Truckstop operator guidance for eHGV charge point installation: Technical Supplementary Guidance

1.0

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Disclaimer

This document is intended to provide guidance for truckstop operators and other service providers serving the strategic road network (SRN) when considering and planning the provision of charging for battery electric heavy goods vehicles (eHGVs).

This guidance is provided “as is” for information only and does not constitute legal, technical or professional advice. National Highways makes no representations or warranties of any kind whether express or implied regarding the adequacy, accuracy or completeness of the information provided.

Truckstop operators and other providers must obtain their own independent legal, technical and professional advice before undertaking any action, decision, works or investments related to the subject matter discussed in this guidance. It remains the responsibility of providers to ensure all relevant industry standards and regulatory requirements are met at all times, and industry processes are followed.

You can appoint a specialist consultant to act on your behalf throughout the process, helping to ensure the transition to electric charging infrastructure at your site feels manageable and achievable, even for those with limited experience.

To the fullest extent permitted by law, National Highways accepts no liability for any loss, damage, cost or expense arising from the use of or reliance on this guidance.

A note on technologies:

UK Government and National Highways policy on decarbonisation is ‘technology neutral’. This means that Government is not mandating a technology with which decarbonisation should be achieved. Instead, it is allowing and encouraging industry and operators to adopt the appropriate technology that is the most commercially viable and meets their business needs.

Whilst we recognise that hydrogen and other zero-emission technologies will serve a role in transport decarbonisation, this guidance focuses solely on **battery electric HGVs**, which represents the most mature zero emission HGV technology at the time of writing.

This guidance does not consider refuelling infrastructure for other zero-emission HGVs, such as hydrogen fuel-cell vehicles or overhead catenary HGV systems.

1. Purpose and How to Use

This document provides technical supporting information to the **SCI Truckstop Operator Guidance**. It is intended as a reference document to be used alongside the main guidance, providing additional detail on specific topics where required.

It focuses on three things:

- demand (how many vehicles and bays)
- your site (layout, equipment and safety)
- working with DNOs (connections, constraints and timescales)

Truckstop operators at an early stage of considering and planning the provision of charging for battery electric heavy goods vehicles (eHGVs) should focus on the preparation content and use the connection readiness checklist in Appendix A of the main **SCI Truckstop Operator Guidance**.

2. Site considerations

This section expands on **Section 2** (Site considerations) of the **SCI Truckstop Operator Guidance**.

2.1. Early preparation

Early preparation is often considered alongside wider site works, such as refurbishment, resurfacing, or longer-term redevelopment. In these cases, enabling works for eHGV charging may be incorporated at the same time, which can reduce disruption and avoid the need for more extensive retrofit works later.

Where eHGV charging is a longer-term ambition, early assessment of site feasibility (including potential grid connection requirements, lead times and associated costs) can provide an initial indication of what may be required to support future deployment.

Given ongoing changes in vehicle technology and charging requirements, site design and infrastructure may need to accommodate evolving demand over time, including potential expansion or changes in charging provision.

2.2. Understanding future charging demand

Developing an early view of demand is typically approached by combining site-level data (such as historical fuelling or parking activity) with wider industry trends to form a year-by-year demand profile. This can help illustrate how charging requirements may evolve over time, rather than relying on a single high-level estimate.

In many cases, demand modelling is considered over a longer-term horizon (often 20–25 years), to reflect the expected lifespan of major infrastructure such as grid connections and site layouts. Where site-specific constraints limit this, shorter-term projections (for example 10 years) may still be used as an initial basis for planning.

This demand profile is also used to inform engagement with electricity network operators. In particular, it may form part of the information required for connection applications or discussions such as connection surgeries, where indicative power requirements and phasing of demand over time are considered.

2.3. Land use and planning

Planning considerations for eHGV charging are shaped by wider policy requirements and practical constraints, particularly where proposals affect HGV parking provision and established site uses.

At a national level, there is a recognised shortfall in secure HGV parking across the strategic road network. As a result, proposals that alter or reduce existing parking provision are likely to be subject to increased scrutiny through the planning process.

2.3.1. Lorry parking policy

When planning site layouts for eHGV charging, reconfiguration of existing lorry parking areas may be required to accommodate charging bays and associated infrastructure. Any such changes are typically considered in the context of wider government policy, which places strong emphasis on maintaining adequate HGV parking provision on the SRN. While Department for Transport (DfT) policy does not prohibit changes to existing parking layouts, the ongoing national shortfall in secure HGV parking means that any proposal reducing lorry parking provision will require robust justification through the planning process.

DfT National Lorry Parking Surveys
The DfT's National Lorry Parking Surveys highlight a significant shortfall of over 4,500 secure spaces nationwide. The survey observed 21,234 vehicles at on-site and off-site parking facilities within five kilometres of the SRN in England and an on-site capacity of 16,761 spaces translating into an excess of 4,473 vehicles against current capacity.

The National Planning Policy Framework[1] (NPPF) requires local authorities to support adequate overnight HGV facilities, which is reflected in local plans where HGV parking is often treated as a regional infrastructure priority. Consequently, any application that reduces parking capacity must demonstrate that there is no local shortfall, that alternative provision exists nearby, and that driver welfare and safety are not compromised.

Recent funding signals reinforce this policy direction. Through the HGV parking and driver welfare grant scheme the Department for Transport and industry partners are projected to deliver up to £35.7m of joint investment to enhance truckstops across England. This significant investment is in addition to joint investment by National Highways and industry of up to a further £30 million, aimed at improving lorry parking facilities along the SRN.

2.3.2. Planning permission

Your LPA and local 'planning policy' will depend on what area of the country your site is located. Your LPA can be found by entering your postcode here:

Find your local council - GOV.UK

Most LPAs in England provide information on their websites, setting out the specific arrangements for getting in touch and initiating early pre-application discussions. It should also be noted that at time of writing, local authorities in England are

[1] National Planning Policy Framework

undergoing significant restructuring. As a result of this, the structure and name of LPAs responsible for a truckstop are likely to change over the next 5 years.

2.3.3. Planning application timelines

Planning application timelines for eHGV charging infrastructure can vary significantly depending on both scheme-specific factors and the approach taken by the relevant local planning authority (LPA).

While standard planning timeframes exist, in practice the duration of the planning process is often influenced by:

- the scale and complexity of the proposed development
- the extent of site reconfiguration required
- potential impacts on existing land use, including HGV parking provision
- the level of stakeholder engagement and consultation required

In addition, many LPAs may have limited experience in assessing eHGV charging schemes at truckstop scale. While authorities are increasingly familiar with smaller EV charging proposals, eHGV infrastructure introduces additional technical and operational considerations, including high-power electrical infrastructure, grid connections, and site layout changes. As a result, applications may require a greater degree of clarification and iteration during the assessment process.

A further factor is that aspects of the scheme design — particularly those relating to grid connection — may continue to evolve during the planning process. Engagement with electricity network operators may refine requirements for substations, connection points or on-site infrastructure after initial planning submissions have been made. In some cases, this can lead to amendments or updates to planning applications.

