



Annex 15:

6.6/11kV Transformer (GM)



Scottish & Southern
Electricity Networks

Powering our
community

Contents

Executive summary	3
Ofgem EJP Feedback	4
Treatment of ENWLs Smart Street CVP	5
Our RIIO-ED2 Deliverability Strategy	8
Impact of Ofgem's DD Position	10

Executive Summary

The purpose of the document is to supplement the evidence provided within the 6.6/11kV Transformer Engineering Justification Paper (EJP), **308_ SSEPD_NLR_HV_TRANSF**, and to respond to the concerns Ofgem have highlighted with our proposed cost and volumes.

The EJP is currently classified by Ofgem as “Partially Justified”. This document sets out our understanding of why this position has been taken and our response to these concerns. In summary, the concerns associated with this EJP correspond to our proposed plans to deploy an LV On-Load Tap Changer (LV OLTC) equipped transformers when replacing ‘end of life’ 6.6/11kV Transformers (GM).

This technology has been built into our RIIO-ED2 business plans primarily because of the significant customer benefits associated with the real time management of voltage across the LV network. The technology has been proven to directly lower customer energy bills which is becoming increasingly important as society looks to decarbonise the energy system. It does this through a principle known as Conservation Voltage Reduction (CVR) which has been proven to significantly reduce customers electricity bills by supplying a voltage which allows home appliances to operate more efficiently. This functionality has become more relevant given the rising cost-of-living crisis and the need to better protect vulnerable and fuel poor customers.

Ofgem EJP Feedback

Ofgem have provided SSEN with the following feedback on our 6.6/11kV Transformer (EJP). The sections highlighted in bold show the key concerns with this EJP:

“The needs case is considered justified and the proposed interventions are CNAIM driven based on annual inspection of all HV GMTs. A CBA justifies rollout of LV OLTC with phased rollout preferred. The unit cost therefore reflects assumed 47.6% replacements with LV OLTC over ED2 - starting low, ramping up to 80% all replacements end ED2. There is some risk related to the outrun percentage of replacements with LV OLTC over ED2, hence we consider partially justified.”

As a result, we understand Ofgem’s concerns and the subsequent response to our submitted costs and volumes to be as described below:

- Ofgem has accepted our proposed volumes of conventional 6.6/11kV Transformer (GM) volumes within the CV7 disaggregated benchmarking.
- Ofgem has disallowed the blended unit cost we have proposed for the LV OLTC equipped 6.6/11kV Transformer (GM) asset category in CV7a entirely preventing us from deploying this technology during RIIO-ED2.
- Ofgem has taken this approach because they believe there is some risk related to our ability to meet the volumes of the LV OLTC variant we have proposed within the EJP.
- Ofgem believe there is risk because this is a new innovation technology that we have not deployed as business as usual in previous price controls.

We do not agree with Ofgem’s assessment here and believe there is a need to reassess their response regarding this feedback as it is in complete contrast to the assessment of the benefits, incremental cost and how the same technology has been assessed for another DNO proposing the whole scale deployment of this technology. This disproportionate approach to SSEN’s proposal is covered in more detail within the sections below which provide our response to each of these areas of concern with supporting additional evidence we believe will assist Ofgem in reviewing the current position and help to reclassify this EJP as “Justified”.

Treatment of ENWLs Smart Street CVP

We are pleased to see that Ofgem has accepted ENWL's Smart Street CVP and agree in principle with Ofgem's decision to fund the activity as part of the CV2 baseline. We are strong advocates for the Business as Usual (BAU) deployment of innovations that have been funded during RIIO-ED1 via customer funded mechanisms such as the Network Innovation Allowance (NIA), Network Innovation Competition (NIC), and Innovation Rollout Mechanism (IRM).

It is critical that Ofgem funds the BaU deployment of innovation projects that have demonstrated a strong business case for network customers if they are to see a return on the investment made by funding these various innovation projects.

