Akshay Kaul
Interim Director of Infrastructure and Security of Supply
By email: connections@ofgem.gov.uk
June 2023

RE: Open letter on future reform to the electricity connections process

Dear Sir,

MCS Charitable Foundation's 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.

Our net-zero vision is dependent on a well-developed, reliable electricity grid to support the significant increase of Distributed Energy Resources at both transmission and distribution. It is predicted that renewable technologies will generate from 70% to 90% of all electricity by 2035, a capacity of between 80GW and 280GW.[1] There will also be a significant increase in heat pumps and EV Chargers as the UK decarbonises transport and heat. With 70% of recent connection requests receiving waiting times of 5 years or more, there is clearly a need to reform this system in order to achieve our important net zero goals.

We agree that the scale and pace of this transformation cannot take place with the current grid regulatory mechanisms. Based on the wide array of Ofgem consultations this year, we are pleased to see that there is acceptance of the need for whole system transformation, in which many aspects need to be considered including grid infrastructure development (RIIO-2 reform), distributed flexibility, local energy planning, as well as grid connections management.

We believe a key part of all these reforms is better communication, data sharing, and collaboration across distribution and transmission levels. Ofgem's role, therefore, must be to act as the interface between the two and approach grid management from a holistic, whole system perspective, with net zero and consumer protection as joint priorities moving forward.

The Nature and Priority of connections issues

The substantial increase in volume of new connection offers provided by the Electricity System Operator (ESO) over the last five years demonstrates that the investment in Distributed Energy Resources (DER) and renewables is there. It is now the responsibility of Ofgem to derisk the connections process for customers, as this risk creates uncertainty which could result in good projects being discontinued. This involves, among other things, reducing connections times.

[1] https://green-alliance.org.uk/wp-content/uploads/2023/01/The-building-blocks-of-a-zero-carbon-power-system.pdf

We broadly agree with the short-term, medium-term, and long-term goals set out here, especially that any reforms must align with other reforms consulted on by Ofgem, as mentioned in the consultation. However, we wish to stress the importance of prioritising strategic reinforcement of infrastructure across distribution and transmission networks without delay.

Strategic network investment

The long-wait times for connections, some of which are over 15 years, is indicative of a management system that is outdated and is no longer fit for purpose for a new, net-zero electricity system made up of DER. We agree that this is in part due to the connections management approach, but also believe that the problem goes beyond this. We have to disagree with the affirmation that the current RIIO-2 and Connect and Manage model has resulted in the anticipatory building of the networks. To the contrary, we believe that the design of the RIIO-2 and Ofgem's consumer protection remit has delayed grid development from taking place at the pace and scale needed. For example, for the recent RIIO-2 period (2023-2028) which was completed in 2022, network reinforcements budgets proposed by the networks were reduced 17% by Ofgem.[2] We believe that Ofgem has taken a significant risk in potentially delaying transition to net zero in an effort to lower costs for consumers. The consequences of this are already posing a threat to the UK's net zero targets:

- Renewable energy generation and battery storage projects already in the pipeline are facing up to 15 year waiting times for high-voltage connections.
- If spare capacity predictions are correct, the distribution network headroom will run out in 2035, however this could be as early as 2028.[3] Anecdotally, we have heard of housing developers being forced to install gas boilers instead of heat pumps, simply on the basis that the distribution network cannot support them. We have heard similar stories regarding EV charging stations.
- Investment in network capacity has fallen behind generation deployment.[4] The UK government's success of achieving 50GW of offshore wind power[5] directly relies on the construction of sufficient transmission infrastructure to support extra supply.

The Connect and Manage approach is no longer sufficient to match the scale of change happening to the electricity network. Instead, this must be reformed to an anticipatory model, in which grid development takes place in advance of connections. This would significantly reduce wait times. With clear signals from government in their target to decarbonise the power system by 2035,[6] the volume of applications is likely to remain this high, or even increase further. As summarised by 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."[7]

This is why MCS Charitable Foundation support the proposed amendment to the Energy Bill to include a net zero remit for Ofgem. This is also recommended by the Climate Change Committee, the National Infrastructure Commission, the House of Lords industry and regulators committee, the

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[2] Regen (2023). *Building a Great British electricity network ready for net zero* https://www.regen.co.uk/ p.24
[3] Regen (2023). *Building a Great British electricity network ready for net zero* https://www.regen.co.uk/ p.22
[4] Regen (2023). *Building a Great British electricity network ready for net zero* https://www.regen.co.uk/ p.36
[5] https://www.gov.uk/government/news/uk-signs-agreement-on-offshore-renewable-energy-cooperation
[6] https://www.gov.uk/government/news/plans-unveiled-to-decarbonise-uk-power-system-by-2035
[7] Regen (2023). *Building a Great British electricity network ready for net zero* https://www.regen.co.uk/ p.24

Government's "offshore wind champion", the recent Skidmore Net Zero Review, Energy UK, Renewable UK, Energy Networks Association and Warm This Winter. MCS Charitable Foundation agree that this is critical for forwarding the UK's net zero and energy security goals.