Taken together, these factors mean that planning timelines for eHGV charging projects are often less predictable than for more established forms of development. The duration of the process may therefore be shaped by ongoing design development, stakeholder engagement, and the need to address site-specific constraints as they emerge.

2.3.4. Interface with grid connection applications

Planning permission approval and land rights are not typically required before submitting a grid connection application. These consents are, however, required before construction and before the distribution network operator (DNO) or independent distribution network provider (IDNO) can install or adopt any connection assets. Truckstop operators can therefore progress planning and land rights processes in parallel with DNO engagement to streamline programme timelines. More information is available in published DNO and IDNO guidance on what activities can proceed ahead of planning permission. For example, National Grid Electricity Distribution (NGED), who are one of the UK's electricity DNOs, note that they can typically install small substations and lay underground cables under permitted development rights, meaning planning permission is not always required for these works.[2]

However, it is worth noting that in situations where landlord and DNO negotiations run in parallel to the planning process, amendments to planning applications are often needed. A key decision truckstop operators need to make at an early stage is whether to seek early approval and amend later or wait until all details are finalised before applying for planning permission.

Recent changes to national planning policy and regulations are intended to simplify and speed up the consenting process for EV charging by expanding ‘permitted development’ rights, allowing more schemes to proceed without full planning permission. This is under consultation. Any updates to the NPPF and ‘permitted development’ regulations will be published in due course.

In advance of these updates and the limited number of test cases, the extent to which existing truckstops transitioning to eHGV charging will qualify as permitted development is uncertain. Additionally, permitted development would require bays to be in areas “lawfully used for parking”, which must be examined and demonstrated on a case-by-case basis.

It is likely that many eHGV sites would still require full planning permission due to the scale of associated infrastructure change required, including grid connections, site reconfiguration, new high powered electrical infrastructure and safety equipment. Truckstop operators can partake in the collaborative process of pre-application engagement with their LPA who can advise whether planning will be needed for their site. The NPPF recognises that LPAs play a key role in supporting effective pre-application engagement and encourages them to participate in this process.

Note on planning circulars
There is currently no single planning circular specific to eHGV truckstops. The NPPF does apply to these sites and must be adhered to when developing plans for eHGV charging infrastructure. Any planning applications will be determined by LPAs.

2.4. Site constraints

The different layouts and space required for eHGV charging, compared to diesel refuelling, may mean that it is not technically feasible or commercially viable to provide eHGV charging within existing truckstop sites. Where for example, options for phased installation and site expansion through land acquisition are not feasible or viable, relocation to a new site may be a feasible and commercially attractive option. This could involve a site with an existing large but underused grid connection, or an easily upgradable connection with lower costs and easy access from the SRN.

[2] Land Rights and Consent Requirements for New Connections

Whilst it may be a significant undertaking, relocation may also present a significant opportunity for some truckstop operators. New, purpose-built eHGV truckstops serving the SRN could potentially 'tap into' underserved markets and may in some cases be developed and delivered at lower costs and shorter timescales (for construction and energisation) than the refit and repurposing of existing sites. However, this is site specific, and cost and complexity will vary between sites.

Information is available in some parts of the country, via DNO substation utilisation data, on potentially viable areas for new eHGV charging facilities along key freight routes. This data allows for identification of areas and substations with available grid capacity, and where sites may be suitable for eHGV charging infrastructure. Your local DNO may be able to support you in identifying suitable locations and advising on available grid capacity for a specific site. DNOs such as Electricity North West (ENW) and Northern Powergrid can be contacted through their standard enquiry channels for discussions on potential grid upgrades. You can also consult their respective heat map tools to ascertain existing grid capacity and headroom at specific areas (ENW heatmap and Northern Powergrid heatmap).

2.5. Spatial and operational considerations

The integration of eHGV charging infrastructure may result in spatial and operational considerations at certain sites. Important aspects include the physical requirements for charge point installation, expected vehicle dwell times, and the provision for pull-through configurations to accommodate heavy goods vehicles (HGVs).

Sites located within industrial parks or other space-limited environments may face further considerations in comparison to conventional A-road truckstop sites or those with designated overnight parking facilities. These arise from:

- The British Standards Institution (BSI) guidance recommending the use of drive-through charging bays to improve flow and safety.
- Statutory bay dimension standards and associated safety protocols limiting the number of available charging spaces.
- Longer vehicle dwell times during charging, when compared to diesel refuelling, which may influence space utilisation and output, highlighting the potential requirement for increased queuing provisions.
- Concrete surfacing is advisable at eHGV charger locations, as it offers improved durability and resistance to deformation from heavy loads and prolonged stationary vehicles.

Collectively, these constraints necessitate careful site planning and may require bespoke design solutions for regulatory compliance and operational efficiency. The impact of these constraints on truckstops is expected to diminish over time as policymakers and industry bodies work to develop solutions and the eHGV charging market matures.

A charging site should be designed using appropriate tools, such as specific vehicle path modelling software, to ensure a site is readily accessible to the full range of vehicle heights, lengths and weights currently permitted in the UK and in general circulation. This includes, but is not limited to, rigid and articulated HGVs, solo tractor units and rigid HGVs pulling a drawbar trailer.

2.6. Infrastructure requirements and dimensions

Some findings on the required space for infrastructure are presented in **Table 1**Error! Reference source not found. below. Please note that this is to be used as a guide and not an exhaustive list. Further detail can be found in the BSI code of practice for design and implementation[3].

Infrastructure	Requirements
Bay sizes and turning requirements	The main vehicle maximum permitted lengths applicable to UK charging site designers are: • 12 metre (m) – rigid HGV • 13.5m – bus/coach with 2 axles • 15m – bus/coach with more than 2 axles • 16.5m – articulated HGV (with standard trailer) • 18.55m – articulated HGV (with longer semi-trailer) • 18.75m – rigid HGV with drawbar trailer To account for potential future changes to vehicle weights and dimensions, the BSI suggests that vehicle types up to 25.25m in length and up to 60t in gross weight are considered. In general, a minimum 1.2m width of walkway should be provided either side of the vehicle (this allows for a visually impaired person being guided), with a minimum unobstructed width of 1m. To minimise the need for reversing, where feasible, charge points with a rated power of 300kW or greater should be accessible using a drive-through design.  NOTE Figure 1 is not to scale.
Cable lengths and charger placement options	The length of charging cables should be sufficient to allow their use with the intended equipment without risk of damage. Chargers should be positioned at the end-of-bay. There are also limitations on how long cables can be before they become too heavy and potentially lose voltage and efficiency.

