BEMP RESEARCH CORPORATION PRESENTATION

Bemp Research plans to revolutionize the battery industry by commercializing Lithium-Sulphur batteries - a more sustainable, cost-effective and safer alternative to current Lithium-ion batteries.

info@bempresearch.com

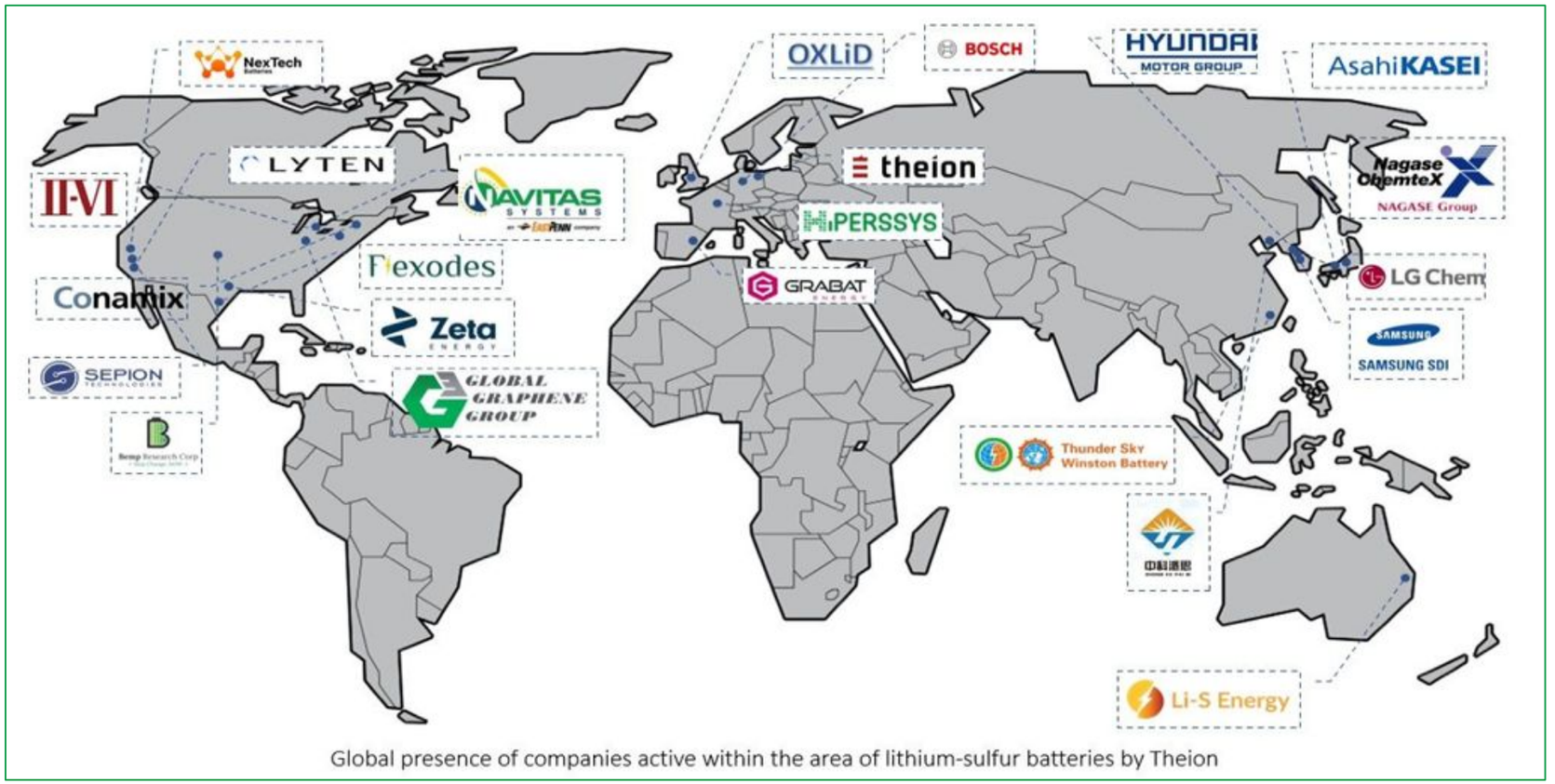
WHY NOW

The race is on for next generation battery chemistries.

