POSITION PAPER JULY 2025

SMMT DRIVING THE MOTOR INDUSTRY

POWERING THE AUTOMOTIVE INDUSTRY: ELECTRICITY GRID REQUIREMENTS FOR UK AUTOMOTIVE

WHO WE ARE

The Society of Motor Manufacturers and Traders (SMMT) is one of the largest and most influential trade associations in the UK. It supports the interests of the UK automotive industry at home and abroad, promoting the industry to government, stakeholders and the media.

The automotive industry is a vital part of the UK economy and integral to supporting the delivery of the agendas for levelling up, net zero, advancing global Britain, and the plan for growth. The sector contributes £92 billion turnover and £25 billion value added to the UK economy, and typically invests around £5 billion each year in Research and Development (R&D). With more than 183,000 people employed in automotive manufacturing and some 796,000 in total across the wider automotive industry, we account for 13.4% of total UK goods exports, generating £108 billion of trade.

The UK manufactures almost every type of vehicle, from cars, to vans, taxis, trucks, buses and coaches, as well as specialist and off-highway vehicles, supported by some 2,500 supply chain businesses and some of the world's most skilled engineers. Many of these jobs are outside London and the Southeast, with wages that are around 8% higher than the UK average. The automotive sector also supports jobs in other key sectors – including steel, chemicals, plastics and rubber, as well as more broadly in advertising, finance and logistics.

EXECUTIVE SUMMARY

The automotive industry is changing more rapidly than at any time in the past century with the move to electrification – and similarly fundamental changes are taking place in the UK's electricity system, just as both industries are becoming increasingly interlinked. Indeed, over the next decade, the bulk of the burden of the UK's carbon cutting will fall on road transport, according to the Climate Change Committee 7th Carbon Budget – which will only be possible if the automotive industry can access more affordable, renewable/zero carbon electricity. A transformation of electricity grid connection processes will be needed, to enable the quick delivery of necessary infrastructure, as well as government measures to bring down the cost of electricity now and in the long term. Such steps would improve the competitiveness of the UK automotive industry but also to provide a clear incentive for consumers to switch to electrified vehicles. The automotive industry is committed to decarbonising industrial practices and products, but this will be impossible without prompt access to affordable, stable supplies of clean electricity and strong consumer demand.

The automotive sector must be seen as a key delivery partner of decarbonisation. Solutions should be developed in collaboration with the industry, which will provide better outcomes for consumers. When traditional industries are changing, traditional ways of doing things must also change and silos broken down to open up new benefits – which automotive can provide to the electricity system and vice versa.

SMMT believes that smart charging, Vehicle to grid (V2G) and Vehicle to everything (V2X) applications can play an important role in flexible electricity systems in the UK but they must work for consumers, and the consumer must have ultimate control over this. This means that it must be easy for consumers to understand and use, with appealing tariffs and ready support available. For vehicles to be an asset to the grid, consumers must be given transparent information and market mechanisms in which to engage with flexible markets.

Consumers must be central to this transition – they need to be engaged and empowered to control their electricity usage. Therefore, engagement and education are crucial. The public needs access to transparent and clear sources of information, to educate and support them on the transition – not just to zero emission vehicles but smart electricity systems more broadly.

RECOMMENDATIONS

Electricity Decarbonisation

- We welcome the government's decision to aim for grid decarbonisation by 2030, but this must be delivered with a reduction in electricity costs. The electricity used to produce and power electric vehicles must be affordable and renewable/zero carbon.
- Cutting grid infrastructure connection timeframes is fundamental and grid connection reforms must be implemented immediately. All key stakeholders, including Mission Control, must engage directly with the automotive sector.
- Gigafactories and vehicle manufacturing sites should be classed as critical national infrastructure and prioritised for new connections to the grid.

Preparing for EV charging infrastructure

- The rollout of EV charging infrastructure should be seen as a programme of national significance and should be supported as such by the government, allowing easier and speedier installation of chargepoints, in a more coordinated way, across the country.
- The funding earmarked for charging infrastructure should be used to over-size connections to service areas to future proof sites in the anticipation of future demand from electric heavy-duty fleets.
- Government should set binding targets on itself for charging and refuelling infrastructure, including specific targets for HGV charging and commit to these in the forthcoming HGV infrastructure strategy. OZEV must work with National Energy System Operator (NESO) and Ofgem to develop an implementation strategy for effective HGV charging infrastructure as soon as possible.

Smart charging engagement

- When it comes to demand management and grid flexibility, we favour the use of appropriate market mechanisms – for example, smart tariffs – which incentivise consumers to take up smart charging, and which are more acceptable and effective than mandatory mechanisms. Consumers should ultimately be in control of when they charge their vehicle(s).
- There must be a collaborative approach to the development and introduction of energy smart appliance (ESA) regulations between government and relevant industries. The automotive industry should continue to be engaged with specific consideration, given

electric vehicles are a form of mobility with their own set of regulations rather than a standard appliance.

- The Distribution Network Operator's ability to influence load must be limited to the boundary of the home only and not control beyond the meter. This allows the consumer to prioritise load within the home at times of constraint to meet their immediate needs.

Cybersecurity

- In developing smart and secure electricity systems, avoiding double regulation on automotive actors must be avoided. Responsibility for the electricity grid should reside with the energy supply companies and infrastructure providers (such as DNOs).

Consumer engagement

- There should be a government-backed, single source of information on EVs, EV charging and, specifically, smart energy tariffs – like the previous Go Ultra Low campaign.

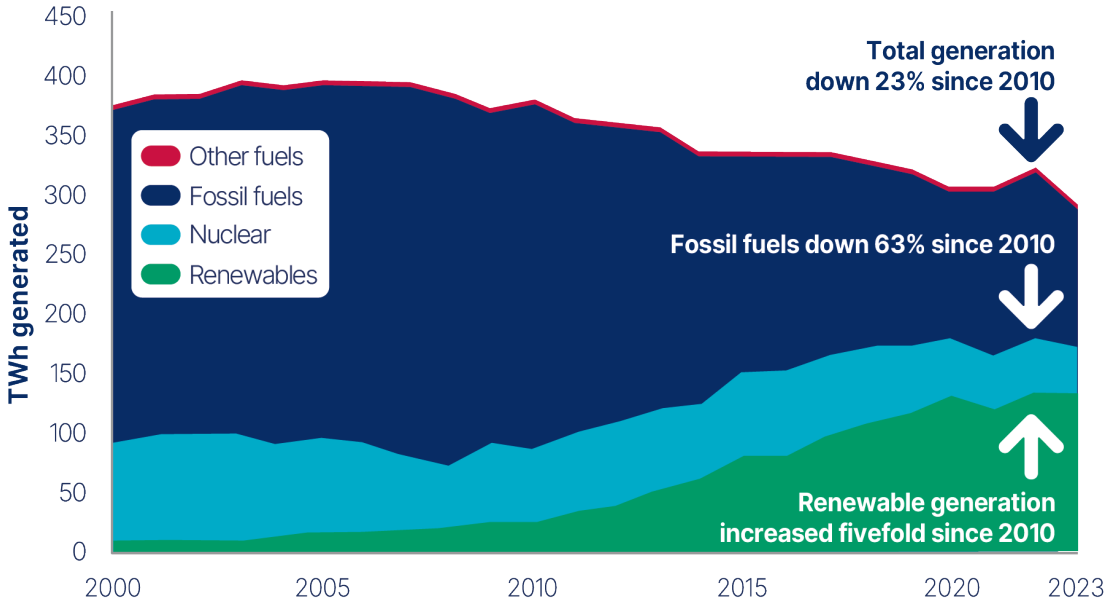
1 - UK DECARBONISATION CONTEXT

With projections of electricity demand facing large increases of 40% by 2035, there is no doubt that more generation and capacity, more efficient use and flexibility are required. UK Automotive as an industry is in the process of decarbonising its processes and products, both of which will rely heavily on increasing amounts of electricity.

The automotive industry is committed to decarbonising industrial practices but this will be impossible without prompt access to affordable, stable supplies of clean electricity. This will also be a key to increasing the competitiveness of UK vehicle manufacturing.

Electric vehicles and batteries are typically more energy intensive to produce than conventionally fuelled cars – so abundant access to affordable clean energy will play a major role in investment decisions on where to build next generation models. Alongside affordability, the move to renewable and zero carbon electricity and sustainable energy in the UK will mitigate the risks of energy price volatility, which is particularly important for investments by manufacturers and large fleets.

