

Future prospects of energy storage batteries 85 kWh

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As EV sales continue to increase in today's major markets in China, Europe and the United States, as well as expanding across more countries, demand for EV batteries is also set to grow quickly. In the STEPS, EV battery demand grows four-and-a-half times by 2030, and almost seven times by 2035 compared to 2023. In the APS and the NZE Scenario, demand is significantly higher, multiplied by five and seven times in 2030 and nine and twelve times in 2035, respectively. To put this in context, in the APS in 2035, there could be as much EV battery demand per week as there was in the entire year of 2019.

Cars remain the primary driver of EV battery demand, accounting for about 75% in the APS in 2035, albeit down from 90% in 2023, as battery demand from other EVs grows very quickly. In the STEPS, battery demand for EVs other than cars jumps eightfold by 2030 and fifteen-fold by 2035. In the APS, these numbers reach tenfold by 2030 and more than twenty-fold by 2035. Battery requirements differ across modes, with a 2/3W requiring a battery about 20 times smaller than a BEV, while buses and trucks require batteries that are between 2 and 5 times bigger than for a BEV. This also affects trends in different regions, given that 2/3Ws are significantly more important in emerging economies than in developed economies.

As EVs increasingly reach new markets, battery demand outside of today's major markets is set to increase. In the STEPS, China, Europe and the United States account for just under 85% of the market in 2030 and just over 80% in 2035, down from 90% today. In the APS, nearly 25% of battery demand is outside today's major markets in 2030, particularly as a result of greater demand in India, Southeast Asia, South America, Mexico and Japan. In the APS in 2035, this share increases to 30%.

Stationary storage will also increase battery demand, accounting for about 400GWh in STEPS and 500 GWh in APS in 2030, which is about 12% of EV battery demand in the same year in both the STEPS and the APS.

Battery production has been ramping up quickly in the past few years to keep pace with increasing demand. In 2023, battery manufacturing reached 2.5TWh, adding 780GWh of capacity relative to 2022. The capacity added in 2023 was over 25% higher than in 2022.

Most of the announced manufacturing capacity remains concentrated geographically in today's major EV markets. Of course, as EVs and stationary storage reach global markets and battery demand diversifies, new opportunities will be created around the world to produce batteries near demand centres. However, today's front-runners, which have thus far dominated the supply of batteries to EV makers in China, the European Union and the United States, are still expected to play a critical role in the coming decade.

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In China, the total committed battery manufacturing capacity is over two times greater than domestic demand in the APS by 2030, opening opportunities for export of both batteries and EVs with batteries made in China, but also increasing financial risks and reducing margins of battery producers. Notably, in both the United States and European Union, battery manufacturing capacity that is already operational or otherwise committed is almost or already sufficient to meet projected battery demand in the APS by 2030. Companies operating in these regions will, however, need to scale up production rapidly and demonstrate that they are cost-competitive in order to satisfy all or a large share of their domestic demand.

The announced manufacturing capacity outside of China, the European Union and the United States, of which 85% is already committed, together with today's capacity, can meet almost half of APS needs in 2030 in these other regions. Almost all the committed manufacturing capacity is divided among other European countries and Canada (about 35% each), India (12%), other Southeast Asian countries (8%), particularly Viet Nam, Malaysia and Singapore, and Japan and Korea (5%). Korea and Japan, however, also account for over 80% of today's capacity in these regions.

There is significant space for growth in South American countries, which today have no significant announced battery manufacturing capacity by 2030, and in countries with manufacturing capacity that falls short of their pledges, such as India, whose announced capacity would cover only a quarter of its demand in the APS. These gaps have important implications for future battery trade and could increase the risk of these regions failing to meet long-term decarbonisation targets without relying significantly on imports.

As the EV stock ages, effective end-of-life strategies that encompass recycling and reuse must be put in place to make supply chains circular and to help mitigate critical mineral demand. The battery recycling sector, still nascent in 2023, will be core to the future of EV supply chains, and to maximising the environmental benefits of batteries.

Global recycling capacity reached over 300GWh/year in 2023, of which more than 80% was located in China, far ahead of Europe and the United States with under 2% each. Confident in the transition to electromobility, many technology developers and industry actors are seeking to position themselves in the future market for EV end-of-life management and have announced considerable capacity expansions. If all announced projects are developed in full and on time, global recycling capacity could exceed 1500GWh in 2030, of which 70% is in China, and about 10% each in Europe and the United States.

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