Disjointed Supply Chains

First Mover Advantage

Low Cost Technology



Global presence of companies active within the area of lithium-sulfur batteries by Theion

Peer recognition for work achieved to date

EXECUTIVE SUMMARY

Bemp Research Corporation was incorporated to be a battery materials research company. Bemp's priority is to make, Patented, Made-in-USA, Low-Cost, Fast Charging Lithium-Sulfur Batteries using Boron-Treated Pyrolyzed Hemp.

$100+ Billion Market Opportunity by 2028

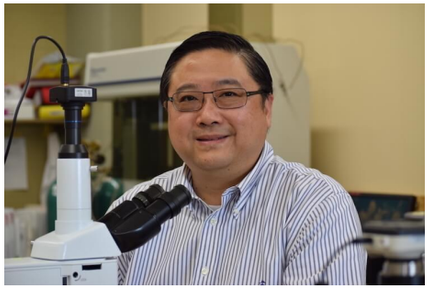
Li-ion batteries have high costs and safety issues and do not have enough energy to power heavy duty Electric Vehicles for prolonged time per battery recharge.
The use of non-domestic Nickel, Cobalt, Manganese, Copper and Lithium means the United States does not control the supply chain of materials for Li-ion batteries.
China dominates current raw material refining and battery manufacturing.
Bemp's Chemistry of domestically sourced Boron, Sulfur, Hemp and Lithium (Americas) will allow the United States to have a secure supply chain and be globally competitive on costs.

Bemp can solve the problems of current Li-ion batteries by using domestic raw materials and create thousands of well-paid jobs within the USA.

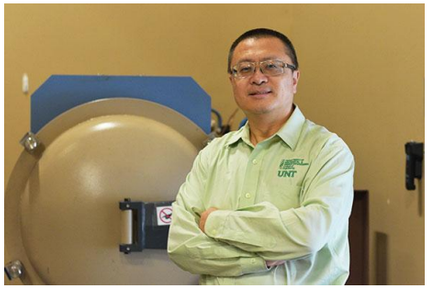
Bemp Research Corporation was founded by Son Nguyen and Paul Matthews to prove Mr. Nguyen's research into Lithium Sulfur batteries using hemp. The goal of Mr. Nguyen was to show how an organic biomass can mitigate the shuttle effect when combined with Boron and Sulfur. Lithium Sulfur batteries when commercialized will expedite the transition away from the dependance on hydrocarbons and the resulting pollution.

Task number one was to assemble a team.

The Team



Professor Deyang Qu



Professor Sheldon Shi

Professor Deyang Qu | Mechanical Engineering Department Chair, Univ. of Wisconsin, Milwaukee Johnson Controls Endowed Chair, Univ. of Wisconsin Milwaukee

Professor Qu has made extraordinary contributions to the electrochemistry and electrochemical engineering of next-generation batteries, including long-lasting lithium-ion, Li-Air and Li-sulfur batteries and capacitors such as those used in electric vehicles. UWM's lab - one of the most advanced at a university in North America has a dry manufacturing pilot line with mass production capabilities.

Dr. Dong Zheng | Mechanical Engineering Department, Univ. of Wisconsin, Milwaukee

Renewable energy and power sources expert, including lithium-sulfur, lithium-air, lithium ion and supercapacitors. Dr. Zheng has worked together with Professor Qu in the field of Lithium Sulfur battery research for the past 10 years.

Professor Sheldon Shi PE | College of Engineering University of North Texas

Mechanical and Energy Engineering expert with a focus on biomass composite materials and bio-based carbon. Professor Shi, with his team and Son Nguyen collaborated to build a lab and successfully created Bemp's cathode material.

