

The Zero Emissions Vehicle mandate

The Vehicle Emissions Trading Schemes Order 2023 – Parliamentary briefing

Key points

The Order legislates for a Zero Emission Vehicle (ZEV) Mandate – a scheme which sets ZEV sales targets to be reached by manufacturers of passenger cars and vans, by earning credits through the sale of ZEVs. The scheme sets out a roadmap to the 2030 phase down (but not phase out) of new petrol and diesel vehicles.

This creates much-needed market certainty – setting a baseline for the market share of EVs in the UK will ensure that manufacturers and infrastructure providers are able to plan and invest accordingly. It encourages manufacturers to prioritise selling electric vehicles in the UK – lowering prices, extending consumer choice, supporting expansion of the charging network, and the resilience of both the supply chain and the national grid. And it will do all this whilst reducing UK greenhouse gas emissions.

The transition to ZEVs is global. Manufacturers and countries across the world are committing to phasing out petrol and diesel vehicles, and pumping money into the supply chain. Parliament must approve this statutory instrument to ensure Government stays the course, reducing emissions, reducing household costs, and improving air quality.

Nevertheless, Government could have gone further – by maintaining the 2030 ban on new petrol and diesel vehicles, and by offering incentives to produce lighter vehicles. These would have supported domestic manufacturing, saved billions for consumers, and improved the air quality of our towns and cities – whilst making our net zero target easier to meet.

New AutoMotive modelling suggests that the postponement will mean 400,000 cars using petrol and diesel on the road in 2050, adding 35 megatonnes of greenhouse gas emissions and costing consumers an additional £6.5–10bn in running costs. Restoring the 2030 switchover would reduce the UK's demand for oil by an amount equivalent to all the additional supply which would be extracted from the North Sea under new licences and refined and consumed in the UK between now and 2050.

Government should also: continually review and ratchet up the ambition in the legislation, wherever possible and proportionate; encourage the phase out of older polluting vehicles, especially those that are driven regularly; and bring forward policies to encourage electrification of heavier vans and heavy goods vehicles.

How the Vehicle Emissions Trading Schemes Order works

The Order¹ introduces a Zero Emissions Vehicle (ZEV) mandate (referred to as the “non zero emission [car/van] registration trading scheme”), under which makers of passenger vehicles and vans must sell a growing percentage of Battery Electric Vehicles. Consumers can continue to buy petrol, diesel and hybrid vehicles for the duration of the Order, which extends to 2030.

Firms which miss the target percentage can buy credits from others who have exceeded the threshold (article 25) or make a “buy out” payment to Government for the shortfall (£15K per car, £20K per van - see articles 28 and 60).

The mandate for cars (Part 3 chapter 1) will start only gradually - 22% of manufacturers’ cars must be ZEVs in 2024 (market share over the past 12 months is 18%²), increasing to 38% in 2027. Targets will increase more steeply after 2027, reaching 80% by 2030 (see part 1 of schedule 6).

Firms are also provided with “flexibilities” up until 2026 - borrowing future “credits” (article 15 and 17) and earning credits by exceeding undemanding emissions targets for internal combustion engine (ICE) vehicles under the Non-zero Emission [Car/Van] CO₂ Trading Scheme (see part 3 chapters 2 and 4, and article 35). These allow time for production to ramp up and costs to decline, but mean firms could hit 2024 targets even if only 5% of their cars are battery electric vehicles. Companies can also carry forward (“bank”) excess credits from outperformance in any year for up to 3 years (article 14 and 16).

The mandate for battery electric vans (Part 3 chapter 3) will follow a slower trajectory (market share for the past 12 months was 6.5%³), increasing from 10% in 2024 to 33% in 2027 and 70% by 2030.

Manufacturers producing fewer than 2,500 vehicles (schedule 4) will be exempt until the end of 2029 as a minimum. Cars and vans of all sizes will be treated equally.

¹ [The Vehicle Emissions Trading Schemes Order 2023](#)

² New AutoMotive. [Electric Car Count](#)

³ New AutoMotive. [Electric Van Count](#).

Why the legislation should be supported

The Vehicle Emissions Trading Schemes Order will lower costs – Whilst the total cost of owning electric vehicles is already similar to or lower than owning vehicles using petrol or diesel (with Government-forecast consumer savings of £39bn in reduced running costs and £15bn in reduced maintenance costs between now and 2050)⁴, the upfront cost of electric vehicles is usually still higher. The ZEV mandate will lower costs of EVs further – long-term sales targets will allow manufacturers to plan and invest to deliver cost savings – and to identify and pass on economies of scale – rather than buy other firms’ credits or make payments to the Government.

