

AI Survey 2023

Discover how leaders in the battery industry leverage AI to accelerate innovation & growth.

The battery market is nuts

The rapidly evolving and booming battery market is also fiercely competitive. It puts immense pressure on battery manufacturers and related businesses to innovate and keep up with the latest developments - in the constant pursuit of the next breakthrough. The market is facing increasing headwinds. Rapidly advancing cell technologies and volatile market dynamics, such as fluctuating raw material prices, new competition, and harsh regulations make long-term planning challenging.

Supply chain disruptions **Fluctuation in raw**
Changes in consumer demand **material prices** **Emerging environmental**
Government regulations **sustainability expectations**
& incentives **Rapid advancements in**
Competitive pressures **battery technology**

And as if the complex battery technology itself is not putting enough pressure on industry leaders, a new technological dispute emerged - Large Language Models (LLM). The latest AI innovation, best known from ChatGPT, enables a new form of Generative Artificial Intelligence (Gen-AI). It allows machines to understand and interpret human language - a real game changer everyone talks about. The potential seems to be endless. But how should leaders and organizations encounter this technological innovation?

Has this technology the ability to help us overcome some of the biggest hurdles, currently holding us back from accessing new growth within the battery market? At Sphere, we are at the intersection of "Data" and "Batteries" and have made it to our mission to provide some guidance to the market on how to best apply this new technology within the battery field.

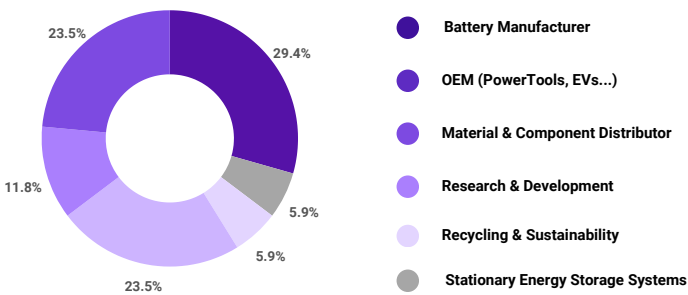
Herein we present a survey that we have conducted with leaders across the globe to elaborate on where the biggest value of Generative Artificial Intelligence lies.

Contact us for our latest White Paper on Large Language Models and Gen-AI.

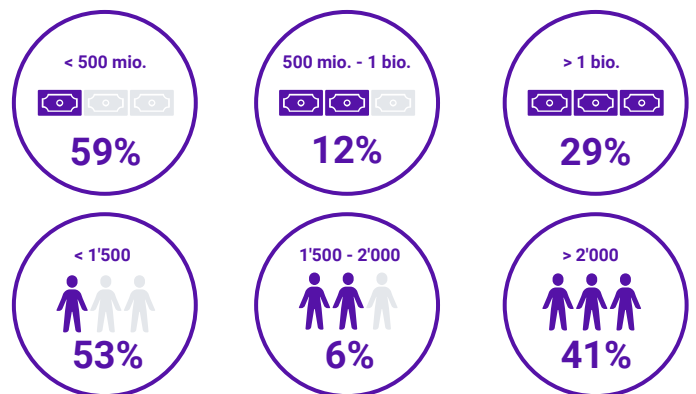
The survey to understand AI adoption and trends in the battery market

To better understand the potential disruptive impact, adoption strategies, and pros and cons of this new technology in the battery market, we interviewed 50 leaders from various companies along the battery value chain. We aimed to obtain a comprehensive overview, encompassing companies of all sizes, from all over the world, providing various components along the value chain to obtain a comprehensive overview, encompassing companies of all sizes, from all over the world, providing various components along the value chain. In the following sections, we will summarize our findings and provide our perspective on how to best capitalize on this technology.

A total of 50 leaders and experts from different sectors in the battery industry were asked about their opinions.



