Department for Transport

Consultation on a New Heavy Goods Vehicle CO_2 Emissions Regulatory Framework for the United Kingdom

January 2026

Department for Transport
Great Minster House
33 Horseferry Road
London
SW1P 4DR

This publication is also available on our website at
www.gov.uk/government/organisations/department-for-transport

Any enquiries regarding this publication should be sent to us at
www.gov.uk/government/organisations/department-for-transport

Contents

Ministerial Foreword

Heavy-goods vehicles (HGVs) are integral to our lives. Each and every day, lorries transport millions of pounds worth of essential goods throughout the UK, delivering food to our supermarkets, medical equipment to our hospitals, and construction material to build our homes. With more than four-fifths of our goods transported by road, the road freight sector employs over 290,000 workers across more than 50,000 businesses around the UK and adds £18 billion to our economy each year. The critical role of HGVs will continue, even if we can make better use of rail freight for longer distances, or cargo bikes and electric vans in the 'last mile'.

Today, lorries have a high environmental impact. Their exhausts emit 16% of greenhouse gas emissions and 5% of NOx emissions from domestic transport in the UK. That is why we are firmly committed to accelerating the transition to clean technologies and to setting a path to phase out the sale of all new non-zero emission heavy goods vehicles up to and including 26 tonnes by 2035, and all new non-zero emission heavy goods vehicles by 2040.

This consultation begins the discussion around how we may design a regulation to enable these phase out dates. Some HGVs may be challenging to shift towards zero-emission, particularly those that drive long distances, carry very heavy loads, or have demanding mission profiles. To address this, we are open to views on which phase out date should apply to challenging-to-decarbonise HGVs. As the shift to zero-emission technologies continues, it brings with it a rapid change in technology, with ever better, cheaper and more capable vehicles. Ambitious regulation for cars and vans has shown how, through regulations, designed with the sector, we are able to unlock billions of pounds of investment in infrastructure, drive forward cheaper vehicles with longer ranges and support the automotive sector to prepare for the future, all while reducing CO_2 emissions. The market for zero-emission cars and vans in the UK in 2024 was the largest of any European country by volume. But we recognise it is not without challenges, as some manufacturers are finding it challenging to sell ZEVs, or do not yet have the products available.

Heavy-goods vehicles are, by their very nature, significantly more challenging to decarbonise than cars and vans. They drive further and require more power to deliver this range as a zero-emission technology. While the public charging infrastructure for heavy-goods vehicles is growing fast, it's not sufficient today to meet the daily driving range of our long-haul vehicles. While the market for zero-emission heavy-goods vehicles is growing rapidly in our neighbouring countries – driven in part by stricter regulation – without action, the UK risks falling behind.

As the UK takes a leading role in the shift away from fossil fuels and towards cleaner technologies, through this consultation we will step up our work with the sector to determine the best way to deliver our shared ambitions for clean HGVs. We will work to develop a clear roadmap to transition our road freight sector to zero-emissions, maintain our competitiveness, boost jobs and growth and to ultimately lower the costs for the logistics sector and consumers. We are committed to working openly with the sector to deliver this transition and to understand the best way to overcome challenges and harness the opportunities this presents.

With supportive regulation, we intend to firmly establish the UK as a leader in tackling the climate crisis, while creating an environment for our world-class freight sector to thrive as the world transitions to zero-emission vehicles and bringing vehicles to market which can drive down costs for consumers and freight operators. This consultation takes the first step in designing this regulation in partnership. While we are committed towards delivering a phase-out of new non-zero emission heavy-goods vehicles, we are determined to work collaboratively on the road to get there.

This consultation marks the beginning of these discussions, to hear views on how a future regulation may be designed to ensure we develop a world-class standard achievable by industry and capable of delivering a clean energy future for Britian.

Keir Mather MP

Parliamentary Under-Secretary of State (Minister for Aviation, Maritime and Decarbonisation)

Executive summary

Introduction

1. The Climate Change Act 2008 commits the UK to achieving economy-wide net zero CO_2 emissions by 2050, with the decarbonisation pathway marked by legally binding five-yearly carbon budgets. Accelerating to net zero offers huge opportunities for the UK. Domestic transport is the biggest contributor to the UK's greenhouse gas emissions (GHG), comprising 29% of emissions in 2023.[1]

2. Heavy goods vehicles (HGVs) created 16% of domestic transport's GHG emissions in 2023. Reducing these emissions and phasing out the sale of new non-zero emission heavy goods vehicles (non-Zero Emission HGVs) will therefore play a significant role in delivering the UK's net zero commitment and provide certainty to stakeholders on the future of the sector. Fortunately, technologies capable of reducing and removing CO_2 emissions from commercial vehicles exist, and a global transition to Zero Emission (ZE) HGVs is picking up pace.

[1] 2023 UK greenhouse gas emissions: final figures - data tables. https://www.data.gov.uk/dataset/9568363e-57e5-4c33-9e00-31dc528fcc5a/final-uk-greenhouse-gas-emissions-national-statistics

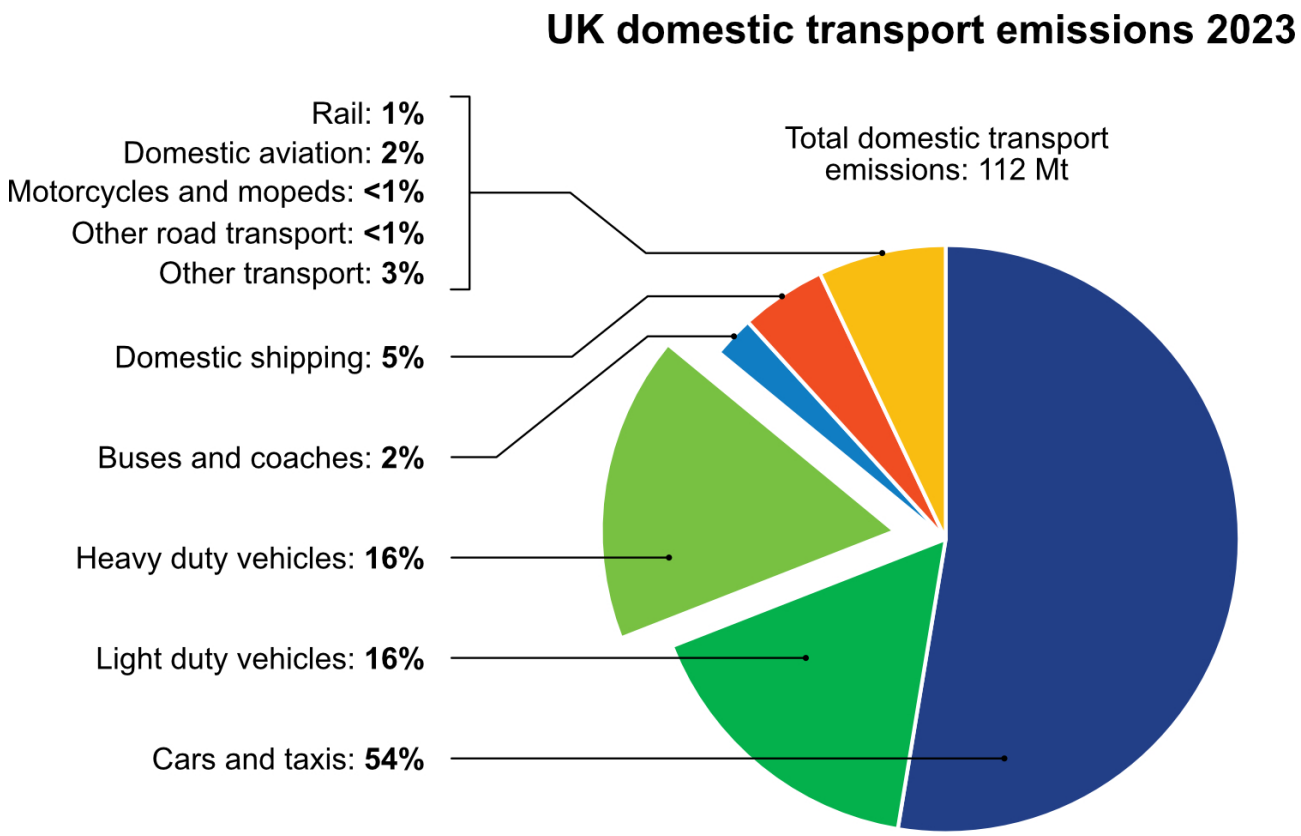


Figure 1. CO_2 equivalent share in domestic transport by source category, in million tonnes carbon dioxide equivalent. Source – 2023 UK greenhouse gas emissions national statistics

3. Following exit from the European Union, the UK retained the EU's CO_2 emissions regulations requiring manufacturers to reduce exhaust CO_2 emissions from most new trucks by 15% by 2025 and 30% by 2030 relative to 2019.[2] These standards alone will not deliver the UK's transition to ZE HGVs, nor the carbon savings required to achieve economy-wide net zero by 2050.

4. To support the move to net zero, in July 2021, a consultation sought evidence on when to end the sale of new non-ZE HGVs[3] alongside a green paper on a New Road Vehicle CO_2 Emissions Regulatory Framework for the UK.[4]

5. Following consultation, in November 2021, the then government announced at COP26 in Glasgow its intention to regulate to end the sale of new non-ZE HGVs weighing up to, and including 26 tonnes from 2035, and to end the sale of all new non-ZE HGVs by 2040.[5] Through this consultation, we are committing to maintain the

[2] Regulation (EU) 2019/1242, https://www.legislation.gov.uk/eur/2019/1242/contents

[3] Heavy goods vehicles: ending the sale of new non-zero emission models, https://www.gov.uk/government/consultations/heavy-goods-vehicles-ending-the-sale-of-new-non-zero-emission-models

[4] Green Paper on a New Road Vehicle CO_2 Emissions Regulatory Framework for the United Kingdom, https://www.gov.uk/government/consultations/CO_2-emissions-regulatory-framework-for-all-newly-sold-road-vehicles-in-the-uk

[5] UK confirms pledge for zero-emission HGVs by 2040 and unveils new chargepoint design, https://www.gov.uk/government/news/uk-confirms-pledge-for-zero-emission-hgvs-by-2040-and-unveils-new-chargepoint-design

ambition of these phase-out targets, while remaining open to the means of their delivery.

6. Transitioning to greener transport may be achieved through increasing the number of ZE vehicles and through reducing CO_2 emissions from new conventional HGVs. This transition brings many benefits to consumers and businesses, including reduced running costs, cleaner air and a protected environment for everyone to share.

7. Establishing an ambitious regulatory framework would underline the UK's commitment to accelerate net zero and drive investment in infrastructure. It would bring opportunity to our manufacturing sector through ensuring a security of supply of ZE HGVs and their components and position the UK as a leader in zero-emission vehicle technologies, as the global transition continues to gather momentum. A stable policy framework provides substantial opportunity for growth. As the world shifts to ZE HGVs, clear regulation will drive domestic investment in the ZE market, and wider infrastructure, positioning the UK as a global leader in the sales and production of ZE HGVs and their components.

8. Transitioning to ZE HGVs can mean reduced costs for freight operators, and ultimately consumers. Today, most ZE HGVs cost more to purchase than diesel HGVs. But for many typical use cases and without government grants, we expect the Total Cost of Ownership (TCO)[6] of small rigid ZE HGVs to reach parity with their diesel counterparts during the mid-to-late 2020s, and for the largest articulated HGVs in the first half of the 2030s. TCO parity can be reached earlier than this with government support, such as the Plug-in Van and Truck Grant and the Depot Charging Scheme.

9. The UK remains a signatory of the Global Memorandum of Understanding (MoU) on zero-emission medium and heavy-duty vehicles (ZE MHDVs) - which includes trucks, buses, and coaches - that aspires to reach a sales share of 30% for new ZE MHDV sales by 2030 and 100% by 2040.[7]

Supply side regulations in the UK

10. The Vehicle Emission Trading Scheme Order 2023 came into effect in January 2024. It is the legal and regulatory framework that enforces the ZEV Mandate for cars and vans. This framework is among the most ambitious regulatory frameworks of its kind in the world and was carefully designed through ongoing engagement with industry and other key stakeholders. This regulation is crucial to tackling CO_2 emissions from our highest emitting transport sector. The success of this framework has already been clear: by the end of 2024, the UK had become the single largest market in Europe for ZE cars by volume. It has also promoted significant investment, already unlocking over £6bn of charging infrastructure investment in the UK. There are already over one million battery electric vehicles on our roads, with increasing numbers of models becoming available and purchase costs for consumers falling.

[6] The Total Cost of Ownership represents the cost of buying and running a new HGV to its first owner over the course of the vehicle's expected lifetime before being scrapped or sold.

[7] Memorandum of Understanding on Zero-Emission Medium- and Heavy-Duty Vehicles, https://globaldrivetozero.org/mou-nations/

11. To restore the 2030 phase out date for new cars powered solely with an internal combustion engine and support the ZEV transition, government launched a consultation in December 2024,[8] and published the joint government's response in April 2025. While sales of ZE vehicles are increasing rapidly, some manufacturers may find the transition harder than others, needing to rely on discounts and flexibilities to meet their annual targets. That is why we have amended the Vehicle Emission Trading Scheme Order 2023 to provide additional compliance flexibilities, as set out in the joint government's response.[9]

12. The transition for HGVs will have its own challenges. These vehicles require much larger powertrains and, on average, drive much greater distances than cars and vans which will need significant charging infrastructure support. While we have become a leader in the sale of ZE cars, we are lagging behind with HGVs. Advanced regulations on the supply side, more generous incentives and infrastructure have led to our neighbouring countries embarking on the transition to ZE HGVs at an accelerated pace. In 2024 the UK had a ZE HGV new registrations share of 0.6% (rising to 1% in Q1 and Q2 of 2025), [10] compared to a 2.0% market share of sales in 2024 across the EU-27 and 4.5% in Germany.[11]

13. This consultation is an opportunity to engage with stakeholders on how a future regulatory framework may be designed to support delivery of the government's missions to kickstart economic growth and make Britain a clean energy superpower, all while considering flexibilities needed to meet individual manufacturer transition plans. It seeks views on the approaches to reducing exhaust CO_2 emissions from new non-ZE HGVs, increasing the numbers of new ZE HGVs on UK roads, and to setting out a stable regulatory pathway towards the government's intention of ending the sale of new non-ZE HGVs up to and including 26 tonnes by 2035, and all new non-ZE HGVs by 2040.

14. It is also an opportunity to explore whether the scope of this regulatory framework may also be used as a mechanism for reducing the CO_2 emissions in the coach sector, as many HGV manufacturers also produce coaches that are sold in the UK. The consultation further explores if any vehicles should be left exempt from a future regulation.

15. Across the five parts of this consultation, we are seeking views on some of the potential design features of this future regulation:

[8] Phasing out sales of new petrol and diesel cars from 2030 and supporting the ZEV transition https://www.gov.uk/government/consultations/phasing-out-sales-of-new-petrol-and-diesel-cars-from-2030-and-supporting-the-zev-transition

[9] https://www.gov.uk/government/consultations/phasing-out-sales-of-new-petrol-and-diesel-cars-from-2030-and-supporting-the-zev-transition/outcome/phasing-out-sales-of-new-petrol-and-diesel-cars-from-2030-and-supporting-the-zev-transition-summary-of-responses-and-joint-government-response

[10] **df_VEH0160_UK**: Vehicles registered for the first time by body type, make, generic model, and model: United Kingdom. https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-files

[11] ICCT data on EU registrations for medium and heavy trucks, 2024

- Part A presents the current market status of ZE HGVs in the UK including the regulatory background, the availability of ZE HGVs today, and current initiatives aimed at promoting the deployment of ZE HGVs.

