

DOCKETED

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Form Energy Comments on Staff Workshop on Strategies to Model Long Duration Storage

Additional submitted attachment is included below.



December 7, 2021

California Energy Commission
Docket Unit
Docket No. 20-MISC-01
715 P Street
Sacramento, CA 95814

Subject: Form Energy, Inc. Comments on Staff Workshop on Strategies to Model Long Duration Storage and Draft Storage Technology Summary, Docket #20-MISC-01

Form Energy, Inc. ("Form Energy") appreciates the opportunity to comment on the California Energy Commission's (CEC) Staff Workshop on Strategies to Model Long Duration Storage, held on November 17, 2021, and the Draft Storage Technology Summary (Draft Tech Summary) authored by The Regents of the University of California, Merced (UC Merced). Form Energy supports the CEC's continued emphasis on improving understanding and modeling of long duration energy storage technologies and applauds the work that the UC Merced team has put into this effort. In these comments, we request that the CEC encourage the UC Merced team to reach out to Form Energy so that we can correct and add to the information included in the Draft Tech Summary.

About Form Energy

Form Energy is developing a new class of multi-day energy storage systems. Our goal is to enable a fully renewable electric grid that's reliable and cost-effective year-round, even in the face of multi-day weather events. Our first commercial product is a rechargeable, iron-air battery capable of delivering electricity at rated capacity for 100 hours at system costs competitive with conventional power plants and at less than 1/10th the cost of lithium-ion. With over 180 employees, Form Energy has offices in the San Francisco Bay Area; Somerville, MA; and the Greater Pittsburgh area. We have secured over \$350M in funding from impact-oriented investors.

Recommendation: The CEC should encourage UC Merced to solicit corrections and additional technical information from Form Energy

Form Energy appreciates the effort that the UC Merced team has put into collecting and collating the information presented in the Draft Tech Summary. We note, however, that some

key information is either incorrect in or excluded from this draft version. We request that the CEC encourage the UC Merced team to solicit additional information from Form Energy for inclusion in the final version of the Storage Technology Summary. In particular, Form Energy wishes to correct details relating to the pilot project we are deploying in partnership with Great River Energy, which is referenced on page 19 of the Draft Tech Summary, and request that metal-air batteries such as Form Energy's iron-air battery be discussed and modeled separately from flow batteries, which can have significantly different technical capabilities and cost parameters.

In addition, Form Energy would like the opportunity to share more information about our initial commercial offering with the team at UC Merced. We include an overview here in order to begin the conversation.

Form Energy is developing a rechargeable iron-air battery capable of continuously dispatching electricity at rated capacity for 100 hours. The primary active material is iron, one of the most abundant elements on Earth. The principle of operation is reversible rusting: while discharging, the battery takes in oxygen from the air and converts iron metal to rust; while charging, the application of an electrical current converts the rust back to iron and the battery releases oxygen. The cells consist of electrodes and iron anodes submerged in an aqueous, alkaline, non-flammable electrolyte. The key advantages of the iron-air technology include:

- Low cost - projected system installed costs of \$10/kWh (one-tenth the cost of lithium-ion systems)
- Safety - chemistry has no mechanism for thermal runaway and exhibits no dendrite formation
- Scalability - iron is the most globally abundant metal and can be found on every continent
- Durability - iron has been demonstrated to be stable across thousands of cycles

Conclusion

Form Energy appreciates the opportunity to provide public comment. We look forward to engaging directly with the UC Merced team on this effort.

Respectfully,

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