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Form Energy comments on Draft SB 423 Report

Please find our comments attached. Thank you.

Additional submitted attachment is included below.

August 23, 2024

David Erne
California Energy Commission (CEC)
Docket Unit, MS-4
Docket No. 21-ESR-01
715 P Street
Sacramento, California 95814

Re: Comments on the Draft SB 423 Emerging Renewable and Firm Zero-Carbon Resources Report

Dear Mr. Erne:

Form Energy appreciates the release of the Draft SB 423 Emerging Renewable and Firm-Zero-Carbon Resources Report (Draft Report) and the opportunity to comment on it. We are excited to see CEC evaluating the role that emerging firm zero-carbon resources can play to support a clean, reliable, and resilient electrical grid in California, including during multi-day extreme weather events and during periods of low renewable generation. Firm zero-carbon resources are the otherwise missing link that will enable California to transition to a reliable, least-cost, fully zero-carbon electricity grid.

We offer the following summary comments on the Draft Report, which are elaborated upon in the sections that follow:

- Emerging, firm zero-carbon resources are a critical element of the clean energy transition, and the Draft Report should incorporate information from studies highlighting the necessity and value of these resources.
- Multi-day storage is a distinct resource class and should be distinguished within the broader long-duration storage resource class.
- Multi-day weather evets are a cause of reliability risks, and such events are not currently part of California's long-term resource optimization planning. The Draft Report should highlight that the lack of least-cost resource planning for such events is a barrier to firm zero-carbon resource development and to achieving California's decarbonization goals.

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- The Draft Report should provide more detail about policy barriers to firm zero-carbon resources and potential solutions to those barriers. Our comments below highlight several barriers and recommend several actions California can take to overcome them, including:
    - Planning for occurrences of atypical weather in all future resource optimization studies;
    - Optimizing for local reliability requirements in future resource planning;
    - Including diverse emerging firm zero-carbon resources in planning;
    - Modeling scenarios of deep decarbonization with and without existing thermal resources in all future planning studies to understand future needs for firm zero-carbon resources, both in the near and long-term (2030-2045);
    - Developing resource adequacy accreditation rules for more diverse classifications for long-duration and multi-day storage to distinguish firm zero-carbon resources from conventional fossil fuel and short-duration storage technologies; and
    - Beginning to track the deployment of firm zero-carbon resources, including by incorporating the duration of battery storage deployments on an energy basis (i.e., MWh) into the CEC's Energy Storage System Survey and related dashboard.
- SB 423 requires identifying pathways to additional procurement of firm zero-carbon resources. This appears to be a missing piece in the Draft Report.

Additionally, we offer a few minor corrections to the Draft Report.

About Form Energy

Enabling a Clean and Reliable Electrical Grid Year-Round

Form Energy is a U.S. energy storage technology and manufacturing company that is commercializing a rechargeable, iron-air battery capable of continuously discharging electricity for 100 hours. Form's multi-day battery will enable a clean electric grid that is reliable and cost-effective year-round, even in the face of multi-day weather events and lulls in output of intermittent renewable resources. With more than 800 employees nationwide, Form Energy currently occupies more than 85,000 square feet of space in Berkeley, CA, with 200 employees supporting our California operations. Form Energy's first commercial battery manufacturing facility in Weirton, WV, will start producing grid-scale multi-day battery systems for utility customers later this year.

Form Energy has over 5 GWh of projects under contract and development, with our first project expected to come online in early 2025 with utility Great River Energy in Minnesota. Form Energy also previously received an award from CEC for a 5 MW/500 MWh project with Pacific Gas & Electric, which could come online in Mendocino, California as soon as 2025. As part of the Power Up New England project, which recently was awarded $389 million from the Department of Energy's Grid Resilience and Innovation Partnerships (GRIP) program, Form Energy will also

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deploy a 85 MW/8500 MWh multi-day battery system in Lincoln, Maine. This project will have the most energy capacity of any battery system announced to date in the world and about a quarter of the energy capacity of all utility-scale energy storage in California, combined, as of August 2024.[1]

Comments

Chapter 1: Introduction

Incorporate information from studies highlighting the necessity and value of firm zero-carbon resources, including multi-day energy storage, in decarbonizing California's electricity grid

