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RESPONSE TO BEIS JULY 2018 CALL FOR EVIDENCE ON

THE FUTURE FOR SMALL-SCALE LOW-CARBON GENERATION

https://www.gov.uk/government/consultations/the-future-for-small-scale-low-carbon-generation-a-call-for-evidence

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1. Have we accurately captured all the opportunities and benefits that small-scale low-carbon generation can provide to the UK energy system over the short, medium and longer-term? Are there any that we have missed? Please provide evidence.

A: Our response should be seen in relation to our view on the projected growth of the electricity network as stated in this consultation, please see below the response to this question (headed "Your assumptions").

While you have identified most of the important opportunities and benefits, by far the most critical of these is the co-location of supply and demand. In our opinion, this should be emphasised and policies developed to limit the need for reinforcement of the transmission, and where possible much of the HV distribution networks.

The other opportunities you have identified are likely to have some impact, but this is probably small and unpredictable/unsustainable. For example suggesting that the rather long term and vague ambition of an EPC band C requirement would increase the take up of rooftop PV, is misplaced. Yes, some will put PV panels on their roofs, but whether these contribute effectively and efficiently to a reduction in electricity consumption is questionable since the actual energy generated over the life of the panels is not measured or guaranteed.

Please also refer to the answer in the next question on opportunities for a more effective, self sustaining and low cost approach to encouraging government's decarbonising objectives.

Your assumption on how much additional energy and peak power demand will be delivered through the electricity network to meet the government's Carbon targets appear to be woefully inadequate!

Government data for 2017 heat energy consumption was ~510 TWh p.a.. Even if only half this were to be electrified the energy carried by the network would have to almost double. Transport which accounted for ~700 TWh p.a., would have an even greater impact.

Given the consumption patterns of both heat and transport, peak winter demand will very quickly exceed the suggested 25GW increase in network transmission capacity by 2050. It is not so long ago that the current 60GW was close to capacity, only a reduction in consumption from the grid has averted the threatened 'black outs'.

All this suggests that unless consumption is drastically reduced, only local energy generation and storage are viable long term solutions to decarbonising through electricity. It is highly unlikely (indeed unnecessary) that the transmission and distribution electricity network could be extended to meet these demands, even by 2050.

2. How can government help consumers benefit from small-scale low-carbon generation such as local communities, local authorities, and those in fuel poverty?

A: Please also refer to our views on financial incentive schemes at the end of this answer and how we would encourage the government to help these (and all) consumers.

Your call for evidence text and this question suggests that you are aware of and are considering the special role local communities and authorities have in this market. Benefiting their community rather than profit are their fundamental values. They are also in a unique position of retaining a degree of trust from their community, certainly when compared to the 'big six', but also large commercial developers of renewable installations.

As a Community Energy Society, working with our local council, public and private sector organisation, we strongly believe that the government should legislate to support local generation for local consumption and retaining economic benefits in the community. Our impression is that the government is legislating against such support through inconsistent and punitive Energy policy

announcements. Examples of the latter include CCL and 3rd party rate charges for renewables (e.g. PV).

Government could help by encouraging local authorities in particular to enter the energy market. With the support of Community Energy groups, DSOs and more generally those organisations with an interest in reducing the Carbon burden, co-location of new electricity supply/demand would be accelerated. It is important that no long-term financial incentives are used, rather generation/supply licensing regulation need to make it possible to allow for these new entrants. An electricity charging structure in line with the one outlined below and our responses to questions 3&5 is also necessary to encourage local investment in such schemes.

We believe that **financial incentive schemes** should only be used to kick start a desired goal. Such schemes need to minimise adverse side effect, often a result of simply injecting money into such schemes. The FiT scheme may have been a lot cheaper, more sustainable and fairer if it had incentivised lower electricity consumption by reducing the unit price at low consumption and increasing it for higher consumption, i.e. progressive pricing. This can be achieved through a number of mechanisms such as taxation (e.g. VAT increase/decrease) or unit price caps for different consumption thresholds. Vulnerable consumers requiring higher consumption due to special needs can be accommodated in the same way as is currently the case with ECO.

In our opinion, many more consumers would have installed effective PV panels and more recently batteries would have been deployed, to stay below unit price thresholds, probably with only a modest initial subsidy. We would have avoided the industry 'cowboys' and the turmoil of ever changing policy signals.

3. The introduction of enabling technology and systems such as the roll out of smart meters, and half-hourly settlement, will provide commercial incentives on energy suppliers to develop and offer tariffs. Will smart tariffs provide a viable route to market for small-scale low-carbon generation? If so over what time frame, and what are the possible barriers to these smart tariffs?

