

Actions for Accelerating the Decarbonisation of Commercial Vehicles in Wales

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Executive Summary

Zemo Partnership was commissioned by the Welsh Government to assess the policy options to decarbonise the commercial vehicle (CV) sector in Wales utilising the main technology pathways. This report represents the findings of Zemo Partnership, working together with Zemo's members and a broad cross section of stakeholders involved in the freight and logistics sector, which is presented to Welsh Government to consider and respond. This will be followed by further consultations with stakeholders.

The road freight and logistics sector provides the life blood for commerce and trade but is also a significant source of greenhouse gas emissions (GHG), 2MtCO₂e in 2022 which represents 34% of total surface transport emissions in Wales. The decarbonisation of this sector needs to be undertaken in a sensitive and appropriate manner, aligned with the rest of the UK. Zemo Partnership, working in consultation with industry stakeholders in Wales and across the UK, has identified a range of 'no regret' actions that can be taken by Welsh Government and industry today that would support an accelerated decarbonisation of the sector. This package of measures would save 8.4MtCO₂e by 2050 and be highly cost effective with a benefit-to-cost ratio of 5.9 representing a significant benefit over the cost of the package of policy interventions required over the period. In addition, the proposed policy programme would unlock significant operating cost benefits for the commercial vehicle sector in Wales over the period to 2050. Each pound invested in the transition to decarbonising the sector would unlock almost eight pounds of benefit to industry in terms of fuel costs. Cumulatively, this could amount to a £2.1 billion reduction in fuel costs to commercial vehicle operators over the period to 2050 given current energy tax policy.

In 2021 the Welsh Government published the Wales Transport Strategy, setting out Welsh Government's priorities and ambitions. This was followed by the Net Zero Wales Carbon Budget 2 and the National Transport Delivery Plan, aligning its transport strategy with plans to decarbonise the Welsh economy. One of the nine modes of transport covered relates to freight and logistics, which is vital to the well-being of the people and economy of Wales. Developing a sustainable and efficient approach to freight and logistics for Wales, has to be done against a changing UK policy environment. The UK Government's vision for road transport decarbonisation is focused on replacing the internal combustion engine with electric propulsion technology, with the phase-out of non-zero emission Light Goods Vehicles (LGVs) by 2035. Along with a proposed longer phase-out of non-zero emission Heavy Goods Vehicles (HGVs) (under 26t by 2035 and all HGVs by 2040).

Against this background there are both near-term as well as long-term actions that can be implemented to tackle decarbonising commercial vehicles operating in Wales, utilising all the major technology pathways to decarbonisation. Implementation of these actions needs to be driven forward by industry and requires Welsh Government to play an important facilitation role to achieve successful implementation in Wales.

The decarbonisation of the commercial vehicle sector is a process which is already underway, driven initially by legislation at international and national levels, and in the freight and logistics sector by consumer preferences and household brands and will in turn be driven along the supply chain. There will be revenue, cost and brand image benefits which will accrue to industry from the transition to net zero road transport. However, the Welsh freight and logistics sector need to be prepared for this transition, especially SMEs. Welsh Government, working as a facilitator, can help Welsh industry to prepare while tackling climate change and meeting Carbon Budget targets.

Pathways to Decarbonisation

The long-term primary pathway to decarbonising the commercial vehicle sector will be electrification. However, this will take time and there are types of operation where electrification may not currently be a viable option. Therefore, to maximise the decarbonisation of commercial vehicles in Wales, all pathways must be adopted in parallel. Low carbon fuels can decarbonise the existing fleet that runs on fossil diesel, with a role for 'repowering' vehicles in special use cases to zero tailpipe emission. The natural replacement cycle of aging diesel vehicles with new battery electric vehicles will contribute to reduced overall energy consumption and improved life cycle emissions. Hydrogen as a road fuel also has an opportunity to play a role in the late 2030s, once a significant supply of low carbon hydrogen production has been reached.



The Role for Electrification

Electrification of transport provides the most energy efficient solution and greatest GHG saving of zero emission powertrain technologies when using renewable electricity. Electrification of cars is already accelerating along with the deployment of charging infrastructure, which will in turn increase infrastructure availability for vans. However, access restrictions and appropriately designed charging bays remain a barrier. The UK Government's Zero Emission Vehicle (ZEV) Mandate will see a significant number of electric vans deployed in the next 5 years and steps must be taken to support community-based vans which lack dedicated infrastructure.

Trials of larger HGVs are underway but are limited given the significant additional capital cost of electric compared with diesel vehicles today. New innovative financial models could enable an accelerated uptake of vehicles, as proven in the UK's bus sector. With HGV manufacturers expecting around 50% of new HGVs produced in 2030 to be zero emission, there is significant support needed for operators to begin planning the transition through education and upskilling.

Wales has made positive steps in support of the development of Local Area Energy Plans (LAEPs) to support holistic transport and energy planning. This data has been passed over to the DNOs and will influence the Distribution Future Energy Scenarios (DFES) to inform their ED3 planning, where DNOs assess their network for future load growth to identify constraints and plan network investments for submission to Ofgem. however, more detailed operational data, such as demand forecasts and grid impact assessments, is required by Ofgem for the electricity Distribution Network Operators to be allowed to invest in additional grid capacity ahead of need. Coordination between the national Regional Energy Strategic Plan (RESP) and LAEPs will be essential. Power banks, made of second-life battery packs, could be deployed where grid infrastructure is limited to provide an interim solution while grid reinforcement takes place.

The Role for Low Carbon Fuels

To complement the long-term strategy of electrification, Low Carbon Fuels (LCFs) present an affordable decarbonisation solution that can be deployed today with minimal impact to operational procedures, particularly in HGVs where zero emission solutions are not yet available.

The Renewable Transport Fuels Obligation (RTFO) mandates the overall proportion of sustainable road fuels in the UK. Effectively this currently mandates up to 10% in petrol and 7% in diesel. However, there are options to go further as diesel earmarked for use in cars declines, freeing up more biodiesel that could be redirected in the commercial vehicle fleet at higher blends. FAME biodiesel and renewable diesel (HVO) are being adopted for displacement of diesel in HGVs, while biomethane compressed gas trucks are being introduced in long-haul operations due to its well-to-wheel benefits. Increased support for appropriately placed infrastructure will maximise the benefits of LCFs in the next decade.

There will be an extensive diesel fleet continuing in operation through the 2030s and 2040s, so ensuring the RTFO mechanism works for Wales will be crucial to minimising Wales' contribution to climate change and meeting Carbon Budgets.

The Role for Hydrogen

While it is clear hydrogen will be a part of the mix in the future energy system, the role of hydrogen in transport is likely to be focused on applications which are hard to electrify with battery technology. The scale of hydrogen's role will depend on the availability and affordability of low carbon hydrogen, supported by a sufficient, robust refuelling infrastructure to ensure greenhouse gas savings are realised.

There are two primary alternative distribution models for hydrogen: centralised mass production and tanker distribution, or decentralised electrolysis close to refuelling points. There are potential cost and practical benefits to centralised production and distribution of hydrogen especially to locations with limited electricity grid connections. Alternatively, hydrogen can be generated close to refuelling infrastructure locations and can play a role in levelling the load on the electricity grid.

The operational benefits of hydrogen include quick refuelling and the ability to distribute by tanker, analogous to the current diesel fuel distribution model. There are also weight benefits compared to today's battery electric technology, where heavy batteries reduce load carrying capabilities. These characteristics indicate that the role of hydrogen in road transport will be in long-haul HGV operations and applications which are weight constrained.

There is potential for the production at scale of low carbon hydrogen for use in transport, through collaboration with heavy industry that will also require low carbon hydrogen as a pathway to decarbonisation. The utilisation of the significant renewable energy resources in Wales will also provide opportunities for low cost electricity needed for electrolysis of water to produce low carbon hydrogen to supply Welsh industry.

Key Actions

There is an extensive range of innovative and easy, 'no regret' actions that can be taken by Welsh Government and industry today that could facilitate the accelerated decarbonisation of the commercial vehicle sector.

These actions will present a range of new opportunities for the Welsh CV industry and wider economy to capitalise on its existing industrial strengths, its significant renewable energy resource and potential new collaborative partnerships which will improve efficiency, upskill workers, reduce greenhouse gas emissions and improve total cost of ownership.

While achieving price parity for new zero emission vehicle solutions will have the greatest impact on reducing greenhouse gas emissions by 2050, there is a huge role for low carbon fuels to decarbonise the existing diesel commercial vehicle fleet which will operate into the 2040s.

Operators are already reacting to customers seeking to reduce their associated supply chain emissions (Scope 3). This commercial pull is already leading to operators switching fossil diesel with renewable diesel, procuring battery electric rigid HGVs and biomethane articulated HGVs.

Many actions suggested in this report seek to facilitate partnerships, remove barriers, support innovation and educate operators. Importantly these do not require significant capital outlay and can be implemented today.

Welsh Government can facilitate improved access to capital, in particular for SMEs, through working with the finance sector to understand the transition, derisk investment and bring together investees and investors with an appetite for green investment.

Welsh Government can facilitate partnerships between key stakeholders, support 'first-of-a-kind' infrastructure deployment and encourage new innovative financing and business models to give the market confidence in decarbonisation solutions.

A key partnership will be with UK Government; clarity from the new UK Government on a number of policy and regulatory reforms which were unresolved under the last Government is needed. This includes: the Renewable Transport Fuels Obligation, grid connection and processes, vehicle operators' licences etc.

Local authorities can help foster local refuelling or community charging partnerships to reduce complexity for SMEs wishing to decarbonise, using their own fleet decarbonisation as a foundation for engagement. Operators can prepare for the transition to zero emission today, through improved understanding of operations using telematics and rapid improvement of technology. There will be long-term benefits to total cost of ownership and staff satisfaction in the switch to zero emission.

With a significant number of second-hand commercial vehicles registered in Wales, there is an extensive long-term role for low carbon fuels. Renewable diesel (HVO) and high blends of FAME biodiesel are already being deployed today. With greater awareness of the options, operators could make significant emissions savings without significant operational changes.

Biomethane is being deployed in new CNG HGV fleets due to lower costs and lower well-to-wheel GHG emissions, enabling decarbonisation of large 40t truck operations. There are opportunities for domestic low carbon fuel supply chains in Wales to support Welsh farmers and businesses by encouraging production of biomethane or HVO using existing waste feedstocks.

Advanced planning and coordination will be required to prepare local authorities and industry for the impacts of the ZEV Mandate, where 70% of new vans registered in 2030 will be zero emission. This will require significant installations of suitable van and truck charging infrastructure across Wales, with Welsh Government encouraging industry to share infrastructure to maximise utilisation and minimise cost.

A sustained myth-busting and education campaign is needed to raise industry awareness of the rapidly improving technologies and required operational changes to prevent a backlash to decarbonisation.

Reforming planning rules to support, prioritise and speed deployment of low carbon fuel and charging infrastructure will allow industry to act now and get on with decarbonisation.

International trades links through Welsh ports and into England present opportunities to work with multinationals and Irish and UK governments, to ensure Wales can support and benefit from international efforts to decarbonise freight.

Wales has a number of key industries such as petroleum and steel that are developing plans for decarbonisation, including large scale production of low carbon hydrogen. Alongside the growth of offshore wind farms in the Irish and Celtic seas, Wales has opportunities to benefit from increased grid capacity over the coming decades to support the decarbonisation of transport and heat.

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Abbreviations / Glossary of Terms

AD	Anaerobic Digestion
B100	Pure 100% biodiesel / FAME (waste biogenic feedstock) Likewise B20/B30 a blend of 20%/30% biodiesel B7 current standard pump (retail) blend of up to 7% biodiesel (93% fossil diesel)
BEV	Battery Electric Vehicle
CAPEX	Capital Expenditure
CAZ	Clean Air Zone (See also Low Emission Zone and Ultra Low Emission Zone)
CNG	Compressed Natural Gas
CO ₂ e	Carbon dioxide equivalent
CCUS	Carbon Capture and Utilisation / Storage
DNO	Distribution Network Operator
DESNZ	Department for Energy Security and Net Zero, UK Government (formerly the Department for Business, Energy & Industrial Strategy aka BEIS)
DFT	Department for Transport, UK Government
e-FUEL	A fuel produced using renewable electricity and sources of carbon, also known as Power to Liquid (PtL)
EV	Electric Vehicle (See also BEV and FCEV)
EVSE	Electric Vehicle Supply Equipment – Charge points and other associated equipment
FAME	Fatty Acid Methyl Esters
FCEV	Fuel Cell Electric Vehicle – Mostly using Hydrogen as a primary fuel to generate electricity onboard a vehicle to provide charge a battery and power electric motors.
GHG	Greenhouse Gas Emissions – Primarily Carbon Dioxide, but includes other gases, such as methane.
HGV	Heavy Goods Vehicle
Ηνο	Hydrotreated Vegetable Oil – a type of renewable paraffinic diesel, typically meeting the requirements of BS EN 15940. Can be used as a "drop-in" fuel in conventional diesel engines, without the need to refit or upgrade the fuel system, either in its pure form or as blend with fossil-diesel.
ICE	Internal Combustion Engine
LCF	Low Carbon Fuel - fuels that offer GHG savings compared to fossil fuels on a whole life cycle basis
LGV	Light Goods Vehicle