Several studies[2] have shown that it is possible to achieve a completely zero-carbon power sector at low or no cost compared to status quo policy, if firm zero-carbon resources are included in clean energy portfolios. California's 2021 SB 100 Joint Agency Report,[3] for example, found that firm zero-carbon resources can reduce electric system costs by an estimated $2 billion annually in 2045. Additionally, a number of studies have specifically identified long-duration energy storage and multi-day energy storage as key elements of a low-cost, reliable zero-carbon electricity grid. Notably, recent CEC-sponsored research conducted by E3, Form Energy, and UC San Diego, *Assessing the Value of Long-Duration Energy Storage* (Value of LDES Study) found that the inclusion of 37 GW of long-duration and multi-day energy storage by 2045 can support a zero-carbon power sector at costs similar to SB 100 goals.[4] Similarly, the U.S. Department of Energy (DOE) Pathways to Commercial Liftoff: Long Duration Energy Storage (DOE Liftoff Study), found that the U.S. grid may need 225-460 GW of long duration energy storage capacity by 2050, including inter-day long-duration energy storage and multi-day long-duration storage, which would result in $10-20 billion in annualized system savings compared to resource portfolios that do not include these dispatchable firm resources.[5] The DOE Liftoff Study finds that by 2040, long-

[1] Assuming the average duration of California's 8,736 MW of utility scale energy storage is four hours. https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-storage-system-survey

[2] For example, see the following:

- https://www.nrel.gov/analysis/100-percent-clean-electricity-by-2035-study.html
- https://www.edf.org/sites/default/files/documents/SB100%20clean%20firm%20power%20report%20plus%20SI.pdf
- https://energyinnovation.org/wp-content/uploads/2020/09/Pathways-to-100-Zero-Carbon-Power-by-2035-Without-Increasing-Customer-Costs.pdf
- https://www.wartsila.com/energy/learn-more/downloads/white-papers/path-to-100-renewables-for-california

[3] 2021 SB 100 Joint Agency Report, p. 13, available at https://www.energy.ca.gov/sb100

[4] https://www.energy.ca.gov/publications/2024/assessing-value-long-duration-energy-storage-california#:~:text=This%20study%20found%20that%20LDES,based%20microgrids%20less%20cost%2Deffective

[5] https://liftoff.energy.gov/long-duration-energy-storage/

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duration and multi-day energy storage will comprise at least 35% of total nationwide storage capacity, and potentially as much as 88%, depending on cost-reductions for short-duration energy storage. Multi-day storage will have a significant role to play in the future grid regardless of lithium-ion battery price sensitivities, with the analysis identifying a need for multi-day storage of about 28% to 37% of the future nationwide energy storage portfolio.[6] Other reports and analyses have made similar findings.[7]

The Draft Report would be even more useful if it were to incorporate a summary of these key findings and benefits from other studies, which would further highlight the value of firm zero-carbon resources to California and the importance of including them in all future California resource planning.

Chapter 2: Identification and Assessment of Firm Zero-Carbon Resources – Long-Duration Energy Storage (LDES)

Multi-day energy storage should be addressed a distinct resource class in the Final SB 423 Report

Long-duration storage is a broad resource class, and it is important to distinguish multi-day storage (24-hr+ duration resources) within it. As we noted above, the DOE's Liftoff Study identifies that inter-day and multi-day long-duration storage are distinct resource classes that provide complementary functions in the grid. The DOE defines inter-day LDES as resources having a duration of at least 10 hours, and multi-day storage as resources having a duration of at least 36-hrs. Form Energy recommends that it is more intuitive and reasonable to define the multi-day storage class as having a duration of at least 24 hrs.

We recommend that the SB 423 Draft Report be revised to reflect distinctions between inter-day long-duration storage and multi-day long-duration storage. As the DOE Liftoff Study notes, different technologies fit within the inter-day LDES and multi-day storage classes. They also have different cost profiles, with multi-day storage delivering lower cost stored energy on a $/kWh. basis. These resource classes also target complementary but different grid services.

