THE ASSOCIATION FOR RENEWABLE ENERGY & CLEAN TECHNOLOGY

Electrifying the Fleet: A Practical Resource for Fleet Managers

By - The REA's HGV and Commercial Fleet Working Group and Energy Saving Trust

energy saving trust

RECHARGE UK
REPRESENTING THE UK EV INFRASTRUCTURE INDUSTRY

RECHARGE UK is the REA's EV member forum

Foreword

Matt Adams - Transport Policy Manager, REA

REA members seek to accelerate electric vehicle adoption. The REA's HGV and Commercial Fleet Working Group consists of a number of leading experts in the fleet space. Ranging from Charge Point Operators, Fleet Operators, expert consultants, installers and software providers.

This resource was produced to support fleet managers to successfully electrify their fleets, providing a step-by-step process, demonstrating value for money and efficiency savings that can be utilised by electrifying, as well as the current barriers to accelerated adoption.

The REA then presents case studies on successful applications of services provided by REA member companies highlighting the excellent services they provide, allowing fleet managers to make well informed decisions on where to obtain services at each step of the fleet electrification process.

The REA is best placed, with its wide membership, to take an authoritative stance on fleet electrification and show those considering fleet electrification a proven, well managed process to electrification, providing savings on fuel costs and allowing fleets to achieve ESG targets.

This resource was produced in conjunction with the Energy Saving Trust (EST) which has provided insight and analysis relating to smart charging. EST's full contributions are detailed in Appendix 1, 2 and 3. EST has a comprehensive portfolio of services, focusing on energy saving and their expertise was vital in highlighting the full business case to electrify a fleet.

Part 1 Setting the context for fleet electrification

1. Fleet Types

This section provides an overview of the types of fleets covered within this resource document.

- End to End Logistics fleets: Discussion on how to establish an end-to-end solution that would provide highly reliable, fully managed depot charging facilities, and to provide drivers with access to high quality, reliable public charging infrastructure in safe and secure truck stops.
- Last Mile and Mobile Engineering: Discussion on common misconceptions, downtime, charging infrastructure, drivers that take vehicles home, cost of ownership, as well as new revenue opportunities, depot sharing and minimising downtime.
- Local and Regional Transport Authority fleets: Discussion on the steps involved in the electrification process and approach including shared infrastructure, retrofitting vehicles (issue of number plating), virtual depots and supporting blue light services. As well as a timeline for the transition, including vehicle procurement, charging infrastructure installation, and training programs for staff.

2. Current legislated targets and vehicle sales

The UK as a leader in the electrification of road transport has already begun to set binding targets for zero emission van sales and broader targets for zero emission HGV's.

2.1 Current UK policy for Zero Emission Van sales in the UK

The UK Zero Emissions Vehicle (ZEV) Mandate[1] sets specific sales targets for the percentage of new zero-emission vehicles (ZEVs) that manufacturers must sell each year. For vans, the mandate outlines a gradual increase in the required proportion of new zero-emission van sales over time. In January 2024, the Government mandated that 10% of new vans sales must be zero emissions by the end of 2024 rising to 58% in 2029: then 70% in 2030 and up to 100% in 2035. Although the 2031-35 targets are yet to be legislated for.

[1] https://www.gov.uk/government/consultations/a-zero-emission-vehicle-zev-mandate-and-co2-emissions-regulation-for-new-cars-and-vans-in-the-uk/outcome/zero-emission-vehicle-zev-mandate-consultation-summary-of-responses-and-joint-government-response

This means that an increasing proportion of vans on the market will be zero emission at the tailpipe. The SMMT estimate that by the end of 2024 due to a slow in demand for new Battery Electric Vans (BEVs) that 9.4% of new van sales will be BEV[2], short of the 10% target set by the Government. In 2023 BEV van sales were 5.9% of all new van sales in the UK.

2.2 Current UK policy for Zero Emission HGV sales in the UK

For HGVs the UK Government have set high level targets for the sale of new, non-zero emission HGVs less than or equal to 26 tonnes will be introduced from 2035 and, from 2040, all new HGVs sold in the UK must be zero emission, in their response to the consultation on when to phase out the sale of new, non-zero emission HGVs[3]. We expect an equivalent of the UK ZEV Mandate for cars and vans to be introduced for HGVs over the next few years to provide investment certainty for the sector.

REA member EY report that 'progression for zero emissions HGVs is a significant distance behind the inroads made in relation to electric cars, with stubborn challenges continuing to stunt growth. For example, there is a substantial gap between the infrastructure for electric HGVs compared to electric cars, with everything from the manufacture of electric HGVs to the location and availability of suitable chargers in need of significant further investment and improvement.' This comes after the SMMT reported that in November 2023 there was only one HGV charging facility in the UK[4].

2.3 Current support mechanisms in place

Presently, there are support mechanisms in place for vans which differ depending on the weight of the van, which will expire in March 2025.

2.3.1 Small Van Plug in Grant

Small vans are eligible for up to £2,500 discount. These vans must be under 2,500kg, produce less than 50 g/km of CO_2 and be able to travel at least 60 miles without any emissions from the tailpipe.

