A Net Zero Transition Plan for the UK Food System

THE TRANSITION IN LOGISTICS: The transport model

Webinar 4

5th December 2024

Welcome

Kirsty Saddler

Director of Health & Sustainability Programmes

Agenda

Welcome

OVERVIEW: Moving to low carbon transport

QUESTIONS AND ANSWERS

Close

OVERVIEW: Moving to low carbon transport

A Net Zero Transition Plan for the UK Food System

David Kennedy, Partner: Corporate Sustainability, EY

5th December 2024

Surface transport emissions are one of the largest components of the carbon footprint after agriculture – they can be reduced through fuel and logistics efficiency improvement and use of low-carbon vehicles.

Transportation is integral to the UK food industry, ensuring seamless movement from agricultural production to consumer access. Transport accounts for a significant part of the food system's carbon footprint. The wider economy move towards low-carbon vehicles offers opportunities for the food system to decarbonise this part of its carbon footprint.

- 7.2 $MtCO_2e$ — Surface transport related emissions in the food industry in 2021
- 6% — Contribution to total food industry emissions in 2021
- 10% — Reduction in emissions: 2030 vs. 2021
- 99.6% — Reduction in emissions: 2050 vs. 2021
- £755 million — Expected cost of abatement in 2050

Emissions drivers

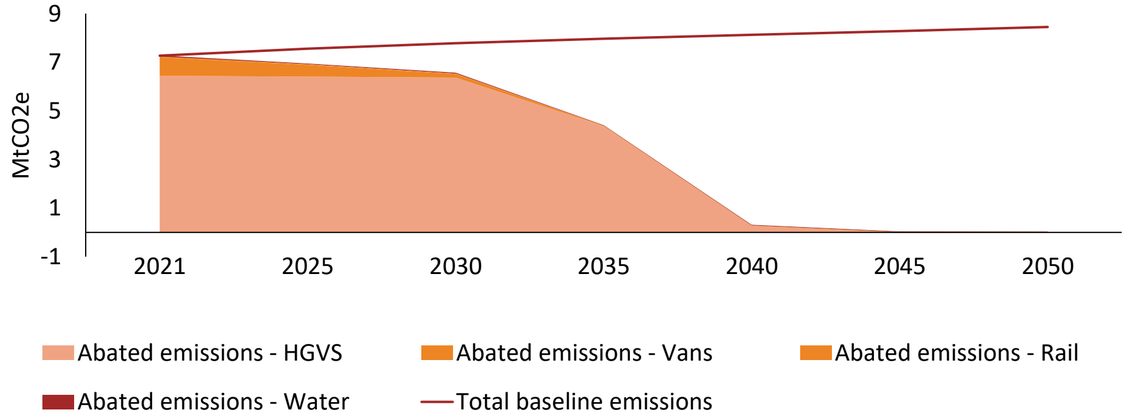
Transport emissions are primarily driven by heavy goods vehicles (HGVs), which are responsible for the bulk of emissions. Grocery delivery services also constitute a significant source. Water and rail transport, while being more carbon-efficient, account for only around 1% of the industry's transport emissions.

Abatement

The UK's broader transport decarbonisation strategy entails a move to electric vehicles. Significant switching for vans is planned for the 2020s, and for HGVs in the 2030s. There is also the opportunity for fuel efficiency improvements for conventional vehicles in the 2020s, and for logistics efficiency improvements across all timeframes[1] (see graph opposite).

While the food sector will not drive transport system decarbonisation, it can be an important player. Relevant companies in the food system should engage with broader programmes for electric vehicles and plan for their widespread uptake, subject to policies being in place, from the early 2030s.

