



LUCINTEL INSIGHT  
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# FIVE TRENDS SHAPING THE FUTURE OF THE BATTERY MATERIAL MARKET

The battery material market is growing and gaining traction due to increasing use of batteries in electric vehicles and rising demand for consumer electronic products such as smartphones and laptops. The rising wave of demand for lithium-ion battery materials and solid-state electrolytes is creating significant potential in various industrial, transportation, and consumer electronic industries. The major growth drivers for this market are growing adoption of electric vehicles,

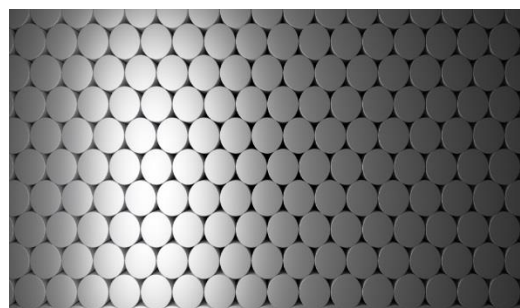
rising demand for portable electronics, and a growing need for energy storage devices.

The battery material market is divided into several segments, such as lead dioxide, lithium manganese oxide, lithium cobalt oxide, nickel manganese cobalt, nickel cobalt aluminum, lithium-iron phosphate, lead, natural graphite, synthetic graphite, and others. Key players in the battery material market include Umicore, Asahi Kasei, Henan Yuguang, Glencore, Nyrstar, Sumitomo Metal Mining, Mitsubishi Chemical, and Hitachi Chemical. These have been working on different strategies to drive sales using highly influential marketing approaches; however, as we examine the challenges and opportunities ahead in this market, companies can benefit from a strategy of developing solid-state electrolytes and lithium-ion chemistries along with the key target market trends we have identified. Lucintel predicts the global battery material market will be valued at \$75.8 billion by 2025, with an expected CAGR of approx. 8.0% between 2020 and 2025.

Lucintel identifies five trends set to influence the global battery material market. Most of the industry players and experts agree that these five trends will accelerate developments in the battery material industry in the near future. In terms of the widespread knowledge about the battery material market already on the horizon, there is still a lack of unified perspective on the direction the industry is moving to proactively address developments. To help bring more clarity to this gap, our study aims to provide insights concerning the direction that changes are taking and how these changes will impact the battery material market.

## 1. Development of Solid-State Electrolytes

Solid-state electrolytes have emerged as high priority materials for safe, energy-dense, high-temperature stability, and reversible storage of electrochemical energy in batteries. Solid-state electrolytes are a composition of lithium tin phosphorous sulfide, sulfide-based oxide, and



non-oxide solid electrolyte materials. Traditionally, battery electrodes are connected with liquid electrolytes, which makes it difficult to reduce the weight and size of battery. The use of solid electrolytes increases the capacity and voltage of a cell. The liquid electrolyte in lithium-ion battery is flammable and when the cell temperature heats above 80°C, it can result in an explosion. Solid electrolytes have been developed for next-generation batteries to overcome the challenges of conventional liquid electrolytes.

## 2. Growing Demand for Lithium-Ion Battery Materials

In lithium-ion (Li-ion) batteries, energy storage and release is provided by the movement of lithium ions from the positive to the negative electrode back and forth via the electrolyte. In this technology, the positive electrode acts as the initial lithium source and the negative electrode as the host for lithium. Lithiated metal oxides or phosphates are the most common material used as present positive materials. Graphite, but also graphite/silicon or lithiated titanium oxides, can be used as negative materials. With actual materials and cell designs, Li-ion technology is expected to reach an energy limit in the coming years. Li-ion battery technology allows the highest level of energy density, high performance such as fast charge and a temperature operating window (-50°C up to 125°C) which can be fine-tuned to a wide choice of cell designs and chemistries. These batteries will be ideal for use in applications such as energy storage systems and for renewables and transportation (marine, railways, aviation and off-road mobility) where high energy, high power, and safety are mandatory.

