

EXPLANATORY MEMORANDUM TO THE VEHICLE EMISSIONS TRADING SCHEMES ORDER 2023

This Explanatory Memorandum has been prepared by the Transport and Digital Connectivity Department, based on that produced by the UK Department for Transport (“DfT”), and is laid before Senedd Cymru in conjunction with the above subordinate legislation and in accordance with Standing Order 27.1.

Deputy Minister’s Declaration

In my view, this Explanatory Memorandum gives a fair and reasonable view of the expected impact of The Vehicle Emissions Trading Schemes Order 2023 and I am satisfied that the benefits justify the likely costs.

Lee Waters

DEPUTY MINISTER FOR CLIMATE CHANGE

16 October 2023

PART 1

1. Description

- 1.1 The Vehicle Emissions Trading Schemes (VETS) Order establishes Great Britain (“GB”) wide trading schemes that will contribute to Wales’s and the United Kingdom’s (“UK”) emissions reduction targets and Net Zero goal.
- 1.2 VETS consists of four trading schemes which will operate by limiting both the numbers of new non-zero emission vehicles (“non-ZEVs”) which may be registered¹ in GB, and the CO₂ emissions from such vehicles, as part of the transition to zero emission vehicles (“ZEVs”). This policy framework will replace the UK’s existing New Car and Van CO₂ Emissions Regulation,² which will cease in GB with the commencement of this Order but will be preserved in Northern Ireland for the time being.

2. Matters of special interest to the Legislation, Justice and Constitution Committee

- 2.1 Part 3 of Schedule 3 to the Climate Change Act 2008 (CCA) states that an emissions trading scheme that applies to England, Scotland, Wales and Northern Ireland must be established by Order in Council. The appropriate procedure for an Order in Council is prescribed by section 48 to the CCA. As the Order sets up a trading scheme, the affirmative procedure will be used.
- 2.2 As the Order will be subject to UK Parliamentary scrutiny, it is not considered reasonably practicable for this instrument to be made or laid bilingually.
- 2.3 The Order applies to Great Britain, as at this time it is not possible for Northern Ireland to join VETS. It remains the intent of the UK Government, Scottish Government, and Welsh Government that, with the approval of the Northern Ireland Assembly, VETS applies UK-wide: in the meantime, existing emissions regulation must remain in place in Northern Ireland.

3. Legislative background

- 3.1 The power to make an instrument to put in place a trading scheme relating to greenhouse gas emissions in section 44 of the Climate Change Act 2008 (“CCA”) is exercisable by “the relevant national authority” (the Secretary of State, the Scottish Ministers, the Welsh Ministers, the Department of Agriculture, Environment and Rural Affairs in Northern Ireland),³ in relation

¹ “Registration” is the process enabling new vehicles to be driven on the road in the UK. A manufacturer is responsible for registrations of vehicles of which it is the manufacturer.

² Regulation (EU) 2019/631 of the European Parliament and of the Council of 17 April 2019 setting CO₂ emission performance standards for new passenger cars and for new light commercial vehicles, and repealing Regulations (EC) No 443/2009 and (EU) No 510/2011.

³ The definition of relevant national authority is set out at section 47 of the CCA 2008.

to matters within their legislative competence. This instrument relates to climate policy and is therefore devolved.

- 3.2 This instrument establishes four separate schemes under section 44 of, and Part 1 of Schedule 2 to, the CCA. The Westminster and Devolved Parliamentary procedures for making a GB-wide trading scheme are set out in Schedule 3 to the CCA. Paragraph 9 of that Schedule enables such a scheme to be established by Order in Council. Pursuant to paragraph 11 of Schedule 3, before a recommendation may be made to His Majesty in Council to make the Order in Council, a draft of the instrument containing the Order in Council must be laid before, and approved by, a resolution of each House of Parliament and the relevant devolved legislatures. If it is approved by each of these, the Order will go to the Privy Council.
- 3.3 At the time of laying, the Northern Ireland Assembly is unable to meet this requirement and, as such, the territorial extent of VETS cannot include Northern Ireland. Consequential amendments to the existing New Car and Van CO₂ Emissions Regulation are made under section 54 of the CCA and preserve that regime for Northern Ireland as described from paragraph 4.20.
- 3.4 The existing new car and van CO₂ emissions regulations are not included in the Windsor Framework. Retained European Union (“EU”) law on the type-approval of vehicles, to which cross-reference is made in this instrument, is included in the Windsor Framework. This instrument therefore refers to both the domestic and the EU versions of the retained EU law on type-approval. This is relevant, for example, to UK (NI) type-approvals, which are valid in GB but continue to follow EU rules.

4. Purpose and intended effect of the legislation

- 4.1 In March 2021 the Senedd established Wales’s statutory target of net zero greenhouse gas emissions in 2050.⁴ Net Zero Wales: Carbon Budget 2, published in October 2021 illustrates the importance of reducing emissions from transport in Wales as part of this ambition and the Welsh

-
- The Scottish Ministers are the relevant national authority in relation to matters within the legislative competence of the Scottish Parliament.
 - The Welsh Ministers are the relevant national authority in relation to matters that— (a) are within the legislative competence of the National Assembly for Wales, or (b) relate to limiting or encouraging the limitation of activities in Wales that consist of the emission of greenhouse gas, other than activities in connection with offshore oil and gas exploration and exploitation.
 - The Secretary of State or the relevant Northern Ireland department is the relevant authority in relation to reserved matters within the meaning of the Northern Ireland Act 1998.
 - The relevant Northern Ireland department is the relevant authority in relation to all other matters within the legislative competence of the Northern Ireland Assembly.
 - The Secretary of State is the relevant national authority in relation to all other matters.

