

CASE STUDY

How Pure Lithium Leverages Voltaiq to Disrupt the Battery Industry



PURE LITHIUM

Pure Lithium is enabling the mass adoption of electric vehicles (EV) and renewable energy through its cost-effective, sustainable pure lithium metal electrodes for use in next-generation battery technologies. By taking a systems-level approach to lithium metal production, Pure Lithium's ground-to-battery process drastically reduces costs and supply chain limitations, thus enabling the commercialization of safer, longer-range, faster charging EV batteries.

However, the challenges surrounding lithium metal (Li-M) battery production are many and complex. From flammability hazards to expensive raw materials to the constant need to analyze data and obtain an accurate representation of product performance – Pure Lithium needed an automated way to collect data during battery development and turn it into actionable insights that drive the business.



Voltaiq makes our work easier and more efficient by providing real-time, accurate data. The more we learn about how our cells operate, the better. We can see what's happening to our batteries in real time – that intelligence allows rapid iteration cycles & course corrections that improve battery safety & performance.

Emilie Bodoin
CEO and Founder, Pure Lithium

With the Voltaiq Enterprise Battery Intelligence™ (EBI) platform, Pure Lithium has unlocked new levels of business agility. It can now identify potential battery issues as early as possible, course correct its development processes in real time, quickly present data to colleagues and investors, and cement its place as a disruptive company in the battery industry.



Data comparisons such as discharge capacity vs. cycle number reduced from hours to seconds



Newfound agility and an ability to rapidly experiment and iterate towards technology goals



Data tagging enables easy searching and visualization for quick comparisons between different experiments



Ingest and curate results from multiple brands of battery cyclers, and automatically store in a harmonized data repository

Current lithium-ion (Li-ion) battery technology will struggle to keep pace with the demand on electrochemical energy storage systems. The growing emphasis on electrification is driving demand for specific, already constrained supplies of nickel and cobalt.

Pure Lithium believes that the path forward lies in enabling a lithium metal electrode, and the world is ready to move to Li-M — “the holy grail” for electrochemical energy storage.

“Our technology is making pure lithium metal electrodes from aqueous brines. We’ve gone through hundreds of iterations to figure out how low in the ‘food chain flowchart’ of lithium sources we can go to collect and use the metal for our electrodes.

Emilie Bodoïn
CEO and Founder, Pure Lithium

The Challenges: Safety, Cost Efficiency, & Escaping Manual Processes

Creating and optimizing a state-of-the-art battery is very difficult. Bodoïn recounts the challenges they faced during product development.

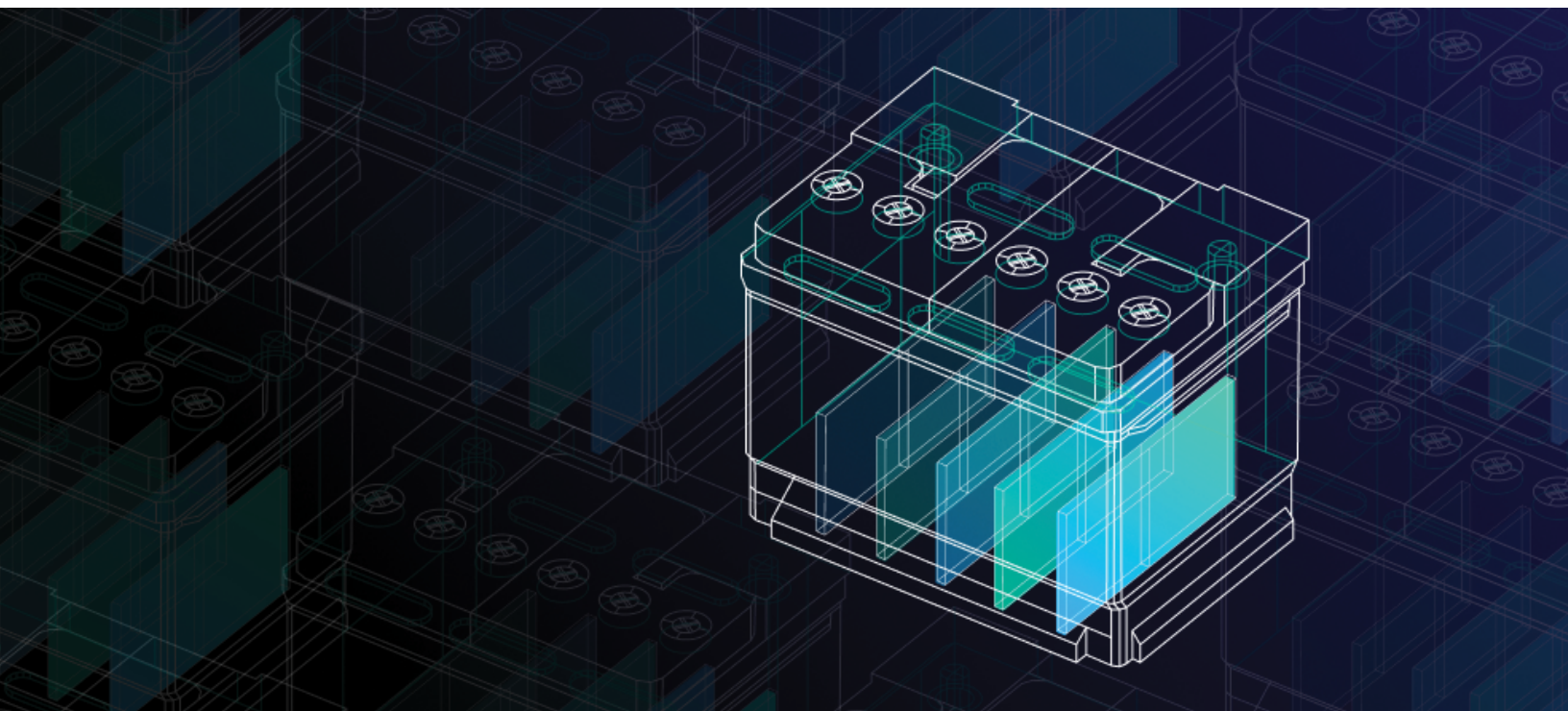
“For lithium metal, one of the biggest challenges is safety. Lithium can burn when exposed to air, even when you’re making a battery with non-flammable materials—especially when you age the battery through long cycle-life testing. We constantly need to monitor the process and establish protocols to ensure that all batteries are tested in a safe operating zone.

