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

DecarboniseNow is an entirely volunteer led climate change campaign which aims to promote and investigate the specific policies needed to decarbonise the UK as quickly as possible. It has a particular focus currently on low carbon transport.

Overview and key messages

We are delighted to see the publication of this consultation, as HGVs have traditionally been seen as a 'hard to treat' sector, not seeing the same level of policy attention as other efforts in the electrification of cars and LGVs in the past. We agree with splitting the categorisation of HGVs into lower and higher than 26t. We also agree with the respective 2035 and 2040 phase out dates, although there is potential for a slightly earlier date for the latter of possibly 2038.

Chief barriers to rollout of these technologies includes current market readiness for these new technologies, competition with electric cars and vans, potential industry pushback, range anxiety, supply chain and manufacturing scale up, grid constraints, charging accessibility and cost reductions.

The main solutions to these barriers will be clear policy direction, successful rollout of electric car and van rollout, industry consultation and champions, falling battery costs, an electric vehicle supplier mandate, grid upgrades around other areas of demand, a dedicated HGV charger network, and a grant scheme with a clear timeline for cost parity respectively.

DecarboniseNow is happy to be contacted to further follow up, and we welcome any opportunity to assist the Department of Transport and wider government in its goal towards net zero transport.

Question 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? Please explain your answer.

Strongly agreed. It will have to be implemented quickly (under this parliament). It will have to be mindful of other sectors that need to reach net zero, as a phase out date for HGV sales presents fewer difficulties than harder to treat sectors and policies to reach net zero emissions. As we demonstrate through this consultation response and has been noted in the consultation document, there are a great variety of additional benefits apart from emissions reductions.

Question 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? Please explain your answer.

Agreed. While it is not an angle we had previously considered, the consultation makes a strong, logical case for two separate phase out dates. This also works well with the decarbonisation of the electrical grid. The Climate Change Committee have recommended that all electricity be produced from zero emission sources by 2035, and by 2040 there is projected to be substantial additional renewable energy capacity to electrify harder to treat areas, such as larger HGVs.

We would be interested to see more detailed numbers on the current CO_2 emissions from both categories. Given the shorter lifetimes of HGVs over 26t, there is also considerable potential for a faster phase out of vehicles from the roads after sales bans, which gives further ammunition for an earlier ban on HGVs below 26t.

Question 3: Do you agree or disagree that 26 tonnes and under, and more than 26 tonnes are the right categories? What evidence do you have for or against?

Yes. There is a clear distinction between HGVs which have zero emission models available and those where there is currently no alternative to the status quo. Infrastructure costs will also rise with heavier HGVs for grid upgrades. There is also a not total but moderately even split between rigid HGVs falling into the 26t and under category and articulated HGVs falling into the over 26t category, making the distinction of models types yet more clear.

Question 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? What evidence do you have for or against?

We agree on the 2035 date. We would be interested in further evidence and/or support for an earlier date, but from our own knowledge and from the available literature, there is little evidence of support for an earlier or later phase out date.

Given the bigger differences in battery cost and range for HGVs than for electric cars and LGVs, it is logical that this phase out will arrive after the 2030 phase out date for fully petrol or diesel powered vehicles of this nature, and it will take longer for the market to fully develop for HGV vehicles for this reason. Much like cars and LGVs, in order for this phase out date to be a success, there will be a requirement for an electric vehicle production mandate on suppliers to ensure adequate supply builds before the phase out date.

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

Market readiness. While electric HGVs are available for purchase currently, they are a considerably less mature and competitive market than for their car and LGV equivalents. Likewise, the demand for these vehicles has further to be cultivated to increase sales incentives. Electric HGVs are also at a greater disadvantage in areas such as battery size, weight and range from their oil equivalents.

Competition with other electric vehicles. With a large scale switchover to electric vehicles across all types, cars and LGVs have far greater mass demand, and use many of the same components. It therefore likely that if there are any supply chain shortages on electric vehicle vital components (aka lithium), then HGVs will be well behind other types of vehicles for product demand.

