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To: RIIO3@ofgem.gov.uk

RIIO3 Call for Evidence on ET3 Business Plans

Dear Ofgem,

Sustainability First is a charity and think tank focussed on social and environmental issues in the energy and water sectors with a track record of engagement on regulatory issues, including as past members of Ofgem's RIIO-2 Challenge Group.

In this response we set out our views on two specific issues with the **Electricity Transmission** Business Plans where we have a particular interest and expertise – (1) SF6 and (2) losses.

PART ONE: SF6

This has been a long-standing area of focus for Sustainability First building on our review of the ED2 SF6 Strategies[1] and our subsequent substantive report (through Grid Edge Policy) on "Green Grids: Tackling SF6 Emissions on GB Electricity Networks"[2]. which explored the SF6 challenge in depth and which we have shared previously with Ofgem. We would encourage Ofgem colleagues to revisit that report as they review the company proposals in this area.

In summary we called for a laser like focus on reducing leakage from existing equipment and close working with manufacturers to develop safe alternatives to SF6. We highlighted the potential role of monitoring and analytics to help in managing leakage and in more accurate reporting.

On availability of new equipment, we highlighted **the impact that the updated EU F-Gas Regulation could have for European manufacturers and hence the supply chain in GB** for high voltage switchgear and suitable SF6 alternatives. This remains a vital matter for GB in the ET3 period given the scale of new investment required by all three GB transmission companies to deliver on the Government's Clean Power 2030 Action Plan.

As well as introducing a ban on SF6, the EU F-Gas Regulation also explicitly banned fluoronitriles and F-Gases with a GWP[3] >1, albeit all subject to various derogations. On the face of it this would preclude most of the alternatives that have been deployed to date by the transmission networks. How the derogations will be applied remains unclear. Irrespective of any thinking on future updates to the UK F-Gas Regulations, and with a firm eye to Clean Power 2030, we would expect the

[1] ED2 Business Plans - Ofgem Call for Evidence. DNO SF6 Strategies -a commentary by Sustainability First. 8 February 2022
https://sustainabilityfirst.org.uk/wp-content/uploads/2022/02/Sustainability_First_-_Commentary_-_DNO_ED2_SF6_STRATEGIES_-_final09022.pdf

[2] The report is here

[3] Global Warming Potential

companies (and also Ofgem in line with its Growth Duty) to be in active discussion with government (both DESNZ and DEFRA) on what, if any, supply-chain issues might arise regarding ready-access to suitable SF6-free high voltage transmission equipment in the ET3 period. The company Plans give no indication that these conversations are taking place and, indeed, make no mention at all of the EU F-Gas Regulation. This should be a priority for Ofgem to explore with the networks.

Having now reviewed the ET Business Plans our view is that:

- **Investment justifications**: None of the Plans provide the detailed evidence that we would have expected to see to (1) demonstrate that the companies really have a grip on leakage or (2) to provide reassurance that a shift to SF6 free equipment is realistic in ET3. In our Green Grids report we highlighted the multiple attempts it took NGET in T2 to demonstrate the level of detailed understanding of its assets that was needed to justify to Ofgem the investment being requested. We hope that the networks have all now done that sort of detailed work to support their Plans and would encourage Ofgem to demand this evidence – and also to ensure that it is shared across networks to aid learning. We continue to stress that this must be an area of collaboration not competition.

- **Metrics and data**: In particular, in its Sector Specific Methodology Consultation (SSMC) Ofgem set out a list of metrics that networks should report against going forward, which we endorsed (with some minor comments). The companies should be providing this data now as context for their ET3 Plans. The chart which Ofgem included in its SSMD showing the volume of leakage is helpful but in judging the ET3 Plans, Ofgem must look also at leakage rates (ie as a %) and differentiate between newer and older assets, SF6 and other gases etc.

- **IIG incentive design**: We recognise the important role played by the IIG incentive and welcome Ofgem's commitment to setting more ambitious targets in line with the companies' science-based targets. That said we would note the very different positions that the companies are in, in terms of the balance of existing and new assets, which will affect how easy it is for them to meet particular targets in ET3 and which should be taken into account in the design of the incentive. Ofgem will need much better data to set meaningful targets. We are also unclear from SSMD where Ofgem has landed in terms of exceptional SF6 leakage events which is relevant here (and we discuss further below).

