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**MCS Foundation response to Ofgem’s consultation: Future System Operator supply and demand modelling**

**Consultation link**: https://www.ofgem.gov.uk/publications/consultation-future-system-operator-supply-and-demand-modelling

**The deadline** for responding is 23rd June 2023 and to respond via email [Joanna.gaches@ofgem.gov.uk](mailto:Joanna.gaches@ofgem.gov.uk)

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**Introduction**

Our vision is a world where everyone has access to affordable and reliable renewable energy and zero carbon technologies – for the benefit of our environment, our communities and the general public. As a Foundation we work to increase public confidence, awareness and access to renewable energy and zero carbon solutions across the UK. We support education and engagement programmes, fund research and facilitate innovative solutions to drive widespread adoption.

In addition, the Foundation oversees the [Microgeneration Certification Scheme (MCS CHARITABLE FOUNDATION)](https://mcscertified.com/) which defines, maintains and improves quality standards for renewable energy at buildings scale.

**Summary**

MCS Charitable Foundation welcome many of the proposals set out in this consultation. We agree that there needs to be a more centralised, strategic approach to network planning as the grid undergoes its largest transformation since the 1960s.[[1]](#footnote-2) Modelling future demand and supply is critical to ensure the development of an efficient, effective electricity network that can support our net zero goals.

Before answering the questions, there are specific points we wish to raise.

1. **The Future System Operator must be put in place without delay.**

We are concerned that there is still a considerable amount of uncertainty surrounding the Future System Operator (FSO), especially considering that FSO feature heavily in several Ofgem plans, including local energy governance,[[2]](#footnote-3) distributed flexibility,[[3]](#footnote-4) and network planning. Any delays to the development of the FSO could have detrimental impacts to the grid network plan, as well as wider decarbonisation targets. We recommend that:

* Ofgem and Government publish the strategy and policy statement for the FSO.
* Ofgem minimises uncertainty by putting the FSO in place as soon as possible.
* The FSO has a clear strategic direction to deliver net zero and the independence and capacity to deliver.
* Ofgem publish a schematic showing the governance of the proposed system, including the likely interaction between consumer energy resources, flexibility providers, the Future System Operator (FSO), DNOs and energy suppliers.

1. **Ofgem must put pressure on the Government to commit to the electrification of heat and transport.**

One main difference between each of the Future Energy Scenarios is the approach to heat decarbonisation. The role of hydrogen for heating is a significant cause of uncertainty, which not only risks delaying heat decarbonisation,[[4]](#footnote-5) but could also result in the underdevelopment of the electricity network. For example, the uncertainty around hydrogen makes network planning difficult for Distribution Network Operators (DNOs) and Transmission Operators (TOs).[[5]](#footnote-6)

We do not agree with Ofgem that "The current FES contains four scenarios which are equally credible outcomes for the energy system."  The evidence from 32 independent studies (which has recently increased to 42) affirms that heat pumps will play the leading role in heat decarbonisation, with hydrogen only playing a small role at most.[[6]](#footnote-7) Hydrogen for heating would increase consumer bills significantly, with estimates ranging from at least 70% up to over 300%.[[7]](#footnote-8) In the midst of a cost of living crisis, committing to a decarbonisation pathway that risks pushing more households into fuel poverty is regressive. ESO announced in the publication of the 2022 FES their aim to “improve affordability” for consumers,[[8]](#footnote-9) which is clearly incompatible with hydrogen heating. Equally, Ofgem’s position as the energy system regulator, with the main remit to protect consumers, suggests that they have a responsibility to advise the Government against net zero pathways that would significantly increase energy bills.