LNG	Liquified Natural Gas
MPAN	Meter Point Administration Number – the "ID number" of an electricity meter.
NRRM	Non-Road Mobile Machinery (e.g. generators)
OEM	Original Equipment Manufacturer – the vehicle manufacturer
OPEX	Operational Expenditure
OZEV	Office for Zero Emission Vehicles
PHEV	Plug-in Hybrid Electric Vehicles
PLV	Powered Light Vehicle – L-Category vehicles including mopeds, motorbikes and quadricycles.
RCF	Recycled Carbon Fuel – used plastic wate turned into fuel
RDF	Refuse Derived Fuel (biomass fraction)
RED II	Renewable Energy Directive II, a legal framework for the development of renewable energy across all sectors of the EU
RFAS	Renewable Fuels Assurance Scheme, managed by Zemo Partnership
RFNBO	Renewable Fuels of Non-Biological Origin (can include hydrogen)
RTFO	Renewable Transport Fuel Obligation - UK Government's low carbon fuel policy for reducing GHG emissions from road transport
тсо	Total Cost of Ownership - refers to the lifetime cost of purchasing an asset. In simple terms, it encompasses the total monetary cost associated with an asset from initial planning to its eventual disposal. TCO provides a more comprehensive view beyond just the initial purchase price.
ттw	Tank-to-Wheel. TTW emissions are generated when driving the vehicle. For renewable fuels, TTW emissions are not the same as the emissions measured from the vehicle tailpipe. This is because the CO ₂ emissions from combustion are offset by the CO ₂ absorbed by the biomass feedstock during growth.
UCO	Used Cooking Oil
VED	Vehicle Excise Duty
WTT	Well-to-Tank. WTT emissions are generated from fuel or electricity production, from the primary energy source to the point of dispensing or charging.
WTW	Well-to-Wheel. WTW emissions are all the emissions generated by a vehicle in- use. This is the sum of the WTT and TTW emissions. This differs from the vehicle life cycle emissions which also include vehicle production and disposal/recycling at end-of-life.
ZEV	Zero (Tailpipe) Emission Vehicle

Introduction

This report provides a summary of Zemo Partnership's investigation into a range of potential actions that can be taken by Welsh Government to accelerate the decarbonisation of vans and trucks.

Zemo has worked with Welsh Government, Welsh stakeholders in the road and energy sector and the wider Zemo Partnership working group membership that include UK and internationally based organisations to inform and shape the actions presented here.

The suggested actions include areas where Welsh Government must work with UK Government to push for UK-wide regulatory changes and complementary actions which require participation and engagement from industry.

The document is aimed at supporting the plan for <u>Net Zero Wales</u> and the wider freight logistics strategy by highlighting decarbonisation options for commercial vehicles (vans & trucks). The actions here can support the decarbonisation of both the public and private sector and help Wales achieve <u>Carbon Budget 3</u> and beyond.

Detailed modelling work to simulate decarbonisation scenarios through to 2040 was outside of the scope of this work. However, Zemo has used an internal high-level model of potential future decarbonisation scenarios and a cost effectiveness assessment to support the actions list and highlight high level wins. The overall aim of the model is to demonstrate the benefits of acting sooner and decarbonising CVs faster.

A detailed presentation of the modelling and cost effectiveness assessment is presented in a supporting Technical Annex Report.



Priorities & Opportunities for Wales

Through an in-depth assessment of the commercial vehicle market in Wales, Zemo Partnership has identified several opportunities that the Welsh Government and businesses could seize upon to facilitate the decarbonisation of the commercial vehicle fleet in Wales.

1. Low carbon fuels, ports and second-hand vehicle market

Commercial vehicle operators in Wales rely heavily on second-hand vehicles, indicating a clear role for low carbon fuels to 2050. The existing import/export of petroleum products through ports such as Milford Haven provides opportunity to improve access and supply volumes to Wales. Renewable diesel (e.g. HVO) is already being imported and could be expanded to accelerate adoption in the wider UK market.

2. Benefits of renewable energy generation expansion to CV sector

Wales has significant renewable energy opportunities through wind and solar farms on land and in the Irish & Celtic Seas. The expansion of the electricity grid to support the expected renewable energy generation capacity will enable easier and lower cost connections to support EV charging hubs and potentially green hydrogen production and refuelling sites. Investments into ports such as Pembroke Dock to support delivery of offshore wind farms can be catalysts for job growth and culture change around deployment of new powertrain technologies.

3. Biomethane & Welsh Agriculture

Biomethane use in long-haul trucks is increasing thanks to well-to-wheel greenhouse gas benefits and favourable total cost of ownership compared to diesel. There is an opportunity for Welsh farmers to benefit from this growing market by generating biomethane from waste through anaerobic digestion. Biomethane can also be used to decarbonise off-road farm vehicles and machinery providing a low carbon heat source.

4. Building on success of LAEPs to improve grid reinforcement

Wales is leading the UK in developing plans for the electrification of domestic heat and transport at a local authority level thanks to Welsh Government funding. Local Area Energy Plans (LAEPs) will forecast the likely increase in energy demand from homes and will inform plans to increase capacity investments in the gas and electricity grids. Wales can build on this initial foundation by including commercial vehicles in energy demand forecasts to better prepare for increased demand on the electricity grid. Welsh Government should ensure coordination between LAEPs and the upcoming Regional Energy Strategic Plan (RESP) from Ofgem to ensure consistent information is used to inform planning for investments to support transport achieve Net Zero.

5. HyHaul hydrogen fuel cell truck trial (ZEHID)

The HyHaul project is part-funded by the Welsh and UK Governments and will trial 30 hydrogen fuel cell trucks and supporting refuelling infrastructure along the M4 corridor in South Wales. This is a good example of leveraging existing Welsh industrial strengths to attract investment from UK Government and private sources to grow the supply chain for green hydrogen and support the decarbonisation of heavy trucks.

6. Centre of Excellence – Developing Knowledge & Skills Base

Wales is already at the forefront of knowledge on decarbonising transport through institutions such as the EV Centre of Excellence at Cardiff University. Building on this expertise across Wales to create centres of excellence to transfer and apply this knowledge into training courses to upskill mechanics and technicians will help build industry confidence in new technologies, promote benefits and accelerate deployment.

Commercial Vehicle Sector in Wales

There are currently around 260,000 LGVs and 25,000 HGVs registered in Wales (DfT, 2024). Annually there are around 18,000 new van and 1,600 new HGV registrations in Wales.

Wales Vehicle Fleet	Car	LGV	Bus & Coach	HGV
New Annual Registrations	~67,800	~ 17,800	~220	~1,600
Total	~1.6 million	~260,000	~9,000	~25,000

Figure 1: Welsh road vehicle parc with new and cumulative vehicle registrations for EVs, 2023 (Vehicle licensing statistics data tables – VEH1103, DfT, 2024)

The total number of vans has significantly increased by 126% from 115,000 in 2000, to 260,000 in 2023, reflecting a similar trend across the UK. Around 97.5% of the Welsh light duty vehicle (LDV) fleet is diesel, with the remaining 2% using petrol and less than 1% battery electric. The Welsh van fleet represents 6% of the total UK LDV fleet.

There has been a smaller increase in HGVs registered in Wales, with 19,200 in 2000, increasing by 30% to 25,000 in 2023. 99% of HGVs registered run on diesel.

Commercial vehicles contribute around 34% of surface transport GHG emissions, with high mileages contributing to a greater contribution per vehicle compared with cars.



Figure 2: Surface Transport GHG emissions in Wales in 2021 (NAEI, 2024)

Role of the Second-Hand Market

On average vans and trucks in Wales are two years older than the average UK fleet. This lag reflects lower rates of new vehicles being registered and a higher proportion of second-hand registrations. This indicates that low carbon fuels will have a greater role to play in Wales than elsewhere in the UK.



Figure 3: Average age of Welsh CV fleet (DfT Vehicle Statistics, 2024)

The role of the second-hand market is particularly pronounced in the Welsh HGV market, with increasing numbers of vehicles registered at 4+ years. The large number of second-hand HGVs presents potential opportunities for repowering to zero emission to reduce costs of ZEVs and reduce life cycle GHG emissions.



Figure 4: Second hand vehicles feature strongly in the Welsh HGV sector (DfT Vehicle Statistics, 2024)

It is important to note that there will be a significant number of vehicles that operate throughout Wales that are not currently registered in Wales and therefore not be reflected in the DfT vehicle statistics.

Decarbonising CVs in the UK Context

As a devolved nation of the UK, decarbonisation of commercial vehicles in Wales will rely on wider UK Government policy and action. Collaboration is key to ensure UK wide policy reflects the needs of Wales.

For example, the Zero Emission Vehicle Mandate for cars and vans is a devolved policy. What this means in practice is that the Welsh Government shares responsibility for it with the UK Government, the Department for Infrastructure in Northern Ireland, and the Scottish Government, and that decisions about the Mandate are taken jointly.

The UK Government is encouraging the demand for zero tailpipe emission vehicles (ZEV) to reduce GHG emissions and improve local air quality.

Through various demand and supply measures, there are national schemes to transition transport away from combustion engines towards zero tailpipe emission powertrains such as battery electric (BEV) and hydrogen fuel cell (HFCEV) vehicles. There are also mechanisms in place to decarbonise the existing combustion fleet using low carbon fuels such as biodiesel (FAME), renewable diesel (e.g. HVO) and biomethane.

Vans

The UK Government provides capital grants through the plug-in van grant of £2,500 and £5,000 for small (<2.5t) and large vans (2.5-4.25t) respectively. Whilst vehicle eligibility requires CO_2 tailpipe emissions of less than 50 g CO_2 /km, most eligible vans are pure battery electric.

Van owners can apply for a £350 discount on the purchase and procurement of a domestic EV charger through the 'Electric Vehicle Homecharge Scheme'. Fleets can apply for support via the <u>'Electric vehicle</u> infrastructure grant for staff and fleets' or 'Workplace Charging Scheme'.

The UK Government legislation currently states that the end date for the sale of new non-zero tailpipe emission vehicles will be 2035. LDV manufacturers are also required to supply a percentage of ZEV vehicles to the UK market based on total vehicle sales, through the ZEV Mandate. Under previous assimilated EU law for cars and vans, there was a requirement on OEMs to meet an average tailpipe emission target of 147 gCO₂/km that applied from 2021–2024. The assimilated law has since been revoked and replaced by the UK ZEV Mandate from 2025 onwards.

ZEV mandate for Vans (<4.25t)

The ZEV Mandate requires van OEMs to supply 10% of new vehicle registrations to be zero emission in 2024, with a target increasing year-onyear to 70% by 2030. Wales has registered around 17,000 new LDVs in 2023. As such, Wales would expect around 1,800 ZEV registrations in 2024. In QI 2024, 227 BEV vans were registered in Wales, 13% of the total expected ZEV registrations for the year (VEH1154 -DfT, 2024).

	2024	2025	2026	2027	2028	2029	2030
ZEV Van Target	10%	16%	24%	34%	46%	58%	70%
Equivalent number of new ZEV van registrations in Wales	1,700	2,720	4,080	5,780	7,820	9,860	11,900
ZEV Car Target	22%	28%	33%	38%	52%	66%	80%
Equivalent number of new ZEV car registrations in Wales	14,900	19,000	22,400	25,700	35,250	44,700	54,240

A much higher proportion of ZEV cars will be introduced due to a higher ZEV mandate target and greater market size. The increasing demand for infrastructure from the car market will ensure that there are many public chargepoints available. However, there is a risk that considerations for vans are lost, given the difference in scale. Ensuring that a significant number of chargepoints are van accessible will be important in encouraging uptake of zero emission vans across Wales.

The sharp increase in number of ZEVs has implications for both grid capacity, lead times for infrastructure procurement and installation, training and skills and zero tailpipe emission ranges that meet operational requirements.

Trucks

The UK Government provides financial incentives for the procurement of trucks through the plug-in truck grant, up to £25,000 per vehicle. The current incentives are not scaled to reflect zero emission range or battery size and there are limitations on the number of plug-in truck grants that can be claimed annually.

Fleets can also apply for support for infrastructure via the <u>'Electric vehicle</u> <u>infrastructure grant for staff and fleets</u>' or 'Workplace Charging Scheme'. However, the current grant is capped at £15k, and only available for EV charging infrastructure for EV charging infrastructure only and do not support hydrogen refuelling or other LCF infrastructure.

The UK Government is currently developing a ZE HGV infrastructure strategy, informed in part by the call for evidence on 'Infrastructure for ZE HGVs and Coaches'. This strategy will be informed by the Freight Energy Forum, a public private partnership created by UK Government to address challenges with deploying infrastructure to support the decarbonisation of freight, including road freight.

UK Government legislation currently states that the end date for the sale of new non-zero tailpipe emission vehicles is 2035 for LDVs (<26t) and 2040 for all vehicles (>26t). However, there is no ZEV mandate for vehicles above 4.25t currently in order to scale the supply of ZEV HGVs, although there is an industry-wide expectation that one will be introduced in the future.

	EU Type Approval	Gross Vehicle Weight (t)	Non-zero emission phase-out date	ZEV Mandate
Van	N1	< 4.25 t	2035	\oslash
Rigid Truck	N2 / N3	4.25 – 12t / 12 – 26t	2035	\otimes
Artic Truck	N3	26-44 t	2040	\otimes

Technological Drivers

The <u>Advanced Propulsion Centre</u> (APC UK) has developed technology roadmaps to guide the automotive industry towards net zero emissions by 2050. The 2024 roadmaps focus on electrification, low carbon fuels, hydrogen, and other key supporting technologies. They outline critical milestones, expected advancements as well as challenges, providing a strategic vision for a zero-emission future.

