From: Lane Sharman
Sent: Wednesday, July 26, 2023 4:08 PM
To: Secretary@thecleanenergyalliance.org
Subject: Input to the July 27 Meeting of the Clean Energy Alliance Board and Advisory Council, Public Comment

Dear Board Members and Advisory Council Members:

Many thanks for your leadership in moving forward with San Diego community energy and incorporation of North County cities into CEA.

Please consider the many advantages of thermal energy batteries versus electro-chemical batteries:

- Up to 1,500c degree heat storage from a variety of thermal battery manufacturers.
- Industry and buildings need heat and 50% of fossil fuels are used for producing heat.
- No precious metals; built from ordinary materials like rock, sand and salt.
- 100% recyclable.
- Durable and safe to operate.
- Highly efficient round trip: Electricity <> Heat <> End Use.
- Multitude of heat battery manufacturers: US, Europe, Israel, and Australia.
- Significantly less cost per KwH than Lithium Ion.

The primary downside is that a Heat Battery is only efficient if it can be used for both the generation of electricity *and* the production of a heating and cooling service. A steam turbine producing 8MWH of output requires 20MWH of input to the heat battery. The remaining 12MWH of energy can be used for cooling or heating. There are of course thermodynamic losses to the 20MWH of input. A steam turbine and generator can vary in output depending on steam pressure and flow.

The beauty is that a multitude of small systems can be placed throughout the cities served by CEA. Wherever there is commercial heating and cooling (hospitals, data centers, campuses, hotels, et al), the system can displace methane gas when used for heating and cooling. As a wholesale system in front of the meter, the thermal battery can charge rapidly during the day; discharge electricity as needed during non-solar hours; and, provide heating or cooling services as needed. It adds strong Resource Adequacy value to a CCA portfolio. It will provide significant employment for construction and operations.

A thermal battery experiences a daily loss of energy of about 2% per day. A single thermal battery in a single container can store 340MWH. It can fast charge at 70MW. It can discharge at a power level of 20MW.

Presently, scientist Dr Jose Torre-Bueno, engineer Selvam Veerappan and I are seeking funding for simulations within an R&D Study. We would like to conduct some of the R&D within North County and want to invite local colleagues to work with us.

I plan to attend the July-27 meeting in person. I look forward to meeting individually and to answer any questions. I am happy to make available our R&D Outline if requested.

I seek to assist in the sustainable growth of the Clean Energy Alliance and the selection of an experienced and visionary CEO.

Kindest Regards,

Lane Sharman
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