- Part B presents the regulatory options under consideration, such as an expansion of the existing CO_2 emissions regulations, a manufacturer's ZEV mandate, or an operator fleet adoption requirement.

- Part C considers the scope of the vehicles that are under consideration for a future regulatory framework. It also presents the eligibility criteria for ZE vehicles that are under consideration.

- Part D presents options on the categorisation of vehicles, the weightings, flexibilities, and explores penalties for non-compliance.

- Part E seeks input on CO_2 emissions reduction trajectories for a future regulatory framework.

16. A full list of all consultation questions is available in Annex A. A summary of the categorisation of HGVs under the existing regulatory landscape is available in Annex B, and a summary of the CO_2 standards in place in other major markets for HGVs is available in Annex C.

Part A: Current market status

17. The HGV sector, covering vehicles with a gross vehicle weight (GVW) of more than 3.5 tonnes, is the second highest contributor to GHG emissions in the domestic transport sector, after cars.[12]

18. At the end of 2023, HGVs were just 1% of the licensed stock of road vehicles in the UK,[13] but created 16% of total domestic transport GHG emissions.[14]

19. At the end of 2024, over 495,000 HGVs were licensed in the UK. Over the last five years, an average of 41,200 HGVs were registered as new each year, of which around half had a maximum gross train weight[15] equal to and below 26 tonnes, with around half above 26 tonnes (see Figure 2).[16]

20. There were also over 143,000 buses and coaches licensed at the end of 2024, with average annual new registrations of 5,900. Coaches and their potential scope for inclusion in this regulatory framework are discussed in more detail in Part C.

[12] Zero Emissions Zero Emissions Vehicles of category N2 with a GVW between 3.5 and 4.25 tonnes are covered under the scope of the Vehicle Emission Trading Scheme (2023), otherwise known as the ZEV mandate. We omit these classes of vehicles from the statistics in this section.

[13] df_VEH0120_UK: Vehicles at the end of the quarter by license status, body type, make, generic model and model: United Kingdom. https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-files

[14] UK greenhouse gas emissions: final figures - data tables. https://www.data.gov.uk/dataset/9568363e-57e5-4c33-9e00-31dc528fcc5a/final-uk-greenhouse-gas-emissions-national-statistics

[15] The maximum gross train weight refers to the gross vehicle weight of both the motorized HGV and the trailer it is permitted to tow.

[16] df_VEH0160_UK: Vehicles registered for the first time by body type, make, generic model, and model.; df_VEH0520_UK: Goods vehicles over 3.5 tonnes registered at the end of the year by country, tax class, wheelplan, detailed body space type, maximum gross weight band, year of first use and fuel: United Kingdom. https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-files

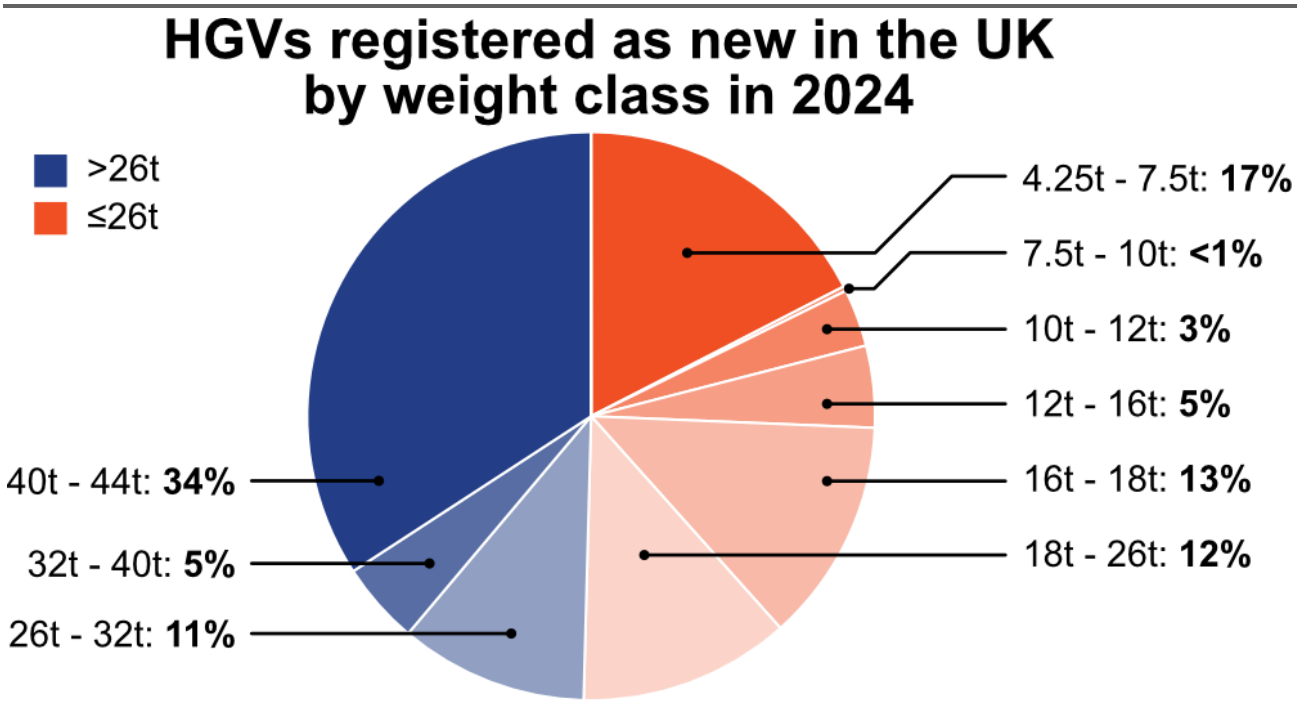


Figure 2. HGVs registered as new in the UK in 2024 by maximum weight. Vehicles with a weight between 3.5 and 4.25 tonnes are excluded from these statistics. Source - DfT statistics

21. Most of the UK's HGV stock is powered by a diesel combustion engine, comprising 98.1% of sales of new HGVs in 2024, and with vehicles powered by a natural gas engine, representing 1.3%. The ZE HGV market is nascent in the UK, accounting for 0.6% share in 2024. The EU-27 average over the same period was 2% (Figure 3).

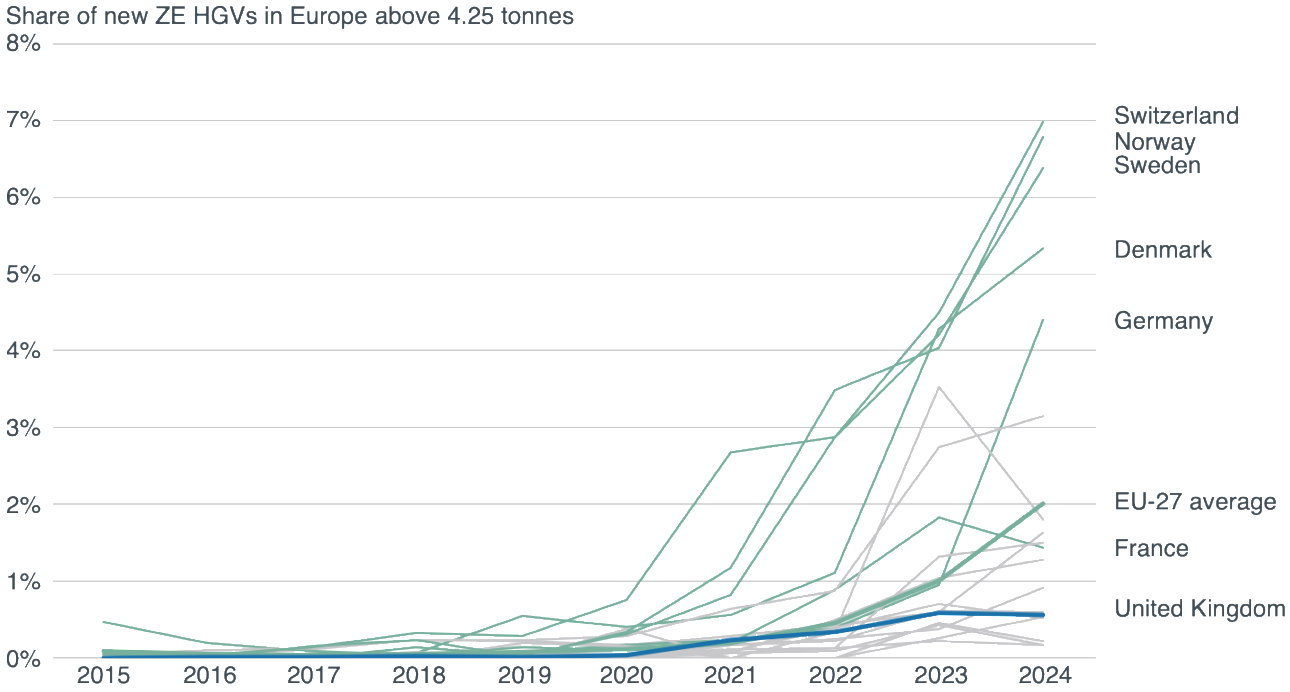


Figure 3. Sales shares of ZE HGVs in the UK compared against European countries, excluding 3.5-4.25 tonnes. Source – DfT Statistics, ICCT.

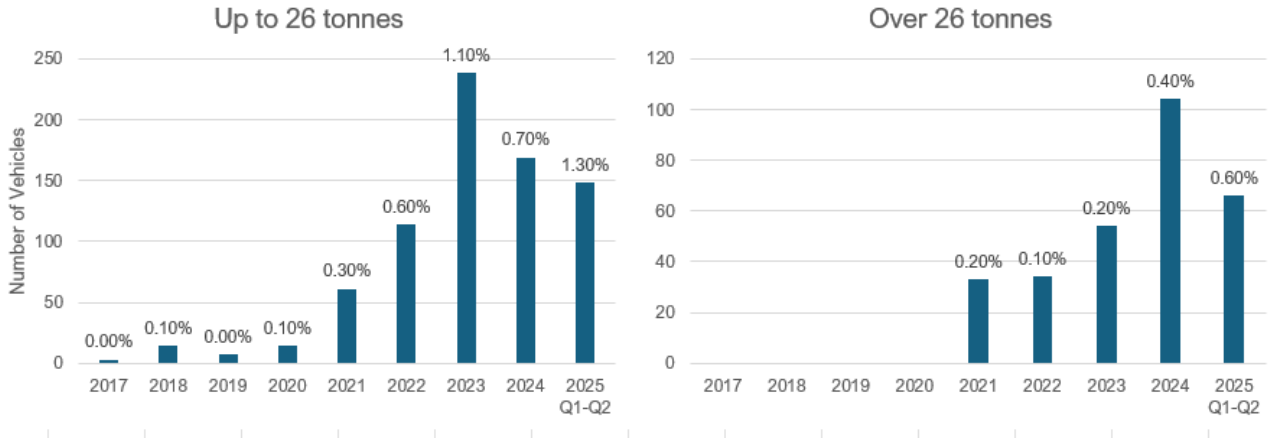
22. An additional 3,502 ZE HGVs with a GVW between 3.5 and 4.25 tonnes were registered by the end of 2024, however under the Vehicle Emissions Trading

Schemes Order (2023),[17] also known as the ZEV Mandate, these vehicles are counted as light-duty vehicles when they have a zero-emission powertrain.

23. Registration of new ZE HGVs in the UK have been largely concentrated in vehicles with a GVW up to 26 tonnes and have increased in the past three years. In 2025 up to Q2, 148 ZE HGVs up to 26 tonnes were registered as new, all of which are battery electric, representing 1.3% of all registered as new in the weight category (Figure 4).[18]

24. Registrations of new ZE HGVs over 26 tonnes are significantly lower, with 66 ZE HGVs over 26 tonnes registered as new in 2025 up to Q2, compared to over 105,000 conventionally fuelled HGVs, representing a zero-emission share of 0.6%, all of which are battery electric. More HGVs are coming to market and the Zero-Emission Heavy Goods Vehicles and Infrastructure Demonstrator (ZEHID) – a government led programme which has already provided over £120 million in funding – is expected to deliver around 300 additional ZE HGVs above 40 tonnes in 2025 and 2026 and to kickstart nationwide investment in the essential charging and fuelling network needed to keep them moving.

25. HGVs over 26 tonnes are also the largest contributor to GHGs in the road freight sector. The most popular HGV category in the UK, articulated HGVs with a 6x2 axle configuration over 26 tonnes, may drive over 60,000 miles per year and are responsible for approximately 60% of the CO_2 emissions emitted from the road freight sector.[19]



[17] The Vehicle Emissions Trading Schemes Order (2023) https://www.legislation.gov.uk/uksi/2023/1394/contents

[18] Based on DfT statistics

[19] CO_2 calculated through applying the reference CO_2 values in accordance with (EU) 2021/781 and (EU) 2023/2698, and the reference mileages and payloads identified in Annex I of (EU) 2024/1610 to the sales of vehicles from DfT statistics.

Figure 4. Registrations new ZE HGVs by weight category in the UK. Shares as a percentage of all HGVs registered as new in the weight category are denoted in each bar. Source – DfT Statistics

26. Other markets have already implemented more stringent regulatory standards than those currently in place in the UK, such as the EU.

27. The effectiveness of any regulation placed on the supply side of the market is dependent on a supportive policy framework and infrastructure network that enables rapid charging and refuelling for long-haul operations.

28. Sales of new ZE HGVs globally have been increasing consistently in recent years, growing over three-fold from 18,000 sales in 2020 to 90,000 in 2024.[20] While sales were almost entirely concentrated in China in early years, sales in Europe – particularly in Germany, France, the Netherlands, and Sweden – have accounted for a rising share due to European manufacturers expanding their portfolios of ZE HGVs. More models are expected to come to market in the coming years with greater ZE capability, and with vehicle ranges of over 300 miles (500 km).

29. Technological innovation, driven in part through effective regulation of the GHG emissions from new diesel HGVs sold in the EU, and consistently falling lithium-ion battery prices have contributed to a falling cost differential between ZE HGVs and their conventional counterparts. These innovations are also expected to deliver ZE HGVs with greater ranges to the market as the sector continues to develop. As the TCO of ZE HGVs continues to fall, freight operators are expected to start to see cost savings from adopting these vehicles over the conventionally fuelled HGVs.

Rationale for intervention

30. There is a strong case for government intervention to correct for market failures; in the absence of regulation, it is highly unlikely that the market will deliver the transition to ZE HGVs that is needed to reach net zero. Non-ZE HGVs emit harmful emissions that contribute to climate change and reduce our air quality, which have an external cost on individuals who are not directly involved in the transactional decision. As such, these costs are not reflected in market prices. This is a negative externality, whereby the existence of the social external cost results in the over-consumption and over-production of a good beyond the socially optimal level.

31. The UK was the first major economy to legislate the requirement to reach net zero CO_2 emissions by 2050. Driven by the Renewable Transport Fuel Obligation, low carbon fuels are already delivering significant carbon savings in the current surface transport fleet, including HGVs. However, to deliver net zero and combat air pollution, we now need to accelerate the transition to ZE HGVs. Market intervention is needed to ensure that their roll-out comes at the pace needed to reduce emissions in line with legally binding carbon budgets.