However, we have a number of concerns regarding the inconsistent treatment of SSEN's own plans to deploy the same Smart Street technology, which has been rejected by Ofgem despite a significantly lower financial ask both in terms of unit cost and total cost.

We note, that ENWL have proposed to replace 1,000 existing 6.6/11kV Transformers (GM) with transformers equipped with LV On Load Tap Changers (LV OLTC). This is in addition to the 350 transformers they requested to replace due to condition (CV7a) and the 455 transformers they intend to replace due to Load growth (CV2). **In total, this equates to 1,805 6.6/11kV Transformers for a single license area.** By comparison, **SSEN has proposed a total 1,321 6.6/11kV Transformer replacements** across both Load (CV2) and Non-Load (CV7) for both SHEPD and SEPD. This volume is also inclusive of the 435 LV OLTC we have proposed to deploy during RIIO-ED2.

Consequently, it appears there is a high risk of significant double count in the Smart Street CVP volumes, particularly if any 'end of life' transformer is replaced with the LV OLTC variant as we would expect. We would ask Ofgem if the proposed volumes across these three investment drivers have been coordinated by ENWL to prevent any double/triple counting of volumes?

From a cost perspective **Ofgem are proposing £72m of funding to allow ENWL for these 1000 LV OLTC** and the associated LV equipment (monitoring and switching devices) built into the Smart Street CVP. This equates to a unit cost of **£72,000 per deployment**. From the CVP document it is unclear how ENWL has arrived at this unit rate or how Ofgem has assessed this to be value for money for network customers.

In total, Ofgem has now awarded ENWL £18m in RIIO-ED1 via the Innovation Rollout Mechanism (IRM) for 180 sites (£100k/site), £8.4m for the initial LCNF funding, and now £72m in RIIO-ED2. **This equates to £98.4m of customer funding that has not been made available to other DNOs.** We believe that given the significant customer funding already allocated to the development of this technology it is now time to build the costs associated with this technology into the baseline ask without relying on bespoke funding mechanisms and innovation funding.

We believe that our plans for the LV OLTC technology represent better value for money for network customers than the £72m allocated to ENWL by Ofgem. Rather than requesting a bespoke output for RIIO-ED2, we have built this innovation into our CV7a baseline. The approach was chosen so that the technology can be deployed efficiently when our existing transformers reach the end of their life. This means we only ask customers to fund the incremental costs over and above the costs to replace a conventional transformer when it reaches an end-of-life condition. It also means that unlike ENWL SSEN will maximize the lifetime of our existing assets and will not replace Transformers in good working condition before there is a need to do so.

Despite the £98.4m of funding awarded to ENWL and the strong signals from Ofgem that this technology should be funded and is in the interest of customers, SSEN has not been allowed the funding required to deploy the same technology during RIIO-ED2. **As a comparison SSEN have requested an incremental cost of only £6.5m for both SHEPD and SEPD** over and above the replacement unit

cost for a conventional 6.6/11kV Transformer (GM) to deploy the technology on 435 sites in ED2. **This is a unit cost of £15,000 compared to ENWLs unit cost of £72,000.**

Ofgem have taken this position despite the NIC/NIA funding governance which requires DNOs to share the learnings associated with customer funded innovation projects such as Smart Street. For SSEN to adopt the learnings associated other DNO's innovation projects Ofgem must be prepared to fund the BaU deployment of these innovation across all DNOs, not just the DNO that has undertaken the initial innovation project – in this case ENWL.

Ofgem has provided very little explanation to justify why this decision has been reached and when asked in a direct Response SQ (**SSEN007**) from SSEN would not comment on why the Smart Street CVP has been accepted and built into the CV2 baseline as a bespoke output whilst our own CV7a incremental costs have not been allowed.

