Final Report

Electric Freightway Report 4

GRIDSERVE
ELECTRIC FREIGHTWAY

in partnership with

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Inspire the Next

Innovate UK

Funded by UK Government

Final Report

Electric Freightway Report 4

Contents

Electric Freightway, part of the Zero Emission HGV and Infrastructure Demonstrator programme, is funded by the Department for Transport and delivered in partnership with Innovate UK

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Foreword

It is with pride and privilege that I may deliver the foreword of this, the final of four extensive reports detailing all the pioneering and demonstrable results of the ZEHID Electric Freightway eHGV project. From the principal idea, to one of the largest Innovate UK projects in history (£100m+), delivering the eHGVs and infrastructure at this scale has been a colossal undertaking from a truly broad range of stakeholders from across private and public sector alike.

Alongside GRIDSERVE's ever-present principal partners Hitachi ZeroCarbon, Innovate UK and the Department for Transport we have been able to weather a multitude of challenges to deliver infrastructure, get eHGVs on the road, disseminate activities and publish reports that will not only help the emerging market, but shape it. This final report is another example of collective and collaborative engagement to deliver invaluable insights and learning that will continue to catalyse a market for years to come.

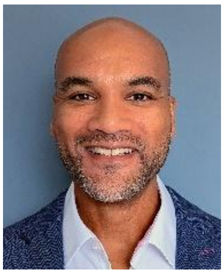
The work is far from complete with sites still under construction and five years of data gathering still to go, but we have begun to make a difference. 12 depot charging hubs are built, two public charging sites are now live with nine more due this year. 161 eHGVs have been placed amongst more than 20 different hauliers from SMEs to big corporates and millions of electric miles already logged. The successes are evident, material and demonstrable. This report will showcase where we have been, what we have built, where we have gone, what people think and what learnings we have created, to name a few valuable outputs of the Electric Freightway project.

Thousands of people can now lay claim to have been part of this journey, meaning there are far too many people and institutions to thank, but you all know who you are. I hope you are as proud as I am to have represented the GRIDSERVE Electric Freightway project to this point.

But we didn't come this far to come this far. This is just the beginning of the next exciting chapter.

Sam Clarke Head of eHGV, GRIDSERVE

Hitachi ZeroCarbon is proud to have partnered with GRIDSERVE on the ZEHID Electric Freightway project, supported by Innovate UK and the Department for Transport.



At a critical stage in the development of the UK eHGV market, this project has generated valuable real-world evidence from more than 160 electric trucks operating nationwide. The data highlights where eHGVs are already viable, the operational changes required for scale, and the infrastructure and policy enablers needed to accelerate adoption.

This milestone reflects the outstanding collaboration between the Hitachi ZeroCarbon and GRIDSERVE teams, alongside our haulier and logistics partners, whose openness and commitment have been central to the programme's success.

We hope the insights shared in this report provide practical guidance for industry and clear signals for policymakers, helping to create the conditions for a confident, investable transition to zero-emission freight.

Leon Clarke Head of Operations and Delivery, Hitachi ZeroCarbon

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01 Executive summary

Welcome to the fourth and final report from the implementation phase of the Electric Freightway project. This report details what the project has achieved and what we've learnt from this pioneering demonstration of eHGVs in the UK.

We will share insights from eHGV use and explore how views of drivers and operational staff have changed as they've adopted electric trucks. Finally, the report will look at how far the industry has come since we set out on this journey three years ago, while considering the challenges that still exist in the transition to zero-emission transport.

Electric Freightway is a collaborative demonstration project driven by GRIDSERVE, Hitachi ZeroCarbon and a consortium of industry stakeholders. The project aims to inform the UK's transition to zero tailpipe emissions freight, based on real-world experience. It's part of the Zero Emission HGV and Infrastructure Demonstrator programme (ZEHID) part funded by the Department for Transport and delivered in partnership with Innovate UK.

Key learnings & deliverables in this report:

161 fully electric HGVs placed with over 20 hauliers and HGV operators.

Over **2 million km** of data has been captured from the new **electric HGVs** so far, saving 2,700 tonnes of CO_2e when compared to diesel HGVs. Over the five-year duration of the project our trucks could save up to 60,000 tonnes CO_2e.

Over **35 million km of diesel journeys** captured, providing a rich data set from which to develop detailed insights for comparison to the eHGV cost of operations (TCO).

The project partners have shared their **eHGV adoption journeys** to help the wider industry understand how to optimise this new technology into their operations.

Dedicated **eHGV charge hubs** deployed at 12 depots with the first two of 11 strategic on-route locations now open, laying the ground for expanding electric supply chains.

Our real-world **operation modelling** demonstrates that when key factors are right, eHGVs can deliver genuine savings in excess of £100,000 over their lifetime operation when compared to equivalent diesel HGVs.

Our **attitude surveys** clearly show that HGV drivers are often sceptical about eHGVs, but once they get behind the wheel and experience first-hand what they are capable of their advocacy increases significantly.

Barriers to eHGV adoption still need to be overcome, including the need for more on route charging, the cost and complexity of depot charger installation, long electricity connection lead times and legislative limitations on the heaviest payloads.

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02 Introduction

Electric Freightway is a collaborative demonstration project of 38-44 tonne electric heavy goods vehicles (eHGVs) and associated charging infrastructure throughout the UK. This fourth and final report from the implementation stage of the project provides an overview of what we've achieved and learnt. This phase of the project has set the foundation for a five-year demonstration of the capabilities of eHGVs and charging infrastructure.

The implementation phase hasn't just been a case of planning and building; we've also been capturing and analysing data from the vehicles to give us an early view of how they are performing. Our analysis also goes beyond the vehicles, with Hitachi ZeroCarbon conducting the second round of stakeholder surveys and analysing the difference between stakeholder views before and after using eHGVs. This report details how eHGVs are being used on the road, the charging infrastructure, how the economics stack up, how drivers have responded and what more needs to happen to enable the transition to zero-emission logistics. The first three reports, introducing the project's objectives, early design challenges and interim findings can be found on our website.

The problem we are addressing

The objectives set for HGVs by the UK's net-zero strategy are some of the most ambitious in the world, with all new HGVs under 26 tonnes expected to be zero emission from 2035 and all larger vehicles sold, such as those taking part in this demonstration, by 2040[i].

If the UK is to meet its net-zero goals by 2050, the scale of this transition will be unprecedented and transform the transport sector. With almost 500,000 HGVs on the road today, a significant rollout of infrastructure will be required to support these zero-emission vehicles.

Whether these zero-emission HGVs will all be electric remains to be seen. This report shows how eHGVs can be successfully implemented on a wide range of routes but also highlights their current limitations.

Alternative decarbonisation technologies exist, but they also come with their own set of downsides – from cost, efficiency, resource availability and not all being zero emissions at the tailpipe – that need to be considered by fleet managers.

This is reflected in the market, where zero-emission sales have started to increase, though still represent a very small proportion of HGVs on the road.

Having the right infrastructure in place is key to a sustainable transition. While we have seen significant progress since the project began, described in Section 09, there are still few dedicated eHGV charging stations in the UK, with most existing charging infrastructure not designed for charging large vehicles. Hauliers' depots also require significant modifications to allow for eHGV charging. This report details the progress that we've made in developing infrastructure, while reflecting on the challenges still faced in getting power to the right place.

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The market for larger eHGVs is also in its infancy; the capital cost of vehicles is high compared to diesel HGVs, range and payload limitations need to be understood and operators require reassurance that eHGVs are capable of running their routes economically before they commit to investing in new technology.

Our previous reports

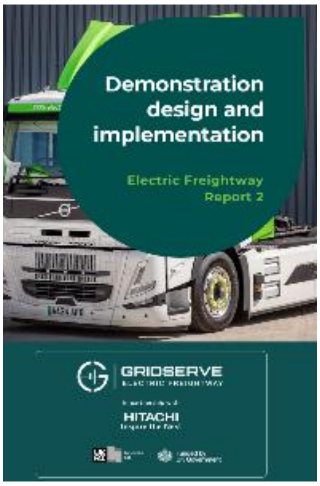
Throughout the Electric Freightway project, we've published findings and insights from the demonstration to help other hauliers and charge point operators (CPOs) make their transition to eHGVs as smooth as possible. For detailed background on the project objectives and approach, see report one. Report two focused on site design considerations and report three provided initial findings from our analysis of the project's data.

Report 1
Project overview & objectives

Initial hypotheses we aimed to test

Data science and TCO approach

Benchmarking eHGVs against Diesel HGVS



Report 2
Planning eHGV charging installation

Electricity grid connections

Early eHGV rollout insights

Planning user attitude surveys

Project data systems

Report 3
Interim TCO findings

Case for on route charging

Output from 1st round of attitude surveys

Encouraging diversity in the sector

Environmental & economic benefits

What we have achieved

Where our previous reports focused on planning and initial findings from project data, this report draws on the experiences of our haulier participants. In Section 03, we've given them the opportunity to share their learnings, both positive and negative, from the implementation and initial operation of eHGVs.

Partners have joined the project for a range of reasons – some to just learn, others for environmental reasons, following customer demand or getting a first mover advantage. All have expressed benefits from involvement in the project but have also experienced challenges along the way. Some challenges were quick to overcome, like planning appropriate routes, while others will require changes in regulation or advances in technology.

Launching the Electric Freightway

Where depot charging is not available, public charging is expected to play an important role in enabling hauliers to electrify their fleets. Public charging is also helping hauliers with their own depot charging to go the extra mile on more ambitious journeys. Since the last report, GRIDSERVE has progressed the development of sites across England's motorways, with the first two of eleven locations opening January 2026 at Exeter and Baldock.

The design and development of this public infrastructure took longer than originally envisaged and Section 04 looks at some of the key challenges when it comes to building publicly accessible sites.

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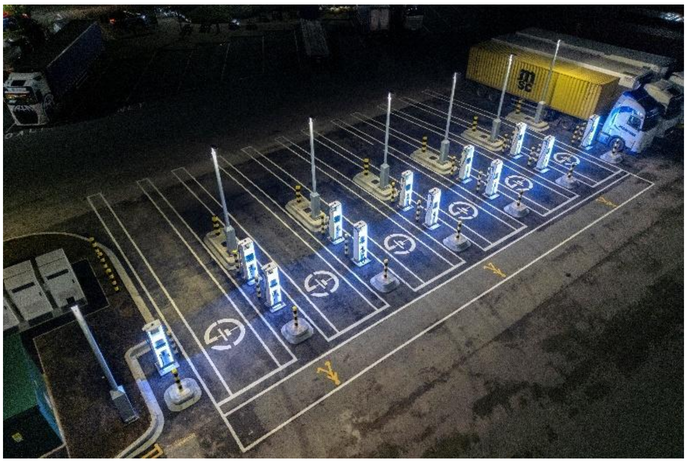

A range of solutions to meet industry needs

Public charging is only part of the picture. Following the launch of Nissan's Charge Yard in Sunderland last summer, GRIDSERVE has been hard at work deploying 11 further depot-based charging sites.

Most operators' initial view is that having infrastructure at their own depots that they control is their preferred charging solution. However, going forward, it's clear that a range of charging options are needed for the industry to enable electrification of all routes. Sharing depot infrastructure between operators has also emerged as an important solution, both for expanding options for charging and reducing charging cost through higher utilisation of capacity. Access to shared and on route charging is perhaps most important for smaller operators who may not be able to afford the high capital costs of building their own depot infrastructure.

Crunching the data

Meanwhile, the data has taken analysis one step further – we now have more vehicles on the road – having captured data from over 2 million kilometres of journeys in a greater variety of conditions. This has allowed us to update our modelling and dive deeper into some of the factors driving efficiency, range and cost.

Insights from data can be found throughout this report, with Section 05 providing an overview of our key findings.

While this may be the final report of this stage of the project, the vehicle operations are only just beginning. It's expected that the outcomes of the project will continue to develop over the next five years.

Building the business case for electrification

We've continued to refine the project's Carbon and Cost Calculator as more data has become available and in response to user feedback.

In Section 06 we take a deeper look at the different motivations that operators have for investing in zero-emission HGVs – as their own customers increasingly expect more environmentally sustainable services.

Cost is an important part of the calculation, and we look at the potential impact of depot infrastructure investments on the cost of operations, highlighting the need to right-size charger investments and achieve high utilisation to optimise their return on investment. This can either be through own use or depot sharing.

How stakeholder attitudes have changed

For the transition to be a success, it's important that stakeholders at all levels of haulier organisations are engaged and supportive. The second round of stakeholder surveys are now complete. We've returned to our partners' drivers and managers to see if their views have changed following the introduction of eHGVs. Section 07 presents the results of the survey.

Overall, drivers' views about eHGVs remain mixed, with doubts remaining about range

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and charging, while views are near universally positive around the improved working environment.

Encouragingly, we see that those who have driven eHGVs have notably more positive views, frequent eHGV drivers are the strongest proponents of electrification.

Returning to our objectives

In Section 08 we return to the objectives that were set out at the start of the project and the hypotheses we expected to either prove or disprove as Electric Freightway progresses. At this early stage of the project, it's not been possible to address all of the questions we had, but we can start putting the pieces together and expect the next five years of the demonstration to fill in the gaps.

How far we have come

The world of transport never stands still, and in Section 09 we look at how the industry is starting to adapt to the needs of zero-emission vehicles. eHGV sales have more than doubled from 2024 to 2025, although still represent a small share of the overall market.

The Government has supported the industry through boosts to zero-emission HGV and infrastructure funding, while OEMs and charging providers are continuing to invest and innovate.

The challenges that lie ahead

In Section 10 we reflect on some of the hurdles the industry still faces in order to meet net-zero targets. UK electricity prices are some of the highest in the world, and coupled with long lead times on electricity connections, the decision to electrify can be daunting for transport operators.

Targeted changes in regulation, together with longer-term certainty on subsidy, will help operators plan for the future. The recent announcement from the Government on 25 March 2026 on the Zero Emission Truck Grant and extension to the Depot Charging Scheme[ii] represent a significant improvement to the incentives available to operators to embark on their eHGV journey.

The future of Electric Freightway

The implementation stage of Electric Freightway is coming to an end, but the demonstration has only just started. Each of our vehicles will be on the road for at least five years.

As the demonstration progresses, Ricardo will be working with the Department for Transport and Innovate UK to continue what we've begun – follow their website to stay up to date. Section 11 therefore looks forward to the next phase of Electric Freightway and the Zero Emission HGV and Infrastructure Demonstrator programme

What has the project resulted in?

The aim of Electric Freightway is to kick-start the deployment of long-haul zero-emission HGVs, with a multi-year demonstration of 38-44 tonne eHGVs and associated infrastructure.

It has achieved this through the rollout of 161, 38-44 tonne eHGVs – a number unprecedented in the UK, and equivalent to a quarter of all Zero Emission HGVs sold in the UK in 2026. The eHGVs are operated by consortium partners across some of the most demanding routes in the UK. This has helped to prove the capability of these vehicles and identify requirements for technical and policy innovations to enable the transition to net-zero road freight.

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The project is creating a network of public charge points on major routes, designed specifically for eHGVs, together with private and shared depot charging. Project partners have also been leveraging the learnings from the project to develop commercial solutions to further accelerate their eHGV transition and that of other businesses in the sector.

Electric Freightway has been analysing the operational, financial and environmental impacts of eHGVs, allowing the industry to develop business models for further scalable deployment of vehicles and dedicated infrastructure.

Following the publication of the [last report](#) in October 2025, the final eHGVs are being delivered, depot sites completed and the first two public sites have opened.

While the project is still ongoing, and will continue for the next five years, we've learnt a lot along the way. This report details the insights that are beginning to emerge as Hitachi ZeroCarbon captures and analyses telematics data from the vehicles. This provides an insight into the performance of the vehicles currently operating across the UK, looking at how this compares to diesel fleets and what factors impact energy efficiency. Outcomes from the early analysis can be found throughout this report.

Zero emissions progress

Alongside this, the industry has continued to make progress towards decarbonisation. More organisations have announced their intention to adopt eHGVs and additional investments in EV charging facilities have been announced worldwide.

In the UK, new zero-emission vehicle (ZEV) registrations increased by 170.5% from 2024 to 2025[iii], though actual numbers are still low, as shown in Figure 1 (from 217 trucks in 2024 to 587 in 2025). This growth in registrations comes against a decline in diesel vehicles being registered, resulting in an annual share of registrations for ZEVs of 1.4%.

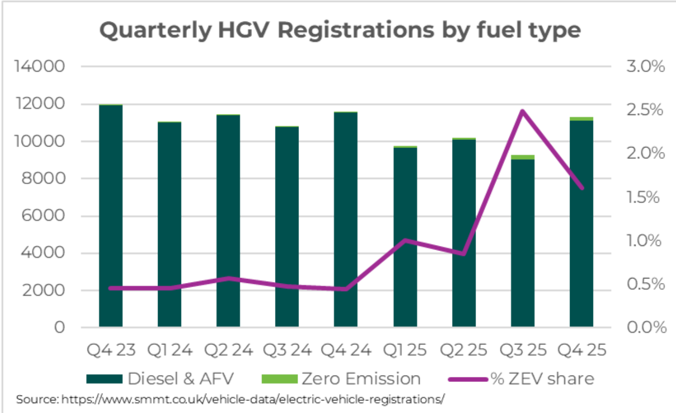

Figure 1 - Quarterly HGV registrations by fuel type

This change is potentially driven by the subsidised vehicles joining ZEHID projects, including Electric Freightway and it will be important to monitor how this trend continues.

The Government recently consulted on a new HGV CO_2 Emissions Regulatory Framework to support the transition to zero emission HGVs in the UK. The consultation document also confirmed the Government's ambition to phase out the sale of all new non-Zero emissions HGVs of 26t and below by 2035 and for all new non-zero emission HGVs by 2040. When implemented, the new regulatory framework will provide a clear long term pathway that supports industry confidence to invest.

On 25 March, Government announced £1bn in funding through the Zero Emission Truck and Van grants and the Depot Charging Scheme, to support the rollout of zero emission HGVs and vans up to 2030.

In July 2025, the Depot Charging Scheme was launched as a pilot to support the uptake of zero emission HGVs, vans, and coaches by part-funding the installation of charging infrastructure at fleet depots - funding 75% or £1 million of civil and chargepoint infrastructure works. Beyond the UK, the European Parliament has adopted new, more aggressive, CO_2 emissions standards for heavy-duty vehicles, requiring a 45% reduction compared to 2019 levels by 2030, 65% by 2035

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and 90% by 2040[iv], providing a clear pathway to decarbonisation for European truck manufacturers.

How was the project funded?

Electric Freightway, part of the ZEHID programme, is funded by the Department for Transport to the tune of almost £63m and delivered in partnership with Innovate UK.

Project partners are also committed to making significant investments in vehicles, infrastructure and resources to support the project, amounting to c.£37m of the £100m+ Electric Freightway budget.

Project objectives

The goal of the Electric Freightway project, as part of the Zero Emission HGV and Infrastructure Demonstrator (ZEHID) programme is that it:

> **"Will stimulate multimodal transport and examine different use cases that will create invaluable insights to allow the wider market to follow."**

To do this, Electric Freightway will deliver:

> **"A demonstration which has a viable route to expanding nationally and internationally, as part of a long-term strategy to decarbonise the sector."**

In doing so, the project and GRIDSERVE will create a viable eHGV charging network:

- **At the lowest possible cost**
- **In the fastest possible timeframe**
- **Delivering maximum customer service**
- **At the forefront of eHGV electrification**
- **With net zero as the priority**

And prove or disprove our key hypothesis that:

> **Electric 40-44 tonne HGVs are ready to replace diesel HGVs and deliver the same function when the right infrastructure is in place.**

In Section 08 of this report we revisit our hypotheses, looking at what we now know and what we hope to learn as the demonstration enters a new phase.

The scale of the project

The project involves:

> **More than 160 eHGV trucks**
>
> **Over 100 high-powered chargers**
>
> **c.20 public and private sites**

This will be achieved through collaboration with a network of partners throughout the sector. This wide-ranging group of companies includes independent and in-house hauliers, charge point operators (CPOs), landowners, financiers, eHGV manufacturers (OEMs) and solution providers.

We are also working closely with other stakeholders such as the Department for Transport, National Grid, National Highways, Connected Places Catapult and Innovate UK. All of these diverse organisations will need to come together to facilitate the transition to eHGVs and ensure that the required infrastructure is put in place.

Lead partner

GRIDSERVE

GRIDSERVE is developing, delivering and operating a network of charging hubs at motorway service areas as well as commercial depot charging solutions, and the underlying technology platforms needed to provide a seamless charging experience. GRIDSERVE is also sourcing and reporting data for the project.

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Principal partner

HITACHI

Hitachi ZeroCarbon is collating, analysing and reporting on findings throughout the project, leveraging experience from similar EV demonstration projects such as Optimise Prime. The reports and outputs will inform stakeholders, the wider market and government policy to drive further decarbonisation of commercial fleets.

Project consortium

Hauliers

We are working with a range of companies across different aspects of the logistics chain, including dedicated third-party logistics companies as well as organisations operating their own vehicles in support of their wider business. For simplicity, we will collectively refer to these companies as 'hauliers' or 'operators' throughout this report. Over recent months we have welcomed several new organisations to the project and are now working with:

OEMs and dealers

The project is agnostic regarding vehicle OEMs and works with whichever supplier hauliers choose to buy or lease from. The following companies are currently working closely with us as part of the consortium:

DAIMLER TRUCK

Charging locations

GRIDSERVE is working with landowners throughout the UK to secure locations for public and private charging infrastructure, including:

Leasing partners

Hauliers can choose to buy vehicles outright or through lease/contract hire arrangements with our leasing partners:

Volvo Financial Services

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Project supporters

The project also works with observers from a range of stakeholders to ensure that findings from the project benefit the whole industry, including:

Department for Transport

Innovate UK

bsi.

Catapult Connected Places

nationalgrid

national highways

RICARDO

Zemo Partnership Accelerating Transport to Zero Emissions

Project timeline – next steps

Electric Freightway is being carried out in two phases. The implementation activities of the demonstrator started in July 2023 and are now concluding. This represents a small extension from the original expected end date of July 2025 to allow for the completion of sites and delivery of vehicles. The delivery of the final public sites will continue until the end of 2026.

Over the last two and a half years, the project's infrastructure has been built and eHGVs have been put on the road. We've been sharing insights through a series of reports and knowledge exchange activities based on what we've learnt from the examination of data and experiences of project partners.

Following this initial phase, the project's partners will continue to operate their eHGV fleets and infrastructure. Ricardo has been appointed by Innovate UK to act as an independent technical evaluator, continuing to collect and analyse data through regular reporting for a period of five years.

Contacting Electric Freightway

If you have any questions about the programme, this report, or have any suggestions for how our future publications and analysis could be improved, please contact the Electric Freightway team at: eHGV.project@gridserve.com.

You can find out more about the project on our websites:

https://www.gridserve.com/electric-freightway/

https://www.hitachizerocarbon.com/electric-freightway/.

Zero Emission HGV and Infrastructure Demonstrator programme

Electric Freightway is one of three projects that make up the Department for Transport and Innovate UK Zero Emission HGV and Infrastructure Demonstrator programme (ZEHID). All three projects have the same aim: to support the UK's commitment to end the sale of new, non-zero-emission HGVs by 2035/40 and to help understand the costs and merits of zero-emission HGV technologies, based on large-scale real-world operations. However, the focus of each project varies.

While **Electric Freightway** has a focus on providing public-access charging hubs, **eFREIGHT 2030** is building shared depot infrastructure, including UK-developed megawatt (MW) capable HyperChargers. **ZENFreight** is trialling both electric and hydrogen vehicles, with a focus on vehicle performance simulations and data analytics.

All three projects have been working together closely to help the industry develop its route to zero emissions.

"One of the unexpected strengths of the ZEHID programme has been the close collaboration of the different consortiums. There is genuine respect and support across the ZEHID community, celebrating each other's successes, sharing lessons learnt across the board and working together on infrastructure standards.

There has been practical help as well – in the early days, GRIDSERVE shared its data sharing agreement with us, enabling us to use that as a template for our own. Later, Voltempo was able to support some infrastructure work for GRIDSERVE. Today, some of our consortium members are using the GRIDSERVE charging network, and we expect that to increase over the coming months.

The value of ZEHID is that each consortium has its own culture and its own agenda but has a shared ambition and goal. These differences have enabled each consortium to work with different partners and enable different parts of the electrification journey, and ensured that the programme has been much stronger than had each consortium worked in its own bubble."

Michael Boxwell, CEO, Voltempo

eFREIGHT 2030 project lead

"Dynamon is supporting the GRIDSERVE Electric Freightway consortium through its fleet optimisation expertise, drawing on experience from ZENFreight, which is uniquely fleet-optimisation-led.

Dynamon is providing participating fleets with access to its advanced fleet optimisation and route planning software, enabling vehicles to operate on longer and more challenging routes while maximising the utilisation of charging infrastructure. As part of this support, RouteZERO is being made available free of charge to all GRIDSERVE Electric Freightway fleets until the end of the ZEHID build phase, helping to maximise the value of the programme for fleets and the Department for Transport."

Angus Webb, CEO, Dynamon

ZENFreight project lead

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03 Where have we been?

Over the last two and a half years, Electric Freightway's partners have introduced more than 150 eHGVs to UK roads, demonstrating their capabilities across a wide range of challenging use cases. High-power chargers have been installed at depots and motorway service areas, enabling hauliers to push their vehicles further as the project continues over the next five years. This section highlights some of the key achievements to date and what our operator partners are doing with their vehicles.

Key achievements

- ***161*** *eHGVs have now been placed with operators*
- *Over* ***2 million*** *kilometres of zero tailpipe emissions journeys have been analysed*
- *The first* ***two*** *high-power eHGV charging hubs have opened on the motorway network*
- ***12*** *depots have been electrified with investments by our project participants at several more locations.*
- ***2,600 MWh*** *of electricity has been used by vehicles in the demonstration*
- *It's estimated that* ***over 2.7 million kg CO_2e*** *has been saved vs diesel operations*
- *Electric vehicles have covered a growing network of routes throughout England and Wales as shown in Figure 2, which shows the relative frequency of eHGV presence throughout the UK*

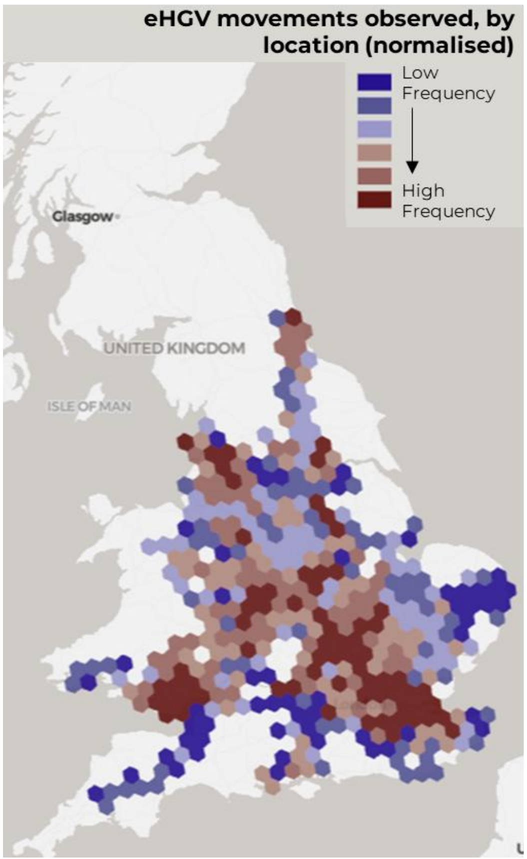

Figure 2 - Electric Freightway eHGV movements

Our demonstrations

The core aim of the Zero Emission HGV and Infrastructure Demonstrator (ZEHID) programme is to test vehicles in a wide range of conditions to better understand their benefits and limitations.

With 25 vehicle operators in the consortium, the demonstration is able to showcase a wide range of duty cycles. While some hauliers often operate a range of routes, Figure 3 summarises the range of markets serviced by our project partners.

Figure 3 - Electric Freightway partner sectors

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Electric heavy goods vehicles

These operations are being serviced by a fleet of more than 160 eHGVs. Project participants have chosen vehicles from across four brands: Volvo Trucks, DAF Trucks, Daimler Truck and Renault Trucks.

The first vehicles were delivered to AF Blakemore back in April 2024, with the final vehicles being delivered in the past few weeks, coinciding with the final depot sites going live.

All of the vehicles are capable of a gross combination weight (GCW) of between 38 and 44 tonnes. Most are in a 4x2 configuration, with a few three-axle 6x2 units being operated by one haulier.

The trucks all have a battery capacity of over 500kWh and are capable of charging at 250kW or faster.

Vehicles taking part in Electric Freightway include:

DAF XD/XF Electric
Up to 525kWh battery capacity
Up to 350kW continuous power
Up to 325kW CCS charging

Mercedes-Benz eActros 600
621kWh battery capacity
400kW continuous power, 600kW peak
Up to 400kW CCS charging/1MW MCS

Renault E-Tech T
Up to 540kWh battery capacity
Up to 490kW continuous power
Up to 250kW CCS charging

Volvo FM/FH Electric
Up to 540kWh battery capacity
Up to 490kW continuous power
Up to 250kW CCS charging

*Exact specifications may vary by model.

Electric Freightway participants

We've asked some of the project's participants to explain what they're doing as part of Electric Freightway – why they joined the demonstration, what they're doing with their trucks, the challenges they've overcome and what their plans are for the future.

Over the following pages our partners explain how they've integrated eHGVs into their fleets, reflecting on both the positive and negative experiences they've encountered as early adopters of the technology.

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ADM is one of the world's largest agricultural processors and food ingredient providers, serving customers in more than 160 countries. ADM's UK milling business, which operates six wheat flour mills throughout England, Wales and Scotland, is using DAF XD Electric 350 eHGVs as part of Electric Freightway.

We asked **Nick Day**, ADM Milling UK's Director of Distribution how the company is getting on.

Why did ADM consider adopting eHGVs?

"A combination of factors led to ADM Milling UK's early adoption of eHGVs. As a business, we are constantly seeking more sustainable solutions to service our customers' needs and have been looking at energy efficiency and the reduction of GHG emissions in our manufacturing processes for many years now. Using electric trucks was the natural next step in this process. We began by engaging with a third-party haulier that provides electric trucks and charging solutions and then expanded this capability through the ZEHID scheme.**"**

How are you using the vehicles?

"A high percentage of our operation uses bulk powder tankers delivering to major food manufacturers. Given that the majority of those customers are within a 100-mile radius of our mills there is a good case for electrification of those routes. We currently operate two 42-tonne vehicles from Corby and one from Knottingley.

We are deploying another vehicle at Avonmouth and have an aspiration to deploy eHGVs at all our sites over the next 12-18 months.**"**

How are you charging the trucks?

"We have a 240kW charger at our Corby mill and 40kW chargers at Knottingley and Avonmouth. We have applied under the Depot Charging Scheme to install another high-speed charger. If successful, it will allow us to deploy more eHGVs in 2026. We have the advantage of being significant energy users already, with enough power to sites to allow some high-speed charging without grid upgrades.

While most charging is done at depot, we have used some on route charging, to enable longer routes (e.g. from Corby to Batley and Hull), though this comes at significantly higher cost.

The overall strategy will be to install high-speed charging at all our mills. However, at one mill, where this is not possible, we have engaged with Fleete in Tilbury Docks to enable eHGV deployment.**"**

How has your organisation reacted to eHGVs?
“The overall reaction has been positive, though not exclusively. There has been the predictable range anxiety, and this has been largely overcome through training and close support. Drivers really like the power and quiet operation of the eHGVs; customers generally really like that we are using them.

We still have lots of work to do for eHGVs to be fully embedded within our operation, but we have made a positive start.**”**

What has surprised you?
“Range anxiety from drivers was expected but the range anxiety from route planners was less obvious but still significant.

The set up of multi-socket chargers and understanding the speed that the vehicles accept charge (which varies by OEM) needed a bit of ‘fettling’.

Benefits around noise and carbon were as expected, though you need to plan in a different way to get the carbon benefits – you can’t just rely on the short routes!**”**

What has been your biggest challenge?
“The main issue stopping an even faster role out is payload; while we can make a TCO case we cannot make a £/tonne case due to payload restrictions. Our ask would be for dispensation on payload – e.g. 44-tonne operation for 4x2 eHGVs.**”**

What advice do you have for other operators?
“Make a start, even if it’s with smaller vehicles (e.g. vans or 7.5 tonnes). There are options with smaller chargers that don’t require network upgrades, so consider this.

Do your research with a ‘can do’ mindset and be prepared to think and plan differently (but make sure it can serve your use case). Attend seminars and speak to people who are operating EVs for advice.

eHGVs are coming, so it is a very good idea to get some knowledge of how to operate them – don’t wait too long!**”**

Voltloader has received Volvo and DAF eHGVs through Electric Freightway and is unique among our partners as an electric-only haulier. **Dave Rose**, CEO and founder, explains how Voltloader's unique offer is helping its customers decarbonise.

"Voltloader was established to help catalyse the roll-out of zero-emission electric HGVs onto UK roads. We are building a fleet of electric HGVs and providing our customers with a complete solution of electric haulage, charger installation and maintenance services. A lot of our focus is on food and agricultural supply chains. Decarbonising road transport can be a relatively straightforward way of reducing overall scope 1 and 3 emissions for most businesses."

voltloader
CHARGED FOR TOMORROW

How are you using your eHGVs?

"We are working with our customers to identify appropriate routes for the vehicles, typically where there is a significant volume moving regularly on defined lanes. We are then deploying vehicles and chargers to support those routes. We are typically working in the food and agriculture space, for example moving bulk grain on tipping trailers, flour on tankers and fresh produce on fridge trailers.

Carrying a product on multiple legs of the supply chain creates a strong decarbonisation story. The continued improvement in the truck and charger technologies means that more and more routes are becoming viable on electric vehicles."

How are you charging the trucks?

"We build and manage charging capability at both our customers' depots and on our own sites. We strongly encourage sharing of charging capability across the industry and most of our chargers are open to third parties. To encourage more electric trucks on the road we strongly believe this will be down to drivers having access to a highly distributed network of chargers that are reliable and priced fairly."

How have your customers reacted to eHGVs?

"Voltloader's fleet is entirely electric. Our customers have commented on how little change they need to make to accommodate these trucks into their operations and how reliable the trucks have been. The quiet operation of the trucks is often overlooked as to what a difference this makes to the site and the drivers."

What is your biggest challenge?

"Our key challenge is educating the market to recognise that eHGV technology is operationally and financially viable today!"

What needs to change to enable eHGV investment?

"Over the coming years it is inevitable that we will see truck range improving, charging speeds continue to increase and electric truck prices move to parity with equivalent diesel models. In other words, the market will continue to address many of today's challenges.

One area of government intervention that would make the most impact right now is around increasing gross vehicle and axle weights on electric vehicles to help even the playing field with fossil fuel technologies."

What advice do you have for operators considering eHGVs?

"We take a phased approach with our customers initially; focusing on those routes that are more suited to electric vehicles. We'd also suggest getting advice before installing charging infrastructure – we see a lot of examples of under- or over-specified installations."

DP World is a world leader in end-to-end supply chain solutions. DAF XD Electric 350 eHGVs have recently joined its UK automotive operations, as **David Munday,** DP World's UK Transport Operations Manager explains:

Why did DP World consider adopting eHGVs?

"DP World's decision to invest in BEVs is driven by a combination of factors: we want to make sure we satisfy our customer needs in terms of CO_2 emissions and want to be ready for market change when more stringent regulations come into play. We are, of course, interested in the subsidy offered by ZEHID and do have corporate sustainability targets to achieve as well."

How are you using the vehicles?

"We use our EV trucks between our Oxford office, Bicester warehouse and DP World ports of Southampton and London Gateway. We are planning to use more EVs everywhere it is possible following our clients' request, as the charging infrastructure develops."

How are you charging the trucks?

"We have access to charging stations at our Oxford site, as well as in London Gateway. These latest are shared. We are planning to use any shared or public infrastructure to get our clients the best services in terms of transit time, cost and sustainability."

How has your organisation reacted to eHGVs?

"Our EVs have been a hit with everyone including our drivers. Many of them were sceptical at the beginning but it took only one try to be convinced. Everyone enjoys their silence and reliability."

What has surprised you most?

"It has been interesting that truck OEMs are advancing the technology at pace to meet the needs of the business. We expected it to take more effort to convince our drivers, given range and charging anxiety. The silence of the trucks is a big plus for music lovers!!"

What would you like to see to help businesses invest more in eHGVs?

"More regulations are always welcome to level the playing field, but we also see a change in attitude from our clients and society as a very important factor.

We know further technological innovations are on the way – length of charging time, range, capacity of the trucks, as well as smart grid and charging station networks with secure parking areas."

What's the main barrier to wider eHGV adoption?

"Maximum payload will remain a key limitation for eHGVs, even for 44-tonne 6x2 configurations, due to the significant mass of the battery system and the additional axle.

While the 4x2 eHGV maximum authorised mass (MAM) has been increased to 42 tonnes – compared with its diesel equivalent – to offset the added battery mass, no equivalent uplift currently exists for the 6x2 configuration. To ensure full market applicability and to maintain competitive payload parity, the 6x2 eHGV MAM will need to be increased in line with the 4x2 allowance. Unless this is addressed eHGVs will not replace the diesel equivalent for all markets."

What advice do you have for other operators?

"Know your routes, speak with your clients, see what's possible and use your BEVs for promotion of your services.

If the truck is required for longer distance, make sure it has the range required.

For heavy haulage, weights can be problematic and a 42ton 4x2 EV solution may not be possible. We are addressing this with a 44t 6x2 coming to our business later in 2026. However, even with 44t the additional weight of an EV truck may remain an issue. We are hoping the gross weight for the UK will increase to 46 or even 48 tonnes this year, as the EU is doing"

BCA Automotive operates the UK's largest transporter fleet, supporting a large portfolio of customers, including vehicle OEMs and leasing companies.

We asked **Phil Holbrow**, Operations Manager, to explain BCA Automotive's zero emission operations.

How are you using the vehicles?

"BCA Automotive started using full BEV car transporters in 2025 to move cars from the Nissan plant in Washington, to the Port of Tyne for export, and to move finished vehicles from the Port of Tyne to the Nissan plant for onward distribution within the UK.

BCA is using three DAF XD Electric FT 525kWh trucks for the operation in conjunction with bespoke and modified, electrically powered, Transporter Engineering Voyager trailers which carry up to seven vehicles per load.

The trucks operate two shifts per day over a five day per week cycle with additional days worked when required to facilitate fluctuations in volume for the plant clearance requirement. Import loads back to the Nissan plant are scheduled within the plant clearance operation dependent on shipping arrivals.

These trucks will continue to work on this operation throughout the five-year ZEHID project. We are actively researching further operations on which eHGVs can be utilised."

Why did BCA adopt eHGVs?

"BCA Automotive was keen to learn about eHGVs prior to the ZEHID grant to understand the opportunities and limitations associated with eHGVs working on a car-transport operation, as this had not yet been attempted in the UK. However, the uplift in purchase price above a standard ICE truck was an obstacle to this.

We work in partnership with our clients and when the opportunity arose with Nissan to collaborate, the subsidy offered by ZEHID made it possible. Our general fleet is a roaming fleet which brings challenges associated with the current levels of infrastructure. However, Nissan's dedicated charging station allows our bespoke factory-to-port operation the opportunity to ensure adequate charging was possible in our regular duty cycle, meaning we could become an industry leader with early adoption and help with sustainability improvements.

Our decision to invest at this point in time therefore was a combination of our partnership's sustainability objectives and the opportunity to understand the performance and possibilities of eHGVs."

What has been the reaction to the vehicles?

"The reaction to the vehicles has been overwhelmingly positive. We have received multiple requests for information from various media outlets. Our wider client base is keen to engage and understand what we are achieving with the trucks.

The feedback from the drivers has also been very positive. The drivers report reduced fatigue, a quieter working environment and a spacious cab. The only negative in this first six months of operations has been some early issues related to the connection between the truck and charger. These are currently being rectified via software updates to the trucks and chargers."

What's surprised you the most?

"The consistency of the trucks has been a pleasant surprise. This was our first exposure to running eHGVs and our initial calculations have proven very consistent with the actual performance of the trucks. This has given us confidence to explore other eHGV operations. The media and industry reaction has also been surprising with genuine interest coming from many outlets and clients."

How are you charging the trucks?

"As part of ZEHID, BCA is working in partnership with Nissan to support its EV36Zero vision. The trucks will charge at the newly-opened £1.4m on-site charging facility which has seven charging stations powering up to 10 trucks simultaneously.

The trucks charge overnight before shift one. Each truck is then charged during the driver's 45-minute break before completing the shift. The truck has a period of down-time during shift-swap during which it is placed on charged ready for the shift to be repeated before being put on charge overnight again."

What needs to change to enable eHGV investment?

"Further government subsidies would help our business roll-out more eHGVs. The purchase price remains very high in comparison to ICE trucks meaning our clients would be subject to rate-uplifts to account for this. Further grants would help our learning cycle as it would give us the opportunity to deploy eHGVs on different routes and operations giving us a fuller picture of the capabilities and limitations of eHGVs.

Whereas many people believe the range of trucks needs to improve before roll-out, BCA's view is that the main limitation is the lack of accessible eHGV charging infrastructure. As drivers are legally required to have a 45-minute break every 4.5 hours, the current range of electric trucks is adequate if the drivers were certain of the opportunity to charge the vehicles during their breaks."

What advice would you give to HGV operators?

"Making the move forward is the most important step – there will always be uncertainty or questions that cannot be answered but that first step to electrification is the most effective way to ready your business for the future."

Global freight forwarder **DSV** has been operating four Volvo eHGVs from its Immingham site since summer 2025.
Keith Northen, Road Operation Haulage Manager, explains some of the benefits and limitations DSV has experienced so far.

Why did DSV adopt eHGVs?

“There are several main drivers for investing in zero-emission vehicles, for example, being able to tender for new and existing business. Without a BEV option we would be unable to tender in some cases.

These vehicles also help towards achieving our company’s sustainability objectives alongside other initiatives such as introducing CNG and HVO powered vehicles.
We feel this has given us a competitive edge to be amongst some of the first logistics companies to showcase BEVs. The subsidy offered by ZEHID made the decision a lot easier to introduce these vehicles to our fleet despite there being limited infrastructure.**”**

How are you using the vehicles?

“These vehicles are based at our Immingham site, our largest transport operation, and we make full load and groupage import and exports mostly between UK, Ireland and Europe/Scandinavia.

We are using these vehicles as we would some diesel vehicles, despite the challenges they give. For example, we lose 5 tonnes payload, they have approx. 220 miles range before recharging and the vehicles are 4x2 so operators must pay special attention for diminishing loads.

Route planning is centred around the charging opportunities; we have set up agreements with third-party energy providers to allow for a more flexible approach to vehicle planning.

