Q1, What is the problem you are trying to solve?

Ans. As we have no viable and fast storage method to store the excess electricity produced on the scale required with reasonable efficiency; energy has to be produced and consumed in real time making the problem complex.

- ❏ Due to the unreliable nature of wind and solar energy plants the problem worsens.
- ❏ Pumped hydroelectricity does provide some storage but it requires very special geography to construct such a facility.
- ❏ Lithium-ion batteries have proven to be the best energy storage solution right now as they have been deployed in the Hornsdale power reserve in Australia, but they tend to degrade in capacity and be costly.

Q2. How does your idea address the problem?

Ans. We propose a new concept of energy storage based on liquid metal batteries, to store the excess energy produced by renewable sources during peak power production hours by reversible alloying reactions.

- ☐ This will help in providing a buffer big enough for renewables to act as a reliable baload source which would help in phasing out coal and nuclear power plants.
- ☐ The solution is focussed to increase the share of renewable sources by providing stability to the electric grid to prevent power blackout incidents due to unreliable grid management as in South Australia's case.

Q3. Who are the target customers?

Ans. Target customers will include large industrial facilities, government-owned grid backups, tele-communications plants, and everywhere else where there is a need for an uninterrupted supply.

Q4. What makes your idea unique?

Ans. Liquid metal batteries have overcome the disadvantages of Li-ion batteries in large scale storage, but still haven't been able to stand out commercially because of economies of scale of Li-ion. Therefore, rather than differentiating Ca-Sb batteries, we propose to develop alternate chemical compounds and identify typical market opportunities where low degradation overcomes high cost.

Q5. Do you have a revenue generation model? If so please do share.

Ans. Government as a policy maker for the renewable energy storage systems has the potential to create an enabling environment that would set the direction for large scale indigenous manufacturing of various types of energy storage systems.

- These actions are prerequisites to communicate to the renewable energy industry and the wider green energy community on the Government's intent and actions to develop India as an emerging hub for Renewable energy technologies. SO, we are looking forward to funding from GOVT. Of INDIA under the scheme for setting up grid connected SPV power projects.

Q6. What are the geographies, do you think the idea would be suitable for?

Ans. Liquid metal batteries can work just fine in extreme conditions. After all, the entire product is designed to operate at 500 degrees. Making the battery more suitable for hot weather climates in applications where the batteries must operate in a warm climate while being used on a daily basis and under deep cycling.

Q7. What are the risks associated with your idea and how can you mitigate it?

Ans. The industry may be reluctant to adopt a novel idea and hence the product may fail to gain dominant share in the market.

Q8. Who are the stakeholders involved in order to take bring this idea/product/service to the market?

(Ex: State govt, Department of trade and taxes, pollution control board, Manufacturers)

The main stake holders are the power companies, PSUs and the government.

Intellectual Property Assessment

Q9. Is your idea patentable or patented?

Ans. Indeed the idea is patentable as new battery chemistry can be proposed instead of the ones existing.

Q10. Is your idea built on existing work? If so, how is it different?

Ans. We propose to develop alternate chemical compounds and identify typical market opportunities to promote and overcome cost factors for storing large scale energy storage.

Prototype/ Proof of Concept

Q11. What is the nature of the prototype/ proof of concept you would be able to submit?

(Ex: Github repository, Hardware prototype)

The company Ambri has developed such batteries using antimony and calcium alloy. Similar novel batteries can be manufactured using different battery chemistry.

Q12. Have you completed pilot tests for your prototype/POC? If so please share.