SSEN are prepared to engage further with Ofgem on this topic but unfortunately this has not progressed successfully during the Draft Determination response window. A reverse SQ (**SSEN007**) was raised to allow us to better understand why plans to deploy the LV OLTCs had been rejected by Ofgem and if an alternative approach such as a PCD or CVP would be preferred by Ofgem.

The **SQ was raised on 7 July 2022** with an initial targeted response date of **13 July 2022**. However, Ofgem did not respond to this SQ although requested to do so until **15 Aug 2022**, effectively timing out SSEN's ability for any further response or further adapt our Draft Determination response.

As quoted below, despite the extended timescales the SQ response provides little guidance to explain why ENWL's CVP has been accepted whereas SSEN's has been rejected or what alternative funding approach SSEN should take to enable our proposed deployment of the LV OLTC technology during RIIO-ED2.

"Our deliverability concern is centred on the unit rate for the OLTC being higher than the nominal TX unit replacement.

We consider CVP and Price Control Deliverable (PCD) proposals as part of DNO business plan submissions and assess these proposals in line with the criteria in our Business Plan Guidance. Where we propose to accept a DNOs proposal for a CVP or PCD, we were satisfied that the DNO had provided sufficient evidence and information to demonstrate the necessary consumer benefit. We do not intend to comment on any submission relating to another DNO as part of our SQ process. If SSEN is seeking justification for LV OLTC technology, we require SSEN to set out a sufficient level of justification to inform any PCD proposal.

Incremental costs were considered as part of a wider review of the RIIO-ED2 unit costs."

As described above our proposed incremental costs for the LV OLTCs are significantly lower than the unit cost accepted by Ofgem for ENWLs Smart Street CVP (£15k vs £72k). As such, it is entirely unclear how Ofgem can have "deliverability concerns centred on the unit rate" regarding the SSEN Business Plan on these assets or claim to have considered the incremental costs as part of a wider review of the RIIO-ED2 unit costs when rejecting our proposed CV7a unit cost for 6.6/11kV Transformers (GM) and accepting ENWLs Smart Street CVP.

We strongly disagree with Ofgem's decision to not allow our LV OLTC incremental costs we have requested through the CV7a baseline unit cost for 6.6/11kV Transformers (GM). We believe this decision will limit the benefits arising from investment made by network customers to fund the various Smart Street projects by preventing us from deploying the technology at all during RIIO-ED2. The decision is particularly damaging for network customers given that the technology has been proven to directly lower customer energy bills during the on-going cost of living crisis.

We also believe the decision contradicts Ofgem's position on the Smart Street CVP particularly given that SSEN have requested only £6.5m compared to the £72m awarded to ENWL.

Ofgem has stated that there are deliverability risks associated with our LV On Load Tap Changer (LV OLTC) plans (as described within our 6.6/11kV Transformer EJP) because we do not have a strong historic track record of deploying this technology. As a result, Ofgem has disallowed 100% of the additional funding we have requested to deploy this technology completely thus preventing the BaU deployment of this innovation across SSEN's network during RIIO-ED2.

This deliverability risk is recognised as the normal case prior to the wide-scale deployment of any innovation or new technology. Ofgem must be prepared to fund innovations with a proven business case despite a lack of previous large-scale deployment. The consequences of not providing this financial support is that customers will not see the return of the investment described when funding the various innovation projects that have taken place during RIIO-ED1. Ofgem has also removed the Innovation Rollout Mechanism (IRM) going forward preventing SSEN from building a substantial delivery track record prior to asking for baseline funding to do so.

As such, in summary we are supportive of Ofgem's decision to accept ENWL's Smart Street CVP as a funded activity (with no reward) although have serious concerns on the volumes proposed and the total funding requested. We would also like to encourage Ofgem to revisit its decision to disallow the baseline funding requested by SSEN to deploy the same technology to ensure that both our proposal and ENWL's CVP are treated consistently. We do not agree that one proposal can be accepted, whilst the other is rejected for the deployment of the same innovative technology at a lower cost (only 21%, £15k of the ENWL's £72k cost) to network customers.

