Department for Transport & Office for Low Emissions Vehicles Consultation on ending the sale of new petrol, diesel and hybrid cars and vans
July 2020

Shell U.K. Limited (Shell) welcomes the opportunity to respond to the Consultation on ending the sale of new petrol, diesel and hybrid cars and vans. Shell's position outlined below has been structured in line with the consultation questions.

Shell fully supports the UK's net zero ambition and recognises the requirement to reduce oil and gas consumption to meet it. Different fuel and vehicle technologies will be needed to meet demand for transport, while reducing air pollutant and greenhouse gas emissions. This includes more efficient fuels and lubricants, as well as cleaner and lower-carbon alternative fuels, such as biofuels, battery electric vehicles, hydrogen and paraffinic fuels. Shell is active in the development of all these fuels and technologies for the transport sector.

In the UK, Shell is already providing charging solutions for drivers at homes, workplaces and growing numbers of Shell forecourts. In 2017, we launched Shell Recharge, Shell's on-forecourt EV charging service, with over 70 EV charge posts available at Shell forecourts across the UK. Our ambition is to reach 200 charge posts (both 50 and 150kW) on retail sites across the UK by the end of 2021, and to continue to grow the network after that. Shell Recharge points are supplied by 100% certified renewable electricity sources. Through NewMotion[1], wholly owned subsidiary of the Shell Group[2], Shell is also developing more flexible solutions for EV drivers in the UK, including for homes and offices.

Shell supports the Government's increased ambition in the deployment of electric vehicles (EVs) in the UK, and believes that the phase out date for sales of new ICE in the light duty vehicle segment could be brought forward to 2030. Setting a date for phase out of new ICE sales in this segment will provide the market with policy certainty and allow it to increase the current pace of EV growth which must rapidly accelerate to ensure enough progress is made in transport decarbonisation to meet the UK's 2050 net zero goal.

Setting a date for any ICE sale phase out must also be supported with a robust and comprehensive package of enabling policy measures to ensure industry and businesses can prepare to deliver the necessary power and infrastructure needed to support fully electrification of light duty vehicles. Strong incentives are equally needed to help consumers to choose EVs. So while setting a date for the phase out sales of new ICE-powered light duty vehicles is an important first step and sends a strong signal, it will only deliver the ambition of passenger car decarbonisation through a robust plan to make the transition fair and deliverable.

Shell believes that the enabling policy support should focus on the system (vehicles, power and infrastructure) and on meeting customer needs. These include:

[1] The New Motion EVSE Limited.
[2] Shell Group refers to Royal Dutch Shell plc and its subsidiaries. The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities.

- vehicle CO2 standards set to a trajectory of zero by 2030 so that EVs continue to be delivered and also so that car manufacturers still have a driver to increase ICE efficiency through 2030;
- Continue time-limited policy support for purchase of EVs and, longer term, the development of a fiscal system, e.g. vehicle and road tax, that drives road transport decarbonisation;
- Continued support for sustainable biofuels to further decarbonise the ICE fleet which will continue using liquid fuels. Biofuels will continue to play an important role in reducing emissions from road transport through 2030 and for those ICE vehicles remaining on the roads after this time;
- Support for EV charging infrastructure, focused on the installation of charging points where commercial provision is not currently viable, e.g. rapid charging;
- Support appropriate measures to enable the development of open, competitive markets for the flexible load and capacity offered by EVs including the wide deployment of smart charging technologies to meet increasing demand at lowest possible cost;
- Build consumer confidence on EVs, ensuring they are well informed about EV charging at every stage of the consumer journey. Consumers need reliable and updated information about where to charge. Charging and payment has to be easy, accessible and customers must be charged in a transparent and fair way.

As the UK starts to consider the potential longer-term damage to the economy from the COVID-19 pandemic, the development of a solid and comprehensive package to support an effective and gradual adoption of EVs represents an opportunity to direct resources, public and private, to support both economic recovery and energy transition. In the absence of a focused effort, economic recovery measures could prolong the use of existing technologies and behaviours, potentially losing years in an already challenging time frame for meeting the UK's net zero target and increase the economic and social cost of delayed action on climate change.

Wide access to a reliable charging network will be critical to have more drivers choose an EV. Bringing forward investments in EV infrastructure could create demand and jobs while also enabling the faster take-up of EVs. Simultaneously, public incentives are still needed so EVs can become a more attractive and affordable vehicle option for consumers.

The phase out date

Shell supports the Government's increased ambition in the deployment of EVs in the UK light duty vehicle segment, and believes that the phase out date could be brought forward to 2030. Setting a date for phase out of new ICE sales in this segment will provide the market with policy certainty and allow it to increase the e current pace of EV growth, which must rapidly accelerate to ensure enough progress is made in transport decarbonisation to meet the UK's 2050 net zero goal.

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"[3] in 2050, highlighting the importance of bringing forward the phase out date.

In the Net Zero report[4], 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 CO_2 emissions and lead to better air quality. In their latest annual report to Parliament[5], 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 Scenarios[6] 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.

While meeting a 2030 target will be challenging, Shell strongly believes that the right policy framework is what is required to make it happen. Urgent action is required to achieve the UK's net zero target and contribute to global efforts to meet the Paris agreement commitments made in 2015. As highlighted in the Transport Decarbonisation Plan (figure 18), there still is a significant policy gap in the transport sector in the UK[7].