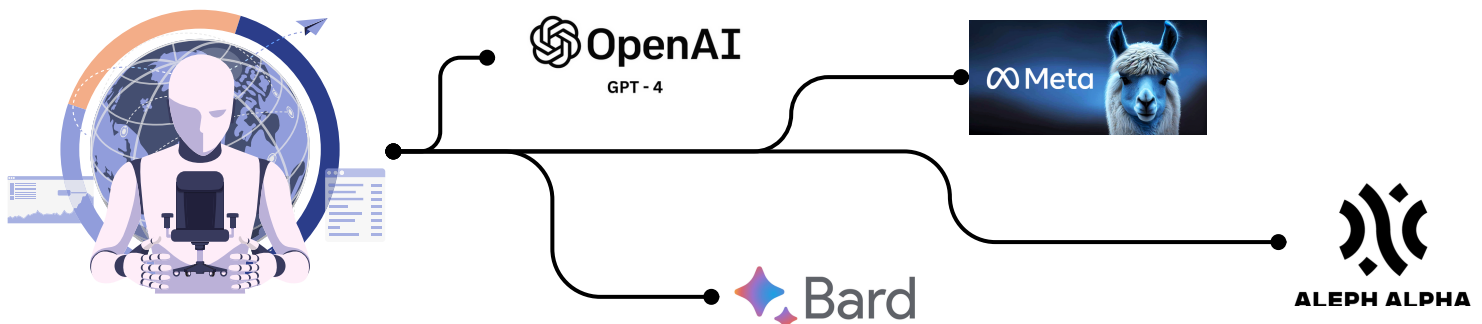
Overview of size and revenue distribution of participating cooperations



Does this technology provide an opportunity to catch up with China's battery dominance?

Gen-AI certainly has the potential to assist us in becoming more efficient and to overcome challenges that seem unsolvable right now. But who will benefit from it?

Currently, the US and Europe are leading the research on Gen-AI technology. With Open AI's GPT4 model, Google's Bard, Facebook Llama, and the German Aleph-Alpha, the most advanced LLM models come from Western companies. However, Asian countries such as China, Japan, and South Korea are also making significant investments in Gen-AI and are about to catch up.

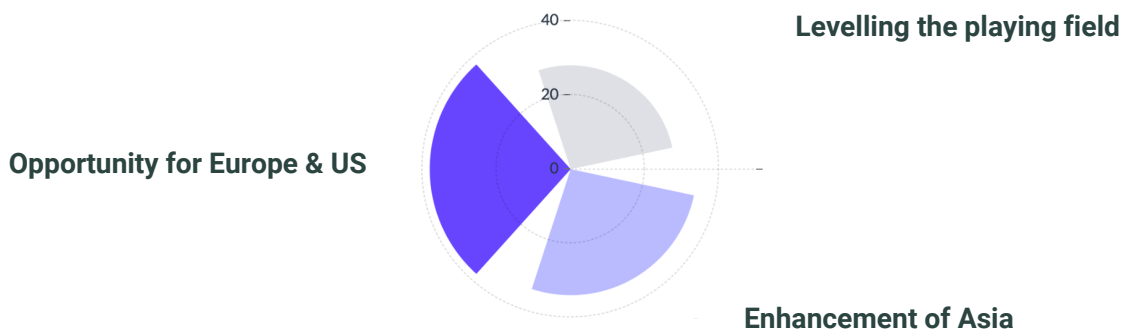


Will Europe and the US adopt this technology fast enough to gain a competitive edge in the battery market? Or will the Asian battery giants further solidify their advantage? We asked the participating leaders to provide predictions on the most plausible scenarios.

Interestingly, more than 70% of the respondents believe that it is a close race between being left even more behind and catching up to Asia. The actual outcome will largely depend on the strategies and investments made by companies to leverage this technology. It is important to note that Gen-AI is not only a race between countries and regions, it is also a race between players of different sizes. Even small companies can leverage the technology. By partnering with AI start-ups or investing in their own AI capabilities, small players can develop and deploy Gen-AI solutions that meet their specific needs to gain a competitive edge.



How do you anticipate AI affecting the competitive landscape within the battery industry?