Our RIIO-ED2 Deliverability Strategy

We have confidence in our ability to deliver the proposed volume of 6.6/11kV transformer (GM) replacements for the following reasons:

- We have proactively engaged with the supply chain including suppliers of the LV OLTC technology. We have also taken learnings directly from ENWL's Smart Street innovation project.
- We are proposing a steady ramp up in volumes throughout RIIO-ED2
- Overall, our 6.6/11kV Transformer (GM) volumes are significantly lower than the volumes delivered in RIIO-ED1, and the installation of the LV OLTC is not significantly different from a conventional fixed tap 6.6/11kV Transformer (GM).

Recent Track Record

The table below shows the volume of 6.6/11kV Transformers (GM) that we plan to deploy during RIIO-ED2 compared to volumes from the last 5-years of RIIO-ED1 as a good indicated of our current delivery capability.

Table 1: RIIO-ED1 vs RIIO-ED2 volume comparison

License Area	ED1 Volume	ED2 Volume	Change (%)
SEPD	945	532	-43.7%
SHEPD	341	382	+12.0%
SSEN	1,286	914	-28.9%

As per Table 1 across both licence areas the total volume of replacement 6.6/11kV Transformers that we will look to replace due to condition is down by 28.9%. There is a small increase in SHEPD of 12%. This increase is driven by our Network Asset Intervention Methodology (NAIM) and the corresponding Health Score intervention Criteria (HSIC) as described within the EJP.

As a result, we are confident that we have the ability to deliver the proposed volumes of 6.6/11kV Transformer (GM) replacements planned for RIIO-ED2 including our plans to replace a proportion of these end-of-life transformers with the LV OLTC variant.

Ramp Up Proposal

However, we recognise that there will be a (albeit manageable) learning curve when deploying this innovative technology at scale for the first time. This why we have proposed a steady ramp up of the LV OLTC volumes throughout RIIO-ED2 starting from only 5% of the 6.6/11kV Transformers scheduled for replacement and increasing to 80% by the final year of RIIO-ED2.

We believe this conservative approach together with the preparation we have undertaken so far (included the described supply chain engagement) gives confidence in our ability to deliver the volumes associated with the LV OLTC variant volumes.

Table 2: Phased RIIO-ED2 deployment of LV OLTCs

	2024	2025	2026	2027	2028	Total
Number of end-of-life HV Transformers	149	179	194	196	196	914
Percentage replaced with LV OLTC	≈5%	≈20%	≈50%	≈70%	≈80%	≈47.6%
Number of standard replacements	165	137	91	54	35	479
Number of LV OLTC replacements	18	47	91	130	149	435

Supply Chain Engagement:

When preparing our RII0-ED2 plans for this asset category our procurement team undertook an engagement exercise with the supply chain to identify suppliers that can provide the technology and to better understand the impact of this technology on the CV7a unit cost. This engagement has given us confidence that the proposed volumes can be facilitated by the supply chain and that our proposed unit cost is sufficient to enable the deployment of the LV OLTC variants.

Impact of Ofgem's DD Position

As described above, Ofgem's decision to reject the incremental funding required to deploy this technology during RIIO-ED2 means that we will not be able to fund the deployment of this technology at all during RIIO-ED2. This will negatively impact our network customers in particularly the vulnerable and fuel poor customers that this technology will have been targeted at. The impact of this decision has become more severe given the growing cost of living crisis and the increases in energy prices for customers.

As a reminder the Figure below shows the expected benefits for network customers if the LV OLTCs were to be deployed during RIIO-ED2. Further details on these benefits can be found in the EJP.