⁴ [The Environment \(Wales\) Act 2016 \(Amendment of 2050 Emissions Target\) Regulations 2021](#)

Government's support for stretching targets for the uptake of electric vehicles.⁵

- 4.2 Having left the EU, the UK no longer is part of the new car and van emissions regulatory framework. While the current, EU-derived New Car and Van CO₂ Emissions Regulation manages emissions only, VETS consists of both a ZEV mandate (a requirement that the number of manufacturers' new non-ZEV registrations must be at or below a certain proportion of overall registrations) and a CO₂ emissions standard that together simultaneously increase the number of ZEVs on GB roads while limiting the total emissions of non-ZEVs.
- 4.3 Climate policy, and therefore establishing VETS under the CCA, falls within devolved competence. DfT and Devolved Governments (as well as His Majesty's Treasury, Department for Business and Trade, and Department for Energy Security and Net Zero) have worked closely on developing VETS policy and legislation; Scottish and UK Ministers will be laying this instrument in draft in the Scottish Parliament and UK Parliament where it will be subject to affirmative resolutions of those legislatures.
- 4.4 Emissions regulation for cars and vans has been present in the UK since the Motor Vehicles (Construction and Use) Regulations 1973. Effectively managing the emissions of road vehicles into the atmosphere is not just a climate policy objective, but a public health imperative recognised globally, including in the EU's new car and van CO₂ emissions regulatory framework that the UK adopted and operated after exiting the EU. The UK has continually evolved its approach to emissions regulation and VETS represents the next step as the UK continues to lead the transition to ZEVs.
- 4.5 This instrument will set up VETS as four separate GB-wide trading schemes that will be operational from 1st January 2024 or 21 days after the day on which the order is made. Two of the schemes apply to cars: the Non-Zero-Emission Car Registration Trading Scheme ("CRTS") and the Non-Zero-Emission Car CO₂ Trading Scheme ("CCTS"), and two apply to vans: the Non-Zero-Emission Van Registration Trading Scheme ("VRTS") and the Non-Zero-Emission Van CO₂ Trading Scheme ("VCTS").
- 4.6 The scope of VETS includes all vehicle manufacturers who register a car or van as defined by this instrument in GB, subject to the exemptions and derogations described below. Non-zero emission special purpose vehicles, including wheelchair accessible vehicles, are exempt from VETS but zero emission versions will earn credits. This exemption is necessary to ensure special use cases continue to receive the vehicles they need, while the credit incentivises transitioning such vehicles. Multi-Stage Vehicles⁶ have bespoke arrangements in place to fairly assign responsibility for emissions and for ZEV registrations.

⁵ Net Zero Wales: Carbon Budget 2

⁶ Multi-Stage Vehicles are built in multiple stages, either using complete or incomplete base vehicles.

- 4.7 The CRTS and VRTS (together the “ZEV mandate schemes”) provide for annual targets for non-zero emission vehicles (“non-ZEV”) registrations, decreasing yearly. This is implemented by the schemes’ administrator (the Secretary of State for Transport) allocating CRTS and VRTS allowances to car and van manufacturers by multiplying a manufacturer’s registrations in a given year by that year’s non-ZEV target. One CRTS/VRTS allowance must be surrendered to the administrator for each non-ZEV registration, referred to as “activity”. If a manufacturer registers fewer non-ZEVs than the target allows they will have spare allowances, and if they register more non-ZEVs than the target they will have an allowance deficit.
- 4.8 The effect of these schemes is that manufacturers must register increasing numbers of ZEVs as a proportion of their overall registrations each year. Manufacturers may trade allowances amongst themselves or make use of other flexibilities, such as banking previous years’ over-compliance, to meet their targets. Manufacturers who do not have enough CRTS or VRTS allowances to meet their targets are required to make a payment of £15,000 per CRTS allowance. For VRTS this payment is £9,000 per VRTS allowance in 2024, increasing to £18,000 from 2025 onward. Overall allowances and activity in these two schemes are limited as required by paragraph 7(2) and (3) of Schedule 2 to the CCA. The limits on activity in articles 12(3) and 44(3) are based on the maximum number of allowances and credits that may be acquired over the schemes’ lifetime and that therefore may be surrendered in return for the registration of a non-ZEV. The limits on allowances are set out in articles 13 and 45, which are the number of non-ZEVs registered in a scheme year (subject to derogations).
- 4.9 The CCTS and VCTS (together the “CO₂ standard schemes”) set a baseline per-vehicle emissions target derived from a manufacturer’s 2021 performance and compliance; a manufacturer that was compliant with the existing regulations in 2021 will receive a target that is the higher of their actual emissions or their 2021 target and a manufacturer that was not compliant with the existing regulations in 2021 will receive a target that is their 2021 performance tightened by the percentage by which they missed their target. The schemes’ administrator will allocate CCTS and VCTS allowances to car and van manufacturers annually. One CCTS or VCTS allowance is equivalent to 1gCO₂e/km. Allowances are calculated by reference to the emissions of CO₂ from the non-ZEVs registered each year, multiplied by a participant’s 2021 baseline target. The administrator will then calculate a manufacturer’s in year average emissions multiplied by their total non-ZEV registrations to calculate the number of allowances. If the allocation is greater than the requirement then the manufacturer has a surplus of CCTS or VCTS allowances, if the allocation is less, the manufacturer has a deficit.
- 4.10 Manufacturers must therefore keep per-vehicle average emissions the same or lower than in 2021 while selling fewer non-ZEVs as set out in the ZEV mandate schemes. There are no credits under the CO₂ standard schemes, but manufacturers may make use of flexibilities during the trading window. At the end of each scheme year, a manufacturer must have one CCTS or VCTS allowance for every gCO₂e/km from their car or van

registrations that year. Manufacturers who do not have enough CCTS or VCTS allowances to meet their targets are required to make a payment of £86 per CCTS or VCTS allowance.