Electrification is identified as the primary pathway for decarbonising passenger cars and light commercial vehicles in the UK. The APC roadmap emphasises advancing electric vehicle technology, including batteries, motors, and power electronics. Goals include improving battery energy density, reducing costs, enhancing charging speed, and expanding infrastructure. The APC roadmap envisions a fully electrified light duty fleet by 2050, supported by the UK's significant renewable energy resources. Low Carbon Fuels are seen as bridge solutions in the short to medium term for sectors difficult to electrify, like heavy freight. The APC roadmap promotes sustainable production and distribution of biofuels to reduce emissions from existing vehicle engines, while suggesting further research and development of synthetic e-fuels using Carbon Capture and Utilisation (CCU) technologies should be explored.

Hydrogen is crucial for heavy-duty transport and long-haul applications. The APC roadmap highlights advancements mostly in hydrogen fuel cells and pressurised storage technologies. The APC foresees significant growth in fuel cell electric vehicles (FCEVs) in the medium to long term as it offers a viable alternative to battery EVs, providing comparable range and refuelling times as current diesel technologies. The APC focus is on the development of Proton-Exchange Membrane Fuel Cells (PEMFCs) for their efficiency and responsiveness, with Solid Oxide Fuel Cells (SOFCs) considered for niche applications.

Energy Vector Drivers

Low Carbon Fuels

99% of the commercial vehicles in the UK use internal combustion engines that run on fossil fuels. To decrease the GHG impact of road vehicles, the UK Government obligates fuel suppliers through the <u>Road Transport Fuels</u> <u>Obligation</u> (RTFO) to supply low carbon fuels such as biodiesel (FAME) and renewable diesel (e.g. HVO) to displace fossil fuels.

In 2022, around 6.8% of all fuel by volume sold in the UK was deemed sustainable renewable fuel by the RTFO. The RTFO target is due to increase to 14.6% renewable fuels by 2032. (DfT have opened a statutory review of the future of the RTFO scheme in Nov 2024)

The UK Department for Transport (DfT) is developing a 'Low Carbon Fuels (LCF) Strategy' that will look to reform the RTFO to provide greater stability to 2050. Zemo supported <u>a series of stakeholder workshop in 2022</u> to inform this strategy.

The UK Government has since announced a <u>RTFO statutory review</u> call for evidence, which includes a review of future RTFO targets.

Nature of Electricity Grid in Wales

As more sectors electrify, the demand for electricity in Wales is expected to rise significantly. This increase in demand puts additional pressure on the existing grid infrastructure, which is already at or near capacity.

Connecting new (renewable) generation and loads to the Welsh grid can be costly and time-consuming, not only in terms of the supply chain for the physical equipment needed for infrastructure, but also the planning permissions etc.

Efficiency measures to alleviate these grid constraints, such as the use of "Smart charging" and "Smart grids" can help to an extent in the short to medium term, but ultimately the electricity grid will need to be upgraded. There is need for anticipatory investment and strategic planning to ensure the grid can meet future demands. This will require collaboration between the Welsh Government and Local Authorities, Ofgem, the network operators as well as the commercial vehicle operators.

One successful example of this level of collaboration has been in the development of the Local Area Energy Plans (LAEPs) in Wales. Funded by the Welsh Government, every local authority in Wales has, or is process of finalising, a plan for the future energy requirements of their region. Reporting in Autumn 2024, this piece of work should be further developed to incorporate the needs of the commercial vehicle fleet in Wales.



Figure 5: The electricity grid in Wales, reflecting high population density and limited high voltage lines in rural areas. (Source: <u>https://openinframap.org/</u>)

Hydrogen in Wales

The extent of hydrogen's role will depend on the availability and affordability of low carbon hydrogen and the development of robust refuelling infrastructure. Hydrogen could benefit areas with limited electricity grid connections, but large-scale refuelling infrastructure will still need good grid connections for gas compression etc. Hydrogen offers quicker refuelling times and weight advantages over current battery electric vehicle technology, making it particularly suitable for applications where weight is a critical factor, such as long-haul HGV operations.

Wales has opportunities to collaborate with heavy industries and leverage its renewable energy resources for low cost hydrogen production. Hydrogen production for industrial processes is currently carried out across a variety of sites in Wales. Most hydrogen is currently produced as "grey hydrogen" via Steam Methane Reforming (SMR).



However, new "green hydrogen" production facilities, using electrolysis, are starting to come online. For example, the Protium facility in Neath, Port Talbot, plans to scale up production over the next five years to supply green hydrogen to various industries. In December 2023 the UK Government selected two Welsh projects for funding in the first hydrogen electrolysis allocation round (HARI): HyBont in Bridgend which will consist of a 5.2MW electrolyser and solar farm; and the 14.2MW West Wales Hydrogen electrolyser in Milford Haven.

Legislative Drivers

Welsh Net Zero Policy

The graphic below details the greenhouse gas (GHG) emission reductions targets within Wales, with the overall goal of achieving Net Zero in Wales by 2050. Within this are interim emissions targets to 2030 and 2040, focused on a % GHG reduction compared to each GHG's baseline year specified within the Environmental (Wales) Act 2016.

Under advice from the Climate Change Committee, Wales has introduced a series of five-yearly carbon budgets out to 2050. The first Carbon Budget ran between 2016–2020 and equated to 212,933 ktCO₂e. Carbon Budget 1 was achieved, with the total final budget equating to 199,718 ktCO₂e.

Welsh Net Zero Commitments



Figure 6: Welsh Policy Timeline Infographic

Interplay With UK-Wide Policy

The UK is signatory and party to the UNFCCC and other international treaties. However, like transport policy, climate change mitigation and adaptation policy are devolved to Scotland, Wales and Northern Ireland.

The UK Government has set a legally binding target to achieve net zero greenhouse gas emissions by 2050. It focuses on a broad range of policies, including transitioning to renewable energy, improving energy efficiency, and investing in green technologies. While both the UK and Welsh Governments are committed to achieving net zero emissions, their timelines and specific strategies differ, as outlined in the section above. This can have significant impacts on businesses, influencing their operations, costs, and strategic planning.

Businesses across the UK must comply with national regulations aimed at reducing carbon emissions, such as the Climate Change Levy (CCL) and the Emissions Trading System (ETS). These policies can increase operational costs, particularly for energy-intensive industries, but they also drive innovation and investment in green technologies. Companies may face administrative burdens due to the complexity of overlapping policies. However, there are opportunities for businesses to benefit from incentives from both Governments for adopting sustainable practices and technologies.



Modelling and Cost Effectiveness Assessment

Zemo employed a high-level internal model to assess the impact and cost effectiveness of alternative pathways to decarbonising the commercial vehicle sector in Wales. This was developed to give insight to the Welsh Government of likely future outcomes of the action plan developed, based on the existing available evidence base and industry informed assumptions. The key results of the modelling and cost effectiveness are summarised here, with a more detailed analysis provided in the Technical Annex Report.

Modelling Approach

The model is based on the existing commercial vehicle fleet and how its powertrain mix and fuel and energy use may evolve over time to 2050. The basic methodologies and the model's key underpinning assumptions have all been developed with the full co-operation and engagement of the wider project's expert stakeholder community. The approach followed guidance set out in HM Treasury's Green Book and utilised future energy prices published by UK Government.

In outline, a Fleet Model was used to characterise the existing Welsh commercial vehicle fleet, an EV Business Case model was used to project future market demand for BEVs and two Fuel Demand models (one for Wales and one for the UK as a whole) were used to assess the feasibility and effects of accelerating the uptake of low carbon fuels. The outputs of the models provided total user costs, energy consumption and GHG emissions for each decarbonisation pathway.

The final step was to combine the key outputs together to assess the likely cost-effectiveness of high-level policy interventions (assessed as financial incentives) to achieve the fastest plausible uptake of both new BEV and low carbon fuels (LCFs) within the legacy fleet. An assessment was also made for the potential GHG benefit from hydrogen fuel cell electric vehicles (HFCEV), but a full cost effectiveness wasn't calculated due to lack of future data sets for hydrogen provided in the Green Book.



Figure 7: Model Approach Diagram

For the purpose of assessing the suitability and likely adoption of different decarbonisation pathways from 2025 – 2050, use cases were created for vans, rigid and articulated trucks based on age and average annual mileage. Based on UK average diesel fuel consumption and mileages, each use case was allocated a proportion of the total diesel fuel consumed in Wales. Overlaying the current market trends and future possible decarbonisation pathways onto these use cases provides an indication as to where emissions savings are possible today and where actions can be taken to increase emissions savings in the coming years. Each use case was assessed for its potential to decarbonise through the pathways of electrification, higher blends of biodiesel or renewable diesel and biomethane. Hydrogen for fuel cell vehicles was only considered for the articulated truck use cases.

The use cases developed reflect current trends in decarbonisation, where the greatest GHG saving impact today is from LCFs. The increasing adoption of ZEVs in the 2030s will begin to significantly displace diesel demand in the car and van sector, with slower uptake in the HGV sector, particularly in longhaul high mileage.

Scenarios

To reflect the potential range in the rate of decarbonisation of identified use cases, Zemo has developed 3 sets of scenarios. These scenarios highlight that the greatest GHG emissions savings are achieved through the parallel support for increased supply of LCFs and higher uptake of ZEVs.

Scenario	ZEV uptake	Low Carbon Fuel Supply	
Best Case	Market Enthusiasm	High Ambition	
Intermediate Case	Central Scenario	Mid Ambition	
Worst Case	Market Reluctance	Current RTFO	

The worst case scenario is based on a market reluctance for ZEVs and a limited supply of LCFs into the market. The central scenario represents the most likely trajectories for the uptake of ZEVs, reflecting the suitability of ZEVs in some use cases while in other use cases poor take up due to longer payback period based predominately on high CapEx costs. While the current RTFO increases the supply of LCFS to 14.6% by 2032, the total amount of LCFs will fall as overall volume of fossil fuels decrease as new vehicles are replaced by ZEVs.





Fuel Demand and LCF Demand

Figure 8: Three Scenarios - Diesel fuel demand (top) decreases towards 2050 based on uptake of ZEVs, while GHG savings are maximised by increasing supply of LCFs (bottom) into the market.

The second key output of the Welsh fuel demand model is shown in Figure 9. This shows the extra volumes of renewable diesel fuel that would need to be supplied to the Welsh CV fleet to meet the high ambition scenario, over and above those that would be supplied simply to meet the baseline ambition scenario. The figure also shows the additional tonnages of bio-methane needed under the high ambition scenario.



Welsh CV fleet additional LCF demand in modelled scenarios

Figure 9: Additional renewable fuels needed under high ambition scenario

EV uptake and Electricity Demand

The third and final set of key outputs from the Welsh fuel demand model are shown in Figure 8. The three graphs illustrate how the model projects new sales of battery electric vans, rigid HGVs and articulated vehicles (tractor units) would evolve in Wales under the three market attitude scenarios. These numbers have been derived by converting the model's projected drops in fuel demand into rising electricity demand, and then using the Welsh CV fleet model new vehicle archetypes to estimate how many battery electric vehicles would need to enter the fleet each year to consume that amount of electricity. The graphs project forward to 2037; the electrification model discussed in the following section indicates that financial support mechanisms would not be needed for electrification under any scenario after that date and hence post-2037 sales volumes are not needed for the cost effectiveness assessments.



Implied annual new BEV sales in three scenarios

Figure 10: New BEV sales volumes under modelled market attitude scenarios

GHG potential savings

The first of these is shown in Figure 9. This displays the projected Well-to-Wheel (WTW) GHG emissions under two baseline scenarios (both assuming no increases in existing RTFO targets but using two alternative scenarios for ZE market attitudes) and under the modelled fastest ("target") net zero pathway (combining high ambition LCF policies with the ZE market enthusiasm scenario for BEV uptake). The WTW emissions for the target pathway are also split to show the relative contributions from burning fossil diesel and charging batteries with electricity, assuming grid-average carbon intensities as projected by the Department for Energy and Net Zero (DESNZ), and assuming that all ZE vehicles are battery electric.



WTW GHG Emissions, ktCO,e (High Ambition LCF & ZEV Enthusiasm pathway)

Figure 11: Well-to-Wheel GHG emissions under baseline and target net zero pathway scenarios

The WTW GHG emission savings of the net zero pathway, combining high ambition LCF policies with the ZE market enthusiasm scenario for BEV uptake, were calculated for each year from 2024 to 2050. The cumulative sum of GHG savings from these is calculated to be 8,381 tCO₂e, this is also shown in 5-year periods below.

In order to calculate the cost benefit of the policy the GHG benefit is transformed into a monetary value using the approach set out in the HM Treasury Green Book. The prescribed carbon values in \pounds/tCO_2e for each year were used to calculate the value of the carbon savings. This was then discounted using the prescribed discount rate of 3.5% per annum to calculate the net present value (NPV). This was done for cumulative savings and the savings attributed to each 5-year period.

	2024 - 2027	2028 - 2032	2033 - 2037	2038 - 2042	2043 - 2047	2024-2050 cumulative
GHG WTW (ktCO₂e)	238	1,257	2,885	2,888	1,114	8,381
GHG WTW NPV (£mil)	57.3	276	574	524	183	1,615

Policy Cost & Cost Effectiveness

The effective policy cost of the combined actions required to shift the market from the reluctance scenario to the enthusiasm scenario were estimated by the capital expenditure (CapEx) and operational expenditure (OpEx) support required to ensure parity in total cost of ownership between diesel and the alternative technology pathways.