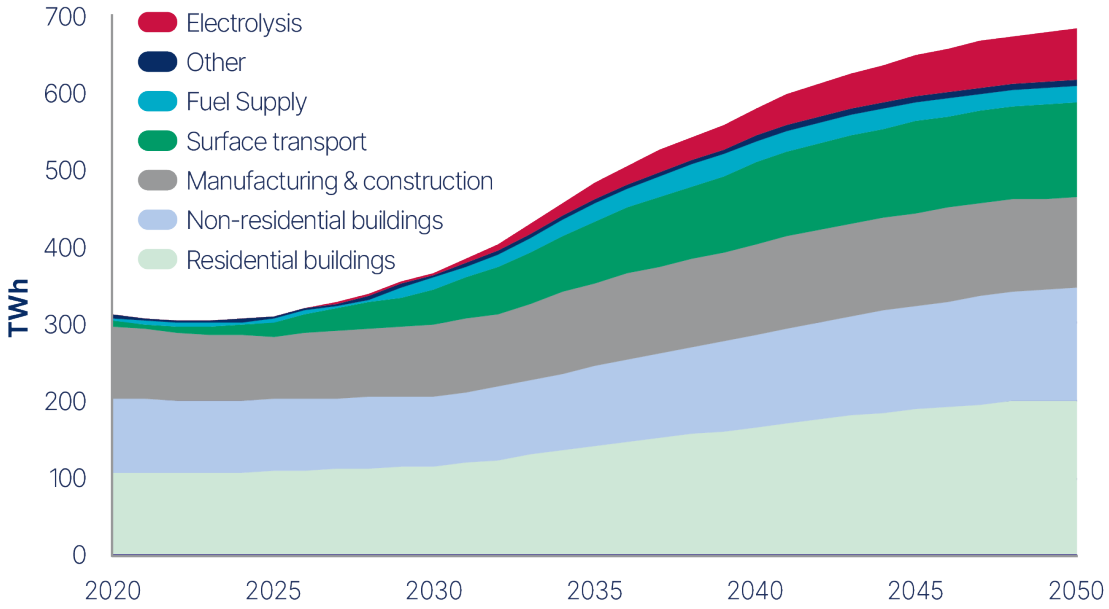
Figure 1: DUKES Electricity generated by fuel, 2000 to 2023



Source: Department for Energy Security and Net Zero, Digest of UK Energy Statistics (DUKES)

Over the coming years we will see a revolution in the customer base for the electricity system. The Climate Change Committee (CCC) estimates that, due to the increasing electrification of the UK economy, demand for electricity will double between now and 2050, growing from around 300 TWh to 360 TWh in 2030, 460 TWh in 2035, and 610 TWh in 2050. The carbon intensity of electricity, meanwhile, is projected to fall from 220 gCO2/kWh in 2019 to around 50 gCO2/kWh in 2030, 10 gCO2/kWh in 2035, and 2 gCO2/kWh in 2050.[1] Between 2023 – 2042 (carbon budgets 4 – 7), surface transport contributes the largest share of emissions reduction in the UK economy, dropping 86% from 2023 levels by 2040. NESO's Future Energy Scenarios 2025 'Holistic Transition' scenario has energy demand for road surface transport increasing from around 6TWh in 2024 for electric vehicles, to 127TWh in 2050[2]. These figures show the scale of the challenge ahead, and the crucial role transport has to play on economy-wide decarbonisation.

Figure 2: Electricity demand by sector in the Balanced Net Zero Pathway (2025-50)



Source: Climate Change Committee 'The Sixth Carbon Budget – The UK's path to Net Zero (2020)'

[1] The Sixth Carbon Budget – The UK's path to Net Zero (2020)
[2] https://www.neso.energy/document/364541/download

Against a difficult backdrop, including increasing electricity costs and the introduction of the Expensive Car Supplement tax to EV purchases, current market conditions mean that SMMT expects the EV market to grow by more than 20% both this year and next. The new Electric Car Grant should provide a welcome boost to the market. The Vehicle Emission Trading Scheme (VETS – known as the ZEV Mandate) regime includes a very ambitious trajectory for EV uptake to 2030 and this should help grow demand for new charging infrastructure and justify anticipatory investment by electricity networks.

A crucial barrier in the decarbonisation ecosystem is access to the ever-increasing amounts of renewable and zero carbon electricity being produced. Currently the grid connection process in the UK is holding back decarbonisation efforts. According to Energy Networks Association (ENA) data, the amount of new electricity supply waiting to be connected to the grid in February 2025 was 765GW.[3] This is more renewable electricity than the UK needs to reach net zero. A moratorium on new connections was announced in January 2025 while new queue criteria was established, which would implement a 'first ready, first connected' approach.

This was announced in April 2025 and would remove 'zombie' projects from the queue. The significant issue will not be about having enough renewable power to decarbonise the UK economy by 2050, but will more likely be the challenges around when and where businesses and consumers can access it. The length of time it takes to connect is a major barrier for the automotive industry and is the factor that will put pressure on the UK's emissions targets between now and 2050. The grid connection process needs to change to release the benefits of this renewable electricity. The government and associated agencies will need to work with industries to ensure there is no geographical lottery to access grid connections or renewable/zero carbon electricity, and that all have equal access to affordable power.

A serious challenge the UK currently faces is the energy cost crisis, which is hitting the automotive industry particularly hard amid the EV transition. While prices have increased across Europe in the last five years, the UK has been hit especially hard due to the structure of the UK energy and electricity markets. Data from the Department for Energy Security and Net Zero

[3] https://www.energynetworks.org/industry/connecting-to-the-networks/connections-data#:~:text=February%202025,energy%20needs%20for%20net%20zero

(DESNZ) shows that for large industrial energy users the UK has the highest electricity prices in Europe, and on average more than double (112%) other countries[4] Retail electricity costs are also higher than in many European countries. This only serves to reduce the competitiveness of the UK automotive industry, increasing production costs, but also hampering the cost benefits of BEV ownership via increased electricity costs for charging. It is essential that the UK addresses the cost of energy crisis immediately and understands the wide-ranging impact not taking drastic action will have on consumers and businesses alike. The government cannot allow costs to be passed onto consumers at a time when prices are already high.

Industrial electricity costs must also be reduced to improve the competitiveness of the UK's automotive industry. In recent years, energy has been the single biggest concern for UK automotive manufacturers, with almost seven in 10 (69%) SMMT members worried about the impact of onerous cost increases on their business operations. Energy is the second largest in-house cost to manufacturers, after labour. According to Climate Change Committee (CCC) advice, during the UK's 7th carbon budget (2038-2042), electrification will be the main pathway to decarbonising industry. A competitively priced supply of renewable/zero carbon energy creates a win-win for both the manufacturing sector and EV users. The government needs to work with industry to bring down the cost of industrial electricity immediately.

The government recently announced its new Industrial Strategy.[5] This set out a number of actions the government will take to improve the competitiveness of UK industries, including reducing electricity costs. SMMT welcomes the publication of the Industrial Strategy and its focus on reducing the cost of electricity to businesses. However, alongside this immediate action we need to see a true reshaping of the wholesale electricity market to decouple the cost of renewable electricity and gas prices, alongside a focus on investment in grid infrastructure. The introduction of the British Industrial Competitiveness Scheme (BICS) is welcomed and the confirmation that automotive can access this is a real positive to the industry. SMMT will push for access to be open to the whole sector and believe it should be operational before the announced 2027 start date. Alongside this the UK automotive industry should be included on the

[4] https://www.gov.uk/government/statistical-data-sets/international-industrial-energy-prices?utm_medium=email&utm_campaign=govuk-notifications-topic&utm_source=2161a7e3-d361-4d2f-a8d7-64099dee3f9a&utm_content=daily
[5] https://assets.publishing.service.gov.uk/media/68595e56db8e139f95652dc6/industrial_strategy_policy_paper.pdf

Energy Intensive Industries (EII) list and thus be able to access the British Industry Supercharger support programme.

The UK market does not operate in a vacuum and, therefore, we need to have regard for developments in Europe – and specifically the EU, as the UK's largest trading partner. The UK and European electricity markets are increasingly linked, and physically in the case of the growing number of interconnectors. The UK government must work the EU and our European neighbours to identify areas of cooperation to reduce electricity costs. It is claimed that linking the UK and EU Energy Trading Schemes (ETS) could reduce energy costs for consumers.[6] SMMT welcomes reports that government is seeking to link the EU and UK ETS, which would help to create a more level playing field with our largest trading partner and improve liquidity in the market and reduce the risk of the Carbon Border Adjustment Mechanism (CBAM) of adding additional costs to UK-EU trade.

As well as lowering the wholesale price of electricity, we believe the UK must enable lower retail electricity prices. Smart tariffs can help consumers, who are able to charge at home, to lock in lower prices; however, the lower cost of renewables needs to feed through to lower consumer prices as soon as possible. SMMT has also called for VAT on electricity at public charging points to be cut to 5% to support consumers when charging using public infrastructure. If this is not done, UK consumers will have to unfairly shoulder the burden of higher prices due to government inaction and market failures. The UK will not reach its legally obligated net zero targets if the appropriate frameworks are not in place for automotive to decarbonise.

Alongside electricity price reductions, the automotive industry needs easy access to the renewable energy currently being rolled out across the country. This means speeding up grid build out and grid connections as a matter of urgency. To have an accessible and convenient charging infrastructure network across the country, giving confidence to consumers to move to electrified vehicles, charging infrastructure must be installed quickly, without major power constraints.

[6] https://www.scottishrenewables.com/assets/000/004/712/Linking_EU_and_UK_ETS_letter_FINAL_original.pdf?1746012058

2 - SUPPLY SIDE

As highlighted in the previous chapter, the UK has seen remarkable growth in renewable electricity generation since 1990. To meet the Clean Power 2030 target of sourcing 95% of electricity from clean energy, annual installation rates will need to increase to levels never seen before by 2030. Despite this growth in renewable generation, there has been a struggle in recent years to reinforce and connect this new generation to the grid and transport it to businesses and consumers within reasonable timeframes. In its current form, the UK grid is not able to keep up with the demands being placed on it.