**The Government and Ofgem should invest in a digital twin to help inform decarbonisation pathways and ultimately strategic network plans.**

Data is the backbone of every future energy modelling. With more accurate and open data, it is possible to be more strategic with investment, resulting in an electricity network that supports net zero at the lowest cost to the consumer. For this reason, we strongly advocate for Ofgem to support the development of a detailed, real-time network model. This model would cover connected generation, transmission and distribution capacity and the behaviours of demand-side products (including peak demand, average demand, and flexibility capacity). Overtime this could evolve into a digital twin, providing increased efficiency and more strategic planning. Digital twins are an effective tool to test certain policy decisions, as well as testing different options for net zero.[[9]](#footnote-10)

**Q1. Do you agree that we should move towards pathways instead of scenarios, to provide greater clarity on the type of investments required under the CSNP?**

Yes, we agree. We understand that there are a number of uncertainties around policy, technological, systematic and societal changes in the future. However, there is much more certainty in the short-term on policy surrounding electricity generation, storage, and demand. The FSO must make strategic and directive decisions in the next decade, with the main remit of achieving net zero.

**Q2. Do you agree that there should be a single forward view of the near term for all pathways?**

We agree that a single forward pathway will help provide clarity for short-term investment. For example, the Government have a 50GW offshore wind target by 2030 and yet transmission reinforcement is currently lagging behind offshore wind development.[[10]](#footnote-11) The short-term pathway should aim to address this by incorporating key Government targets for energy generation and storage. This pathway will need to be based on evidence of technology deployment pipelines as well as policy decisions.

One area that needs clarification is the Government’s pathway to heat decarbonisation. This not only impacts long-term investment, but also short-term (7-12 years). MCS Charitable Foundation strongly urges the Government to abandon plans for hydrogen heating in the short-term and focus support on the electrification of heat. Cadent, a grid distribution network, have admitted that hydrogen village trials are unlikely to receive hydrogen for heating until 2030,[[11]](#footnote-12) which suggests that 100% hydrogen for heating will not be available at a commercial level until 2035 at the earliest, if at all. Making the decision to focus support of the electrification of heat in the short-term pathway would not only provide clarity and certainty to key industry members in the heating sector, but also key stakeholders in the electricity and gas network.

**Q3. Do you agree with our proposal to have Net Zero compliant pathways (number to be determined by FSO), with a separate counterfactual demonstrating the scale of activities and investment that falls short?**

We strongly agree. Counterfactual scenarios remain valuable to show what a lack of demonstrable progress towards net zero looks like, on both a technology and regional level. However, removing it as a possible pathway sends a clear message to stakeholders and investors.

**Q4. Do you agree that the pathways should run to 2050, and if not, why not?**

We agree. In the next decade at least, efforts should solely focus on what needs to be done to achieve net zero by 2050.

**Q5. Do you agree that the model should develop the capacity to include extreme data ranges when requested of the FSO in its role as strategic advisory body?**

Yes, we agree. As extreme weather events are likely to become more frequent and extreme due to anthropogenic climate change, it is important to consider the impact they will have on the pathway.[[12]](#footnote-13) Equally, other political and geopolitical, such as the pandemic and Russia’s war on Ukraine have also impacted energy prices. Thus, we agree that they should include extreme data ranges, however, these extreme data range should be considered/modelled as sensitivities and shown as such in the outputs to the FSO and anything that is published.

**Q6. Do you agree with our consultation position on modelling network constraints?**

We do not agree. Modelling network constraints should not obstruct the short-term, nor the long-term investment in renewable energy generation in areas. The outputs of pathway and scenario analysis should, by definition, be used to inform where and when network investment needs to be prioritised to enable energy project development. Therefore, applying existing constraints and current planned network build-out timelines would be at odds with the aim that near-term pathway analysis is supposed to be informing network planning, not the other way around.

**Q7. Do you agree with our consultation position, and do you have a view on which data principles should be possible to adopt for the first FES?**

We strongly agree that input and output energy data for the FES should be open. Data is the backbone of any future energy scenarios and thus the more data and stakeholder contribution, the more accurate the models will be.

There are also wider benefits to open data, such as benefits to wider energy planning, connections management, as well as collaboration between Transmission Operators, Distributions Operators, and grid customers. We would even go one step further and argue that to support the FSO and planning, that the Government should fund the development of a detailed, real-time network model. This model would cover connected generation, transmission and distribution capacity and the behaviours of demand-side products (including peak demand, average demand, and flexibility capacity). Overtime this could evolve into a digital twin, providing increased efficiency and more strategic planning. Digital twins are an effective tool to test certain policy decisions, as well as testing different options for net zero.[[13]](#footnote-14) The FES data workbook and report suite is already a rich and detailed source of information. Both incremental and more extensive improvements to the quality and accessibility of FES data (e.g. an open access digital twin), alongside an increase in spatial granularity is strongly supported by MCS Charitable Foundation.

