Consultation on when to phase out the sale of new non-zero emission heavy goods vehicles

Introduction

Thank you for responding to our consultation on setting phase out dates for the sale of new non-zero emission HGVs.

The closing date for this consultation in 23:45 on is 3rd September 2021. Please send your completed response form to HGVconsultation@dft.gov.uk

Due to remote working, we strongly encourage responses by email. If you are unable to respond by email, we would invite you to please let us know by asking someone to email on your behalf.

If none of the above is possible, then we invite you to send written responses to:

HGV phase out date consultation
Great Minister House
33 Horseferry Road
London
SW1P 4DR

About this consultation

Background

Transport is the largest contributor to domestic UK greenhouse gas (GHG) emissions, accounting for 27% of emissions in 2019. Within transport, HGVs are second only to cars and vans in terms of total GHG emissions. The proposed phase out dates put forward in this consultation reflect what is needed for the UK's HGV fleet to deliver its contribution to net zero by 2050.

Consultation proposals

We are seeking views on the following proposed phase out dates for the sale of new non-zero emission HGVs:

- **2035** (or earlier if a faster transition seems feasible) for vehicles weighing from 3.5 tonnes up to and including 26 tonnes.
- **2040** (or earlier if a faster transition seems feasible) for vehicles weighing more than 26 tonnes.

We are also seeking views on:

- whether to extend these phase out dates to HGVs using low carbon fuels.
- whether the maximum permissible weights of zero emission or alternatively fuelled HGVs should increase to allow for their generally heavier powertrains. Weight limits would increase by the additional weight of the powertrain, up to a maximum of 1 tonne for alternatively fuelled HGVs and 2 tonnes for zero emissions HGVs.

Confidentiality and data protection

Department for Transport (DfT) is running this survey to assist with setting appropriate phase out dates for the sale of new, non-zero emission HGVs.

We are asking for:

- your name and email address, in case we need to ask you follow-up questions about your responses (you do not have to give us this personal information, but if you do provide it, we will use it only for the purpose of asking follow-up questions.)

- whether you are representing an organisation or yourself.

- if you are representing an organisation, the name of the organisation or business you represent and the type. Please note, sole traders are not required to provide this information.

Your consultation response and the processing of personal data that it entails is necessary for the exercise of our functions as a government department. Any information you provide that allows individual people to be identified, including yourself, will be protected by data protection law and DfT will be the controller for this information.

DfT's privacy policy (open in new window) has more information about your rights in relation to your personal data, how to complain and how to contact the Data Protection Officer.

Your information will be kept securely and destroyed within 12 months after the closing date.

Your details

Questions in this section provide us with important information on your relationship to the consultation, whether your interest is as a member of the public, an academic or as the representative of an organisation. Understanding this information allows us to understand how different sectors of society view our proposals.

1. Your and email address:

Name:	Kate Young
Email:	kate.young@aldersgategroup.org.uk

2. Are you responding: *

	as an individual?
X	on behalf of an organisation?

Organisation details

3. Name of your organisation:

Please note sole traders are not required to provide this information.

Organisation name:	Aldersgate Group

3. Are you responding as:

Please note sole traders are not required to provide this information.

	a representative of a business or firm?
	a representative for a trade body?
	a representative of an academic or research organisation?
	a representative of a local authority or other public body?
	from a community group?
X	another organisation? Not-for-profit membership organisation

Consultation Questions

Please note none of the questions in this consultation are compulsory.

1. **Do you agree or disagree that introducing a phase out date for the sale of new non-zero emission HGVs will help us meet our legally binding net zero target?**

x	Yes
	No
	Don't know

Please explain your answer.

The Aldersgate Group[1] strongly supports a phase out date for the sale of new non-zero emission HGVs and believes this will be essential to ensure the transport sector is on a credible pathway to reaching net zero 2050. HGVs are vital to the prosperity of the UK economy, carrying 90% of the UK's goods.[2] Whilst they make up only 5% of road vehicles, they represent 18% of road transport emissions – disproportionately high due to their large average milage and weight.[3] Progress to date on fuel efficiency in HGVs has been offset by an increased proportion of larger/heavier HGVs amongst new registrations.[4] Demand for freight in the UK is also expected to rise - in 2019, the UK-registered vehicle fleet comprised a total of 334,000 rigid and articulated units below and 192,000 above 26 tonnes. The UK HGV fleet below 26 tonnes is expected to increase to 440,000 vehicles and above 26 tonnes to 260,000 vehicles by 2050 (excluding foreign registered goods vehicles circulating on UK territory).[5]