- 4.11 The ZEV mandate schemes have a number of flexibilities to allow a variety of routes to compliance. There is a banking mechanism where over-performance in early years may be used in later years, a borrowing mechanism where allowances can be borrowed from a participant's own future allocation, and conversions. Vehicle manufacturers may also earn credits for registering zero emission special purpose vehicles, zero emission wheelchair accessible vehicles, and if the zero emission vehicle is used by a car club. These credits are awarded on the basis that the specified use cases represent a particular benefit in CO₂ emissions reduction. One CRTS or VRTS credit is equal to one CRTS or VRTS allowance.
- 4.12 There is limited interaction between the CRTS and the CCTS, and between the VRTS and VCTS, as permitted by paragraph 11(1) of Schedule 2 to the CCA. CRTS allowances may be converted into CCTS allowances at an exchange rate, and CCTS allowances may be converted into CRTS credits at an exchange rate. The same is true of VRTS and VCTS with different exchange rates. There is no interaction between the car schemes (CCTS and CRTS) and the van schemes (VCTS and VRTS).
- 4.13 There are derogations from the ZEV mandate schemes. Micro volume manufacturers registering fewer than 1,000 cars or vans receive an automatic derogation. Small volume manufacturers registering more than 999 but fewer than 2,500 vehicles may make an application for a derogation. Derogated manufacturers do not have a target for non-ZEV registrations, but still receive an allocation of allowances based on their actual numbers of non-ZEV registrations.
- 4.14 There is also an exemption to the CO₂ standard schemes. In the CO₂ standard schemes micro volume manufacturers registering fewer than 1,000 non-zero emission vehicles are automatically exempted, as well as those registering only ZEVs.
- 4.15 Derogations and exemptions for car and van schemes are applied separately and assessed on an annual basis. A participant may be derogated or exempted for the van schemes but not for the car schemes and vice versa or may be derogated or exempted for both car and van schemes depending on their registrations. A participant may be derogated or exempted in one year and brought in scope for the next if their registrations cross the respective thresholds.
- 4.16 VETS participants are subject to a system of monitoring and reporting that underpins compliance with and the integrity of the schemes. The data that is used to assess compliance is primarily collected by the Driver and Vehicle Licensing Agency through vehicle registration. Participants then have the opportunity to correct that data and supply evidence to support any corrections. The data collected and the process of error correction are largely unchanged from the existing new car and van CO₂ emissions regulations.

- 4.17 VETS sets up a robust and proportionate enforcement system. The enforcement of VETS rules will be carried out by the appointed trading schemes administrator. The administrator has the power to require information from participants, and failure to comply results in escalating civil penalties and enforcement measures, culminating in the power to question officers of a company, the power to demand information, and the power to apply for a warrant to search premises and seize documents and records. The administrator will work closely with participants and the Devolved Governments to ensure civil penalties included in VETS are effective, dissuasive, and proportionate.
- 4.18 Where VETS participants are aggrieved by decisions of the administrator made under this instrument, a complaints procedure will be available and some decisions may be appealed.

New Car and Van Emissions Regulation for Northern Ireland

- 4.19 Northern Ireland is currently unable to join VETS. To ensure that Northern Ireland is covered as appropriate by existing regulations, consequential amendments are made in Part 8 of this instrument to the UK's new car and van CO₂ emissions regulations. These are made in close consultation with the Department for Infrastructure (Northern Ireland). The amendments will preserve the existing regulations in Northern Ireland alone and scale them appropriately for that market. They will also preserve, with minor amendments, the current system for approving eco-innovations (innovative technologies that produce CO₂ savings beyond what is measured over the standardised test cycle during vehicle type approval) which are relevant for measuring activity in the CCTS and VCTS, as well as under the regime that will continue to apply in Northern Ireland.
- 4.20 The relevant parts of this instrument have been drafted to meet two criteria:
- That at the point at which GB moves to VETS, Northern Ireland remains covered by an appropriate emissions regulation.
 - To maintain regulations that as closely as possible match the current arrangements in the UK in order to minimise any potential additional burden to both administration and environmental performance as a direct consequence of GB's move to VETS.
- 4.21 In the current UK-wide application of these regulations, manufacturer targets are established by formulae which compare the mass of all newly registered cars and/or vans in a manufacturer's fleet against the average mass of all such vehicles in the UK. This formula ensures that, as it is only the fleet average that is regulated, manufacturers may register any vehicle they like within the UK market, thereby protecting the diversity of the fleet, whilst the fleet as a whole becomes more efficient. These targets and formulae will remain in place for Northern Ireland, and compliance with these targets will be assessed using registrations in Northern Ireland only.
- 4.22 Manufacturers may currently apply for derogations from the formula that establishes the manufacturer fleet CO₂ target if their total registrations for any calendar year fall beneath pre-defined thresholds. These derogations

will remain in place for Northern Ireland, and eligibility for these derogations will continue to be assessed based on UK-wide registrations levels, to ensure no change in burden levels for manufacturers that have been eligible for derogations in the existing new car and van CO₂ emissions regulations to date.

- 4.23 “Excess emissions premiums” are levied for non-compliance of manufacturer CO₂ targets. At the point at which VETS starts and Northern Ireland alone is subject to these regulations, the fine will be £86 per gram of exceedance per vehicle registered.
- 4.24 UK Government, Welsh Government, and Scottish Government are open to Northern Ireland joining VETS at such time as a sitting Assembly chooses. It is further the joint position of the UK Government, Welsh Government, and Scottish Government that the benefits of VETS including reducing emissions, increased ZEV ownership, and regulatory certainty for industry should be enjoyed UK-wide. The VETS order does not relate to the UK’s withdrawal from the EU or trigger the statement requirements under the European Union (Withdrawal) Act.