John Paul Merritt | Chairman of Delta Agriculture, the largest supplier of hemp-based raw goods in the USA

Delta Ag is the ONLY industrial hemp company producing high-quality hemp flower, fiber, and grain at scale.

Son Nguyen | Founder of Bemp Research

Next Generation Battery Expert, graduate of Oklahoma State University. A vocal supporter of next generation Batteries having grown up in Vietnam and witnessed the effects of climate change.

BMM Holdings LLC | Alan Barksdale, Ross Murrell and Paul Matthews partners

Supportive Capital with an expertise in state and federal government grants.

Edward Okpa | Public Affairs and Govt Relations Director

A distinguished career in business and politics domestically and internationally. Edward provides guidance and council across multiple industries and governmental departments.

Connector Labs

Expert team providing legal advice, patent advice and public fundraising direction.

EV BATTERY INDUSTRY OVERVIEW

“The global electric vehicle battery market is projected to grow from $27.30 billion in 2021 to $154.90 billion in 2028.”

- There are currently big problems with the supply chain of battery metals: lithium, nickel, cobalt, manganese and graphene.
- R&D into electric vehicle(EV) batteries is key to solving the supply chain problems, reducing the cost of EV’s, increasing the range per charge and being less dependent on Asia.
- Reducing cost means using cheaper materials, making batteries safer and easier to recycle, and designing simpler cell architecture. A simpler cell architecture means a shorter supply chain and further lowers costs. Our cell’s architecture, with no extra interlayer and no other metal except Lithium makes it a lot easier to recycle the Lithium at the end of the batteries’ life.
- Increasing range per charge means designing batteries with higher gravimetric energy density.
- Almost 100% of EV batteries are Li-ion and all have Chinese components.
- Growing demand for EVs, growing interest to reduce CO2 in the atmosphere, and improved EV battery technology are major factors driving this market.

<https://www.fortunebusinessinsights.com/industry-reports/electric-vehicle-battery-market-101700>

BEMP'S LiS BREAKTHROUGH TESTED AT UWM

Bemp's powerful LiS battery chemistry uses **Boron** and **carbonized hemp** to **mitigate the shuttling effect**. Our cell architecture does not require graphite, graphene or other metals, except Lithium.

Please refer to graphs #4 vs #5 when reading the next 2 slides as we explain how Bemp can mitigate the shuttling effect. **Mitigation of the shuttling effect means stable LiS cycling, which means achieving much higher recyclability, safety, and gravimetric energy density without the low cycle stability setback. Bemp's LiS #4 vs #5 graphs here demonstrate for the first time very positive signs that LiS will soon replace Li-ion in the next couple of years.**

Please note that #4 is the breakthrough material, Boron combined with hemp. #5 is hemp with no Boron and is the control material to compare against #4.

3C rate cycle between 1.0 – 2.8 V

Material:
70% sulfur, 30% Bemp (wt)

Coating:
85% material, 10% C65, 5% PVDF (wt)

Sulfur loading: ~1.6 (mg/cm2)