Analysis from Transport & Environment has shown that whilst efficiency measures such as improved fuel efficiency of trucks, modal shift to rail and optimised logistics supply chains can contribute to reducing freight emissions, they are not even sufficient to reach the UK's 2030 target, let alone fully decarbonise the UK's inland freight sector by 2050. Combining the efficiency measures would result in tank-to-wheel emission reductions of 29% by 2030 and 20% by 2050 against 1990 levels due to increasing freight demand. Phasing out non- zero carbon HGVs will therefore be absolutely essential as a low regret option to deliver significant emission reductions in a sector which has seen marginal falls in emissions year on year.[6]

An ambitious commitment to phasing out non-zero carbon HGVs will enable the concentration of efforts within the private sector to scale up supply chains, invest in infrastructure for zero-carbon

[1] Individual recommendations cannot be attributed to any single member and the Aldersgate Group takes full responsibility for the views expressed.
[2] Department for Transport (2018) *Freight Statistics, TSGB0401: 'Domestic freight transport by mode',*
[3] CCC (2020) *The Sixth Carbon Budget – Surface Transport*
[4] Department for Transport (2021) *Transport and Environment Statistics 2021 Annual Report*
[5] Transport & Environment (2020) *How to decarbonise the UK's freight sector by 2050*
[6] Committee on Climate Change (2019) *Reducing UK emissions: 2019 progress report to Parliament*

HGVs, and develop expertise in critical technologies like battery manufacturing and recycling, data sharing and software development. Developments in these areas could translate into a competitive advantage for HGV manufacturers and related OEMs. A phase-out date will additionally act as a clear indicator for National Grid regarding the additional capacity needed to accommodate an increase in electricity usage.

Alongside furthering progress to the UK's net zero target, such a phase-out will also have an impact on air pollution – research has suggested that removing 2,000 non-zero carbon articulated HGVs over 32 tonnes from four of England's most heavily congested freight routes could reduce NOx air pollution by 10%.[7] Reducing air pollution from HGVs could therefore amount to significant savings for the NHS and social care.

A phase-out date must be accompanied by early policy decisions to leverage private investment, as well as public investment that will be essential to accelerate decarbonisation efforts of HGVs by scaling up supply chains, reducing costs and upskilling the workforce as early as possible. There is a particular need to begin rolling out charging infrastructure to support urban and regional HGV deliveries, which should be supported by funding in the upcoming Comprehensive Spending Review from HM Treasury. In order to achieve the goals of the Government's recent Transport Decarbonisation Plan, a whole system approach to transport is needed which an integrated strategy brings together road, bus, freight and rail planning.

2. Do you agree or disagree with our approach to split the phase out dates for new non-zero emission HGVs into two weight categories?

X	Yes
	No
	Don't know

Please explain your answer.

The two weight categories of HGV face varying challenges and readiness for scaling up. For the lighter HGVs of under 26 tonnes, commercial vehicles are commonly used for urban delivery and regional freight transport. These typically occur in one urban area and may include a pick up from nearby distribution centres and a return to the depot overnight. Urban delivery trucks have a typical daily mileage of 200 to 400 km, while regional delivery trucks are characterised by single trip lengths of up to 400 km.[8] Direct electrification of these vehicles based on a larger onboard battery is not only technically feasible but, under certain conditions, today already cheaper than diesel from a total cost of ownership (TCO) perspective.[9]

[7] Metropolitan Transport Research Unit (2017) *Supplementary report on environmental and safety impacts of the transfer of freight from road to rail on key strategic corridors*
[8] Transport & Environment (2020) *How to decarbonise the UK's freight sector by 2050*
[9] Heid et al. (2017) *What's sparking electric-vehicle adoption in the truck industry?*

Battery electrification is likely to be the most cost-effective and efficient pathway for under 26 tonne HGVs making urban and regional deliveries. HGVs in the heavier category of over 26 typically make longer journeys - some larger HGVs can drive up to 800 km in a single day. For such long-haul freight, battery electric trucks, catenary systems and fuel cell electric trucks running on renewable hydrogen are all credible options at present – therefore comprehensive trials will be needed to determine the best technology mix. Given the varying levels of certainty regarding technology credibility, phase-out dates of 2035 for the lighter category and 2040 for the heavier category are logical.

