



Department for Business, Energy & Industrial Strategy and Ofgem: A Smart, Flexible Energy System – Call for Evidence.
Written Response by Shell UK
January 2017

Shell U.K. Limited (“Shell”) appreciates the opportunity to respond to the Government’s consultation on developing a smart, flexible energy system.

Shell’s response and evidence is underpinned by our experience of smart charging electric vehicles through an extensive Shell led trial during 2013-2015 in the UK as well as participating in numerous demand side response (DSR) markets with electric vehicle (“EV”) charging flexibility. Our UK pilot consisted of electric vehicles operated by businesses and was complemented by similar pilots operated by Shell companies in California – USA (Equilon Enterprises/Shell Oil Products US) and Germany (Shell Deutschland Oil), which in turn enabled us to participate in both a wide variety of demand response markets, as well as the wholesale energy markets. Whilst Shell itself is an electricity trader, for the purposes of our EV smart charging trials we have worked with third party energy suppliers, independent aggregators and UK Power Networks to access DSR and wholesale markets. Should the Government wish to learn more about Shell’s smart EV charging pilots, we would be happy to provide some further background.

Shell’s responses to this consultation are therefore framed with this innovative experience in mind and with the particular lens of what it would take to encourage industry players such as ourselves to continue and expand our efforts on using EVs as DSR assets.

Key points for consideration by the Government regarding how EVs can be used as DSR assets and how barriers can be overcome include the following:

- Whilst Shell recognises the Government’s recent efforts to increase the level of DSR procured e.g. in Capacity Market auctions, it should be recognised that this is still a fraction of the potential which exists today, before even considering the potential future growth.
- For the demand side market to emerge there needs to be sufficient value in the chain for each player involved i.e. customers, aggregators and grid operators.
- Consumers need to have a financial incentive not only to change their consumption behaviour from today, but also to allow third parties access in order to influence that behaviour. This is needed for both residential and business customer types. The income available from DSR today – even if stacked – is generally insufficient to be able to both deliver that incentive and equally cover the costs and deliver a reasonable return to new players in the energy chain.
- The natural absence of volume and scale at this early stage of market evolution means that with the cost of delivery at the consumer level - and particularly EV - DSR is the potential blocker to further market growth. To address this, the market framework should carefully balance the need for:
 - o Obligation on the grid operator(s) to purchase an increasing share of DSR across both capacity and balancing markets. This should give aggregators or energy



suppliers in this early stage market sufficient confidence there will be demand from the grid to facilitate continued business innovation.

- Fit for purpose regulation. Shell's experience in the EV smart charging sector has shown that the cost of meeting regulatory requirements can be prohibitive. An example of this is having to demonstrate an exact response to a balancing market signal at an individual EV asset level (delivering <10kWh response). This requires significant communications investment which far outweighs the benefit associated with market participation. Monitoring, reporting and control at a higher level of aggregated assets or at the level of the aggregator themselves (depending on volume procured) should be sufficient.
- Penalty mechanisms appropriate for the DSR asset class – and potentially per DSR asset class. Again, monitoring and delivery at the right level in the aggregation chain will ensure that insignificant 'delivery misses' are not penalised in the same way as large supply side balancing resources.
- EVs are different to a standard set of consumer smart grid assets. EV charging load will occur during the evening ramp and represents a *significant* increase in the total demand from a residential household. EVs, unlike other traditional consumer DSR assets, are clearly also mobile i.e. they may appear on the system at different locations and equally may not be at a defined point when expected. The combination of both of these effects means that unless there are sufficient incentives and fit for purpose regulation recognising the uniqueness of the asset, the impact on the grid will be significant – particularly at a local grid level.
- Distribution Network Operators ("DNOs") should therefore also be encouraged to procure local DSR load via the establishment of their own Demand Response ("DR") programmes. Regulation of DSR should also not preclude the right for asset classes such as EVs to bid into both System Operator ("SO") (i.e. National Grid) and DNO programmes in order to increase the overall value stack and hence address some of the early stage business model challenges highlighted above.
- A broader set of DSR programmes covering for example shorter time windows and nearer to delivery date (i.e. avoiding a 10 day lead time between bid and delivery typical with markets such as Short Term Operating Reserves (STOR) should also be established specifically for the smaller distributed energy resource classes. This would be beneficial in early market development where the need to cover large time windows can be prohibitive to smaller, flexible loads.
- There are two key segments which should specifically be addressed in the use of EVs as smart grid assets:
 - Daytime charging of EVs at workplaces and other long dwell time location e.g. car parks. These are locations where vehicles can be plugged in for far longer than the amount of charge required and hence can contribute to shifting the evening peak/ramp, encouraging the consumption of excessive daytime renewables as well as being available as DSR resources. To obtain this benefit for a smart energy system, there needs to be both sufficient incentive for such locations to install charging infrastructure as well as an automatic regulatory obligation to use such assets for critical DSR events.



- o **Business vehicle fleets.** Again, the profile of charging of these types of electric vehicles offers flexibility in terms of when to charge, offering both local and national DSR opportunities. The lack of appropriate incentives for businesses to install (currently more expensive) smart connected chargers is a key barrier to the expansion of these customers as a grid resource.

Shell looks forward to continuing to work with the Government to address the above points and would welcome the opportunity to collaborate on pilot projects which would help to advance the use of EVs as resources in a smart, flexible energy system.

If you have any queries regarding this submission, please contact:

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