- **Leakage monitoring**: we are pleased that NGET seems committed to the use of remote monitoring which should also enable more accurate reporting of leakage. We are unclear what SSEN and SPEN are doing in this space. We encourage Ofgem to continue to press for more accurate reporting and in particular to ensure that the design of the IIG incentive does not penalise the networks if a move to more accurate reporting reveals that there has been a level of under-reporting to date (which we suspect may be the case as set out in our Green Grids report).

- **ASTI projects and SF6 alternatives**: we are aware that the major investment programmes for T3 are not a part of the T3 Business Plans but are covered separately through ASTI reopeners. We have not looked at the information provided as part of ASTI but it is important that for each of these major projects there is clarity as to whether they will be able to use SF6 alternatives. Ideally, we would have expected that information to be brought together in the EAP.

- **Supply-chain in SF6 alternatives**: This is the priority issue we flag at the start of this response. There is a level of reassurance in all the Plans that SF6-free switchgear is becoming increasingly available, including information on the different supplier offerings. This is extremely encouraging as we had been concerned that the very stringent requirements of the new EU F-Gas Regulation could prove a barrier. That said we remain unclear how the technologies that the networks are proposing to use sit in relation to the EU Regulation and which derogations they are relying on (noting that typically they are reliant on gases with a GWP > 1, the cut off in the Regulation). None of the Plans mention the EU Regulation. We are also aware that this is a nascent market and that the existence of SF6-free alternatives does not mean that they are available at the volume or precise specifications required by the networks. In the event that SF6-free alternatives are not available we are unclear if any manufacturers would still be offering SF6 switchgear (which clearly should anyway only be considered in extremis as a fallback). Ofgem should test the level of risk associated with the company proposals and the associated supply-chains, including any risk that these solutions could prove hard to maintain in future if they are subject to tighter restrictions. As highlighted above, we would expect Ofgem and the networks to be engaging closely with DESNZ and Defra to understand and manage these risks, given their criticality for Clean Power 2030.

- **Whole-life-costing**: one area of remaining uncertainty in the EU Regulation and also in the Business Plans is the approach that should be taken to whole life costing which is key to one of the important equipment derogations. Whole-life costing also features as a requirement in Ofgem's Business Plan Guidance. However as flagged in at least one of the Plans there is currently no guidance on how this costing should be done (a point we also made in our report). A clearer steer from Ofgem would be of value (but does not necessarily address the EU issue).

- **Clarity on future UK F-Gas Regulation and SF6 use**: The DESNZ updated National Policy Statement for electricity networks[4] clarified government thinking that at the design stage SF6 should be avoided where suitable alternative gases exist or where these cannot be justified on technical or cost grounds. In addition, we would encourage Ofgem to stress to Defra the importance of providing further clarity on its thinking on the use of SF6 in new electrical switchgear to ensure no surprises in a future UK F-Gas Regulation that might create barriers to the investment required for Clean Power 2030 (and beyond). As we understand it, there is currently no timetable for the UK Regulation which we have been expecting for some time. Uncertainty also remains about future approaches in the UK to the PFAS elements of certain SF6 alternative gases (i.e. fluoronitriles) also banned in the EU F-Gas Regulation.

Expanding on these points, we recap below on Ofgem's SSMD, the EU F-Gas Regulation and Ofgem's Business Plan Guidance. We then look in turn at each of the network's Plans on SF6.

Context - SSMD

We are pleased that at SSMD Ofgem continued to highlight the importance of tackling emissions of SF6 (used as an insulator in electrical switchgear) given this is a highly potent, long lived greenhouse

[4] Department for Energy Security & Net Zero. National Policy Statement for Electricity Networks Infrastructure (EN-5). November 2023. 2.9.59 – 2.9.64 https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/nps-electricity-networks-infrastructure-en5.pdf

gas with a GWP (Global Warming Potential) of 23500 and an atmospheric life of over 3000 years and accounts for over 90% of the transmission networks' business carbon footprint. In particular we are pleased that Ofgem recognised a number of points we made in our response on the role of the IIG incentive in driving improved operational performance on leakage but that separate funding would be needed for major investments to replace assets.

