Enertechnos response to Ofgem's Forward Work Programme 2023/24 Consultation

About Enertechnos

Enertechnos is a fast-growing clean tech company, developing innovative solutions to improve how electricity is delivered. Our revolutionary cable technology – the Capacitive Transfer System 'CTS' – helps to address issues with grid capacity and efficiency, helping to deliver more power to where it's needed. Critically it is a lower loss cable, tackling electricity waste which totalled 26,305 GWh of electricity in 2021[1].

Since our establishment in 2014, we have worked alongside a range of partners, including Brunel University, The Welding Institute (TWI), and others from abroad to undertake research and development, and have begun to commercialise this into new technology that can make a significant contribution to the UK's transition to net zero. We are proud to receive investment from around the world, as well as receiving innovation funding from government and other organisations, including through the Energy Entrepreneurs Fund (EEF). Most recently, we were named one of the winners of the Net Zero Technology Centre's (NZTC) 2022 Open Innovation Programme.

Executive Summary

- We are delighted to submit a response to Ofgem's Forward Work Programme Consultation. We know that there is a significant and joint effort required to ensure the grid is fit for purpose, particularly in the context of the nation's net zero ambitions.
- As a leading innovator in this space, we have contributed to certain areas of the consultation where we can provide our unique perspective and specific expertise. We hope that our submission helps to shape Ofgem's plans for future planning and funding of the grid.
- Enertechnos broadly agrees with the framework and priorities as laid out in the consultation, but urges Ofgem to further unpack their plans for how to achieve them, especially relating to upcoming infrastructure investment.
- It is important that greater consideration and planning is taken going forward into managing the challenges associated with the ever-increasing integration of renewables onto the grid, both with regards to the number of renewables connections required and the sheer increase in capacity the grid will need to hold.
- Enertechnos also supports the early consideration in adapting the next price control period to ensure it is fit for purpose. Price control frameworks need to be both practical and proportionate to the changing landscape to ensure system optimisation. Grid efficiency and ensuring greater demand need to be at the heart of planning going forward, with an approach that prioritises new technology and innovation.

Response

1. Consumer Interest Framework

Enertechnos broadly supports Ofgem's consumer interest framework. The current international crisis in energy cost and supply has shone a light on the energy trilemma, and the importance of ensuring

[1] https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2022

security, decarbonisation and consumer affordability are all aligned, while maintaining the necessary quality and standards of services.

Whilst Enertechnos' main focus is the smooth and efficient transition to a decarbonised grid, we recognise the need for this to be done in a sustainable, holistic, and consumer-focused manner.

2. Strategic Priorities

Enertechnos supports the overarching strategic priorities as set out in the consultation. Decarbonisation, security of supply and cost-effectiveness are at the heart of achieving a grid that is fit for the future, and are mutually dependent on each other.

In order to achieve all three of these objectives in the most economical and effective way, long-term investment of the grid and full-scale collaboration will be essential, bringing in expertise from stakeholders from across industry and government.

At the core of all these objectives is the need to ensure greater efficiency throughout the electricity system. Greater efficiency not only relates to the scale of renewable sources implemented into the grid, but also how this greater capacity can be managed to ensure as little waste as possible – maximising supply and keeping costs low.

Ofgem's longer-term priority of facilitating infrastructure investment will be key to ensuring greater efficiency and capacity. While Enertechnos recognises this as a long-term strategy, it is essential that investment into the longevity and sustainability of the grid starts now. It is widely recognised that the next decade will see a significant increase in demand for electricity, owing mainly to the continued electrification of both transport and heat. At present, the current grid infrastructure is not fit for purpose. With key government ambitions surrounding increased electrification due to be achieved within the next ten years, the grid needs to be ready for the projected surge in demand ahead of these targets.

3. Projects and Programmes

Enertechnos recognises the importance of laying out specific short and long-term objectives, along with specific projects and programmes to ensure the longevity, efficiency and security of the grid.

As stated previously, ensuring the facilitation of infrastructure investment in the grid is a key priority. We have further unpacked this priority and the associated projects and programmes below.

Facilitating infrastructure investment

Enable time-critical investment in infrastructure

Supporting faster connections and strategic transmission investment across offshore, onshore and cross-border and coordinated infrastructure will need to be a key priority for Ofgem moving forward. As demand for electricity continues to rise and renewable energy sources are increasingly integrated into the network, a significant barrier reported by industry relates to grid connections. The Financial Times recently reported that renewables developers are being told that they will have to wait six to ten years to connect to the regional networks because of constraints on National Grid's network.[2]

[2] https://www.ft.com/content/7c674f56-9028-48a3-8cbf-c1c8b10868ba?accessToken=zwAAAYQVKoXzkc98Z09WkChIo9OMv8HIsQhouq.MEUCIQCRM7N_t5TCY-YfwVvCdnDrS5jmeljhHucmlsMYnBW0DAIgS9CjSWBxRFhcPJBm7aIY2OvvT0NNkGENSRyOvXYbCRU&sharetype=gift&token=0a8edbf5-1e7c-443d-b9d8-d2fe1348e9ce

Historically, National Grid would receive 40-50 applications for connections per year, which has recently risen to about 400 as renewables suppliers look to integrate. The increase in connections requires large-scale investment and coordination at a national level and across all six regional distributors.