5. Consultation

- 5.1 Between 30 March 2023 and 24 May 2023, the UK Government, Scottish Government, Welsh Government, and Northern Ireland’s Department for Infrastructure ran a public consultation (“the final consultation”) seeking views on “A zero emission vehicle (ZEV) mandate and CO₂ emissions regulation for new cars and vans in the UK”. This consultation stated that emissions trading schemes are the UK Government and Devolved Governments’ preferred policy approach to transitioning to zero emission vehicles.
- 5.2 Alongside the consultation, the UK Government and Devolved Governments jointly commissioned the Committee on Climate Change (“CCC”) for advice on the design of a ZEV mandate and CO₂ standard in accordance with section 48 of the CCA. This advice was published by the CCC and is available at: [Letter: Zero-emission vehicle mandate - Climate Change Committee \(theccc.org.uk\)](https://www.theccc.org.uk/letter-zero-emission-vehicle-mandate-climate-change-committee/)
- 5.3 The consultation received over 148 responses, from a range of stakeholders including vehicle manufacturers, chargepoint operators, and NGOs, with the majority supporting most of the proposals on the design of a ZEV mandate and CO₂ emissions standard. A large proportion of stakeholders expressed a preference that the schemes be UK-wide in their territorial extent.
- 5.4 The key points raised by respondents to the consultation were:
- VETS should apply UK-wide (Q1 & Q2): Approximately 96% of respondents who answered the relevant question wanted VETS to apply UK wide. While it is not practically possible for VETS to apply in Northern Ireland, the

regulation will apply across GB. At such time as the Northern Ireland Assembly chooses to pass any necessary legislation, the schemes will apply UK wide.

- VETS should be delayed from 2024 to 2025 (Q3): Around 8% of respondents to question 3 advocated for a delay of the mandate from 2024 to 2025, or for 2024 to be a “monitoring year” without payments. The UK Government, Welsh Government, Scottish Government, and Department for Infrastructure (Northern Ireland) agreed new flexibilities following the consultation that provide assurances for early years of the schemes in response to concerns that the early years were too challenging for some participants, and kept the 2024 commencement in light of this.
- CO₂ standard baseline methodology (Q14): Approximately 45% of respondents to question 14 felt that the proposal did not fairly account for CO₂ emissions reductions under the existing regulations, proposing various measures to remedy this. The UK Government, Welsh Government, Scottish Government, and Department for Infrastructure (Northern Ireland) agreed a new methodology that recognises manufacturers who were over-compliant in 2021 more effectively, rewarding historic emissions savings.

5.5 The Government Response to the consultation was published on 28 September 2023. Full details of the consultation can be found at: [A zero emission vehicle \(ZEV\) mandate and CO2 emissions regulation for new cars and vans in the UK - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/a-zero-emission-vehicle-zev-mandate-and-co2-emissions-regulation-for-new-cars-and-vans-in-the-uk) The consultation built on the two preceding consultations: [Policy design features for the car and van zero emission vehicle \(ZEV\) mandate - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/policy-design-features-for-the-car-and-van-zero-emission-vehicle-zev-mandate)⁷ (consultation open 7 April – 10 June 2022) and [CO2 emissions regulatory framework for all newly sold road vehicles in the UK - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/co2-emissions-regulatory-framework-for-all-newly-sold-road-vehicles-in-the-uk)⁸ (consultation open 14 July – 22 September 2021).

⁷ <https://www.gov.uk/government/consultations/policy-design-features-for-the-car-and-van-zero-emission-vehicle-zev-mandate>

⁸ <https://www.gov.uk/government/consultations/co2-emissions-regulatory-framework-for-all-newly-sold-road-vehicles-in-the-uk>

PART 2 – REGULATORY IMPACT ASSESSMENT

This RIA summarises the key points set out in the Joint four-nations Government Response Cost Benefit Analysis⁹ and seeks to provide a summary of the likely impacts of the proposed legislation in Wales, including apportioning the identified costs and benefits where possible. For ease of reference, table and figure numbering from the CBA have been used below.

6. Options

6.1 This section sets out the final ZEV mandate and CO₂ regulations policy position, addressing the problem under consideration. Per HMT Green Book guidance, the counterfactual represents a ‘do-nothing’ scenario whereby the ZEV mandate and CO₂ regulations are not introduced, and retained EU regulations remain.

Category	Option	Details
Do Nothing – trajectory & non-ZEV CO₂ requirements	0 - baseline	In the do-nothing scenario, Great Britain maintains the existing retained EU CO ₂ regulations. For cars, this results in 15% and 37.5% gCO ₂ /km reductions in 2025 and 2030 respectively compared to a 2021 baseline. For vans, this results in a 15% and 31% gCO ₂ /km reductions in 2025 and 2030 compared to a 2021 baseline. Manufacturers can comply via deploying ZEVs or more efficient non-ZEVs.
ZEV targets trajectory	1 – ZEV mandate trajectory + non-ZEV CO ₂ requirements	A trajectory of annual ZEV sales targets, plus a flat non-ZEV CO ₂ requirement for each manufacturer, based on 2021 data. Trading, banking, two-way credit transfers, and borrowing permitted, with final compliance payments.

Figure 1 Summary of the final policy position

6.2 The policy position summarised in the table above has been refined through extensive stakeholder engagement during both the technical consultation and the final consultation. Further information on the justification for the final policy position can be found in the supporting Government response to the consultation.