We are regularly making deliveries/collections to South Lincolnshire, Nottinghamshire, East and West Midlands and Cambridgeshire, to name the majority. We would like more opportunities in the future to charge in the Lancashire/ Manchester/Liverpool areas and North Yorkshire/Northeast, as this area is poorly covered.**”**

How has your organisation reacted to eHGVs?

“From a management point of view, these have been well received, they look impressive and different from most vehicles which does draw attention to them. Unfortunately, we have had a poor take up from the drivers who have a reluctance to drive them due to range anxiety, down time for vehicle charging and poor infrastructure.

Schedulers are having to take more time to plan, route and manage these vehicles due to the restriction previously mentioned.**”**

How are you charging the trucks?

"We have two 50 kW twin lead chargers at Immingham, these are used for overnight and weekend charging. We have limited electricity supply to this site and to future proof we would need considerable investment in a substation. The remaining charging is from public and shared infrastructure."

What advice do you have for other operators?

"I would advise other operators to look at their current and regular runs, considering weight, distance and charging point opportunities. Also, employing the right drivers who are on board is a big factor, the four DSV drivers have been instrumental in making this successful for our business and building up good working relationships with third-party charging partners.

eHGVs will be fundamental for the future for a lot of companies, I think if you embrace it and take a very proactive approach to planning, paying special attention to the deliveries, collections and the charging requirements, you will make these vehicles successful in your business. Hopefully our customers who want to be greener will embrace these vehicles."

What would you like to see changed to help businesses invest more in eHGVs?

"The initial cost of these vehicles is a huge prohibitor, so government funding is essential. This, in parallel with the lack of national infrastructure, limited payload and driver retention would need to change for our business to invest further in eHGVs."

What has surprised you most?

"There are a few elements: the changing weather conditions, also battery drain overnight is higher than expected, the heavier the load more energy is consumed is obvious, but this is greater than anticipated. Charging points are fewer than expected and the speed that they charge at is more varied that I imagined."

Fergusons Transport is a 100-year-old family-owned haulier based in the Northeast of England. 12 DAF eHGVs have joined its fleet, delivering parts to Nissan's Sunderland factory from suppliers throughout the region.

We asked **Hamish Patterson**, Commercial Director at Fergusons, how the introduction of electric has been for them.

Why are you embarking on trialling eHGVs?

"The main driver for the electric HGVs was customer requirement; however, I don't believe it would have happened without the ZEHID subsidy."

How are you using your eHGVs?

"Fergusons has 12 eHGVs. They are all operating on our Nissan contract. This consists of single and double shifted operations doing local milk runs. The routes are a mix of local roads and dual carriageways.

To date we have not completed any challenging routes. Once we have good data and confidence on the potential range we intend to use them on a collection location in Knaresborough."

What part of the project implementation surprised you the most?

"Within the Electric Freightway project the legalities and contractual requirements around the charger construction and then asset adoption were significantly more complicated than expected. This took up a lot of time and to my mind affected implementation.

The overall time and effort required by various stakeholders was significantly more than originally anticipated. The number of meetings and updates around the Nissan Charge Yard were far more than planned and the delay to the delivery of our vehicles and ensuing technical issues was unexpected.

The flexibility from the OEMs to facilitate the moving goalposts on this project has exceeded expectations!"

How are you charging the trucks?

"The vehicles have been charged 100% at the Nissan Charge Yard.

Fergusons' depot charger was commissioned early December so we will now build the use of that into the plans.

There are no plans to use other infrastructure for charging other than in an emergency.

We are open to allowing third parties to use our charging infrastructure – this is something we will investigate after commissioning."

What has been the reaction to the eHGVs?

"Generally, the reaction has been positive. Some drivers are not keen on the cameras for mirrors but really like how the eHGVs drive compared to their previous vehicles.

Planning the charging does add a new complexity for the planners and we have had to adapt our planning model to incorporate this."

What needs to change to enable eHGV investment?

"Regulatory change to increase the payload to compensate for the battery weight would be a help. Similarly, an increase in the length would enable 6x2 tractor units to be implemented in a like-for-like manner to ICE.

Charging infrastructure and the cost of third-party energy is the main stumbling block for eHGVs being used for our general transport. There is not the network and the constraint of the driver needing to go out of their way and then taking their break when the vehicle commands it is too inefficient. The cost of third-party fast charging negates the TCO saving from depot charging."

What advice do you have for operators considering eHGVs?

"Look into the energy supply requirement first, as non-commodity costs increase exponentially with each band.

Study how the vehicles will be used and whether a slower charge is possible.

Ensure vehicle and charger delivery are aligned."

Electrical retailer **Currys** has added two eHGVs to its distribution network. We asked **Nigel Willott**, Senior Account Manager, what Currys has learnt from operating eHGVs.

Why has Currys decided to adopt eHGVs?

"A combination of factors really, we, of course, have our sustainability objectives and electric vehicles form part of our strategy to deliver these. However, these HGVs weren't originally in the early phases of our plans, which focused on vans, cars, and 7.2-tonne vehicles. But the subsidy made these HGVs financially viable, and we adapted our plans to install appropriate chargers and adapted operational plans accordingly. The ZEHID subsidy was the biggest factor influencing the decision as it brought the EV costs more in line with a diesel equivalent."

How are you using the vehicles?

"We are operating two 4x2 38-tonne tractor units, one from Nottinghamshire and one from Essex, completing a mixture of shop delivery and trunking work. They pull everything from single deck box trailers to double deck longer semi-trailers (LSTs).
The vehicles are performing well and completing everyday trips averaging around 250-400km. Our aspiration is to truly test the boundaries of what the vehicles can achieve and how far we can go using top up charges along the route."

How are you charging the trucks?

"The vehicles in the main are using our own charging infrastructure at our sites. Via the Paua App and card system we also have access to shared and public infrastructure. We are not currently planning to share our own infrastructure at present but that is not to say we won't in the future."

How has your team reacted to eHGVs?

"Driver reaction has mostly been positive with a driver survey returning a satisfaction score of 8.7/10.0. The drivers like the quieter cab environment and the regenerative braking system. Once range anxiety is overcome drivers find them an enjoyable, less stressful drive.
Transport team operators are a little more reserved, as more thought and planning is required on trips the vehicles are allocated to and this reduces flexibility for them."

What has been your biggest surprise?

"Driver engagement has largely been easier to achieve than expected and range anxiety overcome. However, vehicle utilisation during peak times when there are diesel vehicles available instead has proved more challenging than out of peak utilisation suggested it would be."

What would you like to see changed to help businesses invest more in eHGVs?

"Cost is undoubtedly a significant barrier to entry and further subsidies and incentives, or regulation to lower manufacturer costs, is required to make EVs a more viable solution. Along with this, more accessible public sites are needed, offering charging at a more competitive rate than currently. This is usually circa three times our own charging cost. Ease and cost of depot power connections is undoubtedly a challenge, as are delays from the DNOs – improvements in this area would certainly help."

What advice do you have for other operators considering eHGVs?

"Plan your depot charging well in advance and have infrastructure in place before any vehicles arrive. Engage drivers early and take them on the journey with you. Be prepared for higher TCO if you cannot secure subsidy funding."

Graphic Packaging International has recently introduced eHGVs in order to support its sustainability objectives.

Dan Parker, Transport and Compliance Manager, explains some of the successes and challenges of eHGV adoption.

How are you using your eHGVs?

"We're using one of our two eHGVs for sort movements between sites three days a week and runs of around 140 miles two days a week. The second unit is doing between 150 to 180 miles, five days a week, making deliveries to customers in the Cambridge and London areas.

We've done two longer runs from Leicester to Gateshead. The first run was very successful, but this was at 33-tonne, warm weather and with most of the trip on cruise control. The trip ended with 33% left in the battery.

Trip two was not so good. Same trip apart from the truck was at 36-tonne, very cold weather and there was some traffic. The trip ended on 12%."

How are you charging the trucks?

"We're using an 80kW DC charger at both of the sites we're running them from. We're able to upgrade to 200kW, this will be done in 2027.

We plan to open a new site with a 400kW charger in 2027-2028. This will be open to the public – invite only to start off with."

What part of the project implementation surprised you the most?

"The project has been a hurdle; it's all been the unknown.

The biggest surprise was the drivers asking to drive them and how positive the feedback was."

What has been the reaction to the eHGVs?

"Feedback from the drivers that have driven them has all been very positive. Some of them did not like to say it, but they're all happy to drive it. The only negative from them is that the range is unpredictable.

The schedulers find it hard to put them on runs that they are capable of completing without charging away from site. This is more of a problem when drops get added and it exceeds the truck's range.

I'm happy with how it's going. It has been up and down, but I knew it would be. This is all new to everyone and the next year is just to learn and push the trucks to their limits and beyond."

What needs to change to enable eHGV investment?

"There needs to be further subsidies as the cost of ownership is just way too high or impossible.

Payload needs to be a high priority. A 4x2 needs to be 44-tonne.

There needs to be tax benefits when using third-party chargers to bring the cost down, so it matches diesel cost, at a minimum.

More help is needed to help with on-site charging i.e. planning, installing and cost."

What advice do you have for operators considering eHGVs?

"Make sure you get a demo vehicle and use it on runs you intend to use it on.

Go and visit a site that is already using them.

Look at what an EV truck can do, not what it can't do."

"The whole process has been a massive roller coaster for me. One minute you're on high and the process is going well then someone puts the brakes on!

I always tried to say positive and keep moving forward as I know EV trucks are the way we need to go today, not tomorrow.

The day the trucks rolled into the yard was a high point in my career and I also know this is just the start of the journey."

Maritime Transport is the UK's leading provider of integrated road and rail freight logistics, operating a national network across container transport, domestic distribution, inland and off-dock storage, terminal operations, international freight management, and truck sales.

The business is delivering one of the sector's most ambitious decarbonisation strategies, leading the transition to a cleaner, more sustainable UK supply chain through rail freight expansion, zero-emission vehicle deployment, truck charging infrastructure, alternative fuels including HVO, and smarter route planning to reduce empty miles.

Electric road transport plays a central role in this approach and is being delivered through Maritime ZERO, the company's zero-emission road transport division. Maritime ZERO integrates eHGVs with one of the UK's largest privately operated truck charging networks, alongside rail freight services, to support emissions reduction where electrification is commercially and operationally viable. In parallel, Maritime is a lead partner in all three national projects under the government-backed Zero Emission HGV and Infrastructure Demonstrator programme, contributing operational data and helping to build a national blueprint for wider industry adoption.

Deputy Chief Executive Officer, **Tom Williams**, explains how Maritime is approaching the transition to zero-emission road transport, and what must change to accelerate industry-wide deployment.

Why has Maritime decided to adopt eHGVs?

"We had several motivations. As a privately owned, family business, we want to do the right thing by our people and invest in a greener future. At the same time, it's important that we're involved with and learning from new technologies to support the long-term success of the business. We believe zero-emission transport will become the norm, and the support available through this programme made it the right opportunity to get involved, especially due to the generous subsidy on offer. Finally, our customers see Maritime as an innovator and solutions provider, so developing practical zero-emission options was always something we wanted to be able to offer."

How are you planning to use the vehicles?

"The strategy is to ensure our eHGVs are highly utilised each day. To achieve this, and to maximise the benefits while minimising the operational restrictions, we're integrating them with our rail operations wherever possible. Rail services will complete the long-haul element of the journey, reducing emissions and road congestion. On arrival at our rail terminals, eHGVs will collect containers and complete multiple short-to-medium-range journeys over a 24-hour period. This approach maximises utilisation and helps offset the reduced range compared to diesel vehicles. For eHGVs based at our port locations, we plan to use our charging network to support medium-to-longer-haul journeys where the route profile allows."

How are you going to charge the trucks?
"Our approach is to use our own depot chargers wherever possible. This reduces downtime and queuing, lowers costs compared to public charging, improves driver welfare through access to on-site facilities, and increases overall charger utilisation. Where additional capacity is needed, we'll use private B2B charging arrangements, with on-the-go public charging used only as a last resort."

What has been your biggest challenge?
"eHGVs are far more capable than many people give them credit for, and a large proportion of routes can be electrified. The primary constraint so far has been the time and process involved in securing power and installing charging infrastructure at our sites."

How has your organisation reacted to eHGVs?
"We're currently operating six vehicles, as part of a separate consortium, and have only been doing so for a short period. Early feedback has been very positive, although it's still too soon for detailed analysis. A good example of change in perception is at the depot where our first eHGVs are based. Vehicles from that manufacturer had not previously been widely favoured by drivers, but since the electric version arrived, interest has increased significantly and many drivers now want to operate them."

What would you like to see changed to help businesses invest more in eHGVs?
"The two key changes that would most improve the operational deployment of eHGVs for Maritime are increased payload allowances – both total payload and axle weights – and greater flexibility around vehicle length. If payload and axle weights were addressed, there's a strong argument that increasing vehicle length may not be necessary. For example, if a 4x2 tractor unit could legally operate at 44 tonnes with uprated axles, the need for a 6x2 configuration would be reduced. Improvements in range would also be beneficial, alongside continued support through subsidies and better access to power. However, based on current energy deployment across our network, vehicle weights and configurations remain the most significant obstacles to overcome."

What advice do you have for other operators considering eHGVs?
"My advice would be to start small and gain experience. Nobody is suggesting a full switch to eHGVs today – that wouldn't make sense financially or operationally – but most operators will have sufficient volume to introduce one or two electric vehicles and see how they perform in live operations. Access to charging is essential, but the network is improving, and operators with existing infrastructure are increasingly open to sharing it through partnerships. This means businesses don't always need to rely on more expensive on-the-go public charging."

As the UK's largest food retailer, **Tesco** is committed to building a resilient, sustainable food system that nourishes people, supports customers, and protects the planet for future generations.

Sustainable logistics is a key part in achieving this goal.

Cliff Smith, Tesco's Fleet Engineering Manager, outlines the challenges the company faces in decarbonising a large transport operation.

Why are you embarking on trialling eHGVs?

"Tesco has a public commitment to transition its UK transport operations to zero emission by 2035. LGVs form part of this transition. We need to trial zero emission trucks to understand if they will be able to complete the work that diesel trucks do today."

How are you using your eHGVs?

"Today Tesco operates circa 2,300 LGV trucks, of which six are BEV (three owned and three ZEHID funded), 118 are biomethane and 200 operate on HVO.

As we operate 21 regional distribution centres (RDCs), these e-trucks predominantly deliver stock to our stores in the catchment area of the RDC they operate out of."

What challenges have you faced in getting ZEHID eHGVs on the road?

"Internal approvals for data sharing have been problematic, as have negotiations with telematics providers to supply the data ZEHID-funded vehicles require. Charger availability delayed the deployment of one ZEHID-funded truck, and one e-truck has had software related defects since day one (that have now been resolved) that we weren't expecting!"

How are you charging the trucks?

"Depot charging will be the only solution that works for Tesco, we don't anticipate sharing this infrastructure. For the future we are planning to complete the depot-based charging infrastructure roll out across our RDCs.

Public charging will be impactful to our operation, from going off route, delays waiting for a charger to be available and the high cost would make public charging not suitable. Unless something changes in terms of funding or other incentives, we don't see this view changing."

What has been the reaction to the eHGVs?

"Feedback so far has been really good. Drivers like the new technology and we have been able to operate the vehicles without any form of restriction. Due to the very small number of battery electric vehicles, we haven't received any customer feedback yet."

What needs to change to enable eHGV investment?

"Cost parity with diesel trucks and support with the high cost of charging infrastructure are all issues stopping us from transitioning any more diesel trucks to zero emission. Until this changes we are not in a position to move forward and our long-term plans will continue to change until zero emission truck TCO matches or beats that of diesel trucks.

In order to transition to zero emission between now and 2035. we need solutions for 44-tonne GVW operations to be in place without payload impact. Without this, there will be continued nervousness around backing the wrong technology."

What does the government need to do to support the industry?

"ZEHID-funded trials will not be the one-stop solution to allow fleet operators to transition to zero-emission trucks. There needs to be some key decisions made by the UK Government on either incentivising the change or disincentivising the use of diesel.

Adding in additional cost to the logistics industry will not work; either support the transition or allow the use of low emission LGVs until such time as TCO achieves parity."

What advice do you have for operators considering eHGVs?

"Continue to challenge the UK Government to incentivise the transition to zero-emission trucks.

Trial if you can and understand how much additional power you will require for truck charging infrastructure."

GXO is the world's largest specialist contract logistics provider. Through Electric Freightway, GXO has started operating 11 Renault e-Tech T electric trucks, servicing customers including Iceland, Huel and Shepherd Neame.

We asked **Steve Milsom**, Fleet General Manager, to outline some of GXO's key considerations when it comes to adopting and operating eHGVs.

Why has GXO decided to adopt eHGVs?
"Both GXO and its customers are focused on carbon zero transport solutions; early adoption was critical to show commitment to sustainability."

How are you using the vehicles?
"Due to limited public infrastructure, we operate in proven localised regions. Several vehicles operate on fixed routes while others are carrying out multi-store deliveries."

How are you charging the trucks?
"Economic viability plays a significant role in EV locations due to locations and grid capabilities needed to provide, mainly internal, charging stations. Shared could be perceived as the way forward but we approach sensitively due to some influential customer requirements."

What has been the reaction to the eHGVs?
"The vehicles have been extremely well received by drivers, once they have become comfortable around range capabilities. Customers were also very excited and publicly endorsed their satisfaction with the ZEHID EV offerings."

What would you like to see changed to help businesses invest more in eHGVs?
"Payloads on lighter (7.5-16 tonne) eHGVs are a point of concern, particularly when temperature-controlled bodies and restricted access points are to be considered.
Grant schemes are very beneficial and would certainly help in accelerating the journey to EV.
Power connections and modifications to sites are extremely expensive, disruptive and lengthy, so help in that area would be greatly welcomed, specifically incentives to future-proof older sites.
Perhaps there is an opportunity for OEMs to support with vehicle replacement but I'm sure this will come in time."

What has been the biggest surprise?
"Roll out has been as expected and operators are very happy. Reliability and support from OEMs has been critical and they have surpassed expectations."

GXO recently made use of power take-off (PTO) for refrigeration purposes, and we look forward to receiving accurate power consumption data to prove that these vehicles already surpass expectations."

What advice do you have for other operators considering eHGVs?
"Take the OEM's advice seriously, use every bit of their data analysis from day one, it's the first part of a successful journey."

Midlands-based **Fenn Logistics** has been providing transport services to a range of customers, including food processors and multiple retailers, for almost 30 years.

Having already converted the majority of its fleet to HVO, Fenn started operating its first eHGVs – two Volvo FM Electric tractor units – as part of Electric Freightway.

Fenn's Managing Director, **Gary Major**, explains how eHGVs are fitting into the company's operations.

Why did you decide to embark on trialling eHGVs?

"This was a project instigated by our client, Nestlé, in support of the dedicated work we do and have done for them for over 20 years.

This involves having dedicated vehicles employed to shunt between Nestlé's main manufacturing site in Tutbury and its dedicated warehouse at East Midlands Gateway.

Given the repetitive nature of the work for the vehicles and the ability to install a 200kW charger at East Midlands Gateway, this made the eHGV solution an easy fit for both us and the client, supporting their global carbon reduction targets and ambitions."

How are you charging the trucks?

"Both eHGVs are charged at GXO's site at East Midlands Gateway. Given the dedicated nature of the work these vehicles have been employed for, we do not anticipate any changes to be made for the duration of the contract, with the exception that will we need a back-up/contingency site option in the rare event both chargers at East Midlands Gateway go down."

What has been the reaction to the eHGVs?

"The drivers have taken to the vehicles fairly easily and, in fact, one person applied for the role purely on the basis that he wanted to be involved and drive an EV.

The schedulers are a little disappointed with the reduction in range, as this has meant less miles/less work gets covered. From their perspective this means more loads have to be planned on other hauliers due to the fact the double shifted EVs cannot achieve the same work output the diesel trucks, which were previously employed on these runs, did."

What needs to change to enable eHGV investment?

"Lower cost and better range are an absolute necessity."

Campeys of Selby is a Yorkshire-based family-owned haulage company. Campeys has a track record of investing in sustainable vehicles – operating a fleet of compressed biogas trucks and the UK's first 19-tonne battery electric DAF LF. This has recently been joined by a DAF XF tractor unit as part of Electric Freightway.

We asked Commercial and Operations Director, **Harry Campey**, and Quality Manager, **Simon Batty**, about the motivations behind the company's adoption of eHGVs, and how the vehicles are working for them.

Why has Campeys decided to adopt eHGVs?

"Campeys of Selby is a forward-thinking company that wants to be involved in the innovation process, early testing and feedback. This ensures that we have a good understanding of incoming developments. We believe that the industry must move towards greener technology and are happy to be supporters of the development and introduction of that technology."

How are you using the vehicles?

"We use the EV units in areas that are highly populated, we believe this is where the reduction in emissions is valued. We look forward to the time when the full fleet can run this way, of course, development is needed and support from the industry is essential to this."

How are you charging the trucks?

"We have charging points at our depots. It would be good to use the infrastructure available to the public, however, improvement is required to enable more flexible planning strategies."

What has been the reaction to the eHGVs?

"Positive, we ensure that the vehicles are planned within their capabilities, moving on routes that have the infrastructure to charge when required. Feedback from customers and the public is positive."

What has been your biggest surprise?

"We have been surprised by the driving workforce's positive attitude towards the vehicles. There is no shortage of drivers that are requesting that they be allocated an EV unit."

What would you like to see changed to help businesses invest more in eHGVs?

"Increased range is a priority, a charging infrastructure that covers a wider area including rural areas is needed to fully utilise the vehicles.

The technology is currently expensive, wider use and technology development is needed to reduce production costs.

Increased payload ability is also a key consideration to reducing the impact on the environment."

What advice do you have for other operators considering eHGVs?

"With considered usage, these are valuable assets to any company. Company participation in the development and testing ensures that the vehicles are built around functioning transport operations."

Royal Mail operates the largest commercial EV fleet in the UK, having turned over 8,000 of its iconic red vans green. Through Electric Freightway attention is now turning to its national distribution network.

Fleet Innovation and Environment Manager, **Anna Pearson**, explains what Royal Mail has learnt so far, and highlights some of the challenges the company still faces.

Why did Royal Mail decide to embark on trialling eHGVs?
"The phase-out of internal combustion engine trucks is fast approaching. With such a large fleet we need to be prepared and be part of finding the solution. We have already learned so much and being part of the consortium, we can share learnings with other members and work collaboratively to achieve our goal.

It is also great to demonstrate to our customers that we are committed to our sustainability objectives."

How are you using the trucks?
"Royal Mail has eight 42-tonne DAF XDs, four each at our Midlands and North West parcel hubs. They're charged using our onsite ABB T360 chargers.

The trucks were delivered in December so we're still in the early stages.

To start with, the trucks will perform local duties and as confidence builds and telemetry data is assessed, journeys will lengthen to maximise utilisation."

What has been the reaction to the eHGVs?
"Our posties were interested and excited to see and drive the electric trucks.

Understandably, there has been some nervousness about range and how to operate the trucks, but this will be overcome in time with regular review of data, feedback and engagement."

How are you charging the fleet?
"We currently use depot-based charging for the vast majority of our electric fleet. We cannot rely solely on depot-based charging for our fleet, however, as some Royal Mail depots face space or power constraints.

Currently, public charging is a contingency option for our vans and is used for training vehicles while infrastructure is being installed. Once issues around public charging's cost, location, availability and reliability have been addressed, we would definitely consider using it more widely to supplement depot-based charging."

What needs to change to enable eHGV investment?

"The purchase price of eHGVs must be addressed to make sure it is financially viable for fleets to transition to electric. That said, vehicle supply is just one component of meeting fleet decarbonisation aims, and a holistic, sector-wide approach is needed to make sure they are met.

To ensure EVs are fit for purpose for commercial fleets, it is important to guarantee robust public infrastructure and remove barriers for fleets installing depot-based charging.

Public charge points must be accessible and competitively priced for commercial vehicles and energy supply upgrades for depot charging must be cheaper and less time-consuming.

We'd also welcome steps from government to make it easier for organisations to transition to electric fleets. Right now, the end-to-end process with Distribution Network Operators (DNOs) can be complex and time consuming, so simplifying connections, ensuring costs are predictable, and guaranteeing the right capacity would make a huge difference.

At the same time, the UK needs a workforce with electric vehicle maintenance and charging infrastructure deployment skills, so investing in training will help meet growing demand across the country. For fleets to be able to make long term investment decisions, stability and clarity around grants for electric vehicles are essential. Consistent terms and funding allocations give businesses the confidence to plan ahead in their transition."

What part of the project implementation surprised you the most?

"We were most surprised by the number of legal agreements required and the time that was needed to effectively complete these.

From experience of installing chargers for our electric van fleet, we knew that the infrastructure would be the most time consuming, however we underestimated the time and resource needed to manage this on larger and more critical sites.

We are still in the early stages of deployment but are looking forward to seeing the benefits of our electric fleet unfold."

What advice would you give HGV operators?

"Engagement is key – consider every stakeholder that could be impacted.

Invest plenty of time in training drivers and fleet technicians and focus on the similarities to ICE trucks.

Many people have preconceptions about the limitations of EVs, and reliable data is key to proving them wrong."

Kuehne+Nagel is one of the world's leading logistics providers, with nearly 85,000 employees operating at almost 1,300 sites in close to 100 countries.

As part of both Electric Freightway and eFREIGHT2030, Kuehne+Nagel is operating a mixed fleet of DAF and Renault eHGVs from its East Midlands depot and has made the first international eHGV journeys from the UK.

We asked Road Logistics Truck and Fleet Operator, **Matthew Scoble**, to share how Kuehne+Nagel has been making use of its eHGVs

Why has Kuehne+Nagel decided to adopt eHGVs?

"Kuehne+Nagel's decision to invest in zero-emission vehicles at this point in time is driven by a combination of customer expectations, competitive positioning, and long-term sustainability objectives. Emissions performance is increasingly influencing customer requirements and procurement decisions, making low-carbon transport solutions an important factor in maintaining competitiveness within the logistics sector.

The investment also reflects a strategic decision to gain early operational experience with zero-emission technologies while external support, such as the ZEHID programme, helps reduce risk. This approach enables us to test vehicle performance, infrastructure needs, and scalability, informing future decarbonisation pathways as zero-emission transport becomes more commercially viable."

How are you using the vehicles?

"We are operating 12 eHGVs – four Renault E-Tech Ts and eight DAFs (four XFs and four XDs) across the UK carrying out general groupage operations, full loads, and specific lanes with customers. We have completed the first-ever eHGV crossing into France via P&O Ferry earlier in 2025 and have again achieved another industry-first milestone by crossing the channel via Eurotunnel and going into Germany in 2026, replicating a diesel linehaul. We have also dedicated certain routes with customers, such as Siemens, to deliver an electrified, sustainable 'milk run' to decarbonise its supply chain.

Future aspirations involve a more suitable public and semi-public charging network to be able to do more domestic operations via electric, alongside more depots opening their charging infrastructure for a more collaborative approach to electrification."

How are you charging the trucks?

"All our road fleet operate out of our East Midlands Gateway depot which houses our new megawatt-scale Hypercharger system, alongside Garo AC chargers. Currently, our electric fleet mainly uses depot charging as we can still pair appropriate work with this style of operating, including some having top-up charges to go back out again during the day. We are increasingly double shifting the trucks into the night as we can have quick turnaround times thanks to our Hypercharger system.

Due to limitations with public eHGV charging infrastructure, it is currently not feasible for us to utilise this often, however, as we expand and as charging costs decrease, we will rely more on public infrastructure. We aim to semi-open our charging infrastructure at our depot so that external, pre-approved operators can book in to top-up charge at our site."

KUEHNE+NAGEL

What has been the reaction to the eHGVs?

“The reaction to the eHGVs has been predominantly positive, with the business seeing this as a major forward step towards our decarbonisation goals and helping accelerate the industry-wide transition to zero-emission vehicles. Those working with the trucks everyday have faced some challenges regarding routing and range but were quickly able to adjust and take time to give extra attention to how the vehicles are operated.

The drivers are more mixed in their reactions, with those that have their own EVs taking to the trucks and embracing them more naturally, and even those with little or no experience of EVs adjusting quickly and enjoying using them. However, there are others who are more stuck to their routine and would rather operate their diesel counterparts.

The stakeholders and customers that we have engaged with are excited about the opportunity to create strong relationships where freight is moved in a more sustainable way, building committed, future-thinking partnerships.**”**

What has been your biggest surprise?

“The impact on driver welfare – drivers have expressed that since switching to eHGVs their drives are far smoother, quieter, and stress-free. Being able to move quicker from a dead stop means the drivers worry less when it comes to junctions as they know they can take advantage of more gaps in traffic.

Furthermore, the impact of driving style with the eHGVs has a far greater effect on efficiency and range than in a diesel equivalent. Having engaged drivers who plan ahead and pay extra attention to their routes and conditions plays a big part in the quality of the shift and the efficiency of the vehicle.

We exceeded our own and the OEMs’ expectations with the range of the vehicles – we have achieved 265 miles on a single charge on our Renault E-Tech Ts and 314 miles in our DAF XDs and XFs which were both more than originally quoted by the OEMs.**”**

What would you like to see changed to help businesses invest more in eHGVs?

“Government incentives will always be welcomed to help reduce the TCO of eHGVs and infrastructure, but more importantly developments in truck and charger technology will help accelerate the uptake of zero emissions vehicles as they will be more desirable if they can go further on a single charge and, when they need to charge, can do so quicker.

As we have already invested in sufficient charging infrastructure at depot this wouldn’t be as essential as we could cope with having more vehicles, however, there is a tipping point for the vehicle-to-charger ratio where this becomes unsuitable. Furthermore, operators need clearer guidance and understanding on the lifespan of vehicles and infrastructure, and what it means to move from site or to have further on-site expansions.**”**

What advice do you have for other operators considering eHGVs?

“Take lessons from what we’re doing here within the ZEHID programme and elsewhere to see which path is appropriate for you. Decide carefully how many trucks you choose to implement, how or if you install depot charging, your plan for integrating eHGVs into your current fleet and balancing depot and public charging to fulfil your current and future demands. You CAN start small, target the low-hanging fruit that can easily be electrified first and build from there.**”**

04 What have we built?

Report three introduced the first depot charging site at Nissan's Sunderland plant, as well as many of the challenges faced in getting eHGV-ready chargers in the ground. Since then, GRIDSERVE has been hard at work completing Electric Freightway's depot sites and launching the first two public charging locations at motorway service areas (MSAs). This section introduces what we've built and what we've learnt along the way.

Public charging

Where we have got to

As the network moves from delivery into operation, GRIDSERVE's focus is on ensuring sites are accessible, easy to use and commercially viable for operators.

Public Electric Freightway sites are being delivered as open-access infrastructure, supported by booking and bay reservation services that are currently in development and will evolve as usage patterns and operational requirements become clearer. In parallel, payment and commercial frameworks are being established, including card-based payment and contracted access models, with increasing emphasis on preferential pricing for committed and repeat fleet demand.

The first two sites, at Baldock and Exeter, opened in January 2026. Five further Electric Freightway motorway service area sites are at various stages of development, with an additional four sites in the planning phase. Moto Tamworth on the M42 at Junction 10 and Moto Thurrock on the M25 at Junction 30 are nearing completion and are expected to open shortly. Roadchef sites at Chester on the M56 at Junction 14 and Strensham Northbound on the M5 between Junctions 8 and 7 are expected to follow in mid-2026. The Extra site at Leeds Skelton Lake on the M1 at Junction 45 is expected to open towards the end of the year, subject to the completion of power supply upgrades.

In addition to the motorway service area programme, GRIDSERVE Electric Forecourt sites at Braintree, Norwich and Stevenage are already capable of supporting eHGV charging. Though not dedicated eHGV charge locations, these sites have been used by several project partners by arrangement with on-site teams, providing additional flexibility during early fleet deployments.

To mark the opening of the first two Electric Freightway hubs we sent an eHGV from Exeter to Baldock – watch the video to find out more from our project partners

The journey so far

The journey from initial concept to operational site has been complex, as set out in report three.

Where delivery has taken longer than anticipated, this has largely been due to extended planning processes, significant grid reinforcement works and protracted negotiations with distribution network operators (DNOs). These challenges are typical of first-of-a-kind infrastructure and have generated learning that will reduce risk and timescales for future delivery.

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GRIDSERVE has also strengthened its capability in delivering heavy-duty charging infrastructure in constrained, live environments. Key lessons include the need for early DNO engagement, flexible site design to accommodate evolving vehicle standards, and clear separation of HGV and light vehicle movements. These lessons are now embedded within GRIDSERVE's standard design and delivery practices.

A growing network

The wider market continues to develop, with new charging providers entering the eHGV sector and a range of infrastructure and commercial models emerging. Shared access to depot-based charging is becoming increasingly important, enabling infrastructure owners to improve utilisation and generate additional revenue.

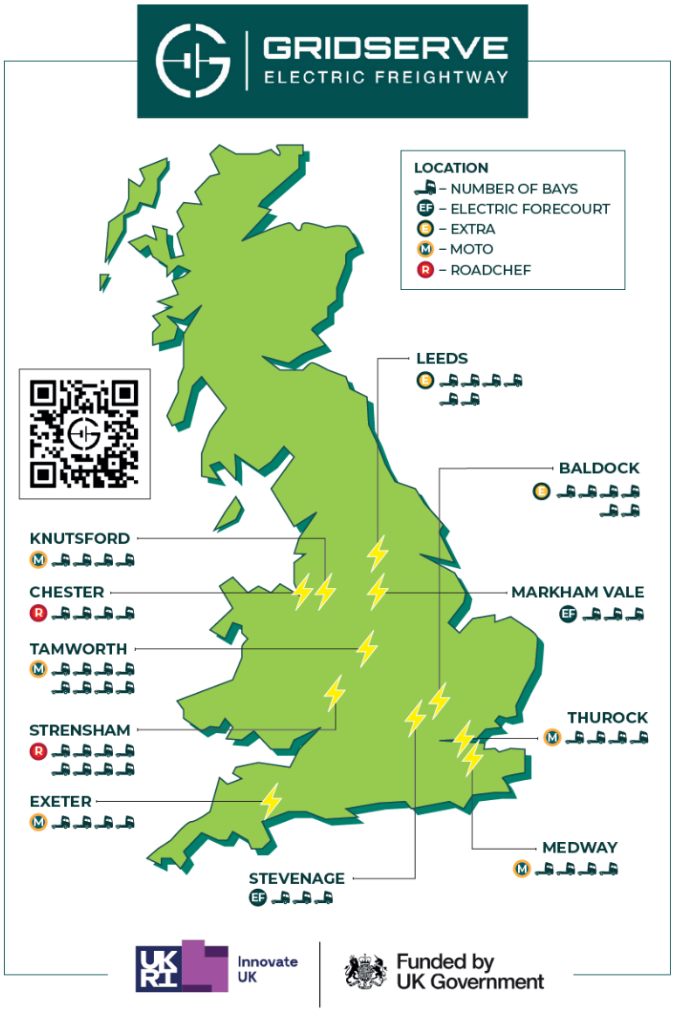
Several project partners have already opened, or are planning to open, their depot charging sites to other operators. Other ZEHID-funded projects, including eFREIGHT 2030 and ZENFreight, are also enabling wider industry access to depot infrastructure. Together, these developments highlight a shift towards more collaborative charging models that complement public networks and support the transition to zero-emission HGVs.

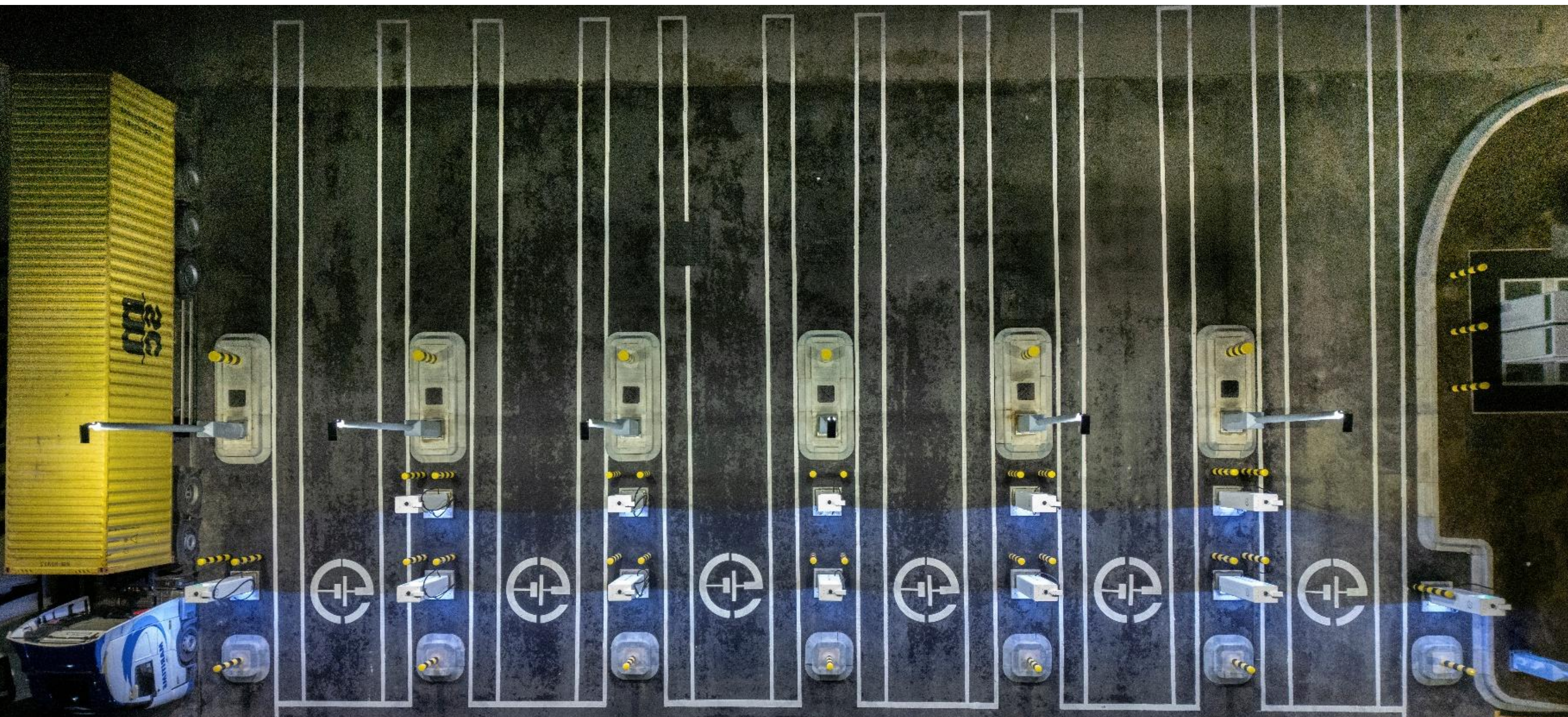
Overall, the programme demonstrates GRIDSERVE's transition from infrastructure delivery to long-term operation, combining physical assets with evolving digital services and commercial models to support electric freight at scale.

Electric Freightway sites

The public eHGV charging sites have now begun to open with the first two locations opening in January 2026 with a significant launch event attended by OEM partners, hauliers and MSA operators which included a fully electric run from the Exeter MSA site to the Baldock MSA site.

Figure 4 - Planned GRIDSERVE public eHGV charging locations





Sites now open

EXTRA, Baldock (A1M J10) – GRIDSERVE has developed a public MSA charging hub at Baldock with six bays and 12 chargers which is now live.

MOTO, Exeter (M5 J30) – GRIDSERVE has developed a public MSA charging hub at Exeter with four bays and nine chargers which is now live.

Sites planned for 2026

MOTO, Tamworth (M42 J10) – GRIDSERVE is developing a public MSA charging hub at Tamworth with eight bays and eight chargers, targeting go live in May 2026.

MOTO, Thurrock (M25 J30) – GRIDSERVE is developing a public MSA charging hub at Thurrock with four bays and 12 chargers, targeting go live in June 2026.

ROADCHEF, Chester (M56 J14) – GRIDSERVE is developing a public MSA charging hub at Chester with four bays and eight chargers, targeting go live in June 2026.

EXTRA, Leeds Skelton Lake (M1 J45) – GRIDSERVE is developing a public MSA charging hub at Leeds with six bays and 12 chargers, targeting go live in November 2026.

ROADCHEF, Strensham Northbound (M5 J8-7) – GRIDSERVE is developing a public MSA charging hub at Strensham Northbound with eight bays and 12 chargers, targeting go live in November 2026.

A second phase of sites, including Moto locations at Medway and Knutsford, together with dedicated bays at GRIDSERVE's Markham Vale and Stevenage Electric Forecourts, has recently been announced.

Accessing the sites

All Electric Forecourt hubs are open to all eHGV operators. There is no need to book, and all existing payment methods from our EV charging network apply without any registration. This is aimed at the occasional freight operator, say, for example, moving trucks on occasional routes between regions.

For regular users of our services, GRIDSERVE will engage contracted demand agreements with service level agreements (SLAs) and preferential rates driven by utilisation.

We are also very aware that whilst today there are more bays than there is demand for bays, in the coming years there will be an inflection point where demand exceeds supply. To be ready for this inflection point we are building a booking and reservation system.

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Unintended consequences: cable theft

EV charging cable theft is a rapidly growing issue in the UK, driven by organised crime targeting copper scrap, with incidents more than doubling in some areas in 2025. Whilst only containing minimal amounts of copper, perhaps £20 worth per cable, stolen cables cause immense and expensive damage to public infrastructure.

Charge point operators (CPOs) such as InstaVolt[v] and Osprey have been in the media consistently as victims of this crime. Regrettably, GRIDSERVE and Electric Freightway are no more immune to this mindless vandalism. Back in December our anticipated launch of the first eHGV charging hub at the Extra Baldock site was thwarted by opportunistic thieves, days before the opening.

The challenge

With the increase in thefts being recorded UK wide, it's evident that this behaviour shows no sign of abating without preventative measures. While the copper value is low, damage to chargers can, and does, run into the 10s of thousands of pounds to remedy. Furthermore, the long-term disruption is tangible with chargers out of service for weeks and in some cases months, reducing public confidence in EV infrastructure.

Prevention and security measures

Whilst this criminal activity is all but impossible to eradicate, there are measures that we and other CPOs have taken.

- **Untethered chargers:** One methodology is installing chargers without permanently attached cables until the very last stage of the energisation process. This reduces the target time for thieves prior to sites going live.
- **Security upgrades:** The use of CCTV, 24/7 monitoring and bright lighting is deemed a deterrent, although evidence suggests this does little to dissuade thieves that enter sites with masks and/or hooded tops, driving vehicles with fake plates.
- **Advanced protection:** Implementation of smart tracking, GPS, and forensic liquids (e.g. SmartWater)[vi] to track stolen materials can also be regarded as a deterrent. While statistically there is a very high conviction rate where SmartWater is used as evidence, this assumes the criminals are caught and brought to account, which is so often not the case.
- **Protective equipment:** Perhaps the most effective deterrent is using cut-resistant sleeves like CableGuard™. This Kevlar sleeved solution makes the act of cutting cables significantly more challenging. At Baldock for example, it took the thieves little more than five minutes to cut all the cables (c. 10 cables). If CableGuards had been fitted it would likely have taken them five minutes per cable which may have been enough for them to not even attempt it.