For technology pathways which are dependent on a vehicle with a higher upfront capital cost, such as battery electric, biomethane and hydrogen vehicles, the current CapEx differential between diesel and the alternative technology was calculated and the time over which that CapEx would reduce.

This is also complemented by the cost of shifting the market from the existing supply of LCFs under the current RTFO to mid or higher supply volumes, based on a presumed persistent cost differential.

Assumptions

Prescribed cost projections from HM Treasury Green Book (2022), up until 2050:

- Cost of electricity
- Cost of retail diesel and petrol

The Green Book does not provide a range of required information. Zemo has created assumptions for these non-prescribed costs:

Capital Expenditure (CAPEX)	Operational Expenditure (OPEX)
Electric Vehicles: difference between diesel and electric, driven by battery costs assumed to decrease over time, charging infrastructure.	Low Carbon Fuels based on current delta with diesel. Assumed to persist.
CNG Vehicles: difference between diesel and gas vehicles, tanks etc. Assumed to persist over time.	Low Carbon Fuels based on current delta with diesel. Assumed to persist.
Hydrogen Fuel Cell Vehicles: difference between diesel and FCEV decreasing over time, refuelling infrastructure.	Hydrogen: based on 3 x electricity cost projections from Green Book

Discounting future difference between CapEx and OpEx costs using the 3.5% social rate specified and otherwise following Green Book protocols (with the exceptions described above) yields the net present values (NPV) of the policy cost. The NPV of the cumulative policy cost over the period 2024 – 2050 is estimated to be £275million.

	2024 - 2027	2028 - 2032	2033 - 2037	2038 - 2042	2043 - 2047	2024-2050 cumulative
GHG WTW (ktCO2e)	238	1,257	2,885	2,888	1,114	8,381
GHG WTW NPV (£mil)	57.3	276	574	524	183	1,615
Policy Cost NPV (£mil)	20	81	92	66	14	275
Benefit/ Cost Ratio	2.8	3.4	6.2	8.0	12.7	5.9

The modelling undertaken was to provide an estimate of the potential size of the GHG savings possible through the proposed decarbonisation pathways and to provide an estimate of the cost equivalence of the policy measures required. Further detailed work would need to be undertaken to improve the accuracy of the calculations. However, given the limitations, it is clear that the motivation to decarbonise commercial vehicles in Wales following an ambitious approach would deliver significant GHG savings and would be cost effective.

Benefit to the Commercial Vehicle Operators

Based on the changes in the consumption of diesel, LCF and electricity used to calculate the changes in GHG emissions, the cost of the energy consumed can be used to assess the impact on the commercial vehicle operators operating costs as a sector. Prescribed retail prices of energy from the Green Book along with the application of a 3.5 discount rate was applied to calculate the impact on costs. The results are shown below and the detailed calculations are presented in the Technical Annex.

	2024 - 2027	2028 - 2032	2033 - 2037	2038 - 2042	2043 - 2047	2024-2050 cumulative
Benefit to Industry NPV (£mil)	78	381	824	761	294	2,164
Policy Cost NPV (£mil)	20	81	92	66	14	275
Benefit/Cost Ratio	3.8	4.7	9.0	12.0	20.0	7.9

The modelling gives an estimate of the potential size of the benefit to commercial vehicle operators in Wales from reduced energy costs. The proposed policy would potentially unlock a cumulative reduction in costs of £2,164 million over the period to 2050 for commercial vehicle operators in Wales based on current fiscal policy.

What about Hydrogen?

It wasn't possible to undertake a similar assessment of the impact of hydrogen fuel cell vehicles along side LCF and ZEVs because the data sets required aren't currently available from the HMRC Green Book. In addition there remains potential different pathways for the production and distribution of hydrogen. The project did not have the resources to develop a robust set of data or to come to a consensus view of the production and distribution of hydrogen. This is a limitation of the report and further work in this area should be considered. In the Modelling Annex a limited assessment is undertaken of the impact of the introduction of fuel cell vehicles into the articulated truck sector which is considered to be one of the more challenging sectors the Battery Electric Vehicles.

Pathways to Decarbonisation

To maximise the decarbonisation of commercial vehicles in Wales, all pathways must be adopted in parallel. Low carbon fuels can decarbonise the existing fleet running on fossil diesel, with a role for 'repowering' special use cases to zero emission. The replacement of aging diesel vehicles with new battery electric vehicles will contribute to reduced energy consumption and improved life cycle emissions. Hydrogen as a road fuel has an opportunity to play a role in the late 2030s, once a significant supply of low carbon hydrogen production has been reached.

Low Carbon Fuels

Low Carbon Fuels (LCFs) present an affordable decarbonisation solution that can be deployed today with minimal impact to operational procedures, particularly in HGVs where zero emission solutions are not yet available. FAME biodiesel and renewable diesel (HVO) are being adopted for displacement in diesel HGVs, while biomethane compressed gas trucks are being introduced in long-haul operations due to its well-to-wheel benefits. Increased support for appropriately placed infrastructure will maximise the benefits of LCFs in the next decade. There will be an extensive diesel fleet in operation through to the 2030s, so ensuring the RTFO mechanism works for Wales will be crucial to minimising Wales' contribution to climate change and meeting Carbon Budgets.

Electrification

Electrification of transport provides the most energy efficient solution and the highest greenhouse gas savings of zero emission powertrains when using renewable electricity. Electrification of cars is already accelerating along with the deployment of charging infrastructure, thereby increasing the infrastructure availability for vans. However, access restrictions and appropriately designed charging bays remain a hurdle. The ZEV Mandate will see a significant number of electric vans deployed in the next 5 years and steps will need to be taken to support community-based vans which lack dedicated infrastructure.

Reform of operator licence regulations is required to ensure LDVs with gross vehicle (GVW) derogation are not treated as HGVs. Fleet transition plans using telematics will help operators understand opportunities to decarbonise and plan using more accurate operational data.

Trials of larger HGVs are underway but limited given the significant gap in CapEx investment between diesels and EVs today. New innovative financial models could enable an accelerated update of vehicles, as proven in the UK's bus sector. With HGV manufacturers expecting around 50% of new HGVs produced in 2030 to be zero emission, there is significant support needed for operators to begin planning the transition through education and upskilling. Wales has made positive steps in supporting the development of LAEPs to support holistic transport and energy planning, however more accurate data is required for DNOs to invest in grid capacity ahead of need. Coordination between the national RESP and LAEPs will be essential. Power banks, made of second-life battery packs, could be deployed where grid infrastructure is limited to provide an interim solution while grid reinforcement takes place.

Hydrogen

At present there is a lack of clarity on the role of hydrogen in road transport fuel at a UK level to give industry confidence in its long-term viability.

The scale of hydrogen's role will depend highly on the availability and affordability of low carbon hydrogen, supported by sufficient, robust refuelling infrastructure to ensure greenhouse gas savings are realised.

There are potential benefits of distributing hydrogen to locations which suffer from limited grid electricity connection. However, hydrogen refuelling infrastructure at scale to support large numbers of commercial vehicles will still depend on electricity grid connections to support gas compression for refuelling.

The potential operational benefits of hydrogen include quick refuelling and the ability to distribute by tanker reflecting the current diesel distribution model. There are also potential weight benefits compared to battery electric today where heavy batteries reduce load carrying capabilities. These characteristics indicate that the most likely use case for hydrogen in road transport will be in long-haul HGV operations.

The HyHaul project, which focuses on long-haul HGVs, will start in 2026 and trial up to 30 hydrogen fuel cell trucks, supplied with low carbon hydrogen made in Wales. The trial will be crucial for informing government and industry about the opportunities and barriers to wider deployment of hydrogen vehicles supported by low carbon hydrogen.

Wales has an opportunity to collaborate with heavy industries such as steel who are being supported by DESNZ through the hydrogen allocation rounds (HAR 1 & 2) to scale low carbon hydrogen production. Significant deployment of renewable energy in Wales will also provide opportunities for low-cost electricity needed for electrolysis of water to produce low carbon hydrogen.

Hydrogen combustion engines could present an industrial opportunity for Wales given its history of engine production and does not require the same level of hydrogen purity as HFC vehicles. However, there have been very limited demonstration trials to date in transport, ICE does not provide zero emission tailpipe benefits and would still rely on an extensive hydrogen refuelling network.
Modal shift and wider considerations

Net Zero Wales identifies, along with new technologies, that behaviour change, modal shift and demand reduction will be essential for meeting Net Zero by 2050.

These considerations are being actively researched by other Welsh Government workstreams and are outside the scope of the report. However, there are many opportunities for operators to consider changes to vehicles and operations when assessing the adoption of new fuels or powertrains

The assessment of operational data to accommodate a new technology or fuel may lead to a change in vehicles size deployed e.g. deploying e-cargo bikes in urban areas for last mile delivery. There are also opportunities to move freight from road to rail to reduce vehicle movement and reduce associated GHG emissions.

Wider considerations relating to broader economic benefits and upskilling the workforce were also outside of scope. However, the transition to a decarbonised CV fleet presents a wide range of opportunities for improving working conditions, reducing operational costs and retraining and upskilling the labour market.

Wales is a portal for goods entering and leaving the UK for Ireland and beyond through key ports in Holyhead, Milford Haven and Pembroke Dock. The significant reliance on commercial vehicles for the distribution of key goods presents an opportunity for decarbonisation. Working with Welsh ports, fuel suppliers and charging hubs, the Welsh Government can leverage the demand for logistic services and facilitate investment from large multinational companies seeking to decarbonise their supply chains. This will benefit local business and residents through increasing the use of low carbon fuel options like HVO, EV charging infrastructure and green hydrogen.

There are many other industrial and business opportunities that the decarbonisation transition can bring. There will be significant demand for batteries produced in the UK, along with battery and materials recycling capability to support the growing number of EVs.

Locating an EV battery "Gigafactory" or battery recycling plant in Wales, with its abundant renewable energy potential and existing heavy industry infrastructure, offers several industrial opportunities.

Collaboration with Welsh universities, such as the Circular Economy Research and Innovation Group (CREIG) at Swansea University and the aforementioned EV Centre of Excellence at Cardiff University, can drive innovation in technology and recycling methods, enhancing the competitiveness of the facility.

Actions for Accelerating Decarbonisation

The following actions have been collated through engagement with the Welsh Stakeholder Working Group and wider Zemo membership.

These actions are designed to inform and advise Welsh Government on the different areas that require action to accelerate decarbonisation of commercial vehicles.

Many actions can be taken now by industry to decarbonise their fleet and prepare for the long-term transition to zero tailpipe emission vehicle fleets.

This action list, once reviewed and agreed by members, will continue to be developed by the Welsh Stakeholder Working Group and used to monitor progress, highlighting areas of success and where more effort is needed.

The following section identifies cross cutting actions and specific actions for each decarbonisation pathway, highlighting relevant actions specific to the van and truck sectors.

Cross Cutting Actions

There are a wide range of actions identified that will apply to both vans and heavy goods vehicles and across each of the decarbonisation pathways available.

Themes

The following themes occurred across stakeholder engagement when considering the decarbonisation of commercial vehicles in Wales:

- Developing a knowledge base to better inform policy and industry.
- Ensure transport and energy policy focuses on life cycle GHG emissions analysis.
- Regulations and planning policy updated for Net Zero transition.
- Adopting innovative finance models.
- Myth busting and educating industry.
- Supporting SMEs with Net Zero transition.
- Supporting Net Zero skills development.

Actions

The following actions can be taken to accelerate decarbonisation across the van and truck sectors and will benefit all decarbonisation pathways.

Develop the knowledge base to better inform policy and industry

There is limited publicly available data and analysis of the van and truck market in Wales. Having more detailed information on market trends and best practice will help Welsh Government make better policy decisions and drive collaborative decarbonisation actions by businesses and local authorities.

Under <u>'Llwybr Newydd: The Wales Transport Strategy 2021</u>', Transport for Wales have introduced Monitoring Measures to indicate progress towards Welsh Government's core aims in achieving carbon reduction targets and modal shift. Relevant measures include:

- M2 Percentage of vehicles that are ultra-low or zero tailpipe emission
- <u>M3 Total vehicle kilometres travelled</u>
- M6 Greenhouse gas emissions from the transport sector

This information collected by Welsh Government is high level and does not allow for deeper analysis of trends in cities or local authorities to understand trends. A top down approach should be complemented by bottom up case studies demonstrating best practice that can shared with areas with lower uptakes of decarbonisation.

Deliverable	Collect data on the Welsh vehicle parc and associated infrastructure provision
Specific objective	 Develop a robust knowledge of vehicle uptake to inform policy decision-making:
	 a) Registered vehicles by region, size etc. b) Decarbonisation infrastructure installations by region, type number, power rating, kW c) Key charging and refuelling hub locations.
	 Identify areas that are lagging adoption to target appropriate actions (infrastructure provision, second-hand vehicle availability)
	 Utilise marketing monitoring data to help inform Local Area Energy Plans (see more below)
Timeframe	2025 onwards
Who	Welsh Government, Local Authorities
Examples/ Resources	Zemo Market Monitoring Statistics
Sector(s)	

There is more detailed information that could be collected directly from operators that could inform targeted action from policy makers. This information could be aimed at particularly hard to decarbonise use cases such as long-haul trucks or large vans, to identify locations for key infrastructure installation e.g. megawatt charging hubs on the M4 motorway.

