

Bright Blue's report is examining the demand and supply side constraints to EV uptake and putting forward new policies to catalyse and mature the market for EVs in the UK.

All submissions should be sent to Patrick Hall (patrick@brightblue.org.uk) by Friday 7th August, 2020 at 18:00. Respondents should not feel obligated to answer every question – only the ones relevant to their field of expertise. The key questions that we would like submissions for written evidence to answer are as follows:

How important is fully electrifying private transport to achieving net-zero by 2050?

As the CCC highlights in its Net Zero Technical Report, a 2040 phase out date would leave “around 9.8 million petrol, diesel and plug-in hybrid vehicles on the road”¹ in 2050, highlighting the importance of bringing forward the phase out date.

In the Net Zero report², the CCC notes that 2035 is the latest date by which this phase out should happen to ensure that the entire light-duty fleet consists of ultra-low GHG emissions vehicles by 2050. The CCC also noted however that an earlier date would be preferable, and if feasible as early as 2030, to achieve lower financial costs, lower cumulative CO₂ emissions and lead to better air quality. In their latest annual report to Parliament³, the CCC has further tighten their recommendation, and called for a 2032 phase out at the latest, or earlier.

This CCC report views on ICEs aligns with Shell's own Sky Scenarios work. Shell's Sky Scenarios⁴ represent a challenging but technically and economically possible pathway for the world to achieve the temperature goal of the Paris Agreement. Under this scenario, 100% of new car sales in Western Europe need to be electric by 2030.

What are the key demand-side constraints to the uptake of EVs?

At present, significant barriers to a larger scale adoption of EVs still exist from both a supply and demand perspective. From a consumer's perspective, the most pressing barriers to the adoption of EVs are upfront cost, as well as speed and availability of charging infrastructure.

A survey recently undertaken with Shell Energy Retail customers⁵ showed that 70% are now consider buying an EV as their next car. However, this enthusiasm for an EV is also tempered by concerns,

¹ p148, <https://www.theccc.org.uk/publication/net-zero-technical-report/>

² p178, <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf>

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<https://www.theccc.org.uk/2020/06/25/covid-19-can-be-an-historic-turning-point-in-tackling-the-global-climate-crisis/>

⁴ <https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/shell-scenario-sky.html>

Scenarios are a part of an ongoing process used in Shell Group for over 40 years to challenge executives' perspectives on the future business environment. They are designed to stretch management to consider even events that may only be remotely possible. Scenarios, therefore, are not intended to be predictions of likely future events or outcomes.

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<https://www.shellenergy.co.uk/about-us/media-centre/press-releases/uk-reaches-electric-vehicle-tipping-point>

which were raised by 80% of the respondents. More than half (59%) worry that it takes too long to charge, and 62% said higher electricity bills are a concern.

The fast technology development in the vehicle and battery sectors which is resulting in more competitive cost, and wide deployment of charging infrastructure could gradually address some of these barriers, if adequately supported by Government's policies and support schemes as outlined later in this response.

What are the key supply-side constraints to the uptake of EVs?

A suitable network of EV charging infrastructure needs to be developed as the number of EVs grows, to ensure that customers can charge their vehicles without disrupting their journeys. Unlike conventional vehicles, which rely on petrol stations to refuel, EVs can recharge at a variety of locations and, depending on where they charge, consumer's needs vary. When EV drivers need to stop to charge during a journey, they will need the vehicle to recharge much faster than when it is parked at home or at work. Access to a choice of recharging options that meet the diverse needs of consumers include smart-charging technology, most suitable for charging overnight at home, or during working hours when the vehicle can be plugged in for longer. Consumers also need access to high-powered rapid chargers, designed for when drivers need to get on their way to their destination quickly.

One of the key factors determining the business case for EV charging infrastructure is utilisation. As the number of users increases so does utilisation, improving the business case and providing the confidence for operators to invest in rolling out more chargepoints. As such while Government support for EV charging infrastructure is important, the key for charging infrastructure lies in the wide scale deployment of EVs.

The UK's EV charging infrastructure is continuously expanding. The private sector has shown its willingness to invest in charging infrastructure as a result of which the UK now has over 30,000 public charging points across more than 11,000 locations, including over 7,500 rapid charging connectors across more than 2,000 locations⁶.