Efficient and flexible network management:

We strongly agree that the development of distributed flexibility is critical to network management. Some of the main services provided by flexibility services include[8]:

1. Electricity balancing from Frequency Restoration Reserves (FRR) and Replacement Reserves (RR),

2. Addressing internal or cross-border congestion management in the transmission network and

3. For congestion management in the distribution network.

In essence, distributed flexibility is a critical component of an efficient decarbonised energy system; a balancing tool to complement fluctuating renewable energy. As carbon capture and storage is an underperforming technology globally, with recent research demonstrating a 98.5% capacity shortfall between current and required deployment by 2040 to meet sequestration targets,[9] and as green hydrogen could take a decade to become commercially viable, distributed flexibility is a vital tool that is available now to contribute to power grid management.

Distributed flexibility allows for the connection of more renewable electricity in the distribution system, without having to invest as much in the distribution grids, making the transition more cost-effective for consumers.[10] It also limits the extra renewable generation needed, by making use of surplus electricity generation, reducing the operating cost of low-carbon generation. [11]

We agree that effective planning is needed to support grid development at the pace and scale needed, and that the Future System Operator (FSO) could be in a strong position to facilitate this, through taking a more cross-vector approach both at a local and national level, as well as potentially being a market facilitator for distributed flexibility. However, we are concerned with the level of uncertainty surrounding the FSO and believe that this must be rectified moving forward, especially as the FSO feature heavily in several Ofgem plans, including local energy governance,[12] distributed flexibility,[13] and network planning. We recommend that:

- Ofgem and Government should publish the strategy and policy statement for the FSO.

[8] https://eepublicdownloads.entsoe.eu/clean-documents/Publications/Position%20papers%20and%20reports/170809_Distributed_Flexibility_working-paper_final.pdf?Web=1

[9] https://www.sciencedirect.com/science/article/abs/pii/S030142152100416X

[10] https://www.nordicenergy.org/publications/distributed-flexibility-lessons-learned-in-the-nordics/#:~:text=Distributed%20Flexibility%20is%20a%20key,costly%20investment%20in%20distribution%20grids.

[11] https://www.ukri.org/wp-content/uploads/2022/11/IUK-011122-SmartLocalEnergySystemsPolicyAndRegulationNov22.pdf

[12] https://www.ofgem.gov.uk/publications/consultation-future-local-energy-institutions-and-governance

[13] https://www.ofgem.gov.uk/publications/call-input-future-distributed-flexibility

- 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.

A fit for the future connections process

Whilst we believe that strategic and anticipatory network development and the development of distributed flexibility will play a significant role in reducing connection times to the grid, we understand that these are likely to be more medium to long-term solutions. Thus, creating a fit for the future connections process is likely to have positive short-term impacts, but should not delay these other two actions.

The improvement of data

We agree with the need for industry to improve data transparency for consumers. We would even go one step further and argue that to support the FSO and planning, there should be 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.[14] At the very least, customers should be provided with better data. In some cases offshore projects are not provided with the exact location of connection (which can be in a 20km radius) when applying to the Transmission Operator (TO). This makes gaining planning permission extremely difficult. TOs must rectify this to help their customers and not be the cause of milestone delays.

Priority areas of focus for Ofgem:

We strongly agree that Ofgem needs to play a central role in connections reforms, remaining flexible and driving further action as and when needed. Reforms made by the Energy Networks Association (ENA) in their 3-point plan and ESO in their 5-point plan are likely to focus reform on the distribution and transmission connections separately, failing to address the issues arising as a result of a lack of coordination and communication between both groups. There needs to be greater fairness and transparency between transmission and distribution, and we believe Ofgem should take a strong role in facilitating this.