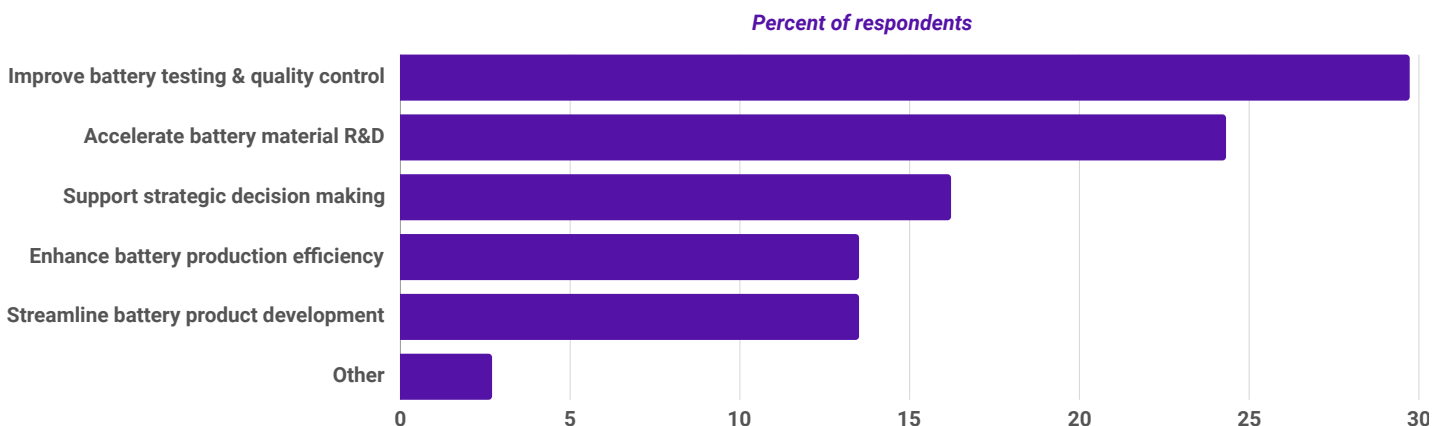
Where is the value generation coming from?

But where exactly will this added value through LLMs come from? Where to focus and where to start? The battery is not only an enabler technology for new electrified products but it also generates vast amounts of new data - in production, product development, and later in the use phase - that can now be accessed and, if properly used, leveraged for business growth.

That being acknowledged, it becomes even more evident that AI will be the pivotal factor in shaping a competitive strategy within the battery industry. Otherwise, in this talent-scarce market, who would possibly manage, analyze, and interpret all this data and information?



Where do you expect the largest impact of generative AI in the battery industry and your organization?



According to the participants, Gen-AI's greatest potential value lies in overseeing data-intensive areas of the battery life cycle, especially battery testing and quality control, as well as R&D. The reason is that the amount of data generated from battery cell, module, and pack testing daily is massive and poses challenges for humans to handle efficiently. Despite having highly structured databases and standardized data formats, a remaining challenge is to determine which data is available to be leveraged in solving business problems.

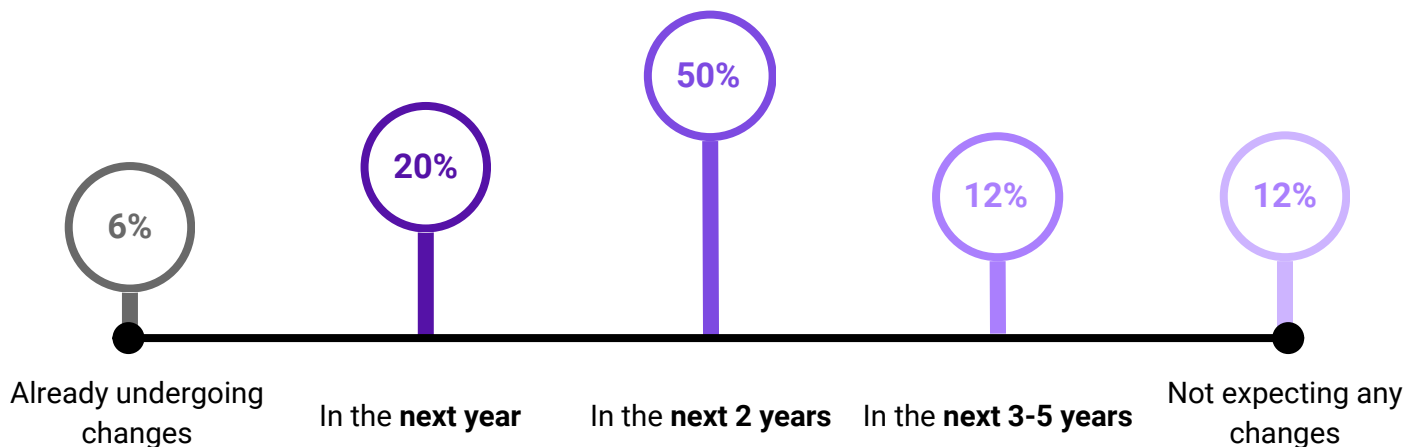
So is now a good time to start?

Our participants say "yes"! Over 50% of the participants in our survey expect to see the first significant impact of AI in the battery field within the next 24 months. Even 20% believe that it will be already next year!

This is a clear signal that the race to develop and deploy AI solutions in the battery industry is already underway. The majority of our participants have already specific Gen-AI-focused working groups, sandboxes, and IT environments set up, to try out and learn! Companies that are not currently engaged in developing AI solutions or, at least, minimal viable products (MVP) to identify the most significant value drivers, face the risk of falling behind. This is because AI has the potential to revolutionize the battery industry in many ways.