Electrolyte:
1M LiTFSI in DOL: DME = 1: 1 (vol), with 0.2 M LiNO3

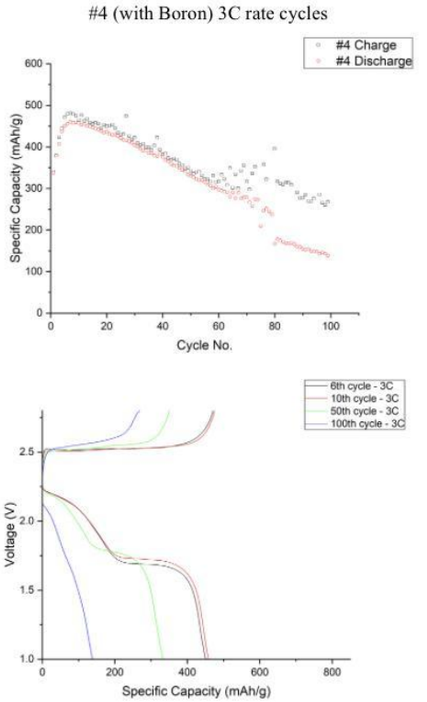
Amount per cell: 25 µL

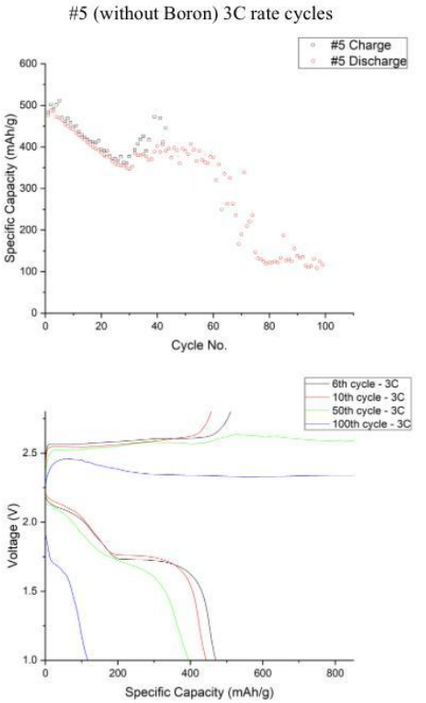
E/S ratio: ~12 (ml/g)

Lithium thickness: 250 µm

2032 Coin Cell

Separator: Celgard 2325





BEMP'S SOLUTION FOR LOW CONDUCTIVITY AND SHUTTLE EFFECT MITIGATION

Hemp is a low-cost alternative for graphene:
Hemp fibres 'better than graphene' - BBC News
To mitigate the shuttle effect. Bemp = Boron + carbonized hemp

- As a fast-growing crop, hemp absorbs a lot of CO2 from the atmosphere. The CO2 released from hemp, when cooked in a furnace at high heat and high pressure, becomes the catalyst for the activation of the highly porous carbon. This hemp cooking process is several times cheaper than the synthesis of graphene.

- Boron significantly helps mitigate the shuttling effect for LiS while fast charging/discharging. (3C means 20-minute charge/discharge). The good electrical conductivity of Bemp's material allows for stable fast charging and fast acceleration, needed for heavy trucks and aircraft.

- See #4 vs #5. For #4, all the charge lines, including the 100th charge, go up to 2.8V. Boron, when combined with hemp, attracts the polysulfides. The polysulfides are therefore trapped in the cathode and cannot easily diffuse into the electrolyte.
  The cell architecture consists of very low-cost, standard, commercially available materials that can be responsibly sourced from within the America's.

BEMP'S SOLUTION FOR BOTH SAFETY AND RECYCLABILITY

Sulfur is an element of insulation that can withstand high heat. With Lithium as the only metal in the chemistry, the batteries are safer and more recyclable.

- Li-ion battery fires are threatening recycling as we know it: Lithium Battery Fires Are Threatening Recycling as we Know It (vice.com)
- If we have a chemistry that is less prone to catch fire, it will be a lot safer to open dead batteries and recycle what is inside.
- A lot of the battery fires happen due to Li-ion chemistries having a lot of other metals: cobalt, nickel, manganese. These metals make batteries more likely to go into thermal runaway. Bemp's LiS chemistry will not have this problem, as the only metal in the chemistry is Lithium. If the cells are damaged, Lithium immediately reacts with Sulfur to form a very thermally stable compound.
- Bemp having Lithium as the only metal in the chemistry makes it easier to retrieve the Lithium at the end of the batteries' life. Bemp will not need to use as much time and energy to separate the Lithium from the mix of cobalt, nickel, manganese... Here is an experiment on recycling LiS batteries, in which 93% of the Lithium can be retrieved: (Metals | Free Full-Text | Environmentally Friendly Recovery of Lithium from Lithium–Sulfur Batteries (mdpi.com))

TIMELINE PART 1

The Journey begins..

