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# Form Energy Comments on on the Draft Scoping Order for the 2023 Integrated Energy Policy Report

*Additional submitted attachment is included below.*

March 17, 2023

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

## Subject: Form Energy, Inc. Comments on the Draft Scoping Order for the 2023 Integrated Energy Policy Report (IEPR), Docket #23-IEPR-01

Form Energy, Inc. (Form Energy) appreciates the opportunity to comment on the California Energy Commission's (CEC) Draft Scoping Order for the 2023 Integrated Energy Policy Report (IEPR), issued March 3, 2023 (2023 IEPR Scope).

**About Form Energy**
Form Energy, Inc. (Form Energy) is a U.S. energy storage technology and manufacturing company that is developing a rechargeable, iron-air battery capable of continuously discharging electricity for 100 hours at a system cost less than 1/10th the cost of lithium-ion battery technology. 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. With over 400 employees, Form Energy has offices in the San Francisco Bay Area; Somerville, MA; and the Greater Pittsburgh area; and has recently announced plans to locate a first commercial battery manufacturing facility in Weirton, WV.

**Recommendation: The CEC should commit to collaborating with the California Public Utilities Commission (CPUC) to develop weather-correlated renewable generation and load profiles that reflect at least 1-in-5, 1-in-10, and 1-in-20 weather years**
Historically, state energy agencies have conducted resource planning and capacity expansion modeling based on generation and load profiles that were derived independently, in the absence of weather considerations or based on 1-in-2 weather years, and added historic production reserve margins (PRM) to achieve a 0.1 loss of load expectation standard. This historical approach assumes that deviations from "average" conditions, as represented by the 1-in-2 year demand forecasts, can be accounted for with a simple percentage margin. In today's grid, atypical weather magnifies reliability risks because the availability of generation is increasingly weather-dependent. Moreover, climate change is increasing both the prevalence and severity of extreme weather events.

As reliability risks are increasingly driven by extreme weather and correlated impacts on load and generation, conducting resource optimizations based on weather-correlated renewable generation and load profiles becomes increasingly essential. The benefit of this approach is twofold: it accurately captures weather-driven reliability risks, and it ensures that resource portfolios are least-cost across diverse weather years. Datasets that do not accurately capture the magnitudes and frequency of renewable generation lulls, or fail to reflect their correlation with periods of high demand, on the other hand, result in modeled portfolios that are not equipped to supply reliable power during extreme and multi-day weather events.

In order to enable capacity expansion modeling that will select reliable, least-cost resource portfolios, weather-correlated renewable generation and load profiles are necessary. Form Energy believes that the CEC is already developing load profiles that reflect more diverse weather years, but we urge that the development of 1-in-5, 1-in-10, and 1-in-20 hourly demand forecasts be explicitly included in the 2023 IEPR Scope. In addition, we recommend that the CEC commit to working with the CPUC to go beyond this first step and collaborate on the development of weather-correlated renewable generation and load profiles that likewise reflect 1-in-5, 1-in-10, and 1-in-20 weather years.

**Recommendation: Work proposed under the "Potential Growth of Hydrogen" should include an evaluation of and comparison with other potential Long Duration Energy Storage (LDES) and Multi-day Storage (MDS) technologies**

Form Energy recommends that the work proposed under the "Potential Growth of Hydrogen" section in the 2023 IEPR Scope, which includes analysis of the potential role of hydrogen in decarbonizing the electric sector, should also include an evaluation of other LDES and MDS technologies that could serve a similar role. These resource classes include a number of promising technology options, including electrochemical, thermal, and mechanical energy storage, that, like hydrogen, are not fully commercialized but have the potential to play key roles in the future grid by firming renewables, providing reliable capacity during periods of peak grid need, and reducing transmission congestion. An evaluation of the wider LDES and MDS space will provide the necessary context to assess the costs and benefits of potential future resource mixes and inform policy decisions going forward.

**Recommendation: The CEC should include Senate Bill (SB) 423 in the list of "Key Statutory and Executive Order Initiatives"**

SB 423 (Stern, 2021) requires that the CEC conduct an assessment of firm, zero-carbon generating technologies, evaluate the magnitude of the need for such technologies, and identify barriers to such the deployment of such technologies, along with potential solutions to these barriers. The assessment is due to the legislature by the end of 2023. Work on the 2023 IEPR should be conducted in coordination with SB 423 work and in alignment with the established legislative intent to better understand the reliability risks posed by multi-day extreme weather events and to support thedeployment of firm, zero-carbon resources.

**Conclusion**

Form Energy appreciates the opportunity to provide public comment and looks forward to continuing to engage with the CEC on these important issues.

Respectfully,

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