[3] flex-2071.pdf

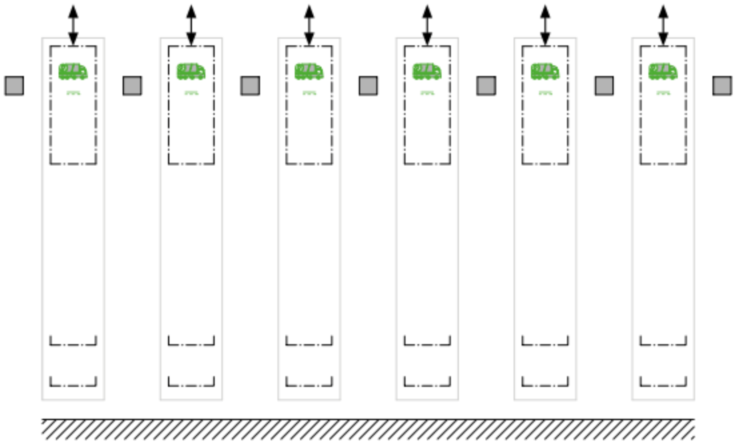
Infrastructure	Requirements
	This is commonly around 10m. Therefore, this should be considered as a maximum cable length for eHGV chargers and incorporated into site design.

Table 1 - Infrastructure requirements and dimensions

2.7. Alternative charging bay configurations

While pull-through bays are recommended by the BSI to maximise safety and operational efficiency for eHGVs, certain sites may face spatial or layout constraints that make this configuration impractical. In such cases, the following alternative arrangements in **Table 2** - Table Error! Reference source not found.can be considered, though they are less optimal.

Configuration option	Snapshot
Side-mounted chargers within standard bays: Charge points installed along the side of the bay, allowing lateral access to the vehicle's charging port. These differ from pull-through bays as there is not a shared charging island that centralises the unit to serve multiple bays from one location.	

Configuration option	Snapshot
Reverse-in bays with side-mounted chargers: Vehicles reverse into a standard bay where the charge point is positioned at the rear.	
Shared charging islands: Centralised chargers positioned between two bays, enabling dual access but requiring careful cable management.	
Dedicated corner or perimeter bays: Utilising site edges or underused areas for charging, where space for pull-through is unavailable.	

Configuration option	Snapshot
Angled bays with side or rear chargers: Bays arranged at an angle to reduce manoeuvring complexity while still accommodating charger placement. These differ from angled pull-through bays, as they require the driver to reverse into or out of the bay.	

Table 2 - Table showing alternative charging bay configurations

Each of these layouts is less optimal compared to pull-through bays due to manoeuvring complexity, cable routing considerations, or operational conflicts. They should only be considered following a robust safety and traffic-flow risk assessment and may require enhanced signage, lighting, and traffic segregation measures to ensure efficient and safe operation.

In addition to the alternative configuration options described above, there are also several practical solutions that sites can adopt to support the transition to electric charging and improve interoperability. One example currently being explored in Germany is the use of hybrid charge points for both cars and trucks. These allow cars to pull up and charge on one side, while eHGVs use the opposite side simultaneously, ensuring safe separation. Although such an arrangement introduces specific safety considerations that would need to be assessed, it is a useful example of how truckstops can make early investments in charging infrastructure more economically viable. Hybrid units can help bridge the gap during the initial years of deployment, when the number of eHGVs visiting a site may still be low.

2.7.1. Battery capacity and charging infrastructure

There are two main technical considerations faced by eHGV adopters; the capacity (and associated weight) of batteries, particularly in relation to payload, and the speed of the charging infrastructure.

eHGVs with battery capacities of 400 – 700kWh are available in the UK from Scania, DAF, and Volvo, and offer ranges of between 200 – 600km at payload optimised weights[4]. Whilst these ranges are suitable for regional freight movements, they may not be suitable to complete longer journeys on a single charge. Battery packs of 700 – 900kWh can currently be produced to extend ranges, however there are trade-offs for fleet operators between increased range and decreased payload capacity and are therefore not currently in widespread use.

The potential impact of larger batteries on payload drive changes in logistics patterns and operational behaviour. As a result, en-route charging using public DC eHGV charge points may offer a solution allowing vehicles to recharge during overnight stops, or during short 'tacho' breaks, while allowing higher payload volumes and smaller batteries.

At present, all announced eHGV models available in the UK use existing charging protocols originally designed for cars, namely the combined charging system (CCS). The more powerful megawatt charging system (MCS) connector require a new connector type, and there is no prevailing standard for this yet[5]. This guidance will be updated periodically to reflect advances in the standardisation of charge point connectors.

It is worth noting that the type of connector required will vary according to battery size and power of the charge point.

This can be seen at the Falkenklev Logistik Truck charging hub in Sweden where an MCS setup is now in operation, as well as the DfT and Innovate UK backed eFreight 2030 demonstrator programme, deploying 100 electric HGVs across 32 new charging locations, all equipped with megawatt-capable infrastructure.

2.7.2. Charge point types

eHGV charging infrastructure is typically categorised by power output and associated charging performance.

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[4] Information from product pages: Volvo FH Electric, Battery electric trucks | Scania United Kingdom, New Generation DAF Electric- DAF Trucks Ltd, United Kingdom

[5] **Note:** Currently, MCS connectors are not standardised, however, interoperability issues are likely to diminish as national and global standards naturally emerge as they have in the passenger EV market.

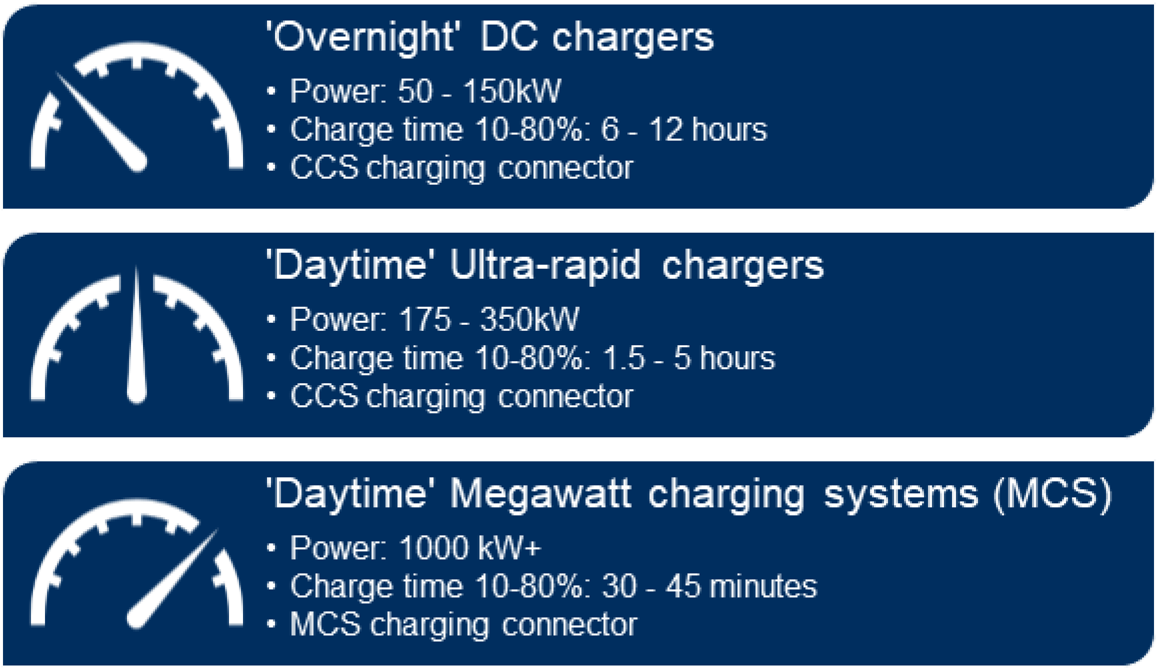

Figure 2.1 of the main **SCI Truckstop Operator Guidance** outlines how these charging types relate to operational use; the information below provides additional technical detail on their characteristics.

