



Department for Transport

Huw Merriman MP
Chair of the Transport Select Committee
House of Commons
London
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From the Parliamentary
Under Secretary of State
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Dear Huw,

I am grateful for the work the transport committee is doing to consider the role of fuels in transport as we progress towards Net Zero. Further to the oral evidence session on 16 March of the *Fuelling the future: motive power and connectivity* inquiry, I committed to come back with further details in response to questions raised by committee members. These details are set out below.

Karl McCartney MP asked about pollution caused by personal and private drivers on the roads compared to other modes of transport and other sectors of the economy.

The Department considers pollution to include both air pollutant emissions which are harmful to human health and greenhouse gas emissions which are responsible for climate change.

This request was made in the context of a discussion about data on domestic carbon emissions from transport, and I should like to clarify the information provided. Some of the figures provided to the committee in that discussion were in volumes of MTCO_{2e} (metric tonnes of carbon dioxide equivalent), as opposed to percentages of UK domestic transport emissions. For 2019 these volumes, and percentages, are set out below by transport grouping:

Transport Grouping	Volume in MTCO _{2e}	Percentage of domestic transport carbon emissions
Cars and taxis	67.7	55.4%
Heavy goods vehicles	19.5	15.9%
Light duty vehicles	19.2	15.7%
Domestic shipping	6.1	5%
Buses and coaches	3.1	2.5%
Rail	1.7	1.4%
Domestic aviation	1.4	1.2%

Motorcycles and mopeds	0.5	0.4%
Other road transport	0.7	0.6%
Other transport	2.4	1.9%

In 2019, transport was the largest emitting sector for greenhouse gas emissions, accounting for 27% of UK domestic emissions. Energy supply made up 21% of domestic UK greenhouse gas emissions, business 17%, residential 15%, agriculture 10%, waste management 4% and other remaining sectors a combined 5%. These include Public, Industrial Processes and Land Use, Land Use Change and Forestry (LULUCF) sectors.

The Department for Food and Rural Affairs publishes statistics on harmful air pollutant emissions. The most recent published statistics on emissions of air pollutants in the UK covers six reported sources, particulate matter PM₁₀ and PM_{2.5}, nitrogen oxides (NO_x), ammonia, non-methane volatile organic compounds (NMVOCs) and sulphur dioxide. Road transport is a major source of air pollutants, accounting for 28% of harmful NO_x emissions, 13% of PM_{2.5} and 3% NMVOCs. Other major contributors include the energy industry which accounts for 21% of NO_x emissions and manufacturing industries and construction at 21%. Domestic combustion accounts for 4% of total UK NO_x emissions and 20% of total PM_{2.5}. Further information on air pollutant statistics is available here:

<https://www.gov.uk/government/statistics/emissions-of-air-pollutants>

Alongside our net zero commitments taking action to tackle poor air quality is a key priority for the Government. Our Transport Decarbonisation Plan considers the entirety of the UK's transport system. Delivering this plan is not some technocratic exercise to stop people doing things, it is about doing the same things differently. At the heart of our plan is the ambition to deliver a second, green, industrial revolution, creating hundreds of thousands of new, skilled jobs.

Karl McCartney MP invited us to write to the committee with details on the work the Faraday Institution is conducting on battery recycling.

There are well over 10 million electric vehicles (EVs) on the world's roads already and there is no evidence to suggest their lifespans are any different to a petrol or diesel vehicle. Most EV batteries have warranties of around 8 years (or 100,000 miles), but are expected to last much longer, with their lifespan continuing to improve. EVs are in daily use across the UK's roads, including taxis and other high mileage roles.

The Government has committed £318 million to the Faraday Battery Challenge (FBC) to support the research, development, and scale-up of world-leading battery technology in the UK. The FBC aims to ensure the UK builds on its strengths and leads the world in the design, development, and manufacture of electric vehicle batteries through three areas:

- 1) *Core research*: The Faraday Institution has been established to be the UK's independent institute for electrochemical energy storage science and technology.
- 2) *Innovation*: Funding is being provided for collaborative research and innovation projects, to allow businesses to carry out feasibility studies and develop their products.
- 3) *Scale-up*: The UK Battery Industrialisation Centre (UKBIC) will allow companies to quickly develop their capabilities to manufacture batteries and get them to market, scale up and go global.