Industry pushback. Industry will have to be brought along on this journey to net zero transport, but there remains the risk of miscommunication of policy and or pushback from a vocal minority.

Range anxiety. Unlike electric buses, which are large scale electric vehicles that have short ranges and benefit greatly from regenerative braking, HGVs are by their nature mostly long haul machines. With heavier batteries for more power necessitating more weight and therefore more power, the more limited range of some electric HGVs has potential to create larger issues than other types of electric vehicles. However, this will be highly dependent on the HGV usage and purpose, which can vary widely.

Supply chain and manufacturing scale up. While the 2035 ban allows we what we believe is sufficient time, scaling up manufacturing of electric HGVs will have to start from a low base at present. Other issues here include procurement of electric vehicle specific raw materials, and business growth for this specific type of technology.

Grid constraints. The higher power demand for HGVs, especially for rapid and ultra-rapid charging, will be beyond the performance of some local power grids. Nationally, a full switchover to electric HGVs could create up to 80TWh per year in the maximum projected scenarios, necessitating further low carbon electrical generation.

Charging accessibility. There may well be more specific charging infrastructure required for electric HGVs, such as 350kW chargers, which will require further investment in the already rapidly expanding electric charging network.

Cost reductions. Currently, electric HGVs are not at cost parity with their oil equivalents. There is a large potential for this to fall, and the global decline in battery costs has already made electric HGVs much more competitive. However, this will require sustained reduction, and there is a wider gap to close when compared to cars and smaller EVs.

Question 6: How can these barriers be addressed?

A clear policy direction to steer the market long term. Effectively, this is addressed through clear structuring of both the outcomes from this consultation and the Green Paper on a New Road Vehicle CO_2 Emissions Regulatory Framework for the United Kingdom and the subsequent legislation. Part of this will need to include an electric vehicle mandate, funding until cost parity is reached, and trials for new vehicles at large scale. This is allowed for in the Transport Decarbonisation Plan, although further support may be required in future depending on development.

A fast and earlier rollout of electric cars and vans is required to avoid any competition. Given the earlier phase out date, this is not anticipated to be a major problem unless there are unforeseen problems with the rollout of lighter electric vehicles.

To avoid industry pushback, there must be *clear communication and outlining of ideas,* continuing in much the same way as this open consultation process. Showcasing success and working closely with industry champions, like the ones mentioned in the consultation paper, is a way to help ensure this.

Falling battery costs and faster charging speeds should help to address range issues further in future, as well as more innovative potential approaches in future, such as wireless and direct overhead charging. We would highlight however we expect range anxiety to continue to be the largest and most persistent barrier for HGVs, more than for smaller vehicles.

An *electric vehicle mandate* for a rising proportion of sales to be electric HGVs year on year, similar to the proposed system for smaller vehicles, is an absolute necessity to scale up manufacturing and the supply chain. We would advise it is one of the single most important policy measures to reach zero emission HGVs, alongside the ban on conventional vehicle sales. The timescales for this mandate will obviously be longer than for smaller vehicles, but given the longer timescales, it is important to give the market long term signals, especially as many businesses are unlikely to operate as far ahead as 2035 in their future planning. Government support for developing manufacturing capabilities, such as supply chains for raw materials and production facilities such as 'gigafactories' should be integrated into this mandate package, to assist companies with manufacturing support where required.

A *separate charging network specifically for HGVs* should be considered as a future possibility. For larger HGVs in particular this will become a necessity, but a dedicated network also gives greater priority to the higher issues of range anxiety for HGVs. It will also likely result in fewer charge points nationally, which could potentially make this easier for District Network Operators and local grid managers to oversee and control. It would also avoid competition with other vehicles, and supply HGVs with higher capacity chargers.

A combination of an electric vehicle mandate, the 2035 ban and grant funding which reduces in line with approaching cost parity can bring certainty and stability to HGVs reaching cost parity. In a similar way to the Plug In Grant for electric cars, reducing the Plug In Truck Grant as HGVs become more competitive is a way to ensure reducing government spend and sending clear signals about market direction. It is likely it will need to be extended beyond 2022-23, but is also likely to require lower government spend.