6.3 In keeping with HMT Green Book guidance for economic appraisal, this cost benefit analysis covers the direct impact of this secondary legislation. For this reason, we model the first phase of the ZEV mandate which raises targets year-on-year until 2030, after which they are assumed to stay constant for modelling purposes. However, the UK Government has stated that the second phase of the ZEV mandate (including subsequent annual targets from 2031 to 2035) will be

⁹ <https://www.gov.uk/government/consultations/a-zero-emission-vehicle-zev-mandate-and-co2-emissions-regulation-for-new-cars-and-vans-in-the-uk>

implemented at a level no less ambitious than set out in the Governments’ response to the consultation.

Counterfactual scenario

6.4 Under the current ‘Do nothing’ policy option, current retained EU CO₂ regulations remain¹⁰; this is the baseline against which the final policy position is appraised. These regulations impose a target for the average CO₂ emissions, measured in g/km, across the new car and van fleet. The targets apply to each manufacturer but are adjusted based on vehicle mass. Manufacturers can meet the requirement with any strategy through using ZEV sales or more efficient non-ZEVs. The regulations are tightened only every 5 years, meaning that no improvement in efficiency is required in the interim years.

6.5 The details of this option are set out in Figure 6. As shown, they are expected to achieve a 15% reduction in the emissions of new cars and vans from 2025, and a reduction of 37.5% and 31% from 2030, for cars and vans, respectively. There are penalties which are intended to impose prohibitive costs of non-compliance, while several flexibilities, exemptions, and derogations are included to mitigate disproportionate impacts for smaller businesses and reduce costs.

Summary of policy impacts

6.6 The primary strategic objective of this policy is to reduce carbon emissions. Table 24 presents the total non-traded carbon savings, estimated net of the counterfactual. The final policy position is estimated to have a significant impact in reducing carbon emissions over UK carbon budget period 5 (2028-2032) and 6 (2033 to 2037) and between the period 2024-2050.

	Policy carbon savings MtCO ₂ e (non-traded)
UK CB4	0
UK CB5	28
UK CB6	77
2024 – 2050	411

Table 2 Total non-traded carbon savings from cars and vans

To estimate carbon savings to Wales road traffic projections have been used from the National Transport Model (National Road Traffic Projections 22)¹¹. From this, Wales’ traffic demand is estimated at 5.6% of GB traffic demand. This proportion has then been multiplied by the

¹⁰ [https://ec.europa.eu/clima/eu-action/transport-emissions/road-transport-reducing-CO₂-emissions-vehicles/CO₂-emission-performance-standards-cars-and-vans_en](https://ec.europa.eu/clima/eu-action/transport-emissions/road-transport-reducing-CO2-emissions-vehicles/CO2-emission-performance-standards-cars-and-vans_en)

¹¹ [National road traffic projections - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/672222/nrtm22-projections-2022-2050.pdf)

GB annual emission savings from the ZEV mandate to give the estimated carbon savings to Wales from this policy as included in Table 24A below.

	Policy carbon savings MtCO ₂ e (non-traded)
Wales CB2 (2021 – 2025)	0
Wales CB3 (2026 – 2030)	0.56
Wales CB4 (2031 – 2035)	3.3
2024 – 2050	22.89

Table 3A Total non-traded carbon savings from cars and vans in Wales

6.7 Furthermore, the cost-benefit analysis appraisal highlights that these carbon savings are both cost-effective and in addition to net social benefits achieved when accounting for all impacts.

6.8 Table 25 shows the direct monetised impacts for the policy when excluding the rebound effect. In this context, the rebound effect is the change in travel demand induced through a change in the price of the good - the price of travel when consumers switch to ZEVs which have lower running costs relative to non-ZEVs. The combined benefits for cars and vans delivers a Net Present Value (NPV) of £116 billion at the GB level, with Present Value Benefits (PVB) of £166 billion and Present Value Costs (PVC) of £50 billion. Both the cars and van markets deliver positive Net Present Value over the appraisal period.

	Impact £m (present value, discounted; 2021 prices)	Policy Impact
Car	Benefits	128,652
Car	Costs	-41,444
Car	Net present value	87,208
Van	Benefits	37,833
Van	Costs	-8,974
Van	Net present value	28,859
Both	Benefits	166,485
Both	Costs	-50,418
Both	Net present value	116,067

Table 4 Expected present value direct monetised impacts excluding the rebound effect (£m, 2021 prices)

6.9 Similarly, Table 26 presents the same impacts but includes the indirect impacts associated with the rebound effect – the most important of which is increased congestion. Even with a significant increase in costs as a result of the rebound effect, the combined benefits for cars and vans delivers a Net Present Value (NPV) of £39 billion at the GB level. This includes Present Value Benefits (PVB) of £166 billion and Present

Value Costs (PVC) of £127 billion. Again, both the cars and van markets deliver positive Net Present Value over the appraisal period.

	Impact (present value, discounted; 2021 prices)	Policy impact
Car	Benefits	128,652
Car	Costs	-95,474
Car	Net present value	33,178
Van	Benefits	37,833
Van	Costs	-31,790
Van	Net present value	6,043
Both	Benefits	166,485
Both	Costs	-
		127,264
Both	Net present value	39,221

Table 5 Expected present value direct monetised impacts including the rebound effect (£m, 2021 prices)

6.10 In both cases, the policy is expected to achieve good value for money.

6.11 A detailed apportionment of the cost and benefits to Wales has not been undertaken due to the complexity of the task. Some of the costs e.g. government administration costs don't apply to Wales. It is reasonable to conclude that the costs and benefits will not be dissimilar to the Wales' share of GB population, 4.78% (2021 Census data). Present value benefits to Wales are estimated at £7.958 billion, present value costs to Wales are estimated at -£2.410 billion (-£6.083 billion including rebound effect), and Net Present Value to Wales at £5.548 billion (£1.875 billion including rebound effect).