The automotive industry needs grid connection to be a quick and easy process to enable connecting manufacturing facilities, private (such as depots) and public (on-street) charging infrastructure to the grid in the timelines needed to decarbonise. Accessing affordable renewable/zero carbon electricity is also a key challenge which will determine the competitiveness of the industry in the years ahead.

SMMT believes that with the move to electrified transport, the sources of that electricity should be decarbonised in the same timeframe otherwise electrification will not provide the full range of potential benefits to the country and consumers. This must be paired with measures that secure lower prices, essential to industry competitiveness and consumer TCO. Without this, the UK risks meeting its legally binding carbon emission targets and consumers will be locked out of the many benefits that electrified vehicles can provide. The European Alternative Fuels Observatory data shows that in Britain the average price for public rapid DC charging is €0.68 (57p), the fifth-most expensive price per kilowatt-hour (kWh) of electricity in Europe.[7] The UK should be aiming for public EV charging prices to be, at the least, competitive with the European average.

The SMMT believes that the electricity used to produce and power electric vehicles must be **affordable and renewable/zero carbon**.

[7] https://alternative-fuels-observatory.ec.europa.eu/consumer-portal/electric-vehicle-recharging-prices

UK electricity prices need to come down as soon as possible and the government should use all levers at its disposal to achieve this. We need the lower cost of renewable electricity to be reflected in the final wholesale and retail prices. Following the recent decisions on the Review of Electricity Market Arrangements (REMA), the government must introduce wider market reforms to lock in the benefits of renewable energy in a clean and flexible energy system.

The BICS will be a positive step to reducing industrial electricity prices.. It also remains to be seen how the exemption for the Renewable Obligation, Feed-in-Tariff and Capacity Market policy costs will affect prices overall. As has been stated above, a long-term restructuring of the market is crucial for long-term business planning, and we urge the government to introduce new market arrangements as soon as possible.

Following the government's recent decisions on the REMA programme, namely rejecting zonal pricing, a restructuring of the market needs to be introduced as soon as possible and should take a consumer-focused, whole energy system approach to decarbonising the electricity system in the UK in a cost-effective and efficient manner. This means focusing on all parts of the electricity system from generation, transmission, distribution and the market must also be considered to create a holistic system. A whole systems approach should ensure energy policy is aligned with other government policies that support progress to net zero - for example, considering other investment requirements on sectors, such as the ZEV Mandate. The reformed electricity market must reflect the true cost of renewables and not be tied to higher gas prices. Decoupling the price of electricity and renewables from gas is essential to experience the benefits of lower costs.

SMMT had cautioned the government against introducing zonal pricing and therefore welcomes the recent decisions on REMA to reject this approach. Zonal pricing could lead to unfair price disparities across the country, which the SMMT does not support. While locational pricing is designed to encourage investment in renewable generation, it can take years for this infrastructure to be realised, and in the intervening period consumers are unfairly exposed to different costs across the country. This would not be fair for businesses and consumers alike. The structural reforms the country needs must be balanced with the potential impacts for industrial users that cannot respond to locational pricing signals. All consumers should have the same right to access affordable low carbon energy across the whole country, so this inequitable

outcome must be avoided. A single national market should be restructured to remove the undue influence of gas prices on electricity prices for consumers.

In the latest Progress Report to Parliament published in July 2024, the Climate Change Committee noted that the UK is not on track to meet its legally obligated emissions targets by 2030. The report states that annual renewable energy production must increase rapidly:

- Offshore wind installations need to increase by at least three times (from 15GW in 2023 to at least 50 GW in 2030).
- Onshore wind capacity was at 15GW in 2023, with only 0.5GW installed that year. Installations will need to at least double; and
- Solar capacity was at approximately 16GW in 2023, with installations needing to increase by five times the average amount over the last 3 years to 60GW in 2030.

The UK is not currently projected to reach these levels unless the rollout of renewables can be sped up between now and 2030.[8]

Battery Energy Storage Systems (BESS) will be needed to decarbonise the electricity system. BESS can store renewable energy at times of abundance and help to flatten demand peaks, reducing overall costs and reduce the UK's exposure to cost shocks from energy sources bought on the international markets (such as oil and gas). BESS could give businesses another option for accessing BEV charging, for example in depots, where grid infrastructure upgrades or grid connections could be too expensive or slow. It could also allow boost-charging and potentially reduced grid infrastructure costs, as stored energy could supplement direct grid supply to meet fast charging demand, particularly during peak utilisation periods. The government must continue to support BESS via enabling regulatory and fiscal frameworks, to ensure it can be part of the solution for automotive businesses and the industry as a whole to decarbonise.

[8] https://www.theccc.org.uk/wp-content/uploads/2024/07/Progress-in-reducing-emissions-2024-Report-to-Parliament-Web.pdf

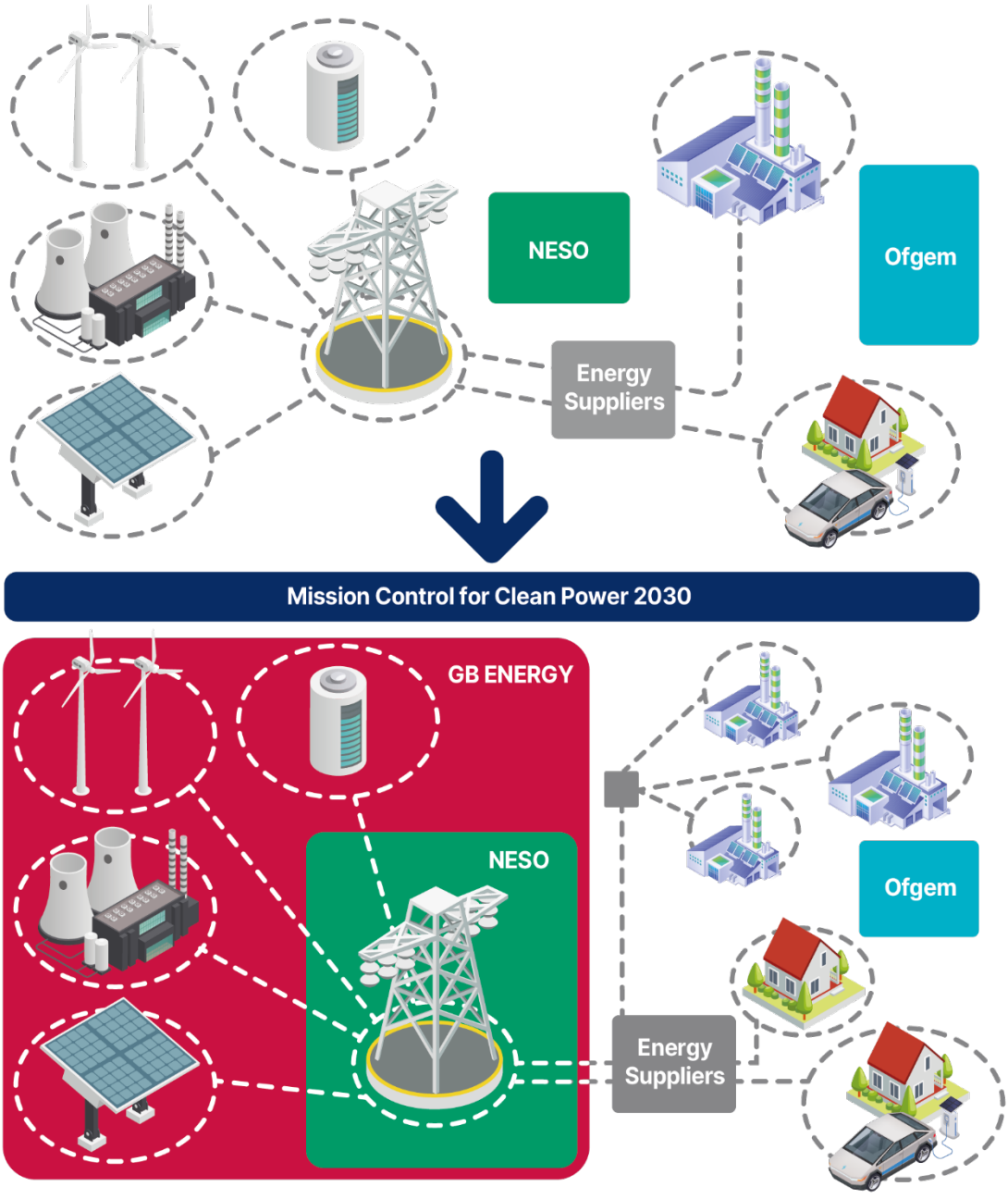
The government cannot focus only on the wholesale market but must consider all parts of the system from generation, transmission and distribution to the different end-uses. This will also require system innovation to be encouraged through the regulatory framework in order to reflect the true cost of renewable energy in consumer prices. Alongside this, a whole systems approach should ensure energy policy is aligned with other government policies that support progress to net zero. For example, considering other investment requirements on sectors, such as the ZEV Mandate, with decisions on energy market reforms must be made with end users in mind.