[2] https://www.smmt.co.uk/2024/02/60000th-electric-van-joins-uk-roads-as-lcv-demand-enters-second-year-of-growth/
[3] https://www.gov.uk/government/consultations/heavy-goods-vehicles-ending-the-sale-of-new-non-zero-emission-models/outcome/outcome-and-response-to-the-consultation-on-when-to-phase-out-the-sale-of-new-non-zero-emission-hgvs#:~:text=After%20hearing%20views%20from%20industry,UK%20must%20be%20zero%20emission.
[4] https://www.smmt.co.uk/2023/11/record-zero-emission-truck-uptake-as-hgv-market-grows-for-sixth-quarter-running/

2.3.2 Large Van Plug in Grant

Large vans are eligible for a discount of up to £5,000. These vans must be between 2,500kg and 4,250kg in gross vehicle weight; produce less than 50 g/km of CO_2 and be able to travel at least 60 miles without any emissions from the tailpipe.

The Government has a full list of eligible vans for these grants[5].

2.3.3 Small Truck Plug in Grant (N2 Vehicles)

Small trucks are eligible for a discount of up to £16,000. These trucks must be between 4,251kg and 12,000kg; have CO_2 emissions of at least 50% less than the equivalent conventional Euro VI vehicle that can carry the same capacity and be able to travel at least 60 miles without any emissions from the tailpipe.

2.3.4 Large Truck Plug in Grant (N3 Vehicles)

Large trucks are eligible for a discount of up to £25,000. These trucks must be heavier than 12,000kg in gross vehicle weight; have CO_2 emissions of at least 50% less than the equivalent conventional Euro VI vehicle that can carry the same capacity and be able to travel at least 60 miles without any emissions from the tailpipe.

The Government has a full list of eligible vehicles for these grants[6].

3. Savings from electrifying a fleet

Fleet managers can expect to see extensive savings on fuel costs per vehicle electrified, with the cost of electricity significantly cheaper than diesel on the whole. This is in addition to the much higher efficiency savings from an EV, which only needs 25-30% of the energy that a diesel equivalent would deliver the same performance. Additional savings can be made where depot or home charging is the only charging type.

An LCV driving 15,000 miles a year (60 miles a day, 250 days a year) could save around £1,500 in annual fuel/energy costs if charged at the depot/home (or more if using an EV tariff).

A rigid HGV driving 15,000 miles a year could save around £3,500 in annual fuel/energy costs if charged at the depot. In all cases savings will vary depending on the vehicle efficiency (mpg), the electricity tariff at the depot, fuel price fluctuations, and use of public charging.

See Appendix 1 for a full breakdown of estimated savings.

[5] https://www.gov.uk/plug-in-vehicle-grants/vans
[6] https://www.gov.uk/plug-in-vehicle-grants/trucks

Residual Value:

There are a number of factors which can impact the residual value of a vehicle, similar to ICE vehicles some of these will be out of the control of the immediate business. Depreciation can be dependent on how an operator sources their vehicles.

- **Business Contract Hire** (Vehicle plus various packages such as servicing, tyres, replacement vehicle etc.) - the vehicle is returned at the end of the lease and the finance company takes the hit for the depreciation.
- **Business Contract Purchase** (Vehicle and servicing inc.) - the vehicle is procured via a lease and the fleet operators owns the vehicle at the end of the lease and therefore liable for depreciation. (Same principle as Hire Purchase.)
- **Outright purchase** (Vehicle only, operator responsible for servicing) - this procurement method is usually favoured by Public Sector and the fleet operator is more likely to retain the vehicle for longer.

Other issues that can impact depreciation include:

- **Lower depreciation value** - increased demand for EV's; vehicle delivery i.e. blocked routes (e.g. Suez Canal); port staff strikes; geopolitical challenges; part scarcity and pandemics.
- **Increased depreciation value** - low new vehicle sales; EV myths/fake news or biased stories from reputable news outlets and papers; issues with the public charging infrastructure.

Part 2 Depot Electrification

1. Key considerations in electrifying a depot

Whilst there are many stages to the fleet electrification journey, there are key aspects that should be considered to ensure a smooth and efficient transition process.

- **Fleet analysis:** A phased transition is the most common approach to fleet electrification; allowing for a controlled deployment of ZEVs whilst also understanding the impact of this transition on fleet operations. Analysis should be undertaken to understand which routes/drivers are the easiest to electrify, to help decide which vehicles will be transitioned to ZEVs first as well as defining, at a high level, the overall fleet electrification timeline.
- **Site design and pre-meter power enablement:** Once a roadmap has been defined for electrification, it is important to understand how charging infrastructure can be rolled out to support these electrification plans. This can be

an iterative process of first defining charging requirements at a site, understanding the impact of charging on local energy infrastructure and implementing energy management strategies where appropriate. Future-proofed charging solutions are critical to ensure efficient use of resources and investment.

- **Operational integration:** Whilst the electrification journey of a fleet can be complex, it is important to minimise unnecessary complexity wherever possible. In this regard, integrating charging solutions into your existing fleet management systems plays a critical role in ensuring a more seamless fleet transition.

Virta UK[7] works with its partners to guide fleets and fleet managers, through the complexities of fleet electrification to both develop and deliver a carefully considered fleet transition strategy.

