

DOCKETED

Docket Number:	21-ESR-01
Project Title:	Energy System Reliability
TN #:	248820
Document Title:	Mainspring Energy Comments on Draft Clean Energy Reliability Investment Plan
Description:	N/A
Filer:	System
Organization:	Mainspring Energy
Submitter Role:	Public
Submission Date:	2/16/2023 4:37:50 PM
Docketed Date:	2/16/2023

*Comment Received From: Mainspring Energy
Submitted On: 2/16/2023
Docket Number: 21-ESR-01*

**Mainspring Energy Comments on Draft Clean Energy Reliability
Investment Plan “ 21-ESR-01**

Additional submitted attachment is included below.

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February 16, 2023

California Energy Commission
Docket Unit, MS-4
Docket No. 21-ESR-01
715 P Street
Sacramento, California 95814

**Re: Comments of Mainspring Energy on the *Draft Clean Energy Reliability Investment Plan*
(21-ESR-01)**

Pursuant to the Notice of Availability and Request for Comments on the Draft Clean Energy Reliability Investment Plan (“Draft CERIP”) docketed February 9, 2023¹, Mainspring Energy, Inc. (“Mainspring”) hereby submits these comments on the Draft CERIP.

About Mainspring

Driven by its vision of the affordable, reliable, net-zero carbon grid of the future, Mainspring has developed and commercialized a new power generation technology —the linear generator— delivering local power that is dispatchable and can be powered using a range of fuels. Mainspring’s linear generator offers a unique and highly flexible capacity and energy solution that simultaneously addresses the critical need of reducing greenhouse gas and criteria pollutant emissions, while also enhancing grid reliability and resilience.

Modular and scalable, Mainspring’s linear generators can be deployed near load, either customer- or grid-sited. Full dispatchability and virtually no limits on daily starts/stops also allows linear generators to consistently follow load while also firming renewables, thereby facilitating the continued rapid adoption of renewable energy. Our local linear generators add resilience and real capacity to the grid while also providing enhanced flexibility to help avoid renewable curtailment.²

¹ TN#: 248717.

² For additional information on technical specifications and performance benefits, visit <https://www.mainspringenergy.com/technology/>.

I. Introduction & Summary

These comments express Mainspring’s appreciation and support of the Commission's goals of diversifying the portfolio of clean generation and energy storage at the distribution level, and mitigating ongoing risks of interconnection delays. Mainspring is pleased to see linear generators recognized as a demand-side resource; linear generators provide significant supply-side benefits as well (e.g. capacity, transmission & distribution (“T&D”) avoidance, electric vehicle (“EV”) charging and other electrification-driven load growth). Linear generators, when using zero-carbon fuels (e.g. clean hydrogen and ammonia), can act as long-duration energy storage; Mainspring recommends amending the discussion of long-duration energy storage to specifically reference technologies that can store energy in the form of clean fuels.

II. Discussion

A. Linear Generators Are a Scalable, Commercially-Ready Technology that Will Diversify California’s Clean Capacity Expansion Plans

Mainspring has developed and commercialized a new category of power generation, the linear generator, that delivers dispatchable, fuel-flexible electric power at low cost. Mainspring’s linear generator offers a unique and highly flexible energy and capacity expansion solution that simultaneously addresses the critical need for greenhouse gas and criteria pollutant emissions reductions while maintaining reliability and resilience.

The Linear Generator technology is modular, scalable and can be strategically deployed to meet the needs of California’s energy supply, whether at a local level for a single customer or for an entire community. Linear generators may serve a large commercial customer’s backup generation need (thereby avoiding diesel-fueled backup), represent a facet of a multi-resource microgrid, or provide a utility-scale solution to alleviate congestion constraints and add local resiliency. Further, full dispatchability allows linear generators to consistently match power output with the specific energy need, while integrating with, and firming, variable renewables such as solar and wind, thereby supporting the continued rapid adoption of renewable energy while bolstering resilience and avoiding unnecessary curtailment.

This technology has been recognized by the CEC in a number of settings, including the Draft CERIP.³ In addition to this report, linear generators have also been recognized in a study by the CEC for its application as a combined heat and power facility,⁴ as well as being a resource capable of participating in the Distributed Electricity Backup Asset and Demand Side Grid Support programs.⁵ Mainspring applauds the Commission for recognizing linear generators as a resource, and looks forward to continuing to deploy our technology to meet local needs and state climate and resilience goals.

B. The Draft CERIP Astutely Recognizes the Importance of Diversity as a Risk Mitigation Tool in the Drive to Reduce Emissions and Meet Evolving Reliability Standards

³ Draft CERIP, at 15.