It will extend consumer choice – Manufacturers are already acting on consumer concerns about range anxiety – the average real world range of new EV models on the UK market is 226 miles, 3 times the 2011 average⁵. But the ZEV mandate will put consumers in the driving seat. Manufacturers who don’t invest in producing the EVs that consumers want to buy, at the right price, will miss sales targets and be financially disadvantaged as a result. In particular it will encourage development of new lower cost vehicle ranges which make targets easier to meet. And the market share of EVs in second hand sales has increased 70% in 1 year⁶ – the impetus of a ZEV mandate will help to grow this further.

The Order will reduce UK and global greenhouse gas emissions – 21% of 2019 UK emissions (the last pre-lockdown year for which data is available) came from passenger vehicles and vans – up from 16% in 2010. And multiple studies have shown that electric vehicles deliver large lifetime greenhouse gas emission reductions on petrol and diesel cars, regardless of the source of electricity used to build them or power them. This is because electric vehicles convert energy into movement at an efficiency of at least 77%, compared with just 12-30% for internal combustion engines⁷.

It will support expansion of the charging network – 2023 New AutoMotive research⁸ found that the most pressing barrier to growth identified by the chargepoint industry was a lack of *demand* for public charging, and uncertainty around levels of demand in the future. Setting clear and ambitious targets through the ZEV mandate will help facilitate the continued expansion of the UK’s public charging network. Already as of July 2023, there were just over 44,000 public charging devices in the UK – a 38% rate of growth on last year, and one-third more than the number of fuel pumps⁹. If this annual

⁴ Gov.uk [Zero emission vehicle \(ZEV\) mandate consultation: final cost benefit analysis](#)

⁵ EV Database. [REDACTED], Society of Motor Manufacturers and Traders. [REDACTED].

⁶ Society of Motor Manufacturers and Traders. [REDACTED].

⁷ US Department of Energy. Where the Energy Goes: [Electric Cars](#) and [Gasoline Vehicles](#).

⁸ New AutoMotive. [On the Road to 2030: How the electric vehicle charging industry will enable the phase-out of petrol and diesel vehicles in the UK](#)

⁹ As of May 2020, Experian reported that there were 33,948 fuel pumps in the UK. Quoted in Gov.uk [Taking charge: the electric vehicle infrastructure strategy](#).

percentage growth is maintained, Government's ambition of 300,000 devices by 2030 will be met. Plus many EV drivers already have "home fuel pumps", with more than 380,000 domestic charging devices, and apps such as JustCharge and Place2Park to enable the 20% of householders without off-street parking or some alternative arrangement to rent them.

The Order will support resilient mineral supply chains – Manufacturers will work to develop diverse and resilient supply chains that minimise the risk of falling short on long-term sales targets and paying the price. In any case, no potentially hostile foreign power has a stranglehold on supplies. Of the three minerals rated critical by the British Geological Survey¹⁰, Australia, Chile and Argentina are major producers of lithium, Australia and Europe can supply cobalt (and alternative battery chemistries avoid it altogether), whilst graphite supply is plentiful from India, Brazil and Canada – although investment in high purity "spherical" graphite production facilities¹¹ is urgently required.

It will support grid resilience – The CCC have forecast that by 2050, electric cars and vans will increase electricity demand by 20–30% on today's levels¹², requiring investment in the energy system. However the higher EV numbers delivered by a ZEV mandate could reduce total costs of energy for everyone – EV owners charging in 'off-peak' hours using smart charging would benefit from lower costs, whilst non-EV owners will also benefit from connected EVs exporting surplus power at peak times, creating a more efficient network which needs less spare capacity.

There is no alternative – The International Energy Agency have described the transition to clean energy as "unstoppable". More than 26 million electric vehicles were on the road worldwide by the end of 2022, 500 times the number of hydrogen fuel cell vehicles. The IEA expect electric vehicles to reach 18% market share globally this year, with 220 million vehicles on the road by 2030. Meanwhile global sales of petrol and diesel vehicles peaked in 2017 and are falling¹³. Governments in the US, the EU and China are all investing heavily in EV supply chains. If the UK does not have its own policy to provide certainty to domestic EV manufacture, we will end up importing all our EVs from overseas whilst our own manufacturers produce cars which no-one else wants to buy, with a devastating effect on the UK motor industry.

¹⁰ British Geological Survey. [UK criticality assessment of technology critical minerals and metals](#).

¹¹ Faraday Institution. [REDACTED], UK Critical Minerals Intelligence Centre. [Study on future UK demand and supply of lithium, nickel, cobalt, manganese and graphite for electric vehicle batteries](#).

¹² Climate Change Committee. [Sixth Carbon Budget](#).