Crowded energy ecosystem

For government to achieve a net zero electricity system by 2030 (Clean Power 2030), the enabling action needs to take place immediately. It will require an increase in investment for all areas of the ecosystem to be optimised towards delivery. There needs to be clarity around the exact role that Great British Energy (GB Energy) will perform in the UK's energy ecosystem. The GB Energy Act essentially gives the company the power to operate in all areas of the market, which creates ambiguity about its place. The announcements about GB Energy and its intended functions suggests it will be incredibly ambitious. In a crowded ecosystem, what is GB Energy's role? What is its unique selling point? Some believe that GB Energy as a solution to the supply chain challenge is where it could be most impactful.[9] There will be an increasing need for cross-sectoral supply chains in energy and transport, and this could be a positive thing for UK employment if managed effectively. Crowding in funding and de-risking private investments should also be a main objective of GB Energy, all with the ultimate aim of supporting the net zero electricity system target but also more specifically on reducing wholesale and retail electricity costs in the UK. The UK has some of the highest wholesale electricity prices in Europe, and for the country to improve its competitiveness across all industries, this needs to be addressed.

[9] https://unbalancingmechanism.substack.com/p/so-what-will-great-british-energy?r=27blkc

Figure 3: New energy ecosystem



Mission Control is another new 'body' within the energy ecosystem whose exact role and powers are not clear. SMMT calls on Mission Control to engage with our industry on the role it can play in supporting the Clean Power 2030 objective, but also to understand the challenges the automotive industry faces in detail. It is essential that the Clean Power Mission delivery group

coordinates with all relevant government stakeholders, and particularly the Industrial Strategy Advisory Council.[10]

SMMT believes that the NESO, while adopting a holistic approach to national energy system management, should establish an automotive energy unit to understand and develop the grid with the specific requirements of road transport and automotive manufacturing in mind. The government must enable the NESO with the necessary powers to play its role effectively. SMMT agrees with the core functions of the NESO as set out by the Strategy and Policy Statement (SPS) for energy policy in Great Britain (2024).[11] This also means aligning the SSEP with the planning system to remove unnecessary barriers and blockages to grid upgrades. SMMT calls on the NESO to engage with key decarbonisation partners – of which the UK automotive industry is one of the most crucial.

Overall, what the market needs and what the automotive industry needs, is clarity on what each sector's role is in this new energy ecosystem. With the incredibly tight timelines for decarbonising electricity, we cannot have duplication of effort or competing priorities from the different organisations in operation. All stakeholders must be focused on reducing costs and carbon. Automotive needs affordable, renewable/zero carbon electricity to achieve decarbonisation. It is not entirely within the industry's control and therefore we expect and are calling for excellent engagement from the key stakeholders including GB Energy, NESO, Ofgem, Mission Control for Clean Power 2030, the Department for Energy Security and Net Zero (DESNZ) etc.

[10] https://www.gov.uk/government/news/government-launches-industrial-strategy-advisory-council-to-boost-growth-and-living-standards
[11] https://www.gov.uk/government/publications/strategy-and-policy-statement-for-energy-policy-in-great-britain/strategy-and-policy-statement-for-energy-policy-in-great-britain-accessible-webpage

Distribution

The entire electricity distribution system, the transmission and distribution networks in the UK need to be aligned to the objectives of enabling non-domestic and domestic decarbonisation at the lowest cost available to the consumer. The distribution network, the final step in delivering electricity to homes and businesses, is owned and operated by the Distribution Network Operators (DNOs) split into 14 areas.

Barriers to improving grid connections have included the lack of the correct regulatory direction, the need for planning system reform, the lack of adequate support for enabling flexibility, constraints in the supply chain and skills shortages[12]. The Energy Networks Association (ENA) has called on the government to address some of these issues, but it requires the government and its associated agencies to all be facing the same direction and acting on these issues now. We have seen some progress from the government, such as removing planning approval to install EV charge points in domestic properties and substations for depot charging. However, they are not addressing the overall issues with the planning system for larger transmission connections, nor for connections or reinforcements to manufacturing facilities with onsite renewable generation.

[12] https://www.energy-uk.org.uk/publications/getting-britain-connected-part-3-the-role-of-local-distribution-networks-for-homes-and-businesses/#:~:text=The%20distribution%20system%20is%20one,grid%20upgrade%20and%20connection%20milestones.

Figure 4: CCC Slow grid connection upgrades could delay industrial electrification

For industrial sites to electrify, they will need to connect high-powered equipment to the electricity network. In many cases this will require a grid connection upgrade. Acquiring such an upgrade can take several years and manufacturers often cite these delays as a principal barrier to electrification.

Despite widespread recognition of the problem of connection upgrades, there has been little quantification of its scale. However, research by the UK Energy Research Centre (UKERC) has begun to address this gap. UKERC compared distribution network operators' Network Development Plans to industrial electricity demand in the Committee's Seventh Carbon Budget Balanced Pathway. Their analysis identified any potential shortfalls in network capacity in UK regions, as well as at the level of individual industrial sites and substations. UKERC found that:

- By 2040, without further upgrades, network constraints could affect industrial electrification in all UK regions and devolved administrations, except North East England and Yorkshire and the Humber.
- Future electricity demand at more than half of industrial sites could be constrained by 2040.
- Dispersed sites and sites with the biggest power requirements are the most likely to be affected.

It is clear that without further action grid connections could present a major barrier to industrial decarbonisation. More information is needed on the extent of the problem. We therefore welcome the UK Government's commitment to 'work with Ofgem, network companies and the new National Energy System Operator (NESO) to understand where investment in grid infrastructure ahead of need may be required to match expected demand from electrifying sectors such as industrial electrification projects'.

Source: *The results have been calculated for the CCC by the UK Energy Research Centre and the University of Leeds based on the method described in the research paper: Gailani A., Taylor P. (2024) Assessing electricity network capacity requirements for industrial decarbonisation in Great Britain*

Source: Climate Change Committee - 7th Carbon Budget

The transmission network is the first part of the system which transfers high-voltage electricity from the production source to the wider distribution networks. According to the National Grid, the owner of the transmission network, the UK will need five times the amount of overground and underground electricity lines that have been built in the last 30 years, depending on where new generation asset are located. Additionally, the country will require approximately four times

more subsea high voltage cables than are currently in place.[13] This is a huge challenge even with recent connection process reforms introduced. It is widely agreed that this is only doable if all incentives and resources are focused on speeding up the delivery of infrastructure.

The Transmission Acceleration Action Plan is a good first step to addressing the challenges the UK faces in ramping up the connection of renewable generation to the grid. We agree with the recommendation to develop a national Strategic Spatial Energy Plan (SSEP) and subsequent Centralised Strategic Network Plans (CSNPs) based on the SSEP. This should lead to a transition towards more strategic planning of the energy system in the UK and help avoid connection bottlenecks.[14] The Winser Report makes a series of recommendations (including developing an SSEP) to cut the transmission infrastructure delivery timelines down from an average of nearly 14 years in half, to around seven years to see the rollout of infrastructure needed to support current carbon targets[15]. SMMT supports this ambition, cutting infrastructure delivery times is crucial given the scale of the challenge and these recommendations should be implemented as soon as possible.

However, seven years is still too long for an industry that must see zero emission vehicles comprise at least 80% of all new cars and vans registered by 2030. The challenges of implementing a new process, including those listed in the Connections Action Plan and Transmission Acceleration Action Plan, within the timeframes necessary and without loading excessive additional costs onto consumers is massive. These changes need to be actioned without delay, while new processes are developed which will mean the UK has an agile and 'flexible' process for ensuring connection to the grid. This will require increasing digitalisation of processes and assets and more data sharing on grid capacity. The other side will consist of working with Local Planning Authorities to ensure an efficient and quick process for installations, for example of EV charging infrastructure. The UK should prioritise the rollout of all charging infrastructure (on-street and destination charging) while also making it easier to install.

[13] https://www.nationalgrid.com/document/149496/download
[14] https://assets.publishing.service.gov.uk/media/65646bd31fd90c0013ac3bd8/transmission-acceleration-action-plan.pdf
[15] https://assets.publishing.service.gov.uk/media/64c8e85219f5622360f3c0ee/electricity-networks-commissioner-companion-report.pdf

The CCC's 7th carbon budget shows the bulk of the burden of carbon cutting in the next decade will be made by the transport industry, which has been dubbed the 'hero sector' for decarbonisation in that timeframe. All efforts must be made to prioritise support for automotive manufacturing in regard to connections approval, which will not only enable decarbonisation of the sector but support UK industry and jobs.

A potential future challenge for network operators and consumers will be when households have more than one EV that requires charging at home. Alongside the potential electrification of heating, upgrades to home grid connections could be required which could prove costly for consumers. This is because most homes in the UK are provided with a single-phase electricity connection, which can cope with current household electricity demand volumes but may not be able to charge two electric vehicles at once. In many cases, this would require a three-phase supply to deal with higher loads, which can cost tens of thousands of pounds to install. Whilst there is no easy answer to this, the government must begin to develop plans for how this issue will be dealt with.

There are going to be specific issues with installing EV charging infrastructure in rural areas. Weakness in local grid infrastructure is a major issue, and there needs to be a balance between focusing on supply capacity and the infrastructure to feed that power into the grid and upgrading the downstream network to ensure that the green power being generated can be effectively delivered to where it's needed. One practical measure would be for the relevant agencies involved in the management of the grid to coordinate the needs of significant local users. That would facilitate cost sharing but would also minimise the risk of businesses competing for limited future capacity.