Because of their significant differences, these resource classes face slightly different market barriers and opportunities. They also provide differing levels of firm capacity. For example, in

[6] See DOE's Pathways to Commercial Liftoff report, page 17, Figure 7, available at https://liftoff.energy.gov/wp-content/uploads/2023/10/Pathways-to-Commercial-Liftoff-LDES-May-5_UPDATED-v10.pdf

[7] For example, McKinsey also sees significant potential for long duration energy storage in the U.S. market, estimating it could reduce costs associated with a zero-carbon grid by $35 billion annually in 2040. https://www.mckinsey.com/capabilities/sustainability/our-insights/net-zero-power-long-duration-energy-storage-for-a-renewable-grid

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most parts of the country, capacity market designs and resource adequacy programs have yet to acknowledge the greater ability of multi-day storage to provide firm capacity relative to inter-day LDES and short-duration storage, and this value is not yet reflected in capacity accreditation studies. It is also worth noting that, as a stand-alone resource, multi-day storage closely aligns with the SB 423 definition of firm capacity, which is based on a resource's ability to "deliver electricity with high availability for the expected duration of multi-day extreme or atypical weather events." The SB 423 Draft Study defined such weather events as 3-day periods, a period during which multi-day storage can discharge continuously to support grid reliability.

Chapter 3: Reliability Assessment

The Draft Report should be expanded to recommend how California can better plan to ensure that the grid is both *least cost* and reliable during periods of multi-day weather events

We appreciate the Draft Report's thoughtful and novel analysis about reliability risks due to multi-day events that stress the grid. We agree with the central conclusion that firm zero-carbon resources can reduce and optimize the needs for variable renewables and short-duration storage while maintaining reliability during multi-day weather events. The analysis also showed how important it is to plan for region-wide weather events that can significantly reduce energy imports into California and cause extended reliability risks.

However, the Draft Report highlights that much more analysis is needed to better optimize portfolios to reliably meet energy demands during weather-driven, multi-day periods of grid stress. Specifically, it further demonstrates how important it is to conduct resource planning that optimizes for both cost and reliability together, which is the only way to accurately evaluate needs for firm zero-carbon resources and their benefits. We hope that the Final Report will include recommendations about how to build upon the reliability analysis and improve California's least-cost grid planning processes in the future.

The reliability analysis should acknowledge its limitations to avoid misconceptions

Greenhouse gas impacts

It is important for the Draft Report to clarify that the SB 423 reliability analysis does not consider cost or greenhouse gas constraints, and therefore some results warrant additional explanation and reframing. For example, Table 25 and the related discussion on pp. 46-47, address the modeled interplay between firm resources and fossil generation. However, they do not represent realistic outcomes and could lead to inaccurate conclusions.

SB 423 reliability modeling did not optimize for greenhouse gas constraints or for cost-optimal combinations of firm and non-firm resources. It is therefore inaccurate to state that "firm

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portfolios require more generation from gas resources and imports." Results from the Value of LDES study led by E3 and Form Energy, which optimized for both cost, greenhouse gas constraints, and reliability over a full year of hourly grid operations, found that firm zero-carbon resources lower both portfolio costs and GHG emissions while meeting reliability requirements. This is a similar finding in the 2021 SB 100 Joint Agency Report. When planning is conducted properly, analysis should conclude that firm zero-carbon resources like multi-day energy storage help make *better* use of renewable energy resources, thus *lowering* system costs and *reducing* greenhouse gas emissions.

The Draft Report demonstrated a critical gap in all California grid planning to date: no long-term resource studies, including this Draft Report, have been designed to identify optimal portfolios that are both *least cost* and reliable over a range of weather conditions. California currently conducts least-cost optimization and reliability analysis in a two-step process. Studies first identify a least-cost portfolio to address *average-year* weather peaks and greenhouse gas constraints. Subsequently, the resulting portfolio is evaluated to check whether it is reliable during a wider range of weather conditions. This two-step approach does not optimize for least-cost solutions that can ensure reliability every hour of the year during a range of weather conditions, and it undervalues firm zero-carbon resources.

Needs for firm resources and how they substitute for non-firm resources

Figure 7 and discussions on pp. 45-47 demonstrate that each GW of firm resources can substitute for many GWs of non-firm resources. However, some of the language in this section is unclear and could benefit from clarifications. We interpret these results to demonstrate that, without considering costs, 1.6 GW of firm resources can *substitute for* significantly more non-firm resources. The study's discussion about 6.7x multiples seems to be saying that 10.7 GW of firm resources can substitute for ~23 GW of non-firm resources in the CPUC's Preferred System Plan. However, this point is unclear from the discussion. Additionally, Figure 8 seems to show that the marginal value of firm resources stays constant, meaning that as more firm resources are added, they continue to substitute for non-firm resources at a constant ratio of 1.6 GW of firm resources to 5 GW non-firm resources. This point could benefit from additional clarification.