A: These technologies are essential, however, on their own they will not have a major impact. We already know that a majority of people will not change their long-term behaviour as a result of marginal tariff differences, especially if these are dynamic/complex. On the other hand, if the tariff signals are too strong, everyone will shift their consumption, and therefore not achieving the objective of spreading the load.

As you have identified, those most disadvantaged in our society are unlikely to see any benefit from Smart Tariffs. They are likely to have other pressing priorities to deal with. They will also almost certainly not be able to afford the Smart Appliances that will be essential to maximise any benefit, at least in the medium-term.

Unless there is a reversal of the current expectation that the more we consume the cheaper things are, we will forever be trying to change human nature! It is therefore essential that an energy charging structure is designed which:

- generates sufficient funds to maintain and operate the network infrastructure through a 'network connection' charge. Connection capacity, not annual consumption volume, should be the primary pricing driver. Decoupling 'fixed' charges to pay for the network and services from the unit price, has several advantages. Not least, it would break the incentive in the supply chain (including government's) to increase consumption, because the total revenue from these charges goes up with greater consumption.
- sets up an Energy unit price structure which delivers a 'basic' amount of energy at a very low tariff and increase this tariff at appropriate threshold for different consumers. Time-of-day tariffs can continue to operate within this scheme, but their impact will remain marginal.

- doesn't penalise low carbon energy generation, such as the CCL and 3rd party business rates. As we are leaving the EU, why not remove VAT on Renewables?
- enables small-scale low-carbon generators to sell their excess energy through local ESCOs working with their DSO to maintain Local Balancing of electricity flows.

4. Do you agree with the challenges we have identified? Are there any challenges small-scale low-carbon generation presents that you think we have missed? Please provide evidence.

A: Yes, agree with the list of challenges, although most could be overcome with smarter policies. See answer to next questions 5.

5. How would you propose the small-scale low-carbon sector, suppliers, off-takers, network/system operators, and/or government can overcome the challenges presented?

A: We have suggested some key principles to guide policy for the small-scale low-carbon sector in our answer to question 3. Namely on charging policy and type of incentive schemes. The third pillar of our approach to achieving the government's stated objective is safeguarding the network itself. All of these suggestions are explained in more detail in our paper on Options to deliver Local Supply (see http://teignenergycommunities.co.uk/wp-content/uploads/2018/05/TECs-Local-Supply-Model-Options-v1.1.pdf).

Having established that matching supply to demand is a critical requirement, it stands to reason that monitoring and control of electricity flows is necessary to address several of the listed challenges. DNOs are already investigating the technology needed at LV sub-stations and exploring how to use this data in a variety of ways.

With this proposed level of monitoring/control it would be feasible to create virtual islands, still managed and maintained by the DSO, but allowing new local generation and supply to grow. Limits on both import and export from these virtual islands are set, as is the case today. Rather than trying to generate and recover costs for wide-spread network reinforcements, new demand and generation could be encouraged, provided its impact remained within the substation area. Appropriate network charges would still apply, both to import from outside the substation area as well as any local reinforcements and use for new generation/demand.

We believe that all four challenges identified could be addressed through the proposals we have suggested so far. Indeed, unless the government's apparent approach changes, the likelihood is that the costs and consequences to the electricity network will be so great that the only option remaining will be to abandon our Carbon Targets.

Behind the meter and inequitable network cost recovery:
This is addressed primarily by shifting cost recovery from energy unit price to standing connection charges based on capacity (i.e. maximum power not energy consumed). Also the monitoring and control at an LV substation level would encourage innovative solutions available to the DSOs and others to replicate if these prove cost effective.

Tracking deployment and network management:
Monitoring & control at an LV substation level will, by definition, provide greater visibility of electricity flows. Additionally deploying two way smart meters would provide the necessary monitoring for 'unregistered' behind-the-meter generation.

System Inefficiencies:
Monitoring and control at the LV substation level would provide sufficient protection against

new surges of demand/supply. Storage solution will play a key role in enabling the shift to decarbonising heat and transport.

System Balancing:
Again, monitoring & control at an LV substation level will, by definition, provide greater balancing of electricity flows. Storage technologies will further help, but are not essential until new demand comes about. It may also be necessary to retain regulation (e.g. through MCS) for post FiT behind-the-meter generation so that this may be controlled through the DSO. Voltage/frequency signals to inverters/controllers would normally suffice, this is currently the case when grid voltage exceeds the upper threshold (inverters shut-down or throttle back).