Grid connections are also often misattributed early on as a key barrier to EV adoption. However, fleet managers should think carefully about the charging speed required, charging type (AC or DC) opportunities for smart charging and scheduled charging to reduce the need for grid reinforcement.

1.1 Simplifying the grid connection process - Aggregators

An electrified fleet provides an opportunity as a flexible energy resource. You can use an aggregator, or flexibility service provider, to take advantage of your resource and monetise flexibility from your fleet. Aggregators can provide the expertise to assist you to participate in the balancing market as they negotiate with electricity producers. They work with businesses to maximise the flexibility you can offer to the grid and manage your participation.

An aggregator can also pool together, or aggregate, capacity from many organisations to enable even small businesses or small assets, to participate in flexibility markets and therefore generate income. Aggregators also have the technical expertise to improve asset reliability and efficiency. It also allows you to provide the National Grid with flexibility, helping to contribute to a greener grid.

1.2 Demand Side Response

You can also engage independently of an aggregator in Demand Side Response (DSR) services. DSR is changing consumption of electricity, in a way that is beneficial to the electricity system. For example, charging EVs during times of low demand. In return, you can receive strong financial incentives, lower your bills, reduce your carbon footprint and play an important role in the transition to a low carbon energy system. More information on DSR can be found on the National Grid ESO website[8] and in Appendix 2.

[7] https://www.virta.global/

[8] https://www.nationalgrideso.com/industry-information/balancing-services/power-responsive/demand-side-response-dsr#:~:text=What%20is%20Demand%20Side%20Response,help%20balance%20Britain's%20electricity%20system.

2. Building a business case

To build a business case a fleet manager will need to understand their organisations' ESG targets including Scope 1 emissions.

2.1 Scope Emissions

Fleet managers will likely have Scope 1 emissions to lower as part of a strategy to hit net zero emissions. Scope 1 emissions include the burning of fuel from fleet vehicles. The adoption of electric vehicles will significantly lower Scope 1 emissions of the company as a whole, as EVs do not have any Scope 1 emissions and will also improve air quality in their community.

Fleet managers will also be interested as part of the wider business in reducing Scope 2 emissions. Scope 2 emissions include the energy purchased to power an electric vehicle, office etc. Fleet managers will be able to reduce Scope 2 emissions by finding tariffs that offer renewable energy. REA members Drax and Octopus EV both offer renewable energy tariffs for businesses and may also offer lower off peak tariffs as well for overnight charging.

Case Study | Syzygy Consulting - Solar PV Installation[9]

In addition to reducing Scope 2 emissions from purchasing renewable energy tariffs, fleet managers may also want to examine the possibility of reducing their grid demand from the installation of solar and battery storage. Fleet depots are likely to have viable commercial rooftop space from which to extensively benefit from producing their own solar power.

REA member Syzygy Consulting have extensive experience in this area and in 2023 were able to undergo an end-to-end service in Zevenaar, Netherlands, where 16.2Mw of solar power was yielded at one of the 20 largest logistics buildings in Europe. Their service included strategy development; feasibility studies; project development; project procurement and delivery and asset management.

2.2 Fleet Analysis

To understand the true costs and viability of fleet electrification fleet managers must do a thorough assessment of their routes to understand which routes are most commercially viable to be electrified. This could be applied across any of the three fleet types mentioned in Part 1, Section 1.

[9] https://syzygyconsulting.eu/projects/zevenaar-netherlands/

REA member Dynamon provide a bespoke service which analyses telematics data to inform fleet managers which battery size to purchase with a new vehicle and which chargepoints would be most appropriate to purchase. This allows a fleet manager to bring more accurate costings to the budget holder to accurately determine an electrification strategy with accurate costings.

Case Study | Dynamon - Magtec[10]

Magtec were asked to deliver ten x 18-tonne electric trucks to NHS Wales, which had complex requirements for battery capacity to meet operational needs and minimize costs and vehicle weight. NHS Wales also sought guidance on the necessary charging infrastructure for their depots to ensure efficient vehicle operations.

After integrating with NHS's telematics data for three depots, Dynamon analysed 10 ICE vehicles with 340 days of operational data using its flagship tool ZERO. ZERO analysed a set of 'what-if' scenarios to produce an electrification factsheet highlighting financial benefits and operational reliability.

The output of Dynamon's analysis identified a detail set of guidance on the battery sizes of the drive systems and the charging infrastructure installation.

Angus Webb the founder of Dynamon says that their flagship tool ZERO is an example to all fleets that you can use software to solve the most complex decarbonisation and operational challenges.

2.3 Data to inform fleet electrification

In addition to software, data sets will also be crucial in a fleet decarbonising. Data such as understanding the cost of getting a grid connection, and whether drivers who take their vehicle home need access to on or off street parking are also required to ensure that full costings are taken in to account.

To do this fleet managers will likely need support to navigate the grid connections process, which vary depending on the Distribution Network Operator (DNO) who is responsible for grid connectivity in a depot's locality, to ensure they get the best value for money.