Indeed, the finding that firm zero carbon resources can significantly reduce the need for intermittent and use-limited resources was identified in the 2021 Joint Agency SB 100 Report, as well. The report evaluated several alternate scenarios for achieving the goals of SB 100, including a "Zero Carbon - Baseload and Dispatchable scenario." As illustrated in that report, the addition of about 15,000 MW of firm zero carbon resources was shown to reduce intermittent and use-limited resources by about 75,000 MW.[8] Normalized per the Draft Report's' representation, this scenario found that every 1,600 MW of additional firm zero carbon resource avoids the need for

[8] See Figure 7 and the surrounding discussion in the 2021 SB 100 Joint Agency Report: https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=237167&DocumentContentId=70349

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about 8,000 MW of intermittent and use limited resources, while reducing resource costs by about $2 billion.

Importance of import assumptions

Weather-driven reliability risks are often regional in nature. The results in Tables 21 and 23 show how important it is to plan for region-wide (i.e. WECC-wide) periods of weather extremes in all seasons. Such events can significantly lower California's ability to import power and increase reliability risks. When the entire West faces a multi-day period of extreme heat in the summer, or several days low renewable output while generators are offline for maintenance, the entire region may face resource constraints. Such conditions have not historically been part of least-cost optimizations in California. We hope the SB 423 Report will recommend that they become a regular feature of future planning studies at the CPUC, CARB, and CEC.

Chapter 5: Conclusion (Barriers and Recommendations)

Further evaluate barriers and solutions to overcome them, including lack of relevant planning, market rules

We recommend that the Draft Report be significantly expanded to more thoroughly address policy and market barriers to firm zero-carbon resources. Rather than focus on technology improvements, it would be far more impactful to examine barriers from the standpoint of actions that are needed to stimulate investment in firm zero-carbon resources by project developers and load serving entities. We highlight a few barriers and solutions that we have previously included in CEC and CPUC comments and that we recommend be included in the Final Report:

Optimizing resource needs for atypical weather over 8,760-hour grid operations

None of California's long-term resource planning studies have evaluated least-cost resource needs over diverse weather years, which firm zero-carbon resources are well positioned to address. All of California's *future* resource optimization plans – including the SB 100 Report, the AB 32 Climate Change Scoping Plan, and the CPUC's Integrated Resource Planning – should conduct least-cost optimizations of resource needs that consider atypical weather, including extreme heat and cold, periods of low renewable energy output, and periods of weather-driven fuel shortages.

The capacity optimization modeling tools that California has used to date have also not been configured to properly account for the value or need for firm zero-carbon resources. For example, models typically optimize for resource needs using only a subset of sample days (i.e., several discrete 24-hour periods), and they do not accurately account for the links between days. Such approaches cannot accurately capture the impacts of multi-day weather events, reflect the value

of multi-day storage, or account for opportunities for seasonal storage to minimize renewables curtailment.

Additionally, California's modeling typically optimizes resource needs only based on average (1-in-2) weather, rather than diverse weather conditions. In the future, it is urgent to optimize resource needs based on many years of weather data (at least ten years) to properly account for periodic extreme events that cause reliability risk. To conduct such modeling, it is first necessary to have hourly demand and energy profiles that are based on the same years of weather.

To our knowledge, the CEC has not yet produced such information in its Integrated Energy Policy Report. The SB 423 Draft Report's approach is emblematic of this data deficiency: the analysis uses a "1-in-2" (i.e. average) demand forecast, and 15 years of renewable energy shapes from different years 2007-2021. If hourly demand profiles and generation profiles are not based on the same weather years, it is impossible to realistically model how weather events will affect both demand and generation profiles. To fully and fairly value firm resources, it is necessary to accurately represent the weather-driven conditions that create needs for firm capacity.

Include diverse emerging firm zero-carbon resources in planning

Such resources have been omitted as candidate resources from past California resource optimization studies, and they should be included in the future. We recommend that the Final Report acknowledge this significant omission and recommend that California address it going forward, as it is a fundamental barrier to identifying needs for firm zero-carbon resources.

Consider local reliability requirements in resource planning optimizations

California has yet to conduct least-cost planning to meet *local* reliability needs, which firm zero-carbon resources will be needed to address. The majority of legacy thermal units remaining in California are located in defined local reliability areas. CAISO's local capacity studies typically subject these areas to a higher degree of uncertainty analysis that considers 1-in-10 year weather and a range of contingencies. We recommend that future least-cost resource planning, particularly in the CPUC's IRP process, begin to consider firm resource needs in local reliability areas. Doing so will ensure that California builds the right mix of resources in the right locations to ensure a least-cost, reliable grid, and it will also send investment signals about firm zero-carbon resource needs.