6. What are possible ways to track and monitor behind the meter installations (we would appreciate specific suggestions in relation to how information can be sourced (e.g. direct from businesses and households) and the method for sourcing it (e.g. an annual survey))?

A: Smart meters with both import and export capability will provide net values of generation/consumption. It is this aggregated metric that should be monitored/tracked over time, rather than the individual generation/consumption. Monitoring at LV sub-station level will provide further useful aggregated data. Provided of course that generating electricity from fossil fuels is licensed for all but the very smallest level (e.g. 500W or even less).

7. What are the special considerations that should be made when attempting to track different kinds of behind the meter activity?

A: See response to question 6

8. Are off-takers, suppliers, and aggregators able to lead the deployment of small-scale low-carbon generation currently? If so how will this occur, over what timescales, and what are the implications for deployment levels? How would deployment be supported by the capacity and ancillary services markets as well as the emerging corporate PPA market? Please provide evidence.

A: In our opinion not in the case of the existing 'for-profit organisations'. They would most likely require subsidy, increase prices and probably offer a generic, doesn't fit anyone, ineffective solution. We have seen how the FiT and RHI schemes have resulted in some inefficient installations and inappropriately placed renewable schemes, compensated for by the subsidy. In the absence of regulation or drivers other than profit, it is inevitable that only the profit margin will determine whether a scheme goes ahead and irrespective of its impact on other goals. There are also plenty of poor installation examples in the construction sector for how small-scale renewables are deployed (e.g. cheap and ineffective rooftop PV in new developments).

9. What would be the impact on jobs, deployment, and the supply chain, if deployment were left to market forces beyond 2019? Please support your answer with clear evidence.

A: Without reforming the energy market (specifically electricity) it is likely that decarbonising heat and transport by shifting to low-carbon electricity will either stall or be chaotic. Those who can least afford it will inevitably be hardest hit, requiring the government to provide them with greater support and protection.

A chaotic rush towards self sufficiency is inevitable as prices rise and energy supply becomes less reliable. There are plenty of extreme examples round the world of this, where unregulated diesel generators and electricity wires replace the grid supply. In the UK we are more likely to develop private wire/network solutions using readily available/approved technology and only connect to the grid when necessary.
We have already seen the boom/bust effect on the Renewables industry as government tinkered with an ill thought through subsidy scheme. However, the FiT scheme was very successful in raising awareness of our energy consumption, at least for many of those who made use of it. It also made a noticeable dent in reducing the electricity network's Carbon footprint.
We also know that tariff (unit price) signals are meaningless to most residential consumers and even some commercial consumers. Evidenced by the low level of switching suppliers, but also by the perception that pricing remains complex and a 'trick with mirrors'. Complex half hourly settlement, although essential, will be even more meaningless to the vast majority and open to exploitation.
We strongly urge the government to consider enabling greater community ownership especially of small-scale low-carbon generation to meet the new demand from decarbonising heat and transport.

10. In your view, are small-scale low-carbon generators currently able to deploy independent of subsidy e.g. through the PPA market? Does this vary for differing technologies and capacities of small-scale low-carbon generation e.g. domestic vs. commercial scale? If not, can you explain how long it will take for this market to emerge and if government intervention is required? Please provide evidence.

A: Yes, but only in some niche cases. For example in rooftop PV, this is possible provided they are above 100kWpk, with at least 90% on site consumption and a perfect roof orientation/structure. We have actually identified one or two such examples where the business owner is prepared to pay a PPA of 90% of their current unit rate (12p). The two reasons we are unable to go ahead are BREXIT uncertainties and as a result the period they are prepared to sign up to a PPA. We can potentially raise local finance for many more such schemes just in our local area if we were able to sell our electricity to others within the substation at ~10p per unit. With current regulation we can only secure ~5p per unit due to network charges and licensed operator charges.
<u>The proposals we have outlined so far would allow local organisations to cooperate on schemes to benefit commercial, public and residential consumers through community ownership of new renewable generation. This can be done with no subsidy and no additional burden on other electricity consumers.</u>

11. What factors, including financial, affect your decisions to invest in small-scale low-carbon generation?

A: See response to question 10.

12. Does government need to take regulatory intervention(s) to enable the development of competitive markets for small-scale low-carbon generation? If so, what and why? If these actions were taken, what benefits would this provide to consumers and the electricity system?

A: Absolutely! Our proposals on charging and local supply described so far would achieve the following:

- A self sustaining growth in appropriate small-scale low-carbon generation, i.e. demand driven and cost effective.