We also welcome Ofgem's focus on improved monitoring of leakage which should lead to more accurate reporting in due course. In our report we highlighted a number of anomalies in the way that leakage is currently reported which is based on top-up. One of these anomalies, that leakage only needs to be reported for assets that are still in situ at the end of the year, is not dependent on additional monitoring equipment and hence should be addressed straight away. More importantly the whole question of how end-of-life assets are treated needs urgent attention. This links with the requirement in the EU Regulation to move away from using virgin SF6 for top-up to instead use recycled gas. None of these issues are picked up in SSMD or in the ET3 Plans (aside from a brief reference in NGET's Plan to its commitment to make more use of recycled gas).

We are also unclear from SSMD where Ofgem now stands on the question of exceptional events, which we were pleased had been raised in SSMC. Based on the claims that had been submitted we argued that while these may be genuinely exceptional events (catastrophic failures, typically early in the equipment's life), it is hard to prove that there is nothing more that the companies could have done to avoid them. Early failures are a known issue (reflected in what engineers call the "bathtub effect") and as a major contributor to SF6 leakage these early life catastrophic failures should be a real focus for the companies (eg putting in place additional monitoring, stronger contractual incentives on their suppliers, sharing learning). Retaining some element of financial penalty (say 10%) could drive this without being unduly punitive. It might then also be possible to make the scrutiny process less arduous for both Ofgem and the companies.

Context – EU F-Gas Regulation

In our Green Grids report we noted the potential challenges with the availability of alternative synthetic gas solutions given the restrictions being introduced through the EU F-Gas Regulation. We also highlighted the ongoing concerns around PFAS (forever chemicals), in particular at an EU level.

Our subsequent blog[5] set out the final details on the updated EU F-Gas Regulation[6] which ultimately set a GWP limit of less than or equal to 1, subject to certain derogations. The EU Regulation also explicitly banned use of fluoronitrile in new electrical switchgear. While these bans for procurement of higher voltage new equipment do not come into force at higher voltages until 2028 / 2032 we had assumed that manufacturers would pull back from developing new equipment offerings that would not be compliant longer term. While there are derogations both around the market availability of alternatives and whole life cycle costing, it is unclear how these will be applied in practice.

Brexit notwithstanding, the EU Regulation remains important because of the GB's reliance on EU manufacturers. We also note the delays in Defra updating the UK F-Gas Regulations which creates some additional ongoing uncertainty.

While the networks do not touch explicitly on the impact of the EU Regulation (and how their proposed solutions will comply) we did note, for example, more focus on air-insulated switchgear

[5] https://sustainabilityfirst.org.uk/blog/tackling-sf6-on-the-electricity-networks/
[6] Came into effect in the EU on 11 March 2024

than was evident when we wrote our report in 2023 which may reflect a recognition that there may be restrictions on the use of some of the alternatives.

Context – ET3 Business Plan Guidance on SF6

At SSMC Ofgem proposed that TOs should include an SF6 strategy as part of their Environmental Action Plans. In the Business Plan Guidance Ofgem said *"TOs should use their EAPs to set out their plans and commitments for reducing the SF6 inventory and emissions from Insulation and Interruption Gases (IIGs) on their networks. This should include:*

• adopting a reduction target for IIG leakage over the course of RIIO-ET3 consistent with their science-based target for the company's BCF;

• minimising new additions of SF6 inventory on the network in RIIO-ET3 ie only in instances where it is the most cost-effective option on the basis of a life cycle assessment;

• economic and efficient interventions to address the worst-leaking existing SF6 equipment on the network; and

• reporting on total IIG leakage using a common TOs' methodology".

In our view the networks have taken a fairly minimalist approach to this requirement.

NGET's SF6 Proposals

NGET have set a high-level target of a 50% reduction in SF6 emissions by 2030 from a 2018/19 baseline and commit to no longer install SF6 where there is a technically, commercially and time viable alternative.

In our Green Grids report we highlighted the very different positions that the different networks are in with National Grid having a much larger, older and hence leakier legacy infrastructure. Our view in the report was that, for them, this rate of reduction, aligned to their science-based target, should not be difficult to achieve. NGET do not quote a leakage rate which would make it easier to compare what they are proposing to achieve against the other networks.

The commitment to no longer install SF6 where there is a technically, commercially and time viable alternative is not much more than a statement of what is required of them, with no real sense of how often this is likely to be the case.

Reducing leakage

NGET's Business Plan includes a request for funding (£ redacted) to deliver physical interventions on existing and anticipated SF6 leaks at sites with the highest risk of SF6 emissions. As a specific example they talk about the leak-sealing solution that they have been rolling out in ET2 and are looking to make more use of in ET3.