When do you expect the battery industry to witness significant changes due to AI adoption?

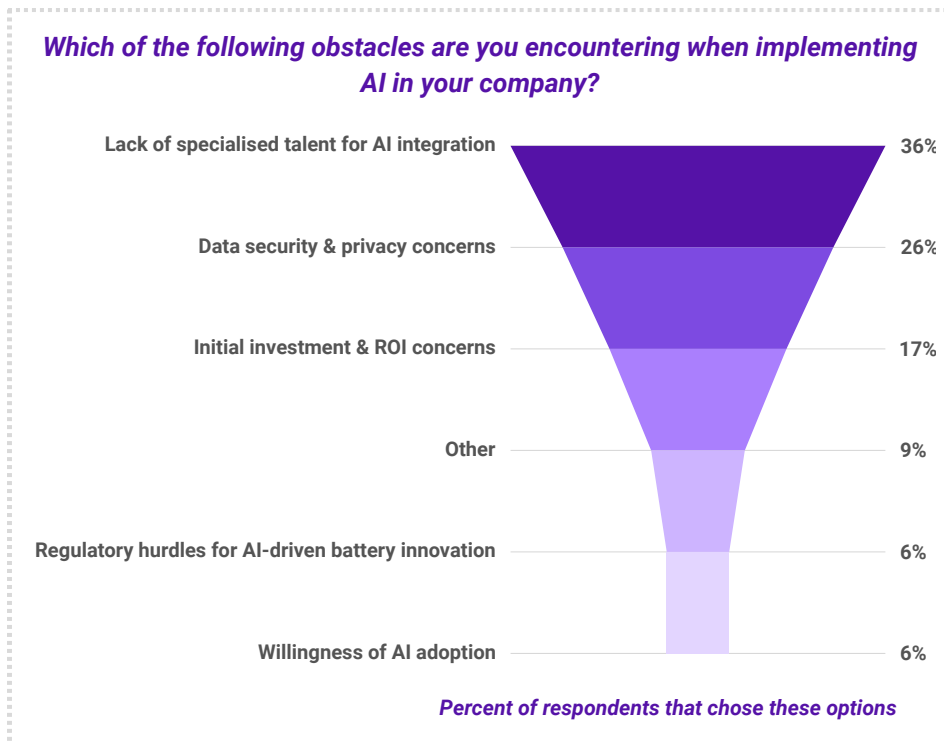


In the next 24 months, we can expect to see several significant milestones in the adoption of AI in the battery field. Some of the latest developments in the Gen-AI space include the development of new algorithms that can interpret graphs and images, as well as contextualize large battery datasets. These developments will enable companies to create and implement Gen-AI solutions to tackle a broader array of battery challenges. Therefore, all players must start preparations for the integration of AI in the field of battery technology now.

R&D is another area where Gen-AI can be highly beneficial, as it is difficult for humans to keep up with the rapid pace of new developments. According to the Web of Science, there were 11,197 scientific publications on batteries published in 2022. Impossible for researchers to stay on top of that. Gen-AI can be a big enabler in finding the right solution (publication) to a specific problem - passively when being searched or proactively as a virtual assistant.

So why is it not here yet?

If this technology is so amazing, why isn't everyone already using it on a day-to-day basis, fully integrated into business processes? According to the participants, a unanimous 100% agree that the lack of specialized talent for integrating such tools is the primary hindrance.



It's a classic chicken-and-egg problem - where do we find the talent that helps us work more efficiently to overcome the talent shortage? Over 36% identify the lack of specialized talent as their primary challenge in rolling out this technology within their organizations. The challenge is very tough because hiring such talent requires exceptionally skilled and well-educated leadership, not only to select the right candidates but also to guide them on the journey. Good people join because of good leaders!

But also data security and privacy concerns seem to be of great importance - with approximately 26% of the participants naming this as their second largest obstacle in Gen-AI adoption.

Understandable, who would want their boss to monitor their activity, productivity, and efficiency, especially when compared to their peers? Who wants their data to be transmitted to a US server every time a user submits a prompt to the LLM?

Both data security and data privacy are currently receiving substantial attention. For example Microsoft Azure already offers a secure hosting environment for the use of OpenAI's Chat GPT, providing protection from undesirable inputs, detecting and mitigating misuse, and offering enterprise-grade security for LLMs today.

