Driving Down UK Transport Emissions: Tackling the Key Barriers

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CREATING CLARITY

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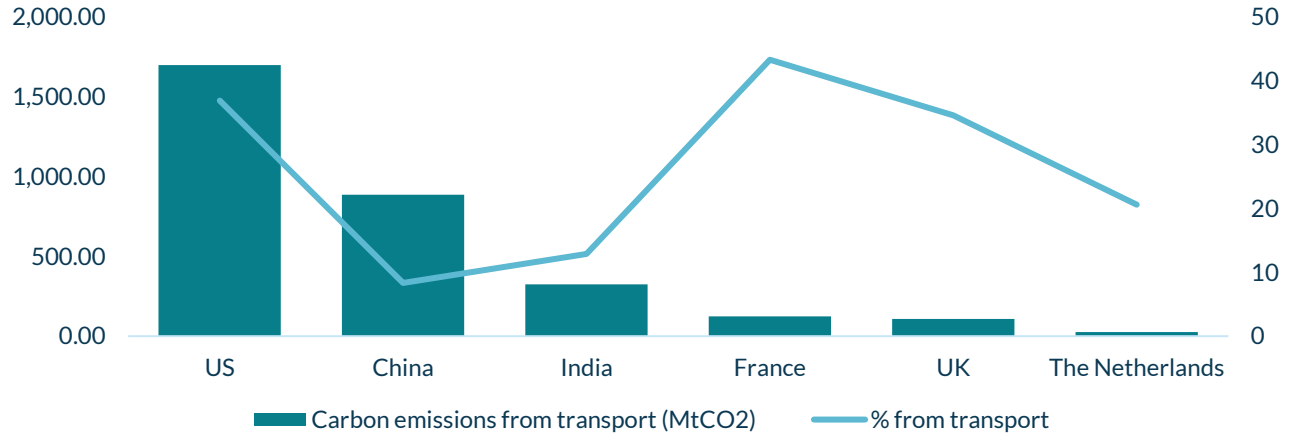
In the UK, like many other major global economies, surface transport accounts for a significant share of carbon emissions (Figure 1) and therefore must be decarbonised to meet net zero targets. The primary mechanism for decarbonising surface transport, both in the UK and across other global economies, is through increased uptake of electric vehicles (EVs) in place of internal combustion engine (ICE) vehicles.

Figure 1: Transport sector carbon emissions ($MtCO_2$) and percentage of total, 2022



Source: International Energy Agency (IEA)

While the UK led the sale of battery EVs (BEVs) across Europe in 2024, there are still a range of challenges preventing their mass uptake.[1] On the consumer side, these include the high purchase cost of EVs and associated private infrastructure, the underdevelopment of the public charging network, and the reduction of EV-related subsidy support and tax benefits. UK manufacturers also face challenges, largely related to a lack of control over critical supply.

These challenges are not unique to the UK, with a variety of approaches to solving them adopted by other nations, dependent on the different political, social, and economic contexts. While acknowledging that there is no one size fits all approach, the UK could learn some lessons from these different approaches to decarbonising the surface transport sector.

Evolution of EV Support

Over time, there has been an evolution in the UK Government approach to decarbonising surface transport and encouraging the uptake of EVs. Focus has changed from a consumer-centric approach, characterised by the provision of purchase subsidies for EVs and supporting infrastructure (e.g. the Plug in Grant) alongside tax reductions for EVs and other low emission vehicles to a market-based approach. While some subsidies remain in place today, the levels of support offered and tranche of consumers with access to them have been reduced over time, with the Government notably removing the Plug in Grant for passenger cars in 2022. The market-based approach is underpinned by policy such as the Zero Emission Vehicle (ZEV) Mandate, introduced in January 2024, which requires that 80% of new cars and 70% of new vans sold in GB are zero emission at the tailpipe by 2030, increasing to 100% by 2035. The Department for Transport (DfT) confirmed, in April 2025, that this means the sale of new petrol and diesel cars will be phased out by 2030, with hybrids able to be sold until 2035.[2]

[1] European Automobile Manufacturers Association
[2] DfT

There is now significantly less financial support available for consumers wishing to switch to an EV and, while the market has matured, it has not done so to the degree that EVs have become cost competitive with ICE vehicles. Moreover, while changes to the ZEV Mandate have been praised by the UK automotive industry, it is still questioned whether additional incentives need to be put in place. For instance, the Society of Motor Manufacturers and Traders (SMMT) suggests that "growing EV demand to the levels needed still requires equally bold fiscal incentives… to give motorists full confidence to switch."[3] Additionally, public attitude towards EVs remains a barrier to uptake. Although 49% of surveyed consumers are considering purchasing an EV as their next vehicle, access to and speed of public chargepoints and affordability remain key barriers.[4]

Tackling the Key Challenges

Charging Infrastructure

Access to public chargepoints is one of the most oft cited challenges to the EV rollout in the UK and, with 25 EVs per publicly accessible chargepoint, the UK has a significantly less developed public chargepoint network than many other major economies (Figure 2). Public chargepoint access, combined with concerns over whether EVs have the range to reach their destinations, has contributed to an issue referred to as 'range anxiety', whereby many drivers believe that they could be left stranded due to EVs running out of charge without anywhere to top up. Solving this issue is complex but the provision of interoperable, more geographically spread out, and faster public charging stations are potential solutions where the UK could learn from other nations (Figure 3).