There is a significant shortage in skilled engineers and technicians needed to support the shift to electrification as part of energy decarbonisation. This ranges from building out solar and wind infrastructure and upgrading the transmission grid, to installing heat pumps and electric vehicle chargers. In turn, this will lead to a rise in demand for skilled maintenance staff for both infrastructure and servicing of a growing fleet of electric vehicles. As of 2024, electrical and

electronic trades are showing a 64% shortage[16]. Timely decision-making, not necessarily 'less' regulation, would allow companies to commence work as early as possible to allow investments to be made and consequently begin to earn revenue. Therefore, improving departmental resourcing and introducing automation where appropriate in the regulatory applications process could help reduce delays in the grid application processes.

Recommendations

- We welcome the government's decision to aim for grid decarbonisation by 2030, but this must be delivered with a reduction in electricity costs. The electricity used to produce and power electric vehicles must be affordable and renewable/zero carbon.

- Cutting grid infrastructure connection timeframes is crucial and grid connection reforms must be implemented immediately. All key stakeholders, including Mission Control, must engage directly with the automotive sector.

- Gigafactories should be classed as critical national infrastructure and prioritised for new connections to the grid.

[16] https://reedinpartnership.co.uk/news/insight-addressing-the-green-skills-challenge/#:~:text=Within%20this%2C%20the%20electrical%20and,be%20out%20of%20our%20reach

3 - DEMAND-SIDE

The UK has a range of vehicle manufacturers in the country, including four mainstream car manufacturers, seven major premium and sports car manufacturers, eight bus and coach manufacturers and four commercial vehicle manufacturers, not to mention key component manufacturers and suppliers. These businesses are facing the challenge of decarbonising their products, processes, and supply chain and will rely heavily on the energy sector's pace of decarbonisation to achieve this aim. The automotive industry need swift access to the electricity grid backed up by a smooth and reliable connections process.

UK vehicle production forecasts are pointing to a difficult second half to the decade in terms of figures, however all projections point to growth from the low of 2025. The base scenario projection suggests vehicle production will be around 875,000 by 2030, with a growing proportion of BEVs given recent investments in new electrified models. This points to a growing demand for electricity demand for production as manufacturing sites decarbonise through electrification.

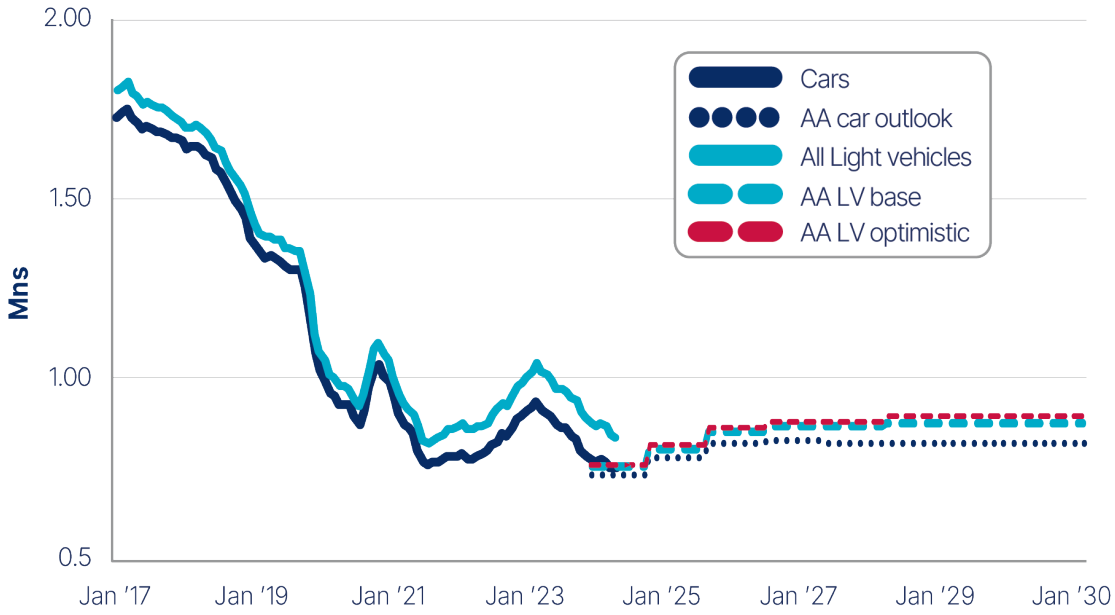
In the last decade, the UK automotive industry has been cutting CO2 emissions across operations, with scope 1 and 2 emissions down 55% since 1999, and CO2 per vehicle down 54%. With an increasing share of renewables on the grid, this trend should continue in the age of electrified vehicles. There are certain processes which rely on natural gas, which is harder to decarbonise. However, there is work being done, such as the HyNet project, looking at substituting natural gas for hydrogen in industrial processes. These investigations are at a relatively early stage but should also be supported to ensure that all areas of automotive and the wider UK economy can decarbonise fairly. Energy efficiency is a crucial aspect of reducing emissions, and the automotive industry is showing that it can improve efficiency year-on-year.

The importance of speedy grid connections has been highlighted previously, it is important to reiterate in relation to automotive efforts to decarbonise their operations through the installation of on-site renewable energy generation, where BESS is not appropriate or practical, for example through solar. Automotive businesses should not be held back when decarbonising their businesses due to long connection timelines. Given the wider importance of automotive to the UK economy, it is imperative that these types of grid connections are treated with the utmost urgency.

Alongside the physical grid connections and enhancement issues, the process for obtaining the Smart Export Guarantee can be protracted, impacting business's ability to plan for the long-term when installing renewables on their industrial sites - a crucial part of the transition to net zero manufacturing. These processes also need to be streamlined and factored into local energy infrastructure planning.

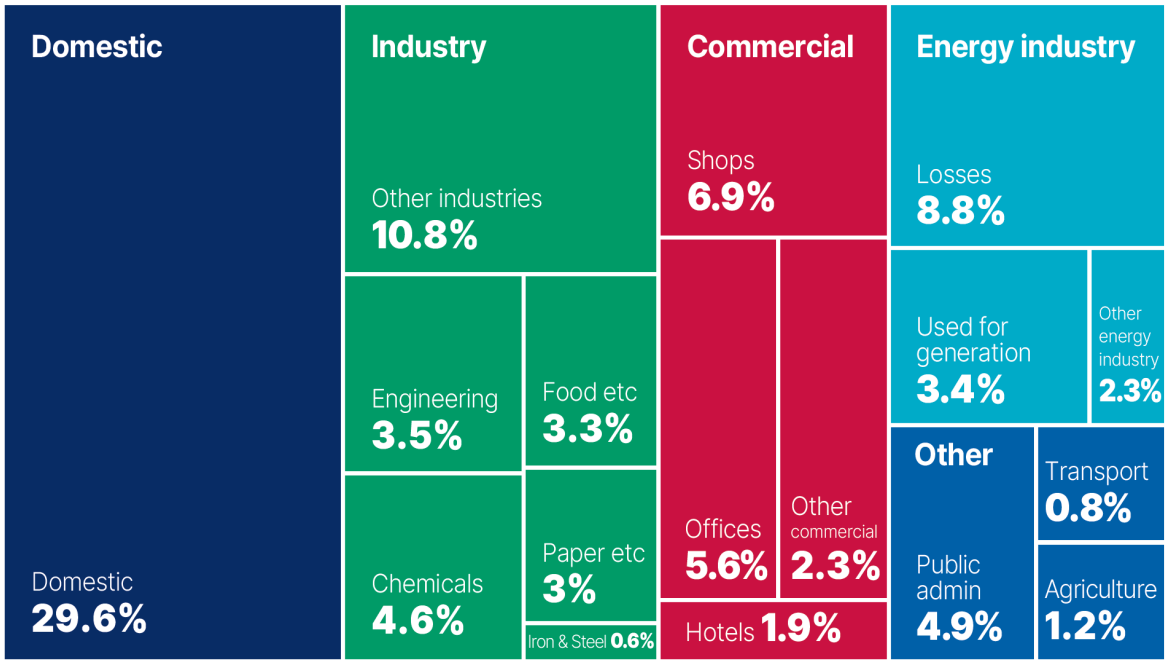
The government must reintroduce the Industrial Energy Transformation Fund (IETF)with grant intensity high enough to make removal of gas from building, heating and processes equipment investable.

Figure 5: UK light vehicle production outlook – different scenarios (July 2025)



Source: AutoAnalysis for SMMT

Figure 6: Share of total electricity demand split by sector, 2023



Source: Department for Energy Security and Net Zero - Digest of UK Energy Statistics (DUKES): electricity

Growth in the BEV market has been increasingly driven by the fleet sector, while private retail demand continues to fall. While private demand is rising in 2025, the share of new registrations going to private buyers is still low with 59.9% of all new registrations going to fleets[17]. . This could be down to higher sticker prices for BEVs than ICE equivalents, but usual worries from consumers include overall cost, access to charging infrastructure and practicality.

Electricity price volatility, largely caused by the marginal gas pricing, creates a lack of confidence in investing in a BEV in the UK. The UK has suffered more volatility than other European markets in recent years, and this can seriously affect investment decisions by businesses and individuals looking to switch to electrified vehicles. Stable low-cost electricity allows the Total Cost of Ownership (TCO) for BEVs to attract consumers over the long term.

