Lithium battery prices over time

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Battery metal prices have struggled as a surge in new production overwhelmed demand, coinciding with a slowdown in electric vehicle adoption. Lithium prices, for example, have plummeted nearly 90% since the late 2022 peak, leading to mine closures and impacting the price of lithium-ion batteries used in EVs.

The price of lithium-ion battery cells declined by 97% in the last three decades. A battery with a capacity of one kilowatt-hour that cost $7500 in 1991 was just $181 in 2018. That"s 41 times less.

Lithium-ion batteries (LiBs) are pivotal in the shift towards electric mobility, having seen an 85 % reduction in production costs over the past decade. However, achieving even more significant cost reductions is vital to making battery electric vehicles (BEVs) widespread and competitive with internal combustion engine vehicles (ICEVs).

At the beginning of 2023, lithium prices stood six times above their average over the 2015-2020 period. In contrast to nickel and lithium, manganese prices have been relatively stable. One reason for the increase in prices for lithium, nickel and cobalt was the insufficient supply compared to demand in 2021.

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The average cost of a lithium-ion battery pack fell to $137 per kWh in 2020, according to a new industry survey from BloombergNEF. That"s an inflation-adjusted decline of 13 percent since 2019. The latest figures continue the astonishing progress in battery technology over the last decade, with pack prices declining 88 percent since 2010.

Large, affordable batteries will be essential to weaning the global economy off fossil fuels. Lithium-ion batteries are the key enabling technology for electric vehicles. They"re also needed to smooth out the intermittent power generated by windmills and solar panels.

But until recently, batteries were simply too expensive for these applications to make financial sense without mandates and subsidies. Now, that is becoming less and less true. BloombergNEF estimates that battery-pack prices will fall to $100 per kWh by 2024. That"s roughly the level necessary for BEVs to be price-competitive with conventional cars without subsidies. Given that electric vehicles are cheap to charge and will likely

require less maintenance than a conventional car, they will be an increasingly compelling option over the next decade.

Like most high-tech goods, batteries tend to get cheaper as they are manufactured at higher volumes. As the world builds more and more electric cars, grid storage installations, and other battery-based systems, higher volumes will drive prices lower and lower.

Economists define the "learning rate" as the percentage decrease in price for every doubling of output. BloombergNEF estimates that the learning rate for batteries is about 18 percent: every time global battery output doubles, prices fall by 18 percent.

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