32. There is also a coordination failure between the deployment of ZE HGVs and the necessary infrastructure needed for their charging and fuelling. These nascent markets require scaling up in tandem to ensure that investments in infrastructure

[20] IEA, Global EV Outlook 2025: Trends in heavy-duty electric vehicles – Global EV Outlook 2025 – Analysis - IEA

provision make commercial sense for private investors. Regulatory intervention will send a clear signal to the market, providing certainty that the sector needs to move forward with the transition to ZE technologies.

Real world usage of HGVs

33. HGVs are used for many different purposes in the UK and beyond, carrying a variety of loads and driving varying distances daily. The freight operator market is also comprised of a vast array of actors, varying from single vehicle owners to those with more than several hundred in their fleet.

34. HGVs with a maximum gross train weight up to 26 tonnes are generally used for urban and regional deliveries, with approximately 80% of daily ranges less than 190 miles.[21] HGVs above 26 tonnes are more commonly used for the transport of long-haul goods, with the daily range of 80% of articulated HGVs being up to approximately 380 miles (Figure 5). Articulated HGVs are responsible for 41% of HGVs registered as new in the UK,[22] the vast majority of which have a maximum gross train vehicle weight above 26 tonnes, and we estimate that they account for roughly 60% of HGV emissions.[23] This reflects the fact that typically they are heavier, carry more goods, and travel longer distances than rigid HGVs.

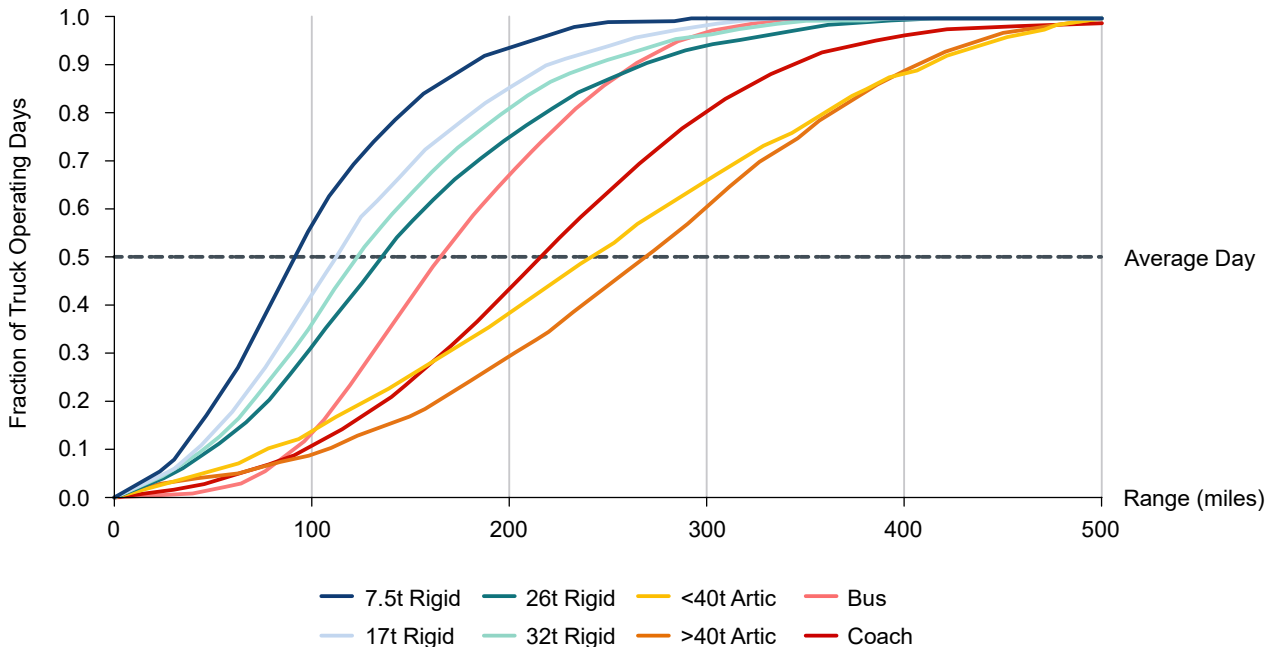


Figure 5. Daily driving ranges of trucks based on the tracking of 10,000 vehicles in the UK over a three-month period between 2017 and 2018. Source - Element Energy

[21] Element Energy, November 2020. Analysis to provide costs, efficiencies and roll-out trajectories for zero emission HGVs, buses and coaches Final report for The Committee on Climate Change. https://www.theccc.org.uk/wp-content/uploads/2020/12/Element-Energy-Analysis-to-provide-costs-efficiencies-and-roll-out-trajectories-for-zero-emission-HGVs-buses-and-coaches.pdf

[22] df_VEH0520_UK: Goods vehicles over 3.5 tonnes registered at the end of the year by country, tax class, wheelplan, detailed body space type, maximum gross weight band, year of first use and fuel: United Kingdom. https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-files

[23] DfT internal modelling of HGV emissions

35. Today, at least 35 different battery electric HGV models are available to purchase in the UK, with a range of hydrogen fuel cell electric options, and a wider range of battery electric options expected to come to the market in the coming years.[24] The majority of these ZE HGVs, with a maximum gross train weight up to 26 tonnes, already have a ZE range above 190 miles (Figure 6). The market for articulated ZE HGVs has been significantly more limited to date with a lower share of models currently able to provide the battery ranges needed to facilitate long-haul daily driving distances without en-route charging. As battery technology improves, and as we approach the target dates for the existing CO_2 emissions standards, we expect the market offering to grow significantly, although vehicles may continue to be restricted by the heavier weight of the powertrain resulting in a payload penalty for higher weights.

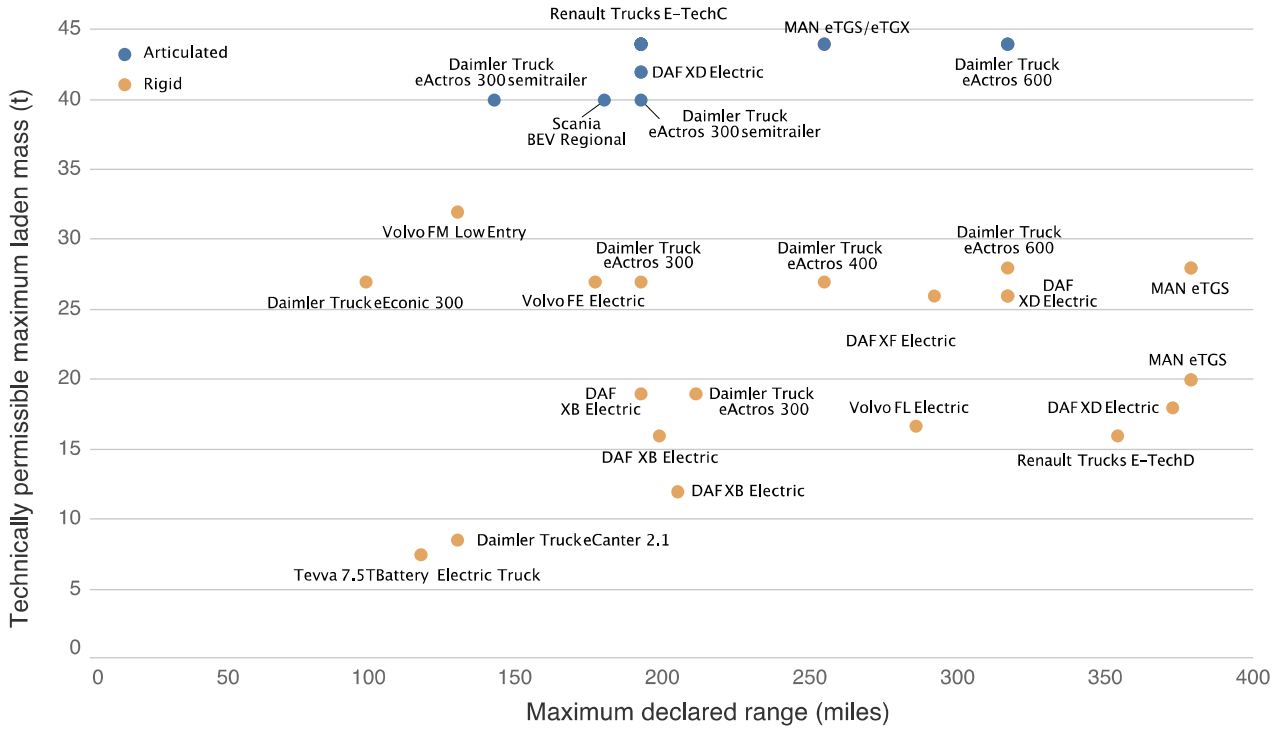


Figure 6. List of some ZE HGV models available for sale in the UK and their maximum declared ranges. Source – manufacturer websites.

36. Several ZE models are expected to be launched in the coming years which will bring ranges in excess of the average daily driving profile of larger HGVs (Figure 7). Renault has extended the range of its E-Tech T 44-tonne electric HGV to 380 miles, an increase from 190 miles in the previous model.[25] 40 such vehicles are being supplied to the eFREIGHT 2030 consortium for the UK's ZEHID programme. Volvo will also launch their FH Electric HGV with a range of up to 380 miles at the end of

[24] SMMT, August 2025. "HGV market declines in Q2 but zero emission uptake reaches record levels" HGV market declines in Q2 but zero emission uptake reaches record levels - SMMT

[25] Renault Trucks. "600 km range for the Renault Trucks E-Tech, from 2025". https://www.renault-trucks.co.uk/press-release/600-km-range-for-the-renault-trucks-e-tech-from-2025

2025.[26] Mercedes-Benz has launched the eActros 600 with a 310 miles range[27] and MAN has started producing the eTGX and eTGS for the UK market with a range of up to 250 miles.[28] Similarly, Scania has also started production on HGVs with up to 250 miles[29] of range and Iveco has launched the S-eWay Rigid, also with a 250 miles range.[30] DAF is also supplying its XF and XD electric vehicles for the ZEHID programme, launching a new generation of electric trucks with a range of up to 310 miles.

[26] Volvo Trucks. "Breakthrough: Volvo to launch electric truck with 600 km range". https://www.volvotrucks.com/en-en/news-stories/press-releases/2024/sep/breakthrough-volvo-to-launch-electric-truck-with-600-km-range.html

[27] Daimler Truck. "The new eActros 600 – International Truck of the Year 2025". https://www.mercedes-benz-trucks.com/int/en/trucks/eactros-600.html

[28] MAN Truck & Bus UK. "MAN Truck & Bus UK showcases the future of Decarbonised Transport – enter the New MAN eTGX and eTGS". https://press.mantruckandbus.com/united-kingdom/man-truck--bus-uk-showcases-the-future-of-decarbonised-transport--enter-the-new-man-etgx-and-etgs/

[29] Scania. "Electric trucks have a range of up to 400 km". https://www.scania.com/group/en/home/electrification/e-mobility-hub/electric-trucks-have-a-range-of-up-to-400-km.html#accordion-dc72801d23-item-217648f82e

[30] Iveco. "IVECO extends the heavy electro-mobility range with its new IVECO S-eWay Rigid". https://www.iveco-dealership.co.uk/news/iveco-extends-the-heavy-electro-mobility-range-with-its-new-iveco-s-eway-rigid

Figure 7. Clockwise from top left: Volvo FH Electric, MAN eTGX, DAF XD Electric, Scania 45 R, Renault E-Tech T

37. In addition to anticipated charging at depots, boosted by the up to £30m Depot Charging Scheme for 25/26, the roll out of high-powered recharging infrastructure that would enable a recharge of most of the vehicle's battery, potentially during a driver's rest period, could help uptake of articulated ZE HGVs with lower driving ranges.

38. Rigid HGVs, which make up around 70% of the UK's HGV fleet,[31] are estimated to travel between 155-180 miles per day on average.[32] These HGVs tend to operate within a defined range and return to their depots overnight or in between shifts and many should be able to do most, if not all, charging at depots. Element Energy found that exclusive depot charging would be suitable for between 65-75% of rigid ZE HGVs.[33]

Government led programs to promote the transition to ZE-HGVs

39. Government has begun to consider the supply side regulatory framework and initiatives are now creating the demand side enabling conditions:

40. Zero-Emission HGV and Infrastructure Demonstrator (ZEHID): government has already provided over £120m as part of ZEHID which is funding hundreds of 40-44t battery electric and hydrogen fuel cell trucks, along with their associated fuelling and charging infrastructure. The majority of vehicles and infrastructure will be in place by March 2026. A five-year demonstration period will follow during which data will be collected and made available to inform commercial investment decisions. Innovate UK, as the delivery partner, has already started running lessons learned sessions to share early learning.

41. Plug-in Truck Grant (PiTrG): on 6 January 2026, Government announced amendments to the Plug-in Truck Grant in GB. This amendment creates four weight categories, replacing the current small and large categories. It also increases the amount of subsidy available for zero emission trucks and HGVs. The grants for small trucks (between 4.25-12 tonnes) have increased from £16,000 to £20,000. The Large truck category has been split into three new weight categories. Trucks weighing between 12-18 tonnes will receive up to £60,000, trucks weighing between 18-26 tonnes will receive up to £80,000, and trucks weighing more than 26 tonnes will receive up to £120,000. This will considerably reduce the upfront cost of purchasing ZE HGVs, and improve the business case for investment in these vehicles. Due to

[31] df_VEH0520_UK: Goods vehicles over 3.5 tonnes registered at the end of the year by country, tax class, wheelplan, detailed body space type, maximum gross weight band, year of first use and fuel: United Kingdom. https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-files

[32] Element Energy, November 2020. Analysis to provide costs, efficiencies and roll-out trajectories for zero emission HGVs, buses and coaches Final report for The Committee on Climate Change. https://www.theccc.org.uk/wp-content/uploads/2020/12/Element-Energy-Analysis-to-provide-costs-efficiencies-and-roll-out-trajectories-for-zero-emission-HGVs-buses-and-coaches.pdf

[33] Road freight statistics: Notes and Definitions Truck charging and TCO study (Road Freight Statistics: Notes and Definitions)

EU State Aid rules that apply in Northern Ireland, existing grant levels for small trucks (up to £16,000) and large trucks (up to £25,000) will continue.

42. Depot Charging Scheme (DCS): launched in July 2025, the up to £30m scheme is supporting installation of charging equipment at HGV, coach and van depots. Fleet operators are able to claim the costs of chargers and civil works.

43. Vehicle Excise Duty: heavy duty electrically propelled vehicles are currently exempt from the vehicle excise duty.

44. Zero-emission HGV weights and dimensions: in 2023, the Department amended maximum weight limits for certain ZE HGVs, helping to offset their heavier powertrains compared to diesel HGVs, although axle weight limits remain unchanged, and no additional allowance is given for the heaviest vehicle combinations, such as 44-tonne articulated lorries or 32-tonne four or more axle rigid HGVs. Further work is being undertaken to understand the associated costs and benefits of any further changes to current rules.

45. Renewable Transport Fuel Obligation: low carbon fuels such as biodiesel, hydrotreated vegetable oil and biomethane are already playing a crucial role in the decarbonisation of road transport, including HGVs. The supply of these fuels is supported by the Renewable Transport Fuel Obligation (RTFO).[34] A review of the scheme was published in August 2025 which set out how it can operate effectively alongside policies supporting the move to ZE vehicles, such as the Zero Emission Vehicle Mandate, to drive rapid and cost-effective decarbonisation of surface transport.[35] This included a commitment to consult on various aspects of the scheme, including on options to increase targets which could in turn increase volumes of LCF's being used in HGVs. However, in doing so, we will carefully consider cost-effectiveness and growing cross-modal and international competition for constrained feedstocks and fuels.

