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CASE STUDY

Scaling Li-ion battery production for clean energy storage

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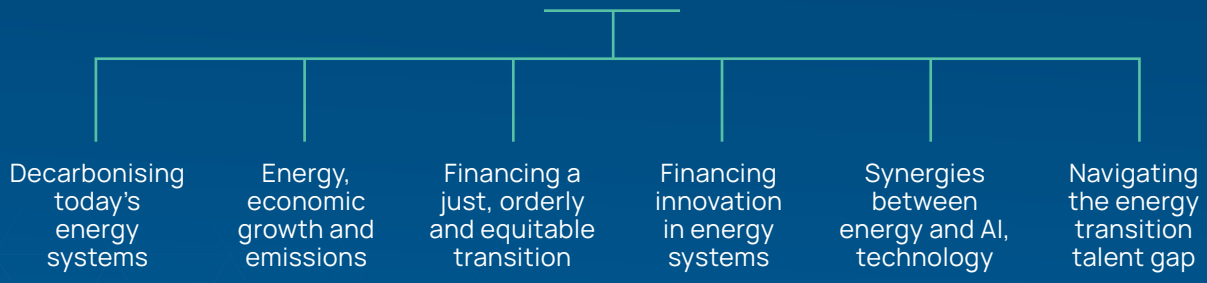

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Scaling Li-ion battery production for clean energy storage

CONTEXT

A new wave of privately owned enterprises is driving economic expansion while addressing critical climate objectives. These businesses are attracting substantial investments and showcasing innovative models and sustainable practices. India stands out with notable examples such as Maxvolt Energy, a pioneering energy startup.

Maxvolt Energy specialises in manufacturing lithium battery packs for electric vehicles, energy storage systems, and medical devices. In May 2024, the company secured US$1.5 million in funding from angel investors. This infusion will bolster its efforts in advancing sustainable energy solutions and introducing fast-charging lithium-ion batteries.

Lithium and lithium-ion batteries are pivotal in the electrification of transportation and energy storage, supporting the global move to a low-carbon economy. This journey is crucial for India, one of the world's fastest-growing economies, as it aims to achieve net-zero emissions by 2070 without compromising economic growth.

Organisations involved

- Angel investors
- Maxvolt Energy

Investment

US$1.5 mn

Location

India

Industry

Energy storage

EMPOWERING SUSTAINABLE GROWTH THROUGH STRATEGIC INVESTMENTS

Maxvolt Energy, a prominent manufacturer and supplier of lithium battery packs tailored for electric vehicles, energy storage systems, and medical devices, secured US$1.5 million in funding from multiple angel investors in May 2024.

This investment will bolster the company's ambitions to advance sustainable energy solutions and introduce high-speed charging lithium-ion batteries in India, the world's fastest-growing economy.

US$54.4bn

Size of the global lithium-ion battery industry in 2023[5]

US$340bn

Estimated size of the global lithium-ion battery industry by 2030[7]

30%

Estimated compounded annual growth rate for the sector from 2022-2030[6]

120-150

Estimated number of new lithium-ion factories needed to be built by 2030 globally[6]

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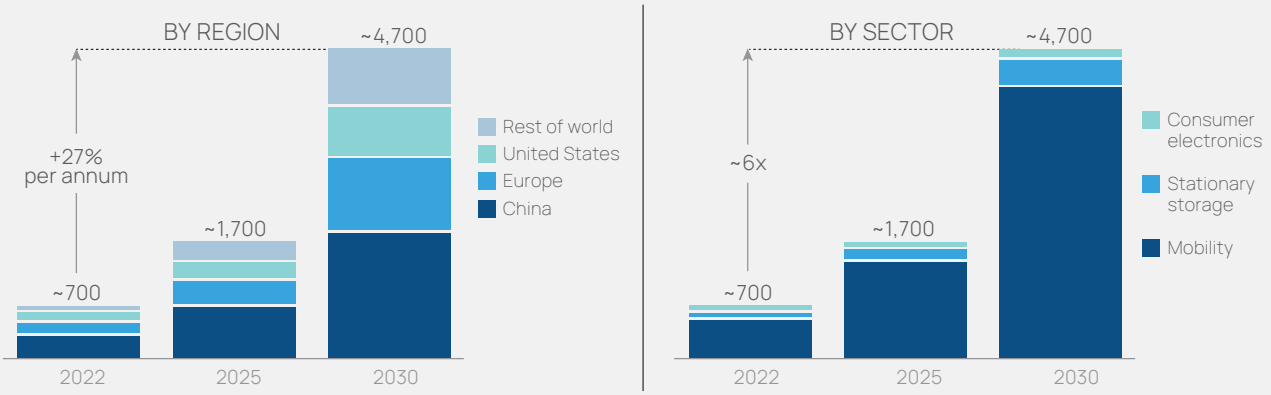
How lithium-ion batteries are charging green energy transition in our battery-powered future

Lithium-ion battery demand is expected to grow by about 33% annually to reach approximately 4,700 gigawatt hours by 2030.