¹³ International Energy Agency. [World Energy Outlook 2023](#), Hydrogen Central. [REDACTED]

Where the legislation could be stronger

The Order should target 2030 for phase out of new internal combustion engine vehicles – The last minute announcements delaying the phase out date for new petrol and diesel vehicles from 2030 to 2035 has created significant cost for:

- consumers – Whilst the shift to EVs will be cheaper for consumers, NewAutoMotive analysis suggests that the saving could be 15–25% higher under a 2030 phase out. The delay to 2035 results in consumers needlessly paying £6.5–10 billion extra in running costs¹⁴ – and when the lower maintenance costs of EVs are taken into account, consumers miss out on even bigger savings.
- the wider economy – Government’s own analysis indicates that the ZEV mandate would lead to employment benefits in terms of the number of jobs supported. Its original consultation – based on the original 2030 phase-out – also anticipated that it would have benefits in the “wage premiums” of these jobs, and that it could drive significant UK export opportunities and increased relative competitiveness, leading to greater UK output and earnings¹⁵. All of these benefits have been dropped from Government’s analysis following the UK’s “retreat into the herd” in postponing the switchover.
- manufacturers – by damaging confidence in the stability of the UK’s emissions policy, the move undermines one of the main purposes of the ZEV mandate, which is to encourage manufacturers to sell EVs in the UK, rather than in markets where it may be more profitable. It also undermines domestic manufacturing, including recent announcements by Jaguar Land Rover of a gigafactory in Somerset, and BMW’s plans to build its next generation electric mini in Oxford, and established plants in Sunderland making the Nissan Leaf and in Ellesmere Port making the the Vauxhall Vivaro, the UK’s best selling electric van. Each of these will now be selling into a reduced domestic market. More than 50% of cars sold in the UK by the top 25 manufacturers come from firms which have publicly committed to end sales of petrol and diesel vehicles across Europe ahead of 2035. Now we risk more of those vehicles being sold elsewhere.
- the climate – the continued sale of petrol and diesel vehicles through the first half of the 2030s is estimated to result in more than 35 megatonnes of additional greenhouse gas emissions. It will mean that in 2050 itself, 400,000 more cars using petrol and diesel will still be on the road, when the UK should be at net zero, meaning a continued annual contribution from cars of 1 megatonne of CO₂ to the UK’s annual emissions. Addressing these excess emissions would necessitate cuts elsewhere –

¹⁴ Internal New AutoMotive analysis, for publication in November 2023. Assumptions include ZEV mandate targets being met, distribution of non zero emission vehicles sold unchanged from present day, with no change in vehicle lifetimes, emissions, miles travelled, or petrol, diesel and electricity prices.

¹⁵ Gov.uk. [Zero Emissions Vehicle Mandate and non-ZEV Efficiency Requirements Consultation-stage Cost Benefit Analysis](#) - see paragraphs 208-212. The [final cost benefit analysis](#) (sections 3.92 onwards) removed these arguments.

for example 2 to 3 short haul flights for every person in the UK over the same period¹⁶, massive expansion of untested and expensive carbon removal technologies¹⁷ or costly scrappage schemes to persuade owners to surrender vehicles which it would have been cheaper not to sell. Restoring the 2030 switch would not only reduce greenhouse gas emissions, it would also reduce UK demand for oil by an amount equivalent to all the additional supply which would be extracted from the North Sea under new licences and refined and consumed in the UK between now and 2050¹⁸.

They should incentivise lighter vehicles – road, brake and tyre wear account for more road transport particulate emissions than engines, with negative outcomes for health and the environment¹⁹. These emissions increase with vehicle weight, which has risen by 25% to an average of 1.5 tonnes (unrelated to EVs) between 2001 and 2021²⁰. Alongside action to improve wear resistance or limit harmful components in tyre materials, Government should consider awarding additional credits under the ZEV mandate to lighter vehicles, as the Order will do for wheelchair accessible vehicles (WAVs – articles 19 and 21) and car clubs (article 20 and 22), and/or reduced credits for heavier vehicles.

Other action Government should be taking

Government should continually review and ratchet up the legislation – Government’s commitment to keep the mandate under continuous review and carry out a mid-point review in 2027 is welcome. However, any action following the review should, barring exceptional circumstances, be upwards-only – raising, not lowering ambition. If some manufacturers falling short of targets are forced to cut costs or buy credits, this is a sign that the ZEV mandate is working, not that it requires dilution. On the other hand, persistent surpluses of “credits” would trigger a collapse in their value, indicating that the ZEV mandate is not contributing to the take-up of EVs, and should trigger further action, including strengthening future targets and withdrawal of some or all the flexibilities. Special purpose vehicles such as hearses and some motor homes which are currently excluded (through the definition of “car” in regulation 2) could also readily begin electrification ahead of 2030.