Furthermore, we agree that learning from incorrect assumptions is important, however, we have concerns that fixating on the costs to the consumer could result in underinvestment in infrastructure in the future. We echo the sentiments of Dieter Helm, Economics Professor at Oxford University:

“If the networks are not sufficiently developed, there will be no net zero. If they are slightly over-invested, the costs across the whole customer base are small, and in any event the assets will in due course probably be needed.”[[14]](#footnote-15)

**Q8. Are there specific stakeholder needs cases for publication of data, including the format of outputs?**

n/a

**Q9. Are there specific data outputs associated with the FES that we should mandate?**

n/a

**Q10. Do you agree that regional and/or industrial hub pathways should be included in the FES?**

We agree that regional pathways could be extremely useful for future Regional System Planners, to guide investment and act as a useful tool for local authorities.

**Q11. Do you agree with our proposal for a ‘major’ FES in the year prior to the main CSNP publication, with smaller annual updates in the intervening years?**

We agree that there needs to be a short-term (7-12 year) plan to provide investment clarity and that as a result, a ‘major’ FES will not be necessary each year. However, we fully agree that yearly updates are necessary to incorporate distribution level changes, such as heat pumps, Solar PVs, EV chargers.

**Q12. Do you consider that longer-term evolution of energy supply and demand modelling should head in the direction outlined above and if so how?**

We agree. The evolution of the FES should be the primary method for the ESO to adapt and consider how to communicate energy system pathways and guidance to Ofgem and Government

1. <https://www.regen.co.uk/wp-content/uploads/Building-a-GB-electricity-network-ready-for-net-zero.pdf> [↑](#footnote-ref-2)
2. <https://www.ofgem.gov.uk/publications/consultation-future-local-energy-institutions-and-governance> [↑](#footnote-ref-3)
3. <https://www.ofgem.gov.uk/publications/call-input-future-distributed-flexibility> [↑](#footnote-ref-4)
4. Lowes, R. and Woodman, B., 2020. Disruptive and uncertain: Policy makers’ perceptions on UK heat decarbonisation. *Energy policy*, *142*, p.111494. [↑](#footnote-ref-5)
5. <https://www.regen.co.uk/wp-content/uploads/Building-a-GB-electricity-network-ready-for-net-zero.pdf> p23 [↑](#footnote-ref-6)
6. <https://www.sciencedirect.com/science/article/abs/pii/S2542435122004160> [↑](#footnote-ref-7)
7. <https://www.raponline.org/knowledge-center/how-much-would-hydrogen-for-heating-cost-in-the-uk/> [↑](#footnote-ref-8)
8. ESO. 2022. Future Energy Scenarios 2022 Report. Available at: <https://www.nationalgrideso.com/future-energy/future-energy-scenarios/documents> [↑](#footnote-ref-9)
9. <https://es.catapult.org.uk/report/digital-twins-the-case-for-policy-use/> [↑](#footnote-ref-10)
10. <https://www.regen.co.uk/wp-content/uploads/Building-a-GB-electricity-network-ready-for-net-zero.pdf> [↑](#footnote-ref-11)
11. [Cadent submits proposal to BEIS for Hydrogen Towns | Cadent (cadentgas.com)](https://cadentgas.com/news-media/news/january-2023/14fcb58c-f652-4193-8383-b93520f4a1ec-a4d9a1c6-9593?fbclid=IwAR1B0Py1uzljFpHSBUvntXIdysmBjPUqfLo6mmlrgIbwJzUdIHISOLCeJHU) [↑](#footnote-ref-12)
12. <https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-11/> [↑](#footnote-ref-13)
13. <https://es.catapult.org.uk/report/digital-twins-the-case-for-policy-use/> [↑](#footnote-ref-14)
14. Regen (2023). *Building a Great British electricity network ready for net zero* <https://www.regen.co.uk/> p.24 [↑](#footnote-ref-15)