The FBC is developing safe and sustainable EV batteries with high performance, low cost, and long life to capture a growing market. Average battery costs have fallen by 89% between 2010 and 2021. By 2030, the price is expected to fall by over 95% from 2010 prices. The reduction in battery costs has been a key factor in the lower cost EVs being brought to market. New EVs start at around £20,000, before deducting the Plug-in Car Grant and have comparatively cheaper running costs than vehicles with internal combustion engines.

EV battery recycling processes are currently inefficient, with less than 50% of materials recovered. One of the eight technical challenges set by the Faraday Battery Challenge is to be able to recycle 95% of an EV battery pack by 2035. When EVs reach end-of-life, remaining battery storage capacity may be over 70%. To extract maximum economic value and minimise environmental impacts, EV batteries can be reused for second life applications, such as home energy storage before then being recycled.

Further to the committee's inquiry into regional aviation you relayed concerns of Loganair about the operation of the UK's Emissions Trading Scheme, and in particular the availability of carbon permits.

As you will be aware the UK Emissions Trading Scheme (UK ETS) replaced the UK's participation in the EU ETS on 1 January 2021. For aviation it covers UK domestic flights, flights from the UK to the European Economic Area and flights between the UK and Gibraltar.

The UK ETS Authority monitors all UK ETS markets closely and carefully considers if it needs to act in response to how the markets are functioning. This includes tracking registry holdings, auction outcomes, secondary market reporting, and any impact of UK ETS on other markets. In the event of excessive market instability, such as persistently high price levels or volatility, the Authority will at the earliest opportunity assess actions to ease potential risks for operators. We are confident that there will be an adequate supply of UK ETS allowances, or "carbon permits" as referred to during the committee, in the market for 2021 compliance. The 2021 UK ETS market supply was 127 million allowances. Prior to the 2021 compliance deadline in April this year,

an additional 68 million allowances will be supplied to the market through free allocation and auctions.

We will continue to monitor the financial impacts of carbon pricing policies to businesses maintaining regional connectivity. In addition, the development of the UK ETS is the subject of a new consultation published on 25 March - "Developing the UK Emissions Trading Scheme" available here: <https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets>. That consultation provides a further opportunity to gather a wide range of views from the industry, including those of smaller regional airlines.

Ruth Cadbury MP asked whether wayleave common law is a constraint that needs addressing to support increases in EV charging infrastructure and grid capacity.

In the EV Infrastructure Strategy we have acknowledged that planning arrangements can be complex to manage. Chargepoint installers can sometimes need multiple permissions, consents and licenses, which adds time and cost to deployment. Planning permission delays are often cited as a major brake on the speed of deployment which is why we have committed to exploring options to streamline and reduce barriers in the planning system. As part of this, we will explore whether Permitted Development Rights could be used to accelerate the process of public chargepoint installation.

Turning to the specific concern raised, we are working across government with both the Department for Levelling Up, Housing and Communities and the Department for Business, Energy & Industrial Strategy (BEIS) to ensure a joined up approach to the efficient rollout of EV chargepoints. In support of this, BEIS will be publishing an Electricity Networks Strategic Framework, which will set out Government actions on land rights and consent processes for electricity network infrastructure, such as wayleaves.

Greg Smith MP asked whether heavy goods vehicles (HGVs) could maintain combustion engines by using drop-in synthetic fuels and I offered to provide more detail on the Department's HGV trials.

Last summer the Department consulted on phase out dates for the sale of new non-zero emission heavy goods vehicles (HGVs) and announced at COP 26 that we will be phasing out the sale of new non-zero emission HGVs weighing 26 tonnes and under from 2035, with all HGVs needing to be zero emission by 2040. This requirement for zero emissions at the exhaust goes beyond just carbon emissions, and includes other harmful emissions such as nitrogen oxides (NOx) which contribute to air quality pollution.