Manufacturer commitments toward ZE HGVs

46. The HGV market is significantly more consolidated than the light-duty market, with seven manufacturers making up over 95% of the sale of HGVs currently covered by the UK's regulation of HGV CO2 emissions (Figure 8).

[34] Renewable Transport Fuel Obligation (RTFO) scheme
https://www.gov.uk/government/collections/renewable-transport-fuels-obligation-rtfo-orders
[35] RTFO statutory review and future of the scheme
https://www.gov.uk/government/calls-for-evidence/rtfo-statutory-review-and-future-of-the-scheme

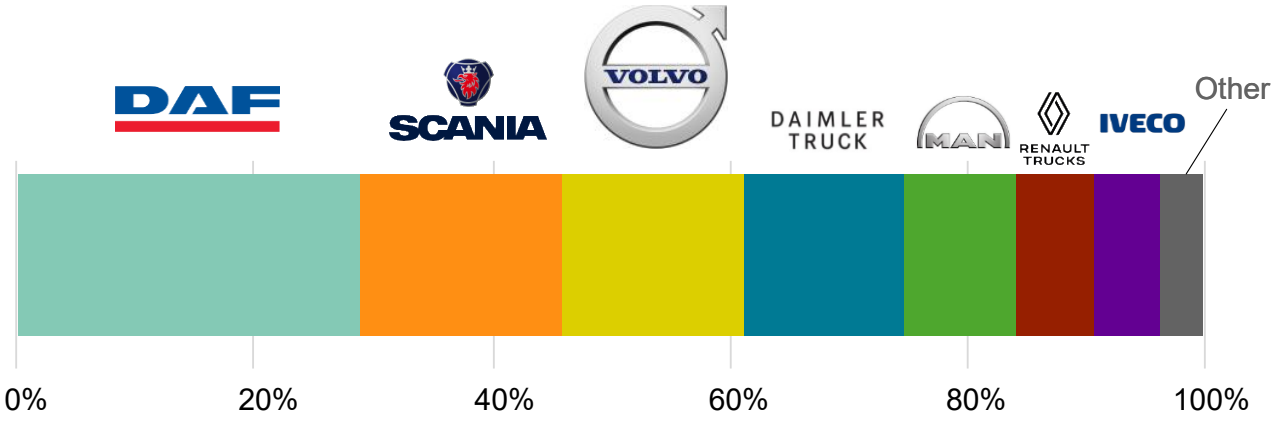
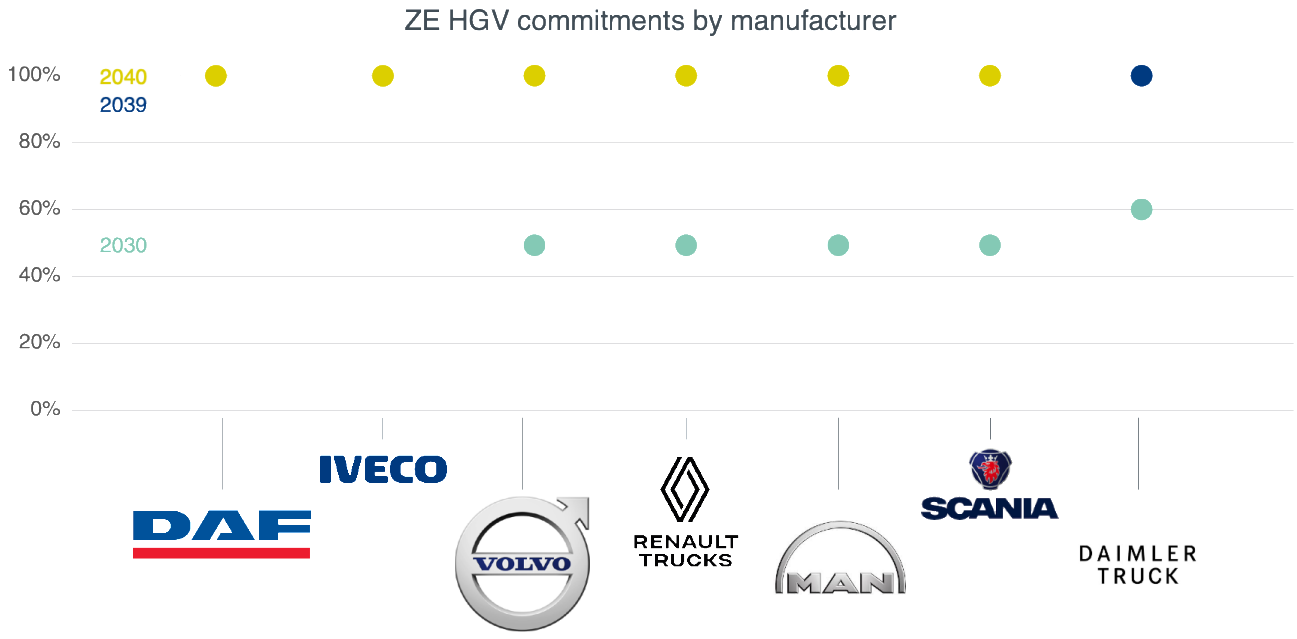


Figure 8. Market share of HGV manufacturers in the UK in 2023 for vehicles covered by the UK's regulation on HGV CO2. Source - DfT statistics.

47. All seven manufacturers have committed to end the sale of new fossil-fuelled trucks by 2040 in a pledge signed by the European Automobile Manufacturer Association, ACEA in 2020 (Figure 9). Some manufacturers have independently pledged to meet intermediate phase-out targets.[36]

48. **Daimler Truck** has targets for its new sales in Europe including up to 60% to be fully zero-emission by 2030, and 100% by 2039.[37]



[36] ACEA and PIK, 2020. Joint statement: The transition to zero-emission road freight transport. https://www.acea.auto/files/acea-pik-joint-statement-the-transition-to-zero-emission-road-freight-trans.pdf

[37] Daimler Truck Group, July 2023. "Green Finance Second Opinion." https://www.daimlertruck.com/fileadmin/user_upload/Shades_of_Green_-_UOP_SPO_-_Daimler_Truck_-_FINAL__25_July_2023_.pdf

Figure 9. ZE HGV commitments for HGV manufacturers. 2040 commitment for DAF, Iveco, Volvo Trucks and Renault Trucks are a fossil-fuel free commitment. Source – Manufacturer websites.

49. **Scania** has committed to net-zero carbon emissions by 2040.[38] Scania is also a signatory to the Global MoU committing to a 30% ZE sales volume globally by 2030 and 90% by 2040.[39]

50. **MAN** Truck and Bus plans for half of all new trucks delivered in Europe to be electrically powered by 2030[40] [and to only produce ZE HGVs from 2040 onwards.[41]]

51. **Volvo Trucks**[42] and **Renault Trucks**[43] are both aiming for 50% of global sales of new HGVs to be electric in 2030.

52. **DAF** has an ambition for 2030 of a 45% reduction in Scope 1 and 2 CO_2 emissions, compared to baseline year 2018, aiming for net ZE in 2050.[44]

Current Regulation

Emission certification

53. HGV manufacturers are required to calculate the CO_2 emissions and fuel consumption of most new HGVs through a simulation tool, VECTO, and report to the Vehicle Certification Agency (VCA) annually. The calculation of CO_2 emissions is required under regulation (EU) 2017/2400,[45] and the reporting of this information to the VCA is required under (EU) 2018/956.[46]

[38] Scania, December 2021. "Scania's commitment to electrification – our initiatives so far." https://www.scania.com/group/en/home/newsroom/news/2021/Scanias_commitment_to_electrification_our_initiatives_so_far.html

[39] Scania, November 2021. "Scania endorses global Memorandum of Understanding for zero-emission vehicles". Scania's commitment to electrification – our initiatives so far | Scania Group

[40] MAN, February 2025. "MAN with last diesel generation in Nuremberg" https://press.mantruckandbus.com/corporate/man-with-last-diesel-generation-in-nuremberg/

[41] Sustainable Truck & Van, January 2022. Interview with Stefan Klatt. https://www.sustainabletruckvan.com/commercial-vehicles-electric-interview-stefan-klatt-man/

[42] Volvo Trucks, January 2024. "Volvo introduces its first ever electric-only truck – optimized for cleaner and safer city transports". https://www.volvotrucks.com/en-en/news-stories/press-releases/2024/jan/volvo-introduces-its-first-ever-electric-only-truck-optimized-for-cleaner-and-safer-city-transports.html

[43] Renault Trucks, July 2024. "Towards low-carbon transport: Decarbonising freight transport…and fast!" https://www.renault-trucks.com/en/towards-low-carbon-transport

[44] DAF Trucks N.V., 2023. "Sustainability Report 2023". Environment - Emission reduction - DAF Trucks N.V.

[45] Commission Regulation (EU) 2017/2400 https://www.legislation.gov.uk/eur/2017/2400/contents

[46] Regulation (EU) 2018/956 of the European Parliament and of the Council https://www.legislation.gov.uk/eur/2018/956/contents

54. Regulation (EU) 2017/2400 was amended once in 2019 under (EU) 2019/318.[47] Under retained EU law, manufacturers producing HGVs for sale in Great Britain fall under the scope of this amendment to (EU) 2017/2400.

55. While not applicable to vehicles placed on the market in Great Britain, Regulation (EU) 2017/2400 was amended for a second time by the EU in 2022, under Regulation (EU) 2022/1379[48] and a third time under (EU) 2025/258[49] applicable in the EU-27 and Northern Ireland. These amendments introduced more vehicle categories and more technology choices for vehicles.

Q1 – Do you think the Certification Regulation (EU) 2017/2400 should be amended within the UK to align with the 2nd and 3rd amendments, as adopted in the EU?

Existing CO_2 regulations

56. Manufacturers of most new HGVs registered in the UK are already subject to CO_2 emission reduction requirements, which were first established under regulation (EU) 2019/1242[50] and amended under SI 2020 No. 1402,[51] SI 2022 No. 1361,[52] and SI 2025/367.[53]

57. This regulation targets manufacturers of rigid body and articulated HGVs with an axle configuration of 4x2 and GVW above 16 tonnes, or an axle configuration of 6x2 of any GVW. Manufacturers are required to reduce their CO_2 emissions by 15% by the reporting year 2025, and 30% by the reporting year 2030, relative to a 2019 baseline period. Manufacturers benefit from a reduction in their target of up to 3% if enough zero- or low-emission[54] vehicles are produced.

58. Manufacturers may earn credits if they over comply with their reduction trajectories. These credits can be used to offset any debts accrued from under compliance in future years.

---

[47] Commission Regulation (EU) 2019/318 https://www.legislation.gov.uk/id/eur/2019/318
[48] Commission Regulation (EU) 2022/1379 https://eur-lex.europa.eu/eli/reg/2022/1379/oj/eng
[49] Commission Regulation (EU) 2025/258 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32025R0258&qid=1740559758380
[50] Regulation (EU) 2019/1242 https://www.legislation.gov.uk/eur/2019/1242/contents
[51] The New Heavy Duty Vehicles (Carbon Dioxide Emission Performance Standards) (Amendment) (EU Exit) Regulations 2020. https://www.legislation.gov.uk/uksi/2020/1402/contents/made
[52] The Road Vehicle Carbon Dioxide Emission Performance Standards (Cars, Vans and Heavy Duty Vehicles) (Amendment) Regulations 2022. https://www.legislation.gov.uk/uksi/2022/1361/contents/made
[53] The New Heavy-Duty Vehicles (Carbon Dioxide Emission Performance Standards) (Miscellaneous Amendments) Regulations 2025. https://www.legislation.gov.uk/uksi/2025/367/made
[54] A low emission vehicle is defined as one with less than half of the reference CO_2 emissions of its subgroup.

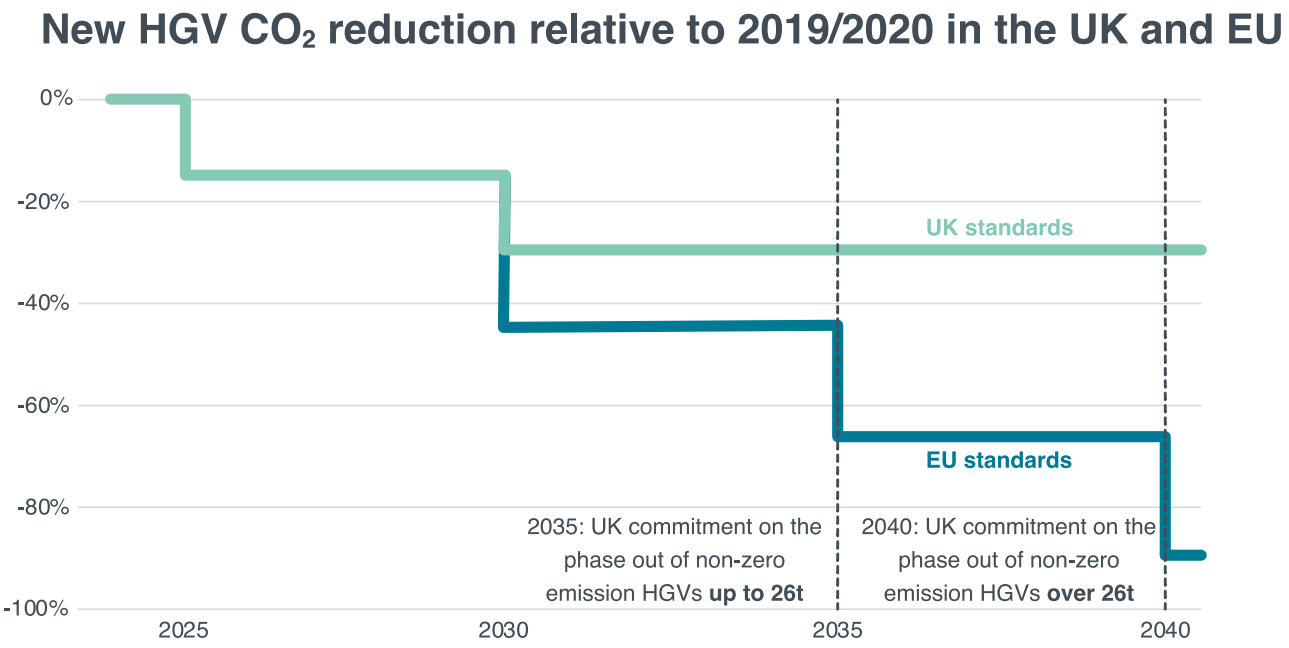


Figure 10. CO_2 emission reduction trajectories under existing CO_2 standards. Source - (EU) 2019/1242.

59. In 2024, the EU amended the standards under (EU) 2024/1610[55] which has significantly increased the scope and the ambition of the original standards. All new urban buses must be ZE by 2035 and nearly all new HGVs, coaches, and inter-urban buses must reduce their CO_2 emissions by 43% in 2030, 64% in 2035, and 90% in 2040 relative to their baseline.[56] These standards do not apply in Northern Ireland, unlike the second and third amendments to the Certification Regulation, but apply in the EU-27 and, pending approval from the European Economic Area Joint Committee, Norway and Iceland. The UK's existing standards are currently lagging significantly behind the EU's standards.