Costs

Administration costs

6.12 The legislation is likely to lead to small administrative costs for both business and the UK Government. Vehicle manufacturers will be required to familiarise themselves with new requirements, set up new systems, monitor their progress against annual targets, and potentially adjust behaviour to ensure compliance.

6.13 Ongoing manufacturer administrative costs are not expected to materially differ from costs they would face in the 'do-nothing' scenario, in which they would be expected to comply with existing CO₂ regulations. Therefore, expected ongoing costs net of the counterfactual are £0.

6.14 The UK Government will be responsible for meeting the costs associated with both administering and monitoring the scheme.

Capital costs

- 6.15 A direct impact of the regulated targets is the cost of supplying more ZEVs into the market. A price differential exists for ZEVs vs non-ZEVs currently on the market, and this is expected to persist, primarily driven by the continued developing nature of battery packs versus the incumbent and established ICEV technologies.
- 6.16 Any indirect effect – cost ‘pass-through’ – could occur through higher consumer prices to purchase a vehicle, as a result of the higher costs manufacturers face. However, this is contingent on manufacturers’ price competition strategies within their respective segments in the market.
- 6.17 The wider analysis included in the Cost Benefit Analysis suggests that, on average, BEV owners are expected to realise net disposable income gains as a result of switching to BEVs. These savings are expected to grow over time as capital costs are expected to fall and are expected to be even greater for those purchasing BEVs on the second-hand market.
- 6.18 The impact to industry is quantified in each year by estimating the total capital value of the sales mandated to switch to ZEVs versus those non-ZEVs they replace in the baseline.
- 6.19 The vehicle sales by powertrains (taken from the ZEV trajectory) are multiplied by their respective vehicle costs to provide the total value of the capital assets in the market. The difference is then taken between the ZEV mandate scenario and the baseline to provide the additional capital cost borne by the industry. Impacts are discounted using the standard (3.5% for the first 30 years of the appraisal period, 3% thereafter) discount rates in line with HMT’s Green Book Guidance. As a result, we expect central impacts of ~£27bn (2021 prices, discounted) to GB industry.
- 6.20 An apportionment of the capital cost to industry in Wales has not been undertaken due to the multi-national nature of vehicle manufacture and the complexity of how these costs would impact on ‘parent companies’. The Automotive sector in Wales comprises over 150 companies – including Original Equipment Manufacturers like Ford and Toyota, as well as high value/tier 1 suppliers such as Schaeffler and Calsonic Kansei¹².

¹² https://tradeandinvest.wales/sites/tradeinvest/files/2021-11/automotive_low_res.pdf#:~:text=The%20automotive%20sector%20in%20Wales%20features%3A-%20%E2%80%94%20Over,over%2018%2C000%20people.%20%E2%80%94%20C2%A33%20billion%20annual%20turnover.

Infrastructure costs

6.21 The ramp-up in ZEV sales will require significant infrastructure investment to provide sufficient charging capacity. This analysis focuses on electric chargepoints, which are the dominant form of ZEV infrastructure in 2023. A ‘baseline’ chargepoint cost trajectory is deducted from the policy scenario’s trajectory to reflect the marginal cost of the ZEV mandate.

6.22 The present value costs associated with the GB infrastructure requirements are presented in Table 33, below. It should be noted that these costs include the private costs borne by those installing and maintaining the chargepoints, i.e. predominantly households and businesses; these are not costs to Distribution Network Operators (DNOs). Additional costs of reinforcing the electricity grid are covered elsewhere.

Vehicle type	Cost type	Net cost, £m
Car	Capex	8,467
	Opex	1,722
	Total	10,189
Van	Capex	2,434
	Opex	554
	Total	2,988

Table 6 Present value infrastructure costs (present value; 2021 prices; £m)

6.23 The below costs have been apportioned according to Wales’ proportion of GB traffic demand (5.6%). As described above, additional costs for reinforcing the electricity grid in Wales are not included in these figures.

Vehicle type	Cost type	Net cost, £m
Car	Capex	474
	Opex	96
	Total	570
Van	Capex	136
	Opex	31
	Total	2167

Table 7A Present value infrastructure costs Wales apportionment (present value; 2021 prices; £m)

Tax impacts

6.24 The increasing switch from petrol and diesel to electricity, on which fuel duty is not charged, and VAT is charged at a reduced rate for

home charging, is likely to lead to a reduction in taxes paid by consumers, for a constant level of fuel demand.

6.25 In line with the Green Book guidance, transfers of resources between people (e.g., gifts, taxes, grants, subsidies, or social security payments) should be excluded from the overall estimate of Net Present Social Value (NPSV). This is because the cost to one party is exactly offset by and equal to the benefit to the other, leading to no net change in social welfare.

6.26 In line with the Transport Analysis Guidance/Green Book guidance this tax revenue change is counted as a transfer. However, this transfer is non-trivial for HM Treasury and is therefore estimated in this assessment. DfT will work with HMRC and HM Treasury to understand the implications of this transfer.

Powertrain	Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Car	£m	107	138	144	111	-119	-544	-1123	-1634	-2077	-2458	-2784	-3066
Van	£m	-29	-27	-70	-161	-309	-508	-653	-787	-896	-985	-1057	-1122

Table 8 Tax revenue transfers, fuel duty and VAT (2021 prices, discounted; negative values imply a reduction in tax revenue)

6.27 The increase in VAT revenue resulting from increased electric mileage per driver is included in the monetised appraisal and shown in Table 36. Unlike tax transfers, this additional impact is included in the monetised appraisal.

