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Docket Number:	22-BUSMTG-01
Project Title:	Business Meeting Agendas, Transcripts, Minutes, and Public Comments
TN #:	246012
Document Title:	Presentation - Item 4 - Information Item on Non-Lithium-Ion Storage Technologies
Description:	Business Meeting Presentation (Sept 12 Item 4) - Staff informational update on non-lithium-ion storage technologies
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Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	9/13/2022 1:48:40 PM
Docketed Date:	9/13/2022



Item 4: Information Item on Non-Lithium-Ion Storage Technologies

September 14, 2022 - Business Meeting

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Benefits to California

Energy storage contributes to California's clean energy future:

- 3.3 GWs currently installed
- 15 GWs needed by 2032 (per CPUC)
 - 1 GW for long duration energy storage
- 40-50 GWs needed by 2045



EPIC Program has Funded Energy Storage Research for More than a Decade



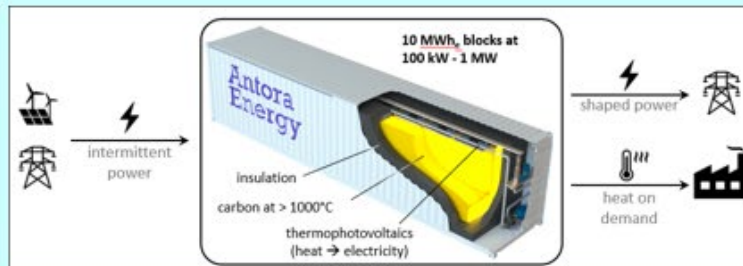
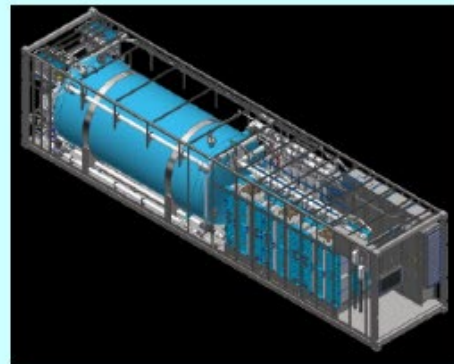


2020 was Pivotal Year for Long Duration Energy Storage Research

- CEC invested \$100 million+ in energy storage in 2020
- Field demonstrations of non-Lithium-ion long duration storage
 - **8 sites** demonstrating **10+ hours** of energy storage duration
 - **3 early-stage grants** providing **up to 100+ hours** of energy storage duration



Examples of Promising Non-Lithium-ion Energy Storage Technologies





Opportunities for Non-Lithium-ion Technologies

- **Supply chain security:** Not reliant on Lithium-ion supply chain elements
- **Safety:** Reduce thermal runaway and improve safety
- **Cost and performance:** Improve \$/kWh, energy density, charge time, and cycle life
- **Demonstrate Field Performance:** Validate performance and stability, enabling future financing opportunities



Investments in California's State Budget

- \$140M in 2022-23 for non-lithium-ion long-duration energy storage
- 3 grants in development based on prior experience:
 - 1. Viejas Native American Tribe Microgrid (June 2023)**
 - 60MWh hybrid system (flow battery and Zinc hybrid system)
 - 2. Camp Pendleton Marine Core Base resiliency/commercial enterprise system (June 2023)**
 - 80MWh Zinc hybrid system
 - 3. PG&E front-of-the-meter system**
 - First-of-its-kind 5MW / 100Hr Iron-Air Technology System (late 2024/early 2025)



Investments in California's State Budget cntd.

- \$240M in 2023-24 for non-lithium-ion long-duration energy storage
- Competitive solicitation to install new systems at 5-7 sites in Summer 2023
 - Preselected sites
 - Open to all that can meet the requirements
- Federal cost share to leverage additional funding
- Second solicitation in 2024 if funding is available



Next Steps

- 3 non-Lithium-ion technology demonstration grants to be considered for approval at upcoming Business Meetings
 - 2 grants currently scheduled for the October Business Meeting
 - ✓ Technologies will be operational by June 2023 to support 2023 summer heat waves
 - 3rd grant scheduled for November Business Meeting
- Public meetings on competitive solicitation to advance promising technologies
 - Stay informed at www.empowerinnovation.net