[55] Commission Regulation (EU) 2024/1610, https://eur-lex.europa.eu/eli/reg/2024/1610/oj/eng

[56] Most vehicles have a 2019 baseline, while those added in (EU) 2024/1610 have either a 2021 or 2025 baseline.

Part B: New regulation options for HGVs

60. The market for ZE HGVs is nascent in the UK. Analysis suggests that existing CO_2 emissions reduction targets under retained EU law (EU) 2019/1242 alone will not be sufficient to deliver CO_2 emission reductions in line with the trajectories needed to meet legislated carbon budgets. A future regulation with enhanced targets could assure the end of sales dates are met and that they deliver carbon savings.

61. Government is committed to cutting emissions by ending sales of new non-ZE HGVs to more closely align the UK's future HGV fleet with our long-term ambitions. To achieve this, multiple options are being considered, which may be introduced individually or in combination:

    - Option 0: no future regulatory framework
    - Option 1: establish a CO_2 emissions reduction regulation for HGVs, drawing upon the existing framework from the retained EU law, with potential for increased scope and targets
    - Option 2: establish a ZE vehicle mandate for HGVs
    - Option 3: introduce a ZE fleet adoption requirement for large freight operators

62. This section elaborates these options, highlighting the advantages and opportunities, as well as the disadvantages and risks of each.

Option 0: No future regulatory framework for CO_2 reduction

63. New vehicle CO_2 emission regulations and ZEV mandates have proved to be an effective mechanism to promote the deployment of cleaner technologies in vehicles across the UK and in international markets.

64. However, there is still a significant cost differential between the purchase price of a conventional and a ZE HGV. While ZE HGVs are expected to offer a more compelling option from a TCO perspective in the future, it is unlikely that the market alone will deliver an increased adoption of ZE HGVs beyond those required by the current regulations. With no future regulation to reduce the CO_2 emissions

contribution from the HGV sector, emission reductions are unlikely to be sufficient to deliver our carbon targets.

65. The absence of a future regulation runs the additional risk of the UK falling behind in the supply of ZE HGVs and their components in an increasingly constrained market. As global momentum towards the adoption of ZE HGVs continues, early regulatory action is needed to provide original equipment manufacturers with certainty on the future of the market and how to invest appropriately.

66. A lack of further regulation may also hamper investment in the necessary charging and fuelling infrastructure; without setting more stringent requirements on the adoption of ZE HGVs, uncertainty in the expected powertrains for the future market may give reluctance for private investors to fund ZE infrastructure projects due to uncertainties in returns.

67. This option will form the baseline for any alternative option against which to measure the CO_2 emissions savings potential.

Option 1: Increased manufacturer CO_2 emissions targets

68. A new framework based on the existing regulation of CO_2 emissions of new HGVs under (EU) 2019/1242 could be created to increase the scope of vehicles covered and the CO_2 emissions reduction targets in line with the government's phase-out commitments, supported through interim targets.

69. A similar approach has been adopted in the EU although no end of sales date for all new non-ZE HGVs has yet been set. This regulation would establish targets based on each manufacturer's fleet average specific CO_2 emissions. Expanding this framework to end the sale of new non-ZE HGVs would involve setting a CO_2 emission reduction target trajectory on a pathway to 100%, supported by interim targets, for the announced end of sale dates.

70. CO_2 emissions reduction targets may initially be met by improving the fuel efficiency of conventional vehicles through, for example, improving aerodynamics, the rolling resistance of tyres, or engine efficiency. The marginal cost of achieving emission reductions from a conventional vehicle increase exponentially once a specific CO_2 emissions target is sufficiently high, requiring manufacturers to start investing in alternative powertrains to achieve targets at least cost.

71. There are many different design considerations with such an approach. The contribution of CO_2 emissions reductions from HGVs could be weighted proportionately to the vehicle's characteristics, such as payload, mileage, average lifetime, or CO_2 emissions. This could mean that the vehicles that are most difficult to decarbonise and those that contribute the most towards GHG emissions are credited proportionately and thus given additional incentive to decarbonise.

72. Further flexibilities such as a credit and debt mechanism (whereby credits earned for over-compliance may be used to balance debts accrued due to under-compliance across vehicle types), a banking and borrowing mechanism (whereby non-compliant manufacturers may borrow credits from future years to avoid penalties), and a trading

mechanism (whereby manufacturers may trade credits or vehicles amongst each other) could also be considered for this option.

Europe's revised CO_2 standards for heavy-duty vehicles

The vast majority of all UK HGV sales are supplied by manufacturers that are subject to the EU's CO_2 emissions regulations as they also sell vehicles in the EU. The EU set its first CO_2 standards in 2019, under regulation (EU) 2019/1242 obliging manufacturers of most new HGVs to reduce their CO_2 emissions by 15% in 2025 and 30% in 2030, relative to 2019.

In May 2024, the EU adopted revised CO_2 standards for HGVs, increasing the targets to 45% in 2030, 65% in 2035, and 90% in 2040. The scope was also increased to cover buses, coaches, trailers, and more HGV types including 4x2 vehicles with a GVW between 5 and 16 tonnes, 8x4 HGVs, and vocational vehicles.

The standards are set based on a fleet-averaging principle, i.e., not every vehicle produced by a manufacturer is required to meet the standards imposed, rather a manufacturer is in compliance provided their fleet-averaged CO_2 emissions are below the set target.

Vehicles are grouped based on axle configuration, GVW, body type, amongst other characteristics. The contribution of these vehicles towards the targets is based on assumptions of annual mileage and average payload, such that vehicles with a high mileage or high payload contribute proportionately more than a vehicle with a relatively low mileage or low payload.

The amended standards introduce a vehicle trading scheme allowing manufacturers that share a parent company to register one another's vehicles. Manufacturers which don't share a parent company can trade ZE vehicles, limited up to 5% of the receiver's sales volume.

The amended standards also extend the credit and debt system so that manufacturers that fail to meet their target in a given year, thus accruing debt, may offset this with credits earned due to over-compliance in the preceding years. Credits earned from 2025 have a lifetime of 7 years. If a manufacturer does not have sufficient credits to offset their debts, they are met with a penalty.

Manufacturers who sell fewer than 100 vehicles per year are exempt from the standards but may request to join the trading scheme of ZE vehicles.

The standards must be reviewed before 31st December 2027.

Advantages and opportunities of Option 1

73. A legislative framework, including a monitoring and reporting mechanism, already exists for manufacturers reporting vehicles in the UK. This was established to ensure manufacturer compliance with the existing CO_2 regulations under (EU) 2019/1242.

74. Most manufacturers selling vehicles for use in the UK already sell into the EU-27 market and are required to meet a regulation requiring CO_2 emission reductions under (EU) 2024/1610, building on the original CO_2 standards (EU) 2019/1242. Manufacturers are therefore already familiar with the existing regulatory framework, easing any new administrative burdens.

75. This approach offers flexibility for manufacturers to comply with their CO_2 emission reduction targets in a cost-effective way, utilising least-cost technologies that are determined by pre-existing investments. This could include improving engine performance, reducing the vehicle's air drag, light weighting, reducing the rolling resistance of the tyres, or investing in alternative powertrains such as battery electric or hydrogen. This may allow the market to transition in a way that is cost effective for each manufacturer.

Disadvantages and risks of Option 1

76. A CO_2 emissions standard would offer manufacturers the ability to decarbonise their fleet through a combination of improving the efficiency of their non-ZE HGV fleet or through the deployment of ZE HGVs. Marginal reductions in CO_2 emissions of a manufacturer's fleet are expected to be most cost effective by focusing on their non-ZE HGV fleet in the early years rather than through the adoption of ZE HGVs. This would potentially increase the number of non-ZE HGVs sold compared to achieving the end of sale dates through only setting sales targets for non-ZE HGV. Option 1 may then possibly increase the emission of harmful air pollutants such as nitrogen oxides, particulate matter, particulate number, and carbon monoxide which are detrimental to human health.

77. The existing framework for the CO_2 standards does not cover all HGV types. Under the 1st amendment to the Certification Regulation (EU) 2017/2400, which the UK currently follows, only the following vehicles are required to monitor and report their CO_2 emissions:

    - 4x2 rigid and articulated HGVs with a gross vehicle weight between 7.5 tonnes and 16 tonnes (vehicle groups 1, 2, and 3)
    - 4x2 rigid and articulated HGVs with a gross vehicle weight above 16 tonnes (vehicle groups 4 and 5)
    - 6x2 rigid and articulated HGVs of any gross vehicle weight (vehicle groups 9 and 10)
    - 6x4 rigid and articulated HGVs (vehicle groups 11 and 12)
    - 8x4 rigid HGVs (vehicle group 16)

78. Adopting the second and third amendment to the Certification Regulation (EU) 2017/2400 as adopted in the EU provides a framework for the CO_2 emissions from vehicles with a gross vehicle weight between 5 tonnes and 7.5 tonnes, buses and coaches to be monitored. However, there is no existing framework for manufacturers to monitor the CO_2 emissions of vehicles with a gross vehicle weight between 3.5 tonnes and 5 tonnes, 4x4 vehicles, 6x6 vehicles, or vehicles with 4 or more axles, excluding 8x4 vehicles. The simulation tool, VECTO, used to monitor CO_2 emissions is managed by the European Commission, so it is not currently possible to set CO_2 targets for these vehicle groups.

79. Setting a CO_2 emissions-based target provides less certainty on the number of ZE HGVs expected to enter the UK market, as targets may be met by either improving the efficiency of a conventionally fuelled HGV, or through the production of a ZE HGV. This results in less certainty to enable effective infrastructure investment that will meet future need in good time.

80. Unlike the way CO_2 is regulated in cars and vans, this approach would rely on a simulation of the CO_2 emissions from new HGVs which uses constant mission profiles and loads for calculation. Considering the diverse nature of the freight sector, the real-world mission profiles and loads of vehicles may deviate from those used in simulation creating a divergence in simulated and real-world CO_2 emission performance. This would create uncertainty in the savings potential of a CO_2 emissions standard.

Option 2: Introduce a ZEV mandate supported by a CO_2 emissions standard for currently regulated vehicles

81. A new regulatory framework could be created setting requirements for HGV manufacturers to provide more ZE HGVs by reducing their share of new non-ZE HGVs sold over a specified period of time.

82. Each year, manufacturers could be issued allowances based on the new non-ZE HGV targets set for each vehicle category, manufacturer's sales of vehicles in that category and a weighting assigned to that vehicle category. The sale of non-ZE HGVs depletes these allowances and selling more non-ZE HGVs than permitted by allowances may result in a penalty, subject to flexibilities.

83. As with Option 1, the contribution of CO_2 emissions reductions from HGVs could be weighted proportionately to the vehicle's characteristics, such as payload, mileage, average lifetime, or CO_2 emissions, to ensure that the vehicles most difficult to decarbonise and those that contribute the most towards GHG emissions are credited proportionately in such a way that recognises the harder to decarbonise HGVs.

84. As a ZEV mandate puts the emphasis of a future regulation on the accelerated adoption of ZE HGVs, it is important to acknowledge the investments that have already been made that will reduce the CO_2 emissions from the new non-ZE HGV fleet. To ensure their CO_2 emission reductions are appropriately credited, an additional mechanism would be considered which monitors the CO_2 emissions of the non-ZE HGVs by manufacturer and ensures these emissions do not rise above their average level in a certain year. Improving the CO_2 emissions performance of non-ZE

HGVs beyond the average levels could be used to support compliance towards the targets set by a ZEV mandate, in a similar way that is currently enacted in the car and van ZEV mandate.

85. Flexibilities such as a credit and debt mechanism (where credits earned for overcompliance may be used to balance debts accrued due to under compliance), a banking and borrowing mechanism (where non-compliant manufacturers may borrow credits from future years to avoid penalties), and a trading mechanism (where manufacturers may trade credits or vehicles amongst each other) would also be considered for this option. We may also consider interactions between the ZE HGV and non-ZE HGV requirements to provide additional flexibility.

Advantages and opportunities of Option 2

86. Setting a ZEV mandate provides more certainty over the proportion of new ZE HGVs being sold into the UK which would provide greater investment certainty for private sector infrastructure provision to a guarantee of ZE HGVs entering the market and ensure a security of supply of these vehicles and their components in the future. In contrast to the setting of CO_2 emissions standards which would be limited in the vehicle categories that could be covered based on the scope of (EU) 2017/2400, a ZEV mandate would be possible to apply to all HGVs registered for the first time.

87. The fuel combustion process in a non-ZE HGVs is a direct source of pollutant emissions harmful to human health including NOx, CO, and PM. While there are still non-exhaust pollutants associated with the operation of a ZE HGV, by ensuring the focus is on ZE vehicles, a ZEV mandate would reduce the level of exhaust pollutant emissions.

88. The CO_2 emission reductions from non-ZE HGVs as calculated in accordance with the Certification Regulation (EU) 2017/2400 may differ from those in the real-world due to a divergence in the assumed mission profiles and those driven in practice. As a ZEV mandate would see a higher number of ZE HGVs to come to the market than a CO_2 standard, which may rely more on the efficiency improvements of the non-ZE HGV fleet, this option may result in more certainty in the downstream emission reduction benefits.

89. Experience from the light-duty sector suggests that clarity on the deployment rate of ZEVs over time can spur significant private sector investment in related infrastructure, such as high-power public charging for electric vehicles.

Disadvantages and risks of Option 2

90. Manufacturers' ability to comply with a ZEV mandate is affected by the demand for their vehicles which is partially influenced by the existing and future enabling conditions such as public infrastructure, TCO, and grant provisions. By contrast, establishing a CO_2 emissions-based target, which may be achieved through improvements in the operational efficiency a vehicle, may bring about CO_2 emissions reductions on non-ZE HGVs without facing any significant barriers to uptake from the demand side due to existing infrastructure and consumer acceptance.

91. Uncertainties in the demand projection of HGVs in a certain year may result in challenges for manufacturers in complying with their targets under a ZEV mandate. Without full foresight on the projected demand for their vehicles, then it may be unclear when a manufacturer has run out of allowances to sell new non-ZE HGVs until the end of the year. Flexibilities may be considered in the final design to reflect this.

92. Some manufacturers may have already invested significantly in the shift to ZE vehicles while others may have invested more resources in reducing the CO_2 emissions of their non-ZE HGV fleet. A ZEV mandate would mean the latter may not have as much opportunity to continue developing those technologies in a way that contributes to future reductions. In the short term, this could mean that the transition is not as cost-effective for all manufacturers, particularly those that have pursued heavily in strategies for lowering emissions from non-ZE HGVs. A trading scheme between the non-ZE HGV and ZE HGV elements of this option could be introduced to alleviate this risk.

Option 3: Fleet adoption requirements

93. The road freight sector is composed of roughly 66,000 businesses across Great Britain with at least one licensed vehicle. While most are Small and Medium Enterprises (SMEs) with 90% of operators controlling a fleet of 10 or fewer vehicles, there are a small number of operators with a significant HGV fleet.[57]

94. Some large fleets are leading the deployment of ZE HGVs and have set targets to fully phase-out their non-ZE HGV fleet. Royal Mail, who operate the single largest HGV fleet in the UK, plan for all of their delivery vehicles to be ZE by 2035.[58] Other large operators such as Tesco plan for all their home delivery fleet to be ZE by 2030.[59] Amazon recently announced that more than 140 new electric long-haul HGVs would join their transport network in the UK over the next 18 months, supported in part through the government funded ZEHID programme.[60]

95. To encourage the uptake of ZE HGVs, fleet targets applied only to the largest freight operators could require an increasing portion of their vehicle purchases, leases, or portion of their fleet to be ZE. To prevent exposing SME operators to undue financial burdens, and to instead target a scheme at large operators who have access to more capital, more financing options, and potential bulk purchasing discounts, a set of exclusion criteria would be established under this option. The criteria could be based on the size of the operator's existing fleet.