Deliverable	Collect data on Welsh vehicle operations
Specific objective	Gather information on van and truck use in Wales to inform policy decision making.
	Government objectives:
	 Typical driver rest periods and vehicle usage patterns Traffic movement data; identify key locations such as ports and truck stops to support decarbonisation of international HGV traffic Identifying difficult to decarbonise use cases that may require more specific long-term actions
	Operator Objectives:
	 Increase use of telematics to understand daily duty cycles in detail and identify opportunities for decarbonisation i.e. which services can adopt EVs or low carbon fuels today. Open sharing of telematics data and fleet transition planning in a secure open forum to drive infrastructure sharing. Particularly with local authorities and DNOs to inform longer term infrastructure deployment planning. For fleets with no access to telematics, utilise existing data reporting to track annual returns on fuel consumption, miles driven, vehicle age etc. Conduct internal surveys to gather data required to fully understand the Total Cost of Ownership (TCO) of assets.
Timeframe	2025 onwards
Who	Welsh Government, Local Authorities, Operators
Examples/ Resources	Zemo Partnership Market Monitoring Statistics, <u>ZEHID Truck Trials</u> , <u>BluMarbl & CPT Coach Telematics Analysis</u>
Sector(s)	

The Welsh Government could provide best practice guidance for fleets to transition away from fossil diesel, to ensure plans include the right information and provide fair advice. These could be tied to fiscal incentives to encourage adoption.

While this may only be adopted by larger operators, it will enable greater confidence in new decarbonisation solutions and help encourage the transition of SMEs.

Deliverable	Produce best practice guidance for fleet transition planning
Specific objective	 Develop best practice guidance for fleet transition plans, including energy use and TCO based on telematics data, to better inform operators on decarbonisation options. Ensure operators can access good quality information, supported by telematics, to better understand operations and support decarbonisation choices.
Timeframe	2025 onwards
Who	Welsh Government, Operators
Examples/ Resources	<u>BSI 3030 Net Zero Transition Plans Code of Practice, CALSTART – CAL Fleet Advisor</u>
Sector(s)	

Base policy on life cycle GHG emissions

Life cycle analysis (LCA) provides a more accurate picture of the GHG emissions associated with all aspects of a fuel or vehicle (production, operation and recycling/end of life).

Zemo Partnership's <u>Vehicle Life cycle GHG emission study</u> shows how LCA can identify which low carbon fuel feedstocks and supply chains are most beneficial for GHG emissions savings and what options may have a detrimental impact.

By embedding LCA in policy decisions, Welsh Government can ensure longterm decisions avoid high carbon pathways and better reflect the GHG emissions impact of vehicle operations. The EU is seeking to incorporate LCA into policy decisions and there is already an international ISO standard that can be utilised for LCA.

Deliverable	New and existing policy to be informed by life cycle GHG emissions
Specific objective	 Revise transport and energy strategy and policy to centre on life cycle GHG emissions, rather than tailpipe; ensure consistent across Gov departments. Determine a methodology for quantifying vehicle life cycle GHG emissions to enable comparable LCA (common scope, boundaries, default values, etc.)
Timeframe	2025 - 2026
Who	UK Government, Welsh Government
Examples/ Resources	<u>ISO 14040 Environmental Management – LCA, EU Platform on LCA , Zemo Vehicle Life Cycle GHG Emissions Study</u>
Sector(s)	

Operators and wider industry can also start to adopt LCA in procurement processes to understand the right time to replace aging vehicles with new zero emission tailpipe solutions and which low carbon fuels to adopt in the interim.

Deliverable	Fleet decarbonisation strategies to be informed by vehicle life cycle GHG emissions (rather than in-use or tailpipe emissions)
Specific objective	 Organisations should consider both LCF and zero tailpipe emission technologies before investing in new vehicles to maximise GHG emissions savings with available budgets.
Timeframe	2025 onwards
Who	Welsh Industry
Examples/ Resources	<u>ISO 14040 Environmental Management – LCA,</u> Zemo Vehicle Life Cycle GHG Emissions Study
Sector(s)	

Regulations updated for Net Zero Transition

Regulations are being adapted by either EU or UK legislators to accommodate the introduction of zero emission tailpipe technology e.g. weight derogation for alternatively fuelled vehicles (4.25t vans). However, other regulations have not been updated to take account of this change to GVW. Vehicle operator licensing regulations have not been changed in light of the GVW derogation, resulting in 4.25t vans being defined as HGVs under current licensing, as flagged by the <u>BVRLA Van Plan 2024</u>.

This places additional new requirements on operators, adding extra costs and resources for utilising the same vehicle type (e.g. to MOT vehicles every 12 months, speed limiters on vehicles, tachograph requirements). The extra cost and administration are preventing operators adopt new zero emission vehicles. Welsh Government should work with UK Government to conduct a full review of regulations relating to vehicle weight classes and operator licenses considering net zero ambitions.



Deliverable	Review weight classes relating to operating licensing
Specific objective	 Undergo a full review of regulations affected by weight derogations for zero tailpipe emission vehicles, particularly focusing on operating licensing requirements, where LGVs are being classed as HGVs resulting in additional requirements for operators. HGV Requirements include: 12-month MOTs, tachograph requirement, drivers' hours, vehicle speed limit, distance from base etc. Affects 3.5t - 4.25t vans and likely to impact other heavier weight classes in the future.
Timeframe	2025 -2026
Who	UK Government
Examples / Resources	BVRLA Van Plan 2024
Sector(s)	

The review of legislation should include health and safety regulations to ensure that new vehicles and infrastructure are rolled out in the safest possible manner. These can include training and maintenance regulations as well as requirements that could help identify different fuels or powertrains to emergency services e.g. <u>TfL first responder bus stickers</u>. This will also feed into the wider action needed to educate operators and wider society on the facts of LCFs and ZEVs, particularly around safety for battery electric vehicles.

Deliverable	Ensure a supportive Health and Safety regulatory landscape
Specific objective	 Ensure health and safety regulations are not a barrier to the uptake of LCFs and ZEVs: Develop a guide to Health & Safety regulations for operators considering decarbonisation. Develop guidelines for depots and public forecourts, particularly for charging and refuelling vehicles safely. Upskill workforce, particularly emergency response teams, to understand different technologies and associated safety risks. Implement powertrain indicator stickers on HGVs for response teams as seen on Transport for London buses
Timeframe	2025 onwards
Who	UK Government
Examples / Resources	<u>TfL First Responder Stickers</u>
Sector(s)	

Cyber security will become increasingly important as vehicles and supporting systems become more digitised and reliant on internet connectivity. The Welsh Government can work with UK Government through the National Cyber Security Centre and with manufacturers and operators to ensure that vehicles and infrastructure deployed in Wales are as secure as possible.

Deliverable	Ensure a fit-for-purpose cyber security landscape
Specific objective	 Ensure the security landscape is fit-for-purpose, reviewing: Cyber security protection for vehicles and charge points e.g. ensure vehicles and charge points update software regularly, protected data sharing between charge points and vehicles. Understand implications for cyber security for shared public infrastructure.
Timeframe	2025 onwards
Who	UK Government
Examples / Resources	n/a
Sector(s)	

Ensure planning policy enables net zero transition

With the introduction of the new <u>Infrastructure (Wales) Act 2024</u>, there are opportunities to ensure planning policy enables the acceleration of the net zero transition. The use of section 17 in the act allows Welsh Government to designate transport projects as "significant infrastructure projects" (SIPs), which could be utilised to speed up the approval of key, first-of-akind, decarbonisation infrastructure e.g. hydrogen refuelling or megawatt charging stations.

For smaller projects, Welsh Government must work with local authorities, operators and infrastructure suppliers to understand how <u>Planning Policy</u> <u>Wales</u> currently restricts rapid deployment of decarbonisation infrastructure. This is particularly important for increasing the number of publicly accessible EV chargers, which has been flagged as a major barrier for those opting to switch away from diesel.



Deliverable	Identify how to speed up the planning process for decarbonisation infrastructure projects
Specific objective	 Undertake a national survey or consultation to identify common planning issues, solutions and efficiency improvements across all decarbonisation infrastructure (e.g. providing evidence for pre-commencement conditions earlier). Welsh Government to work with local authorities to review and revise Planning Policy Wales and link with Traffic Wales to ensure joined up approach.
Timeframe	2025 - 2026
Who	Welsh Government, Local Authorities.
Examples / Resources	n/a
Sector(s)	
Deliverable	Promote the continuous improvement of the planning process for
	decarbonisation infrastructure projects
Specific objective	Create a platform for sharing guidance and information between local planning authorities.
Timeframe	2025 onwards
Who	Welsh Government, Local Authorities
Examples / Resources	n/a
Sector(s)	
Deliverable	Classify transport decarbonisation infrastructure significant infrastructure projects (SIPs)
Specific objective	 Recognise LCF, EV and hydrogen refuelling transport infrastructure as SIP to enable faster planning consent.
Timeframe	2025-2026
Who	Welsh Government
Examples / Resources	n/a
Sector(s)	

Develop a freight decarbonisation infrastructure plan for Wales

Create a decarbonisation infrastructure roadmap for single and multi-LCF refuelling sites, charging stations, and hydrogen refuelling sites at ports, arterial motorway routes and freight distribution hubs.

Providing industry with long-term direction as to the locations and type of decarbonisation infrastructure required to support net zero will build confidence and accelerate uptake of LCFs and ZEVs. Welsh Government can work with UK Government through the Freight Energy Forum and the National Infrastructure Commission to understand the best tools to develop a decarbonisation infrastructure plan.

Deliverable	Develop a Freight Decarbonisation Infrastructure Plan
Specific objective	 Undertake a national survey or consultation to identify strategic locations for refuelling and recharging infrastructure and energy hubs. Use outputs to develop a holistic national strategy for infrastructure covering low carbon fuel, hydrogen, and EV charging infrastructure.
Timeframe	2025 onwards
Who	Welsh Government
Examples / Resources	<u>Trans-European Transport Network (TEN-T)</u> and the <u>Alternative Fuels</u> Infrastructure Regulation (AFIR)
Sector(s)	



Adopting innovative finance models

A significant barrier to the uptake of new zero emission vehicles and infrastructure is high CapEx costs, particularly for SMEs. Unlocking capital through innovative financial measures is one of the ways Welsh Government can support industry to overcome existing financial barriers to decarbonisation.

Deliverable	Promote adoption of innovative finance models by Welsh operators
Specific objective	 Identify and share innovative financial tools to accelerate decarbonisation with key stakeholders e.g. Welsh Development Bank and Green Finance Institute. Focus on supporting SME transition Identify and facilitate significant "First for Wales" projects e.g. megawatt charging stations, strategic hydrogen refuelling network Identify innovative funding mechanisms to combine public and private infrastructure for LCFs (e.g. exploiting the fiscal benefits of Freeports status). Leverage private finance to explore guarantee schemes to help lack of confidence in residual values.
Timeframe	2025 onwards
Who	Welsh Government, Industry
Examples / Resources	GFI Delivering Net Zero, Transport Scotland HGV Financing Models
Sector(s)	

Welsh Government can support industry with a Financing Net Zero guide for commercial vehicles. Working with stakeholders such as the Green Finance Institute, RHA and Logistics UK to identify solutions that can work for large and small operators in Wales.

Deliverable	Publish Financing Net Zero guidance
Specific objective	 Develop and publish a guide to educate lenders and operators on alternative decarbonisation pathways for infrastructure and vehicles. Accelerate regional economic benefits through the education of SMEs and local lenders (e.g. a local bank manager is equipped to approve funding for a farmbased anaerobic digestor used for biomethane production).
Timeframe	2025 - 2026
Who	Welsh Government, Industry
Examples / Resources	GFI Delivering Net Zero
Sector(s)	

Foster and develop Infrastructure Sharing Partnerships

There is a huge opportunity to save costs and accelerate uptake through sharing infrastructure. This applies to both ZEV charging infrastructure and LCF refuelling provision.

Welsh Government can work with local authorities and businesses to encourage infrastructure sharing partnerships to share land, grid connections, refuelling and charging infrastructure, parking and driver facilities.

Sharing infrastructure can provide a new revenue stream and remove the barrier for entry for users who don't have access to a depot. Car parks and supermarkets have opportunities to create flagship local charging hubs, particularly in providing secure charging for commercial vehicles. There are already examples of electrified bus deports sharing charge points with local van businesses, coaches and HGVs, while buses are in operation during the day.

These partnerships will better inform local authorities and Welsh Government about which users are transitioning away from fossil diesel, whilst providing a focal point for DNOs to better plan grid reinforcement work.

Deliverable	Create local infrastructure sharing partnerships
Specific objective	 Explore options for shared refuelling and charging infrastructure to help increase access and reduce costs. Explore opportunities to share grid connections to reduce number of connections and application times. Support partnership formation with stakeholders through workshops to create flagship models that can be adopted across Wales. Conduct trial of sharing public sector fleet charging infrastructure with selected partners. Apply to all decarbonisation infrastructure e.g. biomethane refuelling.
Timeframe	2025 onwards
Who	Welsh Government, Local Authorities, Operators
Examples / Resources	Tysley Energy Park , First Bus in Glasgow
Sector(s)	

Myth-busting and improving the knowledge gap

Decarbonisation technologies are developing at pace. There is a significant knowledge gap between current and historical capabilities of new ZEV vehicles and infrastructure e.g. range and charging speeds. Welsh Government can support a range of engagement activities to improve understanding for decarbonisation options.