Interestingly, approximately 20% of the participants still express concerns regarding the "Return on Investment" of AI projects, indicating some lingering uncertainty among the leadership. Tracking the success of such projects is not trivial, as it involves paying for a learning curve (that usually nobody wants to pay for, yet crucial in this context) with immediate efficiency gains from new applications coming only as a secondary outcome.

Nevertheless, this skepticism will likely be countered by the inevitable consequence that those who do not embrace this technology now, will find themselves falling behind pretty soon.

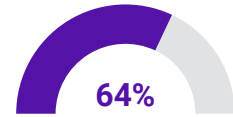
But who is driving the adoption of AI - Leadership or the workforce?

Regarding the readiness of the organization for AI adoption, our survey participants revealed that the workforce is significantly more aware of AI and its benefits than leadership.

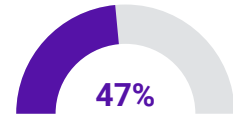
This suggests that workers are eager to harness the power of AI, unlike other technologies, such as Industrial IoT and Virtual Reality, that have faced slow adoption due to workforce resistance.

This is a good sign, as it suggests a strong appetite for AI adoption at the grassroots level. However, leaders must take the lead in developing and implementing AI strategies. Otherwise, there is a risk that AI adoption will be fragmented and chaotic.

The survey results indicate that leaders must consider this technology seriously and enhance their knowledge about it. In addition to its many upsides and advantages, AI also raises ethical and social concerns. Therefore, leaders must understand the pros, cons, and limitations of AI to use it responsibly.



Awareness of workforce



Attention of top management



Readiness of organisation

What's next and how to get started?

Participants pointed out that, in the next six months, the most significant value lies in exploring the latest innovations in Gen-AI. While training the workforce and collaborations with AI providers may seem like less of a priority, we should not forget that AI is a highly complex technology that is best tackled in collaboration with experts.



How likely are you to take the following actions in the next 6 months?

Explore AI-driven innovations

56%

Collaborate with AI technology providers

37%

Invest in workforce training for AI

25%

The overall consensus among participating leaders is that Gen-AI has the potential to revolutionize the battery industry and that now is the time to create awareness and take concrete action. By developing new AI models and algorithms, the market will improve battery testing, speed up R&D, and drive better decision-making.

Currently, Gen-AI is still in its early stages of development, which opens up the opportunity for us to grow with this technology - if we act now! By investing in Gen-AI research and development, battery companies can position themselves at the forefront of this rapidly evolving field.

We want to suggest the following five steps for anyone to approach Gen-AI safely and generate first returns quickly:

- 1 Educate the workforce about AI:** The first step is to educate the workforce about AI, its potential benefits, and its limitations. This will contribute to raising awareness and excitement for AI, and it will also help to reduce any fears or concerns.
- 2 Identify AI use cases & develop an AI roadmap:** Once the workforce is educated about AI, leaders should work with them to identify potential AI opportunities across the organization. This could involve using AI to automate tasks, improve decision-making, or develop new products and services. Once AI opportunities have been identified, leaders should develop a roadmap for AI adoption. This roadmap should include clear goals, timelines, and budgets.
- 3 Invest in AI infrastructure:** Leaders need to invest in the right IT infrastructure to support AI adoption. This includes aspects such as data storage, computing power, and AI development tools.
- 4 Create a culture of experimentation:** AI is still a relatively new technology, so it is important to create a culture of experimentation and innovation. This means giving employees the freedom to experiment with new AI ideas and to experience setbacks without the fear of negative consequences.
- 5 Monitor and evaluate AI initiatives:** It is important to monitor and evaluate AI initiatives to ensure that they are meeting their goals and delivering the desired results. This will help to identify any areas where adjustments need to be made.

At Sphere Energy, we are developing a powerful AI-powered battery brain that will serve as a virtual battery expert for the industry, supporting its growth.

We also offer a range of services to assist battery companies in accelerating the adoption of Gen-AI. These services include:

- **Gen-AI consulting and advisory services:** We assist battery companies in developing and implementing a Gen-AI strategy, identifying potential use cases, and selecting the right AI technologies.
- **Gen-AI custom solution development:** We develop custom Gen-AI solutions for battery companies to meet their specific needs.
- **Gen-AI managed services:** We manage and operate Gen-AI solutions for battery companies and let them focus on their core business.

We are committed to helping battery companies to adopt Gen-AI safely and efficiently. If you are interested in learning more about how Sphere Energy can support you, please contact us today: info@sphere-energy.eu



Get in touch for more information!



info@sphere-energy.eu



Sphere Energy