3. Do you agree or disagree that 26 tonnes and under, and more than 26 tonnes are the right categories?

x	Yes
	No
	Don't know

What evidence do you have for or against?

4. Do you agree or disagree with our proposal to end the sale of new non-zero emission HGVs, for vehicles weighing from 3.5 up to and including 26 tonnes, by 2035?

x	Yes
	No
	Don't know

What evidence do you have for or against?

Based on engagement with our business members, Aldersgate Group welcomes the proposed phase-out dates of 2035 and 2040 for vehicles weighing between 3.5 – 26 tonnes and more than 26 tonnes respectively. The sale of new non-zero emission HGVs locks in emissions for the

future, and with a typical age of HGVs between 6-13 years,[10] a timely phase-out will be necessary to prevent petrol and diesel HGVs existing in circulation past 2050.

Battery electric trucks are becoming available in increasing numbers and with innovation support, direct electrification through overhead catenary systems and fuel cell electric trucks running on renewable hydrogen will also be credible options. Still, replacing conventional HGVs with zero-carbon vehicles represents a significant challenge moving forwards.. Record low prices of low carbon power and disruptions in battery technology should improve affordability and accessibility, but a phase-out date of 2035 and 2040 will be crucial to reach 100% zero emission HGVs by 2050. Analysis for the Climate Change Committee (CCC) has shown that although zero-carbon HGV technologies have high up-front costs, their annualised costs are 5% to 43% lower from a societal cost perspective than the fossil fuel comparator.[11] Analysis by Transport and Environment has shown that to be on track for meeting the proposed phase-out dates, sales of these vehicles will need to reach 38% for the category weighing between 3.5-26 tonnes, and 15% for those weighing more than 26 tonnes, by 2030.[12]

Many manufacturers are already making commitments concerning the sale of non-zero emission HGVs. An alliance of Europe's largest HGV manufacturers have already pledged to stop selling non-zero emission HGVs by 2040.[13] Daimler, Scania, Man, Volvo, Daf, Iveco and Ford will spend around €50bn-€100bn on hydrogen and battery technologies, and call for widespread investment in energy grids and a higher tax on carbon to help drive the change. The Volvo Group has a target to reach net zero emissions by 2040 in order to reach a rolling fleet net zero value chain emissions by 2050 and notably has an interim CO2 reduction target of 40% per HGV by 2030 compared to 2019. The Group has also forged an industry collaboration focussed on creating the conditions for the mass-market roll-out of hydrogen trucks in Europe.[14] Mercedes-Benz Trucks, meanwhile, aims to have all new vehicles in Europe, North America, and Japan 'tank-to-wheel' CO2-neutral by 2039.[15] Given this international context, a phase-out date in the UK will help the UK maintain a competitive advantage in zero emission HGV production by directing resources towards this growing EV market rather than the declining market for petrol and diesel HGVs. Funding for battery production including through the Faraday Challenge is likely to drive big improvements in battery technology, allowing the UK to create an integrated supply chain for HGVs.

[10] https://www.statista.com/statistics/1203363/uk-licensed-hgvs-by-age/
[11] Ricardo Energy & Environment for the Committee on Climate Change (2019) *Zero Emission HGV Infrastructure Requirements*
[12] Transport & Environment (2020) *How to decarbonise the UK's freight sector by 2050*
[13] Financial Times (December 2020) *European truckmakers to phase out diesel sales decade earlier than planned*
[14] https://www.volvogroup.com/en/sustainability/climate-goals-strategy/reducing-carbon-emissions.html
[15] https://www.daimler.com/sustainability/co2-neutral-commercial-vehicle-fleet-until-2039.html

5. What do you consider the main challenges and barriers to meeting this target for HGVs 26 tonnes and under?

Based on engagement with our business members, Aldersgate Group has identified the main barriers in meeting the 2035 and 2040 target to be: readiness of supply chains to bring zero emission HGVs to market, cost, skills shortages, resource scarcity, lack of charging infrastructure and impact on the grid.