Figure 2: BEV and public chargepoint rollout in several major economies, 2024

Country	BEV car stock	Public Fast EV chargepoints (22-350kW)	Public Slow EV chargepoints (3.7-22kW)	Number of EVs per public chargepoint
India	240,000	28,000	47,000	**3.4**
The Netherlands	590,000	8,000	180,000	**5.5**
China	23,000,000	1,600,000	1,900,000	**9.6**
France	1,100,000	32,000	120,000	**11.9**
EU27	6,000,000	150,000	720,000	**12.8**
UK	1,040,000	17,000	71,000	**25.3**
US	4,700,000	53,000	140,000	**32.6**

Source: IEA, IEA

National and local assessments of EV demand and current chargepoint deployment (including private, semi-private, and public) could help the UK Government and industry gain a better understanding of where the deployment of additional infrastructure should be prioritised. This is something that is already being done in Scotland, with Transport Scotland publishing a draft Electric Vehicle Public

[3] SMMT
[4] DfT

Charging Network Implementation Plan in late 2024.[5] Alongside this, ensuring that chargepoints are interoperable and usable by any EV driver is also important, as is improving the speed and convenience of charging through the provision of more rapid and ultra rapid chargers.

Figure 3: Global approaches to tackling charging infrastructure barriers

Solution	Country	Detail
Holistic planning	China	With access to charging, particularly on highways and in rural areas, a barrier to EV adoption, the Chinese Government has been working alongside chargepoint operators to plan a comprehensive network that is more geographically spread out and capable of facilitating both current and future EV demand. Support has also been extended to local Governments to develop smaller scale plans, including battery swapping stations.
Interoperability and accessibility	The Netherlands	The Dutch Government has introduced standards to ensure that EV chargepoints are interoperable, meaning drivers can use any public chargepoint on the network. Additionally, EV drivers in The Hague with no access to private parking, can request, for free, that a public chargepoint is installed.
Speed	China	While some European cities have faster overall charging, China has the largest network of fast chargers worldwide (Figure 2). Faster public charging has helped encourage increased EV uptake as it makes the process of refuelling more convenient. Additionally, China has deployed battery swapping stations as part of an alternative EV ownership model, which facilitates faster refuelling.

Source: Cornwall Insight analysis, IEA, Nationale Agenda Laadinfrastructuur, The Hague, The International Council on Clean Transportation

Affordability

In the UK, switching from an ICE vehicle to an EV is often limited to higher-income consumers, with new EV purchase prices standing at ~40% more than equivalent ICE vehicles as of 2023.[6] The removal of the Plug-in Grant for passenger cars and the reduction of tax benefits from April 2025 has further dampened the economic incentive to switch to an EV, although the lower running costs of maintaining and refuelling an EV remain. In fact, to entice consumers, manufacturers have begun to discount EVs – something they are not subsidised for by the Government, unlike in other countries. Targeted subsidies and the development of a second-hand EV market are approaches that could help reduce the affordability barrier for lower-income consumers (Figure 4). Transport Scotland is already offering 0% interest, six year loans to support the purchase of used EVs.[7]

While analysis from our EV Insight Service[8] shows charging is cheaper than refuelling an ICE (Figure 5), there are still significant costs faced from public charging. Charging at home, something around 80% of current EV drivers have access to, is significantly cheaper. For the remaining 20%, there is greater reliance on the public network, alongside workplace chargers, if provided. Around 75% of all UK street-side households lack access to a driveway and therefore have less opportunity to install a private charger. Without access to workplace charging, public chargepoint prices, alongside the inconvenience associated with slow, and even fast, charging, are likely to remain barriers to the continued uptake of EVs.

[5] Transport Scotland
[6] Office for Zero Emission Vehicles
[7] Energy Saving Trust
[8] Cornwall Insight - EV Insight Service