---

[57] Traffic Commissioners: goods and public service vehicle operator licence records, https://www.data.gov.uk/dataset/2a67d1ee-8f1b-43a3-8bc6-e8772d162a3c/traffic-commissioners-goods-and-public-service-vehicle-operator-licence-records

[58] Royal Mail Clean air https://www.royalmail.com/sustainability/environment/clean-air

[59] Tesco celebrates milestone of 500th electric customer home delivery van https://www.tescoplc.com/tesco-celebrates-milestone-of-500th-electric-customer-home-delivery-van

[60] Amazon expands zero-exhaust emission deliveries with the UK's largest-ever order of electric trucks https://www.aboutamazon.co.uk/news/sustainability/amazon-zero-exhaust-emissions-uk-electric-trucks-rail-deliveries

96. Two broad options could be considered for the targets within a fleet mandate: a trajectory may establish the share of an operator's entire fleet which needs to be ZE for a range of years, or a requirement that a proportion of vehicles added to a goods operator's licence – either through new purchases, second-hand purchases, or through leases – must be ZE after a certain date.

97. As the HGV sector is diverse with a combination of urban, regional, municipal, construction, and long-haul mission profiles, each of which face different challenges in the transition towards ZE technology, such a framework could base the targets on an operator's vehicle fleet composition.

98. Such an approach could be integrated with the existing mechanism to apply for or maintain a goods vehicle licence.

99. Exemptions could be granted to fleet operators subject to a fleet mandate who are unable to acquire a ZE HGV. This may occur due to the lack of availability of a ZE vehicle capable of carrying out the duties of a conventional HGV that would normally be registered for a fleet. A demanding duty cycle that a ZE vehicle would be unable to conduct could also qualify as a reason for exemption. Other valid reasons include unforeseen delays in the installation of a local charging infrastructure or the need to replace a vehicle involved in an accident with a conventionally fuelled truck.

Advantages and opportunities of Option 3

100. A mandate requiring large fleets to accelerate their adoption of ZE HGVs would contribute positively towards the adoption of ZE HGVs and contribute to greater reductions in GHG emissions compared to its absence. It could be targeted at operators in urban areas, delivering air quality benefits.

101. A mandate for freight operators in parallel with CO_2 reduction targets or a ZE HGV mandate would place the onus of adoption on larger operators who are better positioned to absorb the higher initial purchasing costs of a zero-emission fleet.

102. A fleet mandate could encourage ZE HGVs uptake, allowing ZE HGVs to eventually find their way into smaller fleets via the used HGV market at a lower cost than first-hand purchasing.

Disadvantages and risks of Option 3

103. ZE HGVs currently have higher upfront costs compared to their conventional counterparts. A fleet mandate would increase the capital costs associated with vehicle purchases. The differential in the TCO of a ZE HGV has been falling compared to its conventional counterpart but even with a favourable TCO, smaller companies may not have the flexibility to allow for longer payback periods. As such, a fleet mandate might only be considered for larger companies.

104. Companies may have to bear additional costs associated with infrastructure and equipment required to enable the purchase of ZE HGVs.

105. Fleet operators have faced many challenges in recent years including driver shortages, supply chain disruption, and fuel price inflation, hindering the ability of businesses to expand and grow. Requiring fleets to purchase some ZE HGVs is likely to place additional financial pressures.

106. In the absence of a supply side regulation, there may not be a sufficient number of ZE HGVs available in the market to comply with the fleet targets.

Questions on Possible Frameworks

Q2 – What are your views on Option 1 regarding a strengthened and expanded CO_2 standard for HGVs?

Q3 – What are your views on Option 2 regarding the introduction of a ZEV mandate limiting the sales of non-ZE HGVs?

Q4 – If you agree with using Option 2 as a future framework, should the ZEV mandate be accompanied by a CO_2 standard for non-ZE HGV vehicles?

Q5 – What are your views on Option 3 considering requirements for fleets to purchase or lease an increasing share of ZE HGVs?

Q6 – If you agree with using Option 3 as a future framework, what eligibility criteria should be set to include freight operators in a fleet mandate?

Q7 – If you agree with using Option 3 as a future framework, should a purchasing requirement, fleet requirement, or a combination be established?

Q8 – Of the options presented, what is your preferred approach, or combination of approaches, for reducing emissions from HGVs and delivering a phase-out of new non-ZE HGVs?

Q9 – Are there any alternative approaches that the government should consider to reduce CO_2 emissions from HGVs?

Part C: Defining the scope for zero-emission vehicles

Scope of vehicles covered under phase-out

107. It is envisaged that requirements to reduce CO_2 emissions, and set a pathway for the end of sales dates for new non-ZE HGVs will apply to vehicle category N, provided that the vehicles do not fall under the Vehicle Emissions Trading Scheme Order 2023 (VETS), or do not fall under the following categories:

    - agricultural equipment
    - off road vehicles[61]
    - special purpose vehicles
    - off-road special purpose vehicles
    - non-road mobile machinery (NRMM)[62]
    - vehicles exempt from road vehicle type approval, such as vehicles with NRMM engines, auxiliary engines, military vehicles and fire engines

108. Additional consideration is being given to the extension of this scope to cover other heavy-duty vehicles, such as coaches and trailers.

N2 vehicles with a GVW between 3.5 and 4.25 tonnes

109. Under VETS, ZEVs with a GVW between 3.5 tonnes and 4.25 tonnes are in scope of the Non-Zero-Emission Van Registration Trading Scheme (VRTS). This allowance accounts for the heavier powertrain of a ZEV compared to its conventional counterpart which may raise a vehicle's GVW above 3.5 tonnes.

[61] As defined in (EU) 2018/858: https://www.legislation.gov.uk/eur/2018/858/contents
[62] As defined in (EU) 2016/1628: https://www.legislation.gov.uk/eur/2016/1628/contents

110. These vehicles make up a considerable portion of new ZE HGV sales today; in 2024, 1,537 new ZE HGVs with a GVW between 3.5 and 4.25 tonnes were registered, while only 273 ZE HGVs with a GVW above 4.25 tonnes were registered in the same year.[63]

111. As the scope of this standard excludes vehicles covered under VETS, these vehicles are currently expected to be exempt from a future HGV standard.

Q10 – Do you have any comments on the exclusion of ZE HGVs with a GVW between 3.5 tonnes and 4.25 tonnes from a future HGV regulation?

Coaches

112. Coaches are broadly defined as public transport vehicles used for regional and international travel where there is no space for standing in the gangway.

113. In 2022, the EU amended the certification regulation, (EU) 2017/2400, which lays out the requirement for manufacturers to monitor their CO_2 emissions through a simulation tool, VECTO. This 2022 amendment[64] expanded the scope of vehicles that are required to certify their CO_2 emissions to include buses and coaches. This currently applies in Northern Ireland, meaning all buses and coaches that are registered for the first time in Northern Ireland are required to have a CO_2 certification in line with vehicles sold in the EU-27.

114. Coaches were then introduced into the CO_2 standards for heavy-duty vehicles in the EU in 2024. They will be required to reduce their CO_2 emissions by 43% in 2030, 64% in 2035, and 90% in 2040 relative to 2025.

115. Many major HGV manufacturers also produce coaches, and the majority of coaches sold in the UK are produced by manufactures that must follow the CO_2 standards in the EU, so a future regulation aimed at reducing the CO_2 emissions from HGVs is being considered as an appropriate mechanism to also reduce emissions from the coach sector and to align with the government's commitment of making all road-transport zero-emission by 2040.

116. There is some uncertainty over the total number of coaches in operation in the UK at present, as sales and stock of buses and coaches are combined in government statistics. Internal estimates show that 0.2-0.4% of the total stock of coaches in operation today in the UK are ZE.[65]

117. There are significantly fewer ZE types of coaches available compared to ZE HGVs, with just two electric models available for sale currently. While sales of ZE coaches

[63] df_VEH0520: Goods vehicles over 3.5 tonnes registered at the end of the year by country, tax class, wheelplan, detailed body space type, maximum gross weight band, year of first use and fuel: United Kingdom. https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-files

[64] Commission Regulation (EU) 2022/1379, https://eur-lex.europa.eu/eli/reg/2022/1379/oj/eng

[65] df_VEH0120_UK: Vehicles at the end of the quarter by license status, body type, make, generic model and model: United Kingdom. https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-files

have been low in the UK, the sales share of ZE coaches has been growing steadily in China, with 6% of sales battery electric by the end of June, 2024.[66]

118. According to research carried by the Confederation of Passenger Transport, the ranges for the services currently provided by coach operators vary between 50-250 miles.[67] Research by Element Energy found coaches to drive an average of 220 miles per day (Figure 5). [68] To add to the challenge, coaches, may not always return to the depots at the end of each day and are primarily operated by SMEs.

119. However, there may be scope for ZE coaches to use the same public charging infrastructure as ZE HGVs so long as passenger safety considerations are in place, so as the ZE HGV market continues to grow, the ZE coach sector may benefit from a growing infrastructure network.

120. Coaches may be integrated with the options for a future regulation considered in Part B. Under Option 1 (an extension of the CO_2 standards), as coaches have been included in the certification regulation in the EU, there is already an existing framework for the determination and reporting of CO_2 emissions from the sector that may be integrated in the UK. Under Option 2 (a ZEV mandate), as CO_2 certification is not strictly necessary, it may be easier to include coaches compared to an extension of the CO_2 standards.

Q11 – Do you think a regulatory framework for reducing CO_2 emissions from the HGV sector should be extended to include coaches?

Trailers

121. Trailers are usually non-motorised and do not produce any direct CO_2 emissions. However, they can contribute towards the CO_2 emission reduction of the motorised vehicle that is towing the trailer through a combination of technologies, such as light-weighting, aerodynamic improvements, and using low-rolling resistance tyres.

122. Trailer manufacturers in the EU-27 are required to reduce their indirect CO_2 emissions through these measures, amongst others, by 10% for a semi-trailer and 7.5% for a drawbar trailer by 2030 relative to 2025 in accordance with (EU) 2024/1610.

123. These indirect CO_2 emissions are monitored and reported in accordance with (EU) 2022/1362.[69] There is no mechanism for monitoring and reporting the CO_2 emissions directly attributable to a trailer in Great Britian. Establishing a framework for trailer

[66] Zero-emission medium- and heavy-duty vehicle market in China (January-June 2024). https://theicct.org/publication/ze-mhdv-market-china-january-june-2024-nov24/

[67] Coach route map to destination zero. https://www.cpt-uk.org/media/ujknzryr/zect-coach-route-to-destination-zero-report-final.pdf

[68] Element Energy, November 2020. Analysis to provide costs, efficiencies and roll-out trajectories for zero emission HGVs, buses and coaches Final report for The Committee on Climate Change. https://www.theccc.org.uk/wp-content/uploads/2020/12/Element-Energy-Analysis-to-provide-costs-efficiencies-and-roll-out-trajectories-for-zero-emission-HGVs-buses-and-coaches.pdf

[69] Commission Regulation (EU) 2022/1362. https://eur-lex.europa.eu/eli/reg_impl/2022/1362/oj/eng

manufacturers in the UK would require the adoption a similar monitoring and reporting framework as the EU.

124. Trailers may also contribute towards CO_2 emission reductions through the addition of an electrified propulsion system, otherwise known as an e-trailer, which may be towed by both a conventional HGV and ZE HGV. E-trailers may provide greater range for a ZE HGV and contribute towards CO_2 emission reduction of a conventional vehicle.

Q12 – What are your views on a future regulation including CO_2 emission reduction targets for trailers?

Derogations and exemptions

125. The HGV market is significantly more consolidated than the light-duty vehicle market, with seven manufacturers responsible for over 95% of new registrations of HGVs in the UK in 2023, for those covered by the current Regulation (EU) 2019/1242[70] and a small number selling a lower portion of vehicles. As we expect most new HGVs will be ZE by 2040, to put a lower burden on smaller volume manufacturers and to enable a different paced transition for these manufacturers, we would welcome views on providing a derogated target or an exemption based on the annual sales volume of vehicles by manufacturer.

Q13 – Should a derogation or an exemption be given to smaller volume HGV manufacturers in a regulatory framework? If yes, what should that threshold be?

Q14 – Should an exemption be given to smaller volume coach manufacturers? If yes, please elaborate why and explain what that threshold should be?

Q15 – Should a sunset clause be set for any derogation? If yes, by what year should this be set?

Q16 – Should any additional vehicles be exempt from the standards that we have not considered here?

Zero-emission eligibility criteria

126. Establishing an eligibility criteria will provide clarity to the automotive industry and fleet operators regarding what constitutes a ZE vehicle. Vehicles powered solely by a battery electric powertrain or a hydrogen fuel cell powertrain do not produce any direct exhaust CO_2 emissions. Other technologies can offer significant CO_2 emissions reductions either at the exhaust, such as in the case of hydrogen fuelled internal combustion engine (H2-ICE) vehicles, or on a lifecycle basis, such as for vehicles using biofuels or e-fuels.[71] However, these latter fuels still typically

[70]DfT statistics

[71] A relevant example of an e-fuel would be a diesel replacement produced from renewable hydrogen and captured CO_2.

contribute to air pollution such as through emissions of nitrogen oxides and particulate matter.

127. Low carbon fuels (LCFs), principally biofuels such as biodiesel (fatty acid methyl ester, FAME), hydrotreated vegetable oil (HVO) and biomethane, play an important role in delivering carbon savings in HGVs on the road today. While internal combustion engine vehicles remain on the roads, we continue to see an important role for LCFs in helping to reduce the GHG intensity of the fuels they consume, helping to deliver GHG savings and meet carbon budgets in the near term. The Renewable Transport Fuel Obligation (RTFO)[72] supports this goal by requiring fuel suppliers to supply increasing proportions of LCFs in the fuel they supply. However, given constraints to feedstock and fuel availability, the need for LCFs in other hard to decarbonise modes such as aviation and maritime, and the fact that LCFs generally still contribute significantly to air pollution, we see a long-term transition to ZE-HGVs as the priority. As such, we are not proposing that the use of LCFs, such as biofuels or e-fuels, are considered in the eligibility criteria consulted on here.

128. There are several options to consider for zero-emission vehicle criteria:

    - **Engine technology based** – a ZEV may be defined as any vehicle with no internal combustion engine. This would exclude those with an internal combustion engine fuelled either wholly or in part by hydrogen.

    - **Grams of CO_2 per vehicle activity (gCO_2/tonne-km or gCO_2/vehicle-km)** – this is the existing criteria used for determining compliance in the current CO_2 regulations for HGVs in the UK.

    - **Grams of pollutants per vehicle activity (g/km)** – the Euro VI standards establish a testing procedure and limits for various pollutants, including nitrogen oxides, particulate matter, and carbon monoxide.

129. Vehicle CO_2 emissions are certified in accordance with the Certification Regulation (EU) 2017/2400. The first amendment to this regulation has been adopted into UK law, under which there is currently no framework by which the CO_2 emissions of a battery electric, hydrogen fuel cell, or hydrogen internal combustion vehicle are certified.

