SUSTAINABILITY SERIES

PART 1 – ROAD FREIGHT TRANSPORT

As the world is facing a global climate crisis pressure is building on industries to do what they can to reduce emissions. Today, the transport sector accounts for around 21% of global greenhouse gas emissions[1], 64% of all global oil consumption, 27% of all energy use and 23% of the world's energy related carbon dioxide emissions[2].

1 Ritchie H. (2020) *Cars, planes, trains: where do CO_2 emissions from transport come from?* Our World in Data. Available at: Cars, planes, trains: where do CO_2 emissions from transport come from? - Our World in Data

2 Mead L. (2021) *The Road to Sustainable Transport - Still Only One Earth: Lessons from 50 years of UN sustainable development policy.* Available at: https://www.iisd.org/articles/road-sustainable-transport

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The transport sector is therefore, undeniably, in desperate need of finding climate solutions in the face of mounting consumer pressure, competition and increasingly burdensome regulations.

In this sustainability series we will be exploring the climate solutions that could help the transport sector reach net-zero. Within the road, shipping, rail and air freight sectors, we will review the economic and commercial incentives, barriers to change, benefits of and potential issues with such solutions.

Why should the sector change?

In the build up to the latest UN Climate Change Conference (COP 26), governments and industry leaders were urged to do more to build consensus on, and accelerate the transition to, zero emission vehicles (ZEVs). In a positive move towards the transition, over 100 countries, states, cities and organisations signed the Glasgow Declaration on Zero-Emission Cars and Vans to end the sale of internal combustion engines worldwide by 2040. The UK government also announced that all HGVs will be zero-emission by 2040.

Despite recent statistics that the sale of ZEVs is dramatically increasing (ZEVs are forecast to be 70% of all new UK car sales in 2040[3]), and the UK is well on its way to achieving this target, commercial challenges remain for road freight and logistics businesses whose profitability depends on transition investment vs. value realisation concerns.

Legal/Regulatory Incentives

The regulation[4] setting CO_2 emission standards for heavy-duty vehicles entered into force on 14 August 2019 and set targets to reduce the average CO_2 emissions from new HGVs by 15% in 2025 and by 30% in 2030[5]. The expected benefits include saving around 54 million tonnes of CO_2 in the period 2020 to 2030 and up to 170 million tonnes of oil over the period 2020 to 2040[6].

Vehicle and fuel taxation has been designed to incentivise commercial operators to purchase and operate more sustainable HGVs[7]. Whilst the world’s first ultra-low emission zone was launched in London in 2019, more local authorities across the UK are also introducing clear air zones (CAZ). The need to avoid consequent charges and potential fines will undoubtedly encourage freight operators to update their fleets.

The need for more sustainable HGVs will further drive zero and low emission vehicle demand thereby significantly reducing the traditional HGV diesel market and eventually displacing their competitiveness in the market. Commercial operators will therefore have little choice but to transition to more sustainable practices despite the financial impact of doing so.

Market/Consumer Incentives

Operators will also need to adjust their internal procedures and governance to align with external pressures and incentives. As such, they will be looking to work with customers and suppliers who will support them in reaching their targets and assist them to track performance.

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Entities that act inconsistently with commitments and targets, or that mislead customers about their products and actions, will face increased criticism and in the longer term, possible legal action[8] . As the industry changes, those who don’t transition to more sustainable practices will inevitably feel the repercussions of failing to adapt.

Separately, litigation risks can arise from a company’s climate change action (or non-action) and any failure to manage the physical and economic risks. Such risks are evident by the rise in climate change litigation in recent years.

Solutions/Alternative Options

Emerging technologies and alternative fuels play a substantial role in reducing emissions in the road freight sector. For many, upgrading an entire existing fleet will not be a viable option and instead, existing vehicles will need to be retrofitted for the use of alternative fuels. However, with a plethora of different fuel options available, continuing trials and opposing recommendations, the choice is not straightforward.

3 Research from Bloomberg New Energy Finance, commissioned by the UK COP Presidency.

4 Regulation (EU) 2019/1242.

5 European Commission, Climate Action. *Reducing CO_2 emissions from heavy-duty vehicles.* Available at: https://ec.europa.eu/clima/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/reducing-co2-emissions-heavy-duty-vehicles_en

6 European Commission, Climate Action. *Reducing CO_2 emissions from heavy-duty vehicles.* Available at: https://ec.europa.eu/clima/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/reducing-co2-emissions-heavy-duty-vehicles_en

7 Committee on Climate Change. (2019) Net Zero Technical Report. Available at: https://www.theccc.org.uk/publication/net-zero-technical-report/

8 Grantham Research Institute on Climate Change and the Environment (2021) *Global trends in climate change litigation: 2021 snapshot.* Available at: https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2021/07/Global-trends-in-climate-change-litigation_2021-snapshot.pdf

The table below summarises the advantages and disadvantages of a selection of popular alternatives against the current use of diesel.

