
Dear Review Board Members,

Thank you for the careful and comprehensive review of our current application. We appreciate the thoughtful attention that has been paid to our work and the insightful feedback on our intentions for future research. Please find below some additional notes about our current work and opportunities in response to the latest comments from the Technical Review Board. We look forward to discussing these notes further with you and updating you on our latest progress.

Competency & Experience: Our team has a unique combination of skills and experience in the academic, industrial, international, and retail market aspects of lithium battery development, whereas most other research groups only have experience in one or two of these fields. We have many research resources at UND and NDSU, years of industrial production and supply chain experience, strong international relationships with partners and suppliers, and a proven track record of commercialization of our own products, all in one group.

Experts in ‘large module’ design: We feel our experience with designing and commercializing mid-size lithium batteries is the key that will allow us to easily vertically integrate our business model to larger battery packs. It is logical to assume from one perspective that since we currently work on mid-size packs, we are behind other groups who specialize in larger packs. However, we feel the detailed marketing and engineering problems that we have solved already in our commercialization and sales work of mid-size packs actually put us ahead of other research groups. Using our standardized batteries as modules for larger packs to sell to niches we already understand on the marketing side gives us an advantage over other groups who only understand one small focused aspect of the large-battery industry (only lithium chemistry or/and design theory). In other words, our position as experts in mid-size packs really is the key to our competitive advantage, rather than a challenge requiring a “leap” to a different industry.

Price opportunities still available for lithium solutions: Purely from the perspective of raw material production costs, it would seem logical to assume that the lithium battery industry has already maximized economies of scale, and there is little room left for innovative solutions to reduce overall costs to end-consumers of energy storage products. While we acknowledge the commodity chemical materials seem to be reaching a price floor, our own supply chain and vertical integration experience in the industry has shown us there is still significant price reductions that can be made on the retail end of lithium battery supply chains simply by further “removal of middle men.” Four major classic layers exist in this industry: battery cell manufacturers, battery pack assemblers, battery wholesalers, and battery retailers. The two middle layers not only still represent a large portion of the end retail price to the consumer, but they also are coming under large pressure, as often happens, and are, in other industries, as the global telecom and internet-based networks continue to proliferate. The lithium battery industry has a reputation for being “cutting edge,” but the fact is that most of its infrastructure and distribution relationships were all developed in the “pre-internet” era, and there are major disruptive shifts still to come that will greatly reduce retail prices through advanced technology, innovative design and vertical integration of the distribution and sales channels. We challenge the commonly held assumption that lithium retail prices have “bottomed out” because we know how much room for savings is still possible in this post-production portion of the global supply chains and design of products for end-users.

For example, many people can change their cars’ oil in their garages if they want to, but Tesla

Roadster and Chevy Volt owners cannot change their cars' batteries. Another high-profile example of significant 'supply chain fat' that has yet to be cut out of the industry is the failure of multiple batteries on Boeing 787's, the company's latest aircraft design. Few definitions of "cutting edge" would leave a company like Boeing anywhere but the top of a list of technology companies, yet their own chain of engineering, supply relationships, communication networks, and product commercialization culture have led to a complete and utter failure in the most basic principles of lithium battery component choice and application. Are these examples of an industry with a fully-matured chain of designs and price levels? We think not. We feel we are only at the beginning of designs and pricing for large-scale lithium batteries in many different niches that we will see available to consumers in the near future. With your assistance, our group can help keep North Dakota at the forefront of these energy solutions.

Alternative energy storage technologies: We recognize the great advances being made in research and demonstration of other storage mediums, like compressed air, lithium air batteries, flywheels, and advanced lead acid batteries, but we don't feel the maturity of these technologies poses realistic near-term threats to practical lithium battery applications. Even the most advanced lead acid batteries still have serious environmental and total life-cycle problems, and other technologies simply aren't fully developed. Some of these technologies may gain acceptance in some niches in the future, but, as of today, none of them compare to the incredible economies of scale and mass-production maturity available to research and commercialization efforts put forward by teams like ours working with the medium of lithium batteries.

Intellectual Property Concerns: It is indeed important to keep in mind the work of other groups doing similar research. We have reached the same conclusion as the Review Board in this matter from our own market experience. From carefully reviewing and constantly updating ourselves on the research and practical solutions from other groups, we have found niches to commercialize our solutions where there is little conflict and therefore exciting sales opportunities. Likewise, from the intellectual property side, we will continue this effort to stay abreast of any possible conflicts.

Job Creation: Lithium pack building and basic technical support services are core parts of our commercialization plans for our current research work. Most jobs require only basic skills and professionalism. Nearly all of the training required for these jobs can be provided on-site, and we feel there will not be many large challenges to creating and managing these jobs in North Dakota as we continue to expand the sales of our lithium battery products. Certainly, we will also strive to attract more engineers for sophisticated R&D as the production of battery products grows.

Technical Targets & Thermal Management Solutions: Many of our research efforts are connected with cold-weather thermal management goals and research targets, and we are excited to be working on this aspect of the industry. Most of our partners and colleagues in the industry are familiar with the challenges of high-temperature concerns and the needs to "cool down" battery packs. However, very few people in the lithium battery industry are familiar with practical ways to commercialize cold-weather thermal management solutions for medium and large-scale energy storage systems in applications like back up power and wind energy. One of the main technical targets in our work is to beat the industry standard battery capacities in the 0°F to -30°F temperature ranges by at least 10%. It is fitting that a North Dakota group be pioneering work in this niche of thermal management since the region gives our group an intuitive background and local networks in the wind industry and also cold weather solutions, materials, and standard industrial procedures. Our battery insulation and cold-weather performance increasing research is a key aspect of applying mid-sized battery pack technology to large-scale solutions in North Dakota. From our work to streamline solutions for modular

architecture, we plan to have a 90% success rate from individuals in customer service simulations whereby non-experts will be asked to use our standard instruction manuals and directions to safely and effectively replace modules of large pack systems without the direct help of our technicians. The results of these focus groups will be tracked and presented. Also, resulting from the significant advantages of having so much control over the entire supply and design process in our own team, we plan to prove we can achieve all the stated technological improvements while simultaneously offering consumers at least 10% lower retail prices in comparable niches and maintaining a profitable business model.

We look forward to working with you on all these exciting opportunities.

Sincerely,

Yong Hou, Michael Shope
Clean Republic LLC