Global Li-ion battery cell demand, GWh base case



Note: Global lithium-ion battery cell demand, by region, gigawatt hours; the data includes passenger cars, commercial vehicles, two- and three-wheelers, off-highway vehicles, and aviation.

Source: McKinsey Battery Insights Demand Model

The demand for lithium-ion batteries is surging in India, particularly for electric vehicles (EVs). According to S&P Global, the demand for EV lithium batteries in India is projected to skyrocket from 4 gigawatt hours (GWh) in 2023 to nearly 139 GWh by 2035[1]. The substantial growth represents a pivotal opportunity for locally manufactured, fast-charging batteries to drive the development and integration of transformative energy solutions.

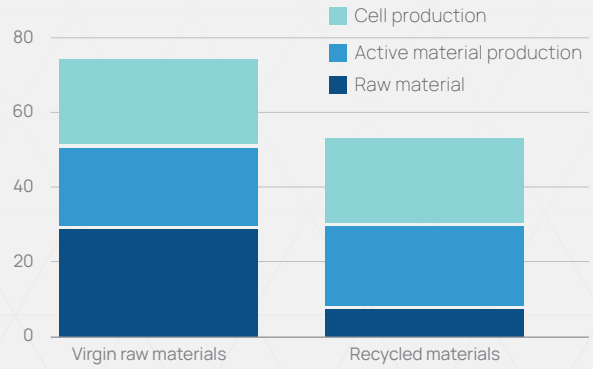
Globally, the market for lithium-ion battery cells is also experiencing rapid growth. In 2022, global demand reached approximately 700 GWh, with China leading at 370 GWh, followed by the European Union (EU) and the United States with around 150 GWh and 120 GWh, respectively[2]. By 2040, global energy demand from lithium batteries is expected to hit about 50 terawatt hours (TWh), with electric mobility alone accounting for 30 TWh[2]. This burgeoning demand underscores the need for significant quantities of batteries and drives the search for critical raw materials (CRMs).

Maxvolt Energy is strategically positioned to address this demand by developing innovative lithium battery architectures for a range of sectors, including electric bikes, scooters, and solar energy systems. The recent round of funding will accelerate the company's research and development efforts, expand production capabilities, and enhance its market presence.

The forthcoming years are likely to see a dominant shift towards battery technology, propelled by increasing demand for electric mobility and electric

Batteries made with recycled materials have a much smaller carbon footprint

Total emissions a nickel-based lithium-ion battery (kg of CO_2 equivalent per KWh)



Source: McKinsey Battery Insights - US Q1 2023
Assuming mechanical pre-treatment and hydrometallurgical recycling

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vehicles. This trend is supported by regulatory frameworks promoting sustainability, growing consumer interest in green technologies, and ambitious global emissions reduction targets. Notable legislative measures such as Europe's 'Fit for 55' programme, the US Inflation Reduction Act, the EU's 2035 ban on internal combustion engine (ICE) vehicles, and India's Faster Adoption and Manufacture of Hybrid and Electric Vehicles (FAME) Scheme are pivotal in fostering industry growth.

In line with this, a report by ALEXEC Consulting projects that the lithium-ion battery market will experience annual growth exceeding 30% over the next decade, with the market value surpassing US$400 billion by 2030[3]. This growth trajectory reflects the industry's potential to generate substantial annual revenues, with a fivefold increase projected by 2030 as global efforts to reduce carbon emissions intensify.

Battery recycling could also play an integral role in supporting this growth by ensuring materials remain within a closed-loop system, thereby mitigating the environmental impacts associated with mining and addressing the diminishing supply of essential elements such as lithium, cobalt, and nickel.

India, as one of the world's fastest-growing large economies and the third-largest emitter of greenhouse gases, is crucial in global climate change mitigation efforts. Collaborative initiatives between the public and private sectors are vital for achieving ambitious climate goals.

The Indian EV sector is burgeoning, with startups having raised US$1.66 billion in 2022 alone, positioning India as the third-largest market for EV startups globally, trailing only the US and China[4]. With significant funding flowing into this sector, companies like Maxvolt Energy and similar startups are poised to drive robust economic growth and innovation across the energy landscape, including advancements in energy efficiency.

> "We are developing a fast-charging solution to significantly reduce customers' charging times…In the first phase, we will reduce the charging time to two hours and one hour in the subsequent phase."

Satendra Shukla
Co-founder and Head of Business Development, MaxVolt Energy

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