⁴ See California Energy Commission, “Linear Generation For Combined Heat and Power, Final Project Report” (CEC-500-2021-017). March 2021. Available at: <https://www.energy.ca.gov/sites/default/files/2021-05/CEC-500-2021-017.pdf>

⁵ See, for example, “Demand Side Grid Support Program and Distributed Electricity Backup Assets Program”, TN #248608 filed in Docket 22-RENEW-01. January 30, 2023.

Recent delays in the development of new clean capacity and the ongoing need to invest in older coastal power plants and diesel generation make clear that California needs more options for clean capacity expansion. This is exemplified by the findings of the Joint Agency Reliability Planning Assessment, which highlights the need for up to 10,000 MW of additional capacity by 2025.⁶ It is essential that the Commission develop a diverse array of resources –including clean firm power– to ensure California’s reliability needs are met while achieving the state’s climate goals. Linear generators represent a unique technology that provides an important and broad set of benefits. First, linear generators can be deployed at a variety of scales depending on customer needs, transmission availability, and can also serve as a transmission solution similar to conventional storage resources that are operated as transmission assets.

Second, the fuel-flexibility of Mainspring’s linear generators provides additional benefits to both grid operators and end-use customers. Linear generators can run on conventional fuels that are readily available now –including biogas– and easily transition to low- or zero-carbon fuels (e.g. clean hydrogen and ammonia) as they become available, with no hardware changes to the generators themselves, enabling a smooth transition to a zero-carbon future. Moreover, by using two moving parts, no lubricants, and avoiding reliance on scarce materials, linear generators represent a functional, reliable resource.

Finally, linear generators are easy to site where power is needed, can be permitted in the most stringent air quality regulatory environments, and use UL-listed inverters for straightforward interconnection. Additionally, linear generators are modular, with the ability to deploy as many units as may be needed to power a given site. As the grid evolves and load-serving entities undertake an unprecedented effort to procure new generation, linear generators will provide essential flexibility to add to the range of resources needed to meet SB 100 targets. We strongly support the recognition in the Draft CERIP of the importance and need for diversity in California’s generation fleet, and encourage the Commission to recognize linear generators as both a supply- and demand-side resource.

C. Linear Generators Meet the Definitions for Long Duration Energy Storage in California Statute when Using Hydrogen Fuels

The Draft CERIP recommends augmenting “...existing programs to further expand the diversity of long-duration energy storage technologies, particularly non-lithium ion, that can provide extended reliability support at the net peak.”⁷ Mainspring encourages the CEC to enable resource diversity by ensuring that the definition of energy storage used accurately reflects California Statutes. California Public Resources Code Section 25642 defines a “hydrogen demonstration project” as an “eligible storage facility”, while California Public Utilities Code Section 400.3 requires the Commission to “...consider green electrolytic hydrogen an eligible form of energy storage...” As a prime mover capable of operating on 100% green electrolytic hydrogen (or its derivatives, e.g. ammonia), linear generators meet the statutory definitions for long-duration energy storage. Recognizing the full breadth of energy storage resources will add diversity to the system as contemplated in the Draft CERIP, enabling the state to more ably meet its resilience and climate goals.

D. Mainspring Commends the Commission for Focusing on Interconnection Improvements

The Draft CERIP underscores the reality that, “Resources are needed to significantly reduce the time needed to review projects for interconnection and permitting of transmission and distribution assets.”

⁶ California Energy Commission, “Joint Agency Reliability Planning Assessment - SB 846 Quarterly Report and AB 205 Report”. TN #248714 filed in Docket 21-ESR-01. February 9, 2023.

⁷ Draft CERIP, at 16.

Mainspring agrees wholeheartedly that improving interconnection processes and timelines is essential, particularly given the significant load growth anticipated in the near future and the volume of resources needed to meet the state's growing capacity needs. As such, Mainspring applauds the Commission for allocating funds in the Draft Plan to address interconnection and permitting barriers. Process improvements that increase the amount of resources deployed and the speed with which they can actively provide value will be essential in meeting California's reliability and climate goals – a fact underscored by the significant focus on distributed energy resources throughout the Draft Plan. This is a foundational investment that will have knock-on effects in creating a more streamlined market for the full range of resources necessary to building the grid of the future.

III. Conclusion

Mainspring appreciates the opportunity to comment on this important Draft Plan, and looks forward to collaborating with the Commission to help California meet its climate and resilience goals in the future.

Sincerely,

/s/ Serj Berelson

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