Scalability and supply chain readiness

Zero emissions technologies for HGVs are not yet deployed at scale to enable companies to upgrade their fleets - more than 99% of the HGV vehicle fleet currently runs on diesel.[16] The limited availability and higher upfront purchase costs are a significant barrier for hauliers investing in zero-carbon vehicles even with their lower operating costs. Trialling the various options for decarbonising HGV fleets – direct electrification through overhead catenary, battery electric vehicles and renewable hydrogen-powered fuel cell electric vehicles – will be absolutely essential to accelerate the transition away from non-zero emission HGVs. In its 2021 Progress Report, the Climate Change Committee (CCC) recommended for trials of zero emission HGVs to commence in the early 2020s with large-scale trials in place by 2024.[17] Such trials will be essential to demonstrate the commercial feasibility of each of the viable technologies and establish the most cost-effective, efficient and suitable mix for both categories of HGV.

Some technologies are ready to be scaled – for example overhead catenary systems could be scaled up using known and available technologies, National Grid, Highways England and the UK's construction industry and infrastructure supply chains. Vehicles have a small onboard battery which charges whilst connected to the overhead system, providing power for the small parts of the journey away from the motorway when disconnected. This technology could be attractive to fleet operators who are concerned about the impact of the need to recharge their vehicles on operations. Direct electrification has a major advantage of being the most energy efficient, resulting in less primary and final energy use and thus reduced fuel costs. The Centre for Sustainable Road Freight's research suggests that investment in pantograph-electric vehicles by fleet operators could pay back within 18 months due to lower energy costs andpay back investors of infrastructure through electricity sales.[18]

Direct electrification through batteries also offers significant potential – with models due to come onto the market over the next few years, for example Daimler's eActros LongHaul with a maximum GVW of 44 tonnes and a range of 500 km.[19] Electrification is currently (and likely to remain) at least twice as efficient as hydrogen and around three times as efficient as internal combustion engines running on synthetic electrofuels.[20] The disadvantages of batteries are potential time losses due to longer charging times, the required infrastructure roll-out and the increased power demand on the medium-voltage power grid. Long-haul battery electric HGVs will need extensive charging infrastructure along the motorway due to intercity travel. Packaging sufficient battery range into the vehicle is a major challenge with battery-electric HGVs. Size is another factor - even after correcting for an electric vehicle's higher efficiency, batteries take up considerably more of the vehicle's size and weight allowances than diesel.

Renewable hydrogen powered fuel cell electric vehicles are another option for zero emission long-haul road freight. Nikola plans to produce the Tre also as an electric hydrogen model with a

[16] Department for Transport (2020). *VEH0503: Licensed heavy goods vehicles by propulsion and fuel type: Great Britain and United Kingdom*
[17] CCC (2021) *Progress in reducing emissions 2021 Report to Parliament*
[18] The Centre for Sustainable Road Freight (2020) *Decarbonising the UK's Long-haul Road freight at minimum economic cost*
[19] Daimler (2020) *Daimler Trucks presents technology strategy for electrification – world premiere of Mercedes-Benz fuel-cell concept truck.*
[20] Transport & Environment (2020) *How to decarbonise the UK's freight sector by 2050*

GVW of 40 tonnes and an estimated range of up to 960 km from 2023, [21] Hyundai and H2 Energy have a partnership which aims to deploy 1,600 hydrogen HGVs in Switzerland by 2025.[22] Advantages include short refuelling times, no tailpipe CO2 emissions or air pollutant emissions and potentially long driving ranges. Disadvantages of hydrogen include the well-to-tank conversion efficiency losses, the high vehicle costs, the need to develop distribution and refuelling infrastructure, and an increased likelihood to rely on fuel imports from outside Europe due to a higher renewable electricity demand. [23] Low carbon hydrogen will also likely be available in limited volumes, so it will be crucial to be strategic about deployment, prioritising use in areas without alternatives such as steel production.

Biofuels offer potential as a transitional fuel, though it is essential that robust accounting mechanisms and sustainability criteria are in place to ensure environmentally positive outcomes. Aldersgate Group member John Lewis Partnership has developed a strategy to decarbonise its fleet by progressively replacing diesel trucks with ones running on biomethane created from waste. By 2028, all 500 John Lewis and Waitrose heavy trucks will be running on biomethane, saving 49,000 tonnes of CO_2 per year.