130. The second amendment to this regulation at EU level, which is not in UK law, introduced a mechanism for those vehicles to be certified. The third amendment to (EU) 2017/2400 builds further upon this methodology.

131. If an eligibility criteria is chosen to be either the gCO_2/tonne-km or gCO_2/vehicle-km, it may be necessary to update the framework of the Certification Regulation to accommodate manufacturers in reporting this information.

132. Further, a number of vehicle categories are not covered under the scope of either the existing or the amended Certification Regulation. If an eligibility criteria is chosen to be either the gCO_2/tonne-km or gCO_2/vehicle-km, there would be no means of

[72] Renewable Transport Fuel Obligation (RTFO) scheme https://www.gov.uk/government/collections/renewable-transport-fuels-obligation-rtfo-orders

applying this criteria to certain ZE HGVs, most notably those with a GVW of less than 5 tonnes, and also to some less common axle configurations such as 8x2/6/8 and 5 axle vehicles.

Q17 – What criterion, or combination of criteria, should be used to set the eligibility of a ZE HGV?

Q18 – For vehicles not covered under the scope of the Certification Regulation, what criterion, or combination of criteria, should be used to set the eligibility of a ZE HGV?

Zero-emission eligibility threshold

133. The eligibility threshold for HGVs is the threshold the chosen eligibility criterion will have to meet for a vehicle to be considered ZE.

134. The threshold should be chosen to ensure a substantial level of GHG emissions reductions is achieved while acknowledging the diversity in ZE technologies.

135. HGVs with a battery electric or hydrogen fuel cell electric powertrain will not produce any direct exhaust CO_2 emissions. By contrast, hydrogen combustion vehicles may have a low level of CO_2 emitted from their exhaust.

136. Monofuel hydrogen combustion vehicles, which only combust hydrogen, may produce small levels of CO_2 emissions due to the byproduct of the emissions control system and from the burning of lubricating oil.

137. Dual-fuel hydrogen combustion vehicle, which may combust a combination of hydrogen and diesel, produce additional levels of CO_2 due to the combustion of diesel.

138. An eligibility threshold will reflect which of these technologies should be considered to be zero-emission when determining compliance with a future regulation on HGVs.

Q19 – For your preferred criterion, or combination of criteria, what eligibility threshold do you propose? Why?

Part D: Vehicle categories, weightings, flexibilities, and penalties

Vehicle groups

139. HGVs are a diverse range of vehicles with unique functions varying in axle configurations, GVW, body type, and mission profiles. For regulatory purposes it can be beneficial to group vehicles with similar characteristics or technologies. Existing UK regulations group vehicles into VECTO categories based on, amongst others, their body type, axle configuration, and GVW.[73]

140. While most vehicles groups have a procedure for certifying their CO_2 emissions in accordance with (EU) 2017/2400 in the UK, not all HGVs are yet included in the scope of this regulation. The latest amendments to this regulation in the EU, under (EU) 2022/1379 and (EU) 2025/258, has extended the scope to include some additional vehicles, but some niche vehicle groups remain out of scope. A full list of the criteria which determines the VECTO group for each vehicle, also outlining those that are in and out of the scope of the certification regulation (EU) 2017/2400, is presented in Annex B.

141. These vehicle categories are currently applied in the heavy-duty CO_2 standards in the EU-27, and thus most manufacturers selling vehicles in the UK will already be familiar with this categorisation. We thus propose to maintain the VECTO categorisation for a future HGV phaseout regulation.

Q20 – Do you agree with maintaining the VECTO vehicle category segmentation? If not, what alternative segmentation would you suggest?

Weightings

142. To provide an incentive to offset the emissions of vehicles in the HGV categories that are hardest to decarbonise due to their average daily mileage, payload, and mission profiles, we are seeking views on the application of a weighting system.

[73] Commission Regulation (EU) 2017/2400 https://www.legislation.gov.uk/eur/2017/2400/contents

143. Under the existing CO_2 standards, vehicles are weighted on the basis of the mileage payload weighting factor, which is calculated for each VECTO category by taking the product of their annual mileage and payload relative to the product of the mileage and payload of the VECTO group 5-LH, the most common HGV category in Europe.

144. We are seeking views on whether to maintain this weighting system, or to seek an alternative, such as including the vehicle's useful lifetime or expected lifetime CO_2 emissions contribution of a representative conventional vehicle within a particular vehicle's sub-category.

Q21 – What metric should be applied as a weighting system for a particular vehicle grouping?

Flexibilities – Credits, debts, and trading

145. Under any of the three options described in Part B, a range of flexibilities could be considered in any future framework's design, including a credit and debt system, banking and borrowing, and a trading mechanism. The existing CO_2 standards employ a credit and debt system, whereby overcompliance with the standards in any given year results in an accumulation of credits. These credits may be used to offset any debts accrued due to non-compliance to avoid penalties.

146. An additional approach would allow for a limited number of credits to be borrowed to avoid non-compliance in a given year. The credits borrowed could be paid back in a future year, possibly with interest, to avoid penalties.

147. Trading credits across manufacturers provides flexibility to allow for one manufacturer to compensate for under-compliance through purchasing credits from a manufacturer who has banked credits due to over compliance. Trading may also be considered through vehicle transfers – whereby one manufacturer may use the CO_2 certification of another manufacturer's vehicle for the purposes of compliance – as is applied in the revised EU CO_2 standards (EU) 2024/1610.

148. To encourage CO_2 emission reductions in the long-haul sector, credits transfers could be limited across sectors. Three broad approaches have been explored which we would welcome views on:

    - Credits earned within certain weight classes may only be used for compliance with the targets set for those classes, e.g., credits earned by vehicles in the VECTO groups up to and including 26 tonnes may not be transferred for compliance towards the targets set for vehicles over 26 tonnes, and vice versa.

    - Credits earned within certain weight classes may be used for compliance across all vehicles, e.g., credits earned by vehicles in the VECTO groups up to and including 26 tonnes may be transferred for compliance towards the targets set for vehicles over 26 tonnes, and vice versa.

    - Credits earned by easier to decarbonise VECTO categories may not be transferred for compliance towards the harder to decarbonise VECTO categories, but credits earned by harder to decarbonise VECTO categories are allowed to be transferred across all categories.

Q22 – Which flexibilities do you think should be established under a future HGV regulation?

Q23 – What is your preferred option for credit transfer? If there is an alternative option you would like to have considered, please elaborate here.

Penalties and enforcement

149. Manufacturers may face fines for non-compliance with the current regulations of £3,830 and £6,130 for every gCO_2/tkm above their target in 2025 and 2030 respectively, multiplied by the sales of vehicles in each year of non-compliance. Under a ZE HGV mandate, any manufacturer using more than their allocated allowances for the sale of new non-ZE HGVs, and who has exhausted all other flexibility mechanisms such as borrowing and trading, would be required to pay a fine.

150. The fine would be a fixed amount, like the arrangements in existing CO_2 standards, but adjusted to account for the carbon reduction potential of a ZE HGV relative to each gCO_2/tkm under the existing mechanism.

Q24 – Do you have any comments on the level and provision of penalties and enforcement in a future HGV regulation?

Part E: ZE HGV uptake/CO_2 emission reduction trajectories

Vehicle groupings for targets

151. Targets for the decarbonisation of the HGV sector are needed to guarantee emissions reductions necessary to meet legally binding carbon targets. They are also needed to provide certainty to manufacturers, freight operators, chargepoint operators, and other stakeholders regarding the future technology mix.

152. The pace of the transition will be impacted by, amongst other factors, technology readiness, the time required to scale up ZE HGV supply chains, and rollout the necessary infrastructure. Most major HGV manufacturers have already committed to significantly increasing their share of ZE HGV sales, with most committing towards a 45-60% CO_2 reduction or ZE HGV share by 2030, and several pledging to only producing ZE HGVs from 2040 (see Figure Figure 9 in Part A).

153. The previous government announced in 2021 the target to phase-out the sale of new non-zero emission HGVs up to and including 26 tonnes by 2035 and over 26 tonnes by 2040. These targets were established on the basis of the maximum gross train weight (GTW) of the vehicle, which includes the weight of the motorised HGV and any trailer attached, including a semi-trailer for an articulated truck and a draw-bar trailer for a rigid body truck.

154. Vehicles under 26 tonnes largely service urban and regional routes. Their shorter duty cycles and more predictable journeys make them more suited to ZE technology than heavier HGVs.

155. In contrast, HGVs over 26 tonnes may need to rely more on a public refuelling recharging network to become a viable alternative to diesel. This is down to their operational requirements: on average HGVs above 26 tonnes are more widely used in long haul applications, with vehicles completing longer journeys and carrying heavier loads than lighter HGVs, requiring them to charge/refuel enroute.

156. As outlined above in Part D, we are proposing to maintain the VECTO categorisation of vehicles. VECTO categories may provide more nuance in the operation of a

vehicle by characterising the vehicle based upon its weight, axle configuration, body type, engine power, and cab type.

157. In the case of each vehicle group as categorised within VECTO, historic CO_2 certification shows that almost all vehicle sales fall entirely into either the "up to 26 tonne" category, or the "over 26 tonne" category. A summary of the sales share of vehicles that have a max weight above and below 26 tonnes based on the CO_2 certification values in the UK in 2020 are available in Table 1.

158. While the weight of a vehicle provides a good indicator towards the challenge of decarbonisation, this challenge may also be dependent on other factors including the annual mileage, mission profile, and average payload of the vehicle. As the vehicles classed under VECTO groups are characterised by a combination of these factors, we are seeking views on which VECTO groups should be included in the 2035 phase out date, and which should be included in the 2040 phase out date. VECTO categories are further described in Annex B.

Table 1. Sales share of VECTO categories in the UK up to and above 26 tonnes based on CO_2 certification data from 2020. Source – VCA. Note: groups 1s, 53, and 54 were not reported in 2020, but as their categories are based on weight, it can be assumed they all fall below the 26 tonne threshold.

Vehicle group	≤26 tonnes	>26 tonnes
1s	100%	0%
1	100%	0%
2	100%	0%
3	100%	0%
4	100%	0%
5	1%	99%
9	99%	1%
10	1%	99%
11	99%	1%
12	0%	100%
16	0%	100%
53	100%	0%
54	100%	0%

Q25 – Which VECTO groups should be included in the 2035 phase out dates, and which should be included in the 2040 phase out dates?

Indicative target trajectories

159. The previously announced phase out targets set two distinct dates for the end of sale for non-ZE HGVs of 2035 and 2040 dependent on their weight category. These phase out targets could be achieved through setting distinct target trajectories for both weight categories, reaching a 100% CO_2 reduction or ZEV share in 2035 and 2040 supported through interim targets.

160. To provide flexibilities in achieving these targets, a credit transfer scheme across categories could be considered whereby over-compliance in the targets for one category could earn credits and be used to balance out an under-compliance in a different category. These flexibilities are discussed in Part D: Vehicle categories, weightings, flexibilities, and penalties

161. The government is seeking views on indicative trajectories that may be set under a future CO_2 emissions regulatory framework. We believe the targets should reflect a balance between feasibility from the supply side, taking into consideration the challenges of the transition outlined in Part A, and stringency capable of delivering the legally obliged carbon budgets.

162. An indication of feasibility may be taken from the EU's regulatory framework, of which most HGV manufacturers selling into the UK are within scope of.

163. The EU-27 targets require most new HGVs and all coaches to reduce their CO_2 emissions by 43% in 2030, 64% in 2035, and 90% in 2040, relative to a base year of either 2019, 2021, or 2025 depending on vehicle category.

164. Further indication of supply-side feasibility may be seen from manufacturer commitments, which have focused mostly on zero-emission sales share targets for 2030 and 2040. Almost all major manufacturers have announced targets that between 45% and 60% of their sales in 2030 will be ZE HGVs. Three manufacturers have announced plans to only sell ZE HGVs from 2040 (see Figure Figure 9).

165. All major manufacturers have committed to end sales of fossil-fuelled HGVs by 2040 in a pledge signed by the European automobile manufacturer association, ACEA.

166. The Climate Change Committee's report providing advice to government on the level of the Seventh Carbon Budget include roughly one third of HGVs in the existing fleet to be battery electric by 2035, rising to two thirds by 2040.[74]

Q26 – For your chosen regulatory option, what target trajectory do you think should be set?

Q27 – If a ZEV mandate is your preferred option, should a CO_2 improvement target also be set for the non-ZE HGV fleet? If so, please elaborate.

[74] The Seventh Carbon Budget
https://www.theccc.org.uk/publication/the-seventh-carbon-budget/

How to respond

167. The consultation period began on 6 January 2026 and will run until 17 March 2026. Please ensure that your response reaches us before the closing date. If you would like further copies of this consultation document, it can be found at www.gov.uk/government/consultations/new-hgv-co2-emissions-regulatory-framework-for-the-uk or you can contact hgvconsultation@dft.gov.uk if you need alternative formats (Braille, audio CD, etc.).

168. Email responses should be sent to: hgvconsultation@dft.gov.uk If you are responding in writing, please make it clear which question or questions you are responding to. Written responses should be sent to:

Department for Transport, Office for Zero Emission Vehicles, Great Minster House 33 Horseferry Road, London, SW1P 4DR

When you reply, it would be very useful if you confirm whether you are replying as an individual or submitting an official response on behalf of an organisation and include:

- your name
- your position (if applicable)
- the name of organisation (if applicable)

Next steps

169. We will undertake extensive engagement with stakeholders to discuss the issues presented in this consultation.

Freedom of Information

170. Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the Freedom of Information Act 2000 (FOIA) or the Environmental Information Regulations 2004.

171. If you want information that you provide to be treated as confidential, please be aware that, under the FOIA, there is a statutory code of practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

172. In view of this it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information, we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the department.

Data protection

173. The Office for Zero Emission Vehicles is carrying out this consultation on the most appropriate future regulatory framework to support the transition to zero emission heavy goods vehicles.

174. View our DfT online form and survey privacy notice for more information on how your personal data is processed in relation to this survey.

175. Do not include personal information in your responses unless specifically requested.

Consultation Principles

176. This consultation is being conducted in line with the government's consultation principles (https://www.gov.uk/government/publications/consultation-principles-guidance).

177. If you have any comments about the consultation process, contact:

Consultation Co-ordinator

Department for Transport

Zone 1/29

Great Minster House London

SW1P 4DR

Email: consultation@dft.gov.uk

Annex A: Full list of consultation questions

Q1 – Do you think the Certification Regulation (EU) 2017/2400 should be amended within the UK to align with the 2nd and 3rd amendments, as adopted in the EU?

Q2 – What are your views on Option 1 regarding a strengthened and expanded CO_2 standard for HGVs?

Q3 – What are your views on Option 2 regarding the introduction of a ZEV mandate limiting the sales of non-ZE HGVs

Q4 – If you agree with using Option 2 as a future framework, should the ZE HGV mandate be accompanied by a CO_2 standard for non-ZE HGV vehicles?

Q5 – What are your views on Option 3 considering requirements for fleets to purchase or lease an increasing share of ZE HGVs?

Q6 – If you agree with using Option 3 as a future framework, what eligibility criteria should be set to include freight operators in a fleet mandate?

Q7 – If you agree with using Option 3 as a future framework, should a purchasing requirement, fleet requirement, or a combination be established?

Q8 – Of the options presented, what is your preferred approach, or combination of approaches, for reducing emissions from HGVs and delivering a phase-out of new non-ZE HGVs?