Their EAP provides a bit more detail on their SF6 "Emission Abatement Portfolio" which is a continuation of the interventions undertaken in RIIO-T2including continuation of the Palliative Coating strategy; retro-filling 8 substations (with alternative gases); installation of Gas Density Monitoring including remote data access and updates and improvements to SF6 data capture and

emission forecasting; and auxiliary equipment, logistics and training required to enable the transition from SF6 to other gases.

We welcome these proposed actions focussed on reducing emissions, and in particular better asset data and modelling which should enable quicker and better decision making, as flagged in our report.

However, what is lacking is any evidence on the interventions that have proved most effective in ET2, what they have learned about key risk factors the profile of their current asset base and how this has shaped their proposed approach.

This stands in sharp contrast to their 2020 SF6 strategy, produced in response to critical feedback at ET2 Draft Determinations, and their eventual 2022 MSIP reopener application, requesting further funding – both of which we referenced in our Green Grids report.

Indeed, there is no mention of o these documents in NGET's ET3 Business Plan and it is unclear if this previous work is being kept up to date or used to prioritise actions.

We also have a strong sense from our past work that an important factor in reducing SF6 leakage is simply the management attention that is given to it – hence our call for a "laser like focus". We did not get a strong sense through NGET's Plan that there is this level of focus.

We note there is a separate EJP for some of the SF6 investment proposed but only the one page exec summary has been published. In our report we highlighted the importance of sharing learning in this space and as such would have expected the EJP if it contains useful evidence, to be made available.

The use of alternatives to SF6 going forward

NGET claim they have led the way in Great Britain, collaborating with several manufacturers and are currently installing equipment with three new alternative gases: GE's G3 (GWP=345), Hitachi's EconicQ (GWP=675) and Siemens Clean air (GWP <1). While they say they are keen to further reduce SF6 usage, they acknowledge this is dependent on the development and availability of new SF6-free technology by equipment manufacturers. They state that 132kV is now an SF6-free market in UK with Air Insulated Switch Gear (AIS) and Gas Insulated (GIS) products established from the big three European suppliers. For 420kV GIS the position varies for the switches, the busbar and live tank circuit breakers.

This update on the market position is helpful but provides little clarity as to how far NGET really expects to be able to make use of alternatives to SF6 in ET3. They make no reference to the new EU F-Gas Regulation, the impacts that is having and which particular derogations they will be reliant on where they are looking at products with a GWP>1.

They note that for many new substations there will be a broad starting assumption that AIS could be more appropriate for relatively unconstrained rural sites and GIS could be more appropriate for land-constrained sites near to communities. Our reading is that this may be linked to the derogation requirements about market availability. As Ofgem starts to scrutinise individual projects it is important that it understands this context given that AIS and GIS will likely have different costs (and planning issues) and the choices may not always be clearcut.

NGET also say that clear guidance is needed on a standardised methodology for evaluation of whole life costs in comparing alternative solutions, taking account of full life-cycle emissions. This is an issue we pick up in our summary points above.

SSEN Transmission's SF6 Proposals

As we noted in our report, and SSEN acknowledge, they face a very different challenge to NGET with massive growth in their network adding to the bank of SF6 (and hence likely total emissions) unless they can find alternatives.

In their Plan they propose a regulatory target for the IIG of 0.26% in SF6 emissions, maintaining their performance and committing to meet this target every year of T3. They make no explicit commitment around the installation of SF6 alternatives.

In their Sustainability Action Plan (their EAP) they include in the list of deliverables "Develop and deliver an IIG Strategy including targets for SF6 alternatives, leakage rate targets and innovation". This would seem to be an acknowledgment that they do not yet have such a strategy. That said they include within that deliverable a very specific metric of 638.68kg of SF6-containing assets with poor performance removed with a further 30,625.85kg of SF6 benefiting from proactive intervention. There is no further explanation of these highly precise figures.

Leakage rates

Reflecting their newer network – but also a strong focus at corporate level on reducing their carbon emissions – they have achieved what they claim is a sector-leading performance, with leakage rates of installed capacity down from 1.01% at the start of RIIO-T1 to 0.17% in 2024. As noted in our report, part of this reduction was the result of a change in the methodology they used for reporting leakage to align with other networks.