At scale trials for all of these technology options should commence as soon as possible, so that policy decisions about decarbonising freight can be made well before 2050 and businesses are able to replace their fleets in the most timely and cost-effective way. A renewal of competitions such as the Low Emission Freight and Logistics Trial could be one such way of achieving this.

Lack of charging infrastructure

The UK is making strong progress on rolling out a network of charging infrastructure for electric cars, but plans for a charging network that can accommodate commercial vehicles including HGVs are largely undeveloped. Transforming existing HGV infrastructure will be a significant challenge that depends upon the availability of labour, skills, resource availability, planning permission processes, government policy and the market landscape. Analysis has suggested that the total cost of an overhead catenary system will be £19.3 billion to cover 65% of all HGV-kms in the UK.[24]

HGV charging infrastructure raises unique challenges compared to EV charging infrastructure given that multiple technologies will likely be necessary for decarbonisation – each requiring separate charging infrastructure from overhead lines, to overnight and high-power charging, to hydrogen refuelling stations. Further, as HGV drivers tend to set off at similarly early times to avoid traffic, and are likely to share stop times set by legally mandated breaks (every 4.5 hours), ensuring adequate grid capacity to meet spikes in demand will be an additional challenge. Long-distance vehicles are likely to require at least 400 km of independent range, plus the provision of sufficient density of HGV-suitable ultra-rapid chargers to be able to recharge ahead of the mandated breaks. Element Energy found that would require a network of recharging points at least every 50 km on the UK's strategic road network.[25]

Countries across Europe are already investing in zero emission HGV infrastructure. Sweden oversaw the opening of the world's first eHighway in Sweden,[26] and Germany is trialling an overhead catenary system also developed by Siemens to work with a custom Scania hybrid truck developed by VolksWagen.[27] Germany's pilot is currently operational on a six-mile stretch

[21] https://www.reuters.com/article/us-cnh-industrial-nikola/cnh-industrials-iveco-joins-the-electric-truck-race-with-nikola-partnership-idUSKBN1Y62FR
[22] https://hyundai-hm.com/en/2019/08/26/hyundai-and-h2-energy-sign-joint-venture-contract/
[23] Transport & Environment (2020) *How to decarbonise the UK's freight sector by 2050*
[24] The Centre for Sustainable Road Freight (2020) *Decarbonising the UK's Long-haul Road freight at minimum economic cost*
[25] Element Energy for the CCC (2020) *Analysis to provide costs, efficiencies and roll-out trajectories for zero-emission HGVs, buses and coaches*
[26] https://press.siemens.com/global/en/pressrelease/worlds-first-ehighway-opens-sweden
[27] https://www.roadtraffic-technology.com/news/siemens-ehighway-germany/

of autobahn near Frankfurt and is set to run until 2022, after which it could be expanded more broadly across the country.

Analysis for the CCC by Ricardo Energy & Environment has mapped out the infrastructure needed to support a ramp up to almost 400,000 zero emission HGVs by 2060, with between 3,500 – 20,000 electric depot chargers needing to be built annually in all scenarios.[28] This analysis also suggests that depot chargers will be needed due to the low number of vehicles that can use a charger at any given time, with around 0.3 and 0.85 depot chargers needed per HGV with an electric element. For hydrogen technology, the Ricardo analysis suggests that around 500-600 hydrogen refuelling stations will be required to support larger HGVs only – if lighter HGVs use hydrogen, this could increase to 1,000.

The UK Government's Project Rapid announced in the March 2020 Budget was a welcome funding commitment for EV charging infrastructure, and should be broadened to include HGVs. First mover disadvantage can hold back private investment in charging infrastructure - if a company wants to install a significant number of charge points which then require a grid upgrade, that company will incur the whole cost of the capacity expansion, even if the additional capacity created can then also be used by others. The Government should therefore also consider introducing funding instruments which support transport companies and the logistics sector to share these costs and install private and shared infrastructure for depot and destination charging for urban and regional delivery trucks. The upcoming Comprehensive Spending Review and the recently created National Infrastructure Bank offer crucial opportunities to invest and plan for HGV charging infrastructure.

Rapidly expanding the HGV charging network need not be wholly reliant on public money, as there are increasing numbers of initiatives exploring different ways of channelling private investment into HGV infrastructure. The Government should consider setting up public-private partnerships with vehicle manufacturers and utility companies focusing specifically on public high-power charging infrastructure for regional and long haul operations along the road network.