The government's latest Freight Carbon Review focusses on liquefied and compressed natural gas, biomethane and liquid biofuels as these are the fuels that are considered suitable for use in the current generation of HGV engines. Whilst these fuels offer significant potential to decarbonise the sector, they are currently only sustainable for the short to medium term as the production and use of some still lead to substantial greenhouse gas emissions.

A longer-term solution is the use and investment in electric highways (e-highways), where 700-volt power lines are hung from poles along the inside lane of the motorway, from which lorries connect via a pantograph which provides power to the motor. E-highways ensure no energy is lost between the power lines and the lorries. However, e-highways require a whole new set of infrastructure on the roads and an entire fleet of compatible vehicles[9]. Studies estimate that the cost of building power lines to cover 65% of the UK's lorry routes will be in the

9 Stacy, T (2021). *E-highways: why motorway cables are probably not the best way to decarbonise lorries*. Available at: E-highways: why motorway cables are probably not the best way to decarbonise lorries (theconversation.com)

Table 1 – Fuel Comparison

	Advantages	Disadvantages
Diesel	• highly efficient • good fuel economy • widely available • volatile cost dependant on changes in the price of crude oil	• CO_2 and NOx emissions • additional taxes and charges
Electric	• lower cost and lower environmental impact • investment returned in shorter timeframe than alternatives • recharging infrastructure easier to develop • developing technology means it is becoming more efficient • integrates more renewable energy into the grid, making recharging increasingly cost-effective	• limited range • requires investment to build recharging infrastructure • long haul HGVs would require batteries with large capacities which are expensive and heavy • require large and expensive substations for charging at depots, distribution centres and motorway services • batteries contain rare earth metals such as cobalt, nickel and lithium
Hydrogen	• refuelling time equivalent to a diesel HGV • operating range and patterns similar to diesel • water vapour only emission	• higher economic costs • sustainability issues – 95% of the world's hydrogen is currently produced using fossil fuels • lack of infrastructure – more hydrogen fuel stations are required
Biodiesel*	• safer to handle as less toxic and easier to store than petroleum • does not require vehicle modification or additional fuelling equipment • lower CO_2 emissions	• higher economic costs • requires energy in the production of biodiesel • lack of biodiesel fuel distribution infrastructure
Natural Gas	• vehicle range without compromising cargo space • time required to refuel similar to diesel • 10-20% less emissions than diesel	• lack of LNG refuelling infrastructure • expensive production • requires investment – HGVs require additional tanks in order to run on LNG

* Firoz, S. (2017) *A review: Advantages and Disadvantages of Biodiesel*. Available at: IRJET-V4I1192.pdf

region of £20 billion[10]. Yet trials have also demonstrated that e-highway technology could be deployed reasonably quickly around the UK's road network, within the next 15-20 years or potentially sooner[11]. E-highways could therefore be one of the longer-term solutions the industry is searching for.

Conclusion

Whilst significant progress has been made, sustainable road freight still requires substantial infrastructure investment. The commercial reality is that currently, many operators can't afford to upgrade entire fleets or make the switch to alternative fuels without further support from the government. The transition path is also not clear and guidance is required to clarify where investment should be focussed. However, one aspect is certainly clear – the transport landscape is changing, and road freight and logistics businesses will need to adapt to survive.

How HFW can help

HFW has a wealth of experience in the transport and logistics sector and can work with clients to achieve their sustainability goals by providing solutions for both sustainable transport and logistics and the entire life cycle of the sustainable transportation system.

10 Ainalis, D.T., Thorne, C., and Cebon D. (2020) *Decarbonising the UK's Long-Haul Road Freight at Minimum Economic Cost*. Available at: SRF-WP-UKEMS-v2 (csrf.ac.uk)

11 Cebon, D. (2020) *Long-haul lorries powered by hydrogen or electricity?* Available at: Long-Haul Lorries Powered by Hydrogen or Electricity? - The Centre For Sustainable Road Freight (csrf.ac.uk)

If you would like to discuss how HFW can support you with your sustainability goals in the transport sector, please speak to:

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SUSTAINABILITY IN OUR SECTORS

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