Food system surface transport emissions pathway



1 – *Climate Change Committee – The Sixth Carbon Budget: Surface transport*

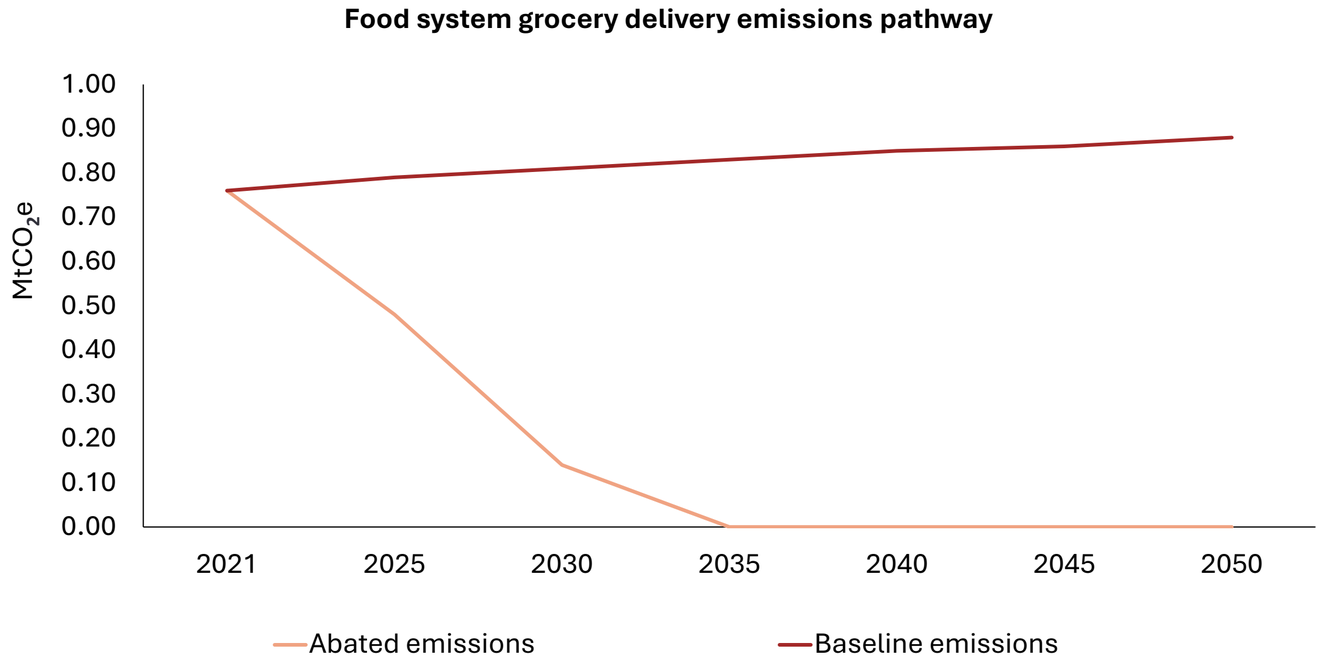
Electric vans are feasible and cost-effective and already in wide use – the aim should be for full deployment of electric vans by 2035 at the latest.

Grocery delivery vans are a critical link in the UK food industry's supply chain, bridging supermarkets to consumers' doorsteps. Electric vans are both feasible and cost-effective, and the aim should be to decarbonise these by the early 2030s at the latest. The industry is addressing this opportunity, with good progress and ambitious plans for investing in electric vans.

- 0.8 $MtCO_2e$ — Grocery delivery related emissions in the food industry in 2021
- 82% — Reduction in emissions: 2030 vs. 2021
- 100% — Reduction in emissions: 2050 vs. 2021
- -£63 million — Expected cost of abatement in 2050 (i.e,. cost saving)

Grocery delivery vans are a key component of the UK food industry's commitment to reducing its carbon footprint. The transition from conventional combustion-engine vans to electric alternatives is already underway, with economic analyses suggesting that electric vans are a cost-effective solution after accounting for infrastructure and operating costs[1]. Industry leaders like Tesco and John Lewis & Partners have set ambitious targets to electrify their delivery fleets by 2030, and Sainsbury's has a 2035 target[234].

The high mileage and frequent turnover of delivery vehicles make the rapid adoption of electric vans both feasible and practical. As a result, it is projected that van-related emissions will be significantly reduced by 2030, with a complete transition to a decarbonised fleet by 2035.



While good progress has been made and ambitious plans are in place, this is not universal. For those companies yet to embark on the transition to electric vans, targets and plans are needed, including for vehicle finance and purchase, establishing charging stations, updating maintenance facilities, and training staff to handle new electric technologies. Such commitments make sense from carbon and cost perspectives.

1 – Climate Change Committee – The Sixth Carbon Budget: Surface transport

2 - Tesco – Annual Report 2024

3 - John Lewis Partnership – Ethics & Sustainability: Transport

4 - Sainsbury's – Annual Report 2024

Most surface transport emissions are due to heavy goods vehicles (HGVs) – with scope to reduce these to zero by the 2040s.