May 2021

Seed Money raised and build out the team. Construct a lab to build first prototypes

July

#4 vs #5 results at UWM in coin cells

December

First conversation with DOE/ submit Patent application. Talks with Investors ongoing.

July 2022

Submit proposal to DOE FOA AOI4. Continued Investor talks

Q4 2022

Results/grant announced by DOE. DOE grant unsuccessful, Louisiana grant process begins..

TIMELINE PART 2

Moving forward with grant funding secured.

2023

Further R&D at UNT.
Utility Patent pending.
Successful ULL/Louisiana Grant funding July 1, awaiting distribution of funds. Continue to talk to investors.
Planning stage for hemp fiber toy cars with Bemp power pack with Dawson Racing JV

2024

Proving out chemistry and material optimization to lead to commercialization of coin cells.
2 Ah pouch cell design stage begins along with further fund raising. International patents.

2025

Pilot scale production
2 Ah pouch cells optimized in conjunction with UWM.

2026

OEM discussions
Battery-pack prototypes and optimization. Explore licensing agreements. Gigafactory Planning/fundraising

2027

Gigafactory construction and expansion

CONCLUSION

This next round of funding will allow for a statistical body of work to be created. With this, Bemp will power towards commercialization options, from coin cells to battery packs.

Path Forward.

- Engineer further B4C-hemp coin cells and engineer handmade pouch cells. We plan to have the pouch cell prototypes engineered by the first quarter 2024 and a peer reviewed scientific journal piece written and published.
- Commercialize coin cells with a strategic partner and build toy cars with Dawson Racing.
- Have the cells tested through the Department of Energy's National Labs network, under the direction of Tien Duong, Senior Advisor, DOE.
- Bemp will quickly move to a series B/C fund raise to engineer hundreds of pouch cells using the pilot production line at UWM and make battery packs for industry OEMs to evaluate.

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Bemp Research Corporation
Hemp Battery Factory Production

ENERGY STORAGE

Will Hemp Make EV Batteries Better?

Texas-based company seeks to raise money to develop and commercialize Li-ion alternative.

EnergyTech Staff

March 29, 2022

Son Nguyen Interview
https://www.energytech.com/energy-storage/article/21177341/will-hemp-make-ev-batteries-better

Watch our B4C-hemp material being tested in lithium sulfur batteries at University of Wisconsin-Milwaukee:

- **Short teaser video** (2 mins) “No one has ever got this far”..Deyang Qu
https://www.dropbox.com/s/kgylawrrudiulcl/BempUWMofficialtrailer.mp4

- **Full video (50 mins)** Discussions by battery experts Deyang Qu, Dong Zheng
https://www.dropbox.com/s/hp7mupdn3hsq6hr/BempUWM.mp4

- **Full video’s transcript**:
https://www.dropbox.com/s/vgfhi73sp03ln12/BempUWM%20video%20transcript.pdf

Investment Development Plan

1. **Business Plan**
2. **Marketing Plan**
3. **Manufacturing Plant—outsource, partnership, infrastructure build out**
4. **International Production/Distribution**
5. **Prototype forecast date**
6. **Product types**
7. **Beta test partners/industry partnerships**
8. **Proprietary Product (Built ins)**
9. **Patents**
10. **Stakeholders**
11. **Funding/Partners/crowd funding**
12. **Licensing**
13. **Solar/Transportation Partnership**
14. **Parent company/subsidiary/market divisions**
15. **Full evaluation of target industries in R&D, product testing, and Industry partners, licensing, white labeling market research; white labeling can be a flexible and cost-effective strategy for introducing hemp-based batteries into diverse industries, allowing companies to leverage existing manufacturing capabilities and distribution networks to expand their product offerings and reach new markets.**

Hemp Battery Industries

Consumer Electronics: Hemp batteries can be used in smartphones, tablets, laptops, and other portable electronic devices, providing a more sustainable alternative to traditional lithium-ion batteries.

Automotive: Hemp batteries can be used in electric vehicles (EVs), hybrid vehicles, and other automotive applications, offering a lighter and potentially more durable alternative to conventional batteries.

