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Additional submitted attachment is included below.

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September 8, 2023

California Energy Commission
Docket Unit, MS-4
Docket No. 23-ERDD-01
715 P Street
Sacramento, California 95814

Re: *SB 100 Kickoff Workshop (23-SB-100)*

Mainspring Energy, Inc. (“Mainspring”) hereby submits these comments on the Senate Bill (“SB”) 100 Joint Agency Workshop held on August 22, 2023.¹

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 fuel-flexible. Mainspring’s linear generator offers a unique non-combustion 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. Mainspring’s inverter-based technology offers a full range of valuable grid benefits including fast (and unlimited daily) starts/stops, a wide dispatch range from minimum to maximum load, quick ramping, and in many cases on-site fuel storage which allows linear generators to firm renewables for short or extended periods of time, thereby facilitating the continued rapid adoption of a reliable renewable energy grid. Our locally-sited linear generators add capacity and resilience to the grid while also providing enhanced flexibility to help avoid renewable curtailment.² Finally, by virtue of their modular size (20.5’ x 8.5’ x 9.5’) linear generators are space- and land-efficient and can be sited in load pockets, deferring expensive transmission & distribution investment.

Mainspring encourages the Joint Agencies and other parties to visit www.mainspringenergy.com for additional information on our linear generator technology and welcomes the opportunity to develop a candidate resource designation in the RESOLVE model.

¹ In these comments, Mainspring refers to the California Air Resources Board, the California Energy Commission, and the California Public Utilities Commission as the “Joint Agencies,” consistent with SB 100’s delegation of reporting obligations to these agencies.

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

I. Executive Summary

Mainspring thanks the California Energy Commission (“Commission”) for the opportunity to provide comments on the workshop presentation covering the 2025 SB 100 Joint Agency Report (“SB 100 Report”). Through these comments we recommend:

- Resource diversification should include fuel-flexible generation;
- Anticipated retirement of combustion resources and planning scenarios that further reduce availability of combustion resources require the addition of alternative firm resources;
- The process for the 2025 SB 100 Joint Agency Report should further address what is an eligible renewable energy resource and what defines a zero-carbon resource.

II. Introduction

Dispatchable, fuel-flexible, clean firm power is an essential part of the grid of the future. Such resources, including the linear generator, are generally utilized in a manner that can be categorized as distributed energy resources (“DERs”).³ Adequate treatment of, and support for, clean firm DERs is especially important as DERs are a listed factor in the “Reference Pathway” assumptions, and as part of the “DER Focus” pathway’s clear emphasis on increased DERs, DER sensitivity, and load flexibility.

The SB 100 Report should include specific actions the Joint Agencies must take to provide adequate support to clean, firm DER technologies. Importantly, updates to the guidance provided for SB 100’s 2045 eligible resources, including the Renewable Portfolio Standard (“RPS”) program eligibility, as a “renewable electricity generating facility”, and other RPS program updates, are necessary to enable innovative distributed generation to participate in all the state programs implemented to meet California’s SB 100 goals.

Other forums that the Joint Agencies should recognize as important to the SB 100 Report and goals development include, but are not limited to, the California Public Utilities Commission’s (“CPUC”) Integrated Resource Plan (“IRP”) procurement eligible resources and obligations, the California Air Resource Board’s (“CARB”) Advanced Clean Fleet (“ACF”) targets for fleet electrical charging (especially when utilities often cannot satisfy new service requests for multiple years due to supply chain issues, interconnection timelines, and other factors), the Commission’s behind-the-meter capacity goals (to be achieved, for example, by the Distributed Electricity Backup Assets program), and others.

These comments suggest aspects of the SB 100 report that should be considered and addressed in order to support clean, firm DER resources, and especially those innovative technologies in the early stages of their commercialization.

III. Discussion

A. Resource Diversification Should Include Fuel-Flexible Generation

The 2021 SB 100 Joint Agency Report recognizes that resource diversity, both technological and geographical, generally lowers total resource costs. It further underscores that, “Commercialization of cost

³ Mainspring’s linear generator also has attributes consistent with multiple categorizations of resources, such as long-duration energy storage, back-up generation, behind-the-meter generation, renewable firming, electric vehicle charging infrastructure, and part of the transmission system infrastructure for congestion relief.

competitive zero-carbon firm technologies could reduce overall system costs and decrease gas capacity retention.”⁴ Greater adoption of linear generators contributes to diversification of resources, especially considering the fuel-flexibility inherent in Mainspring’s linear generator technology and the ability for these modular units to be easily located where needed.

The fuel-flexibility of Mainspring’s linear generators provides additional benefits to both grid operators and end-use customers. Linear generators can run on readily-available fuels today, such as biogas, and can transition to other low- or zero- carbon fuels (e.g., renewable hydrogen and ammonia) as these become available. No hardware changes are required for a linear generator to switch fuels, enabling a smooth transition to a zero-carbon retail electric supply. The ability to fuel-switch should be accounted for in candidate resource designations in the SB 100 modeling by enabling a candidate resource to change its emission profile over time.