At present all commercial internal combustion engines produce harmful exhaust emissions. However, some manufacturers are working to build internal

combustion engines running on hydrogen and other low carbon fuels that have zero harmful emissions, including zero CO₂ and zero NO_x. We support this work, and the Advanced Propulsion Centre has recently jointly funded with industry a hydrogen-fuelled internal combustion engine programme.

Currently, any technology which produces harmful emissions will be subject to the above-mentioned phase out dates. However, should it be proven that ICEs using zero emission fuels can be truly zero emission at the exhaust, then they would continue to be able to be sold beyond these dates.

As part of the Zero Emission Road Freight Trials programme, the Department will be publishing information generated during the first year's work. We will also shortly be launching a competition to identify industry consortia who will be taking forward the design and delivery of the on-road trials in future years. As announced within the Net Zero Strategy, the trials will cover three different technologies: battery electric, hydrogen fuel cell and electric road systems. As on-road trials progress over the coming years, the Department will ensure that the data gathered will be made available to inform future investment decisions, both by Government and by Industry.

Karl McCartney MP asked whether the 70% efficiency from a battery electric motor, includes the generation of the electricity to get to those motors or not.

The Government commissioned analysis of UK road vehicles for different powertrains across a range of vehicle types. This analysis found that battery electric vehicles have a 74% net efficiency of converting energy production to wheel energy. The report prepared by Ricardo, "Lifecycle analysis of UK road vehicles" was published on 25 March 2022 and is available here: <https://www.gov.uk/government/publications/lifecycle-analysis-of-uk-road-vehicles>. Table 3.5 in this report illustrates the cumulative efficiency losses associated with converting electricity into motive energy for BEVs, FEVs and ICEVs

The report also includes analysis of lifecycle carbon and shows that even with today's energy generation mix, a typical battery electric car is estimated to emit just a third of the greenhouse gas emissions of an equivalent petrol car across its whole lifecycle, including battery production and disposal. These emissions will decrease over time as we decarbonise our electricity grid and efficiency of vehicle manufacturing and disposal improves.

You asked if the absence of contracts for difference (CfD) price support for sustainable aviation fuel (SAF) is holding back private investment. I undertook to provide further information on the extent to which the private sector is investing in SAF at the moment.

SAF supply is already supported under the Renewable Transport Fuel Obligation (RTFO), with SAF that meets strong sustainability criteria awarded “development fuel certificates” which have a higher value than certificates awarded to traditional road transport biofuels. I’m pleased to confirm that in December 2021 the first SAF was approved for support under the scheme. To further reward SAF supply and encourage future uptake, we are now considering the introduction of a bespoke SAF mandate. Following a consultation conducted last summer, we will be providing further clarity on that policy in the coming months.

On top of this, we have previously allocated over £60 million to support the development of production processes and facilities for advanced fuels, including SAF. We are now making available £180 million to support industry in the commercialisation of SAF plants and fuel testing in the UK between 2022 and 2025. This includes £168m for a multi-year grant funding competition which we aim to open before the Summer. This is intended to accelerate the development of UK SAF production facilities and aims to attract match funding from private sector investment.

In October 2021 the Prime Minister also announced a £400m partnership between Bill Gates’ Breakthrough Energy and the UK Government, which will mobilise £200m of private sector funding in the UK to accelerate the development of the technologies needed to achieve net-zero emissions by 2050, including SAF.

In 2020 Sustainable Aviation (SA) published the UK industry’s decarbonisation road map to net zero. This highlighted many current investments and joint ventures of UK airlines on SAF. It also estimated that SA members are collectively planning to invest £3.5 billion in supporting new plant construction, fuels testing and R&D, as well as providing bankable fuel offtake agreements, over the next 20 years. The past two years alone have seen multiple memoranda of understanding and offtake agreements being signed between airlines/airports and SAF producers both globally and in the UK, demonstrating the industry willingness to invest in SAF for the future. There is clearly private investment in SAF production in the UK and an appetite to do more.