Energy Storage: Hemp batteries can be utilized for storing renewable energy from sources such as solar and wind power, helping to enhance grid stability and promote the adoption of clean energy technologies.

Aerospace: The lightweight and potentially high energy density of hemp batteries could make them suitable for aerospace applications, such as powering satellites, drones, and spacecraft.

Military and Defense: Hemp batteries can be used in military equipment and portable electronic devices used by soldiers, offering a renewable and potentially safer alternative to conventional batteries.

Hemp Battery Industries (cont'd)

Medical Devices: Hemp batteries can be used in medical devices, such as pacemakers, insulin pumps, and monitoring devices, offering a more sustainable power source for healthcare applications.

Wearable Technology: Hemp batteries can be integrated into wearable devices, such as smartwatches, fitness trackers, and medical wearables, providing a lightweight and eco-friendly power source for these devices.

Environmental Monitoring: Hemp batteries can be used in remote environmental monitoring systems, such as sensors deployed in forests, oceans, and other ecosystems, providing a sustainable power source for long-term monitoring Military and Defense: Hemp batteries can be used in military equipment and portable electronic devices used by soldiers, offering a renewable and potentially safer alternative to conventional batteries.

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Environmental Monitoring: Hemp batteries can be used in remote environmental monitoring systems, such as sensors deployed in forests, oceans, and other ecosystems, providing a sustainable power source for long-term monitoring applications.

Low-Speed Vehicle (LSV) : Hemp batteries can be used in the Low-Speed Vehicle (LSV) industry. LSVs, such as golf carts, neighborhood electric vehicles (NEVs), and similar small electric vehicles used for transportation in limited-speed environments, could benefit from the lightweight and potentially cost-effective nature of hemp batteries. These batteries could provide a renewable and sustainable power source for LSVs, contributing to the eco-friendliness of these vehicles and potentially reducing their environmental impact. Additionally, the use of hemp batteries could align well with the increasing demand for green and sustainable transportation solutions in various communities and industries.

Strategic partnership teams can include reviewing with consultants and technology partnerships the improvements and/or modifying new approaches with new creative solutions that include:

1. **Team Collaboration and Expertise Utilization**
   Ensure close collaboration among team members, leveraging their expertise in electrochemistry, renewable energy, biomass composite materials, and government relations. Encourage interdisciplinary discussions to drive innovation and problem-solving.

2. **Research Focus**
   Focus R&D efforts on optimizing the battery chemistry and cell architecture using domestically sourced materials such as boron, sulfur, and hemp. Emphasize the importance of mitigating the shuttle effect and improving conductivity to enhance battery performance.

3. **Prototype Development**
   Prioritize the development of prototypes, starting with coin cells and progressing to handmade pouch cells. Aim for engineering prototypes by the first quarter of 2024. These prototypes will serve as proof of concept and enable further testing and validation.

4. **Strategic Partnerships**
   Establish strategic partnerships with industry stakeholders, including manufacturers and automotive companies, to facilitate the commercialization process. Collaborate with Dawson Racing to develop toy cars powered by Bemp's lithium-sulfur batteries, demonstrating their potential applications.

5. **Testing and Validation**
   Utilize resources such as the Department of Energy's National Labs network for testing and validation of the battery prototypes. Ensure rigorous testing to assess performance metrics such as energy density, cycling stability, and safety.

6. **Funding and Commercialization**
   Secure additional funding through Series B/C rounds to scale up production and commercialize the battery technology. Explore options for pilot production using facilities like the dry manufacturing pilot line at UWM.

7. **Publication and Peer Review**
   Aim to publish scientific journal articles detailing the research findings and advancements made by Bemp Research. Peer-reviewed publications will enhance credibility and visibility within the scientific community.

8. **Regulatory and Legal Compliance**
   Work closely with legal advisors from Connector Labs to navigate patent issues, ensure compliance with regulatory requirements, and protect intellectual property rights.