enertechnos

ENERTECHNOS

Response to Ofgem consultation on approach to setting the next electricity distribution price control (RIIO-ED2)

Question 1: Do you have any views on the proposed objective for RIIO-ED2?

Enertechnos welcomes the focus on delivering a safe and resilient network that is responsive to change, as well as being environmentally sustainable, with network companies enabling the transition to a smart, flexible, low cost, and low carbon energy system. We also welcome the main priorities set out, in particular decarbonising to fight climate change at the lowest cost to consumers and enabling innovation to help increase efficiency, and it is vital that Ofgem plays a key role in ensuring these priorities are delivered.

To deliver these positive outcomes and priorities, the UK needs to fundamentally change its approach to tackling losses in the energy transmission and distribution system. We simply cannot afford to lose 26,663 GWh of energy annually – enough to power nearly seven million homes and costing consumers £1.3 billion – and be considered efficient, low-cost or decarbonisation friendly. Enabling innovation to tackle losses needs to be a key pillar of RIIO-ED2.

Question 2: To what extent should we take into account outcomes linked to decarbonisation targets, and what outcomes might this involve?

Enertechnos welcomes Ofgem's core priority of decarbonisation at the lowest possible cost alongside a commitment to taking a more active role in building Great Britain's low carbon energy system in the interests of future consumers. Given the scale of the challenge in tackling climate change, the regulator's oversight and involvement will be fundamental in achieving meaningful change.

Supporting the decarbonisation of sectors such as heating and transport, and ensuring capacity to cope with increased demand, will require networks to be as efficient as possible. Energy losses caused by inefficient cabling, threatens to undermine this shift towards decarbonisation, which will lead to the need for costly reinforcement. Ofgem should incentivise distribution network operators (DNOs) to tackle losses within their networks and/or link revenues to a measurable losses reduction target.

Energy losses mean more energy must be generated to service the same level of demand, and last year totalled 26,663 GWh – 7.6 per cent of total demand, enough to power almost seven million homes and making up 1.5 per cent of carbon emissions in the UK. As we shift towards electrification, more power will be required, and losses will grow. Based on the 2018 National Grid Future Energy Scenarios, tackling losses could make enough power available to meet between 50 and 200 per cent of the energy needed to service peak electric vehicle (EV) demand. Without the need for additional generation. The less generation required, the larger the share of the energy mix renewables will make up.

Question 3: Are there activities that DNOs are best placed to carry out in order to achieve these outcomes? What are the alternatives? Why would it be appropriate for energy consumers to fund these activities?

Given that the vast majority of losses occur during the process of distributing electricity to customers, DNOs are the best placed to tackle the problem of energy losses. Innovative technologies are available to help tackle energy losses and DNOs should deploy these as a priority. For example, the Capacitive Transfer System 'CTS' technology tackles losses by providing a cost-effective solution to replacing existing outdated cabling and deploying new infrastructure. By balancing reactance and capacitance, the cable's technology significantly reduces voltage drop during transmission by as much as 50 per cent, resulting in lower energy loss. As new

infrastructure is connected and cable replacement programmes are undertaken, DNOs should use technologies such as CTS-enabled cable to ensure the network of the future is as efficient as possible.

DNOs must be supported by Ofgem to make the necessary investments to reduce losses and support these outcomes. For example, given DNOs have an important role to play in ensuring future capacity, they must be supported by Ofgem to invest in technologies ahead of demand, so infrastructure installed now will be fit for a decarbonised future. This is especially true for cabling given the long lifetime of cable infrastructure.

Consumers need a network which will meet their needs into the future, as they charge EVs and decarbonise their homes, and which is resilient and reliable. Tackling losses is key to providing this. Furthermore, losses carry a 'societal cost' of over £1.3 billion a year, and leave consumers paying for energy which is generated but never reaches their homes. Ultimately, tackling losses will reduce consumer bills.

Question 4: How should we assess DNO funding requirements and measure DNO performance in these areas?

Given the challenges the UK faces to meet its carbon commitments, we believe that DNOs have an essential role to play in ensuring the energy network is as efficient as possible. As a starting point, losses must be metered, monitored and reported on in real terms by DNOs. It is only possible to tackle a problem once we understand it further, and for progress or action to be meaningful it must be measurable.

Adding measurement technologies along existing infrastructure, at substations for example, would be both simple and inexpensive for DNOs. Furthermore, as smart meters are being installed in most homes and businesses, actual half-hourly consumption data is becoming available. By comparing aggregated consumption data from meters with half-hourly data from Bulk Supply Points, a very accurate estimate of distribution losses can be made (after adjusting for unmetered supplies).

The data should be used to establish a baseline amount for distribution losses. This baseline should be calculable well before the start of RIIO-ED2 in 2023. Any increases in losses over the baseline in a regulatory year should be regarded as avoidable losses. DNOs should be rewarded or penalised for the decreases or increases in network losses in their networks, as relating to the baseline amount.