Deliverable	Create decarbonisation guidance materials for operators
Specific objective	 Develop a "Decarbonising commercial vehicles" guide covering vehicles and infrastructure. Promote through a cross-Wales engagement campaign. Update content regularly with new models and information. Include cost and carbon saving tools, links to infrastructure maps, and best practice through case studies.
Timeframe	2025 – 2026
Who	Welsh Government
Examples / Resources	Zemo Renewable Fuels Guide
Sector(s)	

Deliverable	Facilitate knowledge and experience building focused on operators
Specific objective	 Launch an online information portal highlighting guidance for fleet operators, include a platform for sharing decarbonisation experiences. Run a series of regional workshops with advice and case studies for using low carbon fuels and zero emission vehicles. Promote opportunities for operators to gain hands-on experiences with vehicles and infrastructure, including short-term trials of vehicles.
Timeframe	2025 onwards
Who	Welsh Government
Examples / Resources	<u>The Freight Portal, GreenFleet Cymru Events, the Battery Electric Truck Trial (BETT)</u> Portal, Kent County Council electric van trial for businesses
Sector(s)	

Supporting SMEs to ensure an equitable transition

There are a significant number of SMEs in the commercial vehicle sector that play an important role in providing affordable logistics services. SMEs have limited time and resource to engage with new technologies and processes. Targeted engagement and activities including knowledge workshops and guides will help SMEs navigate adapt to the net zero transition.

Deliverable	Engage with SMEs to promote an equitable transition
Specific objective	 Work with SME forums to understand their specific requirements in the transition and to remove barriers to uptake. Ensure learnings from large fleets, which can take more financial risks, are disseminated. Showcase appropriate finance and leasing schemes, including new business models Welsh Government needs to ensure that decarbonisation policies do not negatively impact or disadvantage SMEs.
Timeframe	2025 onwards
Who	Welsh Government and Welsh Business
Examples / Resources	RHA Net Zero Forum
Sector(s)	

With an expected decline in the diesel demand from the car market, there is a possibility that the number of petrol and diesel forecourts also decline. This will impact a range of commercial vehicle users, particularly SMEs who rely on public refuelling to operate. Welsh Government should monitor availability.

Deliverable	Monitor decline of petrol and diesel forecourts.
Specific objective	 Track petrol and diesel forecourt closures to mitigate the risk of isolated or unregulated diesel and petrol usage amongst the legacy commercial vehicle fleet.
Timeframe	2026 onwards
Who	Welsh Government
Examples / Resources	n/a
Sector(s)	

Supporting Net Zero Skills Development

Developing the skills base to support the maintenance of vehicle and installation of infrastructure will be key to accelerating decarbonisation. Welsh Government can encourage apprenticeships and training courses focused on decarbonisation sectors. Ensuring the latest knowledge from academia is shared to industry to ensure operators are adopting the most suitable technology and best practices.

Deliverable	Develop skills initiatives to support Net Zero
Specific objective	 Create apprenticeship schemes for zero emission vehicle technicians and infrastructure engineers. Invest in a Net Zero Centre for Excellence in Wales to ensure educators have the most up to date knowledge on technological developments. Develop guides and courses focused on net zero skills development for both the vehicles themselves, and the supporting infrastructure landscape.
Timeframe	2025 onwards
Who	Welsh Government, Academia, Operators
Examples / Resources	Bus Centre of Excellence
Sector(s)	

Understanding the Role of Auxiliary Engines

Many CVs have auxiliary engines to provide heating or cooling for cargo, separate from the main powertrain. Ensuring that zero emission vehicles also have zero emission auxiliary engines will be important to ensure GHG savings are made and public confidence in the impact of ZEVs is maintained.

Deliverable	Secure Emission Reductions from Auxiliary Engines
Specific objective	 Be cognisant of emissions from auxiliary engines used on Welsh roads, and include into decision-making and policy (and associated opportunities for co-benefits for improving air quality) Understand and communicate where opportunities exist to reduce emissions (e.g. from the emerging low/zero tailpipe emission TRU market) Communicate how low/zero tailpipe emission solutions may impact vehicle performance.
Timeframe	2025 onwards
Who	Welsh Government
Examples / Resources	ZEB Certificate - zero emission heating systems for EV buses
Sector(s)	

Low Carbon Fuels

Low Carbon Fuels (LCFs) will be an important pathway to decarbonise heavy duty vehicles, in particular long-haul trucks, during the transition to zero tailpipe emission propulsion technologies.

The LCFs for consideration for commercial vehicles are biodiesel (FAME) and renewable fuel (e.g. HVO), which can be used in diesel engines, and biomethane for use in gas engines.

LCFs have played a role in decarbonising the UK vehicle parc for many years, with FAME biodiesel used in pump average B7 blends and higher blends of B20 in bus fleets. More recently renewable diesel such as Hydrogenated Vegetable Oil (HVO) are being used as a direct dropin replacement for diesel in truck fleets. Wales has started to see the deployment of its first publicly available.

The Renewable Transport Fuel Obligation (RTFO) is an overarching policy mechanism, established by the DfT over a decade ago, to deliver reductions in greenhouse gas emissions from fuels used in road transport and nonroad mobile machinery (NRMM). The RTFO requires large fossil fuel suppliers to blend a proportion of biofuels in petrol and diesel supplied to end users. For more information about LCFs, Zemo has produced a Renewable Fuels Guide aimed at helping HGV operators lower their GHG emissions.

State of the Market

Under the RTFO, renewable fuels made up 6.8% of total road and NRMM fuel in the UK in 2022, saving a total of 7,177 kt CO_2e .



RTFO Facts in 2023

- Average GHG emissions saving of 82%, or 77% when accounting for indirect land use change.
- 93% waste feedstocks for biodiesel.
- 9% feedstocks from UK.
- Less than 0.5% of verified renewable fuel was development diesel.
- Less than 0.001% of verified renewable fuel was renewable hydrogen, from solar power.





Renewable Fuels Assurance Scheme (RFAS)

Working alongside the RTFO, Zemo has created the Renewable Fuels Assurance Scheme (RFAS), an initiative designed to verify claims made by companies supplying renewable fuels to heavy duty vehicle and equipment operators regarding their product's GHG emission savings and provenance of raw material feedstocks.

Data monitoring of Zemo's RFAS scheme for Q1 & Q2 2023				
Renewable fuel	Declared under RFAS ¹	Average GHG savings ²	Estimated no. of buses	Estimated no. of HGVs ³
Biomethane	33 million kg	88%	70	1,460
Renewable diesel (100%)	137 million litres	87%	0	5,200
Renewable diesel blends (30 and 45%)	8 million litres	39%	0	730
Biodiesel blends				
(range from B10 to B30)	30 million litres	19%	1,080	1,360

The RFAS scheme is designed to give greater transparency in the accounting of GHG emissions savings from specific supply chains and feedstocks, rather than just the UK average provided by the RTFO. This increases the desire for LCFs with higher sustainability criteria and greater GHG savings and enables companies to demonstrate best practice.

UK Low Carbon Fuel Strategy

The previous UK government was due to publish the Low Carbon Fuel Strategy. However, the current government has now launched a call for evidence on the Renewable Transport Fuel Obligation (RTFO). This call for evidence seeks stakeholder views on the future of the RTFO, including how low carbon fuels such as biofuels, renewable hydrogen, and recycled carbon fuels can be integrated to reduce greenhouse gas emissions from heavy-duty road vehicles, including buses, coaches, and trucks. The RTFO remains a key policy for encouraging the use of sustainable low carbon fuels in the transport sector.

Themes

The following themes occurred across stakeholder engagement when considering maximising the benefits of LCFs in Wales:

- Increase the RTFO target and transition to a GHG emissions target.
- Support the wider availability of high blend LCFs in the national bunkering network for HDVs.
- · Make high-blend low carbon fuels financial attractive.
- Maximise opportunities to exploit regional biomass waste and residues in Wales and encourage local LCF production.

Actions

This section lists actions that can be taken to help accelerate decarbonisation of commercial vehicles by supporting the access to LCFs.

This section should be read in conjunction with the <u>Cross Cutting Actions</u> <u>chapter</u> where actions have been amalgamated to reduce repetition

Increase and extend the RTFO targets

The current RTFO could be amended to enable greater GHG savings from the existing legacy fleet over a longer timeframe. This reform could include increasing overall volume of fuel supplied and ensure certainty for investments by extending targets beyond 2035.

Deliverable	Increase and extend the RTFO targets
Specific objective	 Lobby the UK Government (DfT) to amend the RTFO (statutory review opened in Nov 2024) Set more ambitious RTFO targets (e.g. 21% by 2032 as per RTFA recommendation) to enable: a) existing volumes to be maintained, and b) growth of sustainable LCF supplies in the UK Extend RTFO targets beyond 2032 to provide long-term security for LCF investments.
Timeframe	2025 onwards
Who	UK Government
Examples / Resources	

Sector(s)



Deliverable	Introduce GHG emissions targets (Well-to-Wheel)
Specific objective	 Evolve the RTFO into a GHG emissions target aligned with Net Zero Strategy (reinstate GHG obligation?)
Timeframe	2025 onwards
Who	UK Government
Examples / Resources	
Sector(s)	

Introduce a fuel duty discount for LCFs

Make low carbon fuels more financially attractive for operators to adopt.

Deliverable	Introduce a fuel duty discount for LCF use
Specific objective	Welsh Government to engage with the UK Government to introduce a discount based on GHG emissions, e.g.
	 15 ppl for 100% biodiesel or renewable diesel and scaled for blends (3 ppl for B20, etc). 5 ppl for blends of 20% or more (B20, 20% HVO) with the blend increasing over time (2024: 20%, 2028: 25%, 2030: 30%). All changes must be linked to RTFO reform.
Timeframe	2025 onwards
Who	UK Government, Welsh Government
Examples / Resources	
Sector(s)	

Support Low Cabon Fuel infrastructure financing

Reduce the upfront cost of installing infrastructure to support the decarbonisation of commercial vehicles. This can be done through direct capital grants and/or facilitating the use of innovative financial models being developed by the Green Finance Institute and leasing and financing providers.

Deliverable	Grants for LCF refuelling infrastructure
Specific objective	 Introduce grants to developers of major commercial sites, linked to planning policy (e.g. Section 106, Town and Country Planning Act 1990)
Timeframe	2025 onwards
Who	Welsh Government
Examples / Resources	
Sector(s)	

Deliverable	Build a land bank for LCF refuelling sites
Specific objective	 Make land available through the planning process at discounted land values to make public refuelling infrastructure more financially viable.
Timeframe	2025 onwards
Who	Welsh Government, Local Authorities
Examples / Resources	
Sector(s)	

Increase supply of LCFs

There are opportunities to support the wider economy by encouraging the development of LCF supply in Wales.

Deliverable	Publish a sustainable biomass and biomethane study
Specific objective	 Publish a study that: Identifies opportunities for using waste feedstocks Identifies opportunities for increasing LCF production Identifies funding sources Highlights co-benefits such as the creation of green jobs, reduction of waste and pollution, and decarbonisation of the agricultural sector.
Timeframe	2025 - 2026
Who	Welsh Government
Examples / Resources	
Sector(s)	



Deliverable	Exploit regional biomass waste and residues
Specific objective	• Maximise the use of regional biomass waste and residues e.g. cover crops, collecting used cooking oil, building anaerobic digestion plants, and capturing fugitive methane from slurry.
Timeframe	2025 onwards
Who	Welsh Government, Industry
Examples / Resources	
Sector(s)	

Deliverable	Introduce incentives to encourage LCF production in Wales
Specific objective	 Provide a fiscal incentive to make Wales an attractive location for investment in LCF production (renewable diesel and biomethane).
Timeframe	2025 onwards
Who	Welsh Government, Industry
Examples / Resources	
Sector(s)	

Support RFAS and extension schemes

The Renewable Fuels Assurance Scheme (RFAS) to encourage the use of LCFs in public and private sector fleets.

Deliverable	Recognise RFAS-Fleet (allocation scheme)
Specific objective	 Support the growth in LCF demand by enabling companies to reduce their Scope 3 'transport and distribution' GHG emissions where refuelling infrastructure is currently limited.
Timeframe	2025 onwards
Who	Welsh Government, Industry
Examples / Resources	
Sector(s)	
Deliverable	Increase LCF deployment
Specific objective	 Embed RFAS and RFAS-Fleet in tendering contracts and use LCFs from RFAS approved suppliers in public and private sector fleets.
Timeframe	2025 onwards
Who	Welsh Government, Industry

Examples / Resources

Sector(s)



Deliverable	Execute a fuel allocation demonstration trial
Specific objective	• Demonstrate how LCFs can be used by freight operators using fuel cards.
Timeframe	2025 onwards
Who	Welsh Government, Industry
Examples / Resources	
Sector(s)	

Electrification

Electrification of transport provides the most energy efficient solution and lowest greenhouse gas saving of zero emission powertrains when using renewable electricity.

The electrification of commercial vehicle operations is seen as challenging due to the operational adjustment required and higher CaPex investment for EVs. Limited zero emission ranges, charging power limits, lead time of installing depot infrastructure, limited accessible public charging availability and limitations on vehicle payloads due to powertrain. However, technology is advancing with larger and light batteries capable of charging at higher speeds are becoming available.

Availability of public charging has been identified as a major challenge, particularly as man-van operators allow drivers to take vehicles home, relying on public infrastructure. This challenge presents an opportunity for infrastructure sharing business models to be developed.