As standard we are now installing CableGuard solutions to all our past, present and future eHGV locations.

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Electrifying depots

Following months of planning and design, 12 depots will feature high-power charging infrastructure funded by Electric Freightway.

Complementing this, several project partners have funded their own charging infrastructure or are making use of existing chargers on their sites. Across Electric Freightway there is a combination of high-power DC charging, and slower overnight chargers in use.

What we have delivered

Nissan Charge Yard, Sunderland – Nissan supports three hauliers operating a mixed fleet of DAF and Volvo eHGVs, including BCA which operates trucks only and doesn't have its own owned chargers. The Charge Yard has 10 ABB chargers (T360 for drive in and T184 for drive though).

Fergusons Transport, Washington, Sunderland – Fergusons operates DAF eHGVs from the Washington depot, with two charging bays powered by an ABB T360 charger with Ferguson trucks helping enable Nissan Motor Manufacturing UK inbound operations.

Yusen Logistics, Leeds – Yusen operates Volvo eHGVs from its Leeds depot, with four charging bays powered by ABB T360 chargers and Garo AC chargers installed to support Nissan Motor Manufacturing UK long range inbound operations.

Yusen Logistics, Derby – Yusen operates Volvo eHGVs from the Derby depot, with one ABB T360 charger powering two charging bays supporting Nissan Motor Manufacturing UK operations.

Maritime, Trafford, Manchester – Maritime operates Volvo eHGVs from the Manchester depot, supported by 10 ABB T360 enabled charging bays.

Maritime, Tamworth – Maritime will soon operate DAF eHGVs at the Tamworth depot, supported by 10 ABB T360 charging bays.

Wincanton, Greenford – Wincanton will operate DAF eHGVs from their depot in Greenford, with four charging bays available powered by two T360s.

Royal Mail, North West Superhub, Warrington – Royal Mail operates DAF eHGVs at the Warrington depot, supported by four charging bays powered by T360 chargers.

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Royal Mail, Midlands Superhub, Northampton – Royal Mail operates DAF eHGVs from the Northampton depot, with four charging bays powered by T360 chargers.

GXO, Enfield, London – GXO operates Renault eHGVs from the Iceland-owned Enfield site, with six charging bays installed, powered by three ABB T360s.

United Utilities, Davyhulme, Manchester – United Utilities operates Volvo eHGVs from the Davyhulme depot, with five charging bays powered by ABB T360 chargers.

Sewage waste collected by the eHGVs is subjected to anaerobic digestion at the site, with the resultant biogas used to generate renewable electricity.

XPO, Gotham, Nottinghamshire – XPO operates Volvo eHGVs at the Saint-Gobain site in Gotham, with seven ABB T360 powered charging bays.

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GRIDSERVE recently completed the eHGV charging hub at Maritime Transport's Tamworth depot. Deputy CEO Tom Williams explains how Maritime will use the site, and gives an insight into some of the challenges.

Why did you decide to electrify the Tamworth site?

"The Tamworth depot is an extremely important operation for Maritime and one we think works perfectly for the deployment of eHGVs. Our Tamworth site includes a rail terminal that receives intermodal trains from all the southern deep-sea ports daily as well as a service that runs between the site and Maritime Mossend (our Scottish hub). This ensures that there is an abundance of volume, typically short stem miles, from the terminal, allowing for high utilisation of the vehicles, removing any range anxieties and permitting the vehicles to "snack" on the chargers at multiple times during the day. The variety of work from the site is also high, as we operate both distribution and container fleets with a variety of shifts including long haul tramping."

How long did the process take from initial designs to getting the site energised?

"The short answer is too long. Whilst the design and planning process was relatively quick, as well as much of the construction, there were delays around fulfilling certain obligations and ensuring the chargers interacted safely and seamlessly within our fast-paced operation. The most complicated and protracted issues were the legal negotiations with the DNOs. This took far longer than anyone could have anticipated at the outset of the project and we found it very frustrating that a common-sense approach wasn't adopted."

What do you think could be done to make site electrification easier in the future?

"There are several aspects that could make this easier in the future. Reflecting internally, this was one of our first sites and so the whole process was new to us. Going forward, having had this experience, we will certainly be more efficient on future sites. I think an important part of depot electrification is to expect a long process and therefore to start as early as possible, ensuring all stakeholders are involved from the outset. Another aspect we found helpful was to talk to the decision makers directly and not spend an inordinate amount of time liaising between legal departments. Of course, working closely with trusted partners is an essential part of any project."

With a network of high-power charging infrastructure across the UK, what plans does Maritime have to provide access to other operators?

"Maritime is developing this high-powered charging network with the main aim of delivering zero-emission transport solutions to our customers. We are a logistics business, and that must be our priority. However, we do not shy away from the privileged position we are in and therefore the ability we have to accelerate decarbonisation of the heavy goods industry (and other industries). So, with that in mind, provided we can charge our vehicles as and when we need to, there is the commitment that we will work with ZEHID operators and other approved partners to accelerate their decarbonisation plans. Whilst there will be certain restrictions to align with health and safety and operational compliance, we anticipate that we will be in a position to offer high-power charging at a number of our sites across the country."

Getting the sites built

Developing the sites

Getting the sites from initial concepts to operational readiness has been a lengthy process, which we described in some detail in report three.

Some sites are taking a little longer than expected, which is due to several reasons including long lead times on planning permissions and time-consuming grid upgrades and DNO negotiations.

The main delays are grid supply related, falling into the following categories:

1. Delays in securing quotes and allocation of supply
2. Delays in DNO and iDNO legals, which are further extended when a superior landlord needs to be included in the agreement
3. Booking in the engineering works to connect supply to the site

Planning and consenting continue to be a source of complexity across the sector. Interpretation of planning requirements varies by local authority, leading many developers to submit applications to manage risk. Key challenges include meeting biodiversity net gain requirements on constrained sites, securing landlord approvals and navigating evolving planning rules, particularly where charger installations may not benefit from permitted development rights in commercial car park environments.

1. Biodiversity net gain needs to be addressed, which in some sites is difficult to achieve due to available green space
2. Engaging with landlords to secure approval for works carried out on leased sites
3. Navigating evolving rules (chargers are less than 2.3m high and residentially would be typically exempt from planning, which may not apply to a commercial car park)

The depot cutting room floor

Not all depot sites assessed during the Electric Freightway programme progressed to delivery, as illustrated in Figure 5. In several cases, sites were taken through early feasibility and design before being paused or withdrawn. This was an intentional and necessary part of the programme, ensuring that investment was focused on viable locations capable of delivering long-term operational and commercial value.

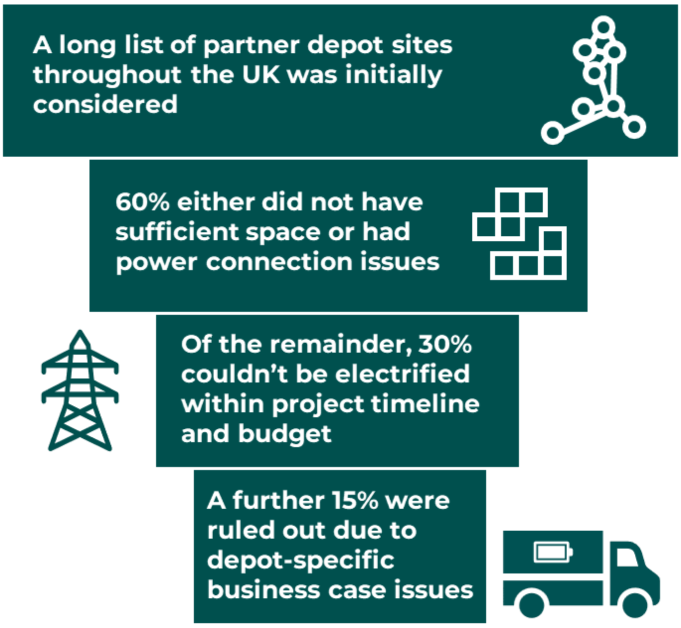

Figure 5 - Shortlisting of depot sites

The most common constraint was grid connectivity. Several otherwise well-suited depots faced disproportionate connection costs or delivery times due to local network constraints. In one case, the required grid works would have involved major highway intervention, including temporary closure of sections of a motorway, rendering the option

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impractical in terms of cost, programme risk and disruption. These experiences reinforced the importance of early, detailed engagement with distribution network operators (DNOs) and the need to screen sites rigorously against grid deliverability, not just theoretical capacity.

Physical site constraints were a second recurring factor. Several older depots were found to be too space constrained to safely accommodate high-power charging infrastructure. Requirements for safe separation from fuel storage, buildings and live operational areas, combined with turning radii and dwell space for articulated vehicles, meant that compliant layouts could not be achieved without unacceptable operational compromise. This highlighted that depot electrification is not solely an electrical challenge but one of spatial and operational design.

Finally, organisational readiness proved to be a decisive factor. Successful sites demonstrated alignment at three levels. Senior leadership needed to view eHGV adoption as strategic to future growth rather than a short-term compliance exercise. Operational teams needed to be engaged early and supported through the changes required to routing, scheduling and depot practices. At a driver level, acceptance and confidence in the vehicles and charging process were essential to realising the benefits of the investment. Where this alignment was not present, the cost and complexity of delivery could not be justified against the likely value.

Taken together, these lessons underline that depot electrification is as much about infrastructure suitability and organisational commitment as it is about technology. Screening sites against these criteria early materially improves delivery outcomes and reduces the risk of stranded investment.

Construction and development

As delivery has progressed from early sites into a repeatable construction programme, several additional lessons have emerged that were not fully apparent at earlier stages of the project.

A key learning has been the importance of designing for late-stage flexibility. Vehicle specifications, charger firmware and operator use cases have continued to evolve during construction, requiring designs that can accommodate changes without material rework. This has reinforced the value of modular electrical architectures, spare containment capacity and configurable charger limits that can be adjusted post-commissioning.

Working within live operational environments has also driven new approaches to construction sequencing. Many depot and motorway service area sites required works to be carried out alongside ongoing logistics and customer operations. This has highlighted the need for phased delivery strategies, clear isolation boundaries and close coordination with site operators to minimise disruption while maintaining safety.

Grid connection works have proven to be the single largest source of construction risk. Beyond lead times, variability in DNO delivery quality, resourcing and handover processes have had a direct impact on programme certainty. GRIDSERVE has responded by increasing on-site oversight of DNO works, tightening interface management and building greater contingencies into commissioning schedules.

Finally, commissioning and handover for high-power HGV charging infrastructure has been more complex than for light vehicle sites. Longer cable runs, higher fault levels and tighter protection settings require extended testing and validation periods. As a result, construction completion and operational readiness are now treated as distinct milestones, with enhanced commissioning procedures embedded as standard practice.

Together, these lessons have strengthened GRIDSERVE's delivery model and materially reduced delivery risk for subsequent Electric Freightway sites.

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A step towards meeting the varied needs of the industry

The eHGV charging market continues to mature, with a growing range of infrastructure models emerging alongside publicly funded programmes. One of the most notable developments is the emergence of shared depot charging. Operators such as First Bus are leading this approach, with other fleet operators increasingly exploring how surplus depot capacity can be made available to local third parties to improve utilisation and support wider fleet electrification.

Within ZEHID, other projects including ZENFreight and eFREIGHT 2030 are also opening depot charging sites to the wider industry. Their approaches and progress are shared through combined Innovate UK dashboards and programme reporting, contributing to a more coordinated view of national infrastructure development.

Alongside publicly funded activity, a number of commercially led shared charging hubs are beginning to emerge from providers such as Milence, Fleete and Aegis Energy. These organisations are developing their own commercial and access models, typically focused on strategic freight corridors and high-utilisation locations.

Public motorway service area charging remains a critical part of the ecosystem. Networks such as GRIDSERVE's Electric Freightway hubs provide turn-up-and-go capability for cross-regional operations and tramping, complementing depot-based and shared infrastructure.

Overall, the industry is moving towards a more blended model of public, shared and depot-based charging. Shared access and depot sharing are increasingly recognised as mechanisms to improve asset utilisation, generate incremental revenue for infrastructure owners and accelerate the transition to zero-emission HGVs at lower system cost.

The project's flagship depot-based charging site is the Charge Yard based at **Nissan Motor Manufacturing UK** in Sunderland. In report three we gave an overview of the site. Six months later, we asked Nissan's ZEHID Project Manager, **Ian Pattison**, to reflect on what they've learnt.

Why did Nissan choose to invest in eHGV operations?

"At Nissan Motor Manufacturing UK, our journey into electric freight and the ZEHID opportunity began in 2022. Our vision was to participate in the national demonstration programme, decarbonise our UK logistics flows, and make a significant step change from ICE HGV operations to fully electric transport.

Why? Nissan is committed to creating a 360 degree EV supply chain – a supply chain that mirrors our ambition for electric vehicles by delivering an end-to-end decarbonised logistics flow, right through to the finished vehicle and beyond. Transitioning to electric logistics allows us to significantly reduce our UK CO_2 footprint while supporting the inbound movement of parts for every electric model we produce today and in the future.

The subsidy provided through the programme has enabled us to develop a key asset: the new Nissan Charge Yard in Sunderland. This infrastructure supports growth and scalability. With 25 electric HGVs currently on fleet, we now have the capability to extend this transformation to new hauliers and suppliers, unlocking continuous improvement and wider adoption.

Three core advantages will drive us forward:

Energy cost control: We procure and manage our electricity rates, delivering meaningful savings versus diesel.

Commercial opportunity: These savings can be passed directly to our logistics providers operating on our behalf – supporting both current flows and future business, while accelerating the adoption and viability of eHGVs across the UK.

Most importantly we are realising our **sustainability vision**. EV360 is our sustainability ambition, and this large step change has contributed by successfully replacing 25 vehicles with huge CO_2 benefits.**"**

How are you using zero emission vehicles in your operations?

"Building on the progress described above, we are now in a position to offer hauliers and suppliers the opportunity to transition to electric operations on both our inbound and outbound flows from the plant, enabled by the capabilities of the Nissan Charge Yard. This infrastructure will now form the basis for future commercial discussions. Any new haulier bidding for Nissan business will be expected to demonstrate carbon reduction strategies that align with Nissan's long term sustainability ambitions.

We currently operate with three long standing logistics partners who have already benefitted from the introduction of new electric fleets:

- Fergusons has 12 DAF XD Electrics
- BCA operates three DAF XD Electrics
- Yusen operates Volvo FH Electric units

These vehicles are already deployed across a range of operational routes:

We currently trunk parts and loads from Leeds into NMUK using electric vehicles.

- Yusen operates longer distance electric routes as far as Derby and the Midlands.
- Fergusons utilises its DAF XD Electrics for local collections within 75 km of the plant.
- BCA's three vehicles are configured with adapted electric car transporters, moving finished vehicles to port for global shipment.**"**

Do you have any plans to expand eHGV operations?

"We are currently in the stages of running trials now we are fully operational and embedded. This will be made up of calculated extended routes and journeys in from our UK ports. Capturing more data and replacing miles that historically would be carried out on ICE HGVs.**"**

How has your organisation reacted to eHGVs?
“ZEHID as a whole has created a fantastic reaction here at the plant. It’s real steps and progression in our EV360 project and ambition to create our new greener supply chain. The project has needed the skill, flexibility and motivation from over 80 stakeholders in Sunderland to achieve our new charge facility and deliver to plan.

Externally, we are extremely encouraged by the early feedback from drivers using both the new electric fleets and the supporting infrastructure. Driver engagement is a critical part of this transition, and the response so far has been overwhelmingly positive. Many drivers are seeing a smoother driving experience, improved acceleration, and significantly reduced noise levels. The quieter environment is already influencing driver mindset and contributing to an improved working experience.

To support this shift, we have invested heavily in creating infrastructure that works for drivers, not just vehicles. Our charging area includes facilities that allow drivers to rest comfortably and take breaks during charging, ensuring downtime is both efficient and productive. Providing the right amenities on site was a deliberate and strategic decision to ensure the move to electric transport enhances – rather than complicates – day-to-day operations.

From an operational perspective, transport offices remain fully confident in the performance and mileage outputs achieved to date. Having now experienced the fleet through multiple seasons and varied usage patterns, there are currently no concerns with the existing routes, reliability, or day-to-day performance.

As referenced earlier, data will continue to drive our next steps. As route, mileage, and charging data matures, we will use this information to determine how far we can extend electric operations – pushing capability forward, step by step, in a controlled and evidence-based way.”

How did you deal with challenges?
“The project has been naturally challenging but there has been some fantastic multi agency collaboration and adaption to each. Every challenge was met with agility and innovation here in Sunderland, this motivation from all involved overcame all issues to deliver the final product, something we are really proud of here at NMUK.”

How is your charging capacity being used?
“We are open to collaboration with existing hauliers and agreed hauliers, if possible. Our ability to go public at present is limited, however our internal growth is not.”

What would you like to see changed to help businesses invest more in eHGVs?
“Simply, vehicle costs. Embedding infrastructure has been a real challenge but it’s quickly becoming normal business to see chargers appearing nationally. Fundamentally the cost of new eHGV vehicles is making the step change just too big for most.”

What advice do you have for other operators?
“Make the change now. We are now fully operational and seeing the CO_2 benefit along with some hidden key cost benefits like reduction in maintenance costs, cheaper running costs and an overall happier workforce. There’s been some real delight in drivers going through this experience with us.”

Any final thoughts?
“This has been a large and very, very beneficial venture for Nissan. I would say there’s need to be louder and have more published funding opportunities in the sector to further promote what we have achieved and have better visibility of what’s next on offer. Great collaborative demonstration.”

05 What can eHGVs do?

Data is at the core of our understanding of eHGVs and will be increasingly crucial as operators plan their route efficiency. Throughout the implementation phase of Electric Freightway we've been collecting and analysing thousands of miles of eHGV and ICE truck data. This section highlights some of the key findings from this analysis.

The data we have collected

Just over 100 eHGVs have contributed data to our analysis in the implementation phase of the project. These eHGVs have travelled throughout England and Wales, as shown in Figure 6 where the red areas highlight the highest concentration of journeys. Some Electric Freightway eHGVs hit the road too late to be considered in this analysis but will be included in the longer-term data collection being carried out by Ricardo on behalf of Innovate UK.

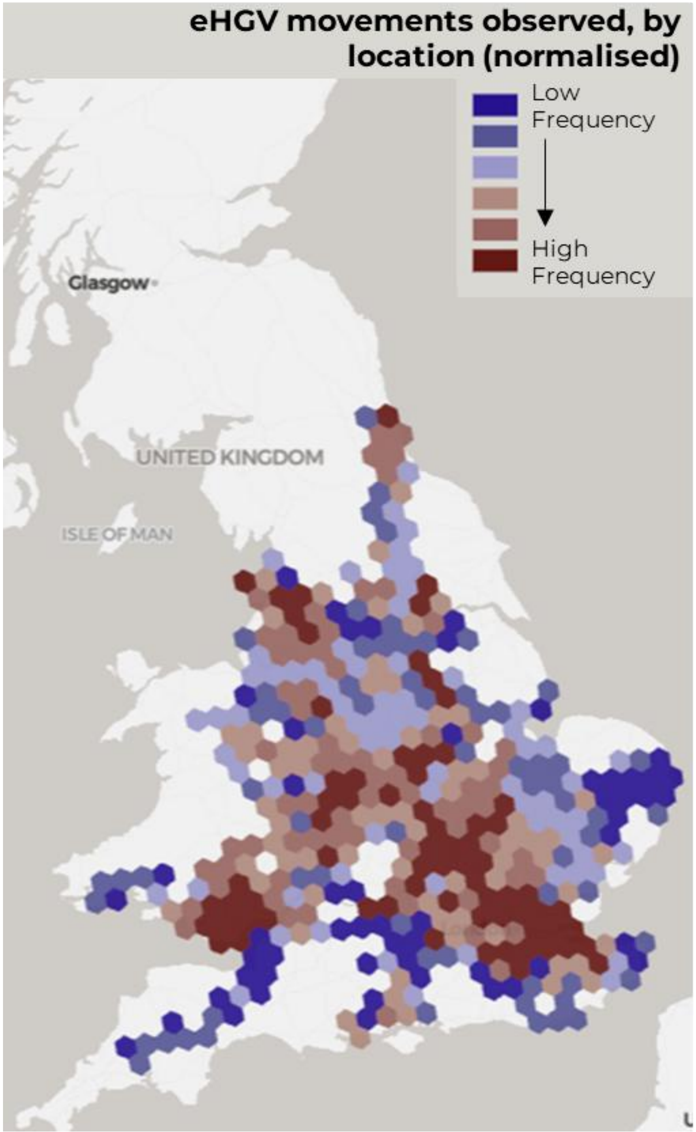

Figure 6 - eHGV movements

In addition to the eHGVs, we're grateful to our project partners for providing access to a sample of their ICE vehicles, 267 diesel trucks travelling over 35 million kilometres, as shown in Figure 7. This additional data allows us to compare the eHGVs in operation with existing ICE vehicles that operate similar routes.

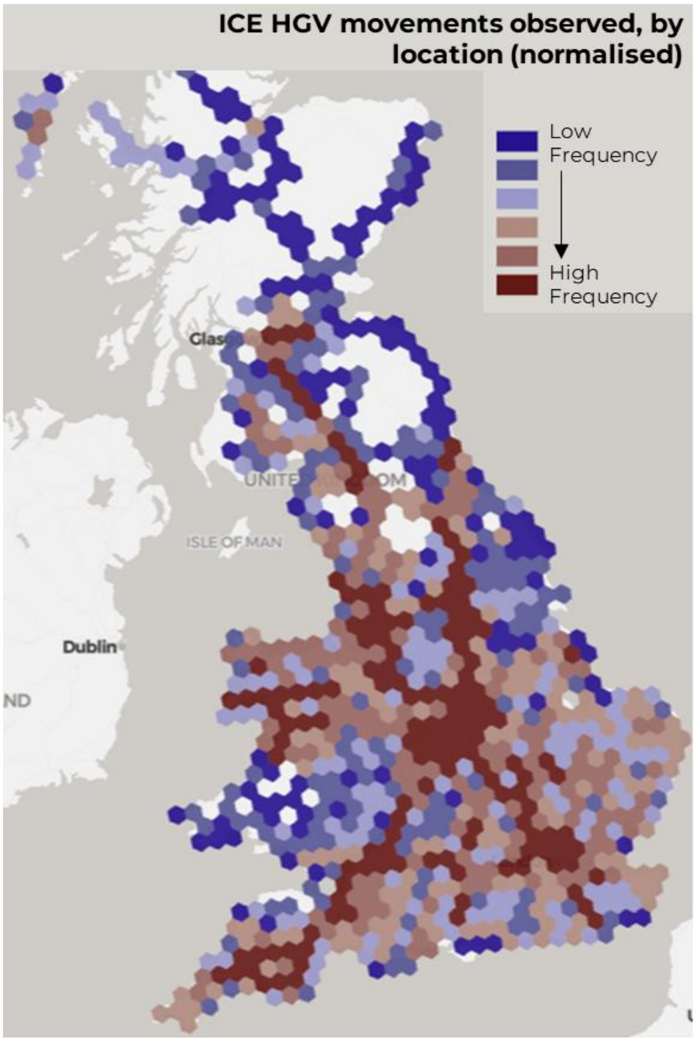

Figure 7 - ICE HGV movements

The primary source of data used in this analysis has been vehicle telematics, recording locations, state-of-charge, speed, weight and other metrics as the trucks go about their business.

This data, from multiple OEM and third-party providers, has been collected and processed to

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create one consistent and comparable dataset that we can use in analysis.

This section of the report builds on the initial findings covered in [report three](), and takes a deeper dive into aspects of vehicle efficiency and charging.

Project use cases

As demonstrated in the previous sections, the project's eHGVs have covered a wide range of route types with more than 20 different operators.

In the early stages, operators have taken quite different approaches to the use of their vehicles – some choosing to use them on short shuttle routes, while others run much more intensive multi-shift operations. This has sometimes been as a consequence of using slow temporary chargers with longer charge dwell times, in advance of faster chargers being installed. However, as operators gain more experience and confidence, and faster chargers are installed or available on route, we expect route lengths and complexities to increase.

This can be seen in Figure 8 and Figure 9, where the average weekly distance per vehicle hides a wide variety of duty cycles, with some exceeding twice the average weekly distance at times. The average is also impacted by new vehicles entering the demonstration throughout the implementation period, and

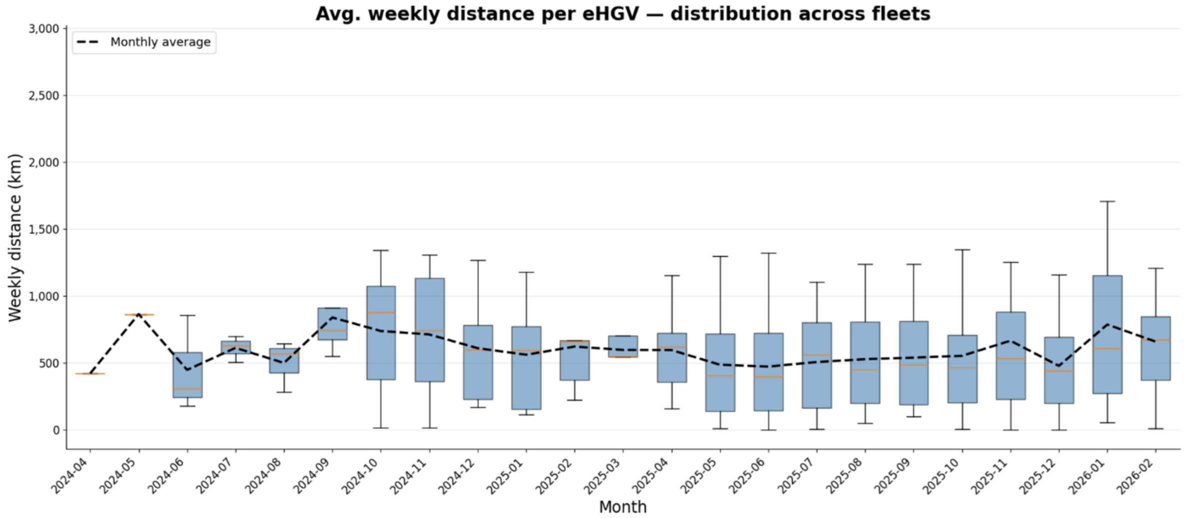

Figure 8 - Distribution of average weekly distance travelled by eHGVs

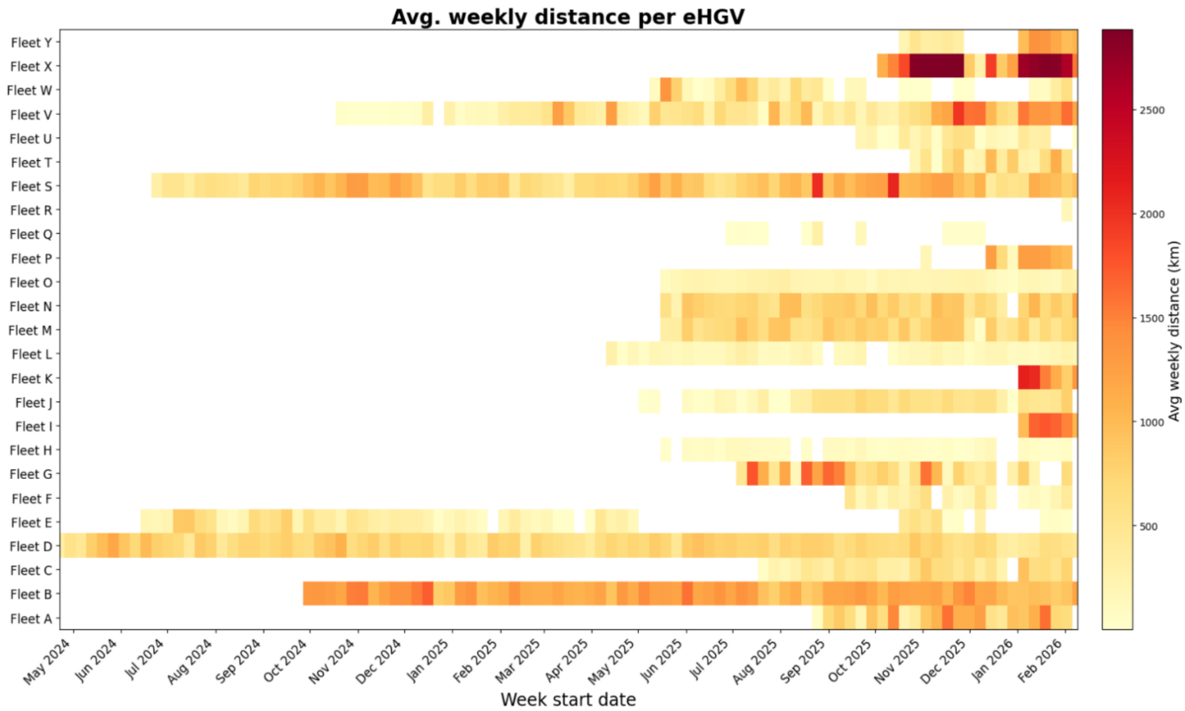

Figure 9 - Heatmap of weekly distance by fleet

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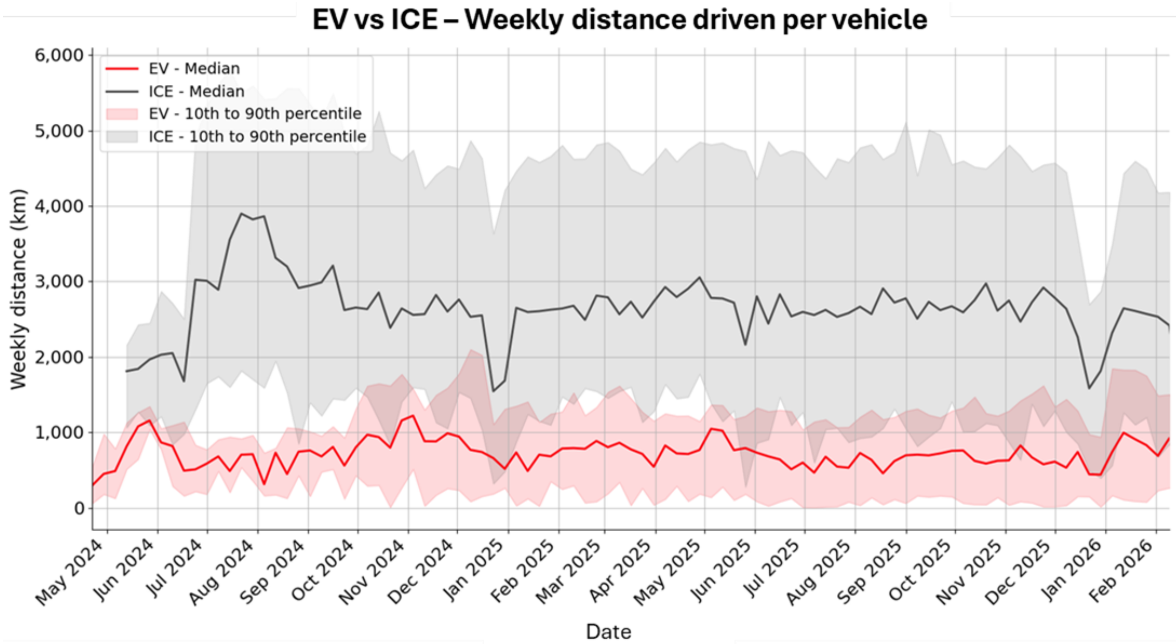

Figure 10 - Weekly distance driven, eHGV vs ICE

lowers the average vehicle use metrics, as operators await the availability of high-power charging. Therefore, monitoring over longer periods in the future is needed to assess these emerging trends.

Charging strategies can have a significant impact on what can be achieved from an eHGV. Fleet 'V' in Figure 9 demonstrates this, with the weekly mileage increasing significantly when they moved from slower AC charging to high-power DC charging at their depot in late 2025. Fleets B, I, K, S and X also have vehicle utilisation that exceeds 1,500km/week at times, though not always consistently.

When we compare the eHGVs to our sample of ICE vehicles (Figure 10) we can see that there is still a significant difference in weekly distance travelled, and it will be important to see how this develops as the demonstration enters its 'business as usual' phase and more eHGVs are operated intensively.

Evaluating efficiency

Understanding efficiency is key to helping us understand the cost effectiveness (total cost of ownership, or TCO) of eHGVs and the types of routes that can be undertaken.

The project team has looked at a range of factors potentially impacting efficiency, and identified weight, speed and seasonal variations as key factors.

The data and analysis shared in this section is generally derived from vehicles across all of the fleets, it's therefore an average and does not reflect the differences in operational practices or the different efficiencies of the various vehicle models in use.

We use the terms 'duty' and 'trip' throughout this section. Duties are longer periods from when the driver logs in to the vehicle and it becomes 'available' in the telematics, to when they log out and the vehicle becomes

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‘unavailable’. A truck may have one or more duties in a day. Duties can be formed of multiple trips. Trips are shorter segments between ‘ignition on’ and ‘ignition off’ events in the telematics.

Effect of vehicle weight

Increased weight, including the tractor, trailer and payload, results in higher fuel consumption for both eHGVs and diesel HGVs, as shown in Figure 11 and Figure 12 respectively.

Weight data is provided by onboard telematics and is based on the average weight recorded across a trip.

The relationship is similar between both types of vehicles. The median 35-40 tonne eHGV is 31% less efficient than a 20-25 tonne eHGV, while a 35-40 tonne diesel HGV is 36% less efficient than a 20-25 tonne diesel HGV.

It should be noted that there is a wide distribution of trip efficiencies, reflecting the fact that weight is not the only driver of efficiency. There are also relatively few eHGVs operating in the highest weight categories. We expect analysis of this factor to improve in the future as trip data volumes increase.

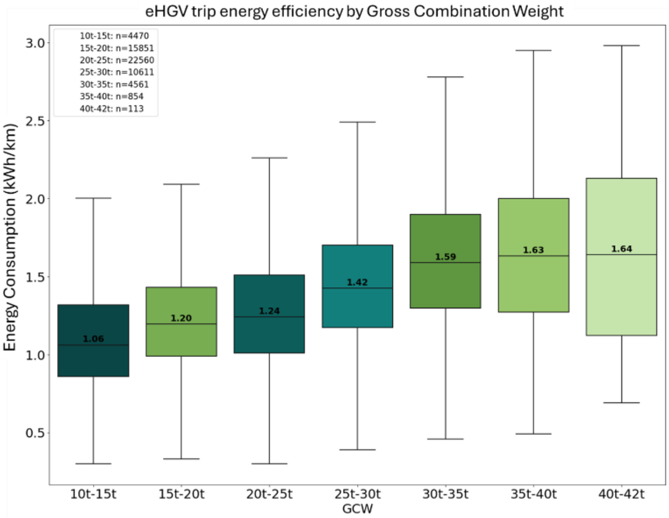

Figure 11 - eHGV trip power consumption by GCW

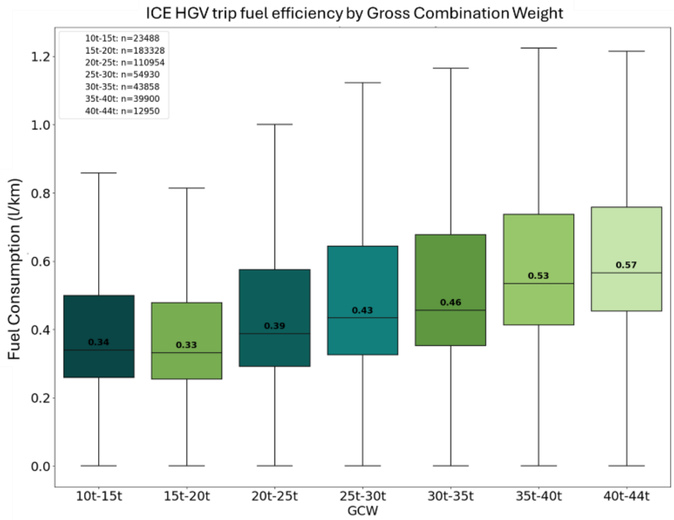

Figure 12 - ICE trip fuel consumption by GCW

Speed

We calculate speed on an average basis over a trip, rather than the highest speed reached by a vehicle. Average speed is strongly correlated with energy consumption. eHGVs travelling faster overall generally consume less power per km, as shown in Figure 13. Only the fastest trips don’t follow this pattern, though this may be a result of the small sample size.

The slowest vehicles are least efficient, likely due to start-stop driving, together with the greater effect of heating, cooling and other ancillary loads over the longer periods of time it takes to complete each kilometre.

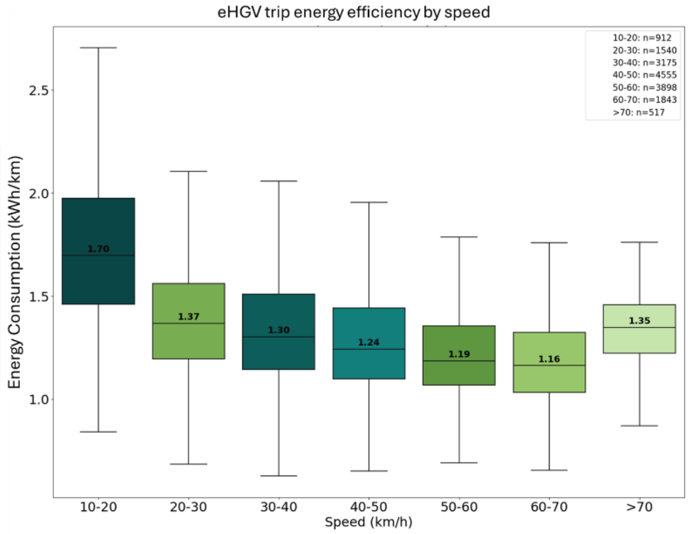

Figure 13 - eHGV trip power consumption by speed

The situation for diesel HGVs is similar. However, the range of efficiencies varies (Figure 14). The interquartile range is narrower at the highest speeds, suggesting more consistent fuel efficiency, however, at lower speeds the range is wider, suggesting that the

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impact of start-stop operations may be greater for diesel engined vehicles. It may also be impacted by eHGV regeneration, which helps make start-stop journeys, more suited to eHGVs than diesels.

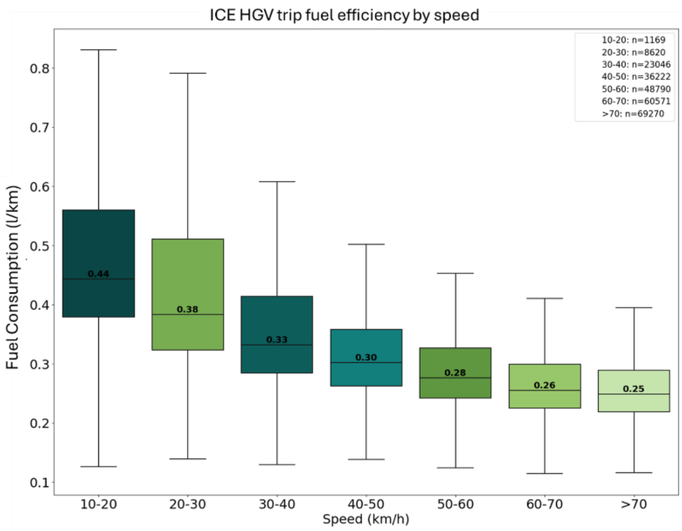

Figure 14 - ICE trip fuel consumption by speed

The median efficiency also varies much more for diesel vehicles, with the 20-30km/h median fuel consumption being 46% higher than the median fuel consumption at 60-70km/h. For eHGVs, the energy consumption at 20-30km/h is 18% higher than at 60-70km/h.

What does this mean?

Weight and speed both have a strong influence on efficiency and need to be considered in route planning. This is a change from diesel operations, where similar patterns occur, but range on a tank of fuel is rarely a limiting factor.

While the overall pattern of efficiency for eHGVs is similar to diesels, the degree of variation is not. eHGVs are relatively more efficient than diesels at lower speeds (for example where there are many stops).

Operators need to consider their specific route types, using their telematics data to understand range capabilities and allocate vehicles appropriately. Using a fixed range to plan routes is likely to result in vehicles being underutilised.

Seasonal effects

Seasonal effects are most often a result of temperature and weather conditions, but can also be driven by other factors, such as higher demand from retailers in the run up to Christmas.

One way in which we can see the impact of seasonality is by looking at the state-of-charge of electric trucks when they end their daily duty. Overall, the trucks in the demonstration finish their duties with between 45 and 60% of their battery capacity remaining. This indicates that the vehicles are capable of significantly longer routes, which is likely to become more evident as confidence grows with operators. However, it is worth noting that in the winter months we see more vehicles returning with less power in their batteries. (Figure 15), indicating that seasonality should be factored in when planning longer routes. It also highlights the role that on-route charging plays.

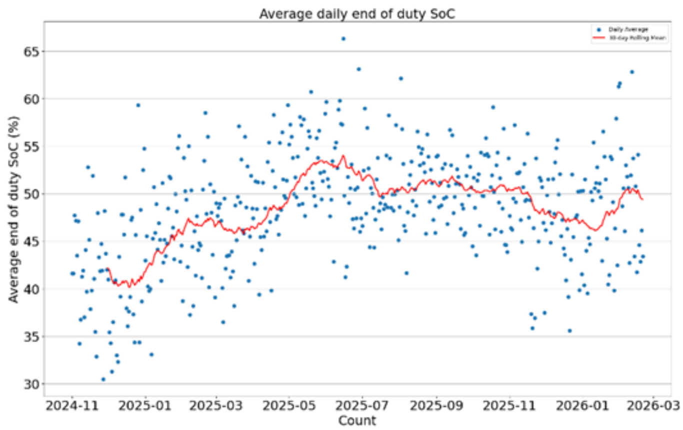

Figure 15 - Average end-of-duty state of charge

This can be compared to the vehicles' efficiency (measured by energy consumption in kWh/km) (Figure 15). Some seasonal patterns can be seen, such as a peak in power consumption in the winter of 2024/5. However, the impact of more vehicles joining the demonstration in more varied use cases in the summer and autumn of 2025 has potentially skewed the results over this period. It will be important to continue to monitor seasonal efficiencies to fully understand the long-term trends.