- **Overnight charge points** – Typically operate in the range of 50 – 150 kW. These lower-power systems are designed to deliver charging over extended periods and generally require lower-capacity grid connections and electrical infrastructure. Typical charge time is 6 – 12 hours.
- **Daytime 'ultra-rapid' charge points** – Typically operate in the range of 175 – 350 kW. These systems are designed to deliver higher amounts of energy over shorter periods and therefore require higher-capacity grid connections, as well as more substantial on-site electrical infrastructure. Typical charge time is 1.5 – 5 hours.
- **Megawatt charging system (MCS)** – Typically operate at 1 MW and above. This technology is designed for very high-power charging over shorter durations and is currently in early stages of deployment. MCS requires dedicated high-capacity electrical infrastructure and new connector standards. Typical charge time is 30 – 45 minutes.

At present, most eHGVs in operation use CCS connectors, adapted from the light vehicle market. MCS connectors are being developed to support higher power transfer and are expected to become more widely adopted as the market matures. Connector standards and equipment specifications are evolving and are expected to become more consistent over time.

2.8. Understanding power, energy and costs

This section explains the key electrical terms you need to understand when planning eHGV charging.

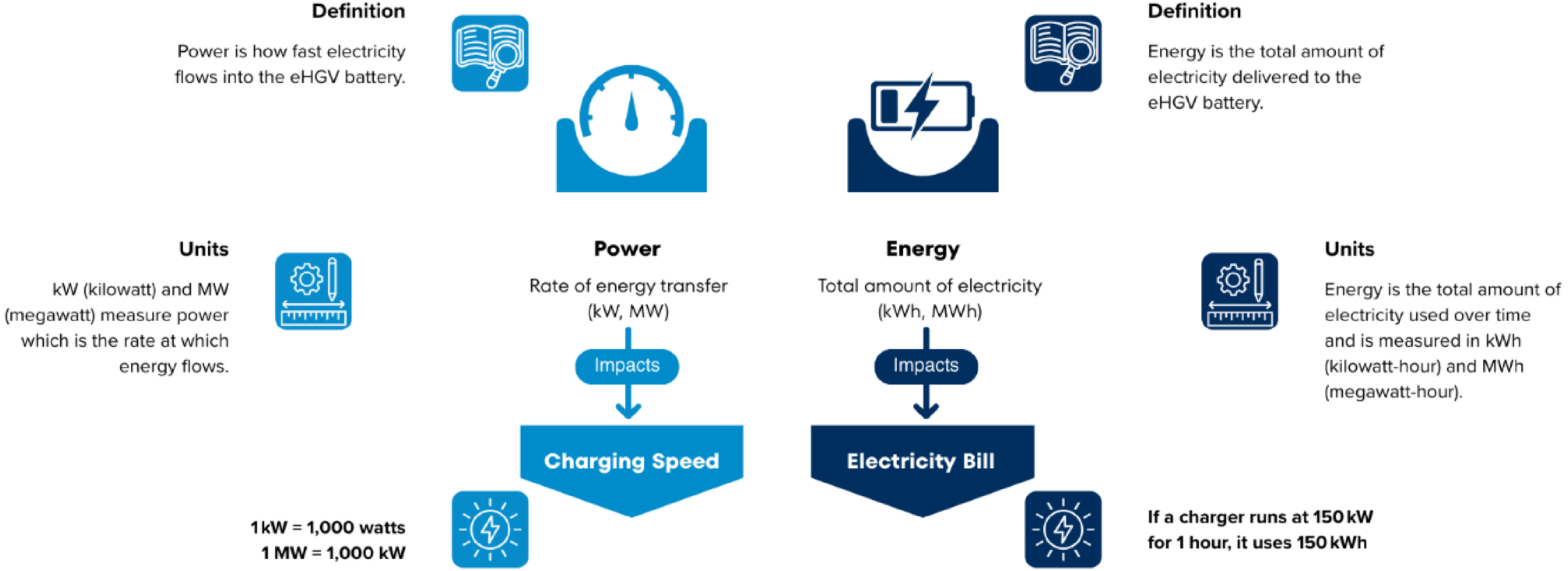

Figure 2-1 - Power vs Energy

Understanding a few basic electrical terms is crucial when planning eHGV charging, as they relate to the required grid connection size, charging speed, and overall, the cost to you and your customers. **Figure 2-1** above details the difference between power and energy.

Electricity costs are driven by energy in kilowatts (kWh), not power, therefore your bill depends on how much you use, even if higher power speeds up charging. Therefore, if you charge a truck with a 500kWh battery, you will pay for 500kWh of energy, regardless of whether you charged it slowly at 50 kW or quickly at 400kW+. It is important to note that in some public charging markets (particularly for cars), higher power chargers often have higher p/kWh tariffs to reflect the additional infrastructure, operating costs, and utilisation risks associated with delivering high power. A similar pricing model may apply at high power eHGV charging hubs.

Additionally, it is worth noting that faster charging requires higher power, which can:

- require a bigger grid connection (higher capacity)
- lead to higher electricity supply costs, as demand-based or peak-time pricing could be reflected in tariffs
- increase infrastructure costs (more expensive chargers, high-power electrical infrastructure)

To summarise, energy consumption drives your electricity bill, but power drives your investment, so pricing models usually reflect both.

2.9. Infrastructure costs

The upfront cost for eHGV charge points and related infrastructure can be a significant investment. Delivering eHGV charging infrastructure can involve several significant cost components, many of which vary widely depending on site conditions, charging power requirements, grid connection requirements and the chosen delivery model. The purpose of this section is therefore to highlight the types of costs that operators should expect to encounter, rather than provide definitive values. Actual project costs should be developed on a site-specific basis through engagement with DNOs, IDNOs, ICPs, charge point suppliers, and contractors (with more detail on their typical roles in **Appendix B:** Stakeholders and typical responsibilities, in the main **SCI Truckstop Operator Guidance**).

It is important to note that return on investment timelines cannot be generalised for eHGV charging. Charge point charging scenarios and expected demand from fleet operators, along with extensive groundworks and substantial grid upgrades, can all influence payback periods, which may vary significantly between sites. Truckstop operators should undertake their own financial modelling based on utilisation forecasts, tariff strategies, and potential funding mechanisms.

