Response to Ofgem Significant Code Review

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Overview

Ofgem state in the introduction to the consultation that they welcome responses from users of the network who this proposal may affect as well as the public.

I believe that I am a member of the public who may be affected by these proposals, so this is a personal response to the significant code review submitted from a householder's point of view.

Personal Background

I installed a 4.7kWp solar system and air source heat pump on a new well insulated house in 2011. This system benefitted from the Feed in Tariff (FiT). Though at that time I could not prove it, it is fairly clear that the majority of this solar generation was exported. In 2015 I installed a dumb EV charge point for a new PHEV, which could in a limited way use some of the excess solar in summer. At the end of 2017 I installed a Tesla Powerwall storage battery, which is an AC connected battery and so does not affect the metering of FiT. Installation of storage battery significantly reduced our electricity import, and since then I have been able to record electricity flows metered by the Powerwall in a database, this gives me an accurate record of generation, load, import/export and solar generation. Since then we have used this information to use as much of our generation on site as possible, and since the start of 2019 we have used over 96% of electricity generated on site. I bought an EV at the end of 2020, and investigated charging this from excess solar energy for the summer period. In order for this to succeed I needed an EVSE that I could control via an API and to increase the amount of solar generated. So applied via an installer to WPD to install 3kW of additional PV and an EVSE. As the additional panels would not qualify for FiT, they could not be connected to the existing PV inverter, so a new 3kW inverter was proposed. The EVSE did not present a problem, but the PV was not accepted even if its inverter was limited to zero export. WPD informed me that the additional PV could not be installed without me paying for network reinforcement. The installer said this would cost 10s of thousands of pounds. This effectively blocked the project.

I understand that some payment towards additional network costs would be reasonable, but I believe that under the current regime the high cost cap (HCC) would apply. As I read it the HCC applies if the cost of works is more than £200/kW, it seems unlikely that any works would cost less than £600.

I also understand that WPD's calculation is based upon the connected inverter capacity, rather than actual export. This is a worst case engineering calculation based on the inverters outputting at peak power and there being no demand. In practice the battery will not export significantly to the grid as its software is currently configured (or user configurable), so its inclusion in the calculation as generation is difficult to understand, but that is the way the calculation is done.

This may be reasonable to protect the network, but in an ideal world other means could be adopted that could enable connection of additional PV such as fitting an export limiting device or entering into a local load balancing agreement.

To reduce the impact of climate change, the carbon intensity of the grid needs to decrease fast, and at the same time electrification of heating and transport needs to occur. There is a risk that increased demand could also increase grid carbon intensity, particularly if policy is neutral on this point. So policy needs to favour connection of renewables and storage.

I contend that the best low carbon way to increase supply to meet increased demand due to electrification is keep supply and demand in balance at as local a level as possible. Firstly this should

be behind the meter, secondly in the local network, and so on through the subnetworks supplied through each level of substation. I believe what I want to do fits with this overall view.

Clearly there will be times particularly in winter when local solar energy is negligible. In practice this means that On-shore wind should be encouraged as a local energy source. The local plan being consulted on by Teignbridge district council has nominated a number of potential on-shore wind sites as part of the consultation, so that district can be as self sufficient in renewable energy as possible. The DNO (WPD) could in an ideal world plan its investment based on (or interacting with) this planning information.

Even with our existing PV system and the new EVSE, I am able to charge the car from solar on sunny days almost enough to cover local mileage by restricting the current going to the car (typically to between 6A and 11A). This minimises but does not eliminate grid charging. As the car has a sizeable battery capable of storing electricity for at least 260 miles it can stand a couple of weeks poor weather with little charging.

EV charging is an area where estimates have been attempted in Future Energy Scenarios (FES), it is possible that a tipping point will be reached where EV take-up occurs much faster than predicted. It has been suggested that EV drivers drive further than ICE drivers. In this scenario charging demand will become a significant problem.

This could have consequences for the carbon intensity of grid electricity. Co-operative means will need to be found to smooth demand in order to avoid overloading substations, this could be:

- Agreed access times for each vehicle
- A local control system which fairly distributed energy to each vehicle.

Smart control of charging based on internet connection between charger should be cheaper to implement then extensive network reinforcement.

Now I have set the background I will respond to those questions which relate to my experiences.

3. Connection boundary Question

3a: ***Do you agree with our proposals to remove the contribution to reinforcement for demand connections and reduce it for generation?***

Yes

Do you think there are any arguments for going further for generation under the current DUoS arrangements?

The SCR P.83 says: “We think there is merit in keeping the HCC as it protects all consumers from high cost projects (particularly in less densely populated distribution areas, which may also coincide with the location of generation in parts of the network which require more reinforcement). While it is rarely triggered, our understanding is that the HCC is a useful tool in early discussions with potential connectees.”

CEPA-TNEI report p21 says of renewable generators: “However, these charges are only one, potentially small, part of the complicated set of factors that would inform these decisions. For example, for embedded renewable generation, locational decisions will be strongly influenced by the energy yield (e.g., the wind or solar resource at each location), the ability to get planning

permission (which may be significantly more challenging in certain locations), and other factors like accessibility"

The two quotes above demonstrate that it is recognised that reinforcement cost is effectively a deterrent to more generation from households particularly and to some extent community energy.

For small generators particularly households wanting to expand their PV systems the HCC would still a significant barrier, as it is unlikely any works could be done for a few hundred pounds. This relates to my personal position that I have outlined in my personal background.