Model scenarios of deep decarbonization with and without existing thermal resources to better understand future needs for firm zero-carbon resources, both in the near and long-term

State planning typically has not considered scenarios of deep electric sector decarbonization with and without existing thermal power plants. Such scenarios are important to model because firm

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zero-carbon resources are potential substitutes for legacy thermal resources, and there is value in understanding what least-cost mix of resources will be needed as these aging thermal resources retire. The E3/Form Energy Value of LDES study, for example, examined such scenarios, and found that it is possible for portfolios of renewables, short-duration storage and multi-day storage to substitute for all existing in-state thermal resources without increasing portfolio costs. Such scenario planning, and resulting resource development, can also avoid future needs to engage in out-of-market procurement measures to retain uneconomic thermal units that are needed to support grid reliability. We recommend that the SB 423 report highlight that the lack of planning for zero-carbon scenarios without legacy thermal generation is a barrier to the development of firm zero-carbon resources that the state can easily remedy in the future.

Develop resource adequacy accreditation rules and wholesale markets for firm resources

At present, California's Resource Adequacy (RA) program has not yet defined capacity accreditation rules for diverse classifications for long-duration and multi-day storage, or for other firm zero-carbon resources. Additionally, the RA program and CAISO markets are not yet designed to ensure energy sufficiency during sequential day periods of weather-driven reliability risks. Without such planning or resource accreditation rules, project developers and load serving entities lack clarity about how to value firm resources like multi-day storage relative to short-duration storage and other variable resources. We recommend that the SB 423 Report highlight these barriers and identify near-term actions California can take to start to better value firm resources in the RA program and CAISO markets.

Begin tracking the deployment of firm zero-carbon resources, including stored energy in MWh

The CEC has an Energy Storage System Survey and related dashboard that reflects the power capacity (MW) of energy storage deployed in California. We recommend that the CEC and other agencies begin to report the total amount of stored energy in MWh of energy storage deployed. This change will help California better convey how well the energy storage portfolio can deliver firm capacity over sequential day periods of grid stress (e.g. extreme temperatures, lulls in renewable energy output, and fuel shortages).

The Final Report should recommend pathways for additional procurement of emerging firm zero-carbon resources, as required by SB 423

In addition to the recommendations above, SB 423 requires the report to identify "pathways for additional procurement of those resources by load-serving entities, including joint procurements by electrical corporations, community choice aggregators, direct access customers, local publicly owned electric utilities, and other public entities, or a central procurement entity." Specific recommendations related additional pathways for procurement by these entities seem to be missing from the Draft Report and should be added the Final Report. We recognize and appreciate

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that the CPUC has recently proposed measures to support the development of firm zero-carbon resources, but there are other ways California can and should support the procurement of firm zero-carbon resources that warrant some exploration in the revised Draft Report.

Fortunately, many of these barriers can be easily and straightforwardly addressed through existing agency processes. As part of a more detailed evaluation of barriers to deployment and procurement of firm zero-carbon resources, and potential solutions to those barriers, we encourage the revised SB 423 to lay out a roadmap of issues California can address within existing processes to overcome barriers to firm zero-carbon resources.

Recommended Clarifications and Corrections

Finally, we recommend the following additional clarification and corrections:

- **Corrections to Table 3: LDES Performance Characteristics**
  - Cycle life: The table incorrectly identifies that 100-hour duration iron-air batteries have an 8,000-cycle life. We recommend instead that the table be revised to reflect a range of *400 to 800* cycles, with the understanding that the batteries, even if used on a daily basis and to shift loads seasonally, are not expected to *fully* cycle too many times per year. The characterization in the table of 20 full cycles per year is fair, which over a 20-40 year life, amounts to 400-800 throughput-equivalent cycles.
  - Response time: The table should be revised to clarify that iron-air batteries have a response time that is *less than* 10 minutes from offline to full power
  - Lifetime: The table should be revised to specify a lifetime range of 20 to 40 years, as system lifetimes will increase over time.
- **Figure 1**
  - To improve the clarity of Figure 1, we recommend separating local reliability and resiliency into distinct columns, so that it is clear which resources meet all the roles and highest standards (e.g. long-duration storage). Additionally, we recommend including a column specifying which resources, like long duration energy storage, will be commercially available prior to 2030.
- **Land Use Considerations and Table 26**
  - One of the primary benefits of long-duration energy storage, and multi-day energy storage in particular, is that it lowers total needs for new renewable energy resources. It achieves this by lowering renewable energy curtailment, thereby making more renewable energy available when it is needed most: during periods of grid stress due to weather events. By lowering total needs for new capacity, long duration energy storage lowers total land use impacts at the system level. Although it is useful to know plant-level energy density, we recommend that the SB 423 report highlight that what matters most is system-level land use, and the

