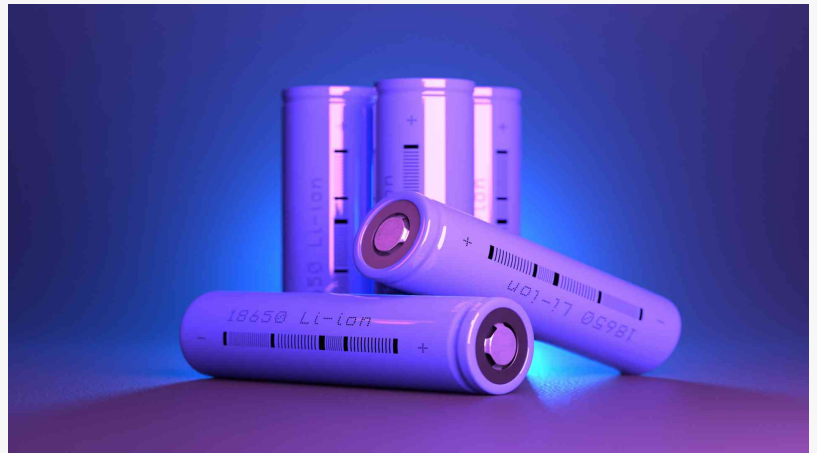


# Lithium-ion Battery Market Analysis

*The lithium-ion battery market continues to grow in popularity, with electric vehicles and the need for better energy storage solutions driving its demand.*

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The [lithium-ion battery](#) market will significantly grow in the next few years due to the increasing demand for electric vehicles and the need for better energy storage solutions. The market is also driven by the advancement of technology, leading to the development of new and improved battery materials and designs.



Lithium-ion Battery

## Global Lithium-ion Battery Market

The global lithium-ion battery market was valued at \$41.97 billion in 2021 and is projected to grow at 8.1% on average to 2030. Lithium-ion batteries are widely used in portable electronic devices such as laptops, smartphones, and digital cameras. These batteries are also used in electric and hybrid vehicles owing to their high power density and ability to store large amounts of energy.

## Market Growth Factors

One of the key factors driving the lithium-ion battery market is the increasing demand for electric vehicles. Electric vehicles are becoming more popular due to their environmental benefits and lower operating costs than traditional gasoline-powered vehicles. This will lead to increased demand for lithium-ion batteries as they are needed to power these vehicles.

Another factor is the increasing use of renewable energy. Renewable energy sources, such as solar and wind, are becoming more popular due to their environmental benefits. Lithium-ion batteries store energy from these sources to use when needed. This will lead to increased demand for lithium-ion batteries as they are needed to store this energy.

The rising demand for consumer electronics, such as laptops, tablets, smartphones, and digital cameras, is another major factor driving the lithium-ion battery market growth. Lithium-ion

batteries are the best for consumer electronics as they offer a high energy density and a long cycle life. In addition, lithium-ion batteries are lightweight and have a low self-discharge rate.

Due to reduced demand for lead-acid batteries, lithium-ion batteries are also gaining popularity in automobiles. This is mainly due to EPA regulatory standards on lead contamination and the subsequent environmental hazards and regulations on the disposal, storage, and recycling of lead-acid batteries.

Furthermore, governments in developed and developing countries offer subsidies and incentives to encourage the establishment of lithium-ion battery production plants worldwide. This factor will drive the lithium-ion battery market growth in the forthcoming years. Besides that, strict government laws governing carbon and greenhouse gas emissions, and pollution, provide opportunities for the lithium-ion battery market to expand.

### The Influence of COVID-19 on the Lithium-ion Battery Market

The COVID-19 pandemic significantly influenced the lithium-ion battery market. In the existing COVID-19 situation, market growth was expected to slow as the pandemic restricted batteries and other components' supply due to significant interruptions in businesses and the global economy.

Key battery components are primarily designed and produced in the Asia Pacific. The COVID-19 situation has highlighted the nation's overdependence on critical raw materials, particularly in China.

The operations breakdown in China and other Asia Pacific countries significantly impacted battery producers in the United States, Australia, and Germany. This reduced production, significantly decreasing business inputs. The recovery depends on government support, corporate debt levels, and how industries and markets deal with reduced demand. After the recovery period, the market is expected to expand at a moderate pace until 2030.

### Lithium-ion Battery Properties

A lithium-ion battery is a rechargeable battery made up of cells wherein lithium ions travel from the negatively charged electrode to the positively charged electrode via an electrolyte during discharge and back again during charging. Li-ion cells need an intercalated lithium substance as the positive electrocatalyst and graphite as the negative electrocatalyst.

