

CEN briefing note: electric vehicles

- **Despite increased electricity prices, electric vehicles (EVs) are cheaper to drive than petrol cars.** The upfront cost of an EV is still higher than a petrol car, but has fallen in the last decade, and they are still cheaper to run on a whole cost of ownership basis. A full charge overnight at home costs around **£17** for a typical electric car (Nissan Leaf), compared to **£79** for a full tank for the average petrol car (Ford Fiesta). An EV charged up at home costs around **3 pence per mile**. Refilling a petrol or diesel car costs on average between **19 and 21 pence per mile**. ‘Rapid’ charging at motorway service stations costs more at about **£37** for 80% charge.
- **The transition to EVs is necessary to ensure a thriving British automotive sector and to achieve net zero.** The Government’s independent advisor on climate change - the Climate Change Committee - calculated that transport emissions, of which **61% is from cars and taxis**, will need to be **cut by over 70%** to keep the UK on track for 2050. Meanwhile, recent investment announcements include over **£4 billion from Tata** to build a new EV battery factory, **£600 million from BMW** to produce electric cars in Oxford, **£1 billion from Nissan** for an EV manufacturing hub, and over **£380 million from Ford** to develop EV components. These investments will create thousands of jobs across the country.
- **In 2023, 16.5% of all new vehicle sales were pure battery EVs, rising to 23.9% if you include plug-in hybrids. This proportion is going to increase due to the Zero Emission Vehicle (ZEV) Mandate.** The ZEV mandate requires manufacturers to produce an increasing number of zero emission vehicles, going from 22% of their total car sales in 2024, to 80% in 2030 and 100% in 2035. The ZEV Mandate will give drivers more choice of make, model and price point for their EVs. Despite a **slower start** to EV sales at the start of 2024, the price of EVs is **now falling**, as manufacturers seek to meet their ZEV mandate targets.
- **EVs are better for the environment than petrol cars.** EVs have higher production emissions due to the carbon intensity of making batteries, but make up for these emissions compared to a petrol and diesel car within **two years of use**. Even when their production and the electricity generation to charge them is taken into account (‘life-cycle emissions’), they still produce over **three times** less CO₂ than equivalent petrol cars. They also emit much less nitrous oxide, and use regenerative braking to reduce particulate emissions from brake and tyre wear.

- **EVs have sufficient range for UK drivers.** Nearly [99%](#) of journeys by car are under 100 miles - every EV on the market is capable of doing this. The longest range model in the UK can reach over 450 miles on a single charge.
- **Critical minerals used in EV batteries will not, by themselves, make us dependent on China.** The countries with the biggest deposits of the [minerals](#) are Bolivia, Argentina, Chile, Australia, and the United States; more investment is needed in processing, which is mostly China-based currently. More democracies are signing critical minerals partnerships which will help secure supplies of materials like lithium without increasing dependence on China. The UK is also looking at battery recycling, and there is [promising research](#) into sodium batteries.
- **There were over [61,000](#) public chargepoints in the UK at the end of April 2024, of which over [10,500](#) are 'rapid' and 'ultra-rapid'.** This represents a growth of [45%](#) in 2023. Rapid chargers are able to charge an EV in around 30 minutes. Around 975,000 fully electric vehicles and 590,000 plug in hybrid vehicles were on the road in the UK as of [December 2023](#). For comparison, 66,000 spaces at fuel stations currently serve around 37 million petrol and diesel vehicles. It is estimated that there are [more than 700,000](#) private chargers in homes and workplaces; the [vast majority](#) of users charge at home. The Government have [made it easier](#) for drivers to charge their cars, by mandating all new chargepoints to include contactless payment options, and removing the need for memberships of multiple operators.
- **Increases in electricity demand can be managed by National Grid.** Overall energy demand is lower than it has been for years. [National Grid estimated](#) that even if there was an overnight switch to EVs, the increase in overall demand would only amount to 10%, which is well within their manageable range. There is also increasing [innovation in flexible charging](#) that pays EV owners to export to the grid at times of high electricity demand, as well as smart chargers that can help drivers to charge overnight when electricity is cheaper due to low demand.