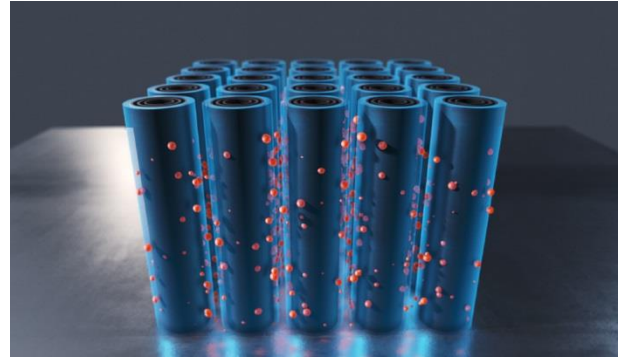


## 3. Ultra-Fast Carbon Electrode

NAWA Technologies has designed and patented an ultra-fast carbon electrode, which is a game changer in the battery market. The ultra-fast carbon electrode uses a vertically aligned carbon



nanotube (VACNT) design and can boost battery power tenfold, increase energy storage by a factor of three, and increase the lifecycle of a battery five-fold. The company regards electric vehicles as the primary beneficiary, hence reducing the carbon footprint and cost of battery production while boosting performance.



## 4. Emergence of Sodium-Ion Battery Materials

Sodium-ion batteries are a strong contender for the replacement of lithium-based batteries given sodium's oxidation potential, abundance, comparable reaction mechanisms during charge transfer to LIBs, absence of alloying with aluminum, and low cost. Recently, sodium-ion batteries have attracted great attention due to the abundant sodium resources in the earth's crust, as well as their low cost. Sodium-ion batteries are considered an alternative to lithium-ion batteries for large-scale renewable energy storage and electric vehicles.



## 5. Adoption of NanoBolt Lithium Tungsten Batteries

The NanoBolt lithium tungsten battery is a new and advanced improvement to current lithium battery technology. These revolutionary batteries are targeted at the industrial and electric vehicle market. The NanoBolt batteries are enhanced with the addition of tungsten and carbon nano tubes to

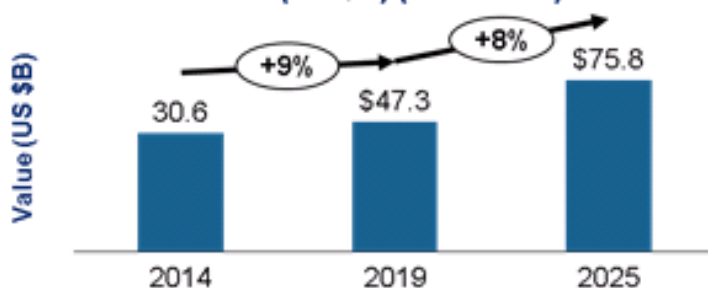


the anode section. The addition of a lattice of nanotube materials greatly increases the battery's ability to charge more quickly and to hold a charge for much longer. The nano matrix added to the anode provides a greater and denser area for electrons to attach during recharge and discharge cycles. This results in faster recharging of the NanoBolt lithium tungsten battery, and it also stores more energy.

## Strategic Considerations for Key Players in the Battery Material Market

The battery material industry is dynamic and ever-changing. Successful industry players are necessarily masters of innovation, change, and adaptation. To retain this status, they need to be attentive to current trends. We believe there will be promising opportunities for battery materials in the transportation, industrial, and consumer electronics industries. As per Lucintel's latest market research report (Source: <https://www.lucintel.com/battery-materials-market.aspx>), the [battery material market](#) is expected to grow with a CAGR of approx. 8.0% between 2020 and 2025, and reach \$75.8 billion by 2025. This market is primarily driven by the growing adoption of electric vehicles, rising demand for portable electronics, and growing need for energy storage devices.

**Trends and Forecast for the Global Battery Material Market  
(US \$B) (2014-2025)**



Source: Lucintel

Whether you are new to the battery material market or an experienced player, it is important to



understand the trends that impact the development process, as these trends as listed above will lead players to create long-term strategy formulation that will allow them to remain competitive and successful in the long run. For example, to capture growth, some of the strategic considerations for players in the battery material market are as follows:

- Battery material market players can increase their capabilities to develop lithium-ion battery materials.
- Players can focus on solid-state electrolytes to increase the capacity and voltage of a cell, which is expected to lead future trends.
- Investment to increase competencies in advanced graphite solutions for electric vehicle applications
- Research and development activities for the development of low-cost battery materials

**Note:** In order to gain better understanding, and learn more about the scope, benefits, and companies researched, as well as other details in the battery material market report from Lucintel, click on <https://www.lucintel.com/battery-materials-market.aspx>. This comprehensive report provides you in-depth analysis on market trends and forecast, segment analysis, regional analysis, competitive benchmarking, and company profiling of key players. In addition, we also offer **strategic growth consulting** to meet your customized needs. We have worked with many PE firms and corporate customers in the process of their market entry and M & A initiatives.



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