Vehicle type	Net cost
Car	-3,222
Van	-2,529

Table 9 VAT revenue associated with the rebound effect (Present value; 2021 prices; £m)

Benefits

Carbon impacts

6.28 The legislation will lead to a significant change in the fuel consumption of the UK and Welsh car and van fleet, as Internal Combustion Engine Vehicles are gradually replaced by ZEVs. Petrol/diesel fuel consumption falls as the number of these sales falls relative to the baseline, while there is some increase in electricity consumption due to the greater number of ZEVs and the associated rebound effect.

6.29 The reduction in consumption of petrol and diesel reduces non-traded emissions, whereas the small increase in electricity demand will come with an additional, albeit much smaller, cost of increased traded

emissions (shown in Figure 39 and Figure 40), until electricity generation is decarbonised.



Figure 10 Annual car traded and non-traded emissions savings for the ZEV mandate

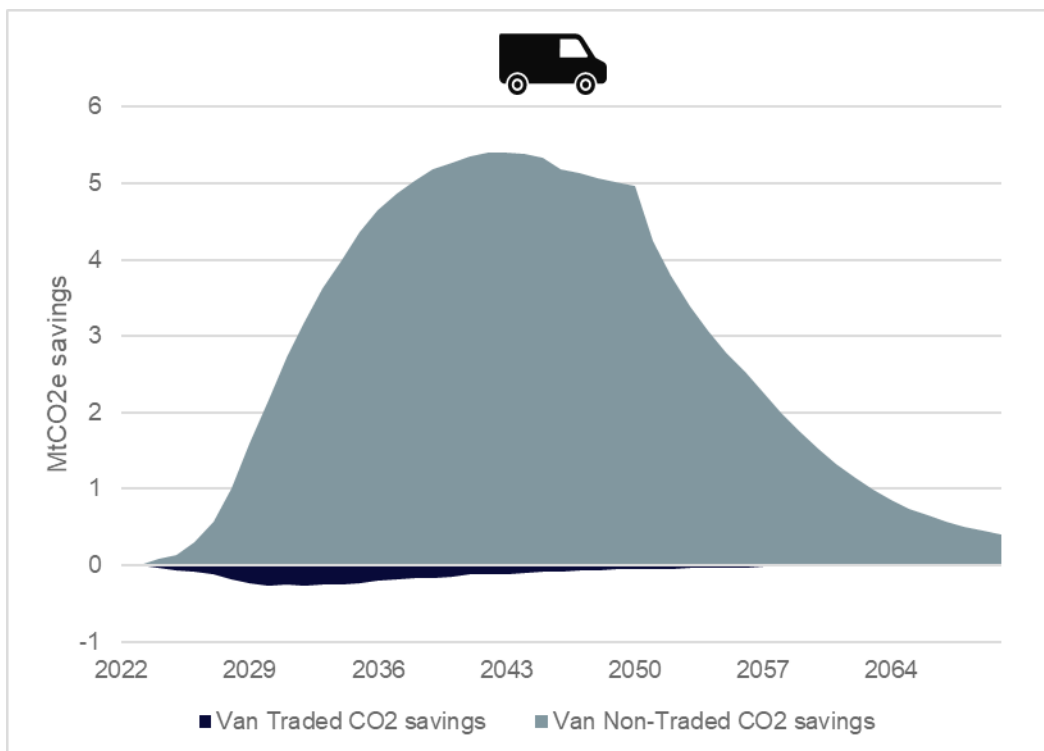


Figure 11 Annual van traded and non-traded emissions savings for the ZEV mandate

Vehicle type	Emission type	Net benefit (£m)
Car	Traded CO ₂ e	-727
Van	Traded CO ₂ e	-862
Car	Non-Traded CO ₂ e	79,083
Van	Non-Traded CO ₂ e	23,859
Car	Net impact	78,355
Van	Net impact	22,996
Both	Net impact	101,351

Table 12 Traded and non-traded monetised impacts for cars and vans (present value; 2021 prices; £m)

6.30 These impacts are monetised using the published DESNZ carbon values and are discounted in line with Green Book Appraisal Guidance. As shown, non-traded emissions savings and benefits far outweigh the increase in traded emissions. The net effect is expected to be just over £100bn in social benefits (for cars plus vans), and 407 MtCO₂e between 2024 and 2050.

6.31 Applying the 5.6% Wales traffic demand apportionment used previously the net impact for Wales is £5.6 billion in social benefits (cars and vans), and 22.79 MtCO₂e between 2024 and 2050.

Fuel impacts

6.32 As the energy cost of driving electric vehicles is lower than the fuel cost for petrol/diesel vehicles (before tax), these requirements lead to a resource benefit to society as shown in Table 42 below.

Vehicle type	Value	Net benefit (£m)
Car	Fuel Cost	34,583
Van	Fuel Cost	4,151

Table 13 Fuel cost to society (present value; 2021 prices; £m)

6.33 However, there are uncertainties associated to the relative forecasts of different fuel costs, due to a range of global shocks which could affect both supply and demand for each fuel.

Vehicle operation impacts

6.34 Operation cost (e.g. repairs, servicing and replacing worn components) savings are significant for both cars and vans. This suggests that, although there may be greater up-front costs associated with ZEVs, particularly in earlier years, ZEV drivers are likely to experience significantly lower running costs. Estimated net operating cost savings are presented in Table 43.