A model from Zenobe Energy applied recently to 34 electric buses across the UK sees Zenobe owning and servicing the batteries of the electric buses and charging infrastructure at depots. The transport operators retain ownership of the vehicle bodies.[29] Splitting the financial risk like this helps to lower the overall costs of adopting electric buses, as well as any perceived risks associated with owning charging infrastructure as discussed above. Applying this structure to the electrification of HGV fleets could accelerate the uptake of commercial non-zero emission HGVs across the UK.

Cost of zero emission HGVs

It is important to note how the cost profiles of zero emission HGVs and diesel HGVs differ. The upfront cost for zero emission HGVs is significantly higher than for an equivalent ICE vehicle, and although their annualised costs are 5% to 43% lower from a societal cost,[30] upfront cost is an impediment to greater uptake of zero emission HGVs. Purchase grants applied meaningfully in the early market phase could offer significant incentivisation in accelerating the market uptake of zero emission HGVs. It is welcome that the UK has extended the plug-in grant scheme to large vans and trucks covering up to 20% of the vehicle purchase price with a maximum grant of £8,000 for vehicles with at least 50% less CO2 emissions. Government should consider amending this purchase subsidy so that it is limited to zero emission HGVs as recommended by the CCC.

[28] Ricardo Energy & Environment for the CCC (2019) *Zero Emission HGV Infrastructure Requirements*

[29] https://www.zenobe.com/news-and-events/milestone-for-abellio-and-zenobe-energy-as-its-first-electric-buses-in-london-enter-service

[30] Ricardo Energy & Environment for the Committee on Climate Change (2019) *Zero Emission HGV Infrastructure Requirements*

In the meantime, continuing initiatives that grow business confidence in the new technology (e.g. through providing better information to businesses, clarifying the fiscal incentives and taxation regimes that early buyers can expect and through clarity of policy) would help support the transition. Should the market not move fast enough towards a full transition to zero emissions HGVs, in the long-term the Government should consider measures to mandate minimum sales of zero emissions HGVs as has been done in California with electric vehicles.[31]

Resource scarcity

Circularity in the automotive production process will be essential for truly zero carbon vehicles. Resource efficiency is a key concern for HGV manufacturing, particularly given that for heavier HGVs both battery and hydrogen technologies are likely to result in increased weight in vehicles. Repair, reuse and remanufacturing components of vehicles offers significant opportunity to improve resource efficiency – remanufacturing can avoid in excess of 90% of the embodied material energy emissions and demand on new material inputs compared to new production and has been shown to be up to twice as profitable as manufacturing.[32,33]

Integrating circularity into the production process will require significant investment in clean materials supply chains, the stimulation of market demand for these materials, close collaboration between producers and aftermarket services, and a modular design process that ensures materials can be easily disassembled, sorted and reused at end of life. Firstly, Government should work with industry to develop a common methodology for the for the assessment and reporting of the whole lifecycle emissions and resource use of vehicles – i.e. beyond the tailpipe. A useful example of this is Volvo's life cycle assessment, which includes emissions from upstream supplier activities, manufacturing and logistics, the use phase of the vehicle and the end-of-life phase.[34]

Government should also encourage schemes that reduce material waste and support resource efficient production models. Extending producer responsibility through the review of the End-of-Life Vehicle regulations scheduled for 2021 and the review of battery regulations this year could both serve to incentivise battery re-use. Fiscal measures such as adjustment of tax rates, or Vehicle Excise Duty, on vehicles or on specific components such as batteries and tyres, with a high content of recycled material could also encourage more efficient resource use. Likewise, higher taxes could be placed on the same components with a high content of primary resources. DEFRA's recent Waste Prevention Programme includes promising proposals to consider eco-design principles for the automotive sector. Mandatory standards on durability, reusability, repairability and recyclability will be essential to integrate circularity into the design of vehicles and batteries.