The baseline itself would need to be reset periodically, perhaps at every successive price control, although the resets should not increase the baseline without a very high level of justification. Penalties or rewards could be adjusted through the annual iteration mechanism along with other incentives and penalties.

The financial indicator Ofgem uses, the 'societal cost of losses' should also be updated so the true cost of losses can be made clear. Currently the figure is set at £48.42/MWh as per 2012/13 prices – this should be updated to reflect today's prices and updated on an annual basis.

Question 7: What, if any, changes to the framework are required to support strategic investment?

Enertechnos welcomes the focus within RIIO-ED2 to set price controls that support strategic investment in assets in anticipation of changes in demand or network use. We believe that strategic investment should be used to invest in innovative technologies which will help facilitate the shift to a low carbon energy system. In particular, investment in cable infrastructure will be fundamental to helping the UK meet its carbon commitments.

Given the long lifetime of cable infrastructure, it is crucial that cabling installed now, both in new build infrastructure and replacement programmes is future proof. Ofgem should ensure that DNOs are able to use strategic investment to invest in technologies which improve network efficiency, such as low-loss cable technology. Doing so is in line with the National Infrastructure Commission's (NIC's) recommendation that

Ofgem take a more proactive approach to preparing the grid, the Committee on Climate Change's recommendation that at the point network infrastructure is upgraded, capacity is augmented sufficiently to avoid the need for further upgrades to 2050.

Question 15: To what degree should DNOs modernise their handling practices to adhere to data best practice, and therefore (among other things) provide available, transparent, and interoperable data about their networks? What measures will be needed to ensure data remains secure?

To ensure the UK's energy network is efficient, resilient and future-proof, DNOs must accurately meter and monitor distribution losses occurring on their networks, reporting on them in real terms. It is only possible to tackle a problem once we understand it further, and for progress or action to be meaningful it must be measurable. Adding measurement technologies along existing infrastructure, at substations for example, would be both simple and inexpensive for DNOs. Furthermore, as smart meters are being installed in most homes and businesses, actual half-hourly consumption data is becoming available. By comparing aggregated consumption data from meters with half-hourly data from Bulk Supply Points, a very accurate estimate of distribution losses can be made (after adjusting for unmetered supplies).

Collecting this data would not infringe General Data Protection Regulation (GDPR) as it would be anonymised before aggregation.

Question 18: We welcome views on our proposed position of a five-year price control for RIIO-ED2.

Enertechnos welcomes the proposed five-year price control as a step in the right direction. Change is occurring at a rapid pace within the energy system and it is vital that the regulator and industry are able to be proactive and flexible in responding to such change. Whatever the length of the price control, it is essential that there are mechanisms to allow flexibility and responsiveness as the energy system evolves, for example as electric vehicles become the norm.

In terms of monitoring and reporting on distribution losses, the price control should allow for a baseline allowance levels of losses to be reset periodically, perhaps within the length of the price control. This is necessary so that any increase in losses over the baseline in a regulatory year can be regarded as avoidable losses and DNOs can be rewarded or penalised for the decreases or increases in losses in their networks.

Question 24: We welcome views on how DNOs should continue to ensure their networks are resilient, particularly in the context of the new and changing ways assets are used.

A key pillar of ensuring networks are resilient is ensuring they are efficient, fit for purpose and future proof – capable of enabling a new flexible, responsive, decarbonised energy system. Fundamental to achieving this resilience will be through tackling waste and losses in the energy system – for example through using innovative technologies such as the CTS cable technology.

Last year, energy losses totalled 26,663 GWh – 7.6 per cent of total demand, enough to power almost seven million homes and making up 1.5 per cent of carbon emissions in the UK. As we shift towards electrification, more power will be required, and losses will grow. Based on the 2018 National Grid Future Energy Scenarios, tackling losses could make enough power available to meet between 50 and 200 per cent of the energy needed to service peak electric vehicle (EV) demand. Flexibility, and the shift away from traditional one-direction movement of electricity, will also multiply losses.

Given the long lifetime of cable infrastructure, it is crucial that cabling installed now, both in new build infrastructure and replacement programmes, is future ready and will help DNOs continue to ensure their networks are resilient in this changing energy system.

As renewables make up an increasing share of our energy mix, their intermittent nature will have an enormous impact on the resilience of the UK energy system. Using innovative cabling to connect to and distribute renewable electricity will help DNOs to ensure their networks are resilient. In the simplest terms, tackling losses means less power is needed to service the same demand. The less generation required, the larger the share of the energy mix renewables will make up.

Innovative cabling can also increase the output of intermittent sources, such as windfarms, whilst our current cable infrastructure undermines the impact renewables can have. The resistance and impedance inherent in current cables means there is a threshold of power generation required before any usable electricity is produced at the output end. This means that when wind or solar levels are low, transmission ceases, so the asset is curtailed.