Vehicle type	Value	Net benefit (£m)
Car	Operating Cost Savings	9,370
Van	Operating Cost Savings	5,974

Table 14 Operation cost savings for cars and vans (present value; 2021 prices; £m)

Air quality impacts

6.35 An uptake in ZEV policies is expected to have net co-benefits of cleaner air and associated wider economic benefits. ZEVs almost exclusively have no exhaust emissions of particulate matter (PM) or NOx, which are emitted by petrol and diesel engines and which contribute to poor air quality.¹³ Differences in air quality impacts stemming from non-exhaust PM are more complex, uncertain, and mixed.

6.36 Air quality impacts are discounted using Health discount factors, in line with Transport Analysis Guidance. The resulting estimated air quality impacts are presented in Table 44; as shown, this results in net benefits to society, despite potential increases in PM (from more mileage from ZEVs and therefore road abrasion and tyre and brake wear) driving some social costs.

Vehicle type	Air quality impact type	Net benefit (£m)
Car	NOx cost	724
Car	PM cost	-312
Van	NOx cost	781
Van	PM cost	-223

Table 15 Present value air quality impacts under the Policy (present value; 2021 prices; £m)

Consumer surplus impacts

6.37 The switch to ZEVs is assumed to lead to increased mileage per ZEV driver, and when thinking of driving a mile as a normal good, these additional trips have an economic social benefit to drivers – the value of the additional trips taken. As a result, we expect marginal benefits to drivers, as shown in Table 45.

Vehicle type	Value	Net benefit (£m)
Car	Consumer Surplus	1670
Van	Consumer Surplus	540

Table 16 Present value consumer surplus benefits (present value; 2021 prices; £m)

¹³ [Consultation on environmental targets - Defra - Citizen Space](#)

Unmonetised impacts

6.38 Unmonetized impacts are described in detail in the ZEV mandate CBA. These include indirect downstream business impacts such as those for car and van garages, traders, and dealerships for additional training required to sell, maintain, repair, and service ZEVs. These one-off costs are deemed to be indirect and expected to be of a low magnitude. They also include jobs and growth impacts which are inherently uncertain, and typically fall outside the scope of UK Government cost benefit appraisals. Due to this uncertainty the impact of the ZEV mandate on manufacturing jobs has not assessed as part of this analysis.

6.39 The analysis estimates infrastructure FTE employment (e.g. in manufacture and installation of EV chargepoints supported) is anticipated to be around 12,000 Full Time Equivalent (FTE) jobs per year by 2030.

6.40 In terms of lifecycle emissions DfT have recently published [research](#) which quantifies the lifecycle emissions of road transport and this shows that the transition to zero emission vehicles significantly reduces carbon whether appraised from a life cycle or exhaust emission perspective. This research suggests that overall, BEVs are expected to reduce GHG emissions by 65% compared to a petrol car today, and this rises to 76% by 2030.

Indirect costs and benefits

Rebound effect impacts

6.41 The ZEV mandate is expected to increase the number of more cost-efficient vehicles on the road; the relative cost-effectiveness of driving (£/km).

6.42 There is some uncertainty regarding the likely magnitude of any rebound effect. Firstly, there are several determinants of the retail price of fuels, including supply- and demand-side drivers and tax policies. Changes in one or more of these determinants could lead to differences in the relative prices of fuels, compared to those used in this analysis.¹⁴

6.43 Secondly, this analysis is limited to the direct and isolated effect of the legislation. However, there are several other changes in the transport sector which may affect induced demand for driving. For instance, road building and active travel investments.

Energy system impacts

6.44 Energy systems modelling has been undertaken to provide additional assurance on the changes to the energy system of the ZEV

¹⁴ See Fuel Benefits.

mandate. This legislation is expected to lead to a significant increase in electricity demand, relative to the baseline, reflecting the gradual increase in ZEV uptake and their share of the overall fleet.

Value	Net Present Value (£m)
Including the rebound effect	32,786 (25,917)
Excluding the rebound effect	109,632 (102,763)

Table 17 Net present value when adjusted energy system impacts are included (present value; 2021 prices; £bn)

6.45 Table 59 presents the policy net present value when these impacts are included. From this, it can be concluded that the policy still achieves value for money when accounting for upstream system-wide impacts.

7. Competition assessment

7.1 The regulations will have some differential impact on firms of different sizes, as small volume manufacturers (SVMs – those with fewer than 2,500 car or van registrations per year) will be exempt from annual ZEV targets.

7.2 For non-exempt manufacturers (around 99.5% and 97.5% of GB sales, for cars and vans, respectively), these regulations are expected to apply similarly. This is because each manufacturer’s target will be based on a proportion of their sales in a given year.

7.3 The cost of setting up new systems to monitor and ensure compliance may have a disproportionate impact on smaller firms. These costs are likely to be relatively fixed and so larger manufacturers will be able to spread the cost over a greater number of sales. However, the costs are expected to be relatively small since any new business functions will replace those that monitor and ensure compliance under existing EU regulations. Current analysis suggests that the costs of setting up this function, relative to current regulatory requirements, are likely to be less than £200k per manufacturer, on average. On this basis, the effect of these fixed costs on competition is likely to be negligible.

7.4 In addition, the scheme includes a number of policy details which are intended to limit any differential impacts which could affect competition or discourage new car and van manufacturers from entering the market. The rationale and methodologies under-pinning each of these policy details are explained in greater detail in the GB impact assessment.

8. Post implementation review

8.1 The approach to monitoring of this legislation is for a statutory post-implementation review in 2029, supplemented by non-statutory annual

reporting, a non-statutory mid-point review in 2027, and continuous monitoring of vehicle data by the administrator to safeguard against any potential adverse effects.

8.2 A statutory review clause is included in this instrument.