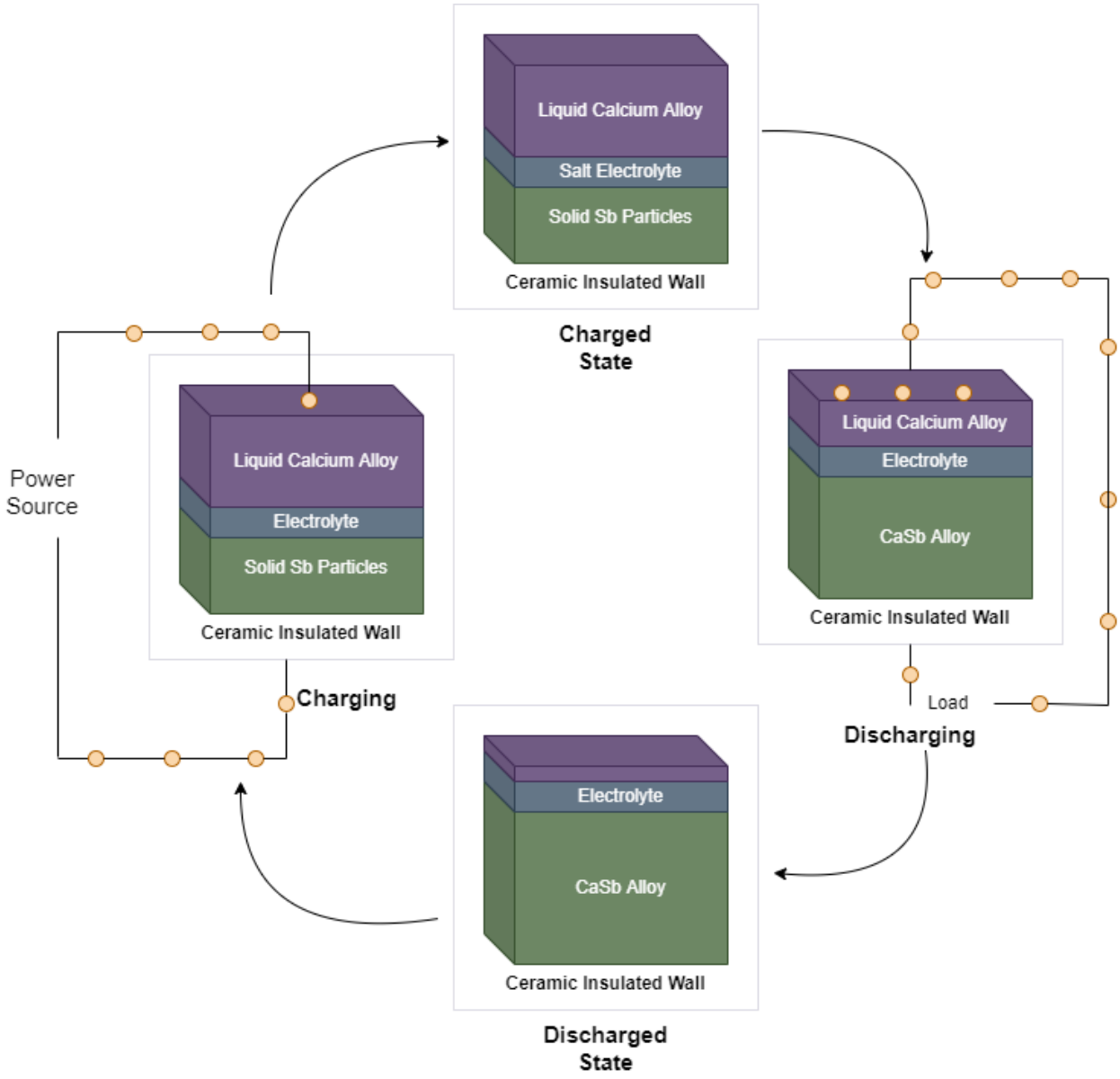
None so far.

Q13. What is the approximate cost of developing the prototype?

Ans. The raw materials cost about a third of their lithium-ion counterparts. On top

of that the manufacturing cost would be lower too.

Q14. Please share the relevant elements while submitting the POC/ Prototype



Supporting details

Q15. What regulatory requirements have to be met to bring the idea to life?

Ans. To bring liquid metal batteries into application, we need to increase energy density by developing different stoichiometric compounds to overcome the cost benefits of Li-ion batteries.

Q16. Do you have a business plan/ commercialization strategy? If so please share.

Ans. Liquid Metal Batteries have their application in large scale storage. Therefore, to develop a successful product, the plan is to partner with industries that require energy on an uninterrupted basis, such as data warehouses, tele-communication, investment banks, etc.

Q17. What is a rough estimate of manufacturing/operational costs?

Ans. The total cost of a battery includes, Capital cost, continual operation cost, maintenance cost, charging cost and end of life cost. The total cost is yet to be estimated, but the capacity cost is estimated to be at $17/kwh.

Q18. What is the volume of products/ amount of revenue you expect to make in the first year?

Ans. The product has an uncertain end cost and hence the cost cannot be yet predicted without further analysis.