

Driving to Net Zero: The Electric Vehicle Transition

The UK's commitment to reaching Net Zero is one of the few unifying issues in British politics, with broad cross-party agreement on the need to decarbonise the economy. While the 2010s saw impressive reductions in greenhouse gas emissions, driven in large part by the rapid decarbonisation of the power grid, the 2020s must see an acceleration in the decarbonisation of transport for the Government to remain on track to meet its climate goals. Electric vehicles (EVs) will play a central role in this key next step on the road to Net Zero.

The Government is already aware of this and has stated its ambitions accordingly. The commitment to phase-out internal combustion engine (ICE) vehicles by 2030, five years earlier than originally planned, featured front-and-centre in the Prime Minister's '10-Point Plan for a Green Industrial Revolution'. Alongside this, the plan included £1.3 billion of investment to accelerate the roll out of charging infrastructure, with a further allocation of £1 billion to support the electrification of UK vehicles and their supply chains, including the development of 'gigafactories' – producing EV batteries – in the UK.

While greater detail and ambition is needed, this is a useful start that shows an appreciation of the challenges that the transition will pose and the opportunities that it can present. If the UK wants to have an automotive industry through the 2030s and beyond, it will need to be a largely electric automotive industry, supported by domestic gigafactories. This could also provide a boon to the economy, especially in those areas that are the target of the 'levelling up' agenda.

Emissions from transport

According to the Government's figures, transport accounts for roughly a third of the UK's annual carbon dioxide emissions, which has shown little sign of abating as the growth in the number of miles travelled over time has outpaced emissions reductions caused by more efficient engines. As a result, carbon emissions from transport in 2019 were only 4.6% lower than in 1990, having peaked in 2007. They are now the biggest contributor to the UK's carbon emissions, thus focusing the minds of policymakers.

The need for rapid progress in decarbonising transport has been brought into even sharper focus by the UK Government's new, ambitious target to reduce emissions by at least 68% by 2030, compared to 1990 levels, as preparations for the COP26 climate summit in Glasgow in November continue at pace. The target is bold, reflecting the Government's desire to lead from the front on climate issues ahead of the summit. As one of the five key thematic pillars of the UK's COP Presidency, clean transport will feature heavily in the run up to and during the conference. While hydrogen and biomass are also expected to play a role in the shift to green transport, the overwhelming majority of the transition for passenger vehicles will be to battery electric vehicles.

The state of the market

2020 was a record year for EV sales in the UK: over 108,000 battery electric vehicles (BEVs) were sold domestically in 2020, up 185.9% on the previous year and capturing 6.6% of the market share. While total vehicle sales were down approximately 30% due to the COVID-19 pandemic, that the raw number of EV sales increased so significantly suggests that the transition is happening apace.

Two of the main barriers are cost and range. However, EVs are expected to become price competitive with ICE vehicles in 2024/25, at which point they will become the rational economic choice thanks to significantly lower running costs. Current incentives, such as exemptions from Vehicle Excise Duty, the Plug-in Car Grant worth up to £3,500, and company car tax incentives, will likely be phased out as the signalling power of the market's price mechanism takes over.

With regard to range, advances in battery technology are occurring rapidly but in many ways the technology is already here. The marketed range of many luxury models of EV exceed 200 miles, with the Tesla Models S, X and 3 all having versions with a range in excess of 300 miles. Smaller models like the Nissan Leaf e+ and BMW i3 each have versions around the 200 mile range. When one considers that the average car in the UK is driven just 20 miles per day, the opportunity for a rapid transition is clear.

Range anxieties nonetheless persist, however, in part due to the extended time required to charge electric vehicles. While a trip to the petrol station can be completed in a matter of minutes, fully charging a car battery from a standard plug at home can take hours. However, the wheels are in motion for this kind of charging experience to be a thing of the past. GRIDSERVE recently opened their first EV charging forecourt in Braintree, Essex, with the ability to add charge equal to 200 miles of range in 20 minutes for 36 vehicles simultaneously.

Indeed, we may be on the verge of a rapid advance in fast charging. In January 2021, Israeli company StoreDot produced the first batteries capable of fully charging in just five minutes. This serves as an important step on the road to functional equivalence between EVs and ICE vehicles.

Further, one must consider the second-hand market for EVs. At present, such a market does not exist – there

simply have not been enough EVs purchased yet. The creation of a second-hand market will come further down the track, naturally, but will also be conditional on further technological advances in battery technology. Nissan declares that its electric car batteries will last eight years or 100,000 miles, with Tesla suggesting similar. This is half as many miles as an ICE vehicle, the average lifespan of which is now 12 years. However, rapid technological advances, specifically the prospect of a million mile battery touted by both Tesla and Chinese firm CATL, could prove transformative for a second-hand market and the recycling of car batteries, enabling those that can't afford a new car to transition.

