



*“Electric cars are not the future.”*

*“The future of four wheels is all electric.”*

Two headlines – one from an investment bank, the other from a national paper – published within weeks of each other. Electric vehicles (EVs) have become an increasingly politicised microcosm of the wider debate surrounding net zero – do the benefits of adoption outweigh the potentially significant costs? Are EVs going to transform transportation, or are they an expensive luxury? With investors betting billions on the answers to these questions, the stakes have rarely been higher.

First up – are EVs better for the environment than traditional modes of transport? Yes. Over its lifetime, an EV driver in the UK will produce on average around two thirds fewer emissions<sup>1</sup>. But that doesn't mean they are a silver bullet. The large amounts of energy required to produce lithium-ion batteries mean that overall, EVs produce around double the carbon emissions of a traditional car when made. The extraction of critical metals, such as cobalt, have also been linked to child labour and other human rights abuses. Increasingly, though, manufacturers are moving away from materials with more questionable supply chains – Tesla, for instance, no longer uses cobalt in many of its new car models.

Once it hits the road, an EV starts to claw back lost ground. According to one study<sup>2</sup>, the breakeven point for an average EV – the point at which you'll be doing less harm to the environment versus owning the petrol equivalent – is approximately 13,500 miles. The good news is that this number is based on the carbon intensity of the US power grid, where c.20% of electricity is still generated from coal. As more renewables come on line and the carbon intensity of the grid declines, the breakeven point falls – in Norway, which generates almost all its electricity from hydropower, the break-even point falls to under 8,500 miles, or just over a year's worth of travel for the average driver.

Range anxiety continues to be cited amongst the foremost reasons why drivers aren't willing to make the switch to a fully electric vehicle. When we look back at earlier models, such concerns are certainly warranted – the first Nissan Leaf offered a range of about 100 miles. However, ranges have improved significantly. In real world testing, Tesla's model 3 provided c.320 miles from a single charge. More efficient models produced by Mercedes-Benz, Hyundai and VW all have similar ranges, while new battery technology promises a pipeline of further improvements in the months and years ahead. In April, Chinese battery manufacturer CATL revealed its latest lithium-phosphate battery with a claimed range of over 600 miles and a recharge time of just 16 minutes. In the UK, most EV models also come with a minimum 100,000 mile battery pack warranty, while some (e.g., Tesla's Model S) are significantly higher.

While battery technology evolves at a remarkable rate, in the UK the deployment of charging infrastructure continues to lag. With

around 30% of UK households lacking off-street parking, the availability (or lack thereof) of local charge points remains a key barrier to EV adoption. According to the government's own targets, the UK must install 2,800 new chargers each month, if it is to hit its 300,000 installation target by 2030. At time of writing, we are installing less than half that. It doesn't have to be this way. In China, there are now more than 2.7 million public charging stations, and this is expected to increase by a further 40% in 2024. No surprise then that China is amongst the leaders in EV adoption – in January 2024, 37% of all new car registrations were either plug-in hybrid or fully electric.

Despite the compelling environmental case, and rapid ongoing technological improvements, demand for EVs does appear to be slowing. Tesla's recent announcement that it expects significantly lower sales growth this year certainly raised a few eyebrows – the subsequent share price slide saw the company unofficially ejected from the Magnificent Seven. Wall Street still projects Tesla to sell 2.1 million units in 2024, up 20% from the 1.8 million sold in 2023, but significantly lower than the 38% growth achieved last year. That said, sales growth of 20% is still some way ahead of most traditional car manufacturers.

In China, too, EV sales growth is slowing; 18.2% in January-February of this year versus 20.8% for the previous year. Increasing competition is also squeezing the incumbents. In March of this year, market leader BYD announced another round of price cuts. Some Chinese EVs are now priced on a par with petrol equivalents, pressuring sales of the latter. China wants to boost its sputtering economy by exporting cheap EVs, but western governments are unimpressed. Worried about cheap Chinese imports undercutting American car manufacturers, the Biden Administration recently announced a fresh set of tariffs, including a 100% tariff on EVs and 25% on batteries. Just last week, the EU announced similar measures, slapping an additional 38% of tariffs on imports of Chinese EVs.

This then, is the predicament for western governments. All have targets for EV adoption, and consumers demanding affordable options. But most western-made models still command a sizeable premium to their petrol-powered counterparts. Whilst Chinese vehicles are considerably cheaper, policymakers facing pressure from domestic manufacturers have so far balked at the suggestion of flooding their markets with imports, instead implementing punitive tariffs. Add in a cost-of-living crisis, and it's perhaps not surprising that sales growth is slowing. But with net zero targets enshrined in law, and transportation one of the major contributors of carbon emissions, a decision needs to be made – further incentivise domestic EV adoption, or open up to markets already at cost parity.

<sup>1</sup><https://theicct.org/publication/a-global-comparison-of-the-life-cycle-greenhouse-gas-emissions-of-combustion-engine-and-electric-passenger-cars/>

<sup>2</sup><https://www.reuters.com/business/autos-transportation/when-do-electric-vehicles-become-cleaner-than-gasoline-cars-2021-06-29/>

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