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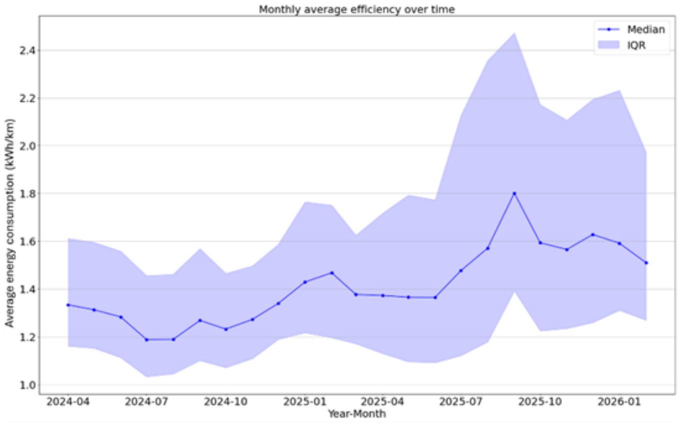

Figure 16 - Monthly average eHGV energy consumption over time.

The impact of charging

Vehicles taking part in Electric Freightway make use of a range of charging locations, mostly located at our partners' depots.

The majority of charging events occur between driver shifts, though approximately 5% of shifts involve an on route charging event, some at public sites, though more often at a destination location.

Where we are charging

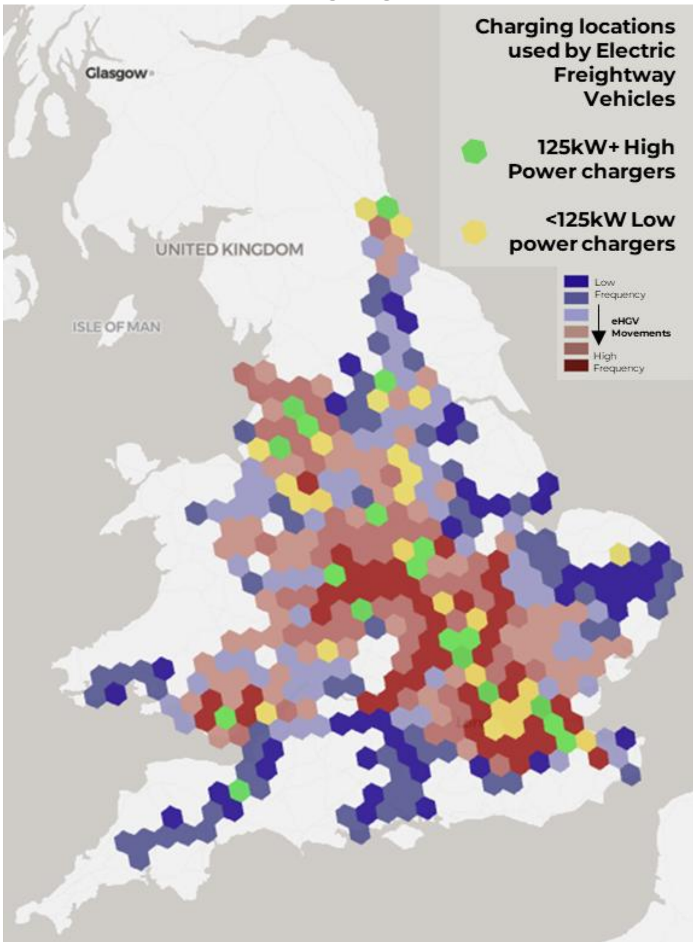

Figure 17 – Charging locations of Electric Freightway eHGVs overlaid on map of eHGV movements

The map in Figure 17 shows where eHGVs are charging in the trial. High-power (in excess of 125kW) are shown in green and lower power locations in yellow. Electric Freightway vehicles primarily charge in private depots but also make use of shared and public facilities.

The graph in Figure 18 shows the spread of different charging speeds in use across the project. The largest group is in the 40-50kW range – representing slower, generally overnight charging on AC and low power DC chargers. In the early stage of the demonstration, a larger proportion of vehicles were charging at slower infrastructure ahead of the completion of high-power charging.

There is also a spread of charging speeds from 100-350kW, representing the range of speeds that high-power charging infrastructure is capable of, often depending on connection constraints. As the project progresses and more depot-based and public high-power infrastructure becomes available, we expect the distribution in this chart to change.

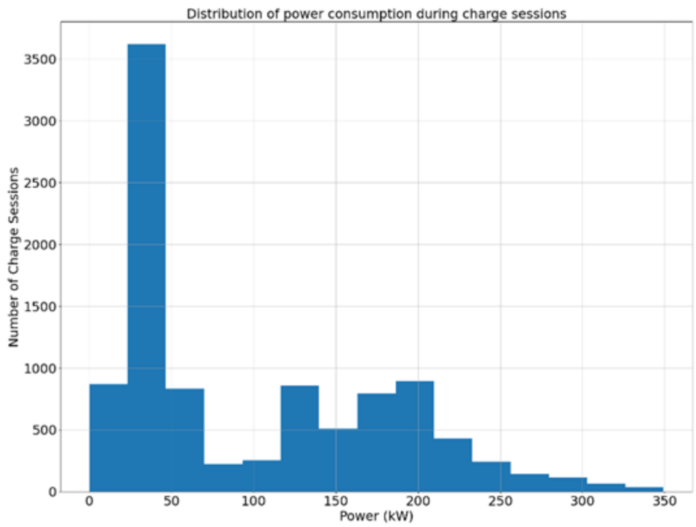

Figure 18 - Distribution of average charging speeds

When we are charging

Road transport is often a 24/7 operation and reflecting this we see eHGVs charge throughout the week, though the volume of charging varies. Weekends see a quarter of the charging activity of weekdays, while Mondays have lower levels compared to other weekdays.

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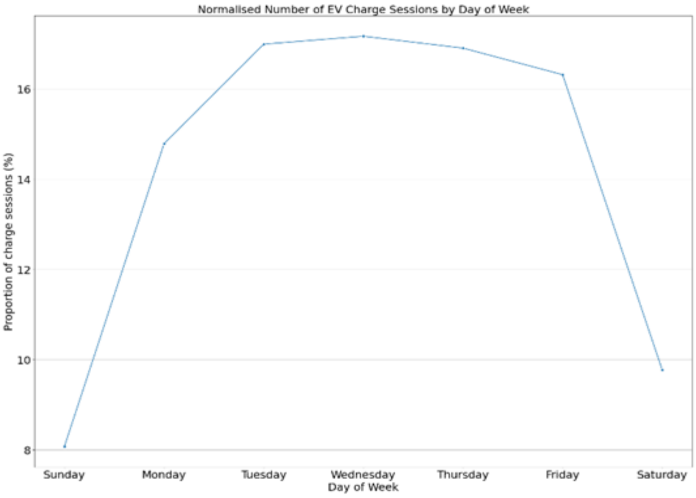

Figure 19 - eHGV charge session by day of the week

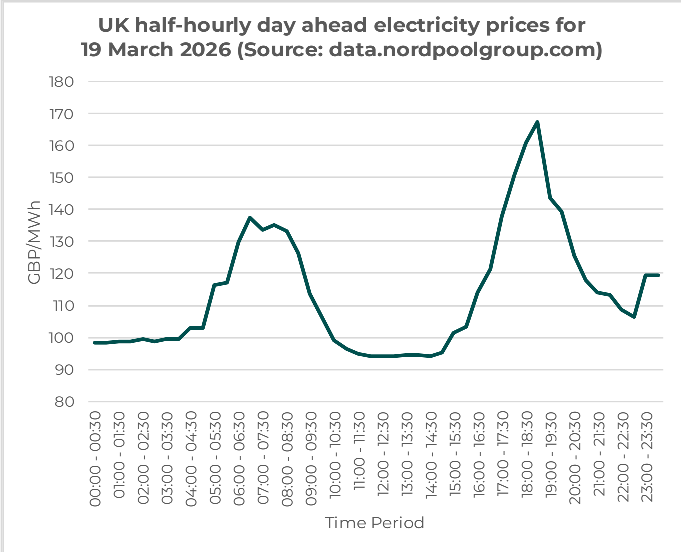

Figure 21 - UK wholesale electricity prices for a typical day

We can use charging data to illustrate the demand placed on the grid by the demonstration's vehicles. Figure 20 shows these sessions in terms of power demand across the month of November 2025. The trucks currently see a large peak in charging from approximately 14:00 to 20:00. A peak in the early evening coincides with some of the busiest hours for the electricity network, and the highest prices for power.

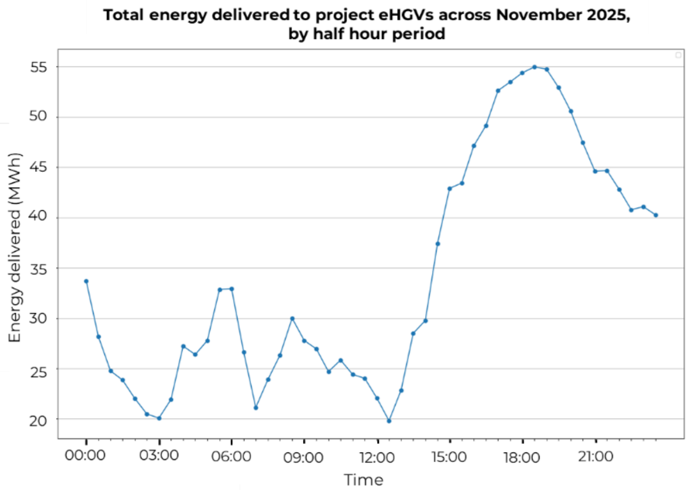

Figure 20 - Energy delivered to vehicles by half hour, November 2025

This can be compared to the UK's power price curve for a typical day (Figure 21). It's likely that if these trucks were charged on a time-of-use tariff without some form of charge optimisation, they would hit some of the most expensive times for charging.

Opportunity for shifting charging

Shifting of demand is an important tool to make sure charging is done at a low cost and with limited impact on the grid. EV car drivers charging at home can achieve a price of 7p/kWh or lower with demand-responsive

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tariffs, by allowing their EVs to be charged in line with price signals. While business tariffs typically operate differently, often requiring longer term commitments, more flexible tariffs are available, and this can have a significant effect on eHGV TCO.

When considering connections, 'timed' connections can often be made available by a DNO at a lower cost than a 'firm' connection (where the same capacity is guaranteed at all times). Timed connections allow more power demand at times where the network is less constrained, often overnight. Using timed connections requires predictability, or flexibility over when vehicles are charged, and may still require some upgrades to local infrastructure if the site's load is increasing significantly.

There may be operational and planning constraints on how much charging sessions can be shifted. Some trucks need to operate at all hours of the day, with some of the busiest times on the road for our sample being relatively early in the morning, as shown in Figure 22.

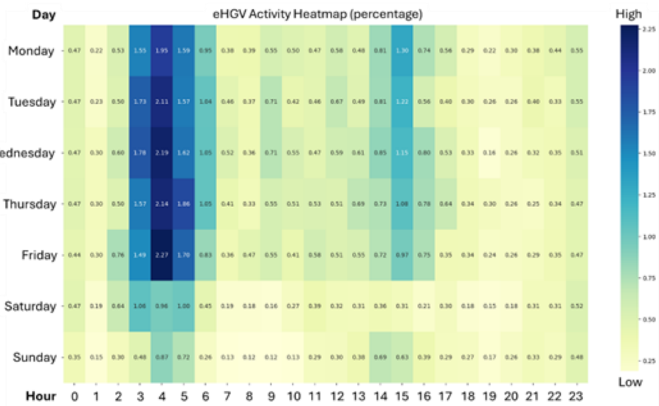

Figure 22 - Heatmap of eHGV activity

Fleets using high-power charging throughout the day may have little ability to shift charging times, as they are based on operational requirements.

However, even within these constraints it seems there may be significant opportunities to match eHGV charging to cheaper energy tariff periods, which would significantly benefit eHGV TCO. Making operational changes in order to access cheaper energy may also be something operators can consider in the future to optimise energy cost in their operations.

Time available for charging

HGVs are used a lot more intensively than cars. While cars often sit parked for 95% of the day[vii], HGVs mainly make money when they're on the road. Therefore, there is likely to be less flexibility on when HGVs can be charged, and it may be more difficult to align charging with variable tariffs.

The longer time it takes to charge compared to diesel refuelling can also potentially limit how many hours a day an eHGV can operate. A typical charge session (from 20% to 80%) can take between 1.5 hours on a 250kW high-power charger and 8 hours on a slower 44kW AC charger. If the vehicles are used more intensively, longer charging dwell times may be required. Higher power chargers have the ability to significantly improve on this but will place more demand on the grid. Optimising TCO therefore favours operators that are creative in matching eHGV dwell time with charging opportunities, across a range of charging solutions.

However, our analysis shows that ICE vehicles often spend a significant proportion of their time not in motion – some of this at depots, some at destinations and some on breaks, with the maximum 'moving' time around 50% of the day and the average around 40% (Figure 23).

This suggests that, with appropriately sited high-power infrastructure, eHGVs would be able to cover the majority of the routes of our sample ICE trucks.

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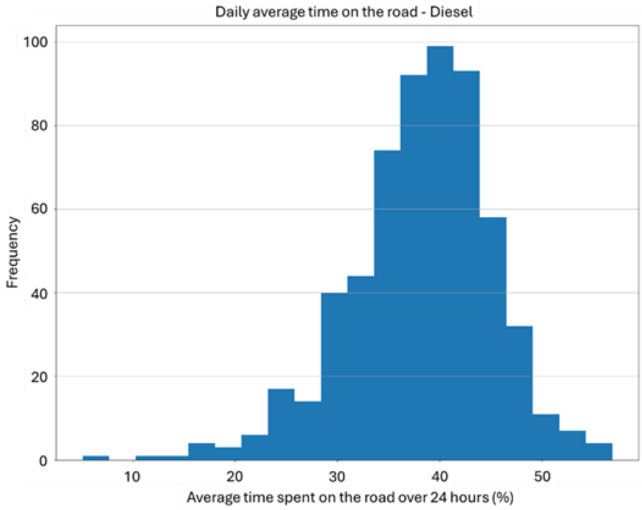

Figure 23 - Daily average time on the road, ICE trucks

While they cover less distance overall, many of the eHGVs in the demonstration are being driven for a similar amount of time each day as the ICE vehicles (Figure 24).

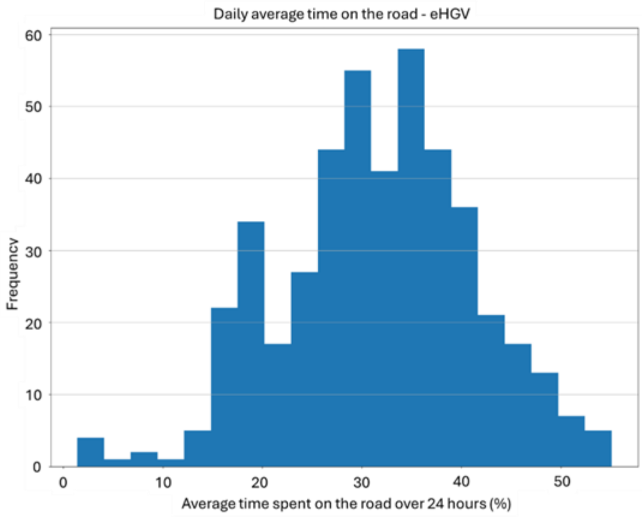

Figure 24 - Daily average time on the road, eHGVs

The proportion of this off the road, 'dwell' time is shown in Figure 25. This includes time when the vehicle is on a trip but is not actually moving. Examples of this are when vehicles are loading or unloading at a destination or the driver is taking a break.

Utilisation of this time for charging will require appropriate charging infrastructure to be available at non-depot locations and may come at a higher cost.

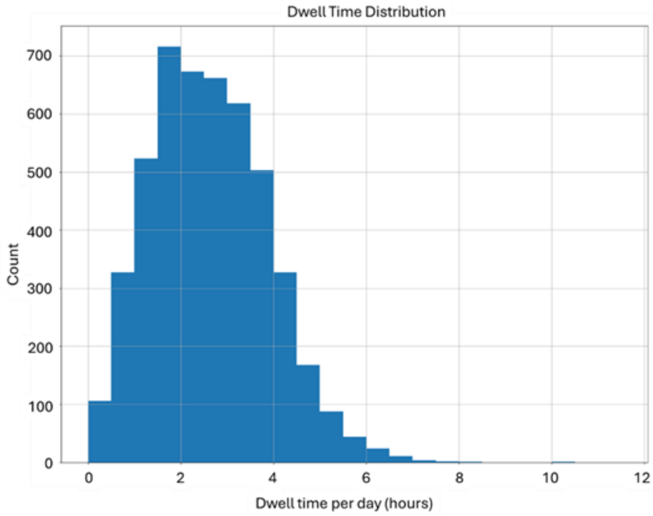

Figure 25 - Daily dwell time of vehicles

What does this mean?

In most cases, existing HGV schedules potentially have enough slack time to allow eHGVs to charge and still complete the same duties.

This does, however, require eHGV charging infrastructure to be made available at (or near to) locations where eHGVs dwell – for example at destinations and wherever drivers take a break, as well as at depots.

Power costs are likely to get increasingly linked to time of consumption in the future, and when operators want to charge does not necessarily line up with when power costs are cheaper.

Operators will need to weigh up the cost and benefits of changing operational practices in order to charge more cost effectively.

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Pushing the boundaries for eHGVs

Are eHGVs being pushed to their limits?

State of charge at the end of a duty gives us an insight into how intensively eHGVs are being operated, and the opportunity to carry out more challenging routes.

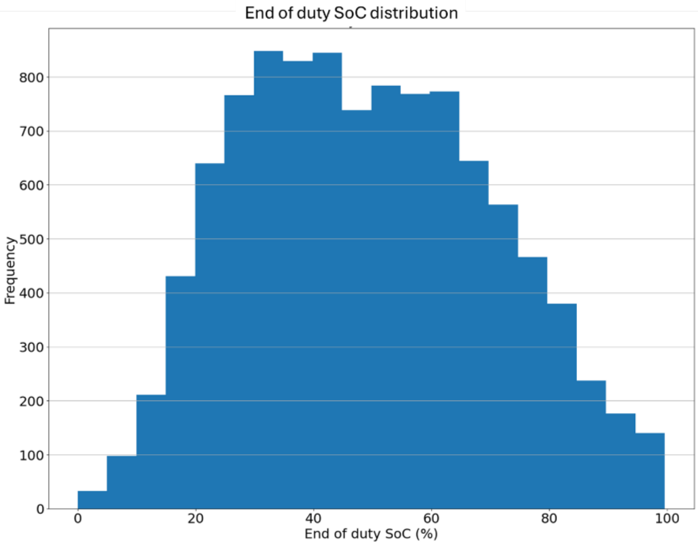

Figure 26 - End-of-duty state of charge

As can be seen in the chart above (Figure 26), there is a wide range of operations taking place, but most vehicles return to depot with over 40% of range. This indicates that many operators have taken a cautious approach to the initial use of their fleet and there's still significant scope to try them on more challenging routes as the demonstration progresses.

What loads are being carried?

Weight is an issue raised throughout this report, as payload limitations caused by weight limits are one of the barriers faced by operators of eHGVs where they operate at maximum weight.

When we look at the maximum gross combination weight (GCW) recorded by our sample of ICE vehicles, we can see that there is a significant variation (Figure 27). Approximately 11% of trips have a maximum weight that exceeds 39 tonnes, which is approximately equivalent to the payload of an eHGV.

This percentage of trips are likely to be impacted by weight restrictions, though a higher proportion of vehicles will be affected, as many will operate with a variety of loads.

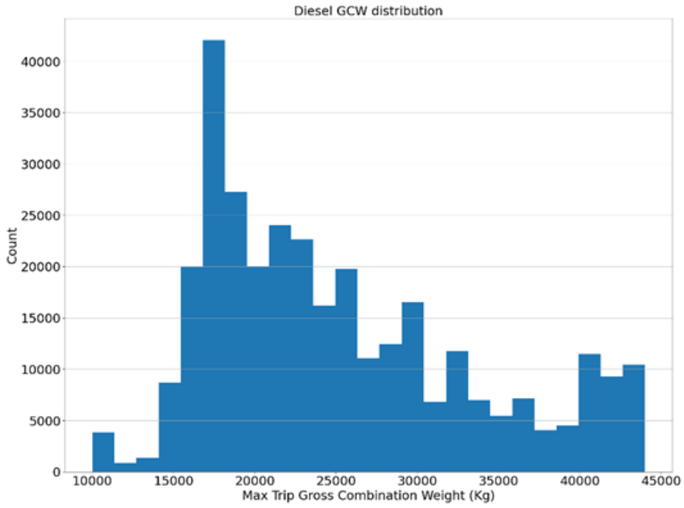

Figure 27 - Maximum GCW per trip

Comparing the eHGV and ICE trips (Figure 28), we see that eHGVs in the demonstration are primarily being used on lighter-weight duties, which may be a result of these limitations.

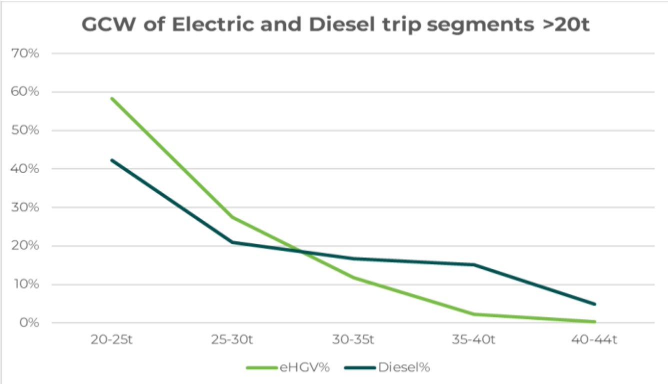

Figure 28 - GCW of electric and ICE trip segments

What does this mean?

Electric Freightway is in the early stages of data gathering. Using the data from the implementation stage we've been able to give an initial insight into what the vehicles are doing and how they are performing.

It's clear that there's scope for operators to push their vehicles further, in terms of daily distance and load as the demonstration progresses. The completion of high-power infrastructure, both in depots and at public sites, will be key to enabling this.

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06 What is the business case for eHGVs?

While cost is at the front of most people's minds when considering investment in zero-emission HGVs, operators' motivations go far beyond simple TCO. In this section we look at some of these factors and consider how the full cost of electrification could stack up, including investments in infrastructure.

Making the case

There's no single motivation for organisations looking to adopt eHGVs. Companies are navigating a complex web of requirements and expectations, as shown through the interviews in Section 03.

Managing cost is important in making the business case and is crucial to many operators working with very low margins, as we discussed in the TCO section of Report 3. However, other non-financial benefits of zero-emission HGVs need to be considered.

Customers and competition

Customer needs are the primary driver of the services operators provide. Tenders from customers are increasingly placing importance on environmental factors and considering environmental metrics as part of their evaluation of bids. In such situations, low- or zero-carbon vehicles are important in order to attract new business and retain customers.

While some customers are pushing environmental requirements onto their suppliers, others are taking a more collaborative approach.

Within the demonstration, some end customers have shown their commitment to decarbonisation through making investments in charging infrastructure at their sites and paying a premium for low- or zero-carbon deliveries.

However, the ability (and willingness) to invest in transport decarbonisation can vary significantly between customer segments. Some customers, such as hospitality and retail are extremely price sensitive, while others may see transport as a relatively cheap and easy part of their operations to decarbonise if their core business is a heavy emitter of CO_2.

Larger organisations are likely to have commitments to ESG targets, often with net-zero targets between 2030-50. These companies will have a plan to decarbonise their operations over time and will increasingly be unable to utilise carbon-emitting transport options if they are to meet these targets.

Environmental awareness

It's not just customers who hold environmental commitments and concerns. Operators, often also have environmental targets with a future aim of reaching carbon neutrality through their operations. Direct emissions from vehicles form a significant part of this.

While a complete decarbonisation of transport businesses may not be feasible today, making a start towards that goal is seen as important first step.

Environmental issues also extend beyond carbon – noise is another consideration. Hauliers operating in urban areas are often particularly concerned about their impact on local communities and see eHGVs as a way to successfully mitigate this.

Driver attractiveness

The transport sector continues to suffer a shortage of drivers, as the average driver age increases and more drivers retire than join the industry [viii]. As our driver surveys show, attitudes towards eHGVs are mixed. However, it's clear that drivers do appreciate a number

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of 'quality of life' improvements associated with eHGVs, and this positive aspect of the transition has been highlighted by fleet managers.

Transport operators suffer from the longstanding problem of an ageing workforce and need to attract new drivers into the industry. The more pleasant working environment offered by electric trucks may be a tool that can help retain staff and attract a wider pool of applicants to the sector.

Regulation

Although the proposed end of new ICE HGV sales may still be 14 years away, most operators replace trucks every 5-10 years, so will only have one or tow procurement cycles left before they can no longer buy a new diesel truck.

Other future regulations, such as carbon pricing or changes to reporting requirements may increasingly force the industry towards decarbonisation. The options in the UK Government's freight decarbonisation consultation suggest that interim targets, either in the form of mandates on suppliers, or requirements placed on larger fleets, are likely to start to hit operators' procurement decisions before the hard deadlines in 2035 and 2040.

Delaying adoption until it's legally mandated, without gaining operational experience of zero-emission vehicles, may be a significant risk for transport businesses.

Cost

Finally, cost is a significant driver of decision making – both the upfront cost of vehicles and infrastructure, and ongoing running costs. If an operator can't afford an eHGV they will not be able to participate in the transition.

Large upfront costs can be particularly difficult to manage for many smaller businesses working on thin margins, lacking economies of scale and with limited access to finance to spread the cost of upfront investments.

Effective use of data, including vehicle telematics, is important when making decisions on electrification. While many operators are used to using data to plan their diesel routes, electrification can introduce a new level of complexity. Operators need to understand what their vehicles are capable of in different conditions in order to plan routes and accurately specify their need for charging infrastructure.

Over the next few pages, we'll take a deeper dive into some of the potential costs faced by operators, and how they stack up against the longer-term benefits of eHGV use.

The cost of charging at a depot

Electricity tariffs

While average prices for commercial electricity are published, tariffs for commercial customers are unregulated, can vary by customer based on their demand, location and negotiating power.

Several options are likely to be available to operators:

- Fixed tariffs, with a single price
- Simple peak/off-peak tariffs
- Time-of-use tariffs, with up to half-hourly price bands
- Variable/pass-through rates, exposing the user to market volatility

Customers are often required to commit to a minimum period and/or volume of energy to achieve better prices.

Fixed tariffs generally price in the risk of price changes, so can be more expensive overall. More variable tariffs can provide electricity at much lower cost, but only at specific times.

Whether this makes sense for an operator depends on when and where they plan to charge, how much flexibility they have and, potentially, what other demand they have on site which would also be subject to the tariff.

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Infrastructure

Costs can vary significantly between sites, with many factors that need to be considered:

- How long vehicles are able to charge impacts the speed of chargers needed.
- Whether vehicles need to charge simultaneously impacts the number of charge points needed.
- Site layout, space and electrical systems impact the cost of groundworks needed to install charging bays.

Charger utilisation is key to making the cost per kWh lower.

Charging infrastructure should outlive vehicles, but how long it should last and be depreciated over may vary by component and utilisation and can be difficult to predict.

Connection charges

Ongoing costs need to be considered, especially those associated with maintaining larger electricity connections. Capacity charges become significantly more expensive for businesses needing over 1MVA of power.

Charging outside the depot, public or shared?

Sometimes installing chargers at a depot isn't feasible, and some journeys may need on-route charging to get to the destination and back. This is where public charging comes into play.

The cost of public charging

The higher costs of public charging are driven by a range of factors. Some of these are common with depots, but others are more unique, including:

- The cost of installing and maintaining infrastructure
- Upfront connection costs and ongoing capacity charges
- Overprovision of infrastructure to ensure availability to users
- Rent to the landowner where the charger is sited
- Costs of operations, payment processing and customer service
- Low initial utilisation, as infrastructure needs to be in place before demand materialises

Given that public charging currently faces higher upfront prices, it is likely to be challenging to make a TCO case if operators are solely dependent on public charging.

Where public charging is easier to justify is filling in gaps in a haulier's own network and extending routes. Often a full charge is not needed, but just enough to get the vehicle back home. The example in Figure 29 is based on 80% of charging taking place at depot (with a total cost of 20p/kWh) and 20% at a public charging site paying 50p/kWh ex VAT. It is also based on the recently announced Zero Emission Truck Grant of £81,000. In this

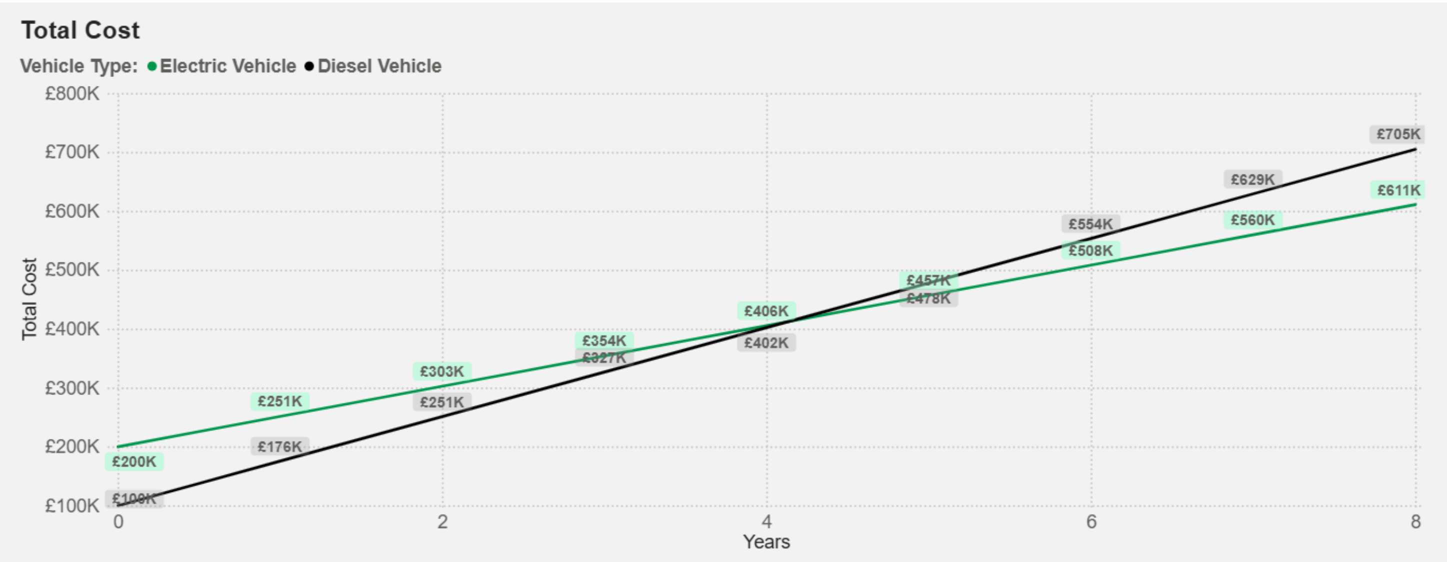

Figure 29 - Comparison of eHGV (green) and diesel (black) TCO with 20% public charging at 50p/kWh and 80% depot charging at 20p/kWh. Diesel modelled at £1.20/l, based on 120,000 km/year. Includes latest Government eHGV subsidy of £81,000

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scenario the eHGV breaks with diesel in year 4, and over the 8-year term represents a TCO saving of £94,000.

Managing the price differential of depot and on route energy isn't entirely new to the industry, diesel HGVs experience similar cost variances, though generally on a smaller scale.

Recent geo-political events have also impacted the diesel supply chain, resulting in fluctuations in wholesale and pump prices. Diesel bought at motorway service areas is typically more expensive than bulk purchased bunkered fuel stored at depots. At time of publication, bunker diesel typically costs £1.20 to £1.30 / litre (ex VAT) compared to on route costs of up to £1.60 / litre (ex VAT). Bunkering comes with its own costs, such as building and maintaining tanks and dispensers – often this can be overlooked when comparing costs.

An alternative option – shared depots

Shared depot charging has emerged as a middle ground between home-depot and public charging.

In this model, depot owners provide third-party operators with access to the charging facilities in their depot at times when they are not in use.

This benefits both parties, as the site operator increases utilisation of their charging assets, reducing cost of operation, while the visiting operator has a greater choice of locations to charge at.

Because the sites have already been built for the 'home' fleet, and there is a higher guaranteed occupancy, prices offered can often be lower than at purely public charging locations.

Use of charging at customer or supplier sites, may bring the additional benefit of charging while loading and unloading takes place.

Sharing of charging sites isn't limited to truck operators. Bus companies have been some of the first organisations to offer shared charging, making use of extensive charging infrastructure that is generally unused in the daytime.

While shared charging brings many advantages, it may not suit everyone, as there can be site-specific limitations such as:

- Limited hours of availability, determined by the host fleet
- Available facilities for driver rest breaks may vary
- Not always 'turn up and charge' – may need to pre-arrange visits
- Hosts may have to make changes to security, safety and insurance arrangements to let visiting operators onto their sites
- Commercial barriers to sharing your own depot charging with a direct competitor

TCO scenarios – taking infrastructure into account

Over the next few pages, we present some examples of how different operators may choose to invest in their first eHGVs and related infrastructure, and the effects on operating cost.

In report three, we introduced the project's Carbon and Cost Calculator, a simple tool aimed at allowing operators to compare the like-for-like costs of eHGVs and diesel trucks.

In this report we're going to delve deeper by including the potential costs of depot electrification. These costs can vary massively, so we've created the following three profile 'scenarios', each representing a type of fleet and business, to illustrate the range of possibilities.

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The three profiles we're looking at are:

- **Scenario 1:** A haulier making their initial investment in one eHGV using low power AC charging to charge between shifts. Their capital expenditure is lower, but slower charging limits their ability to charge between day shifts, so impacts total daily mileage. Primarily using overnight charging results in a lower price for electricity.
- **Scenario 2:** A haulier making their initial investment in four eHGVs. High power charging is installed, giving them the ability to push the vehicles further.
- **Scenario 3:** A larger fleet of 12 eHGVs. The vehicle-to-charger ratio is the same as Scenario 2, but a more expensive energy network connection upgrade is needed.

There are many variables in designing a depot and operating a fleet, so we have to make a number of assumptions across these case studies. Where possible we've kept our assumptions consistent across the different examples.

Our key assumptions include:

- Vehicles are purchased outright and are modelled with an eight-year life.
- The eHGV costs £220,000, taking into account the £81,000 subsidy available under the Zero Emission Truck Grant for the first 100 eHGVs purchased by each operator.
- The diesel HGV costs £110,000.
- The operator owns their depot and has no onerous lease or planning complications.
- There is no inflation or deflation in diesel fuel or electricity costs.
- The lower power 'overnight charging' Scenario 1 has a lower energy cost, as it's assumed charging can happen off-peak.
- Electricity used is not 'green' and comes with standard UK grid emissions.
- Infrastructure costs are averages based on the project's experience delivering depot sites.
- Charging infrastructure is amortised over 15 years, connections and groundworks over 40 years.
- Other factors follow the defaults in the Carbon and Cost Calculator unless otherwise specified.
- All prices exclude VAT.
- p/kWh figures are rounded to nearest 1p.

We specifically do not include the following, as the potential cost is too variable to accurately generalise across fleets:

- The cost of financing investments in trucks and infrastructure (when planning your own fleet, you could inflate costs to take account of this)
- Infrastructure grants are not included in the calculation. Operators can receive grants of up to 70% of the cost of charging infrastructure, capped at £1m per grant under the Government's extended Depot Charging Scheme. This funding is limited on a first-come first-served basis in each application window and does not cover connection costs. Operators are advised to explore the grants available at https://www.find-government-grants.service.gov.uk/grants/depot-charging-scheme-1
- Cost of insuring vehicles and infrastructure
- Recent short-term changes in subsidy.

First, a health warning – these scenarios are examples and, although based on our knowledge from designing and running the demonstration, won't accurately reflect the cost of operating any specific fleet. The examples show the extremes of what might be possible in terms of mileage to demonstrate the impact on cost – most operators will fall somewhere between the two options shown.

The cost and practicality of developing infrastructure at each depot can vary significantly, and vehicle power requirements vary based on routes and loads.

We recommend working with your eHGV OEM and specialists to understand your vehicle requirements and what's possible at your site early in the process of planning electrification.

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eHGV infrastructure scenarios

Scenario	1: Single truck, single shifted, low power overnight charging		2: Small fleet – four trucks sharing a single twin-gun high-power charger		3: Larger fleet – 12 vehicles sharing three twin-gun high-power chargers	
	Lower Mileage	Higher Mileage	Lower Mileage	Higher Mileage	Lower Mileage	Higher Mileage
Vehicles & Operations						
eHGV purchase cost	£220,000		£220,000		£220,000	
Diesel HGV purchase cost	£110,000		£110,000		£110,000	
Electricity price per kWh	£0.19		£0.22		£0.22	
Diesel price (p/l)	120		120		120	
Distance travelled per year (km)	50,000	100,000	80,000	120,000	80,000	120,000
Depot infrastructure						
Vehicles sharing infrastructure	1 (1 per connector)		4 (2 per connector)		12 (2 per connector)	
New/upgraded connection cost	£0		£0		£500,000	
Civils/groundworks	(inc. in charger install)		£50,000		£350,000	
Total site costs (40 year amortisation)	**£0**		**£50,000**		**£850,000**	
Charging hardware (inc panels and switches))	£10,000		£120,000		£300,000	
Charger install cost	£15,000		£25,000		£70,000	
Planning and professional services	£0		£15,000		£20,000	
Total charge infrastructure cost (15 year amortisation)	**£25,000**		**£160,000**		**£390,000**	
Annual maintenance/running cost	£500		£2,000		£10,000	
Additional annual connection cost	£0		£5,000		£50,000	
Total annual running costs	**£500**		**£7,000**		**£60,000**	
Total cost over 8 years	£17,333		£151,333		£858,000	
Annualised cost per vehicle	£2,166		£4,729		£8,938	
kWh consumed/vehicle/year @ 1.34kWh/km	67,000	134,000	107,200	160,800	107,200	160,800
Infrastructure cost/kWh	**£0.032**	**£0.016**	**£0.044**	**£0.029**	**£0.083**	**£0.056**
Depot charging cost including infrastructure p/kWh	**£0.22**	**£0.21**	**£0.26**	**£0.25**	**£0.30**	**£0.28**

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As can be seen in the table on the previous page, the infrastructure cost per kWh of charge is lowest in scenario 1, due to the low total cost of infrastructure. Scenario 2 is slightly more expensive – It is assumed that the DNO can offer a supply upgrade without a new substation (this will not be the case at many sites, and connection upgrades could result is significantly higher costs). Scenario 3 is the most expensive, driven by the need for a new connection and associated infrastructure.

All three scenarios demonstrate the impact of utilisation – with the higher mileage scenarios resulting in approximately a 1/3 reduction in per km infrastructure costs.

Impact on total cost of ownership

We used the adjusted electricity prices above in the project's Carbon and Cost Calculator tool to see how infrastructure costs effect TCO. Carbon savings are also shown, although this is only impacted by vehicle use and not infrastructure choices.

Per vehicle eHGV TCO comparison against diesel, including infrastructure						
Scenario	1: Single truck, single shifted, low power overnight charging		2: Small fleet – four trucks sharing a single twin-gun high-power charger		3: Larger fleet – 12 vehicles sharing three twin-gun high-power chargers	
	Lower Mileage	Higher Mileage	Lower Mileage	Higher Mileage	Lower Mileage	Higher Mileage
Carbon saving per vehicle (CO2e)						
Carbon breakeven	Start of year 2	Year 1	Year 1	Year 1	Year 1	Year 1
Carbon saving over 8 years	286 tonnes	627 tonnes	491 tonnes	767 tonnes	491 tonnes	767 tonnes
Cost saving per vehicle						
Cost breakeven	Year 6	Year 3	Year 5	Year 3	Year 7	Year 4
Cost saving per vehicle over 8 years	**£17,300**	**£133,300**	**£46,100**	**£126,250**	**£12,000**	**£87,800**

This analysis clearly shows the impact of kilometres driven on eHGV TCO.

- All scenarios result in a saving over 8 year, though the size of this saving varies.
- The low cost of infrastructure in scenario 1 makes the upfront cost of the vehicle the key factor that needs to be overcome to achieve TCO breakeven. Higher annual kilometres results in a greater saving, though achieving this can be challenging when slow charging requires long dwell times.
- The significantly higher cost of infrastructure in scenario 3 makes this scenario particularly sensitive to kilometres driven.

These are just examples, based on a lot of assumptions. The cost of electricity an operator might be able to negotiate and the cost of electrifying a site can vary significantly, while vehicle efficiencies vary by route. It's therefore likely that some fleets can break even while others can't.

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Opening the depot for shared charging

If we opened up the depot for shared charging, spare capacity could be used by other operators' fleets. This can offset some of the fixed costs of operating charging infrastructure.

In the scenario set out below, we recover 50% of our charging infrastructure costs from third-party users. Because scenario 1 only features slower charging it's less likely that it's able to service outside users, so we've not included it in this step of the analysis.

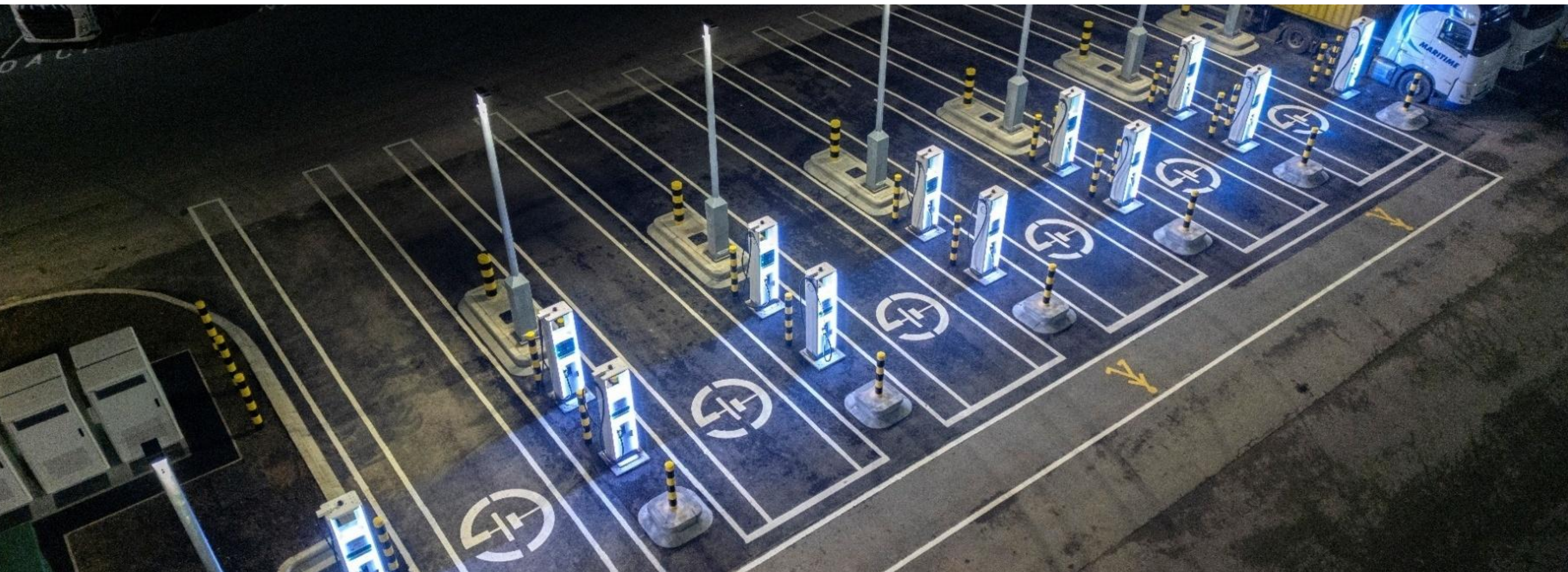
Shared charging				
Scenario	2: Small fleet – four trucks sharing a single twin-gun high-power charger		3: Larger fleet – 12 vehicles sharing three twin-gun high-power chargers	
	Lower Mileage	Higher Mileage	Lower Mileage	Higher Mileage
Impact of shared charging on cost-to-charge				
Annualised cost per vehicle	£2,365	£2,365	£4,469	£4,469
kWh consumed/vehicle/year @ 1.34kWh/km	107,200	160,800	107,200	160,800
Infrastructure cost/kWh	**£0.022**	**£0.015**	**£0.042**	**£0.028**
Depot charging cost including infrastructure	**£0.24**	**£0.23**	**£0.26**	**£0.25**
Impact of shared charging on vehicle TCO				
Cost breakeven	Year 4	Year 3	Year 5	Year 3
Cost saving per vehicle over 8 years	**£63,300**	**£152,000**	**£46,200**	**£126,250**

This table shows the potential benefit of greater utilisation in making a business case. While it is modelled here with the visiting fleets just covering a proportion of the infrastructure costs, a small margin on electricity provided could offer additional benefits to the depot operator.