Proposed objective, outcomes and principles for reform

MCS Charitable Foundation is mostly supportive of the overarching principles that guide the reform of electricity connections arrangements. However, more widely we believe that consumer interest and net zero need to be treated as equal priorities. Research has shown that climate change will cost the UK economy significantly more compared to mitigating climate change and reaching net zero.[15]

[14] https://es.catapult.org.uk/report/digital-twins-the-case-for-policy-use/
[15] https://www.lse.ac.uk/granthaminstitute/publication/what-will-climate-change-cost-the-uk/

Failing to transition the UK away from a volatile fossil fuels energy system is a 'lose-lose' situation for UK in terms energy security, households and the climate, whilst transitioning to towards a decarbonised, renewable system can offer greater prospects for consumers and energy security.[16] What's more, recent research has shown that whilst increases in network investment will involve higher total network charges, as the grid delivers more electricity, the network costs per unit could fall from around £48/MWh to under £40/MWh in a high-demand scenario.[17] Thus, we advocate that in all of Ofgem's planned reforms, net zero must be the highest priority, as the positive externalities not only include mitigating climate change, but also the creation of a resilient energy system that favours consumers. As discussed previously, we feel that the proposed amendment to the Energy Bill to include a net zero remit for Ofgem is critical to ensure that the UK meet 2050 net zero targets.

The illustrative reform stages and options for consideration

We understand that the incremental changes that are already taking place (Stage 1) are easily implementable, incremental changes that are aimed to make a difference in the short-term. We also support these changes including:

- The removal of projects from the queue that are blocking the progress of others, transitioning from a 'first-come-first-served' to a 'shovel ready' system.
- The creation of milestones for transmission projects and the automatic removal of projects that fail to meet them.
- The amendments made for storage technologies, offering certain non-firm connections.

However, we have some recommendations on how these changes should be carried out. For example:

- There needs to be clarification and standardisation of what 'shovel ready' means, to ensure fairness across different operators and networks, although it's likely that separate definitions will be needed for transmission and distribution.
- Communicate this change to developers as soon as possible so that they can input effectively.
- Ofgem needs to ensure a consistent definition of milestones across the board; eliminating inconsistencies across the DNO's or TO's is critical.
- Legacy storage projects which have been granted firm offers should be changed retroactively to non-firm connections. There is a commercial risk that firm connections will be prioritised by investors, meaning there could be unintended consequences in the funding market.
- Given the changes to the treatment of storage. Clear guidance must be set to mandate the network companies to provide adequate network data for customers to carry out their due diligence and DNOs/TOs/SO compelled to resource, monitor and report on responses to such data enquiries.

[16] https://www.ox.ac.uk/news/2022-03-25-delaying-clean-energy-transition-would-be-lose-lose-uk-energy-security-households

[17] Regen (2023). *Building a Great British electricity network ready for net zero* https://www.regen.co.uk/

Despite the efforts made, we agree that this reform needs to go further than these incremental changes.[18] The shortcomings of the connections system go beyond simply the 'first-come-first-served' structure and are also a result of understaffing at both the National Grid and District Network Operators (DNOs). [19] For example, there are challenges regarding Project Progression for customers applying to connect at a distribution level. DNOs have to send the data to the National Grid ESO to await confirmation for a project at distribution levels and customers are not expected to know the outcome of the project until 12-18 months later.[20] This must be addressed moving forward as it is a significant source of uncertainty for customers. What's more, according to other experts, the National Grid ESO's five-point plan that was put in place in February has failed to make a significant difference so far. [21] As mentioned previously, we strongly agree with the need to improve the interface between the transmission and distribution. Therefore, we would support a progression to Stage 2.

We understand that there are ultimately trade-offs depending on the level of reform chosen. However, we have concerns that Stage 1 and 2 will not bring about the change needed to address these issues. For example, 'Zombie projects' that gain grid connections under the current form are project that are likely to never be built and yet result in delays to genuine renewable energy projects.[22] Whilst the addition of milestones could begin to address this, it may ultimately require stricter entry requirements as laid out in Stage 3 or 4. To reach net zero, we also strongly feel that there should be a system in place that prioritises projects that decarbonise the power sector, in alignment with the government's aim to have a decarbonised power sector by 2035.[23] This should include the prioritisation of renewable energy projects and storage projects. At the very least, continued monitoring needs to take place to ensure that improvements are being made with queue management. This must include a certain level of flexibility so that Ofgem can implement further reform if more incremental reforms are not successful.

Yours sincerely,

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[18] https://www.smart-energy.com/industry-sectors/energy-grid-management/national-grid-releases-5-point-plan-to-expedite-grid-connections/
[19] https://www.theaic.co.uk/aic/news/citywire-news/national-grid-puts-forward-plan-to-reduce-connection-delays
[20] https://roadnighttaylor.co.uk/connectology/what-are-statement-of-works-appendix-g-project-progression-mod-apps/#projectprogression
[21] https://utilityweek.co.uk/eso-failing-to-tackle-grid-connection-woes/
[22] https://www.standard.co.uk/business/business-news/zombie-projects-to-step-aside-to-allow-quicker-linkups-to-national-grid-b1085218.html
[23] https://www.gov.uk/government/news/plans-unveiled-to-decarbonise-uk-power-system-by-2035