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extent to which the inclusion of firm zero-carbon resources can lower or avoid total land use requirements to meet California's decarbonization goals. This avoided land use is a benefit that is not presently reflected in resource valuation. To quantify this benefit, it is necessary to include firm zero-carbon resources in least-cost resource optimization planning.

- **Table 28**
  - We recommend that Table 28 be re-titled to show "Current and Announced LDES Projects" rather than "Case Studies," as the projects listed are not truly case studies. Additionally, we wish to correct errors in the table related to Form Energy's projects with Xcel Energy. These projects do not involve "Blue Ride Power." Additionally, there are two projects: one 10 MW / 1,000 MWh project with Xcel Energy in Becker, Minnesota; and another 10 MW / 1,000 MWh project in Pueblo, Colorado.[9]
  - Additionally, Form Energy has several other announced projects planned to be online before the end of 2026 that we recommend be referenced in the table:
    - 5 MW / 500 MWh project at PG&E's Mendocino Substation in California, funded by the California Energy Commission
    - 5 MW / 500 MWh project with Dominion Energy at the Darbytown Power Station in Virginia[10]
    - 10 MW / 1,000 MWh project in New York supported by a NYSERDA grant[11]
    - 15 MW / 1,500 MWh project with Georgia Power[12]
    - These Minnesota, Colorado, and Virginia projects with utilities have all received state regulatory approval.
    - Additionally, Form Energy announced that it will build an 85 MW / 8,500 MWh project in Lincoln, Maine, the largest announced battery energy storage project on an energy basis, which is part of a New England States proposal that was selected to receive DOE Grid Innovation Program funding.[13]
- **Performance Characteristics and Figure 11**
  - We recommend that Figure 11 be revised to more accurately characterize iron-air batteries. The table currently states that 100-hour duration iron-air batteries cannot provide 4-hr and 8-hr applications, which is inaccurate. Multi-day storage does in fact regularly charge and discharge on a daily basis to provide short periods of discharge and charge to balance hourly grid fluctuations. We

[9] https://formenergy.com/form-energy-partners-with-xcel-energy-on-two-multi-day-energy-storage-projects/
[10] https://formenergy.com/dominion-energy-explores-pioneering-battery-storage-technologies-in-virginia/
[11] https://formenergy.com/form-energy-awarded-grant-to-deploy-first-multi-day-battery-system-in-new-york/
[12] https://formenergy.com/form-energy-collaborating-with-leading-georgia-electric-utility/
[13] https://formenergy.com/massachusetts-new-england-states-selected-to-receive-389-million-in-federal-funding-for-transformational-transmission-and-energy-storage-infrastructure/

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recommend examining state of charge plots in the Value of LDES study that E3 and Form Energy conducted, which demonstrate this function.[14]

- Additionally, 24-hr and 100-hr should be revised to "current applications," as these are applications multi-day storage can address.
- Lastly, 2-week and multi-month applications should be revised to "possible applications," for iron-air batteries. As the Value of LDES study shows, multi-day storage seasonally shifts excess renewable energy, and thus it also supports multi-week and multi-month grid needs.
- It may also be worth further clarifying in this section what "applications" means in this context. In general, we recommend that applications be defined to address specific grid needs or problems. A portfolio of resources is often the best solution to address any given grid need.

Conclusion

Thank you again for the opportunity to comment on the Draft Report and for the CEC's important work to advance California's clean energy goals. We hope this report will support growing efforts to deploy these critical resources in California to accelerate the state's transition to clean and reliable energy. Please do not hesitate to reach out with any questions or follow up items.

Sincerely,

Jason Houck
Policy Director
Form Energy
jhouck@formenergy.com

[14] https://www.energy.ca.gov/sites/default/files/2024-01/CEC-500-2024-003.pdf