Adding margin

The table below illustrates the impact on per vehicle TCO of 100,000kWh of power per connector sold to visiting fleets each year at a 5p/kWh margin over the cost of power and infrastructure. There may be some additional costs, such as site management and payment processing that will need to be deducted, depending on the site.

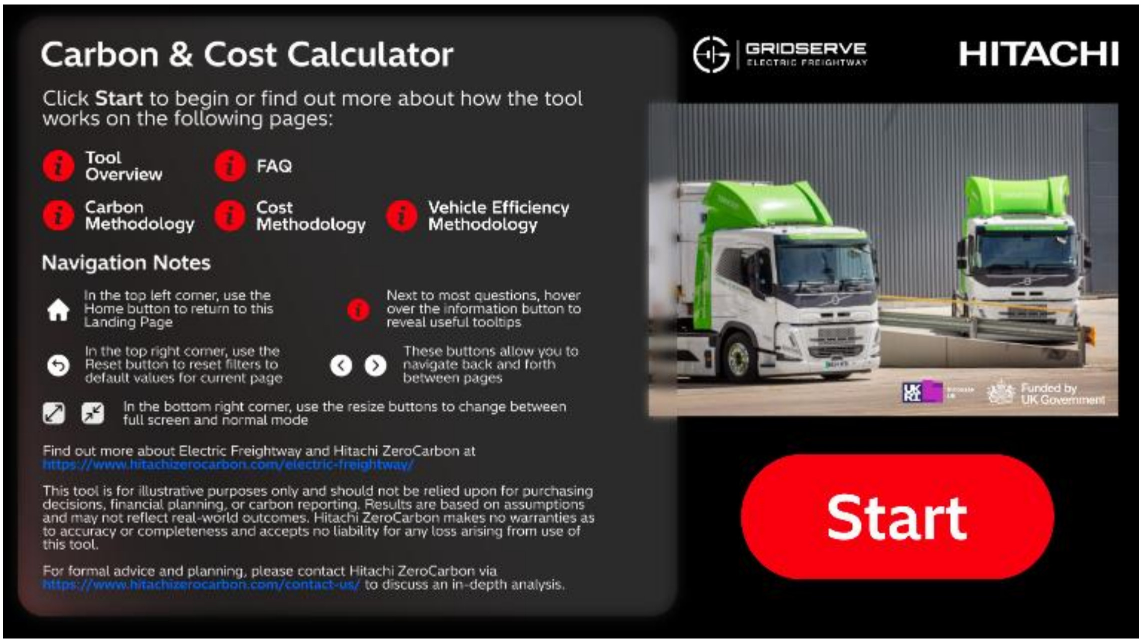
Impact of selling 100,000kWh per socket per year with 5p/kWh margin on vehicle TCO				
Cost to visiting fleets	37p/kWh	37p/kWh	45p/kWh	45p/kWh
Cost saving per vehicle over 8 years	**£83,300**	**£172,000**	**£66,200**	**£146,250**



Try it for yourself

Since the last report, we've updated the project's Carbon and Cost Calculator based on user feedback. We've made a number of changes to improve accuracy and make it easier to use:

- Updated the underlying efficiency data based on the project's latest results
- Refined our diesel comparison so only newer diesels and longer journey segments are included
- Adjusted how efficiencies are averaged
- Added a page to help users include charging infrastructure costs
- Clarified some instructions and help pages



The tool can be found at: https://www.hitachizerocarbon.com/electric-freightway/hgv-carbon-and-cost-calculator/

The impact of weight on cost effectiveness

While TCO parity may be achievable for some operators, breaking even on a £/tonne/km basis can still be a significant challenge with some eHGV scenarios. As can be seen from the interviews in Section 03, weight restrictions are of particular concern to some eHGV operators.

The TCO calculator takes into account the energy efficiency impact of vehicle weight, but it does not consider the impact on vehicle total load capacity.

Heavy batteries, coupled with the impact of the majority of electric tractor units being a 4x2 configuration, combine to limit the maximum payload most eHGVs are able to carry. This can be significantly lower than the maximum payload of a diesel HGV equivalent

There has been some regulatory action in this area – 4x2 eHGVs gain 2 tonnes extra weight allowance against equivalent diesels (generally 42-tonne vs 40-tonne). However, this is often not enough to offset additional battery weight, which is often around 3 tonnes. Axle weight restrictions can also become a constraint, with the positioning of batteries causing weight to sit on the drive axle. This means that load positioning becomes increasingly important in ensuring vehicles stay within their legal limits and can mean that the full 42-tonne limit cannot be reached.

These problems are exacerbated further by the fact that most larger diesel trucks in operation in the UK are 6x2 or 6x4, with a 44-tonne permitted GCW. Against these, the 4x2 eHGV can carry significantly less payload.

While 6x2 eHGVs are available, they don't benefit from the 2-tonne dispensation, as the total weight is capped at 44 tonnes GCW, even if it has six axles. The tractor units are also generally longer than standard 6x2 diesel HGVs, making them only useful for specialist applications. This is because coupling the longer length 6x2 eHGV tractor to a standard-length trailer would result in the total vehicle length exceeding the 16.5m maximum permitted length.

Who does this apply to?

Weight restrictions are not an issue for everyone – Electric Freightway covers a wide range of use cases and only a small percentage diesel journeys we're monitoring exceed 40 tonnes.

Despite this, a significant minority of operators regularly carry heavy loads, especially in sectors such as bulk material handling. General hauliers are also used to having the flexibility to carry heavier loads when needed.

The cost impact

For operations which need to carry heavy loads the impact can be significant. For example, an eHGV with trailer may have a 23-tonne cargo capacity, while a 44-tonne diesel HGV may have a 28-tonne cargo capacity. The exact difference depends on the specification of the truck and the nature of the load. Axle weight restrictions could limit the eHGV payload to less than 20 tonnes in some cases.

As a result of this, five eHGVs may be needed to do the work of four fully loaded diesel vehicles. In addition to the vehicles themselves more drivers will be needed, there will be more movements to plan, and customers will need to be accepting of more frequent, smaller deliveries.

Operators that currently handle a wide variety of loads may have to adopt different ways of working in the future, ensuring that appropriate vehicles are used on each journey. Smaller operators may find this particularly challenging to manage and may need to focus on specific market segments unless regulations change.

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Impact of Tyres on eHGV Performance

Findings from CO2OPT tyre analysis with Electric Freightway

The impact of the transition from diesel to eHGVs on how operators select the optimal tyre is a topic on which relatively little empirical evidence is available. It's expected that the heavier weight of electric vehicles will result in greater wear, but it's not always clear how this impacts the cost or environmental impact of tyres. A trade-off can exist between tyres that provide better energy efficiency and tyres that wear more slowly.

To help quantify these impacts, the project has worked with CO2OPT, a provider of AI base tyre management services, to study tyre wear experienced by two of the project's partners, and look at how tyre choice can impact TCO.

Why tyres matter more than ever

Within the transformation towards eHGVs, the impact of tyres is frequently underestimated. Yet tyres are among the most influential technical components affecting vehicle efficiency, operating costs and overall CO_2 performance.

In electric freight operations, vehicle efficiency is not determined solely by drivetrain technology. Tyre characteristics play a decisive role - primarily through:

- Rolling resistance, directly influencing energy consumption and vehicle range
- Tyre lifetime mileage performance, directly influencing tyre cost per kilometre

Focusing on only one of these parameters leads to suboptimal decisions. A tyre with very low rolling resistance may reduce energy consumption and extend range but can result in shorter service life. Conversely, a highly durable tyre may increase energy consumption and reduce efficiency gains.

For this reason, a holistic TCO perspective is essential.

TCO instead of single KPI optimisation

True optimisation requires balancing multiple interdependent variables:

- Tyre purchase price
- Achieved real-world tyre lifetime mileage
- Rolling Resistance Coefficient (RRC)
- Impact on energy or fuel consumption
- Vehicle uptime implications
- Specific use requirements (such as tread patterns for certain terrains)

Each operator profile is different, and can significantly vary based on factors such as route, terrain, payload and climate. Only by combining these factors can fleet operators determine the optimum tyre configuration that maximises both economic and environmental performance. In electrified fleets in particular, marginal efficiency gains must always be assessed against durability impacts and replacement frequency.

OEM fitment is not always optimal

Original Equipment (OE) fitment does not automatically represent the best tyre solution for an individual haulier's real-world fleet operations. OE tyres are typically selected based on broad operational assumptions and average duty cycles.

However, once vehicles enter specific fleet environments, replacement tyre decisions must reflect:

- Actual route profiles
- Load distribution characteristics
- Duty cycles (regional, long haul, urban)
- Climatic conditions
- Elevation and topography

The optimal tyre is therefore the tyre that best matches the real operational profile of the vehicle, not necessarily the one originally fitted.

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Significant performance differences: electric vs. diesel trucks

CO2OPT's analysis confirms clear structural differences in tyre performance between electric and diesel trucks due to:

- Higher vehicle weight (battery systems)
- Instantaneous torque delivery
- Different braking behaviour (regenerative braking)
- Altered load distribution

eHGVs create fundamentally different stress patterns on tyres compared to diesel vehicles. As a result, tyre models that perform well in diesel fleets do not automatically deliver equivalent results in electric applications.

Data-driven tyre optimisation with AI

To achieve maximum savings, tyre decisions must be based on measurable operational data rather than assumptions.

The CO2OPT analysis therefore combined:

- Telematics data
- Vehicle load and route profiles
- Energy consumption data
- Open-source environmental data
- Tyre specification and RRC label data
- Tyre wear monitoring and measurement

Through big data processing and AI-driven modelling, correlations between rolling resistance, tyre lifetime mileage performance and total vehicle efficiency were identified and quantified.

Real-world validation in Electric Freightway

As part of Electric Freightway, CO2OPT was commissioned to analyse and quantify the real-world impact of tyre performance on electric heavy goods vehicles operating within the consortium.

Field validation was conducted with Fergusons Transport and A.F. Blakemore.

Over several months, vehicle tracking and tyre performance measurements were recorded across both diesel and electric trucks operating comparable duty cycles. This ensured that the findings were based on real operational data rather than laboratory simulations.

Key Findings

Diesel vs. electric – same product line

When identical premium tyre products were mounted on comparable diesel and electric trucks, significant differences in tyre lifetime mileage performance (the lifetime of the tyre, measured by distance before replacement is necessary) were observed (Figure 30).

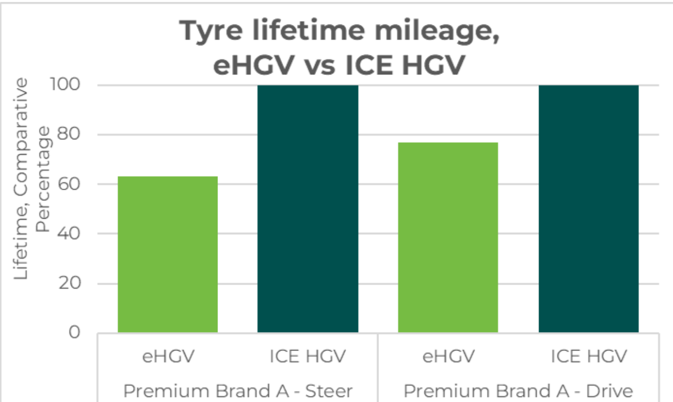

Figure 30 – Tyre lifetime mileage - eHGV vs ICE HGV

On the **front/steer axle**, eHGVs achieved **37% lower tyre lifetime mileage** compared to ICE trucks using the same product line.

On the **drive axle**, eHGVs vehicles achieved **23% lower tyre lifetime mileage** than their ICE counterparts.

These results confirm structurally different wear dynamics between drivetrains and demonstrate that electric trucks generate higher tyre stress under comparable operational conditions.

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Electric trucks – RRC label comparison (Same Brand)

Further analysis focused on the performance impact of different rolling resistance label classes within the same brand on electric trucks (Figure 31).

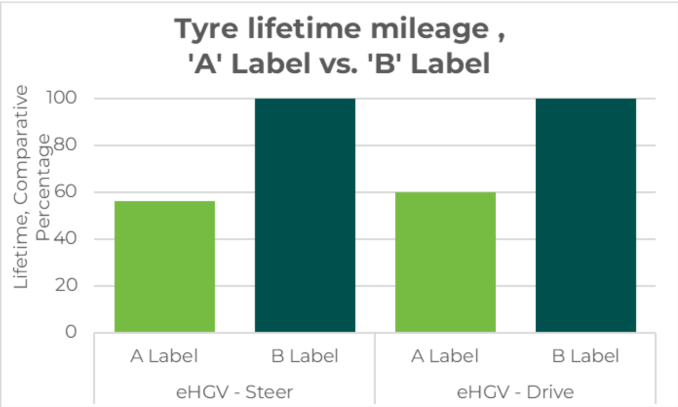

Figure 31 – Tyre lifetime mileage - A vs. B Label tyres

Front/steer axle (A vs. B label)

When comparing a lower rolling resistance (A-labelled) tyre to a B-labelled product:

- Tyre lifetime mileage was reduced by approximately **44%**
- However, overall vehicle energy consumption improved by approximately **5%** when the full vehicle fitted with the A-label tyre

This highlights a pronounced durability trade-off in favour of energy efficiency.

Drive axle (A vs. B label)

On the drive axle, a similar pattern emerged:

- Approximately **40%** lower tyre lifetime mileage for the lower RRC tyre
- Around **5%** improvement in energy consumption and range when fitted with the A-label tyre

The findings clearly demonstrate that rolling resistance optimisation must be evaluated against durability impacts, particularly in electric fleets.

Diesel fleet – RRC impact across all axles

Even within diesel fleets, rolling resistance label class differences had measurable consequences. A difference of one label class (≈1 kg/tonne RRC variance) resulted in a 15–20% difference in tyre lifetime mileage.

This confirms that rolling resistance influences durability not only in electric vehicles, but across drivetrain technologies.

Interpretation – the efficiency vs. durability trade-off

The field data demonstrates two simultaneous realities:

- Lower rolling resistance improves energy efficiency and range (≈5% gain).
- However, tyre lifetime mileage reductions between 23% and 44% were observed depending on axle position and drivetrain.

This creates a measurable TCO balancing challenge.

The economic optimum is therefore not necessarily the tyre with the lowest rolling resistance, nor the tyre with the highest lifetime mileage, but the tyre that delivers the best combined outcome across:

- Purchase price
- Achieved lifetime mileage
- Energy or fuel savings
- Replacement frequency
- Operational uptime

CO_2 and TCO implications

For electric fleets, even small improvements in rolling resistance directly affect range, charging intervals and route planning.

However, when tyre lifetime mileage reductions exceed 30–40%, the increased tyre cost per kilometre may offset the energy savings achieved.

The determination of the optimal tyre configuration for electric vehicles can be simulated individually for each vehicle under a total cost of ownership (TCO) perspective, taking into account the parameters outlined above. An illustrative simulation example is shown in Figure 32.

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Expected tyre life (km)	Tyre cost (4x2 truck)	Tyre cost per km	Additional cost per km with ‘A’ label tyre due to low mileage
110,000	£3,600	£0.033	£0.013
Vehicle consumption kWh/100 km	Average energy cost per kWh	Energy cost per km	Saving per km with ‘A’ label tyre due to low rolling resistance
110	£0.33	£0.36	£0.018
Saving per km			£0.0047
Km per year	50,000	Saving per year	£239.20
Km over 5 years	250,000	Saving over 5 years	£1,196.02

Figure 32 - Illustrative TCO saving from using 'A' label tyres

AI-based modelling across full operational datasets, as has been demonstrated here by CO2OPT, can enable accurate optimisation and scenario simulation.

Technology solutions can also help operators manage their tyres. Through predictive maintenance algorithms, the system identifies emerging wear patterns and performance deviations at an early stage, allowing fleets to intervene proactively before inefficiencies escalate into avoidable costs. Operators can also benchmark real-world tyre lifetime mileage performance, rolling resistance impact and cost per kilometre across brands, label classes and duty cycles as part of their tyre purchasing decisions.

Conclusion

The findings within Electric Freightway confirm that tyre strategy must be integrated into electrification planning.

Key conclusions:

- Electric trucks require a different tyre strategy than diesel fleets.
- The RRC label alone is insufficient for procurement decisions.
- Mileage deterioration on eHGVs can significantly impact TCO.

07 What do people think?

Prior to adding eHGVs to operators' fleets the project asked drivers and managers about their views on eHGV adoption. This has now been followed up with a second round of surveys to gauge how views have changed since the adoption of eHGVs.

What has happened so far?

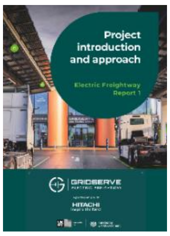
The project has captured attitudes from participating hauliers at two distinct stages: Survey 1 was completed prior to the delivery of new eHGVs (from Spring 2024 through to Summer 2025) whilst Survey 2 was completed after eHGVs entered operation (Autumn/Winter 2025). The elapsed time between each survey round has varied from haulier to haulier due to a number of factors, including variations in vehicle OEM readiness, completion of depot charging infrastructure and when hauliers were on-boarded to the project.

The surveys had three key objectives:

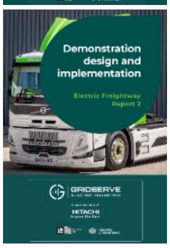
- To identify perceived barriers and enablers of eHGV adoption
- To measure whether and how perceptions evolve following eHGV adoption
- To capture opinions on the specific technologies and charging approaches

Previously published project reports have provided details on the design and implementation of the attitude surveys.

See the following links for further reading:



Section seven in report one outlined the hypotheses being tested.



Section seven in report two described the survey design, methodology and initial responses.

Section seven in report three provided a detailed analysis of survey one.

Who have we surveyed?

The two rounds of surveys collected views from different stakeholders in each organisation. This enabled comparison of attitudes within the same organisation between groups such as managers, drivers and schedulers. Figure 33 shows the number of surveys executed in each of the two survey rounds.

For both surveys, the largest stakeholder group to complete surveys was drivers. It should be noted that surveys were conducted with both drivers that were driving, or going to drive eHGVs, as well as drivers with no eHGV experience. The design of the survey facilitated comparison of all drivers based on eHGV driving experience, so that attitudes to eHGVs could be contrasted. Fleet engineers were approached in Survey 1, but due to the low response rate were not included in Survey 2.

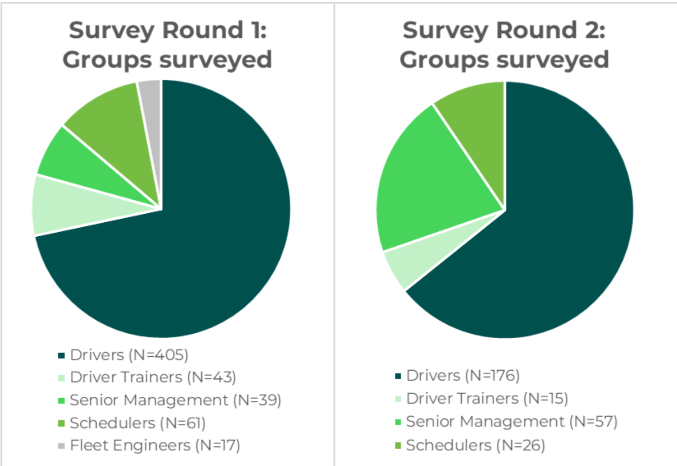


Figure 33 - Groups surveyed

Key findings

There are clearly challenges when drawing conclusions and insights from surveys undertaken across different organisations, at different times. Variations occur in terms of organisational stakeholder engagement, vehicle duty types, elapsed time that eHGVs have been in operation and organisational culture. It's also important to recognise that some organisations had only been in receipt of their new eHGVs for a few weeks before Survey 2 was undertaken.

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However, it's possible to identify patterns in attitudinal change when comparing opinions before and after eHGVs are introduced. In summary we've found:

- HGV drivers that have experience of other EVs (cars, vans etc.) are more supportive of the transition to eHGVs than those drivers with no EV experience.

- Once eHGVs have been introduced to a fleet, support for the transition to eHGVs increases. This is demonstrated in both those who have driven the eHGVs, as well as (to a lesser extent) those who have not yet driven one.
  - There is not (yet) evidence that this support increases or decreases over time, but it should be noted that the eHGVs are still very much in their bedding in phase.

- Senior managers and schedulers are significantly more supportive of the eHGV transition than other groups in the same organisation.
  - This support strengthens in senior managers following eHGV deployment, though softens slightly amongst schedulers.

- Drivers are positive regarding many of the factors associated with the driving experience of eHGVs. This positivity increases with increased eHGV exposure.

- The two factors which most concern drivers are the availability of chargers and the impact of hauling heavier payloads.

- When considering the environmental benefits of eHGVs, drivers become more positive on this topic after eHGVs are introduced to their fleet. However, there persists a significant percentage who are not supportive of the benefits.
  - Some underlying reasons for this lack of support were identified in Survey 1, which included concerns regarding the environmental impact of battery production.

- When considering duties undertaken, the majority of eHGVs are currently being used on predictable (pre-planned), shorter range journeys which return to the home depot at the end of the shift.
  - Where drivers' jobs involve non-pre-planned tramping duties, their confidence in eHGV capabilities reduces.

- Around 90% of eHGV drivers had experience of charging at their home depots. Around 15% had charged at a customer or supplier site. Very few drivers have yet experienced public or shared depot charging.

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Topic 1: Overall support for fleet electrification

This section provides analysis of responses relating to eHGV support since their introduction to fleets (Survey 2) and how perceptions have changed since the pre-delivery survey (Survey 1). The questions focus on:

- Support for the transition away from diesel HGVs, including the adoption of eHGVs
- How this support might vary depending on amount of experience with the new eHGVs
- Comparing attitudes from different groups within the industry (i.e. drivers, trainers, managers etc.)
- How respondents rank various fuel systems (i.e. electric, diesel, biofuel, hydrogen, etc.)

Following the deployment of eHGVs within a fleet, support for eHGVs increases. Direct experience of driving eHGVs is identified as the strongest influence in reducing opposition and building informed acceptance, with indirect exposure also increasing (but to a lesser extent) amongst drivers who haven't yet experienced eHGVs.

Survey 1 revealed that drivers had mixed opinions about the move away from diesel towards fleet electrification (Figure 34).

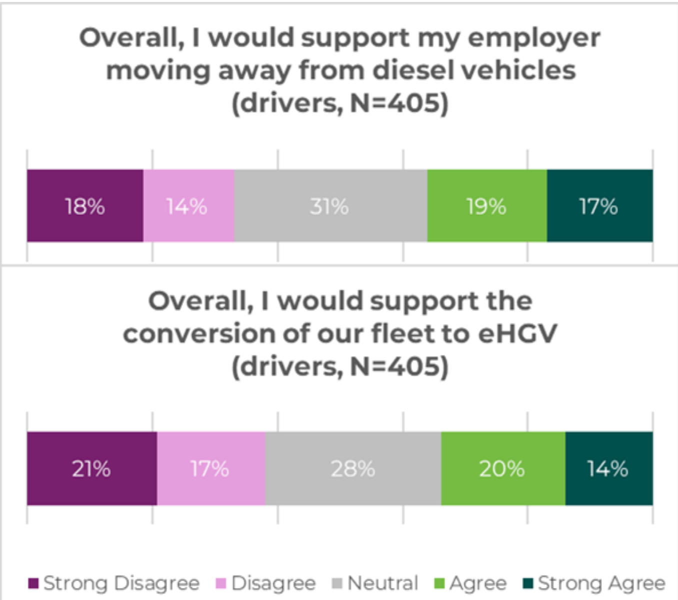

Figure 34 - Driver support for electrification Survey 1

Drivers who expressed more support tended to be those who either owned an electric car or were considering switching within the coming year. The former showed more varied responses, whereas those considering an EV responded consistently across both questions.

Interestingly, in Survey 1 current EV owners were more reserved in their support for HGV fleet electrification (48% vs 65%, Figure 35, Figure 36). This suggests that while owning a passenger EV may increase baseline support, real-world use may cultivate a less idealistic and more pragmatic perspective on the electrification of HGVs.

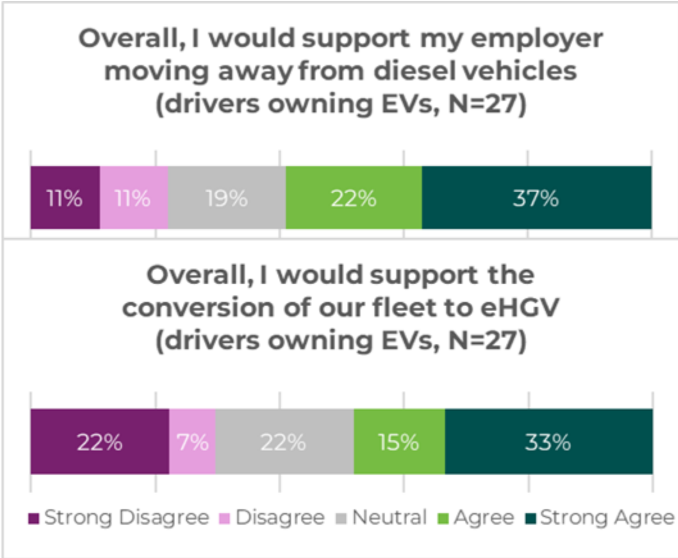

Figure 35 - Support from drivers owning EVs, Survey 1

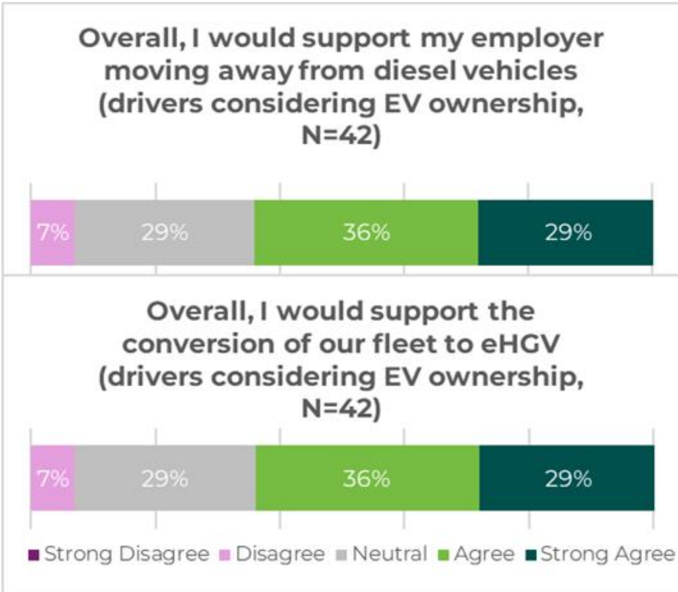

Figure 36 - Support from drivers considering EV ownership, Survey 1

Survey 2 findings reinforce the hypothesis that direct experience with electric vehicles increases support for the electrification of HGVs. This is evidenced by the contrast in support between eHGV drivers and diesel-only

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drivers (Figure 37 vs Figure 38). Diesel-only HGV drivers expressed significantly lower support for moving away from diesel than eHGV drivers (20% vs 52%), and even lower support for fleet electrification (13% vs 52%).

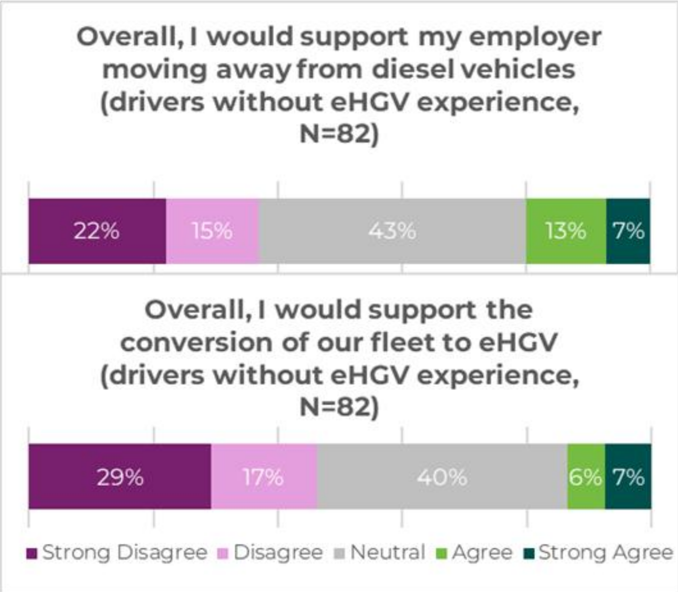

Figure 37 - Support from drivers without EV experience, Survey 2

Figure 37 suggests that once eHGVs are introduced to a fleet, diesel-only HGV drivers mostly expressed neutrality towards the move away from diesel to HGV electrification, with support only significantly improving when experiencing eHGVs directly.

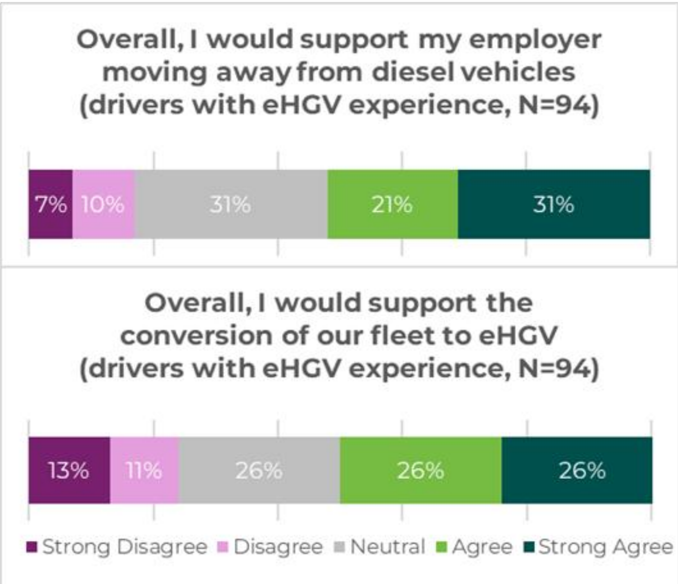

Figure 38 - Support from drivers with eHGV experience, Survey 2

To explore the relationship between direct operational eHGV experience and eHGV support, eHGV drivers were split into two groups: frequent eHGV drivers (who drive eHGVs weekly or more) and those relatively infrequent eHGV drivers.

Frequent (Figure 39) and infrequent (Figure 40) eHGV drivers showed similar overall support and opposition towards fleet electrification. Frequent drivers exhibited slightly lower support but also lower opposition, with higher neutrality. This highlights that regular operation of eHGVs fosters a more measured perspective, where limited eHGV exposure does not automatically lead to disagreement, but more neutrality.

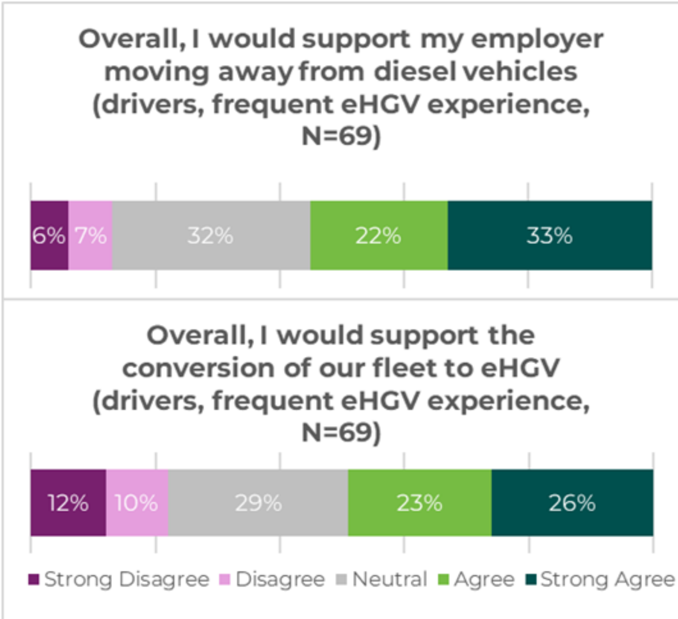

Figure 39 - Support from drivers who drive eHGVs frequently, Survey 2

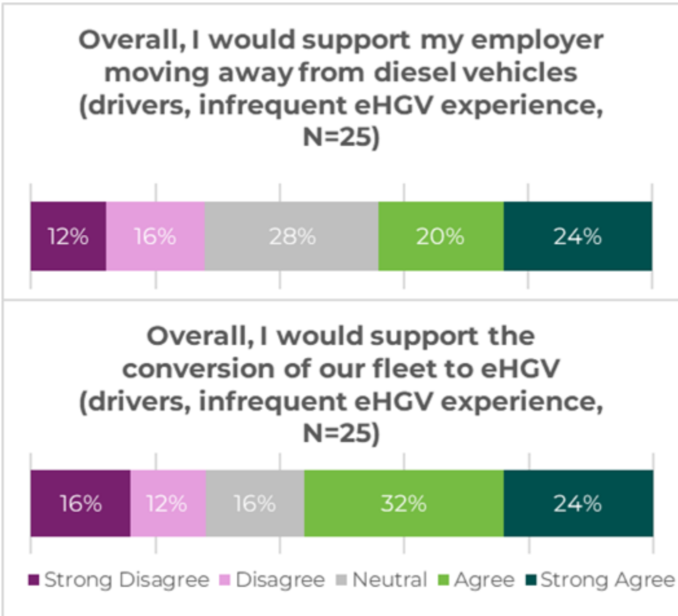

Figure 40 - Support from drivers who drive eHGVs infrequently, Survey 2

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Senior management support strengthened following eHGV deployment, while scheduler support softened slightly, possibly reflecting emerging nervousness on operational and planning considerations which schedulers now have to manage. These patterns suggest frontline operational insights temper short-term expectations, while strategic leadership maintains strong momentum toward fleet electrification.

Since eHGVs were introduced, senior management support has grown, rising from 79% to 83% for moving away from diesel and from 69% to 81% for fleet electrification (Figure 41, Figure 42).

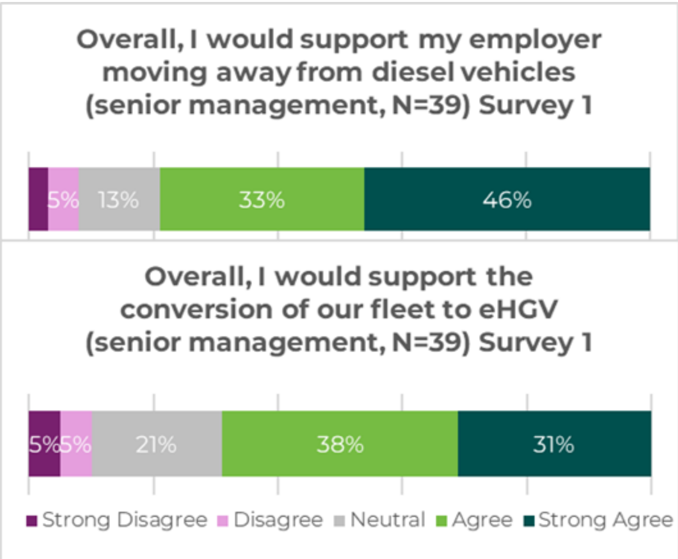

Figure 41 - Support from senior management, Survey 1

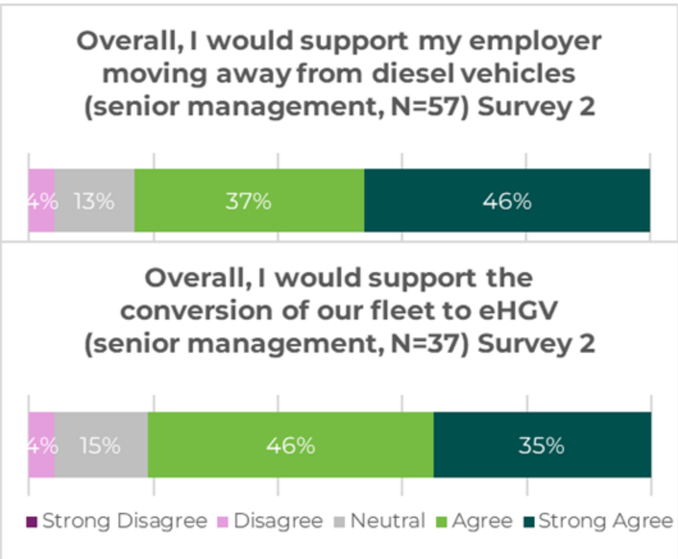

Figure 42 - Support from senior management, Survey 2

When compared to Survey 1, senior managers also still believe that electric will be the most dominant technology in 15 years' time (Figure 43).

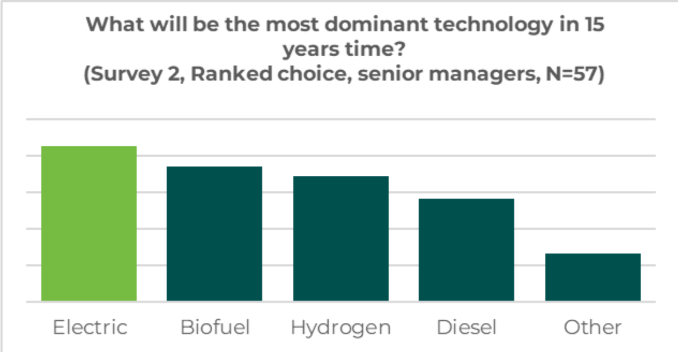

Figure 43 - Senior managers' expectations for future technologies – Survey 2

However, the opposite trend is evident in scheduler responses (Figure 44). While sentiment remains predominantly positive, support for moving away from diesel declined when compared to Survey 1 (72% to 65%), whilst support for fleet electrification remained broadly unchanged (66% to 65%). Despite the slight softening in support, the number of schedulers who do not support electrification has fallen significantly, with more holding neutral views.

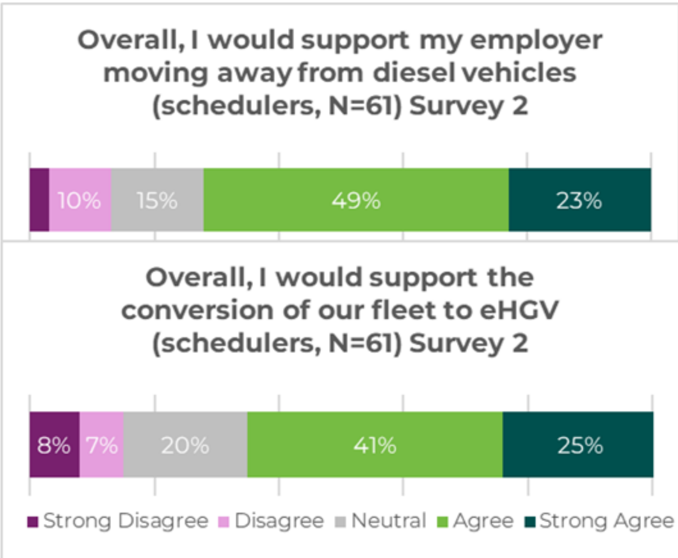

Figure 44 - Support from schedulers, Survey 2

This shift may indicate that the deployment of eHGVs has surfaced unforeseen operational challenges for schedulers, reinforcing the view that diesel HGVs are possibly the better understood, 'safer' option. Nevertheless, schedulers still recognise the long-term potential of electrification and expect it to become the dominant technology within the next 15 years (Figure 45).

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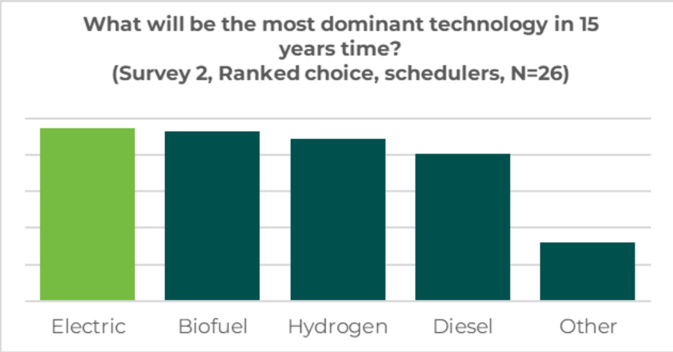

Figure 45 - Schedulers' expectations for future technologies, Survey 2

This can be contrasted to Survey 1, where schedulers ranked electric third, sitting beneath hydrogen and biofuel (Figure 46).

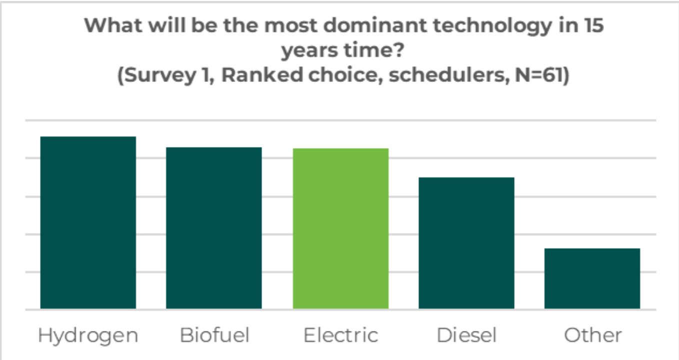

Figure 46 - Schedulers' expectations for future technologies, Survey 1

Overall, given drivers and schedulers are the stakeholders that sit closest to the day-to-day operations of eHGVs, it's positive to observe that their support for eHGVs has strengthened since their deployment.