[10] https://dynamon.co.uk/resources/accelerating-zero-emission-truck-adoption-with-magtec/

Case Study | Field Dynamics

REA member Field Dynamics have worked with the Association of Fleet Professionals to source van telematics data to help understand where stop incidences of 6 hours of duration or longer within a 24-hour period occur over a three month time period. The metric 'average daily stops' highlights areas of concentrated demand for vans, such as depots and industrial parks, as well as residential areas where fleet drivers reside.

2.4 Insurance

Whilst the number of fire claims involving electric vehicles is considerably less than those powered by fossil fuels, they do generate a lot of press coverage, even when this is misattributed. There is also the much higher price tag which attaches to an EV. The inevitable impact, along with no historic data to rely on for pricing, means that insurers are more cautious in their approach to underwriting.

Case Study | Gallagher

Gallagher's approach[11] has been to arrange a conference whereby the underwriters had the opportunity to question EV manufactures on their systems, this removing many myths and providing greater comfort to insure their customers. It then allowed them to create a panel of insurers who will either underwrite a risk in full or work together when the Estimated Maximum Loss exceeds their capacity.

However, critical to securing the most affordable premiums with acceptable terms, is early market engagement. Their experience tells them that meetings with insurers at the initial design stages allows to control risk surveyors' expectations. But this tri-partite approach also allows them to bring the underwriters on board with all of the risk management features, including placement of battery chargers, vehicle spacing, emergency response procedures and business continuity plans.

As more risks are insured without incident, the appetite from insurers will increase and this will then drive down premiums.

2.5 Installing the chargepoints

Fleet Managers will have by now managed to gather data on the speed and number of chargepoints they need, as well as the cost of obtaining a grid connection to do so (if required).

Fleet managers will then need to select a chargepoint operator, or installer to provide the chargepoints and potentially manage them as well.

Some providers will provide end to end solutions which provide consultancy as well as chargepoint installation and servicing. Several of these companies are REA members including Drax, ElectrAssure and Mer.

[11] https://www.ajg.com/uk/

Case Study | Mobile Engineering - Drax and SES Water

Drax's first deployment of chargepoints came in 2021, when they deployed Drax Electric Solutions, a service offering EV charging infrastructure; chargepoint operating software; EV leasing; telematic devices and renewable source electricity power supply. SES Water made an initial investment in 16 new charging points and replaced 10 of its 120 strong fleet of diesel vans with electric vehicles. This small step is saving SES Water an estimated 43 tonnes of CO_2 per year[12].

Case Study | End to End depot charging - ElectrAssure and Western Power Distribution

In 2020, WPD planned to install an EV charging corridor across 12 depots from Lincolnshire to Cornwall to enable its electric van drivers to travel easily between depots. WPD selected ElectrAssure to install chargers at the first depot in Nottingham. ElectrAssure specified two x Delta 50kW Ultrafast Chargers tailored to the requirements of the WPD white fleet while providing a clear upgrade path to futureproof the systems. Despite challenges with COVID 19, the service was delivered on time and to budget[13].

Case Study | Last Mile Delivery - Mer and Ikea

IKEA wanted to roll out EV charging at all its UK stores to enable deliveries to be made by electric vans and trucks. As a result of Mer's end to end service, in total Ikea has invested £4.5 million in power grid upgrades and the installation of 200 Mer chargers, including 40 rapid chargers, in 2023. The charging posts are located at every IKEA store and at the Dartford Customer Distribution Centre[14].

Case Study | NHS Fleet Transition - Blink and Sussex Partnerships Foundation

Sussex Partnership NHS Foundation Trust installed EV chargers across their estate to support the transition of their fleet to electric vehicles, as part of their Green Plan to reach Net Zero emissions by 2040. They partnered with Blink Charging to deploy 27 charging units across three sites, overcoming logistical challenges and ensuring minimal disruption to hospital operations. The successful implementation paves the way for

[12] https://energy.drax.com/insights/drax-cutting-ses-waters-co2-with-evs/
[13] https://www.electrassure.co.uk/case-studies/operational-ev-charging-for-western-power-distribution/
[14] https://uk.mer.eco/news/ikea-case-study-last-mile-electrification/

further expansion, aiming to cover all areas of the Trust's estate to facilitate an all-electric vehicle fleet.[15]

2.6 Utilising the chargepoints

Once the chargepoints are installed, fleet managers should look to ensure their fleet is utilising their energy supply efficiently to maximise the return on investment. Software is crucial in this step to ensure that businesses can adapt charging schedules as they learn on the job, taking in to account the efficiency of each driver with their vehicle, the downtime of the vehicle and ensuring charging can be done at the cheapest time.

Case Study | Showcasing the value of software - Fuuse and SUEZ

REA member Fuuse worked with REA member SUEZ who are embracing vehicle electrification, with a considered, intelligent and iterative approach.

With multiple use cases they needed a charging solution and platform partner that can cater for the different needs of employee vehicles and their own fleet, across multiple locations. They needed a scalable solution that can grow with their rollout, providing the data and insights to enable intelligent planning and ensure a charging infrastructure that is right for their business[16].

As a result of Fuuse's software solution, SUEZ received:

- Comprehensive usage data to inform trends and charging needs.
- All 48 depots and office sites managed from one back office system.
- Clear CO_2 and NOx saving reports to align with sustainability targets.

