

F R O S T & S U L L I V A N

ADDIONICS

2022 TECHNOLOGY INNOVATION LEADER

*EUROPEAN BATTERY
TECHNOLOGY INDUSTRY*

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Addionics excels in many of the criteria in the battery technology space.

AWARD CRITERIA	
Technology Leverage	Business Impact
Commitment to Innovation	Financial Performance
Commitment to Creativity	Customer Acquisition
Stage Gate Efficiency	Operational Efficiency
Commercialization Success	Growth Potential
Application Diversity	Human Capital

Commitment to Innovation and Operational Efficiency

The rising global battery demand driven by the electrification trend and zero-emission mandates demand next-generation battery chemistries that can power improvements in electric vehicle (EV) efficiency. Addionics, founded in 2017, aims to transform the battery and energy storage industry by building next-

gen battery architecture. The UK-Israeli company is developing next-gen rechargeable batteries for EVs and other applications. Through redesigning the battery structure, the company has created an improved rechargeable battery architecture that enhances EV battery performance, increases mileage, and improves charging time, all while reducing the battery costs. Addionics's patented Smart 3D Electrode technology increases key performance metrics of a battery with any chemistry, increases power and energy density, enhances safety, and extends the lifetime. The smart 3D structure improves the mechanical longevity, thermal stability, and degradation factors, and minimizes internal resistance in standard batteries. Addionics replaces the traditional 2D layered electrode structure with an integrated 3D electrode structure. The Smart 3D design creates more surface area, has greater loading of active material, minimizes internal resistance, and improves mechanical longevity and thermal stability.

"While competitors focus on battery chemistry to improve battery characteristics, Addionics focuses on battery physics. The Smart 3D design for electrodes created by Addionics is compatible with any existing or emerging battery chemistry."

*– Sujith Unnikrishnan,
Senior Research Analyst*

enhances safety, and extends the lifetime. The smart 3D structure improves the mechanical longevity, thermal stability, and degradation factors, and minimizes internal resistance in standard batteries. Addionics replaces the traditional 2D layered electrode structure with an integrated 3D electrode structure. The Smart 3D design creates more surface area, has greater loading of active material, minimizes internal resistance, and improves mechanical longevity and thermal stability.

Addionics has developed a new scalable metal fabrication process for both the anode and the cathode. Its fabrication process is supported by AI-powered proprietary software to determine the best 3D structure based on the battery application. Also, the software collects data that helps accelerate and improve product development, optimize processes, and reduce costs related to battery development.

Commitment to Creativity and Application Diversity

While most companies focus on battery chemistry to improve battery performance, Addionics focuses on battery physics. The Smart 3D design for electrodes created by Addionics is compatible with any existing or emerging battery chemistry. Improvements in the key battery performance metrics are largely attributed to its 3D structure allowing active material to be integrated throughout the electrode at higher loads, while reducing internal resistance due to higher contact area between the metal to the active material.

Addionics's has a patent protected cost effective scalable manufacturing process to produce Smart 3D Electrodes. Those electrodes can be used to replace the traditional 2D electrodes which are being used in existing battery factories, as a drop in solution, without the need to build new assembly lines. This Addionics drop-in solution is compatible with all prevailing battery manufacturing facilities and assembly lines and different types of battery materials. The company's AI algorithm can fast-track battery

development time and improve electrode designs to match various applications and their performance requirements while lowering production costs. The advantages Addionics offers enable manufacturers to build high-performance batteries at a lower cost/kWh.

By using its advanced battery design-based solution, Addionics optimizes existing and future batteries to enhance their performance , irrespective of the battery technology to be commercialized in the current electrification race between OEMs. While the company primarily targets the

"The AI algorithm developed by Addionics can fast-track battery development time and improve electrode designs to match various applications and their performance requirements while lowering production costs."

*— Sujith Unnikrishnan,
Senior Research Analyst*

automotive market, its technology also applies to segments such as Grid energy storage, consumer electronics, IoT and wearables, medical devices, drones, and more.