Most windfarms operate only 30 per cent of the time. But the lower resistance and impedance in CTS-enabled cable has the potential to increase the availability of an offshore windfarm to 45 per cent or more, a 50 per cent increase. This equates to hundreds of millions of pounds of additional energy generated over the lifetime of a large-scale windfarm and would significantly reduce the negative impact intermittency has on network's resilience.

DNOs have a key role to play in ensuring the resilience of the system. The RIIO-ED2 price control must enable and ensure that DNOs tackle energy losses with innovative technologies. DNOs must be encouraged and incentivised to invest in these technologies ahead of demand so that the UK's energy system is prepared as change takes place with increasing pace.

Question 28: We welcome views on how DNOs should work to minimise the impact of what they do on the environment and facilitate the transition to a low carbon energy system. We are particularly interested in the implications of the government's updated target of net-zero emissions by 2050.

The government's updated 2050 net-zero emission target will have a significant impact on our energy system and will require a massive programme of electrification and a shift towards renewable energy. The outdated cable infrastructure which makes up our network is threatening to undermine progress towards net-zero. DNOs must tackle inefficiency and losses in their networks to cut their environmental impact and facilitate the transition to a low carbon energy system.

Current cabling is inefficient and is no longer fit for purpose. Last year, energy losses totalled 26,663 GWh – 7.6 per cent of total demand, enough to power almost seven million homes and making up 1.5 per cent of carbon emissions in the UK. This inefficiency, which has damaging environmental consequences, must be addressed as a priority. This will be increasingly important as demand increases with electrification.

Innovative cabling can also increase the output of intermittent sources, such as windfarms, whilst our current cable infrastructure undermines the impact renewables can have. The resistance and impedance inherent in current cables means that there is a threshold of power generation required before any usable electricity is produced at the output end. This means that when wind or solar levels are low, transmission ceases, so the asset is curtailed.

Most windfarms operate only 30 per cent of the time. But the lower resistance and impedance in CTS-enabled cable has the potential to increase the availability of an offshore windfarm to 45 per cent or more, a 50 per cent increase.

In these two cases – improving efficiency and shifting to clean sources – tackling waste and losses promises to minimise the environmental impact of networks and help government meet its 2050 net-zero target.

Question 29: We also welcome views on what this may mean for the type of activities networks undertake, how these may be funded, as well as the outputs/incentives they should be exposed to.

To contribute to net-zero, minimise environmental impact and facilitate the transition to clean energy, DNOs must tackle losses through using innovative technologies when building new infrastructure and conducting replacement programmes. The RIIO-ED2 price control must ensure DNOs prioritise this issue and are able to invest in these technologies to help cope with future demand, supported by a system of rewards and incentives.

Adding measurement technologies along existing infrastructure, at substations for example, is both simple and inexpensive for DNOs, and should be a priority in tackling this problem. As smart meters are being installed in most homes and businesses, actual half-hourly consumption data is also becoming available. By comparing aggregated consumption data from meters with half-hourly data from Bulk Supply Points, a very accurate estimate of distribution losses can be made (after adjusting for unmetered supplies).

The data should be used to establish a baseline amount for distribution losses. This baseline should be calculable well before the start of RIIO-ED2 in 2023. Any increases in losses over the baseline in a regulatory year should be regarded as avoidable losses. DNOs should be rewarded or penalised for the decreases or increases in network losses in their networks, as relating to the baseline amount.

The baseline itself would need to be reset periodically, perhaps at every successive price control, although the resets should not increase the baseline without a very high level of justification. Penalties or rewards could be adjusted through the annual iteration mechanism along with other incentives and penalties.

Question 30: Finally, we are keen to understand how DNOs' performance should be measured, and how we should assess the value that consumers place on the provision of these services and activities.

DNOs performance on tackling losses should be measured against a baseline. This baseline should be established from improved monitoring and reporting of losses undertaken by DNOs using measurement technologies and aggregated smart meter data.

Any increases in losses over the baseline in a regulatory year should be regarded as avoidable losses. DNOs should be rewarded or penalised for the decreases or increases in network losses in their networks, as relating to the baseline amount.

The baseline itself would need to be reset periodically, perhaps at every successive price control, although the resets should not increase the baseline without a very high level of justification. Penalties or rewards could be adjusted through the annual iteration mechanism along with other incentives and penalties.

The value of tackling losses must also be updated. Currently, Ofgem uses the 'societal cost of losses' as a financial indicator of losses impact. This should be updated so the true cost of losses can be made clear. Currently the figure is set at £48.42/MWh as per 2012/13 prices – this should be updated to reflect today's prices and updated on an annual basis.

Given that consumers foot the cost of network, paying for energy which does not reach their homes, investment in losses has a direct material benefit for the consumers.

If stakeholders have any questions on the contents of this consultation response or the work of Enertechnos, please get in touch with Caitlin on CaitlinFordham@wacomms.co.uk or on 020 7227 1649.