Question 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?

We provisionally agree with a 2040 date. However, there is potential for a slightly earlier date.

The work of the National Infrastructure Commission has highlighted that post 2035 to 2040 is an appropriate period for ending the sale of all HGVs, although that work does not distinguish between vehicles below and above 26t. This does leave open the potential for an earlier date of a few years.

In a similar way, the Climate Change Committee in its modelling for the Sixth Carbon Budget runs a phase out date of HGVs for 2040 and for cars and LGVs of 2032. Given the government commitment to phase out petrol and diesel cars and vans of 2030, there may be potential for a HGV phase out for 2038 to be further in line with the government's increased ambition over the sixth carbon budget scenario. However, we do acknowledge these technologies, while very comparable, are not at the same stage of development.

With the European Automobile Manufacturer's Association committing to not sell fossil fuel powered HGVs by 2040, this date sets the UK in line with the pace of change in Europe. However, it may deliver additional competitive advantage for the UK to investigate backing a slightly earlier date, such as 2038.

So we provisionally support 2040, but are also open to a slightly earlier phase out date of potentially 2038. Given the later phase out date for this category of HGV, it becomes even more important for an electric vehicle mandate, and many manufacturers are unlikely to operate on this kind of timescale, and will need clear and earlier incentives.

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

In addition to our answers for Question 5, there will also be a race to established technology in the required time. Smaller HGVs are at a sufficiently advanced stage to be rolled out presently, whereas larger HGV alternatives could possibly run into more fundamental development stumbling blocks, potentially stalling their rollout. Many existing issues will also be scaled up for larger HGVs, such as higher voltage and more specialised electrical infrastructure, additional battery costs, and further issues with range anxiety related to battery weight.

Additionally, if hydrogen is used for larger HGVs as a fuel, it inherits some of the challenges to that fuel, such as availability and cost. Committee on Climate Change analysis finds that fuel cells cost £237 per kWh in 2035, as opposed to £105 per kWh for HGV batteries in the same year. Availability of hydrogen is not yet certain beyond the 5GW target in the Prime Minister's Ten Point Plan, and there remain a wide range of flexible uses for the fuel.

Question 9: How can these barriers be addressed?

In addition to our answers for Question 6, timelines for these larger HGVs will need to be stricter to demonstrate progress. While an electric vehicles mandate for manufacturers should do this, it will be even more necessary to demonstrate progress to larger zero emission HGV deployment by certain timeframes such as 2030 or 2035. This will also have to be reflected for the grid infrastructure and battery technologies required. Effectively, these solutions will be the same, albeit more challenging, than for the smaller HGV equivalents. Alternative innovative

technologies may have more scope here, such as alternative batteries (aka solid state and flow batteries).

For hydrogen HGVs, the energy saving cost of efficient use of hydrogen could give HGVs an advantage. This will also be highly dependent on hydrogen scale up and usage elsewhere in the economy. A high abundance of hydrogen or more limited use in other areas will make the case for hydrogen HGVs more competitive.

Question 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? Please explain your answer.

Agreed. Biofuels and hydrogen will be in very high demand for other sectors in order to reach net zero (such as heavy industry and aviation). As such, not only will HGVs face increased competition for these resources, but from a whole systems perspective it will result in slower decarbonisation of harder to treat sectors. This is a particularly live concern for hydrogen HGVs (whether fuel cell based or direct combustion), for if larger HGV electrification is found to be impractical there will be more fuel competition.

Air pollution will also be cut from electrification, leading to fewer NO_x and PM emissions within cities and on motorways, which will still be an issue from biofuels and combustion-led hydrogen. Together with electrification of cars and LGVs, this can substantially reduce the air pollution issues facing the UK as a whole. For this reason, we would also provisionally support hydrogen fuel cell based HGVs over combustion-led hydrogen HGVs.

Question 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)? Please explain your answer.

Agreed. For this and question 12-13, we feel the consultation paper explains this adequately.

Question 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)? Please explain your answer.

Agreed.

Question 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? Please explain your answer.

Agreed.

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