Disappointingly there is very little in the Plan on how this improved performance has been achieved and what more they expect to do in ET3, including, for example, on remote monitoring. Rather they claim that their performance reflects what they refer to as "a zero-tolerance approach to leakage". While we acknowledge that this attitude is an important factor, we would have liked to see more evidence of what this means in practice and how leakage rates vary across their portfolio of assets.

This is important for Ofgem as it looks to set stretching but fair IIG targets for ET3. SSEN are particularly focussed on this issue and concerned about the potential for an asymmetric incentive that leaves them with little scope for reward and the risk of significant penalties. We understand their concern but are equally keen to see them strive for continuous improvement rather than simply maintenance of the status quo. Their proposed target of 0.26% feels unambitious to us, simply reflecting their historic performance, which in turn reflects the weighting of their asset base towards newer assets with lower leakage rates (notwithstanding the risks of early "teething" problems).

Finally, we are also unclear how a target that is expressed as a leakage rate (presumably based on the % volume irrespective of the type of gas?) would be affected, if at all, by the extent to which they are able to employ SF6 alternatives on their network. In the past Ofgem has translated the leakage rates into a volume target for the IIG incentive, taking account of the carbon intensity of the particular gas. This reinforces the need for a much more granular picture of the networks' performance as reflected in the metrics Ofgem listed in its SSMC.

The use of alternatives to SF6 going forward

Like NGET, SSEN also claim to be global leaders in this space having installed the first SF6-free gas insulated switchgear at 400 kV (using GE's G3 - GWP 345) and the world's first SF6-free 420 kV air-insulated switchgear circuit breakers, in partnership with Hitachi. Again, there is no mention of the

EU Regulation and what derogations might be needed to use GIS technology in future. The use of air insulated switchgear is clearly a safer option where there is space.

Equally there is no discussion of the extent to which they actually expect to be able to make use of SF6 alternatives in their very substantial ASTI investment programme in ET3.

On a positive note, they talk at some length about sharing learning internationally through CIGRE and also their partnership approach to innovation, working closely with the supply chain. In our report we had highlighted the importance of this partnership working with the supply chain in developing alternatives to SF6 which is particularly important while the market is in flux and with the scale of the investment needed for Clean Power 2030.

SP Energy Networks – SF6 Proposals

SP Energy Networks (SPEN) commit that SF6 filled equipment will only be installed if a viable SF6-free solution is not available. They will also reduce emissions from SF6 leakage in line with the trajectory required to meet their Science-Based Target (SBT).

These specific commitments simply reflect the requirements that Ofgem set out in its Business Plan Guidance.

That said their Business Plan does include much more granular detail than either NGET's or SSEN's on the specific actions they propose to take and the evidence to support those actions, which we welcome. While still only short these sections of their Plan come much closer to what we would consider as the elements of a proper SF6 Strategy although, for example, there is no historic performance data that would help in judging whether the target leakage rate is sufficiently ambitious.

Leakage rates

In their EAP SPEN include a commitment to reduce SF6 leakage to a rate of 0.33% by the end of T3.

No historical data is provided to put this commitment in context and (as per the comment on SSEN's target above) it is unclear how that measure would be affected, if at all, by increased levels of SF6-free gas on the network.

In terms of the IIG incentive they say they support ambitious targets based on outperforming the rate of reductions necessary to achieve their science-based target but recognising the difficulties in maintaining an ambitious target, given their strong historic performance.

Putting aside the specific target they propose, what we particularly welcome is the evidence that they have done to justify the interventions they propose. For example they have done a thorough analysis of the condition issues affecting circuit breakers, which are specific to the technology type. They highlight wider issues with maintaining some of their older circuit breakers which they are now looking to replace.

They also talk about the work they are doing in ET2 to replace leaking SF6 filled circuit breakers. Building on that, their ET3 plan has identified family types of circuit breakers which are prone to leaking. While those assets are not currently leaking, the evidence is that they will in the near future and SPEN therefore plan to intervene now to avoid leakage.