Government intervention into the EV charging sector should focus on locations where commercial provision is not currently viable. This include primarily rapid charging.

Shell welcomes the Government's commitment to develop a nation-wide rapid charging infrastructure network. It was encouraging to see the announcement of £500m in the March 2020 Budget to support the connection cost for rapid chargers in England, as well as the direction set in the Government's vision for an EV rapid charging network announced on May 14. We look forward to seeing further details and support this development.

Another key factor currently impacting the business case for EV charging deployment is the power connection process. When installing EV charging infrastructure, the required grid connection upgrades can be extremely complex, both technically and administratively. Simplifying these processes will be important to accelerate the pace of change and therefore need the Government and the regulator's attention. Immediate improvements that could be made include a standardised and consistent connection process across Distribution Network Operators (DNOs) and a reduction in

⁶ <https://www.zap-map.com/statistics/>

the length of substation lease duration (from 99 years), which is at odds with industry standards. The DNOs and the Energy Networks Association have shown their willingness to engage with industry to improve these processes; however, it is likely that more sweeping changes are needed from Ofgem to streamline the grid connection process and enable DNOs to invest ahead of need, where appropriate, to remove bottlenecks.

In addition to the complexity of grid connection processes, some site-specific upgrades can be prohibitively expensive, costing many times the value of the chargers installed. In Shell's experience, this typically ranges from £150k up to £2m to install two 150kw chargers.

Where grid upgrade costs are too high for the private sector to deliver and still make a return, Government partnering will be important. Shell welcomes the announcement that the £500m fund for rapid charging infrastructure will also address connection costs.

Finally, from an energy supply side, power systems (the network of generation, transmission and distribution), will have to be improved to supply the additional electricity required to charge an increasing number of EVs. Over the course of the next decade, ensuring that the energy system is able to meet the increased electricity demand from EVs electric vehicles will be key. This is further developed below.

What types of policy interventions are required to catalyse the EV market?

What are the policy recommendations that would help mature the EV market?

Phasing out the sales of new, light duty ICE by 2030 will only be possible with the development of a comprehensive policy framework. Consistent and consistent support from Government across the different sectors could help to create optimal business environments for car manufacturers, power sector participants, and EV charging providers. Simultaneously, consumers are expected to need stronger incentives that drive longer term confidence and encourage the use of EVs.

Progress in EV technology and infrastructure is crucial to continued growth in EV use. Shell believes that policy support should focus on the system (vehicles, power and infrastructure) and on meeting consumer needs.

Support for EVs

In order to meet a light-duty ICE sales phase out in 2030, the CO2 emissions standards for these vehicles should be progressively tightened over the coming decade and set to zero in 2030. This would provide an appropriate trajectory to ensure the UK is on track to a full phase out date, and to ensure car manufacturers produce sufficient quantities of EVs for the UK market. These standards need to align with the UK's net zero trajectory and be achievable with multi-year targets and realistic implementation.

From a demand side perspective, the Plug-in Car Grant has been one of the most important incentive measures for consumer uptake of EVs. It was encouraging to see its extension until 2022. To build the longer-term confidence and predictability needed to 2030, the Government should further extend these grants, and set a clear timetable for a gradual reduction in grant levels. This grant should be replaced over the longer-term with an incentive scheme to strengthen the appeal of EVs, through better coordinated taxation and road use charges.

Fuel duty and vehicle excise duty (VED) are also important policy levers to deliver decarbonisation of transport could be adjusted to effectively support consumers in switching to EVs. Linking the duty rates to the carbon content of the fuel would help incentivise the switching to lower carbon fuels. Changing the fuel duty to a carbon basis could be combined with a change to the VED, currently paid on an annual basis. By linking the level of taxation to the number of miles and weight driven per year, the Government would create a further mechanism to switch road transport to cleaner forms of travel.

The Government has further opportunity to incentivise low-carbon transport by revisiting the impact of the current VAT rates applied to users of charging stations for EVs. Currently the classification of EV charging station use is not clear in the UK. There is the option for the UK Government to make it clear that firstly the EV charging can fall under the *de minimis* thresholds for the supply of electricity and therefore subject to VAT at the reduced rate of 5% and secondly that climate change levy (CCL) is also not applicable under the same *de minimis* test. This will provide a clear VAT benefit as compared to fuels for ICE car users where standard rated VAT of 20% would be applicable.