¹⁶ 2 return flights from Newcastle or Riga, or 3 return flights from Gatwick to Barcelona. Emissions calculated using Gov.uk [Greenhouse gas reporting: conversion factors 2022](#).

¹⁷ Element energy and the UK Centre for Ecology and Hydrology. [Greenhouse gas removal methods and their potential UK deployment: a report published for BEIS](#) offers a central estimate of £215 per tonne for direct air capture of CO₂, averaged between 2030 and 2050 - the price of capturing 35m tonnes of CO₂ would equate to £7.5bn.

¹⁸ North Sea Transition Authority. [September 2023 Oil and Gas Production Projections and Latest DESNZ and CCC Demand Projections](#). We have assumed that all the extracted crude refined in the UK is made into transport fuels and combusted, with greenhouse gas emissions of 2.92 tonnes of CO₂ equivalent per tonne of transport fuel (weighted average of biofuel blended petrol and diesel from Gov.uk [Greenhouse gas reporting: conversion factors 2022](#)). [DUKES 2023 Chapter 3](#) indicates that 24% of extracted crude oil is refined in the UK, and 48% of that is used domestically.

¹⁹ Gov.uk. [Emissions of air pollutants in the UK – Particulate matter \(PM10 and PM2.5\)](#) and Imperial College London. [Briefing paper: Tyre wear particles are toxic for us and the environment](#)

²⁰ International Council on Clean Transportation. [European vehicle market statistics 2020/2021](#).

It should encourage phase out of older polluting vehicles, especially those that are driven regularly – 25% of UK drivers are responsible for 50% of passenger vehicle miles, whilst just 10% are responsible for almost 30% of mileage²¹. Policies to encourage scrappage of older, dirtier petrol and diesel vehicles with high annual mileage in return for incentives to purchase new or second hand electric cars could take more fossil fuel vehicles off the road and off the market, driving significantly steeper emissions reductions, whilst also improving the air of our towns and cities more quickly. Funding for scrappage could be provided from the proceeds of the “buy out” price paid to Government under the ZEV mandate where firms fall short of their targets and do not have sufficient traded or banked credits. Such an arrangement would also boost the ZEV mandate if targets prove stretching – funds paid over to the Exchequer for missing targets would be recycled back into encouraging more EV purchases, making the targets easier to hit in subsequent years.

Government should confirm arrangements for small manufacturers post-2030 to allow these firms to prepare for electrification. Government has confirmed that it will end the exemption for manufacturers of 1000–2499 cars annually after 2029 with a transitional year in 2030, but has offered no clarity as to the targets for the period 2030–2034, and offered no clarity on the pathway for manufacturers of fewer than 1000 vehicles. With its net zero strategy announcement in October 2021 Government gave larger firms almost 2½ years’ notice to prepare for a ZEV mandate. It needs to work with boutique British manufacturers to set their post-2030 targets by the end of 2027 so they can cost-effectively complete the electrification of their designs and supply chain.

Government should bring forward policies to electrify heavier vans and HGVs – HGVs account for more greenhouse gas emissions than vans, and the likely total cost of ownership of electric HGVs is already less than fossil-powered alternatives. However no scheme or policy exists to encourage companies to make the switch. The UK government committed at COP26 to end sales of new non-zero HGVs by 2040, with lighter (<26 tonne) HGVs being zero emissions from 2035²², but needs to bring forward a policy – which could readily be based on the ZEV mandate – to make this ambition a reality.

Government – and devolved administrations – should monitor, and where necessary fix, charging point blackspots – Government’s provision of Local Authority funding through the Local EV Infrastructure Fund (LEVI) is welcome, Government needs to monitor take-up and work with Local Authorities where progress is slow. Whilst Liverpool, Coventry, Blaenau Gwent, Dumfries and Galloway, the Outer Hebrides and 9 London boroughs all have one or more chargers for every 3 electric cars, some local authorities in Essex, Hertfordshire and Lincolnshire have more than 50 EVs per public charger²³. It may also need to

²¹ Internal New AutoMotive analysis - for publication in December 2023.

²² Gov.uk. [Heavy goods vehicles: ending the sale of new non-zero emission models](#).

²³ New AutoMotive analysis, using Gov.uk data on Licensed EVs by local authority ([VEH0142](#)) and on [Electric vehicle charging device statistics](#).

work - including with devolved administrations - to develop alternative funding mechanisms where low population densities make installation unattractive for private installers.

About New AutoMotive

New AutoMotive is an independent transport research organisation. Our vision is a world where people can move and can breathe, without contributing to climate risk. Our data-driven insights help businesses, individuals and governments navigate the transition to clean transport.

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