

EV growth driven by batteries, not oil shocks

As the electric vehicle network reaches a tipping point, the economics changes and the link with oil prices breaks

When the Strait of Hormuz first closed in March and oil hit \$120 a barrel, a very old question came back: is this finally the moment electric vehicles take off for good – or just another false start?

EVs have been here before. They surged after the 1973 oil embargo, collapsed when oil fell, and surged again. Each wave died when the external pressure eased.

We think this time is different. Our research finds that the economic case for electric vehicles is now improving on its own terms. This is because of what has happened to batteries, not because of the oil price. The same evidence, though, shows the transition creates new problems as serious as the ones it solves.

Why this time is different

Battery costs have fallen 93% since 2010. That is the number that changes everything.

A pack that cost more than \$1,000 per kilowatt-hour in 2010 cost \$108 by late 2025, driven down by a decade of learning, investment and policy support.

Research on the global battery industry finds that every time cumulative production doubles, costs fall by around 9%. More buyers, more production, lower costs, more buyers (Barwick et al, 2025).

Unlike the 1970s, this loop does not need an oil crisis to keep spinning. Electric cars have crossed lifetime cost parity with petrol vehicles across much of Europe (Hargrove et al, 2024); in the used-car market they now have the lowest total cost of ownership (Woody et al, 2026). Newer models even match petrol cars in estimated lifespan – something early EVs could not claim (Nguyen-Tien et al, 2025).

Global sales surpassed 17 million in 2024, one of the fastest technology diffusion processes

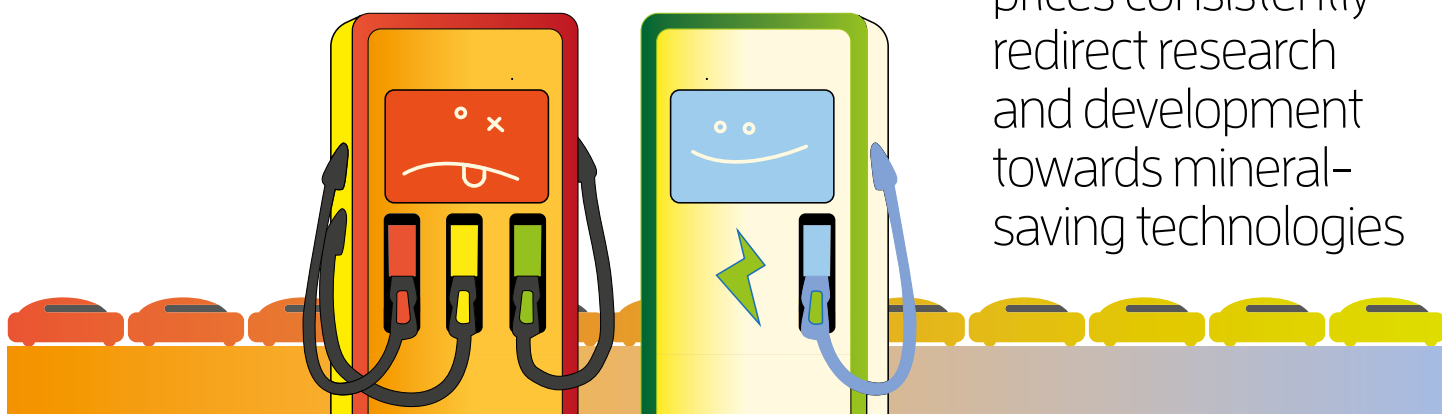
in the history of transport. Norway is near-fully electrified. And Ethiopia reached around 60% EV sales share in 2024, powered by cheap hydroelectricity – some way ahead of the US, for instance, which sits at around 8%.

An economic platform, not just a better engine

The deeper reason this wave will not fade is not technical – it is economic. An EV is a platform. Its value grows as the network around it grows, just as smartphones became indispensable not because of the hardware but because of everything connected to it.

Every charger built makes the next EV more attractive. Every software update raises the value of every car already on the road. Every recycled battery feeds back into the supply chain that makes the next one cheaper. It's part of the reason some other technologies like

Higher mineral prices consistently redirect research and development towards mineral-saving technologies



The transition to electric vehicles creates new problems as serious as the ones it solves

hydrogen fuel cell vehicles have struggled to get off the ground in numbers – the tech exists, but all the other elements aren't quite there.

One study of 8,000 drivers in Shanghai found that range anxiety – the fear of running out of charge – has a real economic cost due to unnecessarily avoided trips (Barwick et al, 2026). But that cost is falling sharply, not because batteries improved, but because charging networks expanded.

Making real-time charger availability visible could add 6 to 8 percentage points to market share by 2030 (Asensio et al, 2025). And because EV charging is far more flexible than other household electricity demand, drivers can shift away from peak hours remarkably easily when the price is right – turning the car into a grid asset, able to store and release electricity when needed (Bailey et al, 2025). These are economic network effects, not engineering features.

Swapping one dependency for another

Ending oil dependence does not end geopolitical exposure. It relocates it.

In late 2025, China introduced rules requiring government approval for exports containing more than 0.1% rare earths. The leverage that once came from control of oil flows now comes from control of processing capacity and component supply chains.

The minerals at stake – lithium, cobalt, nickel, graphite and neodymium to name but a handful – carry their own geopolitical risks and, as we have written elsewhere, serious human costs in the communities that mine them (Jones et al, 2022). This creates a predictable cycle of social contestation that threatens to stall the transition unless the industry commits to responsible, sustainable innovation.

The metal cobalt traditionally helped EVs travel further on the same charge. And when prices spiked, so did research into making batteries with less or even no cobalt. Today, more than half of all EV batteries sold globally are cobalt free (IEA, 2026).

Four decades of patent data show the same pattern: higher mineral prices consistently redirect research and development towards mineral-saving technologies.

Recovering lithium and cobalt from used batteries is becoming economically viable too, shifting part of the supply chain away from geopolitically exposed extraction sites (Harper et al, 2019). In addition, Norway and other countries are looking to exploit new critical mineral resources to diversify supplies.

The transition is real – but not risk-free

The Hormuz crisis is a reminder of what concentrated energy dependence costs. The EV transition does not need it. The learning curve

keeps falling, the platform keeps compounding, the economics keep improving. That is what makes this wave different.

What it does not do is eliminate geopolitical risk. Unlike oil, where leverage comes from control of energy flows, EV supply chains concentrate power at materials, processing capacity and technological bottlenecks – supply chains that are highly concentrated and carry their own serious risks. Fuel dependence becomes mineral dependence. That dependence is highly concentrated.

Traditional car making regions are already absorbing concentrated job losses (Celasun et al, 2023), and history shows such disruptions leave persistent scars even if the long-term aggregate effects are positive. Yet electric vehicle assembly is proving more labour-intensive in western countries than expected – requiring more workers on the shopfloor, not fewer, at least in the ramp-up phase (Weng et al, 2024). Contrast this with China, where massive automation has led to the creation of “dark factories” where there are so few humans, internal lighting isn't required.

The same regions facing losses could benefit. But the gains and losses do not fall on the same people. That is where the work remains.

Further reading

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This article summarises Elliott, R., Harper, G. and Nguyen-Tien, V. (2026) *The economics of the electric vehicle transition: demand, supply chains, and innovation*. CEP Discussion Paper No. 2164. A version of this article first appeared on *The Conversation* (<https://theconversation.com/electric-vehicles-pass-tipping-point-breaking-the-link-with-oil-prices-280655>).

Read Viet Nguyen-Tien's article on why we need replication games on page 17.

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