The definition of what should be phased out

To meet the UK's net zero target, all light duty mileage ultimately needs to be zero emission. Shell does not have a decisive view on the date by which plug-in hybrids (PHEVs) should be phased-out but considers that factors such as real-life use emissions and availability of EVs for all vehicle segments should be considered when determining a date. Clarity with regards to the phase out of PHEVs should be provided as early as possible, so the auto industry, businesses and consumers have the longer-term visibility needed to prepare and plan accordingly.

Shell believes PHEVs, combining electric and conventional propulsion, may have a role to play as a transitional technology to full EVs. PHEVs technology can help reduce CO_2 and improve air quality as long as they are plugged in and used in the electric, zero emissions mode. In recent years, EVs and PHEVs technology has continued to develop and improve, with new models being brought to market

[3] p148, https://www.theccc.org.uk/publication/net-zero-technical-report/
[4] p178, https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf
[5] https://www.theccc.org.uk/2020/06/25/covid-19-can-be-an-historic-turning-point-in-tackling-the-global-climate-crisis/
[6] 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.

[7] p56 https://www.gov.uk/government/publications/creating-the-transport-decarbonisation-plan

and a number of promising commitments from car manufacturers. However, analysis of fuel consumption values of PHEVs demonstrates that there can be great discrepancy between standardized driving cycles emissions and real-life consumption[8].

When considering the appropriate phase-out date for PHEVs, the Government should carefully consider which incentives will continue to support the delivery of the most efficient technologies; as well as realistic levers to ensure these vehicles are frequently plugged-in and operated in zero emission mode as much as possible. PHEVs could, for example, also be limited to certain use cases, where the incentive to plug in exists, and to certain vehicle segments. PHEV drivers would then get more accustomed to driving in zero emission mode and recharging, and therefore helping pave the way for full battery EV adoption.

Barriers to achieving large scale adoption 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 customers[9] showed that 70% are now consider buying an EV as their next car. However, this enthusiasm for an EV is also tempered by concerns, 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.

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

[8] Empirical Fuel Consumption and CO2 Emissions of Plug-In Hybrid Electric Vehicles; Patrick Plotz, Simon Arpad Funke and Patrick Jochem, Journal of Industrial Ecology, 2017

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

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 locations[10].

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 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.

[10] https://www.zap-map.com/statistics/

The impact of these ambitions on different sectors of industry and society

As the numbers of EVs grow, the power system must be able to develop and adapt to cope with the additional demand to charge these vehicles, and install the required capacity (generation, distribution and flexible assets) to support a phase out date for sales of new ICE in the light duty vehicle segment by 2030.

Analysis developed by Imperial College London and Vivid Economics for the CCC on accelerated electrification and the electricity system[11] concluded that grid upgrades in the 2020s should be able to accommodate future uptake of EVs. The analysis includes up to 24 million EVs by 2030, and 37 million by 2035. The report notes that, with smart charging, rapid EV uptake increases peak demand in 2035 by 7GW, annual generation by 37TWh and requires 20GW of additional installed capacity compared to the 2035 central scenario.

This report also highlights that, providing that smart charging is in place, the power sector will be able to meet electricity demand for a rapid EV uptake. The role of smart charging is further reinforced in National Grid's Future Energy Scenarios where smart charging could nearly halve EV peak demand in 2030, with vehicle-to-grid technology potentially reducing EV peak demand even further[12].

These studies demonstrate that, with a sufficiently ambitious policy the UK energy system can generate, transmit, distribute and supply the electricity needed to support the transition to EVs.

The continued innovation of open, competitive flexibility markets to enable development of different demand side response products, including those utilising smart charging could also allow to meet increasing demand at the least cost. Smart charging technologies will help to ensure the smooth integration of EVs into the power system. These technologies allow the charging of an EV to be intelligently controlled, with respect to the price of electricity, the system's carbon intensity or the availability of system capacity. By using smart charging to shift EV charging loads from peak times, the overall network capacity required is reduced. This in turn reduces the investment required in new grid infrastructure, creating a lower cost system and ultimately reducing costs to consumers.

As the transition to EVs accelerates in the passenger and light commercial vehicles sector, fuel demand from these sectors is expected to decline. As already noted, it will be important to continue to address CO_2 emission from the ICE vehicles that will remain on the roads following the start of a phase out of new ICE sales in the light duty vehicle segment. Biofuels will continue to play an important role in decarbonising road transport. This is not only to continue reducing emissions from the legacy light-duty fleet, but also to reduce emissions from heavy goods vehicles, which will rely on the use of liquid fuels for longer.

What measures are required by government and others to achieve the earlier phase out date

Phasing out the sales of new, light duty ICE by 2030 will only be possible with the development of a comprehensive policy framework. Considered and consistent support from Government across the

[11] https://www.theccc.org.uk/publication/accelerated-electrification-and-the-gb-electricity-system/
[12] http://fes.nationalgrid.com/fes-document/

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 report[13] published earlier this year

[13] https://www.lowcvp.org.uk/projects/electric-vehicle-energy-taskforce.htm

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 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'[14] 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.

[14] https://www.energy-uk.org.uk/publication.html?task=file.download&id=7421