2.10. Grid connection costs

Grid connection costs typically cover the works needed to bring power from the DNO network to the site. This includes non-contestable works carried out by the DNO, and contestable works which can be delivered by a DNO, or by an ICP to the adopter's specification. Where cable routes cross third-party land, wayleave and easement costs should be considered as part of the grid connection cost. Depending on local network conditions, grid reinforcement may also be required, which can materially affect overall cost and delivery timescales. These connection costs vary significantly depending on complexity. Grid connections are discussed further in **Section 3.**

2.10.1. On-site electrical infrastructure

Beyond the DNO connection, many sites will require substantial on-site electrical assets to distribute power across the facility. These may include 33kV and/or 11kV step down substations, transformers, cabling, feeder pillars, switchgear, ducting, and associated civil works. These assets can represent a considerable portion of total cost and are essential for delivering high-power charging safely and reliably.

2.10.2. Charge point hardware and installation

The headline cost of a charge point usually includes just the hardware, while the wider installation and connection costs can be much higher. Additional items such as cabling, foundations, ducting, trenching, and commissioning often exceed the hardware cost, particularly for high-power units. Operators should ensure their cost models separate hardware from installation, to accurately assess total expenditure.

2.10.3. Site upgrades and civil works

The cost of site upgrades encompasses non-electrical modifications that may be required to support eHGV charging. These may include resurfacing, bay reconfiguration, kerb adjustments, signage and lighting upgrades, drainage works, accessibility improvements, and any other changes needed to integrate charging into existing site operations. These works can vary significantly depending on site layout and the number of bays required.

Given the variability in costs, operators are encouraged to undertake early engagement with contractors to obtain site-specific estimates. Operators may also consider taking the advice of a duly qualified engineer or quantity surveyor to advise on any quotes received.

3. Grid connections

This section expands on **Section 3** (Grid connections) of the **SCI Truckstop Operator Guidance** and explains how grid connection options and available electricity capacity may affect the feasibility, cost and timescales of providing eHGV charging.

3.1. UK Electricity Network Operators

Figure 3-1 below is a map of the UK electricity distribution network operators (DNOs).

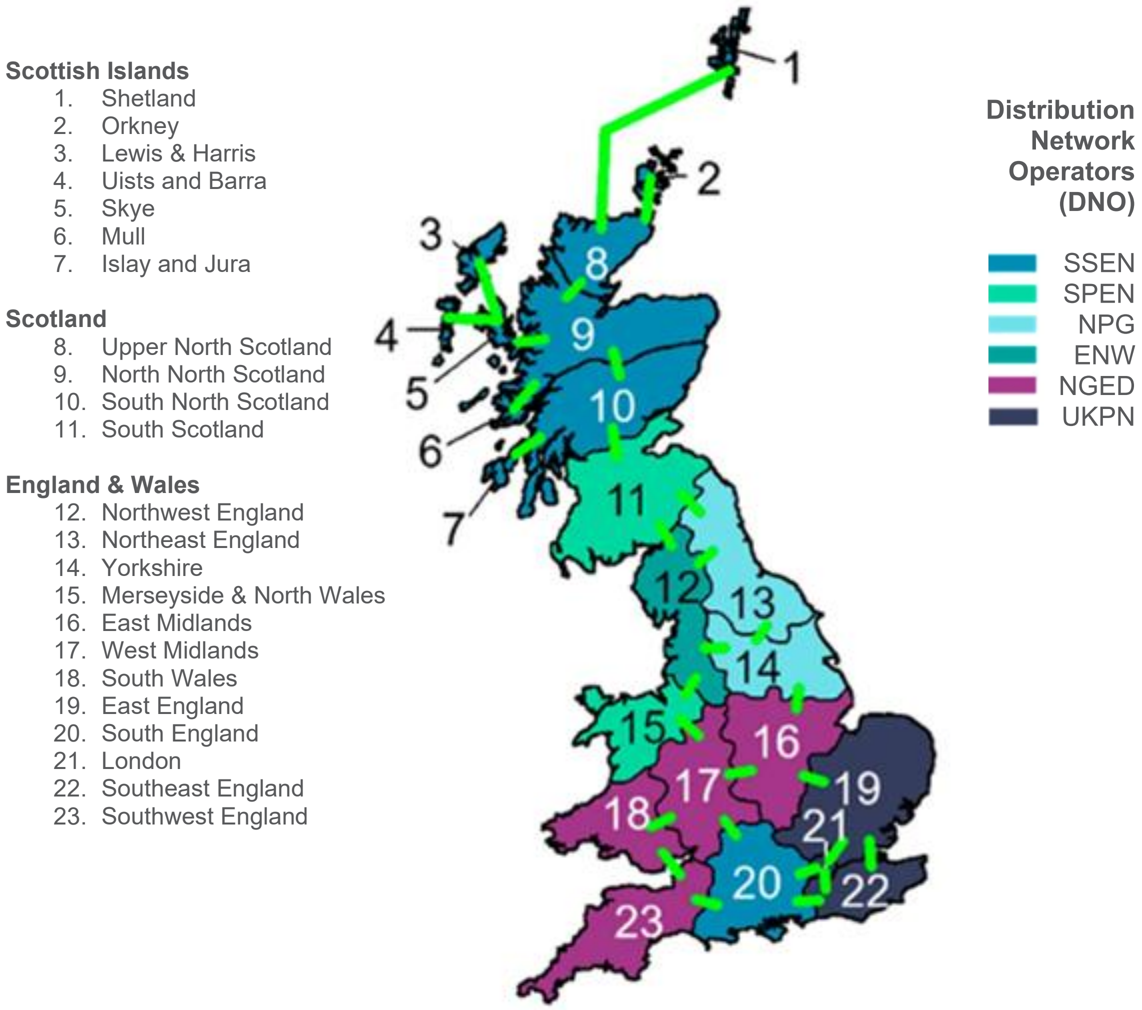

Figure 3-1 - Map of UK electricity distribution network operators

3.2. Infrastructure limitations and options

Barriers to grid connection upgrades may still exist, even with early engagement and robust data. The technical complexity of a required connection is heavily site specific and can influence both cost and connection timelines. Cost is the most common barrier which operators have faced when installing eHGV charge points. However, there are options to reduce this cost and accelerate delivery of connections. This is primarily done through reducing technical complexity, or the use of smart connection solutions.

In some locations, grid constraints may initially limit the number of eHGV charge points that can be installed, even where sites are close to major substations. In these cases, an incremental approach can be effective, enabling the early installation of one or two charge points while allowing for future expansion as network capacity becomes available, and grid connection upgrades are implemented.

In these cases, rather than simply waiting for capacity to be available, it is also possible to consider innovative solutions such as ramped connections. This is an option which accelerates connection timelines and potentially reduces costs by initially providing a lower connection capacity, which increases over time as overall grid capacity increases. This approach has the benefit of allowing early adoption of eHGV charging facilities, whilst also allowing for more data on usage and demand to be collected for future expansion phases. This option requires engagement with your DNO to ensure this solution is taken into consideration throughout the application process.