Driving consumer's confidence

As already mentioned, driving consumers' confidence is one of the most important elements to building demand for EVs. Consumers need to feel confident they can travel to their destination in an EV and informed on their options. The EV Energy Taskforce report⁷ published earlier this year demonstrated how EVs can be effectively integrated with the energy system and how this can be done in a way that ensures the needs of the consumer are met.

Having confident and informed drivers will require clear information about the publicly accessible charging network. Consumers need access to a wide and reliable EV charging network, but they also need easily accessible and updated information about where to charge, local charging points capacity and whether those chargers are functioning.

Charging an EV has to be simple, straightforward and convenient, wherever drivers are. They need to easily be able to find, access and pay for charging at home, at work and while travelling, with minimal extra effort. Interoperability is a key aspect of EV charging that directly impacts the consumer. Ideally, this means that drivers can charge their car at any publicly available charge point, and that they are also charged for the electricity they use in a transparent and fair way.

Government should ensure the principles of interoperability and roaming are met as the UK develops a public network of EV charging. Government funding for rapid charging, as well as on-street charging should only be allocated to fund infrastructure that is available to any consumer on a non-discriminatory basis. In addition, funding should be contingent on allowing all consumers to charge their vehicle, regardless of the equipment used or charge point owner.

Finally, the adoption of smart charging technologies for certain charging options, such as home, offices and longer duration destination charging options, will also ensure that energy can be provided at the lowest cost to the consumer.

Support for EV charging infrastructure

The development of an appropriate and reliable, publicly accessible EV charging infrastructure network is critical to ensure consumer's confidence in EVs. As noted, it is expected that most EV

⁷ <https://www.lowcvp.org.uk/projects/electric-vehicle-energy-taskforce.htm>

charging will happen when the vehicle is parked, at home overnight or during office hours. However, public EV charging will need to continue to grow to meet charging needs while on the go, during longer journeys, and for drivers who don't have access to private charging.

Government support for EV charging infrastructure should consider the need to rapidly grow the network and provide the scale needed for a mass adoption of EVs. To this end, funding should be allocated to projects that can deliver multiple charging posts and develop infrastructure at scale.

Government support for the EV charging sector should focus on locations where commercial provision is not currently viable. This includes primarily rapid chargers. Shell looks forward to supporting the development of a nationwide rapid charging infrastructure. In order for this charging option to benefit as many consumers as possible, funding allocated as part of the Rapid Charging Fund should be made available for charging at locations adjacent to the strategic road network, and not only to Motorway Service Areas (MSAs). Going forward, Shell would also encourage Government to expand funding for rapid charging to other locations, beyond the strategic road network. This can include service stations in different locations which could also become an important rapid charging destination, as well other charging destinations such as supermarkets. Funding support for grid connection upgrades could be key to derisk investment when installing charge points in these locations too.

Finally, we urge Government to take action to address the administrative barriers EV charging installers face regarding power upgrade connection processes. Funding support and a simplified standardised connection process across DNOs would facilitate and accelerate the infrastructure development.

Flexible power markets and smart charging

Balancing supply and demand and ensuring the power networks are able to cope with mass EV adoption requires a smart, flexible energy system. Energy UK's paper, 'Delivering on the Potential for Flexibility'⁸ outlines an industry consensus on what needs to happen to create flexible markets, which is expected to be essential in meeting any phase out target. This includes:

- Appropriate, clear, and stable market mechanisms;
- Regulated monopolies, such as DNOs, being barred from participating in ancillary service markets, just as they are from power markets. This should include an exclusion from managing EV charging services;
- A renewed plan on how to deliver a smart, flexible energy system.

As previously noted, the deployment of smart charging technologies is a key factor for the sustainable growth of EV uptake. It is therefore essential that Government commits to a consumer-centric, market-based approach to smart charging to ensure that providers are given the freedom to innovate and come up with compelling, easy to use options for their customers. Mandating a single solution for smart charging is ill-advised. Instead, setting outcome-based requirements are expected to help balance cyber security and grid protection risks, while meeting innovation and consumer uptake objectives.

⁸ https://www.energy-uk.org.uk/publication.html?task=file_download&id=7421