Welsh Government must help prepare industry for the significant shift to EVs in the van sector due to the impact of the ZEV mandate.

State of the Market

Vehicles

Although lagging somewhat behind the passenger car transition, the market share for battery electric vans has been growing, representing 5.9% of the UK new van market in 2023.

Meanwhile, the electrification of heavy goods vehicles is still in initial trial stages, although vehicles are beginning to appear on the market.

Wales Vehicle Fleet	Car	LGV	Bus & Coach	HGV
New sales (%)	~8% BEV ~4% PHEV	~2% BEV <1% BEV	~13% BEV	<1% BEV
On road	~20,000 BEV ~10,000 PHEV	~1,800 BEV ~45 PHEV	~100 BEV	~35 BEV
Total	~1.6 million	~260,000	~9,000	~25,000

Charging Equipment

Charging infrastructure for commercial vehicle fleets that is utilised efficiently will ensure effective operation and maximise cost savings, while operational requirements, such as charging speed and the number of vehicles capable of being charged at any given time, are met. The specifications of charging infrastructure need to balance any electricity supply constraints at the location whilst minimising the cost of installation. There are four different types of chargers, classified by their speed:

- 1. Standard charging (less than 8kW AC) can typically supply a full charge to a van within twelve hours. This is the default charging available at domestic chargers/on-street chargers, and most likely to be used by vans that go home with the driver.
- 2. Fast Charging (above 8 and below 50kW AC) typically provides an 80% charge in under two hours from a 22kW charge point unit. Most public charging hubs (community car parks etc) and depot chargers are in this range.
- 3. Rapid charging is typically supplied at 50 149kW direct current (DC) which would provide a large electric van with an 80% charge in under an hour and is typically used for en route charging.
- 4. Likewise, Ultra-Rapid charging for vans is typically supplied at 150kW and above and could charge a van in under half an hour.

Shorter charging times will require higher powered chargers, which typically cost more and will increase the power needed at the site and may also have a detrimental effect on the battery life if used repeatedly (although new battery chemistries and management systems are being developed to deal with those concerns).

To help speed up the transition to electric HGVs, the Megawatt Charging System (MCS) standard has been developed, power levels exceeding 350 kW, up to 3.25MW. The first MCS compatible trucks and charging stations are being deployed for trials in the EU and in the near future under the DfT ZEHID trials.

Wales Public Charge Points	Car & Van Accessible	HGV Accessible
Total	2,860	n/a

Themes

Three key themes that emerged from the stakeholder engagement process were:

- The need for a holistic approach to Transport and Energy Planning
- Knowledge and Information Sharing between the broad range of stakeholders that need to be involved in the electrification of commercial vehicles
- Unlocking Fiscal Support for Infrastructure from private finance and not solely relying on the public purse.

Actions

The following actions can help accelerate decarbonisation of commercial vehicles through greater uptake of battery electric vehicles and low carbon electricity.

This section should be read in conjunction with the <u>Cross Cutting Actions chapter</u> where actions have been amalgamated to reduce repetition

Holistic Transport and Energy Planning

To achieve the decarbonisation of commercial vehicles in Wales through electrification, a holistic approach to transport and energy planning is crucial. Electrifying the Welsh Commercial Vehicle fleet will require a coordinated effort across sectors; integrating transport, energy, and infrastructure development.

This approach ensures that the Electricity Distribution Network can handle the increased demand, that charging infrastructure is strategically placed to maximise utilisation, and that Wales' renewable energy resources are exploited to power the fleet.

By aligning its transport policies with its energy strategies, Wales can effectively reduce emissions, support the growth of a green economy, and meet its climate targets. Collaboration between the Welsh Government, local authorities, industry, and communities is going to be essential to successfully transition to a sustainable, low-carbon transport system.



Deliverable	Continue the development of Local Area Energy Plans
Specific objective	• Model commercial vehicle movements and include in a revision of local area energy plans to include the modelled impact and boost local coordination.
Timeframe	2025 - 2030
Who	Welsh Government
Examples / Resources	
Sector(s)	
Deliverable	Facilitate stakeholder engagement
Specific objective	 Create and engage in stakeholder roundtables between operators, Local Authorities, DNOs, CPOs etc facilitated by a neutral party, to identify knowledge gaps, challenges with grid upgrade application processes etc.
Timeframe	2025 - 2030
Who	Welsh Government
Examples / Resources	
Sector(s)	
Deliverable	Support capacity funding for Welsh Local Authorities
Specific objective	 Support capacity funding for Welsh LAs to adequately staff and resource teams that will be required to plan and deliver public EV charging infrastructure that is suitable for all vehicle types.
Timeframe	2025 - 2030

Examples / Resources

Sector(s)

Who



Welsh Government

Deliverable	Standardise DNO grid connection processes across Wales
Specific objective	Review grid connection processes across Welsh DNOs (SPEN and NGED) to ensure alignment andto reduce complexity for operators and infrastructure suppliers.
Timeframe	2025 - 2030
Who	Welsh Industry
Examples / Resources	
Sector(s)	
Deliverable	Connected charging network

Specific objective	 Ensure that all public charge point locations have sufficient data communication coverage to ensure successful charging experience for users (enables pre-booking slots, seamless payments etc)
Timeframe	2025 - 2030
Who	Welsh Government
Examples / Resources	
Sector(s)	

Fiscal Support for Zero Emission Vehicles

The Welsh Government should continue to lobby the UK Government for the continuation of the Plug-in Van and Truck Grants, which need to continue to support the deployment of ZEVs. The grant is essential to improving the business case for operators when comparing to diesel.

Welsh Government should lobby the UK Government to improve the functionality, usability, and access of the grant. Industry feedback raised concerns with various facets of the grant, including the cost impact of the current range test, how very few HGVs can register for the grant, and that the maximum grant available (£25k) is still insufficient due to high upfront CapEx costs.

Additionally, concerns were raised regarding the inequitable nature of the grant, which primarily benefits those who are in a position to purchase new vehicles. Welsh Government should consider lobbying the UK Government to widen the scope of the PiTG to cover energy infrastructure procurement, to improve cross-fleet access.

Deliverable	Extension and improved functionality of the Plug-in Grants for Commercial Vehicles
Specific objective	 Extend the plug-in grants (truck and van) beyond 2024/25 to 2030, removing annual review processes and ensuring longer term financial commitment. Develop an information campaign to highlight the grant to operators, particularly as financial information is not usually detailed on HGV OEM listings (as seen for LCVs). Scale level of grant to ZE range or size of battery to reflect much higher costs of larger trucks (£/ZE mile or £/kWh). Review existing order limits for truck grants (max 100 claims per year for large truck/N3 grant) and understand the potential impacts on uptake. Create an open forum for industry to feed back on grant functionality.
Timeframe	2025 – 2030
Who	UK Government
Examples / Resources	Plug-in Van and Truck Grant
Sector(s)	

Deliverable	Improved Usability and Access of the Plug-in Grants for Commercial Vehicles
Specific objective	 Review and shorten the application form. Ensure the list of eligible vehicles reflects what is available on the market to date. Clarify the use of VECTO simulation for vehicle eligibility and remove the existing range test.
Timeframe	2025 – 2030
Who	UK Government
Examples / Resources	Plug-in Van and Truck Grant
Sector(s)	



Fiscal Support for Infrastructure

The transition to electric commercial vehicles is going to require substantial investment in charging infrastructure to support the roll-out. Fiscal support from both public and private finance mechanisms is essential to overcome the high upfront costs and risks associated with building charging infrastructure.

Public finance, through grants, tax incentives, and subsidies, can help de-risk investments and encourage private sector participation. Private finance is crucial for scaling up infrastructure deployment, bringing in innovation, and ensuring long-term sustainability. Together, these funding sources can accelerate the adoption of electric commercial vehicles, support broader environmental goals, and stimulate economic growth in the green technology sector.

Deliverable	Workplace Charging Scheme
Specific objective	 Extend the Workplace Charging Scheme beyond 2024/25 out to 2030 to support infrastructure provision.
Timeframe	2025 - 2030
Who	UK Government, Welsh Government
Examples / Resources	Workplace Charging Scheme
Sector(s)	

Deliverable	Develop a LEVI fund for Wales
Specific objective	• Work with key partners to develop a Local Electric Vehicle Infrastructure (LEVI) fund to leverage private capital investments in charging infrastructure to accelerate deployment of decarbonisation infrastructure.
Timeframe	2025 - 2030
Who	Welsh Government
Examples / Resources	Local Electric Vehicle Infrastructure (LEVI) fund
Sector(s)	

Deliverable	Create van charging provision guidelines
Specific objective	• Create guidelines for charge point providers and local authorities to provide a minimum level of accessible charge points for vans e.g. 25% of all EV charge points must be suitable for vans.
Timeframe	2025 - 2030
Who	Welsh Government
Examples / Resources	
Sector(s)	

Deliverable	Create an infrastructure provision grant for the second-hand market
Specific objective	 Introduce a grant/government loan to help improve access to (depot- based) commercial vehicle charging infrastructure for electric vehicles purchased on the second-hand market.
Timeframe	2025 - 2030
Who	Welsh Government
Examples / Resources	
Sector(s)	

Deliverable	Build a land bank for strategic public charging sites through Local Development Orders
Specific objective	 Make public land available through the planning process at discounted land values to make public charging infrastructure more financially viable. (e.g. Section 106, Town and Country Planning Act 1990)
Timeframe	2025 - 2030
Who	Welsh Government (National and Local)
Examples / Resources	
Sector(s)	

Improving Infrastructure Experience for Users

Welsh Government should work with industry to facilitate an improved experience for van users when interacting with decarbonisation infrastructure.

Currently not all fuel cards can be used on all public charge points. Working with industry to improve coverage will enable more chargers to be accessible to van users to reduce infrastructure anxiety.

Developing the first community charging hub which provides dedicated chargepoints that are accessible and bookable for van operators would improve adoption. This could be used as an examplar for the rest of Wales t.

The Welsh Government could also work with bus and truck operators to encourage 'local charging partnerships', where businesses with charge points installed share charging infrastructure with local businesses. Bus operators are already starting to do this around the UK.

Deliverable	Community charging hub for commercial vehicles
Specific objective	 Create the first charging hub in Wales designed to support community-based charging infrastructure for vans that do not have access to depot charging infrastructure. Hub to include more accessible parking spaces, ability to book charging spots, options for short or overnight charging, lower kWh costs to comparative public charging. Work with supermarkets, car park operators, landlords and local authorities to form local charging partnerships. Roll model out across Wales once best practice is identified.
Timeframe	2026 onwards
Who	UK Government, Welsh Government
Deliverable	Use of fuel cards for EV charging
Specific objective	 Ensure universal coverage for charge points for fuel cards or "EV charging cards" across all charge networks.

Timeframe	2026 onwards
Who	Welsh Government
Examples / Resources	
Sector(s)	

Ensure ZEV Mandate is fit-for-purpose

The ZEV Mandate requires 70% of all new LGV registrations by 2030 to be zero tailpipe emission, and 100% by 2035. The Mandate needs to ensure that vehicles supplied meet the needs of operators and endusers. Building on the knowledge base of policy makers, an on-going review of the ZEV Mandate is essential to ensure its effectiveness in increasing the roll-out of ZEVs.

Deliverable	Monitor the ZEV Mmandate for LDVs
Specific objective	 Engaging with operators to ensure that the ZEV Mmandate is encouraging suitable vehicles that meet duty cycles and operators' needs. Provide clarity on ZEV Mandate for vans beyond 2030
Timeframe	2025 onwards
Who	UK Government, Welsh Government, Trade Bodies
Examples / Resources	
Sector(s)	



Deliverable	Provide clarity on a ZEV Mandate applied to HGVs
Specific objective	 Collaborate with UK Government to determine the political appetite for introducing a ZEV Mandate for HDVs and expected timelines. Review the existing ZEV Mandate to identify areas of potential relevance for a HDV equivalent mandate, consulting with bus and coach decision-makers where relevant.
Timeframe	2025-2026
Who	UK Government, Welsh Government
Examples / Resources	
Sector(s)	

Supporting the second-hand market

Sector(s)

The Welsh CV sector is heavily reliant on the second-hand vehicle market. Taking steps to improve confidence in the second-hand EV market through a consistent approach to information provision and battery state of health will enable accelerated decarbonisation of fleets that never purchase new vehicles.

Deliverable	Ensure the provision of accurate, consistent and clear information in sales listings
Specific objective	 Work in partnership with manufacturers and trade associations to highlight new EV models with increased range and charging speeds. Use events such as GreenFleet to promote lower TCO of EVs and disseminate knowledge on ZEV mandate. Identify myths around battery degradation for second-hand vehicles. Identify hard to decarbonise use cases for vans and target appropriate actions.
Timeframe	2025 - 2030
Who	UK Government, Welsh Government
Examples / Resources	
Sector(s)	
Deliverable	Second-hand vehicle labelling scheme (inc. battery state of health reporting)
Specific objective	• Work with manufacturers, operators and dealers to create a second-hand vehicle labelling scheme to standardise reporting of key information e.g. original kWh capacity, charging mode and power. Agree standardised reporting of battery state of health.
Timeframe	2025 - 2026
Who	Welsh Government, Industry, UK Government
Examples / Resources	



Repowering Vehicles to Zero Emission

There are opportunities to accelerate decarbonisation by converting or 'repowering' diesel CVs to zero emission powertrains. Repowering can improve the business case for adopting zero emission vehicles, extend its lifetime and reduce embedded life cycle carbon. Wales could have a particular benefit given the large number of older vehicles in use, particularly in the HGV sector.