Through the Jet Zero Council SAF Delivery Group and other work with the financial community we are getting a better understanding of the criteria used to invest in green technology and how private investment in the UK SAF industry can be leveraged. The industry’s ask is for a SAF mandate, guaranteeing demand, plus stability in revenues. The department fully understands that some in industry view a form of price support such as a contract for difference (CfD) as critical and that urgency is needed. SAF production is significantly different from renewable energy supply supported by previous CfD schemes. Current SAF production processes entail a wide range of different feedstocks and fuel conversion technologies (gasification, electrolysis and synthesis, fermentation etc), each with their own sustainability

and availability challenges, different levels of commercial maturity and technology risk. This presents challenges for individual projects and adds complexity to the design of support schemes.

Feedback from the financial community also suggests that demand and revenue stability are not enough on their own. We also need confidence in the supply of sustainable feedstocks used to produce SAF and in the technology chosen to do so, so that investors are certain that SAF plants can operate as planned and consumers can be assured that the SAF they are paying for is delivering carbon reductions. Our grant funding competitions are crucial to providing that reassurance and are providing invaluable insights on the practical challenges that SAF projects face.

With reference to the Chiltern line and East West Rail, Greg Smith MP asked why we do not retrofit trains before a new railway is launched.

As you know, in our Transport Decarbonisation Plan we have committed to delivering a net zero rail network by 2050, with sustained carbon reductions in rail along the way. We have the ambition to remove all diesel-only trains (passenger and freight) from the network by 2040. However, when existing diesel trains require replacement, it is sensible that we work closely with operators and manufacturers on deploying the most appropriate traction technology at that time.

On East West Rail, diesel trains will be used for the commencement of services on Connection Stage 1. This is an interim solution which will allow the earliest possible start date for services between Oxford and Milton Keynes from the end of 2024, bringing wider transport benefits and encouraging modal shift away from cars, while decisions can be taken over traction for the whole of East West Rail. EWR Co. and the Department are currently working to review traction options for the railway, including full electrification along the whole route, as well as various options for partial electrification and using battery/electric hybrid rolling stock.

On Chiltern Railways, a trial of the first diesel-battery hybrid train of its kind in the UK was launched in February 2022. This is cutting edge technology, and the trial will help us to work out how this technology can be used more widely to reduce our reliance on diesel on routes where overhead power lines are not yet installed. If the trial is successful, we hope it will dramatically reduce particulate and noise emissions around stations. We will evaluate the outcomes with regards to understanding how this aligns with value-for-money and a clear future fleet strategy.

Gavin Newlands MP asked what international work has been undertaken to fulfil the Clydebank Declaration since it was agreed at COP26.

The Clydebank Declaration for Green Shipping Corridors remains a major focus for the Department in 2022 and work on next steps has been progressing since COP26.

While establishing green shipping corridors is a multi-year endeavour, we are now moving to design and deliver a programme to support UK green corridors in fulfilment of our commitments under the Declaration. We are closely engaging UK industry, international stakeholders, and other signatory states as part of this process and will be aligning the programme with our wider UK Shipping Office for Reducing Emissions (UK SHORE) initiatives.

We are also continuing to lead the way internationally on corridors by bringing onboard further signatories to the Declaration and supporting signatories' implementation of the Declaration. We have been working closely with the United States on the lobbying efforts, with the Secretary of State recently sending a joint letter with US Special Presidential Envoy for Climate John Kerry to encourage additional states to sign up to the Declaration.

Finally, I look forward to receiving the Transport Committee's report on its *Fuelling the future: motive power and connectivity* inquiry and am keen to consider its recommendations. In particular, those recommendations that add to last year's inquiry and report into *Zero emissions vehicles and road pricing* and which can help inform our policy on liquid and gaseous low carbon fuels.

Kindest regards,

A handwritten signature in black ink, appearing to read 'M/L' followed by a stylized flourish and a period.

TRUDY HARRISON MP

PARLIAMENTARY UNDER SECRETARY OF STATE FOR TRANSPORT