[17] https://www.smmt.co.uk/vehicle-data/car-registrations/

The TCO of a BEV in the UK has historically been lower than that of a petrol or diesel vehicles equivalent, despite upfront costs to date being higher. This is because of several factors, including average home electricity prices are lower than petrol and diesel pump prices, BEVs pay less VED, lower maintenance costs.[18] Businesses and private consumers can benefit from these lower ongoing costs. Over the last five years, the UK has faced significant electricity price increases, mainly due to international market challenges (caused by the COVID pandemic, and more prominently the Ukraine conflict). This has reduced the TCO benefits of owning a BEV, and further increases will only erode this further.

The rollout of electric vehicle charging infrastructure is growing as well. Department for Transport (DfT) figures published in March 2025 showed that over 75,000 public chargers now available in the UK, compared with over 64,000 in July 2024. However, there is a growing disparity between different regions, with the largest growth mainly seen in London and the Southeast.[19] Local authorities have different approaches to installing EV charging infrastructure, which can create a more difficult experience for businesses operating across the country.

All of this shows that, despite some underlying issues, the UK is seeing more BEVs and more EV charging points being deployed than ever before. With BEVs at a 19.6% market share for 2024 and the VETS requiring 28% in 2025, the rollout of EV charge points will need to increase even further. To ensure drivers have confidence, the UK will need to see growth in all different kinds of charging points – from 7kW to 350kW – in all different locations. This is a challenge but local authorities, businesses with large fleets, DNOs, NESO, and large landowners, will need to work together to allow rapid deployment, including sharing data where possible and in a commercially sensitive way. This should be seen as a programme of national significance and should be supported as such by the government, allowing the easier installation of charge points in a more coordinated way across the country.

Having a successful charging infrastructure network is essential if road transport is to meet its decarbonisation goals, and investment is needed. Government funding should focus on urban

[18] https://www.rac.co.uk/drive/electric-cars/running/the-costs-of-running-an-electric-car/
[19] https://www.gov.uk/government/statistics/electric-vehicle-public-charging-infrastructure-statistics-july-2024/electric-vehicle-public-charging-infrastructure-statistics-july-2024

areas but also accelerating the deployment of ultra-rapid chargepoints along the Strategic Road Network, thereby facilitating the widespread adoption of EVs. This work is needed to prepare sites, but also to strengthen the grid connection at key points along the SRN (including key spots on the A-road network). Funding should be used to over-size connections to futureproof sites for further upgrades in the future.

Alongside increasing battery sizes, vehicles will become capable of faster charge speeds over time, increasing the power need and the throughput of vehicles. If connections are not futureproofed to accommodate industry projections, then it will not be possible for consumers to realise these benefits and a technology bottleneck will be created

Removing barriers to the installation of public charging infrastructure is crucial to the automotive industry, and the process needs to be quicker than it currently is. The Connections Action Plan states that the "connections process must be reformed to ensure that businesses and homeowners can readily secure upgrades and new connections to the distribution network to install EV chargepoints in sufficient numbers".[20] This is welcome, but the recommendations made in the CAP, such as providing more transparent and accessible pre-application data and identifying optimisation options for the application process, need to be actioned immediately.

We call on government to equalise VAT applied to public EV charging with the 5% rate that is applied to electricity used for private home EV charging. There is a disincentive for going electric for people who do not have access to their own private EV charger or a property which can facilitate one.

[20] https://assets.publishing.service.gov.uk/media/6581730523b70a000d234bb0/connections-action-plan-desnz-ofgem.pdf

Heavy Goods Vehicles

It is important to separate out Heavy Goods Vehicles (HGVs) as a specific electricity demand. This is due to the large power requirements needed for electrified HGVs. This will have specific implications for the provision of infrastructure along the motorway network, but also at warehouse and depot locations, where HGVs often operate. If depots cannot get access to grid connection upgrades or new connections in a timely fashion, then the rollout of electric HGVs will be held back. It is a complex area given the long lead times and developing a business case to invest, when depots are often rented sites. The costs of upgrading local electricity grids will need to be shared in a fair way, and OZEV must work with NESO and Ofgem to develop an implementation strategy for effective HGV charging infrastructure. Government funding should also consider the provision of grid connections at identified sites for future HGV charging, alongside cars and vans.

The CCC 7th carbon budget balanced pathway now assumes that all HGVs will be battery-electric vehicles.[21] While this may underplay the role that hydrogen fuel cell vehicles play in the future, it shows a growing confidence that BEV technologies will be able to play a greater role in the heavier segments than previously predicted.

HGV electrification will have a different power profile to light duty vehicles, likely requiring fewer charge points of a much higher power output. A Megawatt Charging System (MCS) is being developed by the CharIN organisation. In the future, the amount of power HGV charging stations will need to provide could equal a traditional power requirement of a small city. Considering the step change needed in electricity infrastructure just for HGVs, the government should increase investment in Project Rapid and HGV-associated charging infrastructure to provide dedicated HGV, bus and coach charging infrastructure along the strategic road network and at motorway service areas.

[21] https://www.theccc.org.uk/wp-content/uploads/2025/02/The-Seventh-Carbon-Budget.pdf

NESO needs to engage with the automotive industry to plan and begin implementing the infrastructure needed to support a zero-emission market. An HGV specific unit will likely be needed given the different requirements to cars and small vans.

In our report 'The Road Ahead: Delivering A More Rapid Zero-Emission HGV Transition,' we called for the government to urgently publish its promised national charging infrastructure strategy for HGVs, covering both depots and public locations. The strategy should include details on how operators will be supported with energy connections, a plan for shared charging and refuelling infrastructure and detail how low carbon fuels will be included in the transition. Government should set binding targets for charging and refuelling infrastructure dedicated to HGVs and commit to these in the forthcoming infrastructure strategy.

Recommendations

- The rollout of EV charging infrastructure should be seen as a programme of national significance and should be supported as such by the government, allowing the easier and speedier installation of charge points in a more coordinated way across the country.

- The funding earmarked for charging infrastructure should be used to over-size connections to service areas to futureproof sites in the anticipation of future demand from electric heavy-duty fleets.

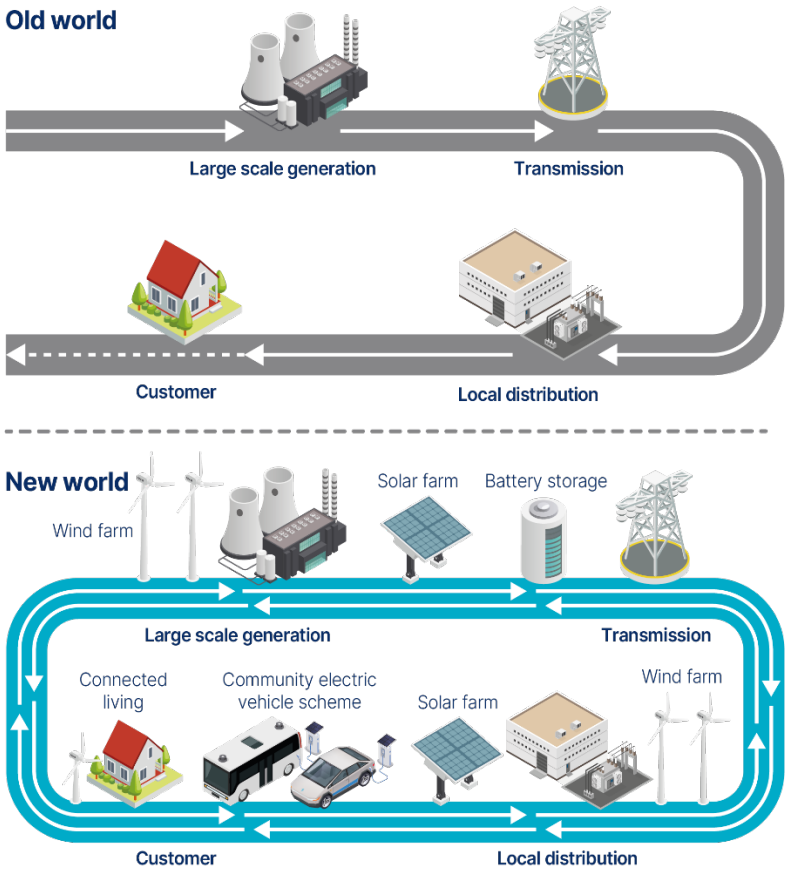
- Government should set binding targets on itself for charging and refuelling infrastructure, including specific targets for HGV charging and commit to these in the forthcoming HGV infrastructure strategy. OZEV must work with NESO and Ofgem to develop an implementation strategy for effective HGV charging infrastructure as soon as possible.

4 - FLEXIBLE ENERGY SYSTEMS

Flexible electricity grids are often pointed to as a crucial part of a future electricity system. Energy systems globally are shifting from a unidirectional system, where a small number of large power plants create electricity that is then carried to consumers, to a decentralised, circular model that enables multi-directional flows sand allows consumers to react to signals and reduce their demand when appropriate through digital technologies.

With the move to electrification, vehicles will be part of a wider, interoperable energy system, allowing different "refuelling" patterns (slow charging, delayed charging etc.) as well as bi-directional charging, which will enable consumers to feed electricity from their vehicles back into the grid when appropriate and convenient.