- Minimal if any impact on the wider distribution and transmission network.
- Increasing local economic benefits and retaining these for the long term.
- Maintaining a below average unit price for locally generated renewable electricity. Without increasing prices for other.
- Maintaining the high standards for operating and delivering electricity through the DSO.
- Raising awareness of Energy consumption through local participation.
- Contributing to the target of decarbonising the economy without the costs associated with upgrading the whole network.

13. How can we encourage and unlock private sector finance to enable market-led deployment?

A: As a Community Benefit Society embedded in our community and working with other organisations we are able to attract 'ethical' investors. By offering a modest index linked interest and a low risk approach for a 'worthy' investment, we would not find it difficult to raise up to £500k relatively quickly for a particular scheme. Beyond that level of investment we would probably require further incentives to raise investment from outside the local area, mainly through tax exemptions.

Electricity pricing, if set well to encourage greater generation for new demand, could go a long way to encouraging self investment.

14. How would a guaranteed route to market operating at a discount to the market price impact the transition of small-scale low-carbon generation to competitive markets? Please provide evidence to support your answer.

A: As stated previously, we would agree that a 'guaranteed' route to market through subsidy or price guarantees are risky and often have unintended consequences. There are plenty of examples of such schemes in the Renewables and other sectors. Typically either the supply-chain absorbs subsidies or prices rise to the minimum threshold set. This may well be case for the Hinkley-C unit price guarantee.

Instead the government should regulate to ensure transparency an a level playing field in the electricity market. So for the specific reference to FiT related export rates, these should be removed together with the FiT scheme itself, as currently planned. As well as a better charging structure (as previously explained), smart meters with both import and export capability should be made mandatory and rolled out more quickly. As consumers already pay for the these meters including the data aggregation charges, these should be no additional charge for exporting through an MPAN (currently ~£250 p.a. would be charged). Small scale generators could negotiate wholesale export prices, especially if these were aggregated through Community owned organisations. The current wholesale export unit price at ~£0.05 is already higher than the deemed FiT export rate.

This export rate will still only represent a modest income to small-scale generators and the bulk of the incentive would (and should) be the saving on imported electricity, especially if over the higher threshold consumption levels.

15. What innovative solutions would be required in the PPA market to bring forward small-scale low-carbon generation? Please provide evidence to support your answer.

A: See response to question 10 for examples of what may be achievable without subsidy or price guarantees. We have also highlighted the reluctance commercial organisations have in agreeing to a

long term PPA (e.g. more than 5 years). The key innovation we envisage is the ability to sell new generation into a local area (within a monitored/controlled DSO owned substation). This requires regulatory changes or 'easier' derogation of licence arrangements (e.g. under the Class-A Supply License exemption). It also requires the DNOs to upgrade their monitoring/control systems to incorporate their 'smart' substation.

16. A guaranteed route to market would require costs to be robustly controlled for consumers, as outlined in the Control for Low Carbon Levies. How could this best be achieved, without creating 'boom and bust' cycles for the small-scale low-carbon generation sector?

A: See previous responses, especially to question 14.

17. What would be the general challenges (including technical challenges) of designing a guaranteed route to market that offers a time of export tariff to support the aim of developing a smart and flexible network?

A: The technology to monitor and control small-scale low-carbon generation already exists. It is probably the organisational systems that pose the greatest 'technical' challenge. Provided there is transparency and a regulated level playing field, business and not-for-profit organisations will develop solutions to these and other technical challenges.
Having a charging system structured with fair network charges and a progressive unit charge that encourages energy saving and local renewables will also be necessary as a motivator.

18. How long would a guaranteed route to market need to run for to help the development of competitive markets?

A: In our opinion this is not relevant, see response to previous questions.

19. How could future regulations or other interventions be designed in order to capture the benefits of storage combined with small-scale low-carbon generation? If specific technical requirements are needed, please specify those as well.

A: Storage is an essential element for making renewable systems more practical and effective. Both short-term (day-week) and longer-term large-scale (month-season) storage solutions will be necessary. Although certain storage solutions are becoming more affordable, they still need to roughly half in price (or electricity doubles in price), before being viable for small-scale renewables. The government stills needs to encourage and certainly not penalise the deployment of electricity storage solutions. Such storage needs to be strictly regulated to ensure that it is not used to store non low-carbon generated electricity.

20. If implemented what effect would the actions you outline have on the small-scale low-carbon generation sector and the benefits this sector brings to UK consumers?

A: We believe that the approach we have outlined would:

- provide stable and long-term certainty to the market
- encourage community ownership and local solutions within a national framework
- encourage innovation and effective solutions to the real energy/Carbon related challenges
- deliver a progressive pricing structure while safeguarding the nation network
- self financed operating in a regulated transparent and fair/free market.