It is important, therefore that greater consideration and planning is taken going forward into managing the challenges associated with the ever-increasing integration of renewables onto the grid. It is critical that the grid is sufficiently future-proofed to meet this increase in demand, and that there is appropriate scrutiny of National Grid and other DNOs.

Future network regulatory framework

Enertechnos supports the early consideration in adapting the next price control period to ensure it is fit for purpose. Price control frameworks need to be both practical and proportionate to the changing landscape to ensure system optimisation.

With an ever-increasing focus on a decarbonised grid, a stronger, joined-up approach between government and Ofgem is needed to underpin this and ensure alignment between net zero objectives and deliverables. Grid efficiency and ensuring greater demand need to be at the heart of planning going forward, with an approach that prioritises new technology and innovation.

In Enertechnos' past experience with Ofgem, we have witnessed an inconsistent approach towards strategic funding that enables the DNOs to invest in new technology. For example, in the RIIO-ED2 price control period, Ofgem has made the decision to withdraw the Losses Discretionary Reward, that was brought forward in RIIO-ED1 to encourage and incentivise the DNOs to improve their understanding and management of electricity losses.

As the demand for electricity continues to grow from the increased electrification of transport and heat, the proportion of losses from the grid will also rise. The Department for Business, Energy and Industrial Strategy's latest release of the Digest of UK Energy Statistics showed that electricity losses came to 26,305 GWh in 2021[3]. This is enough electricity to charge approximately 6.8 million electric vehicles and is equal to the total amount of electricity the UK imported last year. Losses in the energy system cost the UK £1.5 billion in 2019 alone[4], a figure that is burdened on consumers through their bills, which are already increasing at an alarming rate.

The more energy passing through, the more impact resistance has. The effect is that losses do not increase at a constant rate, but instead they multiply. A 2018 study by WSP for the Energy Networks Association found that at maximum levels of renewables penetration, low-carbon technologies could increase distribution losses by up to 350%, from current levels of 6-7% to over 20%[5].

Losses, therefore, present one of the biggest challenges to the UK's energy sector, threatening to undermine the shift to net zero and ambitions for a low carbon, green future. However, despite their impact and cost, there is a distinct lack of regulation to conquer this issue.

It is clear that the RIIO-ED2 price control process did not do enough to tackle grid efficiency. As such, Enertechnos believes that a much more ambitious approach is required in the next price control process. We recommend the following is taken into consideration:

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[3] https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2022

[4] https://www.enertechnos.com/wp-content/uploads/2021/03/Enertechnos-Policy-Paper-Sept-2020.pdf

[5] WSP, "ENA Working Group Project: Impact of Low Carbon Transition – Technical Losses," 2017.

1. Reinstating the Losses Discretionary Reward for RIIO-ED3 (or equivalent) or replacing it with a stronger financial incentive. Specifically, Ofgem should ensure DNOs are able to, and held accountable for, using strategic funding to invest in technologies which improve network efficiency and reduce carbon costs over the price control period and longer term.

2. Introduce an obligation for DNOs to provide two models as part of cost benefit analysis–one looking at business-as-usual technology and another providing an alternative plan which uses innovative equipment, such as low-loss cabling and/or low-loss transformers, to reduce losses and increase capacity. This will allow DNOs to show the regulator the lifetime savings and carbon footprint of each technology and its benefit, justifying the additional spend.

3. Introduce an annual reporting process whereby DNOs must report on their own network findings throughout the year to ensure DNOs remain vigilant and proactive in monitoring for network efficiencies.

4. Ensure that, by the commencement of the next price control period at the very latest, it is written into standard licensing that network inefficiencies, including technical losses, are the responsibility of DNOs to address and to mitigate.

The Copper crisis

Another consideration for Ofgem to make when planning for the future of the grid is with regards to the sustainability of resources going forward. Enertechnos believes that there is greater strategic need to prepare for the transformational changes needed to facilitate greater electrification as part of the transition to net zero, such as cabling.

Current cabling within the grid uses copper as a main component. Recent findings from BloombergNEF indicates that copper demand will increase by more than 50% between now and 2040[6]. This research also found that demand for copper relating to energy transition activities, including clean power, electrified transport and the infrastructure supporting this, is forecast to grow by about 4% per annum between now and 2040. The key challenge associated with this increase in demand is that primary copper production can only increase by about 16% within the same period of time, meaning that by the early 2030s, copper demand could outstrip supply by more than 6 million tons per year.

Thus, when considering future grid planning, Ofgem should ensure that infrastructure is fit for future demand. The solution should not just be about finding ways to ensure sufficient amounts of copper can support future grid infrastructure, but also about ways of supporting new and innovative cabling.

Dominic Quennell, Chief Executive of Enertechnos, would be delighted to discuss the contents of this response with Ofgem in further detail, or provide any additional evidence which would support your work. For queries or for any further information please contact kathrynevans@wacomms.co.uk.

[6] https://www.bloomberg.com/news/articles/2022-09-01/copper-demand-to-rise-50-by-2040-as-clean-energy-takes-hold?leadSource=uverify%20wall