Figure 7: Changing electricity network diagram



Source: UK Power Networks

A massive increase in the installation of private chargers at homes and workplaces also enlarges the addressable market for smart charging and vehicle-to-grid, which motivates electricity suppliers, aggregators and demand-side response service providers to offer a variety of flexibility services. A buoyant 'flexibility market' with competitive smart tariffs not only boosts the participation of EV owners in balancing the grid but also provides a more compelling economic incentive for consumers to switch to EVs.

These changes offer exciting opportunities for consumers, businesses and the electricity grid. Theoretically, the electricity grid could have access to significant amounts of stored electricity that could be deployed during periods of grid constraints and peak demand. Businesses will be able to explore innovative business models, offering demand side response services. Consumers will be able to earn money for the electricity stored in their vehicles by sending it back to the grid when market signals and tariffs make this beneficial. These benefits must be harnessed in a way that works for consumers. They must have the final control over whether to engage with smart charging and/or bi-directional charging and should be encouraged via market mechanisms, rather than controlled by the grid.

Smart charging, bi-directional charging (V2G, V2H, V2X etc.)

There are different terms associated with these emerging vehicle technologies. Vehicle-to-Grid is a form of bi-directional charging that can accept electricity from the grid but also send electricity back out of the vehicle directly to the grid as well, operating exactly like a power plant. Then there are other charging approaches grouped under the wider term Vehicle-to-Everything (V2X), such as Vehicle-to-Load (V2L), in which the vehicle is used to power external appliances like power tools; Vehicle-to-Home (V2H), where a vehicle could act as a home battery; and Vehicle-to-Vehicle (V2V), with one vehicle potentially charging another vehicle.

If the right market solutions are in place, enabling V2G and V2X charging technologies may be another way of limiting the impact on peak demand for electricity and could even contribute to electricity supply. V2X technologies must be a part of a larger network of flexibility technologies that interact seamlessly together.

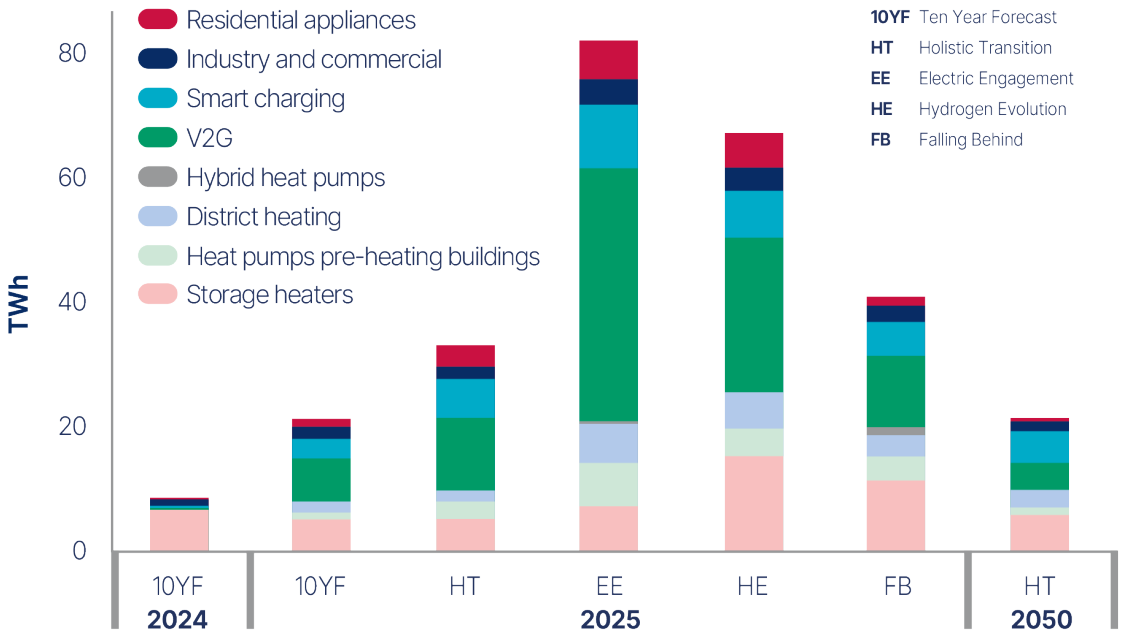
By 2035, total electricity demand is projected to increase by almost 40% to reach 460TWh. According to the National Grid ESO (prior to becoming NESO), BEVs could shift peak demand by 13GW in 2035 just by using smart charging. When including V2G, this could see an additional shift of 14GW of peak demand into off-peak periods. While it is difficult to forecast the impact of this figure as the technology is still nascent, it could radically change the TCO arguments for BEVs in the UK. A previous trial run by government and industry showed consumers in the trial were able to earn as much as £725 a year by simply keeping their vehicles plugged in when not being used. With technology hardware costs coming down, and the smart tariff market growing, this figure could increase. The trial also predicted that if the UK had almost 11 million projected EVs on the road by 2030, and if 50% of these vehicles were V2G enabled, this would unlock 22 TWh of flexible EV discharging capacity per year and could provide approximately 16GW of daily flexible capacity to the grid.[22] Predicting these kinds of figures is difficult but it does provide a clear picture of the levels of energy capacity that could be available.

There are a growing number of vehicles coming to market that have bi-directional charging capabilities in the UK. Previously, only vehicles with a CHAdeMO charging port were able to perform bidirectional charging, but the emergence of the Combined Charging Standard (CCS) has seen the market move away from CHAdeMO. While CCS can support bidirectional DC charging via the ISO 15118 standard, this has not yet been certified for AC charging, which would truly unlock this capability. Some vehicles may be able to retrospectively adopt this standard via software updates but some would require hardware updates, including charging infrastructure, so the sooner this is confirmed, the better for the industry.

Below shows the potential impact of smart charging versus smart charging including V2G on peak electricity demand from transport, as modelled in the FES 2024 report.[23] Smart charging could flatten demand peaks by delaying charging events for BEVs, while V2G could flatten the peaks further by providing electricity back to the grid from BEVs plugged in by their owners, where convenient for them and their charging needs.

[22] https://www.ofgem.gov.uk/publications/case-study-uk-electric-vehicle-grid-v2g-charging#:~:text=Since%20the%20beginning%20of%20the,flexible%20capacity%20to%20the%20grid
[23] https://www.nationalgrideso.com/document/322316/download

Figure 8: Demand side flexibility capacities at peak



Source: 'Future Energy Scenarios: Pathways to Net Zero

Additionally, V2X must be easily integrated with smart charging, micro-generation (solar PVs, domestic wind turbines) and domestic energy storage to offer consumers and the grid holistic flexibility services. Flexibility services need to be as simple and easy to understand and use by consumers as possible. It is unrealistic and impractical to expect consumers to participate in each of these flexibility services via separate platforms. Integration and convenience are fundamental to consumer participation.

A wider benefit of these technologies to the UK could be the role they play in improving energy security by acting as a supporting short-term storage for local energy networks, and directly powering homes via V2G and V2X technology where possible.

Learnings from the National Grid National Innovation Allowance (NIA) project, 'System value from V2G peak reduction in future scenarios based on strategic transport and energy demand modelling', should be harnessed and shared more widely. The final report shows that smart charging can reduce the impact of vehicle charging on peak demand, but that V2G could also

have a significant impact on reducing peak demand. However, the size of the reduction in peak demand, or the consumer's willingness to engage with V2G, depend on the price signals and the number of BEVs that can perform V2G.[24] The study also found that: "The security design of V2G systems should consider potential issues arising from the use of different devices and communication protocols by various stakeholders in a V2G ecosystem. Given the complexity of cyber-physical systems interconnections in V2G environments, further research is needed to better characterise threat sources and understand their origins and motivations." This reflects SMMT's view that communication protocols for energy smart appliances (ESAs) need to be developed in a holistic way, allowing smooth interaction between vehicle, charge points, and wider smart energy management services that will include other appliances within the home. The regulatory framework for ESAs should be proportionate and fair to implement and that it is important for all ESAs to be considered as a collective for demand side response (DSR).

The government classes EVs as ESAs so it is crucial that there is a collaborative approach to the introduction of these requirements between government and the automotive industry. A vehicle, while increasingly connected to the electricity system, is not used in the same way as a home appliance. It performs a different function and the legal relationship between owner and user is different and covered under different sets of regulation. The UK needs to be aware of the importance of harmonized European regulatory requirements when it comes to the design of vehicles.

Smart charging, including V2X can be a useful tool in grid management, but must be consumer-led for it to work. When it comes to demand management and grid flexibility, SMMT favours the use of appropriate market mechanisms, for example smart tariffs, that incentivise consumers to take up smart charging are more acceptable and effective than mandatory mechanisms. Consumers should ultimately be in control of when they can use the domestic energy, they pay for to charge the vehicle they have purchased. Consumers must be able to freely switch electricity supplier and/or EV brand or model without any impact on using the smart chargepoint.

[24] https://smarter.energynetworks.org/projects/nia2_nget0017/

Bidirectional charging could play an important role in the decarbonisation of the UK economy, but bringing this technology to market comes at a high cost, that takes a longer time to recover. Therefore, we believe that to truly enable and encourage V2G technology rollout, there should be a competitive advantage in doing so. V2X enabled vehicles can be supported by developing the markets and protections needed for this to be a compelling choice for consumers, whilst also providing wider benefits to the UK electricity grid. Vehicle manufacturers are already able to offer vehicles with V2L for example, but the market regulation needs to be correct to ensure that V2G and other V2X services are designed in a way that is empowering to both consumers and the grid. The government could support this further by providing a fiscal incentive, for example in the form of favourable tax regimes for V2G enabled vehicles.