HGVs are the backbone of the UK food industry's logistics, transporting goods from farms to factories to distribution centres to retail outlets. As the transport sector moves towards decarbonisation, the role of low-carbon HGVs in the food industry's net zero strategy becomes increasingly prominent. Transitioning HGVs to cleaner energy sources, namely electricity (and possibly hydrogen) is a key pillar of broader food system decarbonisation.

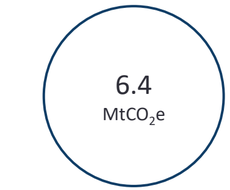
The food system HGV transition has two parts. The first occurs in the short-term and is driven by efficiency gains; the second occurs over the medium and long-term and is due to switching from conventional to low-carbon vehicles.

It is anticipated that there will be a 10% reduction in new HGV emissions between 2020 and 2030 due to advancements in fuel efficiency; this is incorporated into the modelling. This could be complemented by niche use of biofuels, although these are expensive (e.g. using waste vegetable oil).

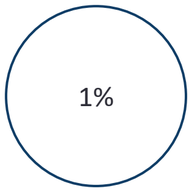
There is also scope for logistics efficiency improvements to reduce fuel consumption by 20%, given current empty running at 40%, Addressing this will require coordination across the industry and a programme of action.

Post-2030, there is scope for emissions to be reduced to zero through the electrification of HGVs. However, this shift is dependent on continued technological innovation and robust policy support to overcome the challenges associated with electrifying heavy-duty transport[1]. Biofuels are unlikely to be the long-term solution for HGVs, given lack of feedstocks and relatively high value of these in other sectors.

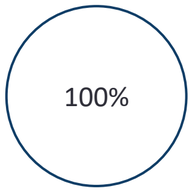
The industry should proactively engage with programmes to decarbonise HGVs, trialling new technologies in the 2020s and planning to roll these out in the 2030s, subject to continued innovation and policy support.



HGV related emissions in the food industry in 2021



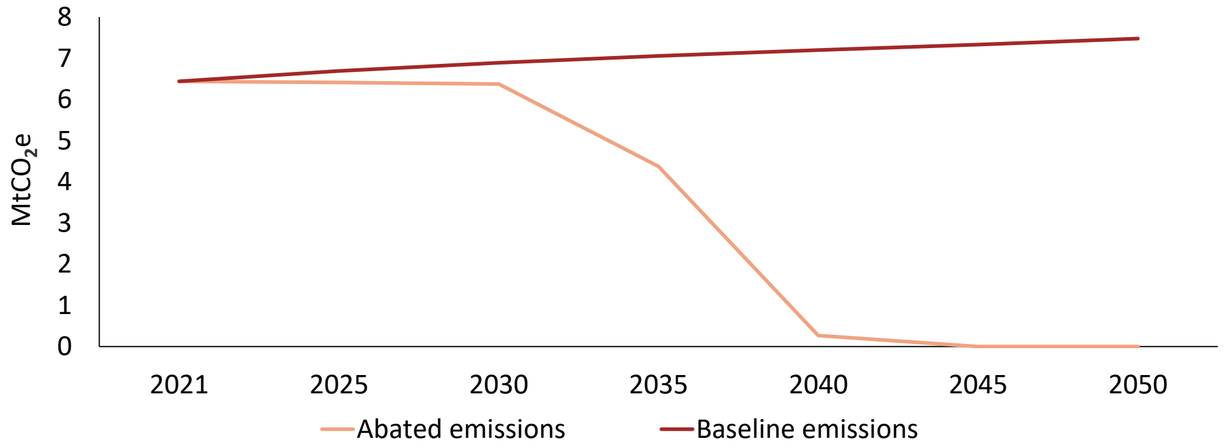
Reduction in emissions: 2030 vs. 2021



Reduction in emissions: 2050 vs. 2021

Expected cost of abatement in 2050

Food system HGV emissions pathway



1 – Climate Change Committee – The Sixth Carbon Budget: Surface transport

Heavy goods vehicles (HGVs) emissions can be reduced through fleet and logistics efficiency improvement in the 2020s; and switching to low-carbon vehicles in the 2030s.

The decarbonisation of HGVs is a critical component of the UK food industry's transition to net zero. By 2030, a 10% reduction in new HGV emissions is anticipated, translating to a fleet average efficiency improvement of around 7.5% due to the industry's rapid vehicle turnover rate, with opportunities for further emissions reductions due to better logistics efficiency. This lays the foundations for more significant emissions reductions beyond 2030, with electrification as the primary lever. Subject to continued innovation and policy support, all new HGVs for the food system could be zero-carbon from the mid-2030s.