For overnight charging, it is expected smart charging solutions, including dynamic load management may need to be employed to ensure that all HGVs are fully charged by morning whilst minimising the total power draw overnight. Due to lower power requirements, overnight charging is not expected to impact the size of a grid connection as significantly as higher-powered daytime charge points. This can help accelerate grid connection timescales in some cases.

3.3. Flexible connections

To accelerate energisation and avoid long delays associated with network reinforcement, truckstop operators can explore flexible connection agreements with their DNO or IDNO.

These arrangements enable earlier deployment of eHGV charging infrastructure by allowing sites to connect to the grid under certain operational constraints. A flexible connection would require the site to manage its demand during periods of network constraint. Below are some examples of typical flexible connection agreements and their relevance to truckstops:

- **Curtailable connections:** The truckstop would have to reduce charging load when instructed by the DNO during peak demand or network stress - this is the most unpredictable of the flexible connection types.
- **Profiled connections:** Demand is limited to a predefined schedule such as off-peak hours, truckstops can have an input to align this to their operations, e.g. aligning with overnight eHGV charging patterns.
- **Timed connections:** Capacity is guaranteed but only during certain periods (e.g. overnight) which could suit truckstops that serve logistics operators that need predictable charging windows.

3.4. Timescales – the current situation

One of the biggest challenges to getting adequately connected to the grid is the long time it takes to upgrade a grid connection, from first contact to being fully powered. DNOs have an obligation to provide connections to any customer that applies and manage this demand through a 'connection queue'. Demand for new grid connection upgrades is high, and there is likely to be variability in the connection queue for a given DNO. Time to connect, or 'wait time', also varies depending on the type of connection and its engineering complexity. This is recognised as a challenge by both the energy industry and government, leading to the 'connections reform' process, which aims to simplify and streamline the grid connection queue, reducing wait times. For small connections (<1MW) this may be a period of 6 months. For larger connections this can be 18 months or, in some instances, several years where significant network reinforcement is required.

4. Operation and maintenance

This section expands upon **Section 4** (Operation and maintenance) of the **SCI Truckstop Operator Guidance** which outlines key considerations for the operation and maintenance of eHGV charge points. The focus below is on safety standards.

4.1. Safety standards

In addition to awareness of key safety principles explored within the text, site specific risk assessments should be carried out, and you should ensure compliance with all relevant standards. Some examples of these are shown below in **3:**

Standard	What it covers
BSI Flex 2071 Code of Practice – Design and implementation of publicly accessible charging sites for battery electric HGVs	• Provides practical recommendations and best-practice guidance for the design, layout, and implementation of publicly accessible eHGV charge point. • Focuses on overall charging site planning, with vehicle circulation, charging bay design, and safety considerations given the higher power requirements involved.
BSI Flex 2072 – Battery electric and hydrogen-fuelled heavy-duty vehicles – workshops and protocols for maintenance and inspection	• This should be reviewed in coordination with the BSI Flex 2071 Code of Practice, linked above. • Details minimum standards and best practice recommendations for the development of inspection and maintenance protocols for battery electric and hydrogen-fuelled vehicles. • Whilst primarily relevant for fleet managers, this will be relevant for operators with on-site maintenance facilities.
International Electrochemical Commission 61851-23 – Electric vehicle conductive charging system: DC electric vehicle supply equipment	• Technical document defining safety and design rules for DC (direct current) rapid and ultra-rapid EV and eHGV charge points. • Specifies how power is transferred between the charger and the vehicle. • Includes requirements for bidirectional charging (vehicle to grid readiness). This allows futureproofing for potential smart grid charging scenarios.

Standard	What it covers
Institute of Engineering and Technology – Code of Practice for Electric Vehicle Charging Equipment Installation	• Provides expanded technical guidance for installers and designers, including requirements from the Smart Charge Points Regulations, cabling and fire-safety considerations, accessibility standards, inspection/testing updates, and clearer design rules for domestic, on-street, and commercial installations.
Health and Safety Executive Guidance – Electricity at work, safe working principles	• Covers the key elements to consider when defining safe working practices on sites where work is carried out on or near electrical equipment. • Given the high voltages involved with eHGV charge points, this is a crucial safety document which should be read in full.
Fire Protection Association – RC59: Recommendations for fire safety when charging electric vehicles	• Best practice safety information to support operators to perform a fire risk assessment for proposed EV and eHGV charge points and ensure safe and reliable operation of these charge points.

Table 3 - Safety Standards

5. Further reading

4 below shows a list of the publicly available documents that have been identified throughout the guidance. You may wish to incorporate these into any further reading and consider their recommendations with the specifics of your site.

Title	Brief description	Link
Public Charge Point Regulations 2023 guidance	Guidance to help operators of publicly accessible EV and eHGV charge points understand the Public Charge Point Regulations 2023, offering examples of compliance and good practice to ensure a consistent, positive experience for consumers across the UK.	Public charge point regulations 2023
British Standards Institute (BSI) – accessibility standards for EV charging	Accessibility standard from BSI provides detailed requirements and recommendations for accessible EV charging. **Note**: These standards are currently focused on public charging for cars and vans, however, can be applicable to eHGV charge points as well.	PAS 1899 / 2022: Electric Vehicle Accessible Standards - Specification
Zero Emissions HGVs and Infrastructure Standards Programme Prioritisation Report	Provides detail to help understand priority standards for zero-emission road freight, including where standards should be focused as the market evolves.	Zero Emission HGVs and Infrastructure Standards Prioritisation Report
Gridserve Electric Freightway Design and Implementation Report	Provides a strategic overview of the project's deployment of high-power charging infrastructure to enable the decarbonisation of HGVs in the UK, focusing on location planning, grid integration, and operational models to accelerate the transition to electric freight transport.	Electric Freightway Report 2 - Demonstration design and implementation

Title	Brief description	Link
Catapult Charging Connections Guide	Guide for planning and delivering grid connections for electric HGV charging infrastructure, outlining technical requirements, timelines, and collaboration steps between freight operators, charge point providers, and electricity networks to enable large-scale electrification of road freight.	eHGV Charger Connections Guide
Connections reform	Current work by the Department for Energy Security and Net Zero (DESNZ), OZEV, the energy regulator (Ofgem) and the wider energy sector, is undertaking sweeping reform to the grid connection queue, known collectively as 'connections reform'. This process is examining ways to reduce waiting times for electricity generation, storage, and demand connections, prioritising applications that are the most viable and ready to proceed. The first stage of this work was completed in 2025, and over 1500 electricity generation and storage, and transmission level strategic demand applications were reviewed and prioritised out to 2035. This has reordered the connections queue to ensure capacity is delivered when it is needed and ensuring the grid is ready to meet growing future demand.	Further information on connections reform and initial results can be found on the National Energy Systems Operator (NESO) website here, and this guidance will continue to be updated as more information is released.
ENA Transport Connections Guidance	Step by step tool developed by the ENA and DNOs to support development of grid connection applications.	Transport Connections Guidance
National Grid - Connection guaranteed standards of performance	Connection guaranteed standards of performance are set by Ofgem and set out the minimum service levels electricity distribution companies must meet, including connection quote times.	National Grid - Connection guaranteed standards of performance

Table 4 - Further Reading

6. Contact lists

To deliver eHGV charging, it is important to understand the roles of the organisations involved in electricity connections.