2.7 Smart charging for EV fleets

To maximise the benefits of the chargepoints installed, fleet managers should look to utilise smart charging options. Smart charging refers to a type of electric vehicle (EV) charging which allows for real-time adjustments to charging patterns based on site electrical capacity, renewable energy availability, and electricity prices.

A smart charger has a data connection to the vehicle, the grid and energy provider, enabling it to be controlled remotely in 'real time' by you or your energy supplier, in order to optimise energy consumption, shifting it away from periods of peak demand. This decreases the strain on the energy network infrastructure, reducing the need for expensive and time-consuming energy network upgrades, while providing fleets with favourable tariff savings depending on duty cycles of specific fleet vehicles.

This type of charging is seen as an essential part of EV charging as more and more ICE vehicles transition to electric in the coming decade and demand for power increases.

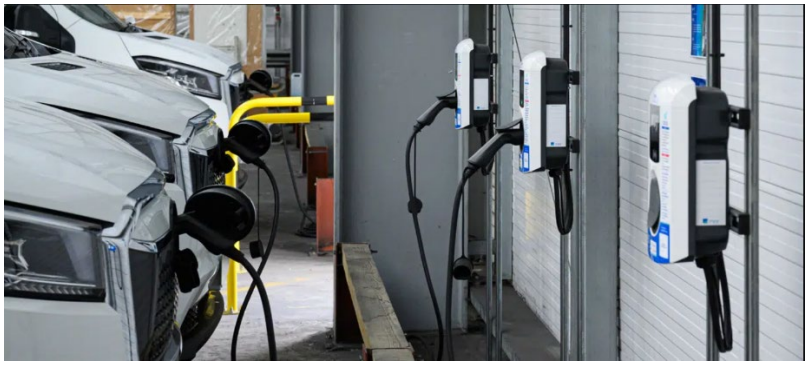
[15] https://blinkcharging.com/en-gb/case-studies/sussex-partnership-foundation-install-ev-chargers-across-estate-to-support-nhs-fleet-transition
[16] https://fuuse.io/suez

Energy Saving Trust carried out research on behalf of the Department of Energy Security and Net Zero (DESNZ) to explore different consumer groups' understanding of smart charging concepts and to explore their attitudes towards smart charging. The report found that amongst fleet managers, key concerns around EV charging were efficiency, reliability, and cost. Awareness of smart charging was low, especially considering that it can offer solutions to these key concerns. Below Energy Saving Trust have outlined some of the high-level benefits of smart charging to a commercial fleet.

The benefits of smart charging for EV fleets include the following:

- **Improved efficiency:** Smart charging allows charging operations to be automated and optimised to ensure vehicles are ready when they are needed. In a fleet with complex duty cycles, this can reduce downtime and improve the overall utilisation.
- **Greater control:** Smart charging gives fleet managers greater control over the charging process. It allows them to monitor and control the charging of individual fleet vehicles remotely, ensuring the vehicles are correctly utilised and charging.
- **Cost savings:** Smart charging offers a more cost-effective way to charge EVs by enabling fleet managers to schedule charging for times when electricity prices are lower throughout the day and overnight, especially if combined with dedicated electric vehicle tariffs.
- **Reduced need for grid upgrades:** Smart charging responds to changes in the site's electric usage to make use of available capacity. This can reduce or eliminate the need for lengthy and costly grid upgrades.
- **Sustainability:** Smart charging benefits the environment as vehicles can be scheduled to charge at times when there is more renewable energy on the grid.

A comprehensive list of the benefits of smart charging, including specific examples for commercial fleets can be found in Appendix 2.



Part 3 Depot Sharing

Fleet managers will be aware, that for fleet vehicles reliant on charging in public, they will experience concerns around there being enough infrastructure, whether it is bookable, whether it is acceptable for a business vehicle to be seen charging, bay sizes and space for commercial vehicles.

The one place where it's guaranteed to be acceptable for a business vehicle to be seen charging, that has adequate bay sizes, and potentially booking capability is a depot. Not every vehicle will fit in every depot, but it will be run for professional drivers whose staff will be used to moving road traffic, minimising the potential for injury.

Depot sharing is becoming increasingly important as fleet managers across the country are tasked with reducing their Scope 1 emissions while also finding cost savings. They will likely be put in a queue for a grid connection which may delay the purchase and use of an electric vehicle. This will mean the carbon savings obtained from eventually purchasing one will be less. With new ICE vehicles on average achieving carbon savings at the tailpipe of 2.1% in 2023 from 2022[17], they end up burning marginally less carbon dioxide per litre than past models of the same vehicle. Therefore, the carbon savings will be both delayed and reduced than if a company was able to more quickly purchase an EV.

In addition, there are approximately 66,973 depots in the UK[18] which if enabled to share their facilities would significantly reduce the demand for public HGV charging infrastructure. But not entirely, as many fleets will still need to charge either at overnight truck stops or for en route rapid charging.

Many smaller haulier's bunker diesel for themselves and also sell to third-party hauliers and so depot sharing is not necessarily an unfamiliar area for some fleet managers.