↓ 7.5%

Carbon emissions can be cut through increasing existing fleet efficiency

- European regulatory requirements and programmes are driving HGV fleet efficiency improvements. These will benefit the UK, both generally and with regard to the food system. The expected 10% fuel efficiency improvement through the 2020s would translate to a 7.5% fleet efficiency improvement, given a five-year turnover of the fleet.
- Logistics fuel efficiency is undermined by 40% empty running. Coordinating across networks could reduce this significantly and offers the opportunity for a 20% fuel efficiency improvement, as identified in previous work for the IGD. Addressing this opportunity would require coordination across the industry and a programme of activity. This would be justified given the opportunities for reduction of carbon emissions and costs.
- There is also an opportunity to move some freight from road to rail. This was highlighted by Dave Lewis in his review of food system resilience for the Government in 2021. Currently there is very little movement of food by rail, notwithstanding that there is spare freight capacity on the network. In addition to resilience benefits, moving food by rail could result in reduced emissions where rail is electrified. This is an area that could be considered further, noting that it is very challenging and could only be justified on multiple benefits rather than carbon alone..

Limitations exist that currently prevent electric HGV market penetration

- There are currently electric battery HGVs in operation, although these are subject to various challenges.
- The current range of battery HGVs is 200+ miles. The payload for a battery electric HGV is around 20% lower than for conventional HGVs, reflecting the weight of batteries.
- The upfront cost of battery HGVs is currently around £300k, and hydrogen fuel cell vehicles are about £500k, compared to £100k for a conventional HGV[1].
- While battery HGVs have slightly lower operating costs than conventional ones, hydrogen vehicles are more expensive to operate due to the cost of hydrogen production.

1 – Climate Change Committee – The Sixth Carbon Budget: Surface transport

The modelling for an ambitious reduction of HGV emissions involves significant deployment from the early 2030s.

The cost for HGV abatement in 2050 is 111.2 £/tCO_2

In 2035, it is modelled that 96% of sales of new HGVs will be Zero Emissions Vehicles

Industry should continue to work with government

Innovation and policy support will be key to low-carbon HGV rollout

- An ambitious future has been modelled, where battery HGVs are deployed increasingly form 2030 and account for the vast majority of new vehicle purchase from 2035; and the fleet becomes decarbonised by 2040, assuming a five-year turnover of the HGV stock, which reflects current food industry practice[1].
- In reality, the take-up of battery HGVs may well start later than this. It may also be the case that there is a role for hydrogen vehicles, depending on innovations for this technology and for battery HGVs.
- While there is uncertainty over the precise path through the 2030s, the key points are that significant penetration of low-carbon HGVs across the fleet is unlikely in the early 2030s; while full decarbonisation should be achieved well before 2050.
- The CCC's estimate of abatement costs has been used for HGVs. Specifically, their cost for HGV abatement in 2050 is 110 £/tCO_2. On this basis, the cost of fleet decarbonisation with associated abatement of 7.5 $MtCO_2$ in 2050 is of the order £830 million[1].

- The Government has a comprehensive plan for developing low-carbon HGVs. This is aimed at driving innovation, including reducing costs, extending range, and improving charging technology. The industry is proactively engaged in this programme, for example, through trialling of battery HGVs and charging infrastructure.
- Further financial incentives may be needed to support rollout, depending on the extent of cost innovation.
- For the full HGV fleet to be decarbonised, this could require charging capacity of 5 GW. This capacity is likely to be required in part where power networks are currently constrained, and a policy driven prioritisation of connections would be required.
- Subject to innovation and policy support, the industry could deploy low-carbon vehicles at scale in the mid-2030s.
- It is recommended the same approach as for other parts of the food system: industry should engage with the Government, plan for deployment including identifying dependencies, monitor closely developments, and execute plans subject to innovations being made and policies being in place.

1 – Climate Change Committee – The Sixth Carbon Budget: Surface transport

Questions and answers

David Kennedy

Partner: Corporate Sustainability

Kirsty Saddler

Director of Health & Sustainability Programmes

The reports

The Overview, Summary and Full Technical reports are available for download from www.igd.com/Social-Impact/Sustainability