9:00 AM – 4:30 PM PT

Sacramento, CA (Hybrid)

Discuss three key dimensions of integration: **Markets, Adequacy, and Transmission.**



Upcoming Meetings



WECC Training for WIRAB Members

To Be Announced

WIRAB Monthly Meeting

First Thursday of the Month

Next Meeting: December 1, 2022

Thank You!

Eric Baran

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