The modeling should also account for the cost savings associated with fuel switching. Retaining some natural gas resource capacity in the near-term will minimize costs while ensuring uninterrupted power supply during the transition to meeting a 100 percent clean energy goal by 2045. As previously explained in the 2021 SB 100 Joint Agency Report, “...natural gas capacity is the most economic option to provide capacity for reliability needs with the current resource assumptions.”⁵ We believe this is still true in the near-term, and adoption of a resource that can seamlessly transition away from natural gas as renewable and zero-carbon fuels become more widely available will both mirror the cost benefits and reality of greater natural gas availability through the near- and medium-term timeframe. Valuing fuel switching will allow timely adoption of renewable and zero-carbon fuels while continuing to rely on existing and already paid-for infrastructure.

B. Anticipated Retirement of Combustion Resources and Planning Scenarios that Further Reduce Availability of Combustion Resources Require the Addition of Alternative Firm Resources

As recognized by the pathways outlined in the 2025 Vision Report presentation given during the workshop, an inevitable aspect of SB 100’s 2045 clean energy goals is a transition away from traditional combustion resources relying on non-renewable fuels. In order to continue to meet the state’s reliability needs, retirement of traditional combustion generation must be counterbalanced by the addition of clean firm resources and other load management strategies to maintain system reliability.

This is exemplified by the findings of a recent Joint Agency Reliability Planning Assessment, which highlighted the need for nearly 10,000 MW of additional capacity by the end of 2026.⁶ It is essential that the Joint Agencies evaluate the need for a diverse array of resources, including clean firm DERs, to ensure California’s reliability needs are met while achieving the state’s climate goals. Linear generators represent a unique non-combustion technology that provides a broad, valuable set of benefits. 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.

The current types of commercially mature, large-scale renewable generation do not provide firm or time-flexible energy needed to serve California’s increasing electric demand. The addition of developing, alternative firm resources is required to meet this reliability need.

⁴ 2021 SB 100 Joint Agency Report at 103.

⁵ *Ibid.*, at p. 103.

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.

C. The Process for the 2025 SB 100 Joint Agency Report Should Further Address What is an Eligible Renewable Energy Resource and What Defines a Zero-Carbon Resource

It is imperative that innovative, emerging technologies have clarity regarding whether they will be eligible to contribute to California's clean energy future. Accordingly, further guidance is needed regarding what will qualify as "zero-carbon resources," and what constitutes an eligible renewable energy resource must evolve.

Despite the 2021 SB 100 Report providing helpful language explaining that zero-carbon resources mean those resources that "generate zero greenhouse gas emission on site" or qualify as renewable, questions remain.⁷ For example, an emerging resource's unique features, such as the linear generator's ability to transition from using a traditional fuel to a renewable fuel to a zero carbon fuel, result in uncertainty regarding future eligibility under SB 100's 2045 retail sales goal. Especially because the 2025 SB 100 Report is a Joint Agency effort, this Report is best suited to provide further guidance and assurance on 2045 eligible resources, and can facilitate market stability necessary to generation innovators participating in various state programs that will determine the makeup of California's future resource portfolio.

The other avenue for innovative, emerging generation technologies is RPS resource eligibility. Currently, some resources may not fit neatly into one of the RPS-eligible resources outlined in the current (and aging) RPS Guidebook.⁸ While Mainspring supports and looks forward to the Commission initiating the process for revising the RPS Guidebook, we are concerned that updates will not keep pace with technology and energy delivery innovations. As such, and without a clear RPS pathway, the "zero-carbon resources" category will remain the likely path for innovative technologies. Since new technologies can raise questions regarding what qualifies as a zero-carbon resource, a more flexible multi-agency definition of "zero-carbon resources" is an important topic that the 2025 SB 100 Report should address.

D. Other Issues that Should Be Incorporated in the 2025 SB 100 Joint Agency Report Process

The SB 100 Joint Kickoff Workshop included a strong proposal for the scenarios, or pathways, that will be modeled. The pathways each present helpful future visions for California's clean energy supply and 2045 goal. However, clear narratives on the base assumptions that comprise the Reference Pathway and the four alternative pathways have yet to be presented. The Joint Agencies should engage parties in fleshing out the inputs and assumptions as they exist in the Reference Pathway and as they may be altered in the proposed alternative pathways. As the proposed pathways are finalized, full descriptions of the factors feeding these scenarios should be available.

Mainspring also encourages the Joint Agencies to engage parties and include a specific discussion and assessment of emerging generation technologies and other technological innovations that will contribute to reliability and grid resiliency during the energy transition outlined in the SB 100 Report. This discussion should aim to consider and report what measures the Joint Agencies can take to support the advancement of these resources. While the state's continued investments in research and innovation are important and appreciated, state support of clean energy innovations must continue beyond state-administered grant programs and progress to policies, decisions, and regulations that remove barriers

⁷ 2021 SB 100 Joint Agency Report at p. 54

⁸ Green, Lynette, Christina Crume. 2017. Renewables Portfolio Standard Eligibility Guidebook, Ninth Edition. California Energy Commission, Publication Number: CEC-300-2016-006-ED9-CMF-REV.

to commercial deployment of emerging clean resources, allowing these needed clean, firm technologies to be cost-effectively deployed at scale within a reasonable timeframe.

IV. Conclusion

Mainspring appreciates the opportunity to comment on this important workshop, and looks forward to collaborating in the future.

Sincerely,

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