The government could support market innovations, such as allowing consumers the choice of using multiple energy suppliers to provide services to their properties. This could enable new business models and competition, helping to reduce costs and offer new options to consumers, which could specialise in V2G charging.

Direct control of a property's load by the DNO should be possible only as a measure of last resort for emergencies or safety-critical conditions, e.g. to avoid black-outs. All other flexibility needs should be met by integration of EVs and other decentralised/distributed energy storage into flexibility markets, leaving the choice of participation to consumers. Government, through the energy sector regulator Ofgem, must introduce statutory limitations on the use of mandatory constraints, i.e. direct control, where the DNO is obliged to reinforce the constrained local network within a prescribed timeframe after excessive use.

The UK already has over 1.3 million electric cars now on the road[25] charging their vehicle at home, and new measures are likely to be needed to help consumers benefit from the best energy deals via a smart, flexible electricity system and to save money on bills.[26] The government must continue to support the trialling of smart, bidirectional charging and its integration into smart flexible energy systems. This should also include trials and demonstrations of public flexible

[25] https://www.smmt.co.uk/more-than-a-million-evs-on-uk-roads-as-vehicle-ownership-reaches-new-high/
[26] https://21ee65c1-6f70-4267-8143-cf318b1a3814.usrfiles.com/ugd/21ee65_c11b473d56194f8797b92dbb489be6fe.pdf

charging, such as dynamic pricing, being supported by government and local authorities to bring the benefits of lower cost charging to those who do not have a private driveway or garage.

The UK Capacity Market (CM) needs to be reformed to provide stronger market signals to flexible capacity. But flexibility needs to be tied to demand and this is where a holistic energy system approach is needed, linking up the wholesale and retail markets, deploying digital technologies for real-time measurement and reaction, with electric vehicles included at the design-phase. Stronger incentives will increase consumer demand and engagement in the flexible energy ecosystem.

Cybersecurity

In relation to cybersecurity, SMMT understands the crucial role the automotive sector will play in a secure electricity system, with a need for greater links between both sectors. The recent Smart and Secure Electricity System consultation proposed new assurance principles that automotive manufacturers would need to adhere to. However, vehicle manufacturers are already subject to vehicle type approval regulations, including United Nations Economic Commission for Europe (UNECE) Regulation No. 155 on Cyber Security which includes a Cyber Security Management System certification that addresses the cybersecurity capabilities and processes of the organisation. We need to avoid unnecessary, additional levels of bureaucracy and cost to electric vehicle manufacturers. A requirement relating to use of the Cyber Assessment Framework (CAF) for electric vehicles and electric vehicle manufacturers is therefore not needed and represents dual and overlapping regulation. The need to avoid dual regulation is already recognised in other regulatory proposals such as the EU Cyber Resilience Act, which excludes vehicles from its provisions on the basis that they are already subject to regulation under national implementations of UN R155.

With more connected devices than ever before, including charging points and vehicles, and growing flexibility markets, there are new business models emerging, specifically on Demand Side Response (DSR). DSR is a mechanism where energy users (businesses and private households) can change their electricity usage, based on external signals from the grid operators. We believe the lines of responsibility must be made clearer between DSR load controllers (a business organisation) and the ESA (a physical product). The burden of ensuring cyber security for infrastructure needs to lie with the energy supply company, that for the

charger device should lie with the supplier and manufacturer of the charging device. Electric vehicle manufacturers are already approving their products to UN R155, and it should be confirmed that there are no additional requirements for audits over and above this required for the vehicle.

Recommendations

- When it comes to demand management and grid flexibility, we favour the use of appropriate market mechanisms, for example smart tariffs, that incentivise consumers to take up smart charging and which are more acceptable and effective than mandatory mechanisms. Consumers should ultimately be in control of when they charge their vehicle(s).

- There must be a collaborative approach to the development and introduction of energy smart appliance (ESA) regulations between government and relevant industries and the automotive industry should continue to be engaged and given specific consideration given electric vehicles are a form of mobility with their own set of regulations, rather than a standard appliance.

- The Distribution Network Operator's ability to influence load must be limited to the boundary of the home only and not control beyond the meter. This allows the consumer to prioritise load within the home at times of constraint to meet their immediate needs.

- In developing smart and secure electricity systems, avoiding double regulation on automotive actors must be avoided. Responsibility for the electricity grid should reside with the energy supply companies and infrastructure providers (such as DNOs).

5 - WHOLE SECTOR CHALLENGES

National planning system

Reform of the national planning system is often cited as a crucial component to speeding up the rollout of new infrastructure, be that new renewable energy generation or charging infrastructure. As previously highlighted in this paper, the growth of charging infrastructure needed should be enabled using every tool the UK has and making it easier to gain planning consent is one option.

The lack of uniformity across the country when it comes to gaining planning permission is frustrating and not the most effective way to address a nation-wide challenge in the short timeframes that the automotive industry is facing.

Reforms to the system should be made, and they should be tied to the entire energy system approach to be undertaken by NESO, with certain infrastructure designated by strategic importance, including EV charging infrastructure. This requires the government to update the National Policy Statements on energy infrastructure and planning to align with these goals.

Echoing the Electricity Network Commissioner's report recommendations on the planning system, having the planning inspectorate aligned with the SSEP to be produced by NESO will provide better guidance for all stakeholders, and lead to quicker decision making.[28] Alongside clearer guidance and supportive policy frameworks set by national government, these changes could begin to speed things up. Local authorities will remain in control of the planning system in their areas but will be more closely aligned to national priorities and objectives.

Consumer engagement

The move to electrification is creating new business and technology opportunities, offering new services to consumers. This means that consumers will need to be supported on their journey, not just to electrified transport but smart home energy management, of which transport is now a part. The relevant government departments (e.g. OZEV, DESNZ, DSIT) should develop a consumer engagement campaign explaining and sharing information on smart home technologies, including electric vehicles. New regulatory frameworks are beginning to be developed to ensure consumers, and the grid, are protected from cybersecurity attacks, and

ready for a more decentralised and flexible system. This is leading to new products from energy suppliers, like energy bundles, which include smart charging tariffs. This will be confusing for consumers and consumer empowerment is crucial to ensure that they can feel confident moving towards electrified transport and really benefit from it from a home energy management perspective.

Energy suppliers are already offering increasingly diverse smart charging tariff options for home EV charging. SMMT strongly supports market mechanisms like this being deployed, as they offer a real benefit to drivers and the grid. The government should incentivise the rollout and development of these kinds of tariffs by ensuring open access data sharing between suppliers and charge point operators and third-party service providers through secure channels.

There should also be work undertaken to make public charging infrastructure, including rapid charging hubs, more visible to consumers. Where possible, high visibility signage should be encouraged (perhaps for a limited number of years) to allay consumer doubts about charger availability.[29] This should be done for all public charging locations, including slower on-street charging and motorway service areas.

There should be a government-backed, single source of information on EVs, EV charging and specifically smart energy – like the previous Go Ultra Low campaign to educate and inform the public of these relatively new technologies and innovation in electricity markets. It could also bring together information from energy suppliers on how new smart EV tariffs work, and the benefits of BEVs. This should engage with local authorities and distribute guidance on the installation of different points, share best practices and act as a conduit for stakeholders in this area. Local authorities have different processes for engaging their residents and applying for funding for charging infrastructure, which can be frustrating for the public to engage with. A national campaign could help align certain processes, supporting local authorities in their journey to becoming electric vehicle charging infrastructure owners.

This campaign should also engage energy suppliers, EV charging providers and vehicle dealers to be better informed both about the vehicle capabilities and smart tariff opportunities to support and educate customers on the potential benefits of BEV ownership which would otherwise require considerable research.

Recommendations

- Automotive industrial sites, such as battery manufacturing plants, should be prioritised in the planning system and designated as critical national infrastructure.

- The government should support the development of a secure, flexible smart tariff market for consumers, helping them to reduce costs when charging their vehicles.

- Bring the public along on the journey by making public charging more visible to the public, including rapid hubs through changes to signage regulations along motorways.

- There should be a government-backed, single source of information on EVs and specifically on EV charging and smart energy tariffs – similar to the previous Go Ultra Low campaign.

6 - CONCLUSIONS

The relationship between the electricity sector and the automotive sector is increasingly symbiotic. Given the importance of automotive to the economy and to the UK meeting its carbon emissions targets, the needs of the sector must be designed into grid arrangements, both in terms of industrial and consumer applications. Consumer needs must be central to a modern electricity system, with clear and transparent tariff options, and easy to engage with services that can utilise and enable the many benefits that electrified vehicles can bring. Automotive is keen to work with all stakeholders to ensure that this outcome is achieved, and that electrified vehicles can enable, as well as benefit from, a zero-carbon grid.

By working together, the experts in the electricity and automotive industries can not only solve the challenges of decarbonisation but create a system that enables consumers to benefit from it in multiple different ways. This is the ambition of UK automotive, but it can only be achieved if the government takes our industry's role seriously in shaping these outcomes and sees the industry as a key delivery partner.

SMMT
DRIVING THE
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