Annex 15:
Tree Cutting

Scottish & Southern Electricity Networks

Powering our community

Contents

Executive Summary

This document complements the Tree Cutting Engineering Justification Paper (EJP) ***(324_SSEPD_NLR_TREES)*** prepared as part of SSEN's RIIO-ED2 business plan submission. More specifically, the document provides additional evidence to address the concerns raised by Ofgem within the RIIO-ED2 Draft Determination.

This document should be read together with our response to the Draft Determination Tree Cutting core methodology question which provides our position on the cost assessment and disaggregated modelling methodology used to assess our Tree Cutting cost and volumes.

The purpose of this document is to provide the additional evidence required so that the corresponding EJP can be assessed as "Fully Justified" by Ofgem and our proposed RIIO-ED2 costs and volumes requested within CV29 can be allowed within the subsequent disaggregated modelling.

Ofgem EJP Feedback

Please see Ofgem's Draft Determination feedback on our RIIO-ED2 Tree Cutting EJP quoted below. The key concerns have been highlighted in bold.

*"We are supportive that there is an ongoing need for tree cutting. The EJP requests funding for a LiDAR survey in 2025 and Ash dieback surveys in 2024/25. LiDAR surveys will be undertaken over the entire OHL asset base within ED1 with SEPD run and analysis of data complete. SHEPD LiDAR flight was undertaken in 2021 and data to be complete in 2022**. LiDAR is repeated again in 2025 SEPD, 2026 SHEPD (every 4 years)**. Ash dieback surveys are considered justified to inform ash dieback cutting UM. **We consider that the next LiDAR surveys due to be undertaken in 2025 and 2026 will better inform future volumes**. There is therefore **a potential risk in the proposed volumes until the next LiDAR flights are complete**. **Future volumes will then be more accurate**. **SHEPD volumes could change following LiDAR data that maybe available prior to FD**. Hence, we consider the **EJP to be partially justified."***

Consequently, our understanding of Ofgem's concerns with our EJP are as follows:

1. Our proposed tree cutting volumes are not fully justified because Ofgem believes there is a risk that the next cycle of LiDAR surveys scheduled for 4-years after the last may provide a different intervention volume.
2. Ofgem considers there to be risk with our SHEPD volumes because the data arising from our 2022 LiDAR survey (the second LiDAR survey of SHEPD) was not available prior to the final submission.
3. Our submitted unit costs have not been accepted and the industry median unit cost has been awarded for both SHEPD and SEPD calculated against "spans affected"

Our response to this feedback is provided below in each of the following sections.

Justification of Proposed Volumes

The LiDAR data used to inform our RIIO-ED2 tree cutting volumes provides a detailed 