The situation for small generators could be helped if there were to be a fixed element to the HCC such that the HCC was the higher of the fixed element and that determined on a £200/kW basis.

Question 3b: What evidence do you have on the effectiveness of the current connection charging arrangements in being able to send a signal to users and what do you think will be the effect of our proposed changes?

The current system is a bit of lottery. WPD have produced an EV connection map which shows the ability for EVs to connect in each substation area. If you happen to live in an area with poor connection availability, then you are likely to pay reinforcement charges to connect an EV. It is welcome that demand reinforcement charges are proposed to be removed.

How does this vary between demand and generation connections?

The threat of large reinforcement costs for household generation connections above 16A storage + 16A non-storage deters larger domestic PV systems backed by storage. In practice these are likely to mainly supply increased on-site demand. The justification for the 16A + 16A limit and the calculation that follows when it is exceeded is to protect the network from excess voltage. In such cases reinforcement may not be the most cost-effective solution, non-firm access to export may be more effective. This could be implemented by an automatic circuit breaker costing less than £2000.

Question 3c: What are your views on the effectiveness of the current arrangements in facilitating the efficient development and investment in distribution networks?

They particularly discourage small renewable generators to connect. Small local generators can supply local demand particularly if there is local storage and flexibility. This removes the need for reinforcement at higher voltages, so can be a cost-effective way of expanding network capacity.

How might this change under our proposals where network companies are required to fund more of this work?

The network companies will be encouraged to adopt the most cost-effective long term solution, rather than reinforcement to meet the needs of a new connection. This could be by local flexibility, storage, or triggered access limitation.

Question 3d: Do you agree whether the need to provide connection customers with certainty of price reduces the potential for capacity to be provided through other means such as flexibility procurement?

If flexibility procurement were to include small scale flexibility, then this would not be the case because consumers with demand that could be flexible such as EVs could participate.

How might this change under our proposals?

Question 3e: What are your views on whether we should retain the High Cost Cap?

The HCC must be removed for demand to encourage EV and Heat Pump take-up, the alternative is increased carbon emissions and catastrophic climate change. EVs will require increased generation, preferably local, which could come from increased local renewables and storage. Increased local generation would be encouraged by removal of the HCC.

Is there a case for reviewing its interaction with the voltage rule if customers no longer contribute to reinforcement at the voltage level above the point of connection?

Don't know.

Question3f: What are your views on the recovery of the costs associated with transmission that are triggered by a distribution connection?

No view

Does this need to be considered alongside wider charging reforms or could a change be made independently?

Question 3g: What are your views on the likelihood of inefficient investment under our proposals (e.g., an increase in project cancellations after some investment has been made)? Are there good arguments for further considering introducing liabilities and securities to mitigate this risk?

No view

Question 3h: What are your views on whether the interactions between our connection reforms and the ECCRs must be resolved before we are able to implement our proposed reforms?

No view

How do you factor in the effects of the ECCRs (if at all) into decision making, given the levels of uncertainty around subsequent connectee(s)?

No view

What suggestions do you have to make our policy and the ECCRs work together most efficiently?

4. Access rights

Question 4a: Do you agree with our proposal to introduce better defined non-firm access choices at distribution?

Yes, but there should be an option to include small users.

Do you have comments on their proposed design?

Question 4b: Do you agree with our proposal to introduce new time-profiled access choices at distribution?

Yes, but this should include small users. Domestic customers, particularly with domestic batteries and EVs can avoid grid consumption during peak periods. Specifying the time of these periods allows customer's systems to plan when these flexible assets can be used.

When a large number of EV users come onto the network limiting customer access during defined periods, could provide certainty of charging times. For this to work the allocated charging times would need to be staggered. See also my comments on shared access rights, which might provide a better solution to domestic EV charging.

Do you have any comments on their proposed design?

Question 4c: Can you identify any benefits to shared access rights, which would indicate we have underestimated the likely take-up?

The discussion has centred on several demand customers agreeing to a common demand cap, which it has been suggested is difficult to police. It appears to be framed in the context of large demand customers.

A small user case might be a street where several users had EVs, if they all charged at the same time, then the network would be overloaded. Individually each user might use 1 hour per day (roughly 7kWh @ 3.5mi/kWh gives 24.5 miles per day or roughly 9000 miles per year). If the EVSE's of this group of users were in communication they could limit the total current drawn by the group's EVs so that all the vehicles were charged, but the total demand never exceeded an agreed limit.

Location of demand and generation on the same network segment, this might arise where a user has excess on-site generation (say from rooftop PV) and has an agreement to sell the excess generation to other users on the same network segment. If the excess generation is consumed in the same network segment there is no impact on higher voltage levels, whereas if the users are considered separately there would be. Allowing this kind of shared access could allow rooftop PV systems to be installed prior to network reinforcement.

Question 4d: Do you have any comment on our proposed choice about how to reflect access rights in charges (i.e. connection and/or distribution use of system charges)?

Agree that a lower connection charge is a reasonable way of compensating for reduced access rights. This then gives no incentive to the DNO to carry out work which would allow later removal of the restriction. An additional connection charge at the point of removal of the restriction could be a solution, as this is effectively a supply upgrade, which would have to be at the customer's demand.

Question 4e: Do you agree with our proposal to not prioritise the introduction of new transmission access choices as part of this Significant Code Review?

No opinion

Question 4f: Do you have views on how access rights should be standardised across DNOs?

No

Question 4g: Do you have any views on our proposed timescale of 1 April 2023 implementation?

Couldn’t it be sooner.

5. TNUoS charges for SDG Question

I am not answering this section.