Addionics's initial focus is to deploy its technology into the EV market together with OEMs and suppliers before extending its reach to wider industrial applications. The smart 3D electrodes can be integrated with lithium iron phosphate (LFP), lithium-nickel-manganese-cobalt-oxide (NMC), silicon, solid-state batteries (SSB), lithium polymer and other existing and emerging batteries chemistries. The company also collaborates with leading OEMs and suppliers in the United States, Europe and Asia to deploy its technology.

Commercialization Success and Growth Potential

Addionics' last funding round (A) was led by Deep Insight together with other investors, including Magna International, Novelis, JX Nippon Mining and Metals, 8090 Partners, Union Tech Ventures, GiTV, Talcar Corporation, Bridges Israel impact investment fund, Doral Energy Tech Ventures, and David Deak. The funding will enable Addionics to accelerate product development and commercialize its technology with the support of OEMs and tier suppliers. Addionics also plans to expand its team and utilize the investment to improve its technology capabilities with the goal of commercialization by 2025. The company will also channel funding toward broadening its activities in Germany and the United States to deepen its engagement with partners. Currently, Addionics is focused on its partnerships and active projects in the automotive space with leading companies. These projects aim to improve battery performance (each has different battery chemistry) by integrating smart 3D electrodes

Previously this year, Addionics was named the BNEF 2022 Pioneer by Bloomberg New Energy Finance (BNEF) in April 2022 for its technology's potential to accelerate global decarbonization and halt climate change. The Annual BNEF Pioneer Program recognizes the top 12 technology innovations for advancing the low-carbon economy.

In June 2022, Addionics partnered with Blitz Motors to develop next-generation batteries for e-mopeds using smart 3D Electrodes. The batteries are optimized to shorten charging times, increase travel range, and reduce production costs for Blitz's fleet of e-mopeds, with the first model expected to be rolled out in 2023. "We've spent years looking for the right partner to help us improve battery performance and cost in our fleet of electric mopeds to better serve our commercial and public sector customers. Two-wheeled vehicles experience significantly more wear and tear in a much shorter time than four-wheeled vehicles. Addionics will help us maximize our battery's lifetime by increasing range, reducing charging times, and enhancing overall safety," says Raphael Moszynski, CEO of Blitz Motors.¹

In 2021, Addionics partnered with Saint Gobain ceramics for developing next gen solid state lithium - ion batteries. The smart 3D electrode technology will enhance the collection of electric current across the electrodes and boosts the battery energy density.

Conclusion

Addionics creates batteries with extended battery life, faster charging rate, Safe batteries with increased energy density through its technology that replaces the electrode's traditional 2D layered structure with an integrated 3D structure. The company's technology demonstrates the potential for application in other industries to improve the performance efficiency of electronic devices, medical devices, drones, and other industrial applications. Addionics offers improved rechargeable batteries to OEM customers by redesigning the battery architecture through its patent-protected scalable 3D electrodes fabrication method. Overall, its technology has the capability to improve battery metrics, including safety, capacity, lifetime, charging time, and cost of the batteries. For its strong overall performance, Addionics earns Frost & Sullivan's European 2022 Technology Innovation Leadership Award in the battery technology industry.

¹ Source: <https://www.bloomberg.com/press-releases/2022-06-14/blitz-motors-signs-collaborative-agreement-with-battery-startup-addionics-to-develop-smart-3d-electrodes-for-electric-moped>

What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation Leadership Award recognizes the company that has introduced the best underlying technology for achieving remarkable product and customer success while driving future business value.

Best Practices Award Analysis

For the Technology Innovation Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization Success: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Business Impact

Financial Performance: Strong overall financial performance is achieved in terms of revenues, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at <http://www.frost.com>.

The Growth Pipeline Engine™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.

[Learn more.](#)

Key Impacts:

- **Growth Pipeline:** Continuous Flow of Growth Opportunities
- **Growth Strategies:** Proven Best Practices
- **Innovation Culture:** Optimized Customer Experience
- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership



The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- **Mega Trend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