The public sector and the policy road ahead

For the time being, however, government is central in setting the conditions to enable rapid uptake. The Prime Minister's '10-Point Plan' has a target of 2030 for 2,500 high powered charging points on England's motorways and major A roads. By 2035, this target rises to 6,000. Analysis from Deloitte suggests that the UK will need 28,000 public charging points, high powered or otherwise, in total in order to service the predicted 7 million EVs on the road in 2030. While this seems like a vast challenge, it is within reach. There are 13,500 public charging points in the UK already.

The costs involved are also manageable. Deloitte's research suggests the cost of delivering this infrastructure will be £1.6 billion between 2020 and 2030, slightly higher than the £1.3 billion the Government have committed. In the grand scheme of things, such an investment over an entire decade is paltry, especially when compared to some of the costs earmarked for other parts of the energy transition. Furthermore, there will be a balance between public and private investment. GRIDSERVE's Braintree forecourt is step one in their £1 billion plan to build more than 100 electric forecourts across the UK over the next five years. The public and private sectors will be required to move in unison on charging infrastructure as EV uptake picks up pace.

As price parity between EVs and ICE vehicles is reached, the importance of the Government's role will diminish. In particular, policymakers will have to consider how best to unpick the current incentive scheme for EV customers, especially the Vehicle Excise Duty exemption. This is already being given thought in Norway, where over 50% of car sales in 2020 were EVs.

The transition to EVs in the UK is likely to lead to a wider shift in policy. Road pricing is a likely contender to fill the vehicle excise duty and fuel duty sized hole in the UK's tax receipts. This received considerable traction when trailed in November, and the Transport Select Committee has subsequently launched an inquiry into ZEVs and road pricing. Polling from Ipsos Mori suggested that road pricing would be popular with the public, with 62% saying they would support charging motorists a fee to drive around towns and cities, with 25% strongly in favour.

The engine of the green economy?

The transition to EVs is also an economic opportunity. It is not yet clear exactly what a green recovery will mean, but the Government is keen to push the UK as a European leader on green technologies. Nissan's recent announcement that they will increase EV production at their Sunderland plant following the Brexit trade deal highlights the role domestic EV manufacturing could play in delivering on the levelling up and green agendas.

As a result of rules of origin included in the EU-UK trade deal, Nissan said that it and battery partner Envision would move battery production from Japan to the north-east, in order to export to the EU. This serves as an example of the need to develop domestic supply chains, and the benefits to the regions that this could yield. The news followed Britishvolt's announcement in December that it would be building its own gigafactory in Blyth, Northumberland.

However, a scaling up of ambition is required if the UK is to hold onto its automotive industry, let alone become a European leader in EVs. A former Nissan executive warned that the Government needs to launch a gigafactory

"Imagine Britain when a Green Industrial Revolution has helped to level up the country. You cook breakfast using hydrogen power before getting in your electric car, having charged it overnight from batteries made in the Midlands. Around you the air is cleaner; trucks, trains, ships and planes run on hydrogen or synthetic fuel."

Prime Minister Boris Johnson, 17th November 2021

taskforce or risk losing the entire UK automotive industry. Combined, the Nissan and Britishvolt plants will have about 15 gigawatts of battery making capacity. However, the Society of Motor Manufacturers and Traders (SMMT) estimates that 60 gigawatts, enough for one million electric cars, will be needed by 2030.

The £500 million earmarked in the 10-Point Plan for gigafactory development is primarily aimed at protecting existing jobs in the West Midlands, Wales, and the North. More ambition is needed. This may come with the arrival of Tesla. The Department of International Trade have been in talks with Tesla with a view to establishing a gigafactory in Somerset. Their arrival could prove to be transformative for the UK's EV ambitions.

China is without doubt winning the global EV race, with more gigafactory capacity than the rest of the world combined and access to the necessary critical minerals such as lithium via an expansionist foreign policy in Africa and Asia. However, an increasingly bipolar world with divergence between East and West, with critical metals a likely future geopolitical flashpoint, could also provide an opportunity for British firms to fill the gap.

While not in the Red Wall, Cornwall is another disadvantaged part of the UK in need of 'levelling up'. The reported discovery of a 'globally significant' lithium deposit in the county could secure British supply of the metal, at a time when global supply is likely to become increasingly constrained. While production remains years away, it nonetheless points to the potential for UK businesses along the EV supply chain, while enriching some of the 'left behind' areas that have increasingly become a focus of domestic politics.

What's Next?

There is a huge opportunity for the Government to deliver both on its green commitments and for its new electoral coalition if it can accelerate the transition to EVs. The transition is already here, it is now a matter of how quickly it can go and whether the British economy will benefit.

While specifics have so far been missing from the Government's policies, further detail can be expected with the soon-to-be published Transport Decarbonisation Plan. The end goal is now clear, how we get there requires some thought.

Regardless of the exact form that policy takes, businesses and consumers will be directly impacted. The vast majority of the population are supportive of efforts to reduce emissions; however, they are less clear on what that means for them. EVs are likely to be one of the first, tangible ways in which they experience the transition. Its success will be crucial should the future, more challenging changes that Net Zero requires be rolled out.

**Cameron Wake**

Consultant

+44 (0)20 7632 5164 T | +44 7929 789 881

cameron.wake@fticonsulting.com

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