Topic 2: Vehicle Technology

This section provides analysis of responses relating to eHGV driving experience, both before and since the new eHGVs have been introduced. The questions focus on:

- Driver experience in the cab, including comfort, air quality and drivability
- How eHGVs perform against factors such as payload, winter driving and inclines
- How these attitudes might change based on frequency of driving eHGVs
- How respondents rate eHGVs compared to diesel trucks on certain criteria

Driver perceptions of eHGVs improved following deployment, with real-world experience reducing uncertainty and negativity across most vehicle technology features.

In both survey rounds, stakeholders were asked to compare eHGVs to their diesel counterparts. For Survey 1, without direct eHGV operating experience, many drivers had yet to form clear views. Despite this, some underlying preconceptions were still evident and act as a useful baseline against attitudes expressed in Survey 2.

Figure 47 illustrates that in Survey 1 drivers expressed particularly strong concerns regarding charging availability (71%) and capacity to carry large payloads (52%), alongside notable optimism around reduced in-cab noise (67%), improvements in gear changes (62%) and acceleration from a standing start (56%).

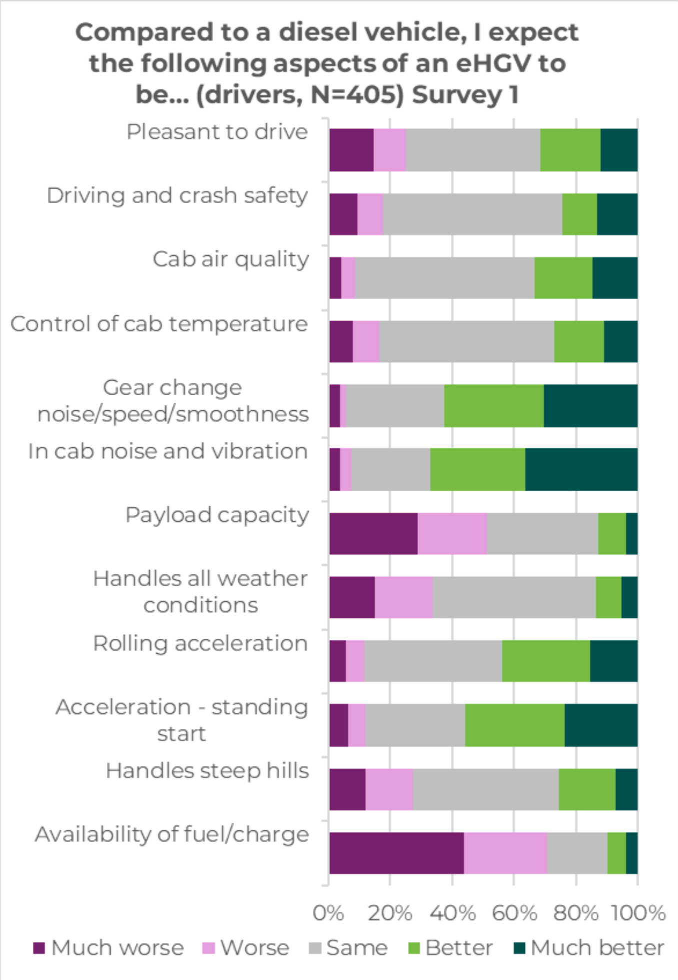

Figure 47 - Drivers' expectations of eHGVs, Survey 1

Following eHGV deployment, Survey 2 responses indicate that perceptions improved across all categories for drivers of eHGVs (Figure 48). Although views on charge/fuel availability and payload remained predominantly negative, this negativity declined to 47% and 38% respectively. Notably, strong negative perceptions were eliminated for rolling acceleration, in-cab noise and vibration, gear changes, and air quality, signalling broader operational acceptance.

Drivers also identified areas where eHGVs appeared to outperform diesel vehicles, particularly in handling steep gradients (53%), maintaining rolling acceleration while in motion (66%), and in-cab air quality (56%).

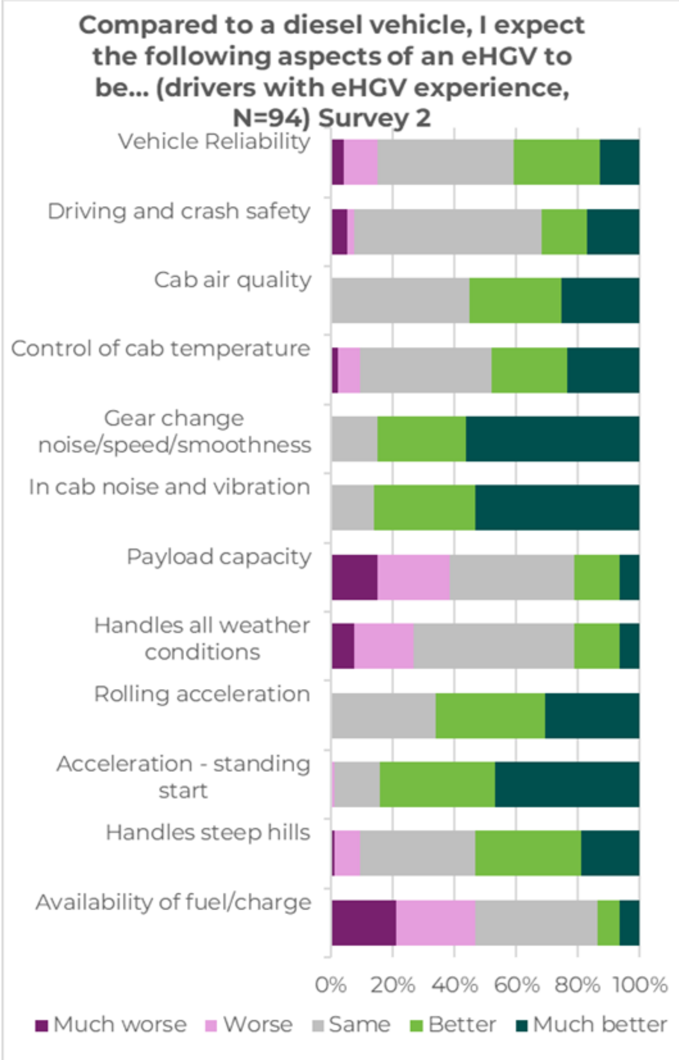

Figure 48 - Drivers' experience of eHGVs, Survey 2

eHGV drivers can again be grouped into those operating the vehicles frequently, such as every day they work and those using them infrequently, such as only once or twice per month. Regular, day-to-day use likely provides drivers with a more balanced and pragmatic understanding of eHGV performance, shaped by repeated exposure rather than occasional use. It's a promising sign that Survey 2 shows that every day drivers reported more positive perceptions across most eHGV vehicle attributes (Figure 49).

However, more occasional drivers (Figure 50) were significantly less negative about the ability to handle all weather conditions (0% vs 33%) and large payload balance (24% vs 39%). Given the infrequent use, these drivers may be less likely to encounter challenging conditions which could temper perceptions of these limitations.

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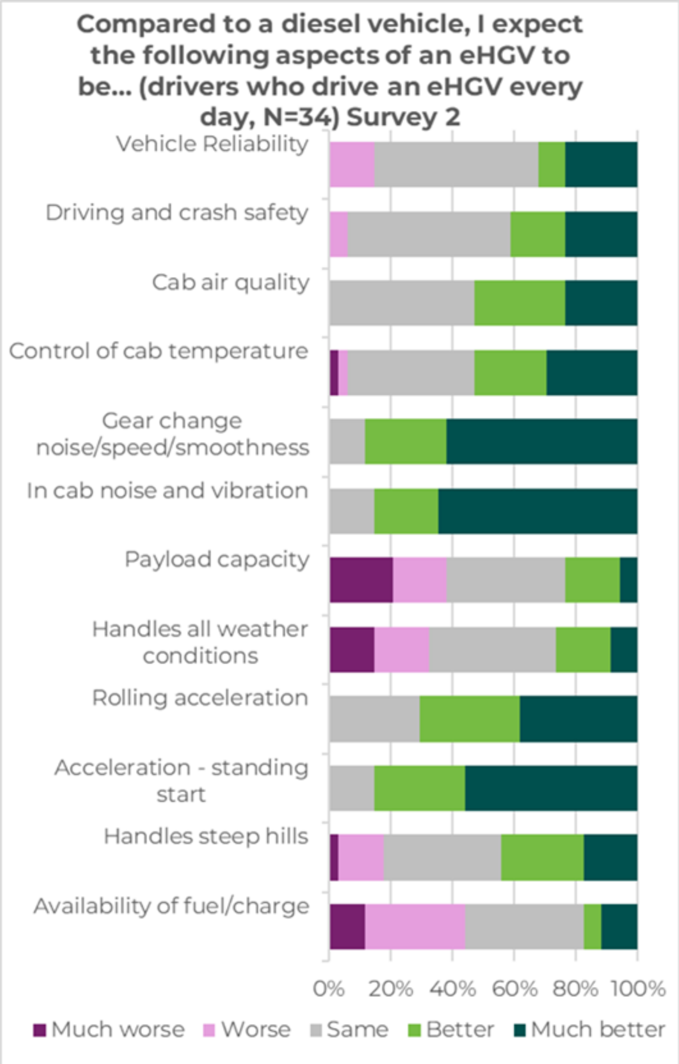

Figure 49 - Experience of drivers who work with eHGVs every day, Survey 2

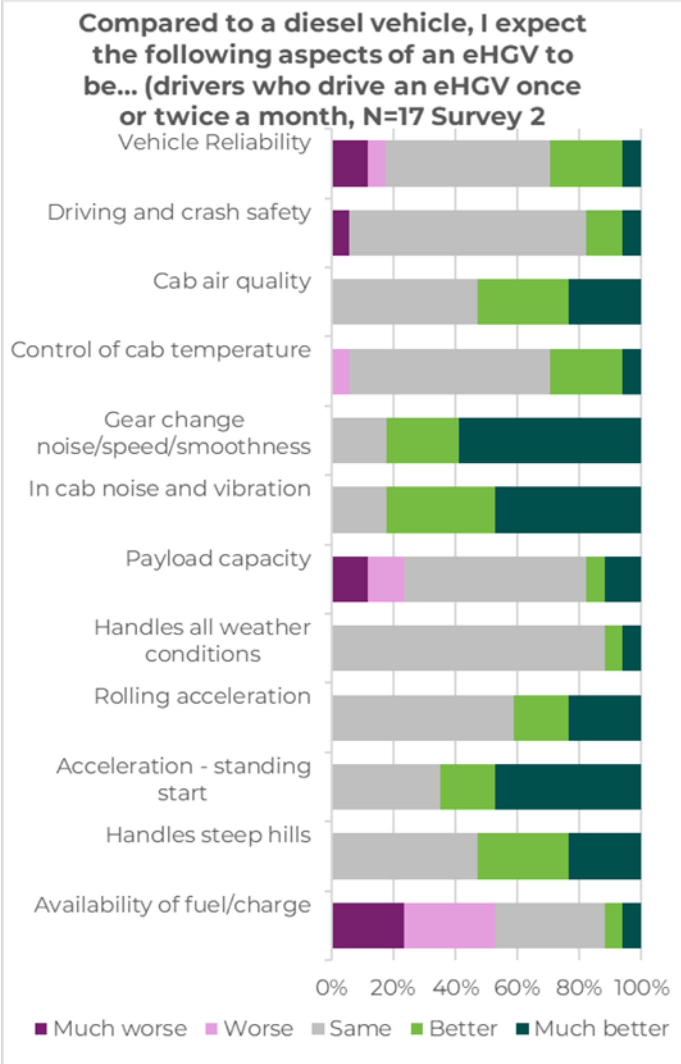

Figure 50 - Experience of drivers who work with eHGVs occasionally

Overall, the findings reiterate that regular, hands-on experience plays a critical role in shaping driver confidence in eHGV technology. As exposure increases, perceptions become more favourable, while remaining grounded in operational reality. This highlights the importance of continued exposure to promote wider acceptance and informed decision-making amongst drivers.

Topic 3: Environmental opinions

This section analyses responses relating to eHGVs and their benefit to the environment. The questions focus on:

- Attitudes towards climate change, carbon reduction and the role eHGVs could play
- Views on the benefits of eHGVs regarding environmental factors such as air pollution
- Comparing attitudes from different groups within the industry (i.e. drivers, trainers, managers etc.)

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Survey 2 indicates that deployment of eHGVs has significantly reduced driver scepticism, with increasing confidence expressed in their environmental benefits. Overall attitudes across drivers remain largely positive or neutral, reflecting growing recognition of the technology's contribution to emissions and environmental impact reduction.

The surveys suggest there is a proportion of respondents that reject the concept of human induced climate change. It's therefore likely that their support for a transition to eHGVs is going to be negative. To separate perceptions of eHGVs from climate change scepticism, respondents who fundamentally rejected the premise of climate change were excluded from the following analysis.

In Survey 1 (Figure 51), drivers showed strong alignment with emissions reduction goals (62%), yet confidence in fleet electrification was markedly lower (39%), accompanied by a relatively high level of negativity (33%).

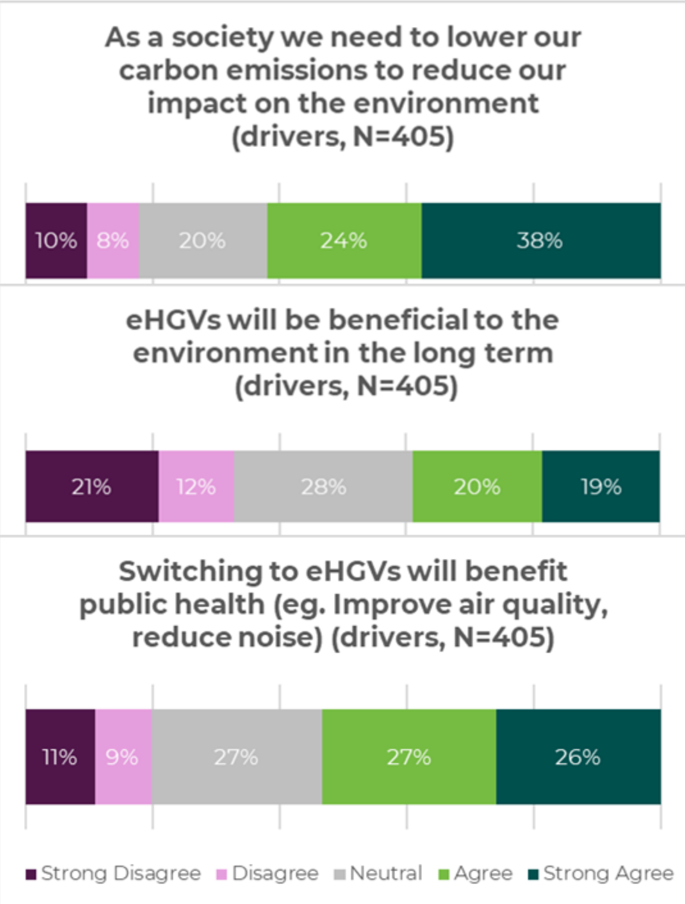

Figure 51 - Driver views on environment, Survey 1

The deployment of eHGVs appears to have coincided with a marked shift in driver environmental opinions. It's not possible to draw direct conclusions regarding the causal relationship between the introduction of eHGVs and increased environmental concern, but it may be reasonable to infer this.

For example, among drivers with direct eHGV operating experience (Figure 52), only 9% still disagreed with the environmental benefits of the technology. Views on other environmental questions were also mostly positive.

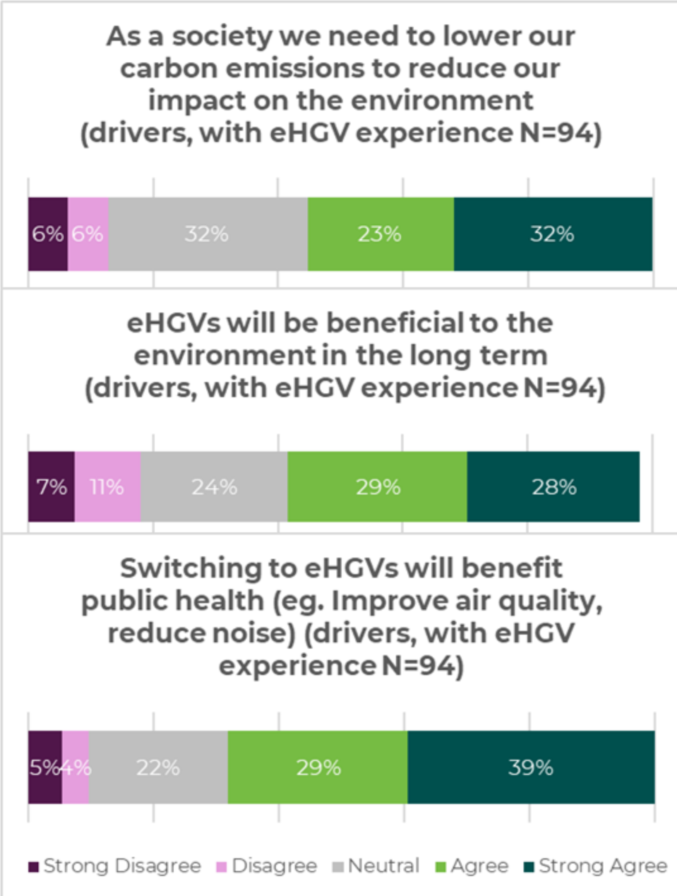

Figure 52 - Views on the environment, drivers with eHGV experience, Survey 2

Diesel-only drivers (Figure 53) show less support for the environmental and climate benefit of eHGVs, when compared to drivers that have experienced eHGV driving (Figure 51). It may be that this is because the drivers that are selected to drive eHGVs are those that are also pre-disposed to support de-carbonisation. It's therefore not possible to directly infer a causal relationship between eHGV driving and drivers then developing wider support for the benefits that derive from driving them.

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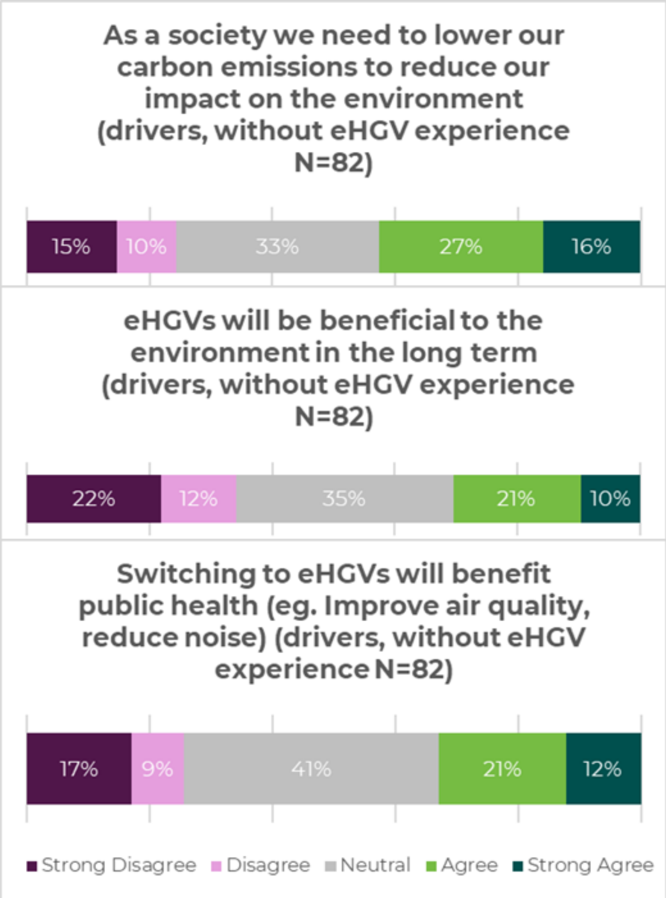

Figure 53 - Views on the environment, drivers with no eHGV experience, Survey 2

Senior management show stronger support for fleet decarbonisation. This may be because their role focuses more on customer expectations, competitiveness, and brand strategy, whereas schedulers' operational focus fosters a more cautious perspective, reflecting their closer engagement with day-to-day planning challenges rather than external pressures. Future studies would benefit from exploring this topic further.

Senior management and schedulers were asked a series of questions relating to the environmental impact of fleet decarbonisation from a corporate strategy perspective.

Senior management were almost unanimous in viewing the transition to zero-emission vehicles as critical for competitiveness (80% in support, Figure 54) while schedulers were slightly less positive (61% in support, Figure 55).

This slight difference may again reflect differing role-based exposure. Senior managers, who are more closely engaged with customers, market positioning and corporate strategy, were more likely to believe that customers expect zero-emission vehicles (55% vs 34%), and that fleet decarbonisation strengthens the haulier brand (86% vs 61%). In contrast, schedulers' day-to-day proximity to operational planning may make them less responsive to external branding and customer-driven aspirations. However, managers and schedulers were sceptical of customer willingness to pay for zero-emission transport.

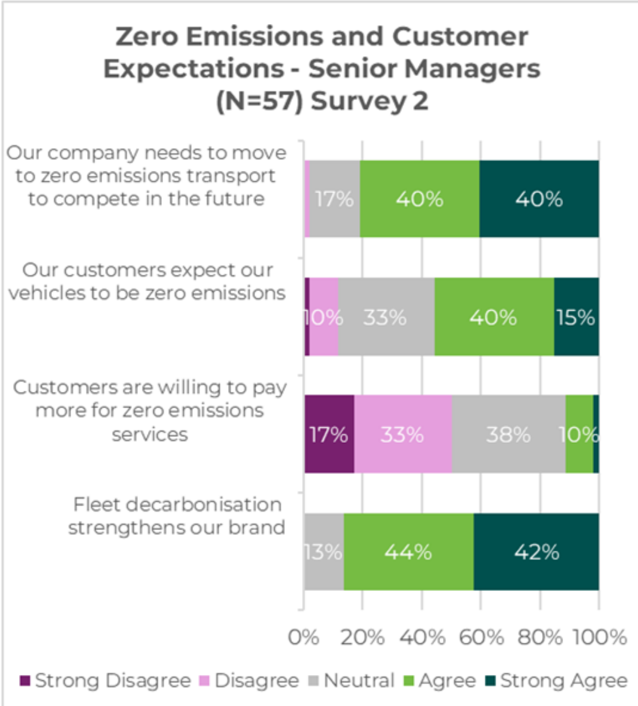

Figure 54 - Senior management views on customer expectations, Survey 2

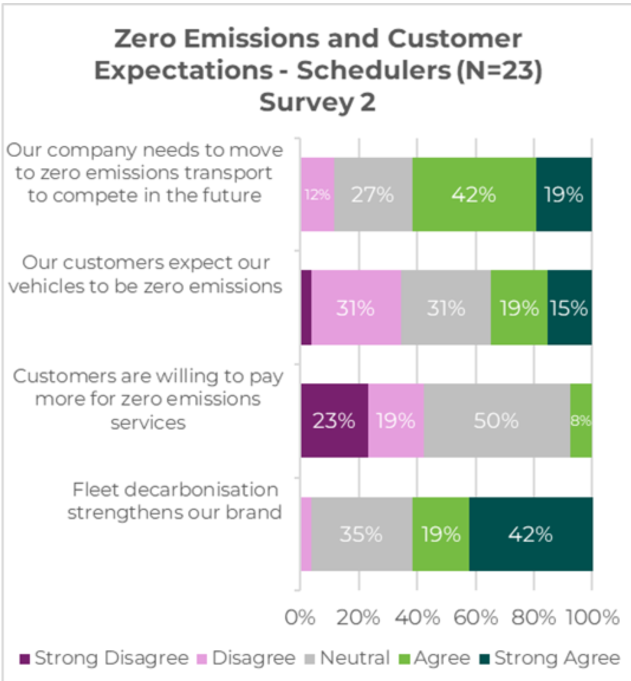

Figure 55 - Scheduler views on customer expectations, Survey 2

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Topic 4: Operations and charging experience

The respondents were asked a series of questions relating to eHGV operations, focusing on:

- Types of routes undertaken
- How route types adopted may impact perceptions of eHGV capabilities
- Charging behaviours
- Charger availability, usability and reliability

Route types

The route types undertaken by drivers of the new eHGVs were captured in Survey 2 via a multiple-choice question. Of the 176 responses, the majority of routes fall into the general category of 'pre-planned'. These include trunking, regional distribution and pre-planned tramping. Only 15% of eHGV drivers had been involved in non-pre-planned tramping type operations.

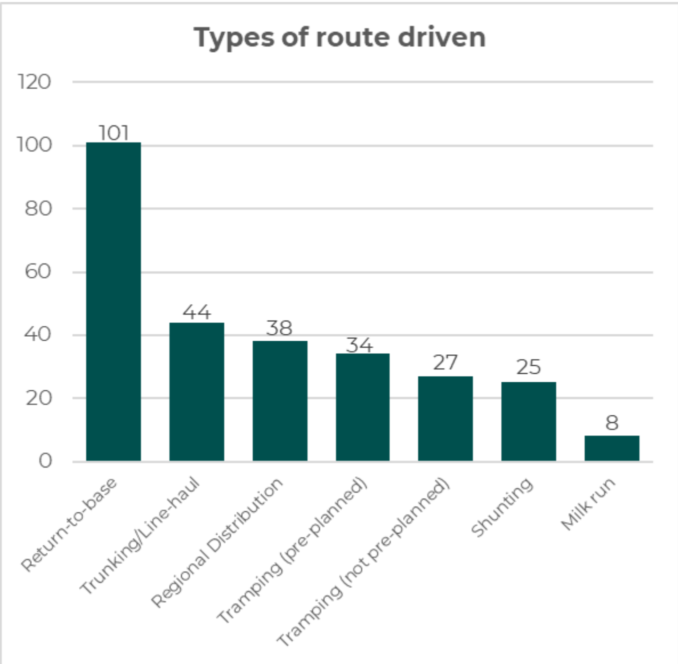

Figure 56 - Types of routes driven by respondents, Survey 2

Of the drivers that identified as using an eHGV every day, the non-pre-planned tramping type duties reduced to just two respondents (6%), with the majority of duties returning to the home depot at the end of shifts.

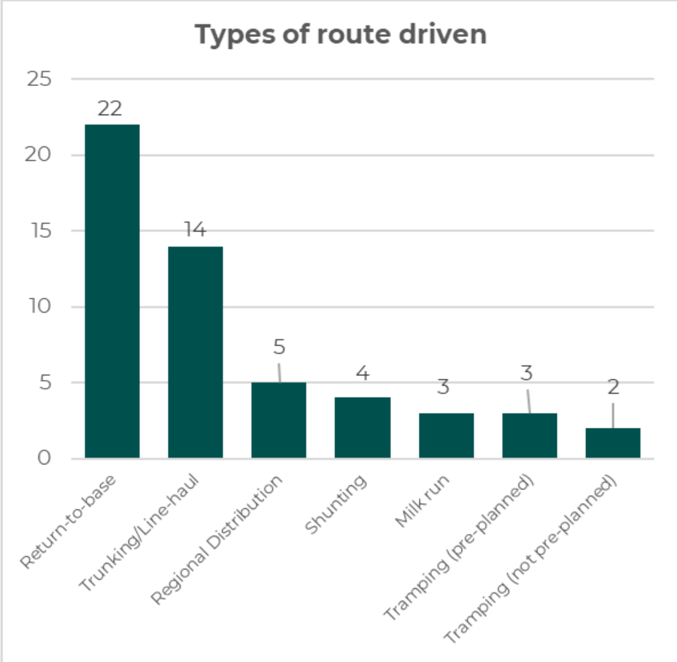

Figure 57 - Types of routes driven by respondents who drive eHGVs every day, Survey 2

When comparing route types to confidence in eHGV capabilities, it's clear that eHGV driver confidence is significantly lower for those identifying that they have operated non-pre-planned tramping type duties as part of their job (Figure 58).

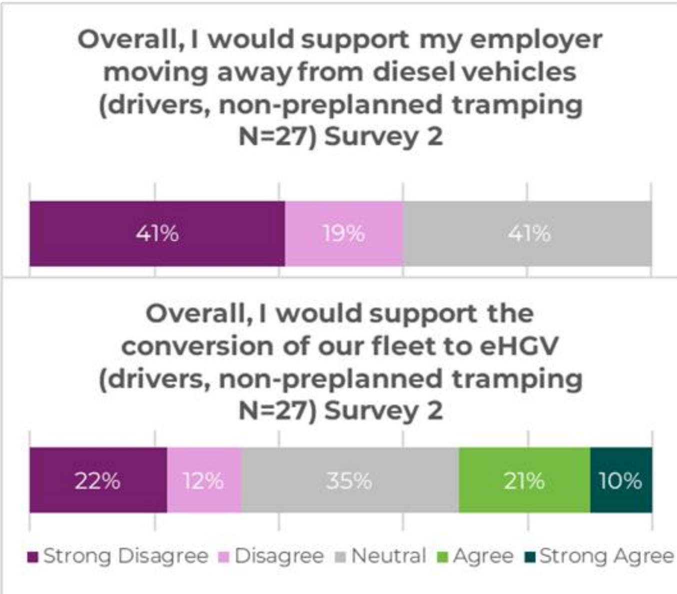

Figure 58 - Support from drivers involved in non-pre-planned tramping, Survey 2

In contrast, driver confidence is highest in eHGV capabilities for those selecting 'milk run' type duties (Figure 59).

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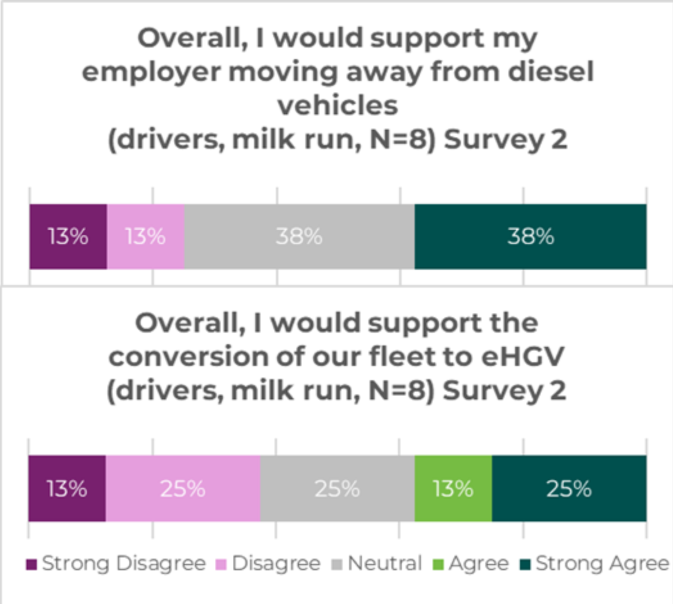

Figure 59 - Support from drivers involved in milk-runs, Survey 2

Conclusions that can be inferred from the above analysis suggest the following:

- The majority of eHGVs are currently being used on predictable (pre-planned), shorter range journeys which return to the home depot at the end of the shift.
- That when considering tramping duties, driver confidence in eHGV capabilities is significantly reduced.

These conclusions are not too surprising, given that the eHGVs are newly placed in operations, and the concerns drivers expressed regard charger availability and vehicle range.

Growing experience

We also explored whether confidence in eHGVs increased as drivers gained more eHGV experience. To try and answer this, the project analysed the relationship between confidence and support for eHGVs against the length of time eHGVs have been in service with each haulier.

Our haulier project partners introduced eHGVs into their fleets on different dates. The earliest were delivered in April 2024, whereas some hauliers didn't receive their eHGVs until early 2026. Survey 2 was undertaken in Autumn 2025, resulting in a range of elapsed times for each haulier between 19 months and one month between eHGV delivery and Survey 2.

This elapsed time has been plotted against a positivity scale (where 1 = all drivers strongly disagree with the statement and 5 = all drivers strongly agree), to see if there is any correlation.

The hypothesis we tested was: *"Positive sentiment towards eHGVs is likely to be higher in organisations that have had eHGVs in their fleet the longest"*.

The two graphs derived from this analysis (Figure 60 and Figure 61) were, however, unable to determine any positive or negative correlation for this hypothesis, indicating that the hypothesis remains unproven in this data set. There are potentially some flaws in the approach though, namely that the comparison is between multiple organisations, rather than how positivity might develop over time within an individual organisation (see recommendations topic, page 83, for more on this).

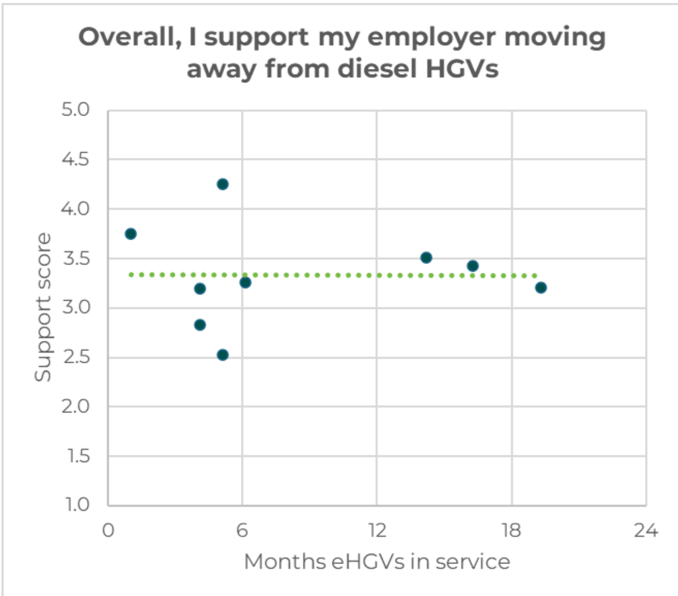

Figure 60 - Support for the move away from diesel mapped against the time eHGVs have been in service

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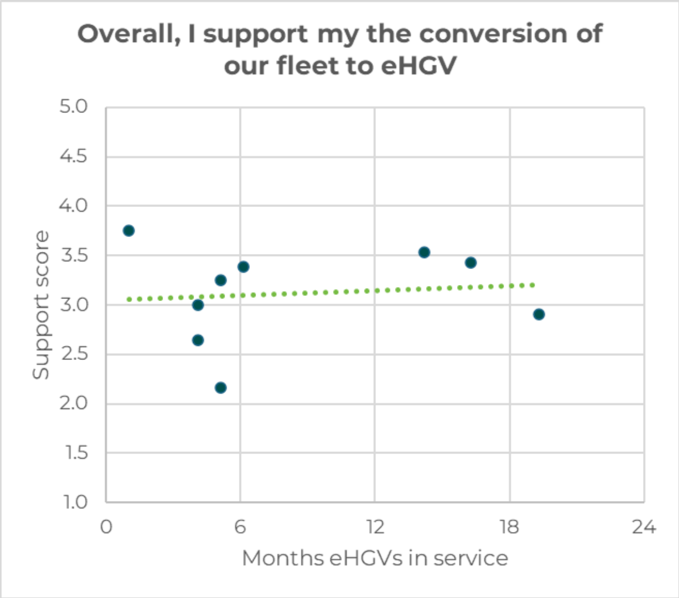

Figure 61 - Support for conversion to eHGVs mapped against the time eHGVs have been in service

eHGV charging

We asked a number of questions around experience of charging, including:

- Where did you plug in the eHGV to charge?
- Impact of public charging
- Problems with public and depot charging

Depot charging is generally viewed as safe, reliable and workable within daily operations, with only intermittent technical issues. Public charging, is characterised more by uncertainty rather than negativity, probably reflecting limited driver experience.

Drivers with eHGV operating experience were asked where they charged the eHGVs (Figure 62).

The vast majority reported having experience charging at an employer's depot (91%), with 73% of respondents using employer's depots daily or almost daily. A sizeable minority had also charged at a customer supplier site (19%), while smaller proportions had experience charging at shared depot infrastructure (7%) or at a dealer site (3%). This distribution highlights the central role of depot charging, supplemented by emerging, but still limited, public charging arrangements.

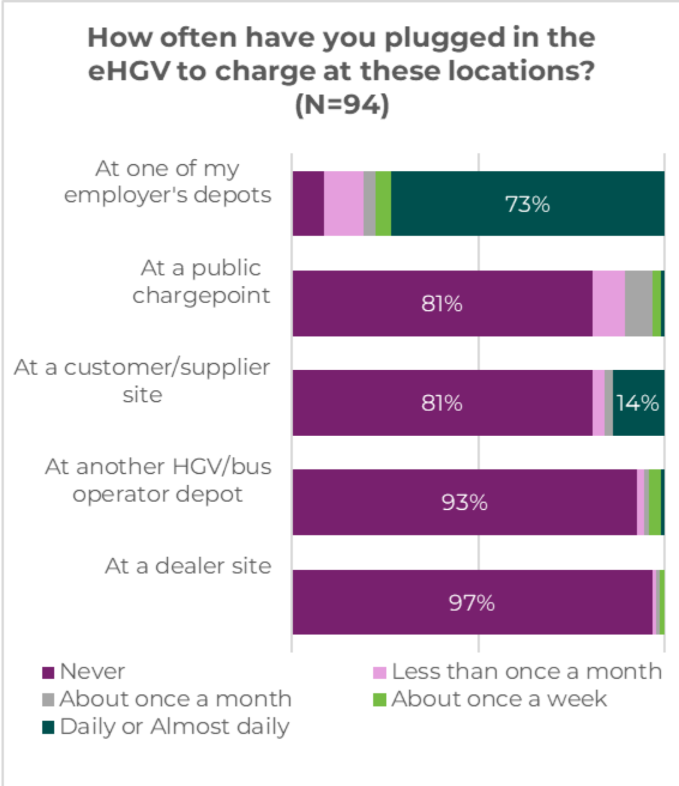

Figure 62 - How often eHGV drivers have charged at different locations

Drivers were then asked to assess a series of statements relating to depot (Figure 63) and public (Figure 64) charging. Just over half (53%) agreed that depot charging provides sufficient range to complete their job. When asked whether charging duration is impractical, responses were largely neutral for both depot and public charging (45% vs 64% respectively). However, 29% actively disagreed that depot charging is impractical, suggesting it's generally viewed as manageable within daily operations.

Depot charging was rated very positively for safety (88%), ease of use (89%) and reliability (80%), in contrast to public charging, which received lower agreement on safety (30%), ease of use (32%) and reliability (23%). Given the very low use of public eHGV charging, a lot of responses to this question were 'neutral'. Among those expressing a clear opinion, positive responses outweighed negative ones.

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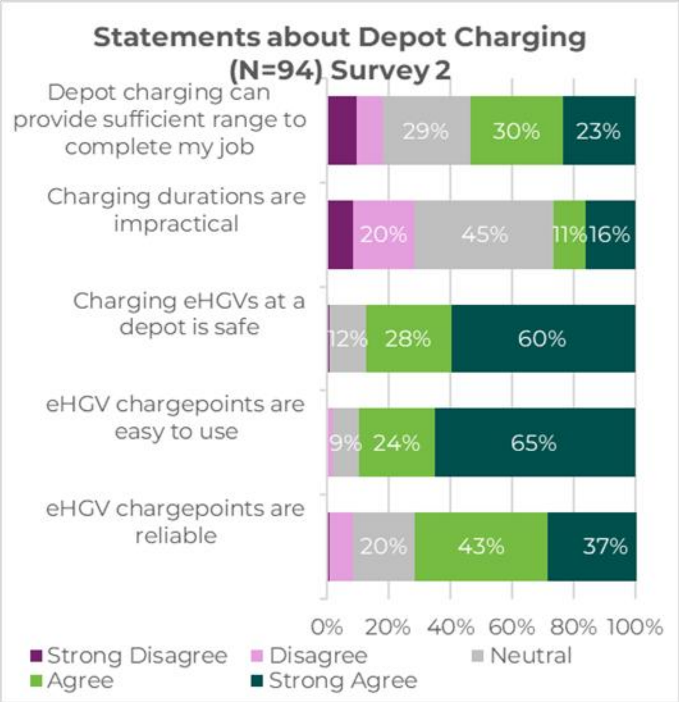

Figure 63 - eHGV driver views on depot charging

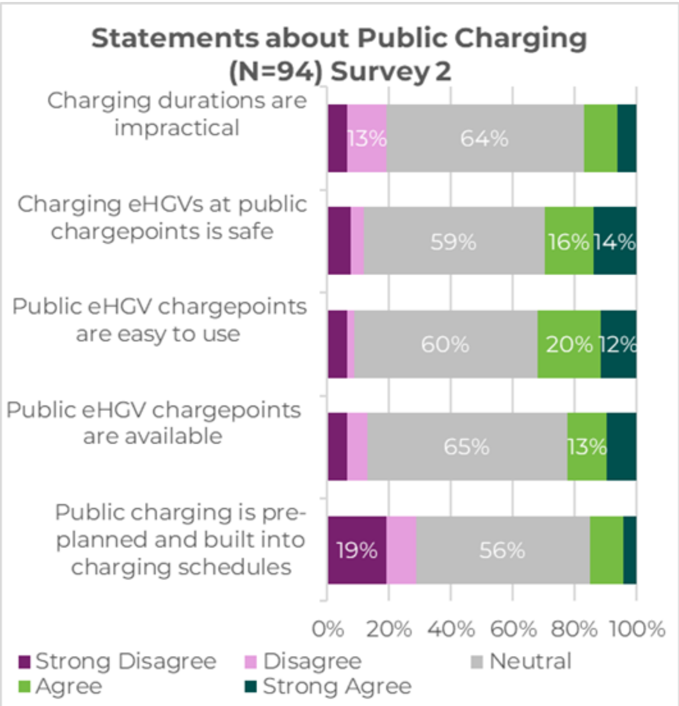

Figure 64 - eHGV driver views on public charging, Survey 2

When asked whether public charging is pre-planned, a majority were neutral (56%), though 29% disagreed. Variations were also observed across organisations. This corresponds with scheduler responses 54% agreed that drivers are clearly instructed where and when to charge (Figure 65). Views were mixed on whether the need to stop to charge caused disruption to operations, suggesting operational friction in some organisations.

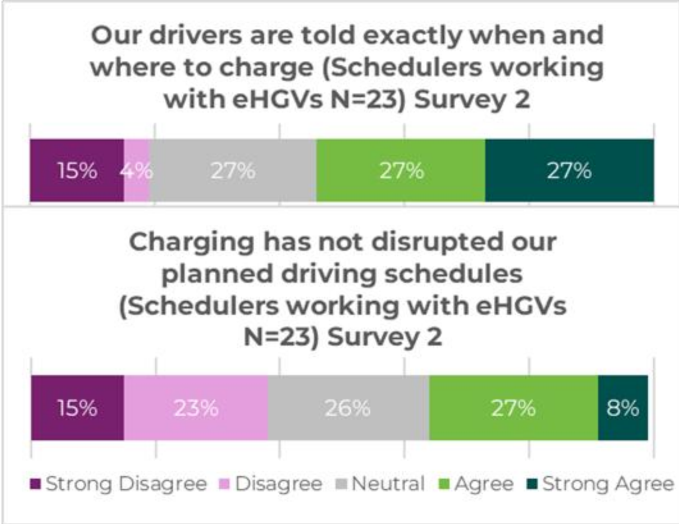

Figure 65 - Scheduler responses regarding charging, Survey 2

Regarding the frequency of problems at depot charge points (Figure 66), the largest proportion of drivers reported never experiencing issues (33%), or problems occurring occasionally (29%), or sometimes (14%).