Figure 4: Global approaches to tackling affordability barriers

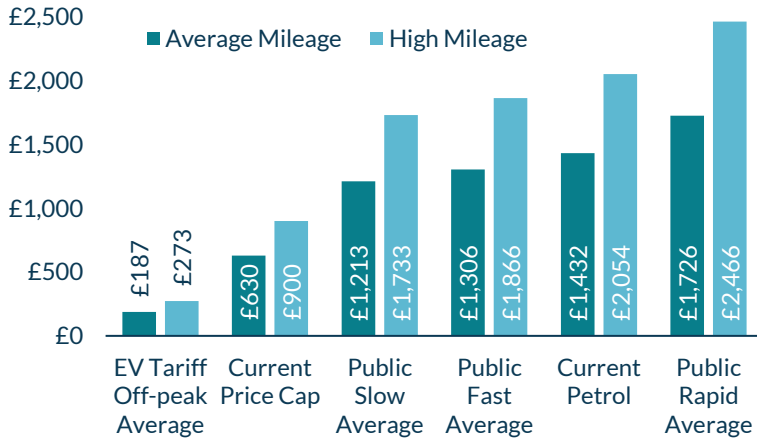
Solution	Country	Detail
Developing the second-hand EV market	France, the Netherlands	Both the Netherlands and France offered subsidy support for second-hand EVs to allow lower-income consumers to switch from ICE vehicles. However, both schemes have since closed in December 2024.
Targeted subsidies	France	France implemented a social leasing program in December 2023, offering European-made EVs for €49-150/month to a tranche of the lowest income households. The program received over 90,000 applications – with 50,000 being accepted – doubling the initial scope of the program. Due to its success, France is continuing the scheme in 2025.

Source: Cornwall Insight analysis, French Republic, French Republic, National Enterprise Service of the Netherlands

Manufacturing and Supply Chains

Continued growth in EV demand will require an increase in manufacturing capacity. A central consideration is whether global Governments prioritise domestic manufacturing capabilities and supply chains (Figure 6) or rely on the import of vehicles and components from elsewhere. In the UK, the focus has been on encouraging greater domestic manufacturing and supply chains, though with the understanding that imports will continue to be necessary, particularly in the supply of critical minerals.

Figure 5: Annual cost of refuelling between EV charging methods and petrol



Source: Cornwall Insight EV Insight Service

Note: Average mileage – 7,000 miles, high mileage – 10,000 miles. Annual figure assumes 100% of refuelling done by each method. EV tariff rate assumes all charging done during off-peak period. Figures based on average vehicle efficiency of 3miles/kWh and 30mpg.

Figure 6: Global approaches to tackling manufacturing and supply chain barriers

Solution	Country	Detail
Access to raw materials & gigafactories	China, US, EU	Most of the critical raw materials needed for EV batteries are supplied by China, who own a range of mines across the globe. Given that these materials account for 50-70% of battery's final cost – which in turn accounts for 25-40% of the total cost for an EV – having cheap access is advantageous. With access to raw materials, countries can produce their own EV batteries, ensuring that they meet relevant local standards, are eligible for subsidies, and reduce exposure to tariffs on non-domestically produced EVs and batteries; something being pursued by many large economies, namely the US and EU.
Battery recycling	China	Development of the battery recycling supply chain, where critical minerals can be recycled and reused for future batteries, is a crucial area. If this is scaled effectively, the demand for lithium and nickel could reduce by 25%, and cobalt by 40% by 2050. China has the greatest battery recycling capabilities at present. Though, the EU, for instance, is seeking to expand its capabilities through its 2023 Batteries Regulation.

Source: Cornwall Insight analysis, IEA, European Parliament, Internal Revenue Service, European Commission, EUR-Lex

Public Awareness and Perception

Overall, the UK public do not consider themselves well informed on EVs, with 47% of respondents to a DfT survey saying that they had "low" to "no knowledge" in the area. This lack of knowledge results in the propagation and proliferation of myths and misconceptions on EVs, which act to exacerbate the concerns outlined around the cost and lack of access to the public charging network. The SMMT reported that in 2023, the average range for new EVs was 300 miles, with the DfT highlighting that 99% of car journeys in England are <100 miles. However, there is still a perception amongst many ICE vehicle drivers that EV ranges are not sufficient for their driving habits. Public information campaigns could be a potential solution for tackling misconceptions and better informing drivers of the potential benefits of owning an EV (Figure 7).

Figure 7: Global approaches to tackling public awareness and perception barriers

Solution	Country	Detail
Government guidance	India	The Indian Government's Handbook to Guide EV Charging Infrastructure" aims to better inform the public and private sector stakeholders responsible for planning the country's future EV charging network. By providing information regarding planning and identifying potential areas for charging infrastructure, it should allow for a more efficient network build-out.

Source: Cornwall Insight analysis, NITI Aayog

Concluding Remarks

Whilst it is clear that EVs are considered the most economically, politically, and socially viable option for decarbonising the UK surface transport sector there remain a series of key barriers to be overcome. Despite the UK showing solid progress in its phase out of ICE vehicles, concerns around affordability and access to public chargepoints are limiting EV uptake, especially among private consumers. With subsidy schemes discontinued or reduced, and unlikely to see a resurgence, other steps need to be taken to encourage the further uptake of EVs.

While the UK's ZEV Mandate is a step in the right direction, more needs to be done. Consideration of the approaches taken in other global jurisdictions highlights several key areas where the UK could adopt similar options to further the EV rollout. These include holistic planning for public charging networks; increasing interoperability and speed of public chargepoints; targeted subsidies and the growth of a second-hand EV market to improve affordability for lower-income consumers; development of domestic manufacturing and supply chains; and public information campaigns. Although different political, social, and economic contexts mean these approaches cannot necessarily be fully mirrored in the UK, they can still offer valuable insight into potential solutions to the challenges faced in the rollout of EVs.

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