

National Assembly for Wales Economy, Infrastructure and Skills Committee inquiry 'Electric Vehicle Charging in Wales', evidence from National Grid

Executive Summary

- 1.1 The UK needs to speed up its preparations for the uptake of electric vehicles. As prices fall and range increases, the take up of electric vehicles could accelerate rapidly. However, a key reason for not purchasing an EV is 'range anxiety'. This is consumers' anxiety that they will run out of charge in their car due to a lack of charging points, the time taken to charge and the limited distance you can travel on a full charge.
- 1.2 Consumers will only switch to EVs if there are widespread charging points, which are easily accessible, and can charge at appropriate speed. As set out in the National Infrastructure Assessment, the most convenient and cost-effective way to address 'range anxiety' would be to locate ultra-rapid (up to 350kW) charging infrastructure at existing Motorway Service Areas (MSAs).
- 1.3 To make the most of the opportunity to improve air quality, reduce emissions and develop one of the best electric vehicle infrastructure networks in the world, government needs to provide the right environment to support and encourage the switch to electric vehicles. With the right conditions, including a national network of electric vehicle charge points, the UK could become a global leader in electric vehicles.
- 1.4 As the owner and operator of the Electricity Transmission network in England and Wales, National Grid are planning for the impact of mass adoption of electric vehicles. We have spoken to a range of equipment manufacturers, MSA's owners, EV charging providers, industry experts and analysts to understand future infrastructure requirements. We are exploring how we can best support a backbone of charging points at the UK's MSAs, and exploring the practical steps that will need to be taken to realise the benefits and opportunities from transport decarbonisation.
- 1.5 Under any likely scenario of EV uptake, most MSAs will require a reinforced power connection to allow for the additional numbers of charge points needed. We have identified 54 MSA charging locations across the strategic motorway network in England and Wales, which once delivered would allow 99% of drivers to be within 50 miles of an ultra-rapid charging station with the ability to charge a vehicle in the time it takes to buy a cup of coffee.
- 1.6 While hundreds of millions of pounds of investment has already been made into the UK charging infrastructure sector, by their nature MSAs tend to be in rural areas. A market led approach will result in an unequal distribution of chargers across the UK, with many rural areas likely to be left with insufficient capacity required for their electric vehicle charging needs. To make the most of the opportunity to improve air quality, reduce emissions and develop one of the best electric vehicle infrastructure networks in the world, the government needs to provide the right environment to support and encourage the switch to electric vehicles.
- 1.7 If the government truly want to encourage and leverage private sector investment to build and operate a thriving, self-sustaining public network, we believe a targeted investment approach, coupled with a proactive strategy to planning network connections, is needed. The Government should designate which MSA sites should be part of a new core network of ultra-rapid chargers by the end of the 2018/19 to ensure EV targets are achieved.

How does the infrastructure need to develop to support an increase in EVs on our roads?

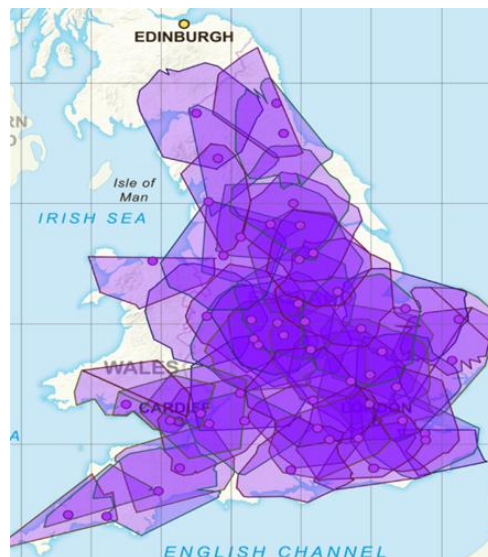
- 2.1 Consumers will only switch to EVs if charging points are widespread, easily accessible, able to charge at appropriate speed and compatible with a range of vehicle models. The availability of charging infrastructure could significantly delay the speed of electric vehicle adoption and materially impact the ability to hit government carbon targets.
- 2.2 While charging at home will be a convenient option for some, around 40% of households do not have access to off street parking and therefore millions of vehicles will still require adequate facilities to charge. A comprehensive network of car chargers, at appropriate speeds to suit the time spent at each location, will be vital to ensure we are ready for EV uptake. In addition to home, destination, local fast and fleet charging, a network of chargers along the strategic motorway network will be needed.
- 2.3 A recent AA survey¹ found that 79% of members surveyed, who do not yet own an EV, were concerned by the lack of rapid charging points on motorways for long distance journeys. Approximately 90% of MSAs do already have some chargers on site. However, while these are often described as 'fast' they are usually 50kw chargers,

¹ [AA June 2018 Survey](#)

which can take more than an hour to suitably charge a vehicle. Where there are 'rapid' chargers (~10% of sites) they are often incompatible for most vehicles.