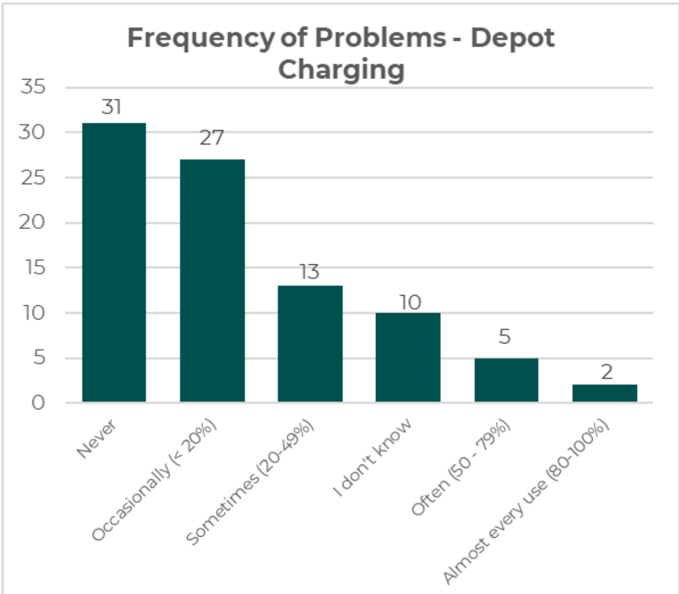

Figure 66 - Frequency of depot charging problems

When drilling further down into the nature of any issues experienced (Figure 67), most issues encountered were related to charge points being out of service or faulty (24%), charge sessions failing to start (22%), charging rates being slower than expected (21%), and all charge points being in use (16%). Overall, this suggests that while depot charging is generally reliable, intermittent technical and availability issues remain present.

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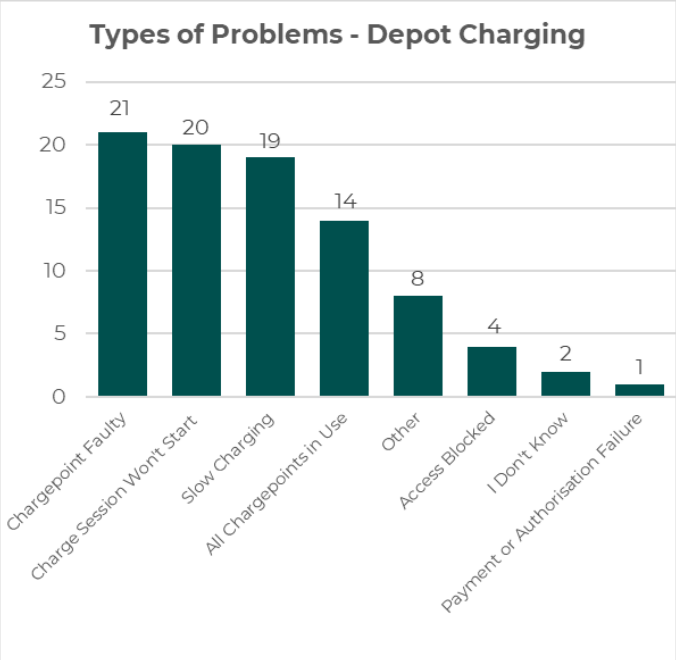

Figure 67 - Nature of depot charging problems

When asked about the frequency of problems with public charging (Figure 68), uncertainty was far more pronounced with "I don't know" (68%) and, 'Never' (12%) responses reflecting the limited use of public charging so far.

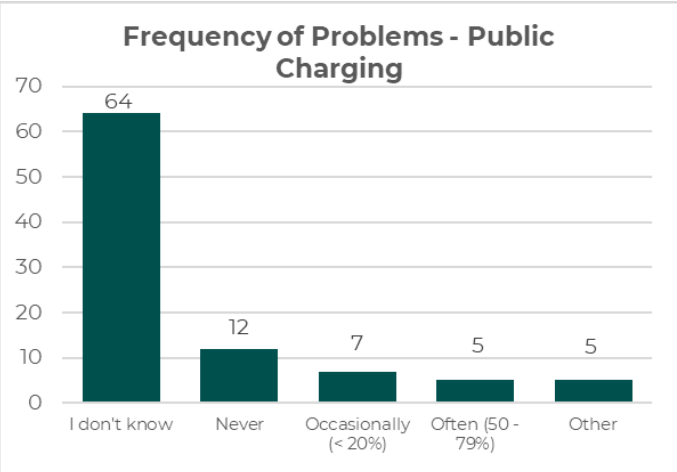

Figure 68 - Frequency of public charging problems

Similarly, over half (51%) did not identify a specific problem type. Among those who did, the most common issues were access being blocked (12%), all charge points in use (11%), charging slower than expected (10%), and charge sessions failing to start (9%) (Figure 69).

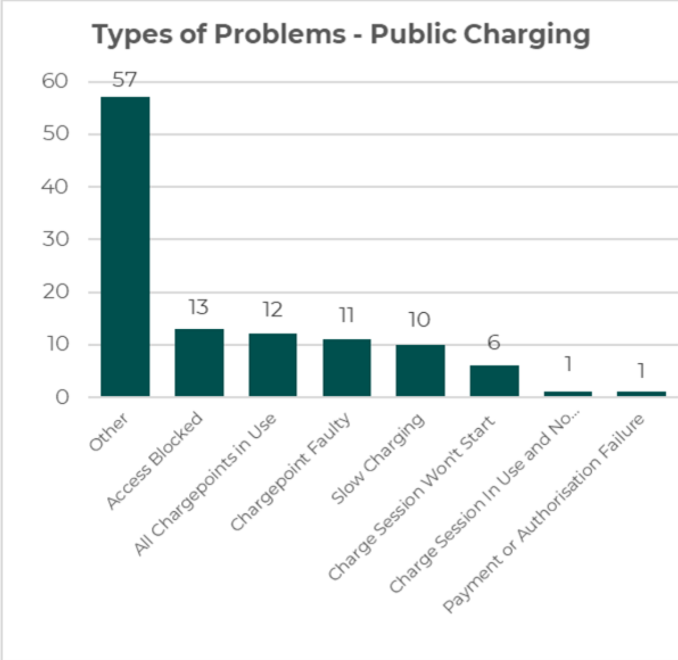

Figure 69 - Nature of public charging problems

Overall, depot charging appears to be functioning well as the operational backbone of eHGV deployment, being widely used, positively rated for safety and usability, and largely integrated into daily routines, despite minor technical issues. Public charging remains less utilised and less clearly understood, with uncertainty driven more by limited exposure rather than by strongly negative experiences. Strengthening familiarity with public infrastructure will likely be key to supporting broader operational confidence as fleet electrification scales.

Topic 5: Training, awareness and readiness

Drivers and trainers were asked questions relating to eHGV readiness, training and awareness within their organisation. The questions focus on:

- Types of training delivered
- Attitudes towards the need for and effectiveness of training
- Feedback from both drivers and trainers

Driver trainers are highly confident in the training and support provided, with strong positive feedback on manufacturer-led instruction and in-cab practical training. Direct, on-road experience is closely linked with driver confidence and positivity, while diesel-only drivers remain more neutral

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towards eHGVs. Prioritising hands-on, in-cab training post-deployment is key to maximising engagement, readiness, and positive sentiment across all driver groups.

In Survey 1, drivers expressed mixed views about their sense of involvement in the transition to eHGVs (Figure 70). When asked if they felt informed about the introduction of eHGVs, respondents were relatively balanced (29% in disagreement, 33% neutral and 38% in agreement). Views on whether they felt engaged in the eHGV transition were less positive.

This distribution suggests that, while some communication and involvement efforts had taken place, these had not yet consistently reached all the drivers.

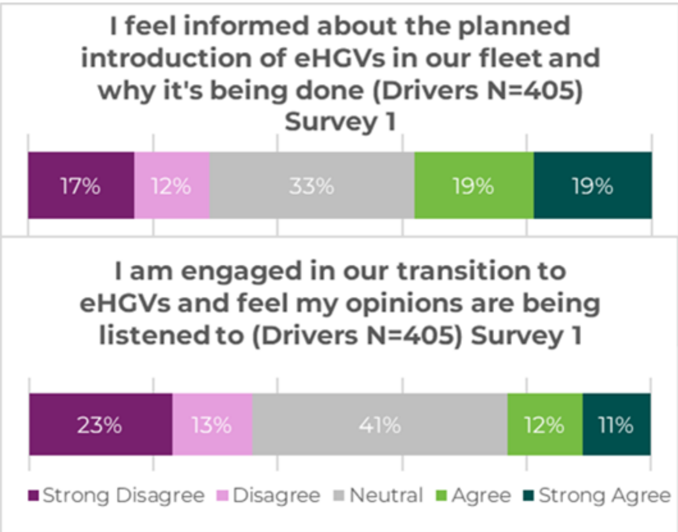

Figure 70 - Driver awareness and views on engagement, Survey 1

However, perceptions had improved by Survey 2 (Figure 71). When asked again about whether they felt informed, driver disagreement dropped to 15%, with 43% neutral and 43% in agreement. Post deployment, drivers were also asked if they felt that training and support was sufficient. Only 14% disagreed, with 42% neutral and 44% in agreement. This shift suggests that once eHGVs became operational, communication and support efforts were more visible and better recognised by drivers.

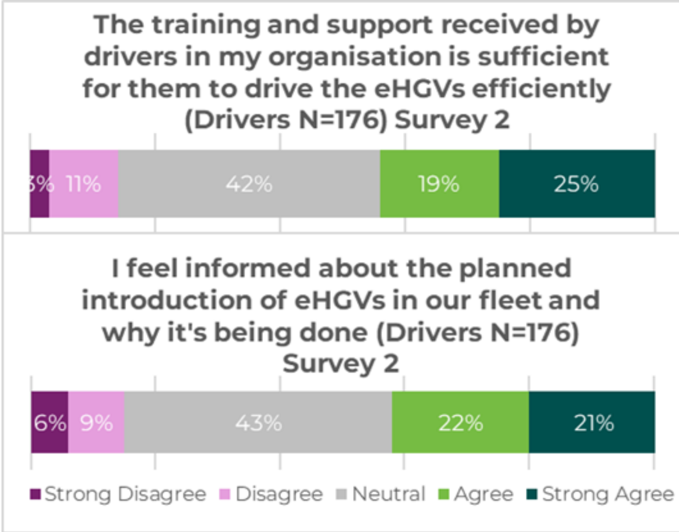

Figure 71 – Overall driver awareness and views on training and support, Survey 2

Comparing eHGV and diesel-only drivers reveals a clear difference in sentiment. Among eHGV drivers (Figure 72), perceptions of being sufficiently trained and supported (72%) and kept informed (68%) were strongly positive, while disagreement was minimal at just 7% and 4% respectively.

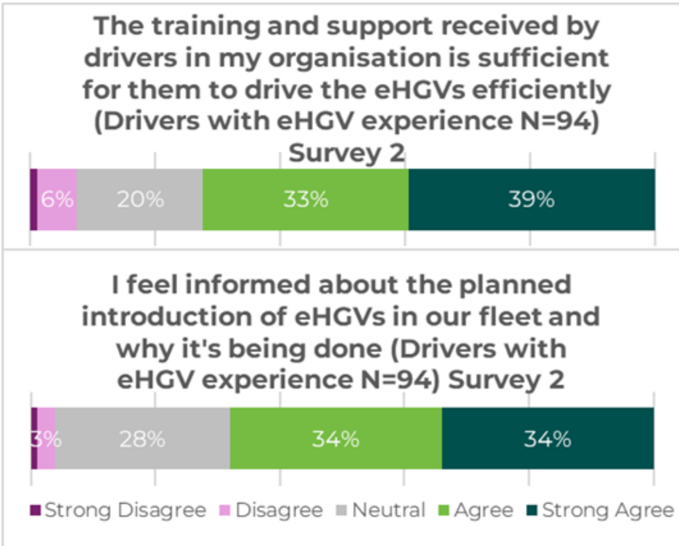

Figure 72 - eHGV driver awareness and views on training and support, Survey 2

In contrast, diesel-only drivers expressed lower engagement (Figure 73). Only 13% agreed that they felt sufficiently trained and supported, and the same proportion felt adequately informed. Most responses clustered around neutrality (67% and 60% respectively), indicating limited engagement rather than outright resistance.

Largely, this is to be expected amongst drivers who are not yet required to drive eHGVs. However, as the transition to zero-emission

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fleets approaches, ensuring this group feels included and prepared will be essential.

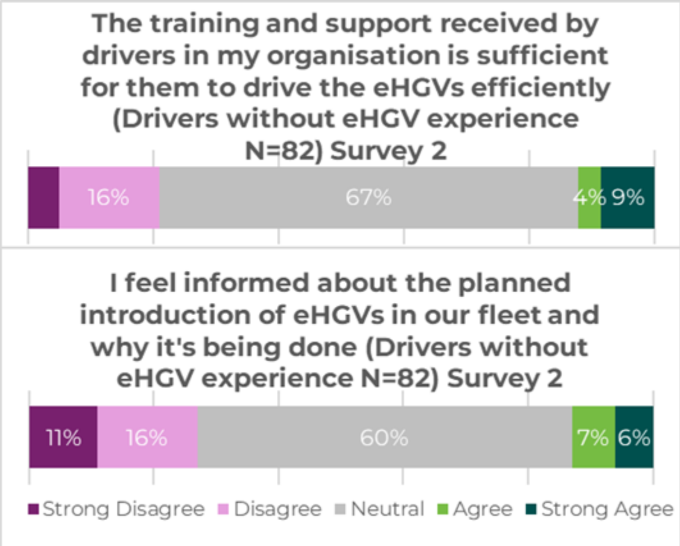

Figure 73 - Non-eHGV driver awareness and views on training and support, Survey 2

Driver trainers were also consulted to assess the transition from an instructional perspective (Figure 74). When asked whether switching to eHGVs would require significant changes to driving habits, 60% did not see it as a major issue and 87% showed confidence in driver adaptation. In addition, driver trainers were also unanimous in their view that the training and support provided to drivers was sufficient.

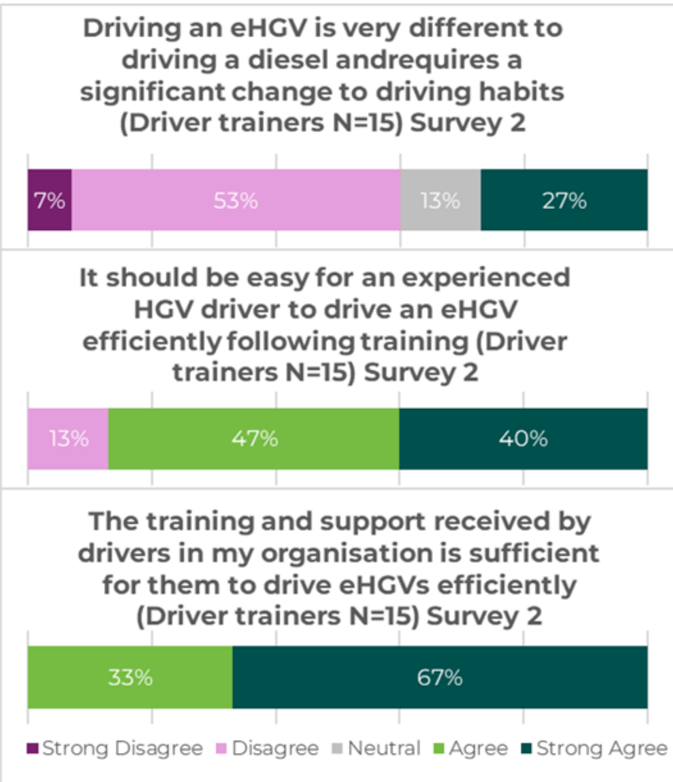

Figure 74 - Driver trainer views on eHGV training requirements, Survey 2

Driver trainers expressed strong confidence in manufacturer-led training. When asked whether they felt confident in training their drivers following manufacturer instruction, 86% agreed, whilst 65% agreed that they felt more confident about electrification after training.

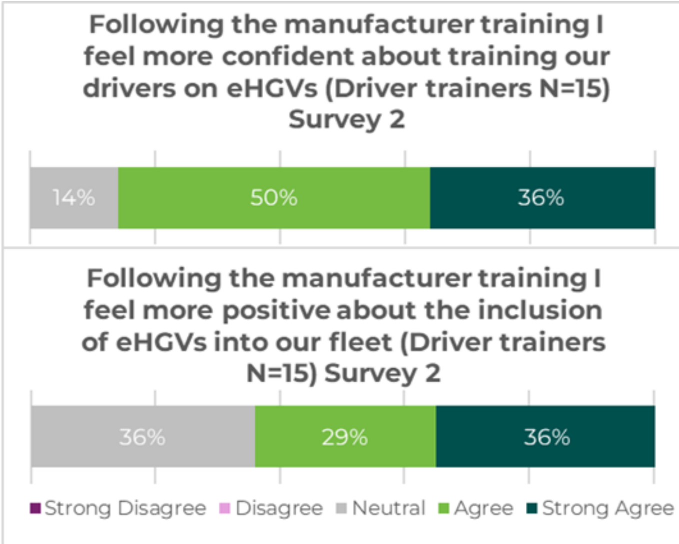

Figure 75 - Driver trainer views on manufacturer training

Analysis of Survey 1 indicates the majority of driver training was delivered through classroom sessions, group workshops and similar formats, followed by one-to-one, in-cab on-road training and ongoing feedback using driver efficiency metrics. Including on-road sessions in training is important, as there is a clear relationship between direct operational experience and positive driver sentiment.

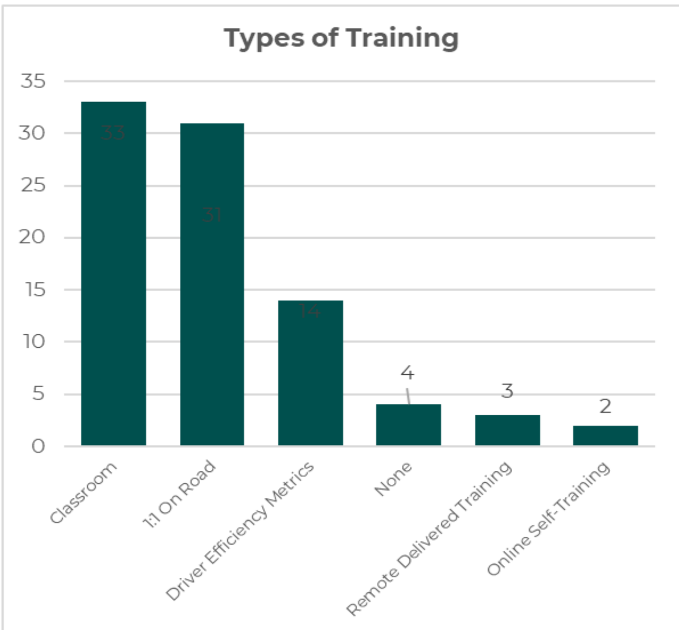

Figure 76 - Types of training carried out by organisations, Survey 1

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Overall, training and support are perceived as effective in preparing drivers for eHGV operation.

To ensure all drivers, including diesel-only drivers, feel informed, engaged, and ready for the transition, continued emphasis on on-road training and ongoing feedback will be essential as fleet electrification progresses.

Topic 6: Survey methodology and future recommendations

This final section provides a retrospective on the survey and analysis of the approach adopted by the project. It also makes some recommendations for delivery of future surveys.

It's clear that the adoption of eHGVs is very much at a 'bedding in' phase amongst the recipient fleets. This is reflected in much of the attitude analysis in the preceding section. It's anticipated that attitudes will continue to become more nuanced as a consequence of drivers and operators developing familiarity with eHGV capabilities, coupled with the maturing of on-route and shared charging infrastructure.

The two phases of attitude surveys we conducted proved to be very insightful. Should further rounds of surveys be carried out throughout of the remainder of the ZEHID programme, we make the following recommendations based on our experience:

Interval: Surveys should be repeated at regular (ideally annual) intervals. This survey repetition will enable analysis of how attitudes develop over time as the eHGVs become bedded into normal operations and more ambitious routes are undertaken.

Format: The survey was designed to be completed in approximately 10 minutes. This was considered to be the ideal duration, without impacting adversely on driver operations whilst also covering sufficient content. Questions were grouped and designed to be as accessible as possible, using language structure which didn't exclude those for whom English isn't their first language. The survey dashboard shows that the median time for drivers to complete the first survey was 11:04 minutes and the second survey 9:23 minutes.

The surveys were predominantly structured around quantitative questions, with scale responses ranging from **Strongly Disagree** to **Strongly Agree** (a five-point Likert scale, Figure 77).

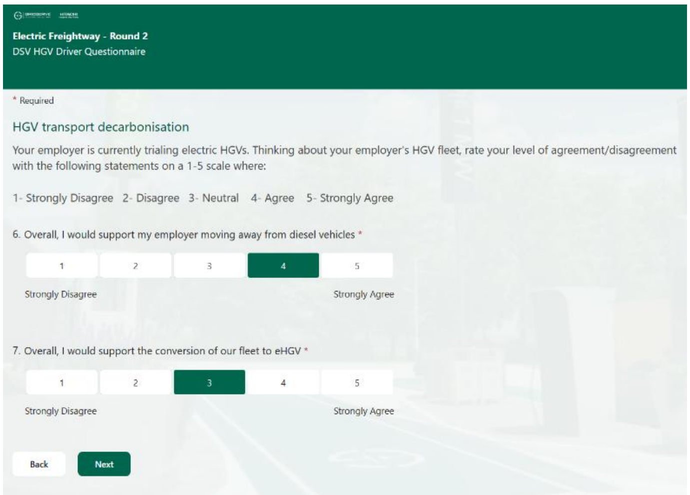

Figure 77 - Example of survey form

As much as possible, we recommend that any future survey structure (question approach and content) remain consistent with this, enabling comparative quantitative analysis to be applied across the survey phases.

Anonymity: Though there are some benefits in capturing a unique identifier from each survey participant such as allowing tracking of an individuals' views over time, we chose to proceed with largely anonymous surveys. It's our contention that this anonymity has resulted in honest responses and comments from the participants, which could be impacted were unique identifiers used. We also suspect that the high survey participation rate was a result of the anonymous nature of the survey.

Distribution: The surveys were distributed by an appointed 'survey champion' at each of the haulier partners. This avoided data protection complications and enabled the host to distribute the survey via whatever means were most effective for their organisation. In some cases, this involved simply setting up a shared survey laptop in driver break out areas or distributing via hand-held devices.

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08 What have we learnt?

One of the main aims of the Zero Emission HGV and Infrastructure Demonstrator (ZEHID) is to provide HGV operators and other stakeholders with answers to questions they may have about adopting eHGVs – either addressing their concerns and uncertainties or highlighting areas where more support is needed. As part of this, at the start of the project, we set out several hypotheses that we wanted to test through Electric Freightway. With the implementation phase drawing to a close, we can now return to those hypotheses.

Hypotheses

The core hypothesis of the project is that:

Electric 40-44 tonne HGVs are ready to replace diesel HGVs and can deliver the same function when the right infrastructure is in place.

The creation of our telematics data ingestion and analytics platform (see Section 5) enabled the project to delve deeper into the underlying factors that make up this hypothesis. This was therefore broken down into several subsidiary hypotheses looking at the underlying topics of vehicle performance, cost effectiveness, infrastructure and environment.

Most eHGVs only recently hit the road and operators are still experimenting with how far they can push the vehicles. Therefore, full answers to all the questions posed can't be given yet. However, we've gathered enough data to start testing the hypotheses.

Ability of 40-44 tonne eHGVs to effectively replace diesel HGVs

Our hypotheses:

Most HGV journeys are possible with current eHGVs and depot-based charging.

Almost all journeys become possible when suitable on-route charging is available.

What we have found:

So far, the demonstration has shown that a wide range of trips across a diverse set of use cases are possible with depot-based charging.

Of the initial journeys that we have ingested telematics data from, approximately 95% of eHGV journeys only charge at their home depot between duties.

During the introductory stage of the project hauliers have been operating eHGVs on shorter routes or single shifting where diesels would be double shifted. Our haulier interviews and surveys show that as operators get more comfortable with eHGV performance they expect average trip lengths to increase over time, and the eHGVs to start to be used on multiple shifts per day. An enabler for this will be increasing access to higher speed and on route charging.

On-route high-power charging can potentially increase vehicle range, making daily distances of 500-600km possible with eHGVs. The longest single duty we've recorded so far was around 340km.

At the time of writing, the first public charging sites has only just opened, so it's too early to say what impact this is having on route feasibility. We expect that the strategic locations of Electric Freightway infrastructure will help operators extend eHGV routes, but a more comprehensive network will be needed to allow eHGVs to service all routes.

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Our hypothesis:

Maximum payloads of eHGVs are less than ICE equivalents. This will impact the ability of some hauliers to directly replace ICE vehicles and impact cost effectiveness.

What we have found:

Weight limitations are a clear concern for some operators.

This impacts different organisations in different ways. Some operators will hit volume limits well before weight restrictions are approached, but for those regularly hauling heavy payloads, the difference can be significant. For example, hauliers carrying bulk high density products (such as grain or liquids) have observed that they are able to transport 10 – 15% less product per load in eHGVs as a direct consequence of this limitation. See Sections 6 and 10 of this report, as well as Report 3, for further details.

Maximum weight restrictions aren't the only limitation, with axle weight limits and vehicle length limits also restricting operations.

Our hypothesis:

Winter conditions reduce the efficiency and range of eHGVs. This can be managed through route planning and top-up public charging so that it is not a barrier to electrification.

What we have found:

The project's data has confirmed that winter conditions do reduce the energy efficiency of eHGVs, as discussed in Section 05.

So far, our partner operators have effectively operated across the winter season – even in the depths of winter almost all vehicles are ending their duties with over 30% state of charge (Figure 78).

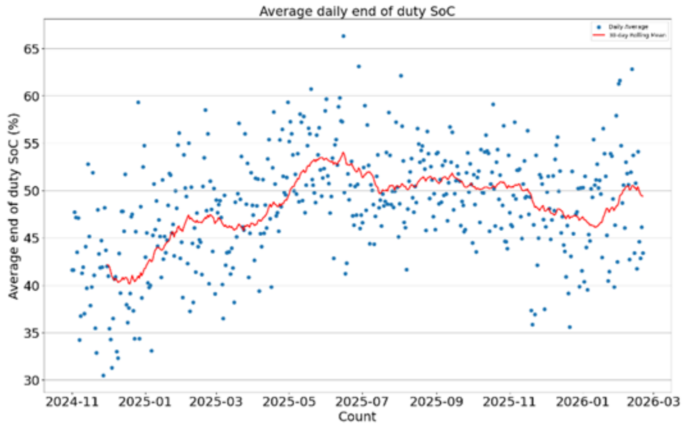
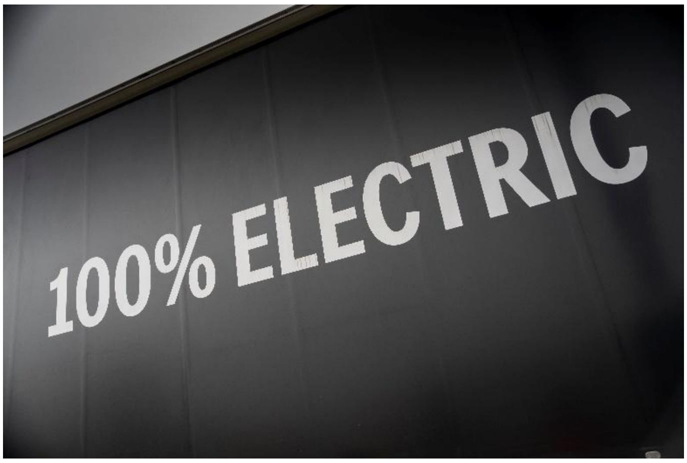


Figure 78 - Average end-of-duty state of charge

As duties get more ambitious in the future it will be important for operators to keep monitoring seasonal effects, feeding this into their route planning. They may also decide to make more use of on-route charging to mitigate against seasonal efficiency variation on longer routes.



Cost effectiveness of electric 40-44 tonne HGVs

Our hypothesis:

Most HGV routes could technically be electrified but would require incentives to be put in place as they would not be economically viable in the short-term.

What we have found:

Financial viability varies less by route and more by how the vehicle is operated. To make eHGVs more viable it's important that operators try to achieve:

- Higher mileages
- Lower electricity costs

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- Lower infrastructure costs through higher charger utilisation
- Use of public charging where needed to extend journey lengths

Payload and route type also have an impact on power use. Motorway journeys with lighter loads use less power, but eHGVs are comparatively more efficient against diesel HGVs on urban routes with lots of stop-start driving.

The project's Carbon and Cost Calculator has provided us with the ability to estimate total cost of ownership (TCO) in various circumstances. The examples shown in Section 6 demonstrate how close the financial case can be for many use cases, with small cost or operational changes making the difference between making a saving or a loss compared to diesel equivalents.

Incentives will continue to be important for several reasons, such as limiting the up-front cost of electrification for operators that have trouble financing new vehicles and infrastructure. Operators on shorter routes and those needing to use public infrastructure are also likely to need support.

On 25 March 2026, the Government announced £1bn in funding through the Zero Emission Truck and Van grants and the Depot Charging Scheme, to support the rollout of zero emission HGVs and vans up to 2030.

Our hypothesis:

The capital cost of eHGVs is currently higher than diesel HGVs and can only be offset by operational savings where vehicles are used intensively.

What we have found:

The capital costs of eHGVs are significantly higher than equivalent diesels – in the region of two to three times more expensive without subsidy.

Our TCO calculations have shown that it's possible to offset this higher cost over the life of a vehicle, however this is dependent on being able to operate a minimum number of miles over the vehicle's lifetime.

- The cost of charging is the main determinant of TCO. Generally, an average cost of charging of below 30p/kWh is needed for eHGV operating costs to be lower than diesel operating costs.
- Annual mileage – as long as EV operations are cheaper, higher mileages will result in savings being generated sooner. Vehicles with low mileage may need lower electricity prices to break even.
- Length of use – often it will be necessary to operate the eHGV for up to eight years for operational savings to cover the initial delta in capital costs.

Our hypothesis:

Opportunity cost from charging is negligible as it can be aligned with existing driver and vehicle downtime.

What we have found:

With relatively little on-route charging so far, we've not been able to fully test this hypothesis.

It's generally understood that mandated breaks can be used for charging, as long as the driver can actually take a break and doesn't need to monitor or intervene. A 45-minute break provides enough time to charge an eHGV battery by about 50%.

Aligning charging times and locations with driver breaks is a challenging task due to the limited range of charging locations currently available.

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Infrastructure enabling efficient operation of eHGVs

Our hypothesis:

Public eHGV chargers can be practically implemented into commercial logistics operations.

What we have found:

We're at an early stage in the public charging journey, having only just launched the Electric Freightway hubs at Exeter and Baldock.

Despite this, a number of fleets have been proactively making use of public charging where needed to extend their routes. Voltloader and Kuehne+Nagel have made use of facilities at GRIDSERVE Electric Forecourts in Stevenage and Braintree. Other hauliers have made use of other charging networks and facilities as well as First Bus depots.

This has shown that integrating charging breaks into longer journeys is possible. Growth of the network will be needed to make it practical across more routes.

Our hypothesis:

Provision of public eHGV charging infrastructure will be commercially viable once the number of eHGVs on the road increases.

What we have found:

While we've demonstrated how public eHGV charging can be built and operated in the UK, how long-term operations can be made financially viable still needs to be tested. Even in the more established car charging sector, few businesses are operating profitably, as the networks are still developing new sites and utilisation is still growing.

Tied to utilisation is cost of charging. Public sites face additional costs that depots don't have to contend with – renting space at high traffic locations, building resilient unattended sites and complying with the requirements of the public charge point regulations. Charge point operators (CPOs) face a delicate balancing act if they are to cover their investment and operational costs without pricing out potential customers. Contracts with specific hauliers, that offer lower prices in return for committed demand may become more commonplace.

GRIDSERVE is not alone in investing in public charging in the UK with a number of companies having begun to invest in charging hubs at key freight locations, suggesting that the market expects there to be a growing business opportunity.

Our hypothesis:

Public charging can be more economical for some fleets because it offsets the need for investment in depot infrastructure and enables longer journeys.

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What we have found:

At this stage in the demonstration, relatively little use has been made of public charging. However, several operators have successfully used public chargers to extend routes. As seen in the interviews in Section 03, a number of fleet operators recognise the need to use public charging, although some are put off by high costs.

The TCO analysis in Section 06 shows that it's difficult to make a case for solely using public charging at the moment. However, as operators seek to extend eHGV journey distances, or avoid costly connection upgrades at their own depots where capacity is tight, an increased use of public charging may become more necessary. As more public charging providers enter the market this may also become more financially appealing.

Our hypothesis:

Securing timely connections to the electricity grid will be a key barrier to the electrification of depots for eHGVs.

What we have found:

The project has found that, without significant changes, connections to the electricity network are likely to be a significant barrier to eHGV electrification.

Initial feasibility studies were carried out on a large number of sites, both public and private, but it was not possible to continue with the majority within the time and budget constraints of the project.

Even when a connection is available, the design, planning process and legal agreements for getting the site electrified can be extremely complex and time consuming.

Power connections aren't the only constraint. Many depots suffer space constraints that can make installing chargers impractical. Planning restrictions and landlord/leasehold related constraints can also make investing in EV charging infrastructure a highly complex prospect.

Our hypothesis:

Use of public charging can overcome limitations on charging at depots as a result of connection constraints.

What we have found:

Project member DSV also described how the company has invested in a small amount of depot-based low-power charging (to keep within their connection) for overnight charging and uses a nearby public charging hub when the trucks need to charge more quickly, demonstrating what is possible.

Cost is the key consideration – while using public charging to 'top up' may be viable, completely replacing depot charging with public is unlikely to be cost effective unless a deal can be negotiated with the CPO.

Shared depot sites offer a potential solution – working together with neighbouring sites to share infrastructure capacity and benefitting from some of the lower costs of running depot facilities.

Environmental benefits of eHGV transition

These hypotheses focus on the non-financial benefits of zero-emission transport and how it impacts people operating the vehicles.

Our hypothesis:

Operation of eHGVs has a significant positive environmental impact compared to diesel HGVs. There are lower emissions of CO_2 and other pollutants over the whole lifespan of the vehicle.

What we have found:

The project's Carbon and Cost Calculator allows for the estimation of carbon impacts based on a range of factors, including the embedded carbon from vehicle manufacture, the carbon intensity of diesel and electricity and the carbon impact of repair and maintenance.

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While eHGVs do have higher embedded emissions during manufacture, mainly due to the battery (approximately three to four times those of a diesel truck), this is quickly offset by operational savings.

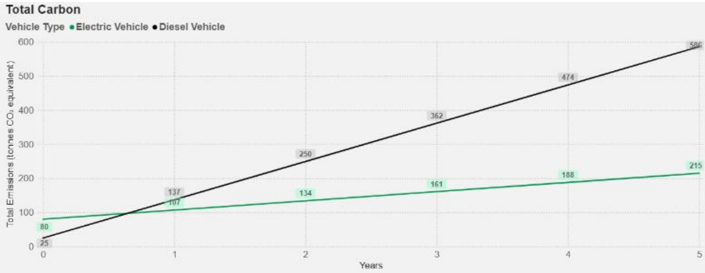

Figure 79 – eHGV (green vs diesel (black) carbon emissions over 5 years

As shown in Figure 79, with the standard carbon intensity of UK grid electricity factored in, an eHGV travelling 100,000km per year is expected to 'break even' against a diesel truck in its first year, emitting less than a third of the carbon of a diesel truck over five years. This can be reduced even further if a haulier has on-site zero-emission power generation, such as solar.

Our hypothesis:

eHGVs provide a more pleasant working environment for drivers, due to reduced noise and emissions.

What we have found:

While drivers have mixed views of eHGVs, some of the strongest positive sentiment is towards the quality of the work environment. Before driving eHGVs there were relatively high expectations of the vehicles (Figure 80).

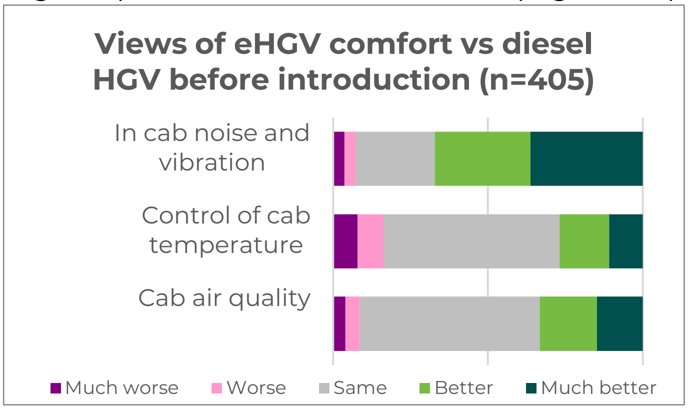

Figure 80 – Driver views on eHGV comfort, Survey 1

After operating eHGVs, drivers' positive views have increased, with very little negative sentiment (Figure 81).

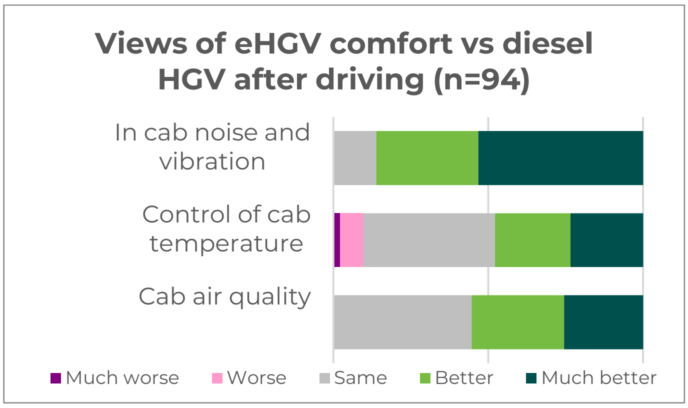

Figure 81 - eHGV driver views on eHGV comfort, Survey 2

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09 How far have we come?

Since the Electric Freightway project was first conceived, in early 2022, there has been rapid change in the sector. Operators, OEMs, infrastructure providers and policymakers have all made commitments to support freight decarbonisation. In this section, we examine some of the positive changes that have taken place and look at what still needs to be done to enable a zero-emission transition.

The developing industry for zero-emission HGVs

While the zero-emission HGV market is still at an early stage, there has been a lot of change over the last two to three years.

The ZEHID projects have started to show what eHGVs are capable of and stimulated debate about the future of road transport decarbonisation.

More businesses have started to adopt eHGVs outside of ZEHID and more OEMs have brought eHGV offerings to market.

The EU's VECTO requirements on HGV manufacturers places a strong supply-side incentive on eHGV adoption which has been strengthened with targets throughout the 2030s.

Regulatory developments

HGV grant

In early 2025, the Government extended the grant available for eHGV purchases, the Plug-in Truck Grant, to the end of March 2026. A 20% discount was available for larger trucks, although this was capped at £25,000, equating to less than 10% discount on the largest eHGVs.

In January 2026, a short-term boost to this grant was announced, with a further £18m made available to increase the grant for the largest trucks (above 26 tonnes) to £120,000. This extra level of funding was available initially up until March 2026[ix].

On 25 March 2026, the Government announced £1bn in funding through the Zero Emission Truck and Van grants and the Depot Charging Scheme, to support the rollout of zero emission HGVs and vans up to 2030. The grants provide significant support for the purchase of new eHGVs as well as the installation of supporting charger infrastructure. In combination, they enable more operators to engage in adopting eHGVs into their fleets, with TCO modelling showing that cost parity with diesel HGVs can be achieved on increasing numbers of use cases. The longevity of the new grant scheme will also help eHGV manufacturers gain confidence in supplying to the growing market.

Developing regulatory framework

In addition to the subsidy developments, a consultation was opened in January 2026 into the regulatory framework needed in order to progress towards the decarbonisation of HGVs[x].

The current rate of adoption in the UK lags behind other European countries and it's clear that a 'wait and see scenario is unlikely to result in the achievement of the commitment of a 2035/40 end of ICE HGV sales. Three potential options are being considered to accelerate adoption:

- Increase manufacturer CO_2 emissions targets, similar to Europe's CO_2 standards
- A ZEV mandate for manufacturers, supported by a CO_2 emissions standard. Similar to the mandate for smaller vehicles
- Fleet adoption requirements, targeting larger operators

All of these options have their pros and cons.

Emissions standards and mandates for manufacturers force the industry to change, without directly penalising hauliers, but do not by themselves solve the problems that are faced by fleets looking to electrify, such as access to, and the cost of charging infrastructure.

The option without a ZEV mandate provides more flexibility to use low-carbon fuels in the short-term to achieve faster decarbonisation, but there is a risk that this may take focus away from achieving zero emissions.

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Fleet adoption targets can be targeted at those operators most able to pay but could potentially put smaller operators at a disadvantage if they are not encouraged to prepare for electrification.

Depot infrastructure grants

A grant scheme was launched in 2025 to provide funding for depot infrastructure. While the funding was relatively generous, its utility was limited by the short timeframe for receiving funding, which required works to be completed in the 2025-26 financial year. Given the complexity of most eHGV charging installations, this meant that the funding was only really applicable for projects already at an advanced stage of planning, or sites that benefited from existing electrical capacity.

The new Government Depot Charging Scheme was opened for application on 25 March 2026, and will provide significant support and incentive to hauliers considering adding eHGVs to their fleet. The scheme is planned to run through to 2030, giving hauliers a long horizon on which to help plan their decarbonisation journey.

Market growth

The market for eHGVs in the UK is still very small. However, growth has picked up since the project began in 2023, supported by the ZEHID programme.

A significant factor that can give operators the confidence to invest in eHGVs is the availability of sufficient infrastructure.

eHGV infrastructure

When the project was planned, there were no public charging locations in the UK designed for eHGVs. By the time we published our first report, two years ago, there was only one purpose-built public eHGV charging station – Rivington on the M61. Since then, interest in the sector has expanded rapidly, in addition to the GRIDSERVE sites introduced in this report, a number of publicly accessible charging sites can be found at locations throughout the UK, with many more planned.

Milence opened its first dedicated eHGV charging hub in Immingham, building on a model implemented across Europe. New market entrants are planning similar facilities.

Where Electric Freightway has focused on the high-speed on-route charge needed at motorway service locations, others are looking at equally necessary factors such as how to keep trucks and their cargo safe during longer charging sessions. On the next page Aegis Energy highlights how the company has been developing solutions with the help of Innovate UK funding.

As well as the commercially operated eHGV charging sites, an increasing number of vehicle operators have opened their facilities to other organisations, making more charging options available for operators in more locations.

Bus operators are also opening their gates to eHGV charging, with First Bus's First Charge, providing access to existing depot infrastructure while buses are out on their routes.