Skills

Another potential barrier to achieving the phaseout dates is the availability of adequately skilled professionals. Moving from the design, construction and maintenance of ICE engines to battery, electric and hydrogen fuel cells is already creating shortages in the automotive sector. A limited cohort of STEM graduates, lack of diversity and inter-sectoral competition for graduates with similar skillsets are all contributing to exacerbating these shortages. The sector is also currently facing skills challenges with an estimated 90,000 driver shortfall that is causing supply chain disruptions across the UK to supermarkets, retailers, and even flu vaccination supplies.[35,36,37]

[31] https://www.transportpolicy.net/standard/california-zev/
[32] 100 International Resources Panel (2018) *Redefining Value: the manufacturing revolution*
[33] The Society of Motor Manufacturers and Traders (SMMT) *2019 Automotive Sustainability Report'*
[34] Volvo (2020) *Carbon Footprint report, Battery electric XC40 Recharge and the XC40 ICE*
[35] https://brc.org.uk/retail-insight/content/monitors/shop-price-index/reports/082021_spi/
[36] https://www.bbc.co.uk/news/business-58442611
[37] https://www.bbc.co.uk/news/uk-58364308

Whilst many employers in the automotive sector have programmes to engage with universities and schools, these can be fairly scattergun and a more comprehensive approach for building a skills pipeline is needed. This is why Government should develop a national low carbon skills strategy, which integrates sustainability at all levels of the educational system in the national curriculum – apprenticeship programmes, higher education and particularly lifelong learning. This will ensure the UK has an attractive pipeline of skilled workers for new and growing industries in the long run. To address skills shortages in the HGV sector, the retail industry has called for greater flexibility in the operation of the apprenticeship levy and reform of the national skills fund to support the recruitment of HGV drivers.[38] A particular consideration for HGVs is gender diversity – the HGV repair sector is heavily male-dominated with only 14% of the workforce comprising female staff members.[39] In engaging with members, the Aldersgate Group identified support for promotion in schools of the HGV industry as essential, high tech, and sustainable – in order to encourage a greater diversity in the sector particularly for gender.

Moreover, with high levels of unemployment following the COVID-19 pandemic, there needs to be a country-wide focus on directing low carbon investment to regions in need of opportunities and where the workforce has transferrable skill sets. This will require identifying parts of the low carbon economy where the UK is particularly well placed to grow its supply chains, and in which geographic areas could be well positioned to host these supply chain and employment opportunities.

Impact on the grid

All of the technology pathways to decarbonise HGVs– catenary systems, battery electric vehicles and hydrogen fuel-cell electric vehicles – rely upon renewable electricity from additional generation capacity. The phase out of non-zero emission HGVs will therefore undoubtedly have implications for grid balancing, given the economy-wide push for electrification. Our members in the private sector agree that a phaseout date would provide a clear steer to National Grid and energy suppliers on grid capacity for charging. National Grid is already using smart charging, using incentives to encourage charging outside of peak times, either through simple peak and off-peak electricity tariffs like Economy 7, or incentivising when there is more low carbon electricity available and 'normal' demand is low. Another smart use of EVs is turning their batteries into storage for excess electricity, which will be essential to avoid issues of oversupply as more renewable generation comes online in periods of low demand for electricity. The Aldersgate Group recently published a report with University College London on delivering competitive industrial electricity prices through bringing mature renewables to grid, investing in interconnection and delivering frictionless trade of electricity to meet the growing demand on the grid.[40]

National Grid modelling shows that excess electricity could rise to around 6% of total annual output after 2040.[41] Storing this excess power in EV batteries means that it could be supplied back to the grid at peak times to smooth demand - what is known as Vehicle to Grid. National Grid estimates show that in 2050, Vehicle to Grid could offset as much as 85% of the residual EV demand that remains in peak periods.[42] These projects will need to be scaled up and the grid prepared for roll out when HGVs become electric.

[38] https://www.ft.com/content/514834b3-b227-4e55-a3c1-9c94513edbef
[39] Ford and Slater (2020) *The Ford & Slater 2019 Gender Pay Gap Annual Report*
[40] Aldersgate Group and UCL (2021) *Delivering Competitive Industrial Electricity Prices in an era of transition*
[41] https://www.nationalgrideso.com/media/batteries-wheels-and-smart-charging
[42] *Ibid*

6. How can these barriers be addressed?

Alongside contribution to the UK's net zero target, a phase-out of non-zero emission HGVs is likely to have important health benefits alongside boosting the competitiveness of the UK automotive industry. A comprehensive framework for decarbonising HGVs, covering regulation, infrastructure, financial incentives needs to be planned now for the 2020s to capitalise on these opportunities. Key short and longer term priorities should include:

- **Implement large-scale trials of zero emission HGV technologies as soon as possible,** including overhead catenary systems, battery electrification and hydrogen fuel cells, to determine the most suitable technology mix and demonstrate commercial feasibility.