They also highlight the importance of gas insulated busbars which generally hold large quantities of SF6 and where in the event of a leak, large volumes of gas can be lost. They are therefore looking to replace the gas in the busbars with a gas with a lower GWP and have set a specific target to remove

and retrofill 9,265kg of SF6 from their network. This retrofill approach is one that NGET have been making use of in ET2, as discussed in our report, but SPEN note that retrofill gases are manufacturer and model specific so one gas cannot be used for all applications and there is an element of innovation involved. The replacement gas they propose to use is fluoronitrile which, as we note above, is explicitly banned under the EU F-Gas Regulation. SPEN go to some lengths to emphasise that use of this gas would lead to a 95% reduction in GWP when compared to SF6. We support the case for using retrofill in this way but would still like to be clear how it fits with the new EU Regulation (presumably as a more efficient solution on a whole-life basis, although the methodology for this is unclear). We would also want to be clear around the longer-term availability of gas for top-up given the restrictions in the Regulation (and ongoing discussions at EU level around PFAS).

We were pleased to see SPEN saying that they are working collaboratively with the other TOs to identify potential assets at risk of leakage which we highlight in our summary comments as a message that we would like Ofgem to reinforce.

The use of alternatives to SF6 going forward

As noted above, SPEN's goal is that all assets installed will be SF6-free when viable alternatives are available. They note that the availability of SF6-free technology is continually evolving. They say that they now have solutions for Gas Insulated Switchgear (GIS) at all voltages, but that a challenge still exists for Air Insulated Switchgear (AIS) at 275kV and 400kV although they anticipate that a solution will become available in T3 which they will install. As such this paints a very positive picture of the prospects for SF6-free installations in T3.

Again, no mention is made of the EU F-Gas Regulation and again SPEN seem keen to stress that the alternative gases used in SF6-free equipment lead to at least a 95% reduction in GWP but with questions in our mind still around the derogations that they will be relying on.

PART TWO: LOSSES

In our response to the SSMC, we flagged that we were concerned by the complete absence of any reference to the need to consider electricity losses in transmission.

We were therefore pleased that at SSMD Ofgem strongly reinforced the importance of losses:

*"Losses contribute to CO2 emissions **and higher system costs**. Several factors affect transmission losses, such as the materials and design of the assets on the network (eg the wires and transformers), the distance the electricity has to travel between supply and demand, and the voltage at which the electricity is transported. While these losses are therefore largely the result of ESO decisions regarding specifications and usage of the electricity system, the TOs also have some ability to impact transmission losses, eg through asset procurement and network design".* (emphasis added)

Ofgem noted that at ET2 the TOs each included a Transmission Losses Strategy in their business plans, and were required to incorporate transmission losses into their EAPs and report annually on transmission losses as part of their AER.

ForE T3 Ofgem said they would specifically target this area in their business plan assessment and provide comment on it in their Draft Determinations. We hope that they will honour this commitment.

Having now reviewed the ET Business Plans our view is that:

- **The Plans fall a long way short of responding to the challenge that Ofgem set out in SSMD** on losses. In all cases losses continue to be seen simply as an element of scope 2 emissions with the carbon impact expected to reduce anyway through ET3 as the grid decarbonises. There is **no acknowledgment of this as a system cost** (ie the higher losses are the more capacity that will need to be built to meet Clean Power 2030).
- We recognise that in almost all cases the TOs impact on losses will come through BAU investments, where replacing older equipment with newer will have a positive impact on losses. However, it is important that in considering technology options the TOs take full account of the impact on losses. As we set out in our response[7] on the ED3 Framework consultation **Ofgem needs to set out how the whole system benefits of reducing losses can be taken into account in the CBA** when investment decisions are being made - and not simply the carbon impact.
- One of our calls has also been for a proper **dialogue between NESO and the TOs** on building a better understanding of losses. Overall transmission losses are around 2.5%[8]. However because losses increase with the square of demand the level of **losses will be higher at peak times** and hence **the impact on system capacity requirements** (ie the amount of generation and transmission capacity required longer term) could start to be material. Understanding where and when losses are occurring (with the better data that is now available across the system) is key to identifying what actions NESO or the TOs might take to contain them. We would welcome Ofgem reiterating this message on the need for joint working.
- Linked to this we have **a concern that the NESO also plays down its role** – "*It is difficult for NESO to forecast future losses because many of the above factors are outside its control. Generally losses are very sensitive to the geographic generation pattern, and small changes in the north / south balance can have a significant impact on the overall transmission loss volumes from day to day and year to year."*[9]. While we clearly do not expect the NESO to optimise the system for losses, we would expect it to be a consideration in the decisions it takes and would hope that Ofgem will reinforce that message. With the challenge of the increased generation and transmission capacity needed to deliver Clean Power 2030, even small reductions in the level of losses could be important.
- At present the formulation that the networks use is that they will "contribute to the evidence base on the proportion of losses that we can influence or control". As drafted, this feels like them looking to provide the evidence that this is not their responsibility.
- While the networks all purportedly had **losses strategies** at ET2 (and SPEN makes reference to a losses strategy as an annex to its ET3 Plan) we have not been able to locate them. Assuming they are publicly available they **should be properly signposted**.