Traditional fuel card providers like Allstar and newer mobility service providers like Paua have developed commercial EV charging offers to help operators navigate the market and access public and shared charging.

Project partner Renault Trucks has developed a map of existing and planned eHGV charging stations across Europe: https://www.renault-trucks.com/en/trucks-charging-stations.

While we're still a long way from having a comprehensive nationwide network for eHGV charging in the UK, the wheels are in motion.

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Innovation across the industry: Aegis Energy ScanSpot

In Section 03 we introduced the problems that charge point operators (CPOs) face from cable theft. Hauliers stopping to charge or refuel are also often the target of criminals. We talked to Aegis Energy about how the company is developing a system to help combat cargo theft, supported by Innovate UK.

"The transition to low-carbon logistics is often described as a journey. But for many UK fleet managers, that journey currently feels like an uphill battle on a very steep slope. It's hard to focus on the clean energy transition when you're navigating a 2026 reality where freight crime is at an all-time high.

With over 1,800 incidents recorded in the UK last year and a staggering £300m+ cost to the industry since 2020, the loss feels heavy both financially and operationally. Much of this loss disproportionately impacts SMEs, who make up 90% of the sector. For a small business running on a 2% profit margin, a single cargo theft is a threat to survival.

For fleets to be able to take advantage of this transition, the role infrastructure providers have in reducing these sunken costs, by designing out opportunities for theft and disruption, is essential. Afterall, how can you be expected to plan for 2035 when your daily logistics chain is under constant physical and financial threat?

Truck and van drivers and fleet managers need reliable access to secure, safe stopping sites. Aegis Energy is building exactly this, offering a network of clean and safe multi-energy hubs constructed specifically for commercial vehicles, with secure parking and offering choices of clean alternatives to diesel. The future of haulage and logistics isn't just cleaner; it's better designed for the wellbeing and safety of drivers and cargo, too.

As Aegis Energy develops sites that will meet the evolving needs of UK fleets, drivers are at the heart of the design. For too long, UK drivers have been forced to make do with facilities that are unfit for purpose and poorly maintained. A recent Transport Focus survey found that almost two-thirds of drivers feel dissatisfied with the number and quality of UK facilities.

Aegis Energy's sites will be fitted with ANPR sensors that allow for seamless, tracked entry into the sites, ensuring that no vehicle movements go undetected. Lighting is being carefully thought through, so drivers can move safely and comfortably through the site, with round-the-clock access to our facilities, including showers, toilets and a communal kitchen.

Using the experiences of real fleets has been an essential part of Aegis Energy's site development process, with its recent ScanSpot R&D project, funded by Innovate UK, providing a unique window into the security concerns that remain top-of-mind for drivers and fleet operators on a day-to-day basis.

The ScanSpot team, made up of individuals from Aegis Energy and the University of Oxford, have developed a system that integrates laser-based sensing (LiDAR), thermal imaging, low-light vision, and radar to create a real-time digital twin of a site. By combining these data streams, on-site risks and security breaches can be identified quickly and accurately, enabling early intervention and more resilient site management.

Aegis Energy recognises the importance of making commercial transport cleaner, safer and ultimately more operator-centric, prioritising the experiences of the driver and the fleet manager above all else."

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Vehicle development

Vehicle OEMs have invested significantly in developing a range of eHGVs to meet the needs of their customers.

Developments continue, with of the first ‘second generation’ eHGVs beginning to hit the market, with innovations such as direct-drive electric axles set to improve efficiency.

Battery technology is also moving at pace – more eHGVs are utilising LFP batteries, which have lower environmental impact and potentially offer longer life. Future battery development is likely to continue to reduce weight, volume and cost per kWh.

OEMs are also investing in their service and support offering to help operators make the move to electric.

In the interviews on the following pages some of our OEM partners reflect on what they’ve learnt from Electric Freightway, how they’re helping customers move to electric and what more needs to happen to accelerate the transition.

Volvo Trucks is one of the project's key contributors, delivering 68 eHGVs to Electric Freightway members.

We asked **Amy Stokes**, Head of e-Mobility at Volvo Trucks, to explain how Volvo Trucks is supporting its customers' transition to electric.

"Volvo Trucks is a leading truck manufacturer and had the largest market share in Europe in 2024. It has taken a prominent position in the ZEHID projects supporting operators with their decisions related to electric trucks and has also worked collaboratively across the projects to align infrastructure timelines with truck on-the-road dates to deliver a successful outcome for all.

Volvo Trucks takes a consultative approach with operators buying electric trucks. We model routes using our in-house software to ensure that the trucks can deliver what the customer expects of them and also to inform specification decisions. Working with operators to understand the charging requirements to enable the operation is also a key part of our process."

What was Volvo's motivation for being involved in Electric Freightway?

"A combination of factors: the transition to zero emission trucks is a key part of Volvo's sustainability strategy and the subsidy offered by ZEHID was a key enabler for our customers to make the move to electric trucks. This project presented a great opportunity to deliver a step change in the transition.

Volvo is the market leader with electric HGVs being first to market and having the greatest share of >16-tonne electric trucks in operation in the UK, Ireland and Europe. Electric Freightway presented the opportunity to build on this and also through the infrastructure funding to unlock further electric use cases."

What has surprised you most?

"More effort than expected has been needed to align truck deliveries with infrastructure timelines.

This has been amplified by the tight project timelines for funding. Even without that, understanding infrastructure timelines and planning around these was a far bigger challenge than expected."

> "The Nissan collaboration is a really interesting use case – the distances and frequency of routes that Yusen is completing is at the most ambitious end of the scale for electric trucks to date."

What has been the reaction to the vehicles?

"Volvo electric trucks are well received by operators and drivers. Drivers across the board love driving Volvo electric trucks with many not wanting to drive diesel again.

Volvo has had electric trucks in operation for six years and has received a lot of feedback over that period. Feedback is positive, schedulers and transport offices may need to adjust their approach with electric, but this is all valuable learning for future fleet electrification. Volvo has worked with the planners in a number of operations to develop their processes and approach for planning electric runs."

What challenges do your customers face in adopting eHGVs?

"The TCO difference is a big challenge – ZEHID funding largely addressed this, but going forward the current subsidy is not enough. The impact of payload is also a huge issue for operators hauling heavy loads; this effectively means more trucks on the road to move the same amount of goods which impacts the operator cost base. As electric trucks are scaled it will have an impact on the frequency of truck movements on UK roads. The payload allowance for zero-emission trucks should be addressed as a top priority.

The other major challenge is the availability of power at sites and the cost of securing additional power both for current and future charging infrastructure. The costs are prohibitive in lots of cases, and the operator is often not aware of the associated standing charges until the infrastructure is complete.

The fundamental issue behind the slow pace of electrification of trucks is that there is no strong legislative driver to spur operators to make the change now. With the challenges related to cost, operational differences and power availability, it's easier for most to stay with diesel."

What is Volvo's plan for the future?

"Our future roadmap will see the introduction of our first e-axle truck in 2026, which will be capable of up to 600km on a single charge – this will open up new use cases for electric trucks."

What advice do you have for HGV operators?

"Making the move forward is the most important step – there will always be uncertainty or questions that cannot be easily answered, but that first step to electrification is the most effective way to ready your business for the future."

Renault Trucks has provided 15 of the eHGVs being demonstrated as part of Electric Freightway.

We asked Renault Trucks' Energy Transition Manager, **Simon Calado**, to explain what the company has learnt from involvement in the project and what advice he has for operators considering the move to electric.

What was your role in Electric Freightway?

"Renault Trucks wanted to be one of the OEM partners in the Electric Freightway consortium and to provide fully electric HGVs – specifically the Renault Trucks E-Tech range – for real-world use by participating hauliers.

These vehicles were to be supplied to several of our key accounts across existing commercial routes as part of the project's objective to put electric trucks into real operational service.

For example, electric Renault Trucks E-Tech T units (42-tonne) have been delivered to operators such as GXO Logistics in partnership with Shepherd Neame, where they operate daily freight movements, replacing diesel trucks and reducing fuel use and emissions.**"**

What was Renault Trucks' motivation for being involved in Electric Freightway?

"Participation in Electric Freightway gives Renault Trucks a platform to showcase and validate its electric heavy truck technology (e.g. E-Tech T units) in real world logistics and freight operations across a variety of routes and duty cycles. This supports evidence-based proof of capability to fleet operators and strengthens confidence in electric HGVs.

By supplying trucks to a high-profile consortia demonstration backed by the UK Government, Renault Trucks can help overcome barriers to electric heavy vehicle adoption – such as range, infrastructure readiness, and total cost of ownership – by gathering data and insights that inform future deployments and policy. The project's data and learnings are designed to accelerate broader industry uptake of electric HGVs.**"**

What has surprised you most?

"Many fleets have successfully integrated electric trucks into day-to-day logistics with minimal disruption to schedules, demonstrating that battery-electric HGVs can already handle a range of duty cycles effectively when deployed in the right applications.

One of the biggest surprises has been the speed at which fleets and drivers adapted to operating battery-electric HGVs. Initial concerns around range, charging routines and operational disruption reduced rapidly once vehicles entered day-to-day service. Drivers have embraced the trucks far faster than expected, with consistently positive feedback around drivability, comfort and reduced fatigue.**"**

What has been the reaction to the vehicles?

"In short: major customers and operators deploying Renault Trucks' battery-electric HGVs – from GXO/Shepherd Neame, XPO and Wincanton – have reacted positively operationally and strategically, reporting environmental benefits, driver acceptance, and alignment with sustainability goals. At the same time, broader industry feedback highlights the many benefits that battery-electric HGVs bring to the existing fleet and their driver population.**"**

What challenges do your customers face in adopting eHGVs?

"We believe the following key challenges in adopting battery electric HGVs will need to be addressed:

- Although strategic targets (e.g., 2035/40 for zero-emission HGVs) exist, some regulatory details and incentives remain unclear, especially around long-haul markets and infrastructure support. This uncertainty makes long-term investment decisions harder for both OEMs and customers. Longer term certainty of grants or subsidies for battery electric HGV purchases and depot charging installations would help close the cost gap versus diesel.
- VAT reform on commercial electricity used for charging could further improve operating costs.
- A national strategy for HGV charging – with high-power chargers on major corridors and at key distribution hubs – would instil confidence in operators and improve the situation for long haul operations around the UK.
- Faster planning approvals and grid connection support would help charge point deployment scale up more quickly."

What are Renault Trucks' plans for the future?

"Renault Trucks has committed to a complete transition away from fossil fuels over the next two decades. This means:

- All vehicle ranges will be 100% fossil-free by 2040 – including heavy goods vehicles across all market segments.
- In the near term, Renault Trucks aims to reach 30% electric sales by 2030.

This transition reflects a long-term vision where electric mobility is the primary solution to reduce carbon emissions, improve air quality, and support sustainability goals for transport operators."

What advice do you have for HGV operators?

"A phased deployment – for example, electrifying a few key vehicles or routes first – helps customers gain real operational experience, refine charging routines and understand true total cost of ownership. Pilots also deliver insightful operational data that builds confidence and prepares teams for broader electrification. Early participation in programmes like Electric Freightway or eFREIGHT 2030 shows this approach works well in practice.

For many customers, electrification is not just about vehicles; it's about meeting environmental commitments, corporate sustainability targets and customer expectations. Integrating electrification into wider ESG reporting and strategy adds value beyond fleet operations.

In essence: Renault Trucks would advise fleets to plan thoughtfully, start pragmatically and iteratively, and prepare both people and infrastructure to ensure a successful transition to electric heavy vehicles. By doing so, fleets can realise environmental benefits, operational insight and long-term cost advantages as their electrification journeys progress."

DAF Trucks is the market leading commercial vehicle manufacturer in the UK and a key partner in Electric Freightway.

We asked **Louis Jones**, EV and Connected Services Director, what DAF Trucks has been doing as part of the project, and what the company has learnt along the way.

"Our role within Electric Freightway has been to provide our New Generation DAF Electric range to operators, working alongside our in-house funding provider PACCAR Finance to provide flexible funding options over the course of the project.

Through this journey, we have completed route simulations to evidence vehicle capability, trained our dealer network, supported with driver training, enabled our data provision via PACCAR Connect, and much more. It has been a company-wide initiative to ensure that we as a business and dealer network are ready to accelerate the transition to electric HGVs. We will have delivered 60 vehicles in total, across a number of different use cases and operations, including Royal Mail operating from two Super Hubs, and supporting both BCA and Fergusons Transport at Nissan's UK production facility."

What was DAF's motivation for being involved in Electric Freightway?

"DAF is a leading manufacturer of HGVs, with a focus on decarbonisation. We saw the ZEHID programme, and Electric Freightway as part of that, as a huge catalyst for the industry to demonstrate how zero-emission HGVs are absolutely viable. We had engaged in the Battery Electric Truck Trial (BETT), working in collaboration with Innovate UK, which was a great opportunity for us to work closely with operators to trial electric HGVs. ZEHID and Electric Freightway was the natural next step and has provided the perfect combination to support some of our key customers with our electric XDs and XFs."

What has been the reaction to the vehicles?

"Feedback from drivers has been fantastic – I've not yet met a driver who has driven an electric HGV that hasn't absolutely loved it. There is a real focus from the transport teams on embedding the trucks into their operations, and we have developed PACCAR Connect considerably during the project to ensure that operators can view their trucks in real time.

It certainly feels like a number of the operators within Electric Freightway see this project as a springboard, and their involvement in the project will lead into further electric HGV procurement outside of the ZEHID programme."

What has surprised you most?

"The engagement of operators in wanting to maximise the efficiency and performance of their trucks has really surprised me – we have seen some operators really pushing their trucks to the limit, achieving well over 300 miles range on a single charge.

We have also seen just how important driver training is to getting the most out of electric vehicles, potentially more important than for diesel vehicles, so this is something we will continue to focus on as part of our offering."

What challenges do your customers face in adopting eHGVs?

"The beginning of 2026 has seen a lot of focus on the decarbonisation of HGVs, following the increase to the Plug-in Truck Grant limits (up to £120,000), as well as a consultation on the regulatory framework in the UK of the decarbonisation of HGVs. It is clear from the industry's response to the improved Plug-in Truck Grant funding, that there is a real appetite from operators to move to electric once the conditions are right.

The majority of focus so far has been on push factors, such as VECTO (Vehicle Energy Consumption Calculation Tool) which is a CO_2 reduction target for manufacturers, however, pull factors are key to support the adoption further. Pull factors include increased weight dispensation for electric vehicles, zero emission zones, or subsidies, that create an environment in which moving to electric is the obvious choice."

What are DAF's plans for the future?

"We have already announced a number of additions to our project offering, such as XG and XG+ cabs and three-axle tractors. This will continue as we work to provide an electric alternative for every operation. We will also continue to expand and improve our services offering, such as PACCAR Connect and the connectivity of our vehicles."

What advice do you have for HGV operators?

"My advice would be to start early and take part in the learning that is invaluable when working through a period of such intense change.

One strategy in such times can be to sit back and wait for technology to improve before adopting, however, I think there are far more benefits in adopting early and embracing change and learning across your organisation."

A global perspective

The UK is not alone in making the move to zero-emission HGVs. Other countries are taking a range of measures to stimulate uptake, with varying degrees of success, and serve as a useful guide when developing UK policy.

Europe

According to the European Automotive Manufacturers' Association (ACEA) [xi], 6,372 electrically chargeable heavy (18-tonne+) trucks were sold in Europe (EU, UK, Norway, Switzerland, and Iceland) in 2025, representing just over 2% of heavy truck sales, a 48.9% increase on 2024.

Uptake varies throughout the region, with Switzerland, Norway and the Netherlands leading in percentage terms (Figure 82).

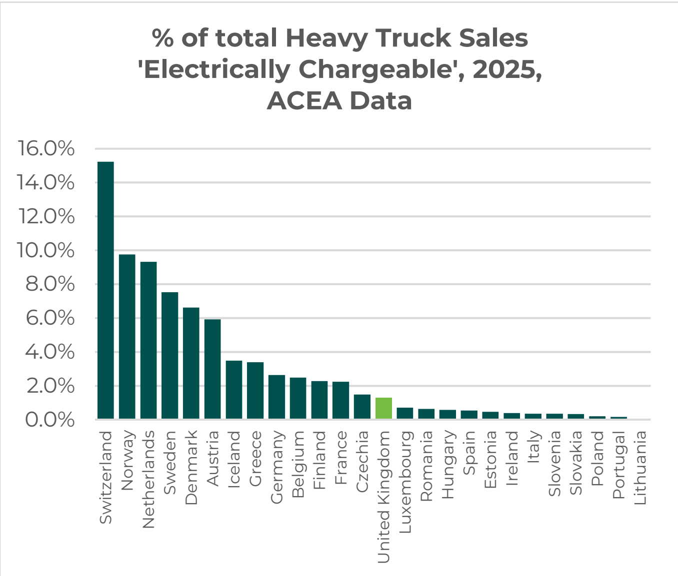

Figure 82 – Percentage of electrically rechargeable heavy truck sales, 2025, by country

When we look at the number of eHGVs sold in each market (Figure 83), the pattern changes, with Germany taking the lead, on account of its greater market size, and the UK moving to fifth position.

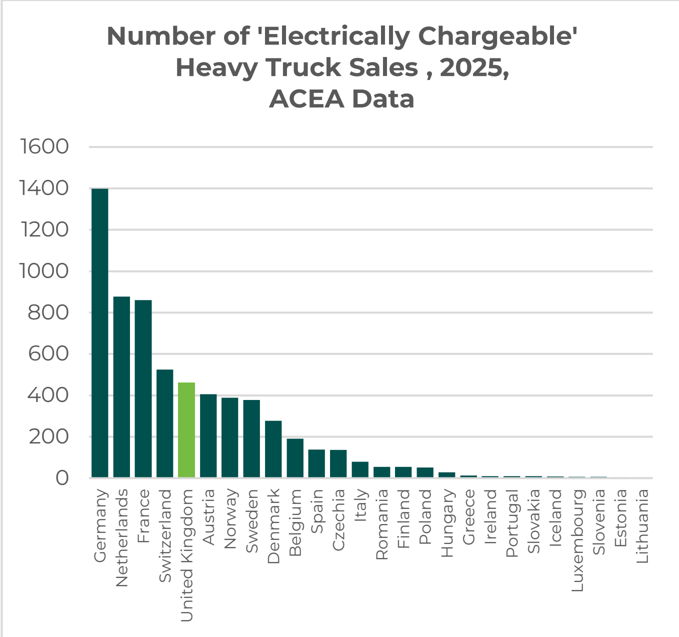

Figure 83 - Number of electrically chargeable heavy truck sales, 2025, by country

Regional incentives

In the EU there are two main legislative policies driving the implementation of zero-emission HGVs and associated infrastructure:

Regulation (EU) 2019/1242 and VECTO (Vehicle Energy Consumption Calculation Tool) certification sets decarbonisation targets for vehicle OEMs, with significant fines levied for non-compliance. New, longer-term targets were recently added through Regulation (EU) 2024/1242.[xii]

Manufacturers had to reduce the emissions of the vehicles they manufacture in 2025 by 15%, against a 2019-21 baseline. This increases to 45% in 2030, 65% in 2035 and 90% in 2040, requiring an increasing proportion of zero-emission vehicles to be sold.

AFIR (the Alternative Fuels Infrastructure Regulation), has set requirements (and provided funding) for eHGV charging infrastructure across Europe's strategic road network.

Under the regulation, fast-charging hubs with a minimum capacity of 350kW are required every 60km on the core TEN-T road network, and every 100km on other key routes by 2030.

Significant progress has been made in delivering the network, with 2,988 eHGV charging stations across 937 locations in Europe[xiii].

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In addition to regional initiatives, several European countries have implemented their own plans for infrastructure as well as subsidies and incentives aimed at operators of eHGVs. These vary considerably by country and some of the more successful rollouts so far come from countries that are also leaders in electric car take up – such as Norway and Sweden, as well as some smaller countries like the Netherlands, Austria and Switzerland.

Many of the stronger incentives come from countries with road tolls. For example:

Switzerland, where the heavy vehicle toll can cost around CHF280 (approximately £270) for a cross-country journey[xiv]. The toll is waived for eHGVs until 2029. As a result of this and other programmes subsidising infrastructure for small businesses, the country has registered the highest eHGV adoption in Europe in percentage terms.

The **Netherlands** has taken a vehicle subsidy approach, tiered by organisation. AanZET, a scheme paid for by the country's truck toll, provides subsidy ranging from 11.1% (max €43,900) for large companies, up to 21% (max €115,200) for small and non-profit enterprises. Each entity can apply for 10 trucks to be subsidised in each funding round.

While **Germany**'s uptake has been small in percentage terms, its early subsidy scheme was one of the most successful in terms of number of vehicles on the road. The direct vehicle subsidy was curtailed in 2024, though toll exemptions were recently extended until 2031, reducing operating costs by approximately €0.30/km.[xv]

The German Government has recently planned a €1.6bn investment to support the deployment of 1,410 charging points at around 130 sites on its motorway network, while a broader strategy calls for 350 eHGV charging nodes nationwide[xvi].

Norway's high uptake is driven by some of the most ambitious zero-emission HGV targets, planning to electrify 50% of HGVs by 2030.

Sweden's climate premium refunds part of the difference between electric and diesel vehicle prices, with larger grants for smaller businesses[xvii].

China

As with electric cars, China is the global leader in eHGV implementation with 22% of HGV sales already being electric[xviii] – this is expected to reach between 50 and 80% by 2028.

Positive TCO is the main driver in China, with lower electricity prices (averaging less than £0.10/kWh) making eHGVs a cost-effective choice. A scrappage scheme[xix] is also in place to encourage the replacement of older trucks with eHGVs.

The country has taken a different technological approach to much of the rest of the world, with battery swapping becoming widespread as an alternative to charging at depots and public sites. This technology brings advantages in terms of vehicle uptime, ability to align charging locations with power availability and lower vehicle CapEx. It does, however, require significant investment in infrastructure and services, together with compatible vehicles. Around a third of Chinese eHGVs are capable of battery swapping and the market is becoming increasingly standardised with CATL's 75# pack[xx] bringing economies of scale.

In general, Chinese vehicles and OEMs are different from those available in other global markets, with Sany, FAW Jiefang and XCMG market leaders[xxi] and more than 11 domestic companies recording over 3% market share for eHGVs, though some Chinese manufacturers are beginning to look to global markets for growth.

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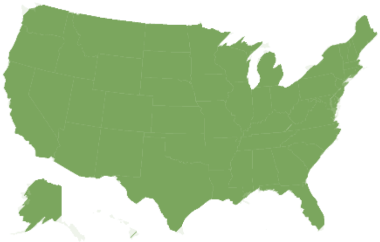
United States



Trucks in the US market routinely cover much longer distances compared to those in the UK and most European countries, so different solutions are needed for long- and short-haul operations. There have been several trials, and eHGVs have performed well in short distance markets like urban distribution and drayage[xxii].

The most high-profile vehicle in the market has been Tesla's Semi, which has been in limited production since 2022 and is being trialled by a number of operators, with volume production beginning in 2026.

Overall, market development has been impacted by rescinding support for local eHGV production, coupled with threatened tariffs on imports. Subsidies for vehicles (through the Qualified Commercial Clean Vehicle Credit[xxiii]) and infrastructure (Clean Heavy-Duty Vehicles Grant Program[xxiv]) ended in September 2025.

However, despite the pressures faced by the industry, 11 States [xxv] have aligned their environmental rules with California's ACT (Advanced Clean Trucks) legislation, with tiered dates for adoption of zero-emission vehicles between 2024 and 2035. The 2035 requirements call for between 40% and 75% of sales to be zero-emission vehicles, depending on vehicle class.

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10 What challenges still lay ahead?

While we have shown that eHGVs can be successfully and economically integrated into some operations, it's clear that this is not currently the case for all hauliers or routes. Relatively small changes in costs, can make a significant difference to the financial case and a number of barriers need to be overcome if eHGVs are to be adopted across the industry by 2035-40.

Powering the transition

Cost of electricity vs diesel

An ongoing issue is that, while there are long-term predictions for electricity price decline due to increased use of renewables, electricity prices have remained stubbornly high, with average prices for businesses over twice those of eight years ago[xxvi]. Meanwhile, diesel prices have largely recovered from peaks seen at the start of the war in Ukraine and, before the recent increases, had seen little inflation over the same period[xxvii] (Figure 84).

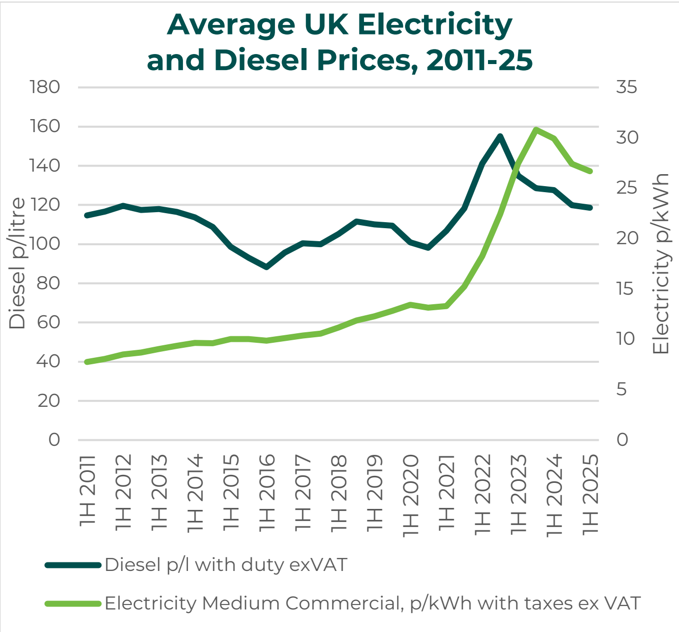

Figure 84 - Average UK Electricity and Diesel price trends, Department for Energy Security and Net Zero Data

With fuel or power being the biggest cost for fleet operators, these prices have a huge impact on TCO and can make investment in eHGVs more difficult to justify.

UK electricity costs for commercial customers are amongst the highest in the world. Figure 85 shows how UK electricity prices for medium sized commercial customers are around 25% higher than the nearest EU comparator and almost twice the regional average[xxviii].

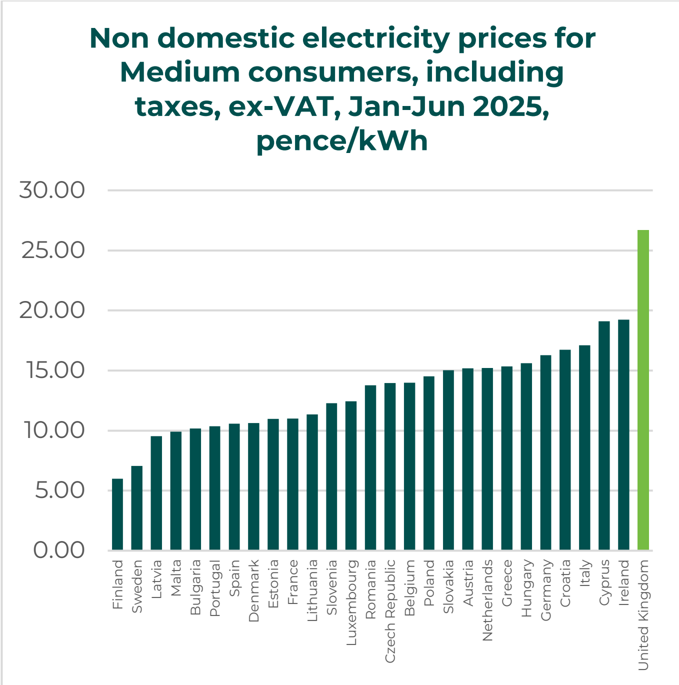

Figure 85 - Comparison of European non-domestic electricity prices. Department of Energy Security and Net Zero Data

Lower prices can be obtained through negotiating time-of-use tariffs, or providing services such as demand response but, as discussed earlier in the report, many hauliers lack the expertise and flexibility needed to take advantage of these types of agreements.

Policy measures that harness the lower cost of renewable generation to help reduce the cost and volatility of electricity to make it more predictable are therefore key to making electrification sustainable for fleets.

The National Energy System Operator's (NESO) future energy scenarios[xxix] suggest the cost of electricity to the economy could halve by 2050, despite growing demand, as fossil fuels are pushed out of the energy mix. However, this decrease is not expected to happen immediately, with a short-term increase in capital costs needed before the benefits of reduced fuel costs is realised over the longer term.

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As long as high electricity costs persist, other incentives are likely to be needed in many eHGV use cases.

Understanding the full cost

The cost of a unit of electricity isn't the end of the story, however. Fleets installing their own charging infrastructure are faced with significant capital costs, together with higher ongoing connection charges that need to be considered as part of the total cost of operating eHGVs. Together, these power costs make operating eHGVs in the UK a less advantageous proposition compared to that in some other countries.

Even finding information on the potential ongoing cost can be challenging, with connecting customers often hit with the surprise of significantly higher bills.

The new Government Depot Charging Scheme was opened for application on 25 March 2026, and will provide significant support and incentive for the capital costs on installing chargers in depots for hauliers considering adding eHGVs to their fleet.

The impact on public charging provision

Operators of public sites face similar cost issues. High site set up costs, coupled with ongoing charges for large connections, mean that in the short term, without high utilisation, the cost of delivering each kWh of power is high. This can result in high costs for users, which in turn may make public charging less attractive, unless the costs are absorbed by the CPO.

Outside of ZEHID there has not yet been significant funding made available for public charging facilities for HGVs. While key industrial sites with high demand may make commercial sense sooner, targeted support is likely to be necessary to deliver a comprehensive nationwide network that meets operators' needs.

Getting electricity to where it is needed

Cost of power is irrelevant if you can't get a connection to the grid. Throughout the project, one of the key stumbling blocks has been the availability and timeline for connections.

This is very site specific, with some sites being able to connect quickly at a lower cost, while others could wait for several years and face a multi-million-pound connection cost, or a timeline stretching into the 2030s. As a result, the cost and practicality of electrification can vary dramatically between different operators and may be of such a prohibitive scale that smaller hauliers can't consider electrification due to matters largely outside of their control. Some hauliers may even need to consider moving sites if they want to electrify.

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The Government, Ofgem and the NESO are taking a range of short and long-term actions to ensure electricity meets future demand, as identified in the Clean Power 2030 Action Plan[xxx].

This includes a programme of connections reform measures aimed at reducing delays, such as moving to an approach based on readiness and strategic alignment. New planning processes are also being put in place to identify future electricity generation and demand requirements for the long term (at least 2050).

Flexibility and load management

The potential load on the grid from eHGVs, together with other sectors that are expected to rapidly decarbonise, is predicted to be huge.

Hauliers can also be part of the solution. Some challenges can be resolved through intelligent design, such as managed smart charging, balancing of depot and charging loads, battery energy storage, or through collaborative arrangements like infrastructure sharing on industrial sites. This needs to be encouraged if there is to be a cost-effective transition.

There are also smaller changes that can be made to make life easier for the whole industry, such as better standardisation of DNO connection application processes and requirements, in order to make the process faster and more efficient. DNOs also offer a range of options that can help to accommodate more customers on constrained supplies, such as timed connections, non-firm connections and forms of flexibility services. While these types of solutions won't be suitable for everyone, they need to be offered more proactively if they are to be effective. DNOs also need to be able to invest in the engineering resources needed to meet rising demand from connections.

However, some barriers will remain, and investment in network reinforcement is going to be needed to support such a seismic shift in how the transport sector operates.

There are positive signs, such as NESO planning its transitional Regional Energy Strategic Plan (tRESP)[xxxi] to guide DNOs in their investment planning, based on strategic energy requirements. However, the 2028-33 timeline for any such investments does not necessarily align with the need to start decarbonising the transport sector at pace, or the commercial requirements of operators wanting to start offering services with zero tailpipe emissions to meet customer demand.

Getting sites built

While the issue of power connections is maybe the most high-profile barrier to getting charging infrastructure built, it's by no means the only limitation, as our third report covered in some depth.

Planning processes can be lengthy and costly. Local authority planning resources are stretched and often have little experience in eHGV infrastructure. Some changes have been made to simplify this for EV charging, through permitted development, though the larger scale of eHGV charging infrastructure means that this often does not apply. Regulation needs to keep up with the needs of the industry and requires coordination so that policies created with positive intentions, like biodiversity net gain requirements, don't inadvertently delay decarbonisation.

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Parking for eHGVs is a more strategic planning issue. For a long time, there has been under-supply of HGV parking across the UK's road network. Without a plan for alleviating this capacity issue, replacing bays with lower density eHGV charging risks exacerbating the problem further.

Weight limitations

As mentioned throughout the project's reports and highlighted in several of the interviews in Section 03, weight limitations are a significant issue faced by operators considering, or operating eHGVs.

While the majority of journeys do not exceed the capacity of a 4x2 eHGV, the number of duties that do is not insignificant. This makes it difficult for eHGVs to compete with diesel trucks, where operators have the flexibility to use the same vehicle across a wide range of payloads.

Some operators, such as those dealing with bulk materials, will need to transport heavy payloads on a daily basis, and at the moment would have to make significant and costly operational changes to adopt eHGVs across their fleets.

Weight limitations can also add additional complexity into eHGV decision making – such as having to trade off the additional range from a larger battery against the associated reduction in payload capacity.

Three key problems face eHGV operators:

- While there is a derogation for maximum permitted vehicle weight of 2 tonnes, this is typically less than the additional battery weight and is capped at 44 tonnes.
- There is no derogation on drive axle weight limits, resulting in the maximum permitted vehicle weight often being unachievable.
- Vehicle length restrictions prevent the use of 6x2 or 6x4 eHGV tractors, due to their longer chassis.

Limitations on vehicle weight and length exist for good reason. The axle weight is directly related to the impact on the road surface, while the maximum vehicle weight is a key consideration in the design of bridges and structures. As a result, any change needs to be carefully considered and the potential costs weighed against the benefits of electrification versus the alternative of more vehicles on the road.

Some changes may be easier to implement, such as changes to vehicle length restrictions. The recent introduction of longer semi-trailers (LSTs) provides a precedent for allowing longer vehicles with negligible impact on safety.

Managing costs

Vehicle costs

An eHGV typically costs two to three times more than a diesel truck. While lower running costs can offset this over the life of a vehicle in some cases, the high upfront cost can be a significant barrier to adoption, especially for smaller operators with limited access to capital.

The cost of eHGVs is primarily driven by the large amount of battery storage integrated into the vehicles. The cost of batteries has continued to fall as technology advances, and next generation trucks may take the opportunity to simplify their architecture, removing unnecessary components, but it's unlikely that eHGVs will ever be as cheap as their diesel counterparts in the foreseeable future.

More operational data may also help to reduce the cost of operating trucks. Due to limited experience, OEMs are having to take conservative estimates when it comes to the cost of repair and maintenance over the vehicle lifetime – this can result in higher lease costs and more limiting warranty terms.

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Financing the transition

Subsidies for the purchase of eHGVs generally come in annual cycles, with continuation into the next year often not announced until the previous year's subsidy is about to expire.

Recent subsidies, such as the depot infrastructure funding and the increase in vehicle grant to £120,000 are generous and have been welcomed by the industry, but the short timescales for implementation have limited which operators can take advantage of them – often benefitting those that have already decided to make their investment.

The issue of short grant timescales has recently been addressed by the new grant scheme. On 25 March 2026 the Government announced £1bn in funding through the Zero Emission Truck and Van grants and the Depot Charging Scheme, to support the rollout of zero emission HGVs and vans up to 2030. The grants provide significant support for the purchase of new eHGVs as well as the installation of supporting charger infrastructure. The longevity of the new grant scheme will help eHGV manufacturers and operators gain confidence in investing into the growing eHGV market.

As we move forward, subsidies are still likely to be required. In order to achieve value for money, grants could also be targeted to overcome specific structural barriers encountered by operators, such as:

- Supporting SMEs that lack access to finance and scale to fund their own infrastructure
- Targeting areas where poor connectivity or congestion results in high upgrade costs
- Encouraging sharing of sites to achieve higher utilisation

Small and medium enterprises are likely to have particular difficulties if the price of purchasing and operating vehicles increases, with most operating on very thin margins and with limited access to finance.

Many smaller businesses purchase their vehicles on the second-hand market. This is likely to continue with eHGVs, so small hauliers are likely to transition to eHGVs later. They will, however, still need support. Access to charging infrastructure is likely to be a major challenge, and public/shared infrastructure is likely to be even more important. It's vital that businesses that rely on public and shared infrastructure don't become uncompetitive as a result of high charging costs.

Prioritising what can be done today

Finally, Electric Freightway has shown that there are many routes that can be successfully electrified now. eHGVs have performance advantages against diesel on slower, more urban routes. These are also the routes that potentially benefit the most from improvements in local air quality and noise. There are also some routes, like overnight tramping and heavier loads, that are much more challenging.

This diversity of routes and operations needs to be reflected in policy, supporting operators who can decarbonise their fleets now, while encouraging the development of the technologies and infrastructure needed for more challenging routes in time for these sectors to transition in the future.

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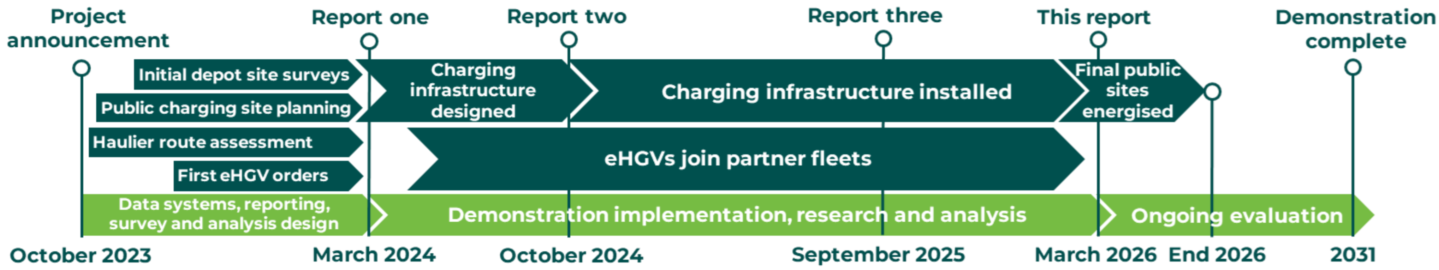
11 What comes next?

While the implementation stage of the project is drawing to a close, this is not the end of the road for Electric Freightway. Work continues to complete the Electric Freightway public charging network. All funded vehicles and infrastructure will continue to report data for a period of five years, providing an insight into the lifetime cost and performance of eHGVs.



Completing the infrastructure

As detailed in this report, the project's first depot site was unveiled in July 2025, and the last of the 12 sites are now being completed.

The public sites have taken longer to complete, largely due to delays in the electrification and planning processes. The first two locations opened in January 2026 with the full network following throughout 2026 as detailed in Section 04.

The ongoing demonstration

As mentioned throughout the report, we've only just begun the demonstration. Our four reports have featured early insights from the implementation period. As they bed in we expect future findings to more accurately reflect hauliers' day-to day operations.

So far, our haulier partners have demonstrated how to successfully introduce eHGVs to their fleets. Over 3 million kilometres have been completed with zero emissions at the tailpipe. Some partners have made use of public and depot infrastructure to extend their operations and our TCO modelling has shown how eHGVs can be cost competitive with diesel in many situations.

However, so far this has been demonstrated with limited infrastructure in place and eHGVs have travelled significantly less each week than their diesel counterparts. Now that we've built the foundations, and high-speed infrastructure is being delivered, operators are becoming more confident in the abilities of their vehicles. As a result, we expect the coming years of the demonstration to be able to thoroughly test eHGVs across a wide and growing range of routes and use cases.

What happens next?

Ricardo has been appointed to collect, analyse and share data throughout this period across all three Zero Emission HGV and Infrastructure Demonstrator (ZEHID) projects.

Data will be shared with the Department for Transport in order to inform evolving government policy for zero-emission HGVs and infrastructure, with insights published to inform the wider industry.

Keeping up to date

Progress on Electric Freightway and all of the Zero Emission HGV and Infrastructure Demonstrator projects will continue to be shared by Innovate UK on its website at:

https://iuk-business-connect.org.uk/programme/zero-emission-heavy-goods-vehicles-and-infrastructure/

Or sign up for the mailing list at:

https://info.iukbc.org.uk/p/2VFU-KDE/zero-emission-hgv-and-infrastructure-demonstrator-mailing-list.

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12 Glossary, References and Links

Acknowledgements

The Electric Freightway team would like to thank all the partners and members of the consortium who have contributed to the demonstration and production of this report.

Glossary

AC	Alternating Current
AFIR	Alternative Fuels Infrastructure Regulation
ANPR	Automatic Number Plate Recognition
BETT	Battery Electric Truck Trial
BEV	Battery Electric Vehicle
CapEx	Capital Expenditure
CCTV	Closed Circuit Television
CNG	Compressed Natural Gas
CO_2/CO_2e	Carbon Dioxide/Carbon Dioxide Equivalent
CPO	Charge Point Operator
DC	Direct Current
DNO	Distribution Network Operator
eHGV	Electric Heavy Goods Vehicle, a zero-tailpipe emission HGV powered by electricity
ESG	Environment, Social and Governance principles
EU	European Union
EV	Electric Vehicle
GCW	Gross Combination Weight, the combined weight of the vehicle, its trailer and the maximum payload it can carry
GHG	Greenhouse Gas
High-power charger	A DC charger capable of charging an electric vehicle at 150kW or over
HGV	Heavy Goods Vehicle, also referred to as LGV (Large Goods Vehicle) or HDV (Heavy-Duty Vehicle). A vehicle with over 3.5 tonne GCW in UN(ECE) category N2 or N3
HVO	Hydrotreated Vegetable Oil
iDNO	Independent Distribution Network Operator
ICE	Internal Combustion Engine
IQR	Interquartile Range
km	Kilometre
kVA/MVA	Kilovolt Ampere/Megavolt Ampere, a measure of apparent power
kW/MW	Kilowatt/Megawatt, a measure of real power
kWh/MWh	Kilowatt hour/Megawatt hour (electricity delivered over 1 hour at 1kW/1MW)
LFP	Lithium Iron Phosphate
LGV	Large Goods Vehicle. An alternative term for HGV
LST	Longer Semi-Trailer
MAM	Maximum Authorised Mass
MSA	Motorway Service Area
NESO	National Energy System Operator
OEM	Original Equipment Manufacturer, a term used to refer to the manufacturer of HGVs and eHGVs
RDC	Regional Distribution Centre
RRC	Rolling Resistance Coefficient
SLA	Service Level Agreement
SME	Small and Medium Enterprises
TCO	Total Cost of Ownership
tRESP	Transitional Regional Energy Strategic Plan
UK	United Kingdom
UN(ECE)	United Nations (Economic Commission for Europe)
VAT	Value Added Tax
VECTO	Vehicle Energy Consumption Calculation Tool
ZEHID	Zero Emission HGV and Infrastructure Demonstrator programme
ZEV	Zero Emission Vehicle

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