- **Provide funding for high-power charging infrastructure for regional and long haul operations** along the HGV road network, including in the upcoming Comprehensive Spending Review an through the recently created National Infrastructure Bank. Private-public partnerships focused on public high-power charging infrastructure should also be set up.

- **Consider mandate zero carbon HGV sales targets from 2025 up to 2035/2040** that would require manufacturers to sell a certain share of zero carbon HGVs as part of their total fleet sales in the UK. A circulation ban on the legacy diesel fleet in 2050 may also be necessary to fully decarbonise the sector.

- **Use tax reform to improve the economics of zero-emission trucks and create strong demand for new technologies.** Examples include extending the exemption from the Climate Change Levy currently granted to the transportation of passengers and goods by train to the transportation of goods by HGVs directly using electricity. Another option is the reintroduction of the fuel duty escalator for diesel.

- **Amend the plug-in grant scheme to large vans and trucks** covering up to 20% of the vehicle purchase price with a maximum grant of £8,000 for vehicles with at least 50% less CO2 emissions, so that it is limited to zero emission HGVs.

- **Ensure the availability of nationwide scrappage schemes**, so that HGV drivers concerned about the cost of this transition can obtain some capital to be put towards the cost of their next vehicle. These could be modelled on the London scrappage scheme, currently covering vans and minibuses, supporting businesses with up to 50 employees to replace vehicles that don't meet the Ultra Low Emission Zone (ULEZ) standards.[43]

- **Develop mandatory standards for the automotive sector on durability, reusability, repairability and recyclability to integrate circularity into the design of HGVs, tyres and batteries.** Government should also work with industry to develop a common methodology for the for the assessment and reporting of the whole lifecycle emissions and resource use of HGVs – i.e. beyond the tailpipe.

- **Explore measures to reduce HGV use, particularly in urban areas, for example e-cargo bikes, use of urban consolidation centres**. Freight operators should also be supported to meet demand more efficiently through logistics measures – improved

[43] https://tfl.gov.uk/modes/driving/ultra-low-emission-zone/scrappage-scheme

routing, better loading and reduced empty running. The CCC estimate that such measures could reduce total HGV miles by around 10% by 2035.[44]

- **Develop an integrated transport strategy that brings together freight, road, rail and bus and directs public investment towards infrastructure choices which will deliver with the most efficient economic, passenger travel and emissions outcomes**. The proposals contained in the Transport Decarbonisation Plan policy paper have great potential to achieve this, and should be implemented as soon as possible.

7. Do you agree or disagree with our proposal to end the sale of new non-zero emission HGVs, for vehicles weighing more than 26 tonnes, by 2040? What evidence do you have for or against?

X	Yes
	No
	Don't know

What evidence do you have for or against?

Answered in response to question 4.

8. What do you consider the main challenges and barriers to meeting this target for HGVs weighing more than 26 tonnes?

Answered in response to question 5.

9. How can these barriers be addressed?

Answered in response to question 6.

[44] CCC (2020) *The Sixth Carbon Budget – Surface Transport*

10. Do you agree or disagree that these phase out dates should be extended to all non-zero emission HGVs, including those using low carbon fuels, in their respective weight categories?

x	Yes
	No
	Don't know

Please explain your answer.

Low carbon fuels such as biofuels will be useful in the transition and are already being utilised by businesses such as John Lewis in their fleet, as explored in answer to question 5, but with investment and scaling up of electrification of fuel cell technologies they should not be necessary beyond the phase out dates of 2035 and 2040.

11. Do you agree or disagree that maximum permissible weights for certain zero emission vehicles (mainly HGVs) on both international and domestic journeys should increase by up to 2 tonnes (without exceeding 44 tonnes)?

x	Yes
	No
	Don't know

Please explain your answer.

12. Do you agree or disagree that weight limits should increase by up to a maximum of 1 tonne for certain alternatively fuelled HGVs on both international and domestic journeys (without exceeding 44 tonnes)?

x	Yes
	No
	Don't know

Please explain your answer.

13. Do you agree or disagree that weight limit increases should only offset any additional weight due to the alternatively fuelled or zero emissions technology?

x	Yes
	No
	Don't know

Please explain your answer.

Final comments

Do you have any other comments?