

# Enertechnos response to Ofgem Open Letter on the next network price control review process

## **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<sup>1</sup>.

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.

We are delighted to submit a response to Ofgem’s open letter on the next network price control review process. 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. We hope that our submission helps in shaping Ofgem’s plans for future planning and funding of the grid.

## **Questions:**

### **Do you have any views on the strategic issues we will face in the development of the next price control review process?**

Enertechnos agrees that, in order to meet future demand, changes to the grid are likely to involve transformations of great complexity. Challenges, particularly relating to the integration of new sources of power and managing increased demand, will be essential to address. 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.

### **Making grid infrastructure fit to meet the rising demand**

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. It is not sufficient to manage the amount of electricity required to facilitate a transition to net zero by 2050. The capacity of the UK’s electricity grid will need to increase to meet these expectations.

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<sup>1</sup> <https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2022>

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<sup>2</sup>. 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 about ways of supporting new and innovative cabling.

### Managing the effect of increased integration of renewables

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 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.<sup>3</sup>

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 sheer increase in connections requires large-scale investment and coordination at a national level and across all six regional distributors.

Managing reactive power is also becoming increasingly important, and should therefore be considered a significant strategic challenge. Without reactive power, we won't be able to 'push' renewable power to where it needs to be and to keep the voltage at the correct level. This will impact the overall capacity and stability of the grid.

Asynchronous generation such as renewables only produce limited amounts of reactive power at best – in some cases producing no reactive power at all. Reactive power is essential for running components such as motors and transformers and has the important role of controlling the voltage throughout the grid and allowing an efficient and reliable circulation of active power. Therefore, the amount of reactive power in our electricity network must be carefully managed and balanced.

Since April 2022, National Grid ESO has spent around £300 million per month on balancing services<sup>4</sup>. Its primary solution is to increasingly add expensive balancing services into the grid to safeguard the sufficient balance of reactive power. But it is far more cost-effective and efficient to ensure the right infrastructural design at the outset, such as cabling. Traditionally cables have been used to simply move electricity from one area to another, but by balancing the contribution of capacitors and inductors in the cables and wires that form the electrical grids, both reactive and active energy can flow through the cables and move with less power losses around the grid.

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<sup>2</sup> <https://www.bloomberg.com/news/articles/2022-09-01/copper-demand-to-rise-50-by-2040-as-clean-energy-takes-hold?leadSource=verify%20wall>

<sup>3</sup> [https://www.ft.com/content/7c674f56-9028-48a3-8cbf-c1c8b10868ba?accessToken=zwAAAYQVKoXzkc98Z09WkChlo9OMv8HlsQhoug.MEUCIQCRM7N\\_t5TCY-YfwVvCdnDrSSjmeljhHucmlsMYnBW0DAIgS9CjSWBxRFhcPJbm7aIY2OvvT0NNkGENSRyOvXYbCRU&sharetype=gift&token=0a8edbf5-1e7c-443d-b9d8-d2fe1348e9ce](https://www.ft.com/content/7c674f56-9028-48a3-8cbf-c1c8b10868ba?accessToken=zwAAAYQVKoXzkc98Z09WkChlo9OMv8HlsQhoug.MEUCIQCRM7N_t5TCY-YfwVvCdnDrSSjmeljhHucmlsMYnBW0DAIgS9CjSWBxRFhcPJbm7aIY2OvvT0NNkGENSRyOvXYbCRU&sharetype=gift&token=0a8edbf5-1e7c-443d-b9d8-d2fe1348e9ce)

<sup>4</sup> <https://data.nationalgrideso.com/balancing/mbss>

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.

#### Addressing grid inefficiencies

One of the most significant challenges that must be addressed when developing the next price control process is in regard to the level of electricity ‘lost’ from the grid during transmission and distribution.

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<sup>5</sup>. 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<sup>6</sup>, 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%<sup>7</sup>.

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 losses. 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:

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.

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<sup>5</sup><https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2022>

<sup>6</sup><https://www.enertechnos.com/wp-content/uploads/2021/03/Enertechnos-Policy-Paper-Sept-2020.pdf>

<sup>7</sup> WSP, “ENA Working Group Project: Impact of Low Carbon Transition – Technical Losses,” 2017.

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.

**Do you have any views on the case for change we have outlined?**

Enertechnos supports the early consideration in adapting the next price control period to ensure it is fit for purpose. We agree with Ofgem in their view that price control periods need to be both practical and proportionate to the changing landscape to ensure system optimisation.

The current international crisis in energy cost and supply has shone a light on the energy trilemma, and the importance of ensuring security, decarbonisation and consumer affordability are all aligned. At present we don't believe this is reflected in the current price control period. The case for change is most evident with regards to both scope and approach.

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 intends 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.

It is essential, therefore that a long-term and coordinated approach is taken going forward.

**Do you have views on whether the changes to the electricity or gas sectors mean we should consider alternatives to the approach taken in the RIIO-2 price control**

Ofgem needs to ensure that its next price control period is in the best position to deliver the increasing amount of additional power required to meet higher demand from transport and heat electrification. To best address the strategic challenges associated with this overarching objective, Enertechnos believes that option 1, providing continued use of periodic reviews, with RIIO being adapted where appropriate to address the strategic issues above, such as including incentives around whole-system optimisation, will be the most effective approach moving forward.

This will provide agility and flexibility to react to changes in demand and in supply constraints. It further provides the ability to adapt incentives to vital issues such as loss reduction and reactive power support as new technology becomes available.

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*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](mailto:kathrynevans@wacomms.co.uk).*