Li-ion batteries offer high energy density, no memory effect (except for LFP cells), and a low self-discharge rate. Cells are designed to highlight either energy or power density. However, as they include flammable electrolytes, they can cause explosions and fires if broken or incorrectly charged.

### Market Analysis by Product Lithium Cobalt Oxide (LCO)

Lithium Iron Phosphate (LFP)

Lithium Nickel Cobalt Aluminum Oxide (NCA)

Lithium Manganese Oxide (LMO)

Lithium Titanate (LTO)

Lithium Nickel Manganese Cobalt (LMC)

According to Grandview Research, the Lithium Cobalt Oxide (LCO) segment led to more than 30.0% of total revenue in 2021. Strong demand for these batteries in smartphones, laptops, tablets, and cameras for their high safety mechanisms and energy density is anticipated to boost the market growth during the forecast period.

Lithium iron phosphate batteries (LFP batteries) provide excellent security and a long lifespan. These batteries will be used in portable, fixed applications requiring high currents and endurance.

High demands for Lithium Nickel-Cobalt-Aluminum Oxide batteries (NCA) will drive market growth due to their high power, high energy, and long lifespan. NCA is used in electric vehicles, medical equipment, and industrial processes.

The increasing use of lithium titanate in various applications such as electric drivetrains, street lamps, UPS, and photovoltaic street lighting will drive market growth. Lithium-titanium-oxide (LTO) has various properties, such as protection, low-temperature performance, and a long lifespan.

#### Market Analysis by Application

Automobile

Consumer Electronics

Industrial

Energy Storage Systems

Medical Devices

In 2021, the consumer electronics sector accounted for more than 40% of the total revenue. Portable batteries are used in portable devices and consumer electronics such as smartphones, tablets, laptops, personal computers, vacuum cleaners, cameras, LED lighting, flashlights, calculators, hearing aids, wrist watches, and other wearables.

Over the forecast period, the hybrid and all-electric vehicle market will overgrow. Increasing awareness of the advantages of battery-powered vehicles and rising fossil fuel prices are expected to positively impact the market growth, especially in Asia Pacific, North America, and Europe.

Lithium-ion batteries also provide power backup for commercial properties, data centers, educational institutions, and energy storage for residential solar systems. These factors contribute to the expansion of energy storage systems during the forecast period. Power tools, cordless tools, agricultural and marine machinery, industrial automation systems, military,

defense and aviation, electronics, oil and gas, and civil infrastructure are other industries that use lithium-ion batteries.

### Market Analysis by Capacity

0–3,000 mAh

3,000–10,000 mAh

10,000–60,000 mAh

60,000 mAh and Above

According to Markets and Markets, the 10,000-60,000 MAh segment had the highest market share in 2020. More than 10,000 mAh Li-ion batteries are used for high-capacity applications such as plug-in hybrid electric vehicles, electric vehicles, e-motorcycles, marine robots, material handling equipment, and industrial and telecommunication systems.

Other applications include standby power supplies, electronic cash registers, hybrid trucks and buses, golf cart vehicles, smart grid infrastructure, automated guided vehicles (AGVs), yachts, solar backup power systems, aviation industry assets, satellites, launch vehicles, and energy storage systems (ESS).

### Market Analysis by Geography

North America (Canada, Mexico, U.S.)

Europe (Spain, U.K., Russia, Italy, Germany, Spain, France)

The Asia Pacific (India, China, Japan, Australia, South Korea)

Central and South America (Colombia, Paraguay, Brazil)

The Middle East and Africa (Saudi Arabia, UAE, Egypt, South Africa)

According to Grandview Research, Asia Pacific's highest revenue share was over 40.0% in 2021. As environmental concerns have grown, China has banned traditional fossil fuel-powered vehicles in all of its metropolitan areas to cut emissions, resulting in a rise in e-scooter sales across the country.

As the Asia Pacific has emerged as a global production hub, there has been an increase in the use of tools operated by lithium-ion batteries. Furthermore, the nation has the world's largest population. As a result, consumer electronics such as smartphones and computers that run on lithium-ion batteries are selling well in the Asia Pacific.

Due to the growing use of lithium-ion batteries in energy storage systems, consumer electronics, and electric vehicles, the German market will grow moderately over the forecast period. Germany is the world's leading energy storage and renewable energy development market.

### Key Market Players in the Industry

The market is highly competitive, with key players investing in research and development and product innovation. Several companies are developing new products to increase their global market share. BYD and Panasonic, for example, have a strong position due to increased manufacturing capacity and an extensive distribution network. Among the major players in the

global lithium-ion battery market are the:

BYD Co., Ltd.

Duracell Incorporated

Hitachi Limited

Johnson Controls Inc.

LG Chemical

Panasonic Corporation

Renault Group

Samsung SDI Co., Ltd.

Tesla

Toyota Corporation

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