ZAF Nickel-Zinc Home Energy Storage System

# Background Summary

Incorporated in 2011, with an R&D center in Montana and a low rate production line in Missouri, ZAF Energy Systems develops and commercializes next-generation Nickel-Zinc (Ni-Zn) battery technologies that use sustainable, non-toxic materials and can be safely and easily recycled. ZAF currently manufactures and develops rechargeable alkaline Ni-Zn batteries for a variety of applications in a 12V G31 form factor where our Generation 2 hybrid and capacity batteries are capable of 146 and 190 Ah, respectively.

Ni-Zn batteries have excellent intrinsic properties that provide a simple and elegant solution for meeting most energy storage system needs. Ni-Zn batteries are a high voltage aqueous battery system providing a combination of high power and energy. They also have more than double the specific energy capability of lead-acid batteries as well as improved life. It is a very safe technology and does not require expensive electronic management at the battery level. With the growing demand of home energy storage for solar energy and EV charging, a new battery chemistry is needed to overcome the drawbacks of the commonly used lead-acid and lithium-ion.

# ZAF Ni-Zn 10kWh Battery Concept for Home Energy Storage

The concept of a 10 kWh ZAF Ni-Zn home energy storage system (Figure 1) will need to compete with established systems such as Tesla’s Powerwall and LG Chem’s RESU systems, along with any other main stream home energy storage. This will require a design that maximizes energy, while minimizing weight, volume, and cost. ZAF will supply the required batteries, inverter, and cover the cost of all other required components. ZAF envisions a full engineering report including, typical home energy storage requirements and competing technologies, along with the full engineering design, and a working prototype with real world battery data to be delivered at the end of the capstone project.

Figure 1: ZAF’s Ni-Zn 10 kWh Home Energy Storage Concept

# Company/Team

ZAF’s 35,000 ft2 low rate production facility is located in Joplin, MO. This facility has 23 operators and engineers and houses a low rate production line for G31 Ni-Zn cells and batteries. This line is equipped with tape casters, presses, and slurry mixing equipment. It also contains cell assembly, activation stations, and a test lab for cell formation. ZAF’s Research and Development facility is currently located in Bozeman, MT. This 8,000 ft2 facility houses 12 employees, including scientists, engineers, and technicians and is equipped with analytical tools and battery testing units.