Q9 – Are there any alternative approaches that the government should consider to reduce CO_2 emissions from HGVs?

Q10 – Do you have any comments on the exclusion of ZE HGVs with a GVW between 3.5 tonnes and 4.25 tonnes from a future HGV regulation?

Q11 – Do you think a regulatory framework for reducing CO_2 emissions from the HGV sector should be extended to include coaches?

Q12 – What are your views on a future regulation including CO_2 emission reduction targets for trailers?

Q13 – Should a derogation or an exemption be given to smaller volume HGV manufacturers in a regulatory framework? If yes, what should that threshold be?

Q14 – Should an exemption be given to smaller volume coach manufacturers? If yes, please elaborate why and explain what should that threshold be?

Q15 – Should a sunset clause be set for any derogation? If yes, by what year should this be set?

Q16 – Should any additional vehicles be exempt from the standards that we have not considered here?

Q17 – What criterion, or combination of criteria, should be used to set the eligibility of a ZE HGV?

Q18 – For vehicles not covered under the scope of the Certification Regulation, what criterion, or combination of criteria, should be used to set the eligibility of a ZE HGV?

Q19 – For your preferred criterion, or combination of criteria, what eligibility threshold do you propose? Why?

Q20 – Do you agree with maintaining the VECTO vehicle category segmentation? If not, what alternative segmentation would you suggest?

Q21 – What metric should be applied as a weighting system for a particular vehicle grouping?

Q22 – Which flexibilities do you think should be established under a future HGV regulation?

Q23 – What is your preferred option for credit transfer? If there is an alternative option you would like to have considered, please elaborate here.

Q24 – Do you have any comments on the level and provision of penalties and enforcement in a future HGV regulation?

Q25 – Which VECTO groups should be included in the 2035 phase out dates, and which should be included in the 2040 phase out dates?

Q26 – For your chosen regulatory option, what target trajectory do you think should be set?

Q27 – If a ZEV mandate is your preferred option, should a CO_2 improvement target also be set for the non-ZE HGV fleet? If so, please elaborate.

Annex B: VECTO categories

Vehicle group	Axle configuration	Body type	GVW (tonnes)
1s	4x2	Rigid or Articulated	>7.4 and ≤7.5
1	4x2	Rigid or Articulated	>7.5 and ≤10
2	4x2	Rigid or Articulated	>10 and ≤12
3	4x2	Rigid or Articulated	>12 and ≤16
4	4x2	Rigid	>16
5	4x2	Articulated	>16
6*	4x4	Rigid	>7.5 and ≤16
7*	4x4	Rigid	>16
8*	4x4	Articulated	>16
9	6x2	Rigid	all weights
10	6x2	Articulated	all weights
11	6x4	Rigid	all weights
12	6x4	Articulated	all weights
13*	6x6	Rigid	all weights
14*	6x6	Articulated	all weights
15*	8x2	Rigid	all weights
16	8x4	Rigid	all weights
17*	8x6/8	Rigid	all weights
18*	8x2/4/6/8	Articulated	all weights
19*	5 axles	Rigid or Articulated	all weights

***CO_2 certification not included in 2017/2400. Group 1s is not included in the version of 2017/2400 that applies in Great Britian, but is included in the version that applies in Northern Ireland and the EU-27.**

VECTO group	Axle configuration	Body type	GVW (tonnes)	Driven wheels
51*	4X2	Rigid or Articulated	>5 and ≤7.4	Front wheel drive
52*	4X2	Van	>5 and ≤7.4	Front wheel drive
53	4X2	Rigid or Articulated	>5 and ≤7.4	Rear wheel drive
54	4X2	Van	>5 and ≤7.4	Rear wheel drive
55*	4X4	Rigid or Articulated	>5 and ≤7.4	All wheel drive
56*	4X4	Van	>5 and ≤7.4	All wheel drive

***CO_2 certification not included in 2017/2400. Groups 53 and 54 are not included in the version of 2017/2400 that applies in Great Britian, but are included in the version that applies in Northern Ireland and the EU-27.**

Vehicle group	Vehicle sub-group	Cab type	Engine power
4	4-UD	All	<170 kW
	4-RD	Day cab	≥170 kW
		Sleeper cab	≥170 kW and <265 kW
	4-LH	Sleeper cab	≥265 kW
9	9-RD	Day cab	All
	9-LH	Sleeper cab	All
5	5-RD	Day cab	All
		Sleeper cab	< 265 kW
	5-LH	Sleeper cab	≥ 265 kW
10	10-RD	Day cab	All
	10-LH	Sleeper cab	All

Annex C: International Context

178. Standards regulating the fuel economy or CO_2 emissions of HGVs are present in seven jurisdictions worldwide: Canada, China, the EU-27, India, Japan, the United States, and the United Kingdom. Figure 11 below summarises the CO_2 reduction ambition of these standards.

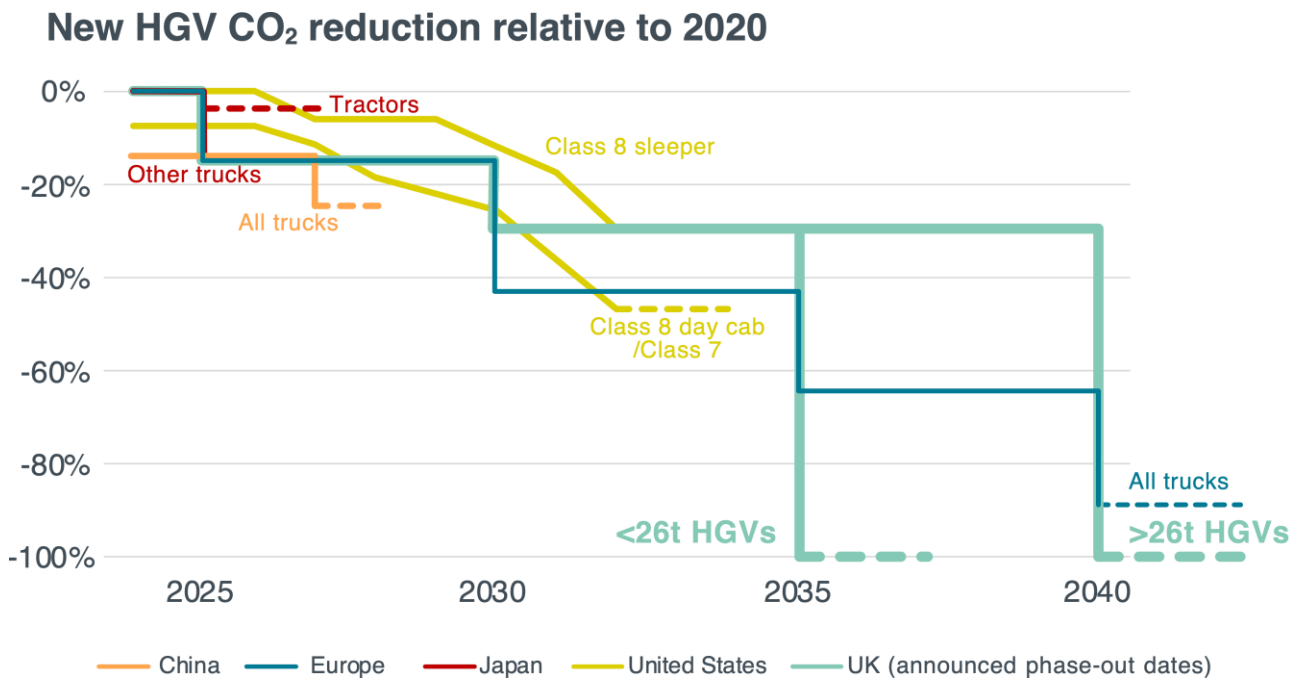


Figure 11. HGV CO_2 reduction targets globally. Canada's standards follow the US standards up until 2027 so are not highlighted here. India's standards came into effect in 2018 and have yet to be updated so are also not highlighted here.

179. The proposed end of sales dates for the UK would represent the most ambitious CO_2 reduction targets of any country globally.

180. A detailed description of the standards adopted in each jurisdiction is available below.

European Union

181. The European Union set its first CO_2 standards in 2019, under regulation (EU) 2019/1242 obliging manufacturers of most new HGVs to reduce their CO_2 emissions by 15% in 2025 and 30% in 2030, relative to 2019. The regulation applies to manufacturers of rigid and articulated HGVs with an axle configuration of 4x2 or 6x2 and a technically permissible maximum laden mass (TPMLM) above 16 tonnes.

182. In February 2023, the European Commission proposed to strengthen these standards, increasing the targets to 45% in 2030, 65% in 2035, and 90% in 2040. The scope was also increased to cover buses, coaches, trailers, and more HGV types including HGVs and vans with a TPMLM between 5 tonnes and 7.4 tonnes with a rear wheel drive, all 4x2 HGVs with a TPMLM between 7.4 tonnes and 16 tonnes, all 8x4 HGVs, and vocational vehicles.

183. The standards are set based on a fleet-averaging principle, i.e., not every vehicle produced by a manufacturer is required to meet the standards imposed, rather a manufacturer is in compliance granted their fleet-averaged emissions are below the set target

184. Vehicles are split into groups based off their axle configuration, TPMLM, and body type. The contribution of these vehicles towards the targets is based on assumptions of the vehicle's annual mileage and average payload, such that vehicles with a high mileage or high payload contribute proportionately more than a vehicle with a relatively low mileage or low payload.

185. The proposal introduced a vehicle trading scheme allowing manufacturers that share a parent company to register one other's vehicles. Manufacturers which don't share a parent company can only trade ZE vehicles, limited up to 5% of the receiver's sales volume.

186. The proposal extends the credit and debt system in the original CO_2 standards (EU) 2019/1242 through to 2040. Manufacturers that fail to meet their target in a given year earn a debt. This debt may be offset with credits earned due to over compliance in the preceding years. Credits earned from 2025 have a lifetime of 7 years.

187. Manufacturers who sell fewer than 100 vehicles per year are exempt from the standards but may partake in the trading of zero-emission vehicles if requested.

188. The European Parliament and the Council of the European Union came to an informal agreement in January 2024 effectively agreeing to the European Commission's proposal. A formal ratification by the European Parliament took place in April 2024 and by the Council of the European Union in May 2024. The final standard was published in the EU in May 2024 under (EU) 2024/1610.

189. The standards will be reviewed in 2027. The review will consider several aspects including the role of CO_2 neutral fuels in complying towards the standards, introducing a methodology for the calculation of a life cycle assessment of the vehicle, analysing options to include retrofitted vehicles towards CO_2 targets, and

expanding the scope of the standards to include small HGVs with a TPMLM ≤ 5 tonnes and special purpose and off-road vehicles.

The United States

190. The U.S. issued its first standards regulating fuel consumption and GHGs, known as Phase 1, for heavy-duty vehicles of model year 2014-2018 in 2011 through the Environment Protection Agency (EPA).

191. The standard applied to HGVs with a gross vehicle weight ≥ 8,500 lbs (~3.9 tonnes) of model years. These standards required CO_2 and fuel consumption reductions from both the engine and the full vehicle.

192. Class 7 and 8 combination tractors were required to reduce their CO_2 emissions by 9-23%, vocational vehicles by 5-9%, commercial pickups and vans by 10-15%, and engines by 2-6% compared to a model year 2010 baseline.

193. Phase 2 standards were introduced in 2016 and applied to model years 2018-2027 expanding upon Phase 1 standards with more stringent targets and originally including trailers.

194. Class 7 and 8 combination tractors were required to reduce their CO_2 emissions by 12-27%, vocational vehicle by 10-24%, commercial pickups and vans by 16%, engines by up to 5%, and trailers by 3-9% compared to model year 2018 baseline.

195. The final Phase 3 standards were initially proposed in April 2023 and built on EPA's Phase 2 program from 2016, setting CO_2 emission reduction targets for several different vehicle classes. The targets are based off ZE vehicle projections, but manufacturers may meet them through either improving the efficiency of their ICE vehicles, or by deploying additional zero-emission vehicles.

196. The standards are expected to see 25% ZE long-haul tractors by model year 2032, 30-60% for vocation vehicles, and 40% for short-haul tractors.

197. The standards are set based on a fleet-averaging principle, i.e., not every vehicle produced by a manufacturer is required to meet the standards imposed, rather a manufacturer is in compliance granted their fleet-average emissions are below the set target.

198. The contribution of different vehicle families is determined by weighting their contribution according to their average payload, annual mileage, and useful lifetime. As such, vehicles which have a higher annual mileage, carry more goods, or have a longer useful life will have their emission reduction contribute proportionally more towards a manufacturers compliance than those that have a relatively lower annual mileage, carry less goods, or have a shorter useful lifetime.

199. Emission credits are transferrable within averaging sets. For HGVs, there are 3 averaging sets; Light HDVs (Class 2b-5, GVW between ~3.9 tonnes and 8.9 tonnes), Medium HDVs (Class 6-7, GVW between ~8.9 tonnes and 15 tonnes), and Heavy HDVs (Class 8, GVW above 15 tonnes).

200. Credits have a lifetime of 5 years. A limited amount of credits earned in Phase 2 of the program may be carried over to Phase 3.

China

201. China first adopted Stage 1 of its fuel economy standards in 2011, which applied to diesel and gasoline straight trucks and tractor-trailers with a weight above 3.5t. Stage 2 was a voluntary program.

202. Stage 2 was a mandatory regulation which was introduced in 2013 and implemented in 2014. It increased the scope to include dump trucks and set maximum fuel consumption levels at an average level of 10.5-14.5% below Stage 1.

203. Stage 3 applied to all vehicles from July 2021 onward and set tighter limits for fuel consumption at a level of 15.3% less than Stage 2 for tractor trailers and 13.8% less for rigid trucks.

204. Stage 4 was proposed in June of 2022 and is scheduled to go into force in 2025 with a two year phase in period. It retains the scope of vehicles as the previous regulation and reduces fuel consumption by an average of 20% over Stage 2.

205. Base models are tested on a chassis dynamometer running on the C-WHTC cycle. Variant models are evaluated through simulation.

206. Vehicles are considered to be in compliance if the conformity of production test results are below 6% of their certified values, meaning the vehicles produced may have a fuel economy up to 6% higher than the vehicle used for certification. This allows for measurement errors in the testing on the chassis dynamometer.

207. Not all production vehicles are measured, but a random selection of vehicles is chosen and tested to ensure compliance with the 6% threshold.

Others: Canada/Japan/India

208. **Canada** has set greenhouse gas emissions standards for heavy-duty vehicles under the Canadian Environmental Protection Act, 1999. These regulations are aligned with the Phase 2 standards of the U.S. EPA, setting targets for vehicles of model years up to 2027.

209. **India** first passed fuel consumption standards for diesel HGVs above 12t with Phase 1 going into effect in April 1, 2018. In July 2025, The Bureau of Energy Efficiency (BEE) released a draft Phase 2 fuel consumption norms for medium- and heavy-duty vehicles for the 2027–2032 period. The proposed standards aim for a 30% fleet-average reduction in fuel consumption relative to 2022–23 vehicle data.

210. **Japan** introduced a regulation on the fuel economy of HGVs in 2005, making it the first country to regulate the efficiency of heavy-duty vehicles. The Phase 1 regulations became fully enforced in 2015 while Phase 2 will come into force in 2025. The Phase 2 regulations apply to all HGVs above 3.5t and require an average

efficiency improvement of 13.4% over Phase 1 requirements, with varying targets by vehicle type.