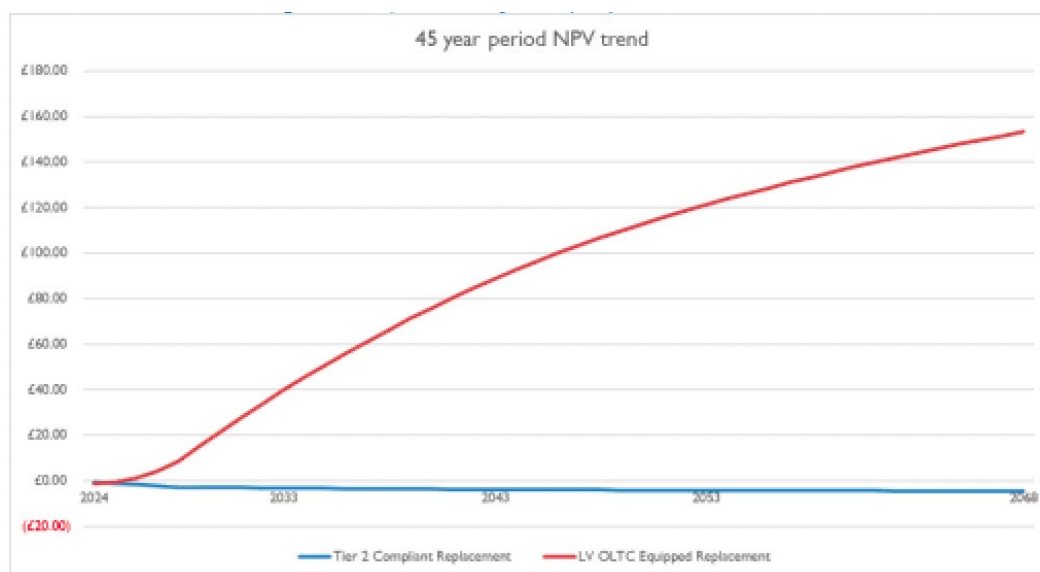


Figure 1 – 6.6/11kV Transformer (GM) CBA Results – SEPD

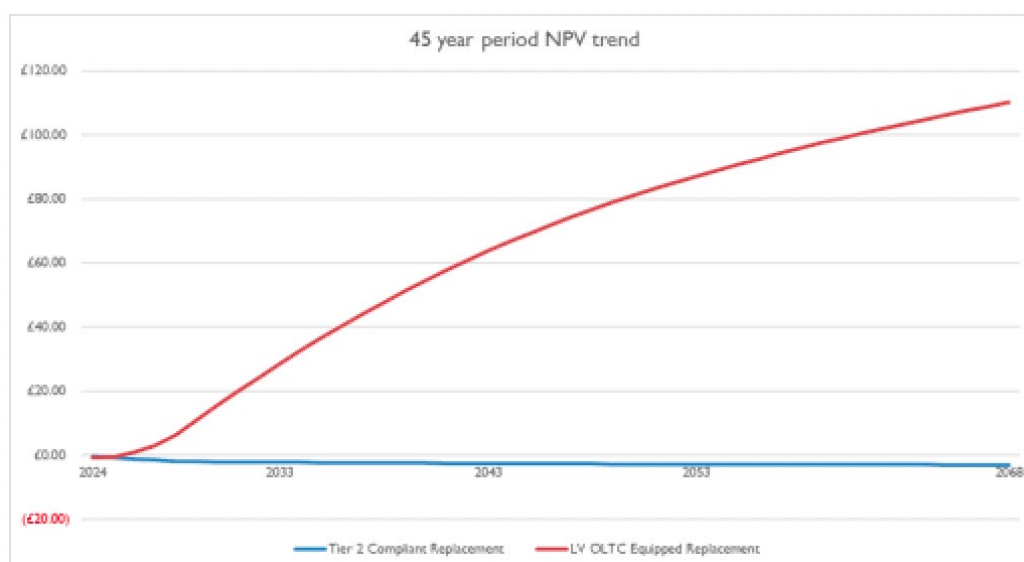


Figure 2 – 6.6/11kV Transformer (GM) CBA Results - SHEPD