In terms of the individual Plans we would note:

NGET – As is common across all the TOs, NGET solely view losses through the lens of their Scope 2 emissions. They have a target to reduce these emissions in line with their science-based target but note that they use the National Energy System (NESO) Future Energy Scenarios to forecast transmission losses, as these emissions will vary depending on the speed of decarbonisation.

They say their losses strategy efficiently manages losses on their network over the long-term, for example how transmission losses are factored into equipment specifications and procurement

[7] https://sustainabilityfirst.org.uk/wp-content/uploads/2025/01/sustainability-first-ed3-consultation-response.pdf
[8] ESO report overall losses – here. Transmission losses in 22/3 amounted to 8.2TWh.
[9] https://www.neso.energy/data-portal/transmission-losses

processes for cables, overhead lines and transformers. However, if they only take account of the carbon impact of losses in their procurement choices, they may well be rejecting options that would deliver net benefits in terms of whole system cost savings.

They note that the emissions occurring due to these losses are calculated using the average carbon intensity of electricity across the electricity system. As flagged in our response on the ED3 Framework this will understate the carbon impact given that most losses occur at peak times when the carbon intensity is higher. We would encourage Ofgem to talk with DESNZ about a more accurate way of reporting the carbon impact (and also assessing the benefits of marginal savings).

In their EAP they commit that by 2031 they will "Implement a strategy to efficiently manage both technical and nontechnical energy losses on our network". This feels like a line added simply to provide a tick against an Ofgem requirement. They should already have a strategy and be implementing it.

SSEN Transmission – There is no reference to losses in the main Business Plan. In their Sustainability Action Plan (ie their EAP) they commit to "reduce the carbon intensity of our transmission losses by 50%". The framing of this in terms of carbon intensity (rather than carbon emissions) is unique to SSEN[10] but either way reflects the fact that losses are seen purely through a carbon lens not as a whole system cost.

They note that losses are considered in broader decision making and therefore no costs are included in this part of the Plan. This is as expected but reinforces the point about the need to ensure the whole system costs are properly taken into account when procurement or other decisions are being taken.

They say they will contribute to shared evidence where possible and appropriate, noting that their network has little to no control over transmission losses.

SP Energy Networks – There is no reference to losses in the main Business Plan. However, their EAP does include more detail on the steps they are taking on losses than either NGET's or SSEN's and they reference a separate Losses Strategy which we were unable to locate.

In their EAP they commit to reduce losses on the network by an estimated 4,781 MWh compared to what would otherwise be the case. We note that this is only around a third of the reduction they committed to (and are on track to deliver) in T2, with no explanation given. They note that there is no direct cost related to losses reductions which simply arise because older, high-loss assets are being replaced due to age and condition and the replacement assets will have lower loss rates. The EAP is clear exactly which assets this applies to (13 transformers, 1 shunt reactor as well as overhead lines and cables). This detail gives us confidence the losses impacts are being considered as part of their wider asset management strategy. However, they talk about reducing losses "*where this is economic and provides benefit to customers*" which reinforces again the need to properly value the whole system benefits as part of Ofgem's CBA framework.

They also say they expect losses to increase in ET3, but are undertaking positive interventions to reduce losses to a lower level than they otherwise would be. Specifically, they expect an increase in losses of approximately 340,657MWh in ET3 as a result of heavier utilisation of existing and new assets to accommodate the significant growth in renewable generation. We recognise that the

[10] SSEN are also unique in being able to count losses as Scope 3 emissions

increased utilisation will drive higher losses but for us this makes it all the more important that there is a proper focus on the issue.

They say they will continue to work to understand the proportion of losses that they can influence and control.

Overall, they say their Scope 2 emissions are forecast to decrease by 72% by the end of ET3 compared to a 2018/19 baseline and that this level of reduction is largely driven by the decarbonisation of energy, which affects the GHG emissions from losses.

We hope that our reflections on these two specific aspects of the ET3 Business Plans are helpful and would be happy to discuss them further.

Yours faithfully

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