6.1. National Highways

National Highways can be contacted via email for support. Please direct all queries to:

info@nationalhighways.co.uk

6.2. Distribution network operators (DNOs)

Below is a list of general contact information for DNOs in Great Britain. To determine which DNO covers your area, use this service from the ENA - Who's my electricity network operator? – Energy Networks Association (ENA)

DNO	Website	Phone number
UK Power Networks (UKPN)	https://www.ukpowernetworks.co.uk/	0800 029 4280
National Grid Electricity Distribution (NGED)	https://www.nationalgrid.com/electricity-distribution	0800 096 3080
Scottish Power Energy Networks (SPEN)	https://www.spenergynetworks.co.uk/	0800 389 1783
Northern Powergrid (NPG)	https://www.northernpowergrid.com/	0800 011 3433
SP Electricity North West (ENW)	https://www.enwl.co.uk/	0800 988 1730
Scottish and Southern Electricity Networks (SSEN)	https://www.ssen.co.uk/	0800 048 3516 (option 2 for connections)

Table 5 - Distribution network operators

6.3. Independent DNOs (IDNOs)

Below is a list of IDNOs operating in Great Britain with their contact details. All companies also have a contact form on their website for email communications, should this be preferred.

Ofgem also provide an up-to-date list of all electricity licensees including DNOs and IDNOs that can be accessed here.

List of all electricity licensees including suppliers | Ofgem.

IDNO	Website	Phone number
Advanced Electricity Networks	https://www.advancedelectricitynetworks.co.uk/	0137 631 2515
Aurora Utilities	https://aurora-utilities.co.uk/	0203 023 0200
Eclipse Power Networks	https://eclipsepower.co.uk/	0123 448 6487
Energy Assets Networks	https://www.energyassetsnetworks.co.uk/	0150 640 5405
ESP Utilities Group	https://espug.com/	0137 258 7500
Fulcrum	https://www.fulcrum.co.uk/	0333 014 6466
Green Gen Cymru (Wales only)	https://greengencymru.com/	0800 233 5338
GTC[6]	https://www.gtc-uk.co.uk/	0135 924 0363
Harlaxton Energy Networks	http://www.harlaxtonenergynetworks.co.uk/	0844 800 1813
Independent Distribution Connection Specialists	https://idcsl.co.uk/	0162 293 3399
Indigo Power	https://www.indigonetworks.co.uk/indigo-power/	0118 436 2510
Last Mile Asset Management	https://lastmile-uk.com/	0330 058 7440
Leep Utilities	https://www.leeputilities.co.uk/	0300 373 3540

[6] GTC is part of the BUUK Infrastructure Group and operates and maintains assets for its two IDNO licenses The Electricity Network Company Limited and Independent Power Networks Limited.

IDNO	Website	Phone number
Mua Group	https://www.muagroup.co.uk/	0800 011 4193.
Optimal Power Networks	https://www.optimalpowernetworks.com/	0345 078 3237 (Connections)
Stark Infra-Electricity	https://www.stark.co.uk/	Contact form only, or book a call online
UK Power Distribution	https://www.ukpowerdistribution.co.uk/	0330 320 9899
Utility Assets	https://www.utilityassets.co.uk/	Email only enquiries@utilityassets.co.uk

Table 6 - Independent distribution network operators

7. Key terms and acronyms

Term	Description
All-purpose trunk road (APTR) network	Non-motorway sections of the SRN in England, including major A-Roads.
Alternating current (AC)	Electricity that periodically changes direction and is the standard form supplied by the grid for long-distance transmission and distribution.
Battery energy storage solution (BESS)	A system that stores electrical energy in batteries for later use, often deployed to support grid stability and provide backup power for charging sites.
British Standards Institute (BSI)	The UK's national standards body that develops and publishes technical standards and specifications, including those for EV and eHGV charging infrastructure.
CCS (Combined charging system)	A widely adopted DC rapid-charging standard for electric vehicles, combining AC and DC charging capabilities in a single connector.
Charge point operator (CPO)	A private business responsible for installing, maintaining, and operating the eHGV charging facilities (eHGV charge points) on a site.
Charge point (OEM)	Companies which design and manufacture the physical charge point units used for EV and eHGV charging.
Charge point	A charging connection through which an eHGV can be supplied with electricity. A single charging unit may provide multiple connections (sockets or connectors); where these can be used simultaneously, each is typically considered a separate charge point for the purposes of planning and assessing capacity.
ChargeUK	Represents some charge point operators and related businesses, advocating for EV and eHGV charging infrastructure development.

Term	Description
Connected Places Catapult	An innovation accelerator focused on smart cities, transport, and infrastructure, supporting projects like EV charging, eHGV charging, and freight electrification.
Connection agreement	A formal contract between a customer and a DNO or IDNO outlining the terms, costs, and responsibilities for connecting a site to the electricity network.
Connection point	The physical location where the customer’s electrical installation interfaces with the distribution network.
Connections reform	A set of regulatory and process changes led by Ofgem and NESO to streamline and accelerate electricity network connections for new demand and generation.
Connection surgery	An engagement meeting between a DNO and an applicant where they discuss the DNO connection options for a project to service eHGV charge points at a site.
Customer sole use assets	Electrical infrastructure (such as cables and transformers) installed specifically for one customer’s connection and not shared with other network users.
Demand forecast	The assessment and assumptions gathered to estimate current and future eHGV electricity demand for a site, and to inform the optioneering for charge point installation scenarios, based on expected charging scenarios. This is a required step for connection surgeries and connection applications.
Department for Transport (DfT)	A ministerial department of the UK Government responsible for the transport network in England, and some transport matters in Wales, Scotland, and Northern Ireland.
Department of Energy Security and Net Zero (DESNZ)	A ministerial department of the UK Government responsible for the transition of the UK to Net Zero and securing national energy security, including the development of renewable energy and decarbonisation.

Term	Description
Direct current (DC)	Electricity that flows in one direction only; eHGV batteries use DC, so chargers convert AC from the grid into DC for more rapid charging.
DNO (Distribution network operator)	A regulated business that manages part of Great Britain's electricity distribution network within a specific 'licence area' defined by their Ofgem licence. Examples include Scottish and Southern Electric Networks (SSEN) and UK Power Networks (UKPN).
eHGV (electric heavy goods vehicle)	A HGV that is powered by an electric drivetrain, usually battery.
Electricity North West	One of the UK's distribution network operators (DNOs), serving northwest England including Cumbria, Lancashire, and parts of Cheshire.
Energy Networks Association (ENA)	The trade association for the UK's electricity and gas transmission and distribution network operators, providing guidance and standards for network connections.
Energy Systems Catapult	An innovation centre that accelerates the transformation of the UK energy system, supporting projects in smart energy, electrification, and infrastructure.
Extra-High Voltage (EHV) Connection	An electrical connection typically at or above 33kV, used for very large-scale power supply to energy-intensive sites or transmission-level infrastructure.
Grid connection	The process of linking a site's electrical infrastructure to the electricity distribution or transmission network to enable power supply.
Grid reinforcement	Upgrades to the electricity network (such as adding capacity or strengthening assets) to accommodate increased demand or generation at a connection point.
Grid scale connection	A high-capacity electrical connection designed to support large-scale energy demand or generation, such as freight charging hubs or renewable energy projects.