Another issue is the cost of making Li-M batteries.

“No one’s commercialized them safely yet. The raw materials are prohibitively expensive – about \$180,000 a metric ton for a lithium foil. If you wanted to make a lithium metal ampere-hour smartphone battery, you’d spend over \$3,600 only on the lithium metal. That problem will persist with conventional manufacturing.

To increase EV adoption, Pure Lithium established its own criteria for battery design that the company pursues:

- Over 400 Wh/kg
- Non-flammable
- No nickel or cobalt components
- No brittle, fragile ceramics
- Readily available materials
- Under \$50 per kWh



To push forward development efforts, Pure Lithium needed to access a tranche of battery data from its experiments and tests, and present this data in a logical way to have meaningful technical dialogues with the investors and stakeholders of the company.

However, Pure Lithium had a rudimentary and cumbersome battery analytics process. Based in Excel spreadsheets, and manual data collection spread across many battery cyclers and computers, the approach created huge data backlogs.

“Before Voltaiq, we were old school. The battery cyclers we used churned out ‘current and voltage vs. time’ data in multiple file formats. To see other, more relevant representations of the data, we care about across multiple experiments from multiple machines, required hours of work each time you needed it. Literally hours for one person to sit and calculate.

The Solution: Course Correcting Towards Success with Voltaiq

In November of 2021, Pure Lithium turned to Voltaiq to help solve its battery intelligence woes. The team was immediately impressed.

“I was extremely excited about Voltaiq, particularly about the usability. I loved it – it is orders of magnitude easier to use. I don’t have to wait for our CTO to hand me the data, I can just go right into my account & see it. It’s just incredibly easy to use & share the data.”

Emilie Bodoïn
CEO and Founder, Pure Lithium

Having reliable data in the same format as colleagues is powerful. For one, it helps the company address the safety challenge that comes with charging a Li-M based battery. As Emilie put it:

“Voltaiq makes our work easier and more efficient by providing real-time, accurate data. The more we learn about how our cells operate, the better. We can see what’s happening to our batteries every second – that intelligence allows rapid iteration cycles and course corrections that improve battery safety and performance.

The Voltaiq EBI platform goes beyond saving hundreds of hours manipulating and extracting clear insights from battery data. Its automation brings the marginal cost of viewing and analyzing data to zero, transforming workflows and enabling a host of benefits and opportunities.

Pure Lithium can constantly observe the inner workings of its product. The company can perform experiments and assess whether those experiments are working, and rapidly iterate towards its goals.

Emilie believes that the EBI platform may have already saved Pure Lithium millions of dollars in materials and expenses, with the ability to course correct in real-time.

“If I did not analyze the data every day, I couldn’t say, ‘Team, we’ve tried this for a month. It’s not going to happen, let’s move on.’ With Voltaiq, we can make these strategic decisions. Voltaiq data changed our entire baseline cell roadmap.

[Contact us](#) and experience the Voltaiq difference today.