Deliverable	Develop repower standards for commercial vehicles
Specific objective	 Develop a repower accreditation scheme for trucks to ensure repowered HGVs meet a high standard. Build on the existing ZEVRAS scheme for buses and coaches. Link to capital grant funding schemes for SMEs such as local air quality grants. Support second-hand market adoption of ZE options at a lower cost.
Timeframe	2025 – 2030
Who	Welsh Government
Examples / Resources	Zero Emission Vehicle Repower Scheme (ZEVRAS)
Sector(s)	

Deliverable	EV Charging Guidance			
Specific objective	 Create guidance for fleet operators and drivers on the EV charging landscape, including: Smart Charging /demand-side flexibility How best to maximise their vehicle batteries, including how to ensure the right battery for operations How to care for the vehicle battery to limit degradation The different types of chargers available for use, and how best to utilise these to suit operations How to amend driving styles to complement regen opportunities / energy efficiency Understanding the public charge point landscape - innovations in apps / fuel cards / booking slots etc 			
Timeframe	2025-2030			
Who	Welsh Industry, Welsh Government			
Examples / Resources	Energy Saving Trust Charging Guidance			
Sector(s)				

Hydrogen

There is a general consensus that hydrogen is unlikely to play a major role in LDVs but could have a role for long-haul heavy goods vehicle duty cycles, where concerns about battery weight and long charging times are seen as significant challenges to electrifying heavy trucks.

There are many challenges in implementing hydrogen for HGVs, from the development of the necessary refuelling infrastructure to the reform of regulatory frameworks and safety standards for the use of hydrogen on the UK's roads.

Hydrogen Fuel Cell

Hydrogen is a clean energy carrier that can power HGVs with zero tailpipe emissions, contributing to cleaner air and reducing environmental impact. Hydrogen fuel cells convert chemical energy directly into electrical energy, offering a higher efficiency compared to traditional combustion engines.

Hydrogen Combustion

There are also proposals for using hydrogen as a combustion fuel, with several manufacturers developing IC engines that are capable of burning hydrogen.

Low Carbon Hydrogen

When produced from renewable sources, such as electrolysis using renewable or low carbon electricity, green hydrogen can be a sustainable fuel option for vehicles.

The UK currently has two mechanisms for the incentivisation of low carbon hydrogen: under the RTFO as a development fuel and via the Low Carbon Hydrogen Standard.

State of the Market

To date there is limited penetration of hydrogen into the UK road parc. High CapEx costs of vehicles, limited infrastructure, availability and cost of low carbon hydrogen have been key barriers to date. There are a handful of public refuelling sites in service across the UK, with some private refuelling sites in Swansea.

	Car	LGV	Bus & Coach	HGV
UK FCEV	131	3	84	0
UK Total Fleet	~33 million	~4.7 million	~140,000	~535,000
Wales FCEV	5	0	0	0
Wales Total Fleet	~1.6 million	~260,000	~9,000	~25,000

Lessons from UK bus market

The UK bus market has trialled hydrogen fuel cell vehicles for over a decade, with around 100 HFCs in service in 2024. Vehicles use 350 bar pressure systems with around 25-35kg of hydrogen storage. Operators have introduced around 20-25 vehicles at a time with a range of different refuelling models, some with depot-based refuelling, and some with en route or off-site refuellers e.g. Aberdeen and Tysley Energy Park in Birmingham.

Experiences of bus operators have been positive, but a lack of low carbon hydrogen availability and high energy costs in recent years have prevented effective operation.

Themes

The following themes occurred across stakeholder engagement when considering maximising the benefits of utilising low carbon hydrogen in Wales:

- Clear strategy for the role of low carbon hydrogen in transport at a UK level.
- Clarification on treatment of hydrogen combustion in road transport decarbonisation from UK Government (H2 ICE)
- Ensuring all hydrogen used in transport meets the RTFO sustainability criteria or UK Low Carbon Hydrogen Standard.
- Building scale from industrial clusters where investment in low carbon hydrogen production is displacing existing grey/brown hydrogen.
- Review planning and health and safety regulations to speed up deployment of hydrogen refuelling stations in Wales.

Actions

The following actions can help accelerate decarbonisation of commercial vehicles through greater uptake of low carbon hydrogen fuel and associated vehicles.


This section should be read in conjunction with the Cross Cutting Actions chapter where actions have been amalgamated to reduce repetition [Hyperlink to Cross Cutting Chapter]

Clear long-term strategy from UK Government on role of hydrogen in transport

The UK Government has provided stop-start, limited support for the deployment of hydrogen refuelling infrastructure in the UK to date. A UK-wide strategy setting out clear use cases for hydrogen in road transport along with targets for the deployment of refuelling infrastructure, that complements the production of low carbon hydrogen, would enable accelerated adoption of hydrogen vehicles.

Deliverable	Define the role of Hydrogen in Transport Strategy
Specific objective	 Clearly defined role for hydrogen in road vehicle's, including commercial vehicles. This strategy should come with deployment of refuelling infrastructure and identified sources of low carbon hydrogen. The strategy should be underpinned with clear sources of funding from Government and/or private financing mechanisms.
Timeframe	2025 – 2026
Who	UK Government
Examples / Resources	Energy Saving Trust Charging Guidance
Sector(s)	

Clarity from UK Government on role of Hydrogen ICE

The EU has enabled legislation and financial incentives to support the deployment of hydrogen internal combustion engine (ICE) vehicles and NRMM. The UK has not clarified if hydrogen ICE qualifies for plug-in vehicle incentives to date.

The UK has existing combustion engine capacity which could be adapted for the mass production of hydrogen and could provide an interim combustion technology to develop the business case for refuelling infrastructure deployment.

Deliverable	Define the role of hydrogen combustion engines in road transport
Specific objective	 Send clear message to industry about the role of hydrogen combustion as an option for decarbonising HGVs. Understand the differences in hydrogen ICE policies between the UK and EU, and how these may impact vehicle procurement.
Timeframe	2024-2025
Who	UK Government
Examples / Resources	
Sector(s)	

Review planning regulations to promote accelerated infrastructure deployment

Review planning policy and engage with industry to understand how it can be reformed to reduce deployment of decarbonisation infrastructure.

Deliverable	Developing a uniform standard for hydrogen infrastructure approval ("first-of-a-kind" infrastructure)
Specific objective	 Undertake a national survey or consultation to identify common planning issues, solutions and efficiency improvements (e.g. providing evidence for pre-commencement conditions earlier), update Planning Policy Wales and link with Traffic Wales.
Timeframe	2025 onwards
Who	Welsh Government
Examples / Resources	
Sector(s)	

Develop repowering scheme for trucks

Zemo developed the Zero Emission Vehicle Repower Assurance Scheme (ZEVRAS) in partnership with EST and industry to develop minimum requirements for the conversion or 'repowering' of diesel combustion buses and coaches to zero tailpipe emission powertrains. A similar scheme could be created for trucks in Wales, encouraging manufacturing and skills development whilst reducing life cycle emissions through zero tailpipe emissions and extending vehicle lifetime.

Deliverable	Develop a repower scheme for HGVs
Specific objective	 Develop an accreditation scheme for the repowering of diesel HGVs to zero tailpipe emission.
Timeframe	2025-2030
Who	Welsh Government
Examples / Resources	
Sector(s)	

Support development of hydrogen clusters where low carbon hydrogen production can be used by local road transport

The hydrogen economy requires significant scale in production to reduce costs of fuel and improve availability of supply. For hydrogen vehicles to be deployed in significant volumes to support decarbonisation, large scale low carbon hydrogen production facilities will be required. Creating hydrogen clusters around heavy industries that are set to produce green hydrogen will enable adoption of hydrogen vehicles.

Deliverable	Support low carbon Hydrogen industrial clusters
Specific objective	 Support large-scale production of low carbon hydrogen at industrial sites that are using grey/brown (high carbon) hydrogen to develop hydrogen economy clusters. Support associated vehicle refuelling infrastructure to decarbonise local CV fleets e.g. RCVs.
Timeframe	2025 - 2030
Who	Welsh Government
Examples / Resources	
Sector(s)	

Increase incentive support for HGVs i.e. plug-in truck grant support Review and expand financial incentives available for the procurement of hydrogen fuel cell HGVS.

Deliverable	Increase the fiscal support for HFC HGVs
Specific objective	 Extend the Plug-in Truck Grant beyond 2024/25 to 2030, removing annual review processes and ensuring longer term financial commitment. Size of grant should reflect size of vehicle and zero tailpipe emission range capability.
Timeframe	2025 - 2030
Who	UK Government
Examples / Resources	
Sector(s)	

Expand ZEHID trials of hydrogen fuel cells in HGVs (HyHaul)

The DfT haves funded the HyHaul project which will facilitate deployment of 30 hydrogen fuel cell HGVs and refuelling infrastructure under the ZEHID programme. Maximising the benefits of this trial by supporting further funding for more HGVs and refuelling infrastructure and improve business cases for low carbon hydrogen production and distribution.

Deliverable	Expand HyHaul HGV trials
Specific objective	 Fund expansion of trials of hydrogen HGVs to support deployment of refuelling network, understand performance in a range of use cases, increase demand for low carbon hydrogen to develop scale and reduce costs.
Timeframe	2025 - 2030
Who	Welsh Government
Examples / Resources	
Sector(s)	

Ensure RTFO and Low Carbon Hydrogen Standard work together to be certain only low carbon hydrogen is used in transport

The supply of hydrogen as a road fuel is incentivised under the RTFO as development fuel, however volume supplied has been very limited to date. The Low Carbon Hydrogen Standard was created to encourage the production of green hydrogen. However, the sustainability criteria for these two do not align, adding complexity to the market.

Deliverable	Harmonise RTFO and low carbon Hydrogen standard
Specific objective	 Align two UK- wide standards incentivising the production and supply of low carbon hydrogen. Review RTFO incentivisation to understand limited supply of hydrogen as development fuel to date.
Timeframe	2025 - 2026
Who	UK Government
Examples / Resources	
Sector(s)	

Forum for Hydrogen in Wales Create a forum to bring together different stakeholders engaged in deploying low carbon hydrogen in Wales, not just from transport but the wider sector and other industries. Best practice knowledge sharing on regulatory developments and international use cases can help remove barriers and educate trade bodies and operators.

Deliverable	Create a Hydrogen in Wales forum
Specific objective	 Establish and promote a forum of relevant stakeholders to share best practice, monitor regulatory developments (e.g. ADR reform), engage international case studies, develop consortia. The forum could deliver knowledge sharing workshops, advise on skills and training and promote successes in Wales.
Timeframe	2025 and beyond
Who	Welsh Government
Examples / Resources	HyCymru (no link supplied?)
Sector(s)	



Conclusions

The decarbonisation of the commercial vehicle sector in Wales presents both challenges and opportunities. The road freight and logistics sector, while vital to the Welsh economy, contributes significantly to greenhouse gas emissions.

This report has examined the different pathways to decarbonising and unlocking significant cost savings for the commercial vehicle fleet in Wales, and has set out a range of proposed actions for the Welsh government and Welsh industry stakeholders. The clear direction for both light and heavy commercial operations is electrification in the medium term, with hydrogen fuel cell technology being an option for operations that may be difficult to electrify with battery technology, where a viable source of green hydrogen is available. In the immediate term, Low Carbon Fuels can play a significant role in reducing the emissions of the existing fleet while transitioning to zero tailpipe emission technologies. The proposed multi-faceted approach, utilising various technology pathways, will deliver substantial reductions in emissions and provide economic benefits across Wales. This is a direction of travel which is in line with both UK and EU policy and industry will need to adapt. Welsh Government has an important role in facilitating the transition.

The next phase is to take the proposals in this report, building on the foundations laid by bringing together the Welsh Stakeholder Group, and work together to implement the suggested actions.



Key Takeaways

- 1. Emissions Reduction: Implementation of proposed actions could potentially save 8.4MtCO₂e by 2050, with a highly cost effective benefit-to-cost ratio of 5.9.
- 2. Complementary Pathways: While electrification is the primary long-term solution, low carbon fuels and hydrogen will play crucial roles in the transition period and for specific use cases.
- 3. Government Role: Welsh Government can act as a facilitator, supporting industry-driven initiatives and helping prepare the sector, especially for SMEs, for the transition to net zero transport.
- 4. Infrastructure Development: Coordinated efforts are needed to develop charging and refuelling infrastructure, with a focus on grid capacity enhancement and innovative solutions like onsite generation and power banks.
- 5. Economic Opportunities: The transition presents new opportunities for the Welsh commercial vehicle industry to capitalise on existing strengths and develop new partnerships.

Moving Forward Together

To achieve the decarbonisation goals, a collaborative approach involvinggovernment, industry, and local authorities is essential.

- Facilitating partnerships and removing barriers to adoption of low carbon technologies
- Supporting innovation and educating operators about available options
- Improving access to capital, particularly for SMEs
- Reforming planning rules to expedite the deployment of low carbon
 infrastructure
- Leveraging international trade links to align with global decarbonisation
 efforts

By implementing these 'no regret' actions, Wales can accelerate the decarbonisation of its commercial vehicle sector, contributing to national carbon reduction targets while fostering economic growth and technological innovation. The transition will require sustained effort and adaptability, but it offers a path to a more sustainable and prosperous future for Wales.

References

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