Term	Description
HGV (Heavy goods vehicle)	A vehicle that is heavier than 3,500kg, including cargo, often used interchangeably with LGV.
High voltage (HV) connection	An electrical connection typically at 11kV, used for large-scale power supply to high-demand sites such as freight charging hubs.
Independent connection provider (ICP)	A company accredited to design and construct electricity connections to the distribution network, operating independently of the local DNO.
Independent distribution network operator (IDNO)	A DNO that is not tied to a specific licence area, e.g., Eclipse Power Networks Limited.
Independent Networks Association (INA)	The trade association representing IDNOs and ICPs in the UK, promoting best practice and compliance in network connections.
InnovateUK	The UK's national innovation agency that funds and supports business-led research and development to drive productivity and growth.
Kilowatt (kW)	A unit of power, equal to 1,000 watts. The higher the kW rating of a device, the more electrical power is required to operate it. For eHGV charge points, this term reflects how much power a single charge point is rated to provide to an eHGV at maximal output.
Kilowatt hour (kWh)	A unit of energy measurement in batteries, equal to 1,000Wh. Or the use of 1kW constantly for 1 hour.
LGV (Large goods vehicle)	A vehicle that is heavier than 3,500kg, including cargo, often used interchangeably with HGV.
Load	The amount of electrical power being drawn from the electricity network at a given moment. It refers to the total amount of power required to operate all charging units and other on-site electrical equipment and therefore higher loads may require upgrades to the grid connection.
Local highway authority	The local authority responsible for managing and maintaining roads within its jurisdiction, excluding motorways and major A-roads.

Term	Description
Local planning authority	The local government body responsible for determining planning applications and enforcing planning policy within its area.
Low voltage (LV) connection	An electrical connection typically below 1kV, suitable for small-scale power supply such as domestic or light commercial installations.
MCS (Megawatt charging system)	A high-power charging standard designed for heavy-duty electric vehicles, enabling charging rates of up to several megawatts.
Mega volt amperes (MVA)	Unit used for measuring 'apparent' power. The apparent power refers to the total current and voltage in an electrical circuit.
Megawatt (MW)	A unit of power, equal to 1,000kW. For eHGV charge points, this term reflects how much power a single charge point is rated to provide to an eHGV at maximal output and is usually used in reference to extremely high power 'ultra-rapid' eHGV charge points.
Megawatt hour (MWh)	A unit of energy measurement in batteries, equal to 1,000kWh. Or the use of 1MW constantly for 1 hour.
Motorway service area (MSA)	A designated rest and refuelling area located along motorways, providing facilities such as fuel, food, and parking for drivers and vehicles.
Motorway service area operator (MSAO)	A commercial company that manages an MSA site on England's strategic road network. Examples include Moto and Welcome Break.
National Highways (NH)	A UK government-owned company charged with operating, maintaining and improving motorways and major A-roads in England.
National Planning Policy Framework (NPPF)	The National Planning Policy Framework setting out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans can provide for housing and other development in a sustainable manner.

Term	Description
NESO (National Energy System Operator)	The organisation responsible for planning and operating the electricity system in Great Britain, ensuring secure, reliable, and efficient energy delivery.
NGED (National Grid Electricity Distribution)	One of the UK's electricity distribution network operators, responsible for delivering electricity from the transmission system to homes and businesses in its region.
Northern Power Grid (NPG)	One of the UK's distribution network operators (DNOs), serving north-east England, Yorkshire, and northern Lincolnshire.
Ofgem (Office of Gas and Electricity Markets)	Ofgem is the national regulator for the gas and electricity networks in Great Britain.
On-site infrastructure	The physical assets and equipment installed at a location to enable electric vehicle charging, such as chargers, cabling, transformers.
Optioneering	The process by which the applicant will assess different grid connection options and select a preferred technical option in line with expected electricity demand and charging scenario.
PAS 1899	A BSI Specification that sets out accessibility requirements for electric vehicle charge points, ensuring they are inclusive and usable by disabled people and those with additional needs.
Point of connection (PoC)	For each proposed new connection, the point (or points) of physical connection between the DNO's existing distribution system and the new assets for the extended network. For instance, this may be the point on the existing network where the new connection will be connected, whether by the DNO or an independent connection provider (ICP). This is not a metering point.

Term	Description
Public Charging Regulations 2023	The Public Charge Point Regulations 2023 ensure that the experience of consumers using public charge points across the United Kingdom is consistent and positive. These regulations dictate legal obligations with regard to price transparency and payment methods, reliability standards, open data requirements for consumer applications and monitoring, and support for consumers.
Scottish and Southern Electricity Networks (SSEN)	One of the UK's distribution network operators (DNOs), serving northern Scotland, and southern England.
Service level agreement (SLA)	A CPO service level agreement (SLA) is a contract defining service standards for eHGV charge points, guaranteeing minimum uptime response times for faults, maintenance, diagnostics, and software updates, all to minimise downtime and ensure reliable charging, and compliance with national standards.
SP Energy Networks (SPEN)	One of the UK's distribution network operators (DNOs), serving central and southern Scotland, North Wales, Merseyside, Cheshire, and North Shropshire.
Strategic road network (SRN)	Motorways and A-roads in England owned and operated by National Highways under its licence as the strategic highways authority for England.
Truckstop	A single, geographically discrete site dedicated to serving HGV traffic on or near the strategic road network.
UK Power Networks (UKPN)	One of the UK's distribution network operators (DNOs), serving East Anglia, London, Kent, Sussex and parts of Surrey.
Charging scenarios	The makeup of expected users at a site. This can be formed of overnight charging, break charging, or ultra-rapid charging, and will most likely consist of a mixed-use scenario. These are usually determined based on power and grid connection requirements.

Table 7 - Key terms

Acronym	Definition
AC	Alternating current
APTR	All-purpose trunk roads
BEV	Battery electric vehicle
BSI	British Standards Institute
CCS	Combined charging system
CPO	Charge point operator
DC	Direct current
DNO	Distribution network operator
eHGV	Electric heavy goods vehicle
EV	Electric vehicle
GFCI	Ground fault circuit interrupter
HEV	Hybrid electric vehicle
ICE	Internal combustion engine
ICP	Independent connection provider
IDNO	Independent distribution network operator
kW	Kilowatt
kWh	Kilowatt hour
MCS	Megawatt charging system
MSAO	Motorway service area operator
MW	Megawatt
MWh	Megawatt hour
PHEV	Plug-in hybrid electric vehicle
SRN	Strategic road network

Table 8 - Acronyms