- 2.4 While the government is encouraging the switch to EVs through funding programmes for local infrastructure, there is currently little funding support for ultra-rapid charging along the motorway network. We agree with the National Infrastructure Commission that the most convenient and cost-effective way to address 'range anxiety' would be to locate ultra-rapid charging infrastructure, suitable for any vehicle model, at existing MSAs, with the ability to charge a vehicle in the time it takes to buy a cup of coffee.
- 2.5 To address consumer needs around charging on longer journeys, a network of ultra-rapid chargers will be required at key sites along the motorway network. We have been reviewing the power capacity at these sites and the synergy with our transmission network, identifying that approximately 60% of the 165 MSA sites in England and Wales are within 5km of our existing high voltage electricity network infrastructure, with most requiring a reinforced power connection before 2030 to ensure they can facilitate the additional numbers of faster charge points.
- 2.6 We have identified 54 strategic MSA sites where an upgraded electricity network connection would allow 99% of drivers in England and Wales to be within 50 miles of an ultra-rapid charging station, as shown in Fig.1. This will enable people to charge their vehicles rapidly (5-12 mins) and drive further, accelerating the shift to EVs.

Fig 1. Map showing the potential 99% coverage, in England and Wales, if the 54 strategic sites were delivered.



- 2.7 When reinforcing power connections to MSAs, it will be important to ensure that the upgrade has the capacity to cope with future EV growth. An upgraded transmission connection is likely to be the most economic and efficient option at many of the sites, there are sites identified where there is enough existing capacity and the connection costs are likely to be lower to upgrade the distribution network.

How can the Welsh Government, private sector and third sector work together to develop EV charging infrastructure?

- 3.1 While hundreds of millions of pounds of investment has already been made into the UK charging infrastructure sector, without some targeted intervention in specific areas, such as MSAs, to unlock the market, there is considerable risk the roll-out will not happen fast enough, or with sufficient capacity to be able to scale up to meet the needs of the future number of cars that will require charging. A national core network of ultra-rapid EV chargers needs to be delivered by 2025, the time at which vehicle cost parity is reached, to ensure infrastructure is not the remaining barrier to consumer EV uptake.
- 3.2 By their nature however MSAs tend to be in rural areas. These locations can often be expensive to provide the additional electrical capacity required to meet future EV demand, with some sites also initially having low utilisation and hence attract low returns, in the early years, for investors. While it is feasible for the market to deliver the low cost, high utilisation MSAs these will not to be delivered within the timescales required to ensure consumer uptake of EVs. A market only led approach will likely result in an unequal distribution of chargers

across the UK, with many rural areas likely to be left with insufficient capacity required for their electric vehicle charging needs.

- 3.3 We believe the Welsh Government should focus their public-sector funding support in areas that best facilitate the adoption of EVs, assists the industry with gaining mass market appeal, and which helps to unlock private investment. National Grid supports the National Infrastructure Commission's recommendation for investment in a national core network of rapid EV charge points to be delivered by the time at which vehicle cost parity is reached². The National Infrastructure assessment also recommended that government should subsidise, by 2022, the provision of rapid charge points in rural and remote areas, where the market will not deliver in the short term, which we support.
- 3.4 We commend the foundational investment of £2million funding secured as part of the two-year Budget agreement, which will be used to help create a publicly accessible national network of rapid charging points by 2020. We also support the drive for further investment in this field.
- 3.5 A key aim of National Grid's proposal is to serve UK consumers universally and we would emphasise the importance of learning from the mistakes of mobile phone and broadband rollout, which remains incomplete. Those communities already facing inadequate mobile and broadband coverage could also be underserved by EV infrastructure if investment is not made now, which may result in the need for more government intervention at a later stage. The roll-out of broadband and mobile coverage provides important learnings around the need for Government intervention and the role of the market in delivering basic utility needs for UK consumers. Today, we are seeing communities resort to seeking further financing and organising their own ultra-fast broadband upgrades to bring them up to the standard found in urban areas. We need to apply the lessons learnt from other infrastructure programmes for EV charge points.
- 3.6 If the Government truly want to encourage and leverage private sector investment to build and operate a thriving, self-sustaining public network, we believe a targeted investment approach, coupled with a proactive strategy to planning network connections, is needed. The Government should designate which MSA sites should be part of a new core network of ultra-rapid chargers by the end of the 2018/19 to ensure EV targets are achieved.

² ['Revolutionising Road Transport', in National Infrastructure Assessment](#), National Infrastructure Commission (July 2018)