Case Study | Shared depot charging - ENROUTE - Syselek

Welch's Transport wanted to replicate this model for electric HGVs by offering charging to third-party electric HGV operators. This offers the twin advantages of improving the utilisation of Welch's Transport's charging infrastructure and providing cheaper charging for third-party operators than from public charging networks. However, commercial sensitivity and privacy concerns over sharing live data make this tricky to implement in practice.

[17] https://www.smmt.co.uk/wp-content/uploads/SMMT-Facts-2024-smaller-size.pdf
[18] https://www.smmt.co.uk/wp-content/uploads/SMMT-Position-Paper-Charging-and-Refuelling-Requirements-for-the-Heavy-Goods-Vehicle-Sector.pdf

Under the Innovate UK-funded ENROUTE project, Welch's Transport called upon Syselek's experience of eHGV charging digital integration for a live data sharing approach, with appropriate data anonymisation and security to overcome key concerns[19]. Cambridge University's Centre for Sustainable Road Freight have been providing independent assessment to the project.

Case Study | Shared Depot charging - Local Authority and Paua

REA member PAUA have also recently bid in to a Innovate UK project to easily facilitate depot sharing. This will be focused on Local Authority depots. However, they acknowledge to achieve a successful trial there are a number of barriers that must be overcome.

Firstly, challenges around access to a third party location need to be overcome. These include safety, security, insurance, accessibility (e.g. booking) , etc.

Secondly, a payment solution is required that enables fleets to find these private locations, enable a charging session to start, and pay for the use of the chargers.

Thirdly, whatever solution is established for steps 1 and 2 needs to be scalable. So, it requires an understanding of where this solution can be repeated to create value for others.

In addition, some in industry have perceived the Public Charge Point Regulations as a barrier to depot sharing. We have received clarity from OZEV that as long as chargers are not accessible to the general public, they are not included in the definition of public chargepoints and hence would not be covered by the Public Charge Point Regulations.

Depot sharing therefore would not come under the public chargepoint regulations as long as depots were not open to the general public at any point. This means as long as someone driving their electric car for example couldn't use the facility, and that it was open to professional van or truck drivers only with pre authorised access, that would be exempt from the Public Charge Point Regulations.

[19] https://www.syselek.com/enroute

Part 4 A reliable public charging network

Some fleets, particularly end to end fleets doing long journeys each day and those whose drivers take their vehicles home will need to charge in public. Those who do need a reliable, easy to use, easy to pay, safe and secure charging experience.

Presently, according to the Association of Fleet Professionals (AFP), 65% of fleets see current charging infrastructure as a barrier to electrification[20].

Fleet managers will need to find an easy way to ensure that their drivers are able to charge in public safely, and securely, knowing that the chargepoints are available and working. Zap Map's website offers anyone the ability to quickly check whether a chargepoint is working before they set off.

The Public Charge Point Regulations 2023 will require that all public chargepoints of 50Kw or more have 99% reliability. This should mean that within the next year, the public charging experience for the vast majority of journeys is not hampered by unreliable charging infrastructure. For HGVs in particular, the importance of a reliable charging network cannot be overstated. With cargo potentially containing items that could spoil if the vehicle loses power and could open the car park owner or chargepoint operator to a law suit if the cargo spoils as a result of not being able to access a charger.

Ease of payment

The Public Charge Point Regulations also require that chargepoint operators (CPO) will have to enter into partnership with at least one roaming provider. That means that charging across multiple networks is easier. Fleet managers should look to work with roaming providers to pay for fuel cards that will be able to roam across multiple networks to ensure a seamless payment experience without requiring drivers to pay with their own cards and require more administrative burden of increased expense forms that would otherwise occur.

Roaming providers include **Greenflux, Last Mile Solutions, Octopus Electroverse, Paua and Zap Pay.**

These platforms are likely supported by **Girevé** or **Hubject** who provide a host of back-end e-mobility solutions including Plug & Charge.

[20] https://www.theafp.co.uk/almost-six-out-of-ten-van-fleets-would-consider-shared-ev-charging-infrastructure-afp-survey-shows/

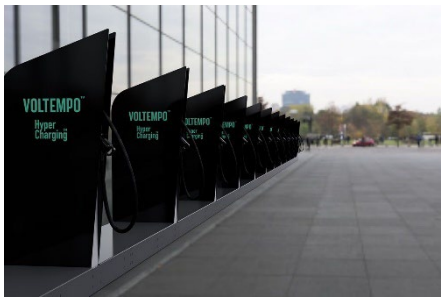
Plug & Charge

Plug & Charge technology, based on the global and open ISO15118 standard, can play a pivotal role for fleet managers. It offers improvements in the charging process by providing an alternative to the need for traditional authentication tools (e.g. RFID cards or apps) and streamlining the charging and billing process for fleet managers. It emphasizes enhanced reliability, reduces common charging disruptions, and promotes interoperability across various charging networks due to its standardized approach. The technology also introduces a multi-contract handling capability, allowing flexibility for fleet operators, and provides tools for more transparent cost management. This potentially contributes to the overall efficiency and cost-effectiveness of HGV fleets.

An improving public charging network

Although there are a limited number of dedicated fleet charging sites to date, progress is being made quickly. The Zero Emissions Heavy Goods Vehicle and Infrastructure Demonstrator Programme (ZEHGVID) awarded funding to consortiums bidding in to electric and hydrogen refuelling projects. REA member Gridserve were part of a winning consortium with £62.7 million of funding for Project Electric Freightway.

The project will see eHGV charging hubs installed at motorway service stations and truck stop locations. With more than 10 commercial depot charging locations for eHGVs, with over 200 chargers capable of delivering 350kW, as well as a trial of two 1-megawatt chargers, with the infrastructure to be supplied by 100% net zero energy[21].



In addition, REA member Dynamon were part of the E Freight 2030 consortium receiving £49.2 million in funding to provide 32 new charging locations, all of which will have megawatt-charging capacity from day one[22].

These projects showcase the innovation that is currently on display in the UK, which will set the tone for new HGV and Fleet on route charging facilities. Car park operators will need to ensure where they plan to cater for on route charging that van drivers and HGV drivers are accommodated for. Wider spaces, no height barriers and space for vehicles to perform long turning circles will be crucial.

For overnight charging, HGV's and vans may benefit from lower speed, smart charging options to maximise renewable energy and lower prices. These facilities should also have wider spaces, no height barriers matched to well-lit safe and secure parking which does not act as a deterrent to women to drive electric vans and HGVs and with space to perform long turning circles will be crucial as well good food and modern shower facilities.

[21] https://www.gridserve.com/electric-freightway/
[22] https://www.freightcarbonzero.com/zerfd-project-update-efreight-2030-consortium-releases-details/1738.article

Importance of point-on-interest (POI) data

To make charging infrastructure for electric vans and HGVs reliable and accessible, industry needs to develop specific solutions for its infrastructure and services. These specific solutions need to cater to different user journey and various use cases. Successful electrification of fleets is contingent upon reliable and standardised location data, also called Point-of-Interest (POI) data. However, the POI data models available today cater mainly to the needs of passenger vehicles and are not suitable for a fleet charging ecosystem.

Fleet managers need very specific information when they are deciding on routes and planning charging stops. For example, this type of HGV specific information could include the height of the roof to ensure that the truck fits into a charging spot, trailer accessibility, the drive through capability of the site, and whether there are shower and overnight sleeping facilities for drivers. Drivers carrying valuable goods need to know whether there are secure truck parking areas on the site just as drivers carrying hazardous goods need to know if these are allowed onto the site.

Case study | Thought-leadership - POI data model requirements for commercial vehicles charging - Hubject

REA member Hubject led a thought-leadership initiative in conjunction with several major industry players to identify POI data model requirements for commercial vehicles (vans & HGVs). This initiative also focused on identifying different charging regimes and distinct user journey of HGVs. Results of this initiative were published via a whitepaper titled - POI data model requirements for commercial vehicles charging[23].

[23] https://assets-global.website-files.com/6047809d3e2d000064d0aba9/657ae8c81ff23b35004bbcc5_2023-12-14-Hubject-CV-POI-Whitepaper.pdf

Appendices

Appendix 1

LCV and HGV charging costs summary (Energy Saving Trust calculations)

Medium LCV driving 15,000 miles a year (60 miles a day, 250 days a year).

Annual mileage	15,000 miles
Diesel energy efficiency	35 mpg
Electric energy efficiency	250 Wh/km
Diesel fuel cost (excl. VAT)	£1.23/L
Depot charging electricity cost (excl. VAT)	£0.15/kWh (average of 22p price cap[24] and 7p EV tariffs[25])
Rapid/ultra rapid public charging electricity cost (excl. VAT)	£0.80/kWh (average of rapid and ultra-rapid charging[26])
Annual diesel cost	£2,399
100% depot charging annual electricity cost	£905
100% public charging annual electricity cost	£4,824
50% depot 50% public charging annual electricity cost	£2,864
80% depot 20% public charging annual electricity cost	£1,688
20% depot 80% public charging annual electricity cost	£4,040

Rigid HGV driving 15,000 miles a year (60 miles a day, 250 days a year).

Annual mileage	15,000 miles
Diesel energy efficiency	15 mpg
Electric energy efficiency	600 Wh/km
Diesel fuel cost (excl. VAT)	£1.23/L
Depot charging electricity cost (excl. VAT)	£0.15/kWh (average of 22p price cap[27] and 7p EV tariffs[28])

[24] https://www.ofgem.gov.uk/energy-price-cap
[25] https://octopus.energy/compare-ev-tariffs/
[26] https://www.zap-map.com/ev-stats/charging-price-index
[27] https://www.ofgem.gov.uk/energy-price-cap
[28] https://octopus.energy/compare-ev-tariffs/

Rapid/ultra rapid public charging electricity cost (excl. VAT)	£0.80/kWh (average of rapid and ultra-rapid charging[29])
Annual diesel cost	£5,597
100% depot charging annual electricity cost	£2,172
100% public charging annual electricity cost	£11,584
50% depot 50% public charging annual electricity cost	£6,878
80% depot 20% public charging annual electricity cost	£4,054
20% depot 80% public charging annual electricity cost	£9,701

Appendix 2

Demand Side Response - Benefits to fleet - Energy Saving Trust

1. **Cost Savings:**
   - Lower Energy Bills: By shifting energy consumption to off-peak times when electricity prices are lower, businesses can significantly reduce their energy costs.
   - Incentive Payments: Participating in DSR programmes often comes with financial incentives or payments from utility companies or grid operators.
2. **Enhanced Energy Efficiency:**
   - Optimised Operations: DSR encourages businesses to identify and implement energy-efficient practices, leading to overall better management of energy usage.
3. **Increased Reliability:**
   - By participating in DSR, businesses help stabilise the electricity grid, which can prevent blackouts and improve the overall reliability of energy supply.
4. **Revenue Generation:**
   - Demand Response Programmes: Businesses can earn additional revenue by participating in demand response programmes, where they are compensated for reducing their load during peak demand periods or emergencies.
5. **Environmental Benefits:**
   - Reduced Emissions: Shifting demand to times when renewable energy sources are more abundant helps reduce reliance on fossil fuels, thereby lowering greenhouse gas emissions.

[29] https://www.zap-map.com/ev-stats/charging-price-index

6. **Enhanced Corporate Image:**
    - Sustainability Efforts: Engaging in DSR can enhance a company's reputation by demonstrating a commitment to sustainability and responsible energy management.
7. **Improved Risk Management:**
    - Energy Price Volatility: DSR can help businesses mitigate the risks associated with volatile energy prices by enabling them to be more flexible in their energy use.
8. **Technological Advancements:**
    - Adoption of Smart Technologies: Implementing DSR often involves adopting advanced technologies like smart meters, energy management systems, and IoT devices, which can lead to improved operational efficiencies.

Examples of DSR Strategies for Businesses

- **Load Shifting:** Moving energy-intensive processes to off-peak times.
- **Temporary Load Reduction**: Reducing or shutting down non-essential processes during peak demand periods.
- **On-site Generation:** Using on-site generators or renewable energy sources to reduce reliance on the grid during peak times.
- **Energy Storage:** Implementing battery storage systems to store energy during low-cost periods and use it during high-cost periods.

Appendix 3

Benefits of Smart Charging - Energy Saving Trust Full Version

1. Cost Savings:
- **Dynamic Pricing:** Smart charging can take advantage of lower electricity rates during off-peak hours, reducing overall energy costs.
- **Demand Charge Management:** By managing and distributing the load efficiently, smart charging helps in reducing demand charges which are based on the highest rate of consumption during peak periods.

2. Enhanced Efficiency:
- **Optimal Charging Schedules:** Smart charging systems optimise charging times based on the fleet's operational schedule, ensuring vehicles are charged when needed and not unnecessarily.
- **Energy Management:** By balancing the load across multiple vehicles, smart charging systems prevent overloading circuits and ensure efficient energy distribution.

3. Improved Battery Life:
- **Controlled Charging Rates:** Smart charging can regulate the charging speed, which helps in prolonging battery life by avoiding rapid charging cycles that can degrade battery health.

4. Environmental Benefits:

- **Integration with Renewable Energy:** Smart charging systems can be integrated with renewable energy sources, such as solar or wind power, ensuring that the fleet's energy consumption is as green as possible.
- **Reduced Carbon Footprint:** By optimising energy usage and incorporating renewable energy, smart charging can reduce the overall carbon footprint of the fleet.

5. Increased Reliability:

- **Predictive Maintenance:** Smart charging systems can monitor the health of both the batteries and the charging infrastructure, predicting maintenance needs before issues arise.
- **Backup Power Management:** These systems can manage power during outages, ensuring critical fleet operations are not interrupted.

Specific Advantages to Commercial Fleets

1. Lower Operational Costs:

- **Bulk Energy Discounts:** Fleets can benefit from bulk purchasing agreements and lower energy rates due to predictable and optimised charging patterns.
- **Reduced Fuel Costs:** taking advantage of dynamic pricing can yield large cost savings across a fleet's total fuel requirements, many fleet duty cycles harmonise well with traditional periods of low electricity demand and so cheaper pricing.

2. Fleet Management Integration:

- **Centralised Control:** Fleet managers can control and monitor all charging activities from a single platform, ensuring all vehicles are ready when needed.
- **Data Analytics:** Access to detailed usage and performance data helps in making informed decisions about fleet management and operation strategies.

3. Enhanced Vehicle Availability:

- **Minimised Downtime:** Efficient charging schedules ensure that vehicles are always charged and ready for use, minimising downtime and maximising fleet availability.
- **Quick Turnaround:** Fast and efficient charging capabilities allow for quick turnaround times, crucial for commercial operations.

4. Scalability:

- **Flexible Expansion:** Smart charging infrastructure can easily scale with the fleet, allowing for seamless addition of new vehicles without significant changes to the existing setup.
- **Futureproofing:** By adopting smart charging, fleets are better prepared for future advancements in EV technology and energy management systems.

5. Sustainability Goals:

- **Corporate Responsibility:** Implementing smart charging helps fleets achieve sustainability goals, enhancing corporate social responsibility profiles.
- **Regulatory Compliance:** Staying ahead of regulations related to emissions and energy use by adopting smart and efficient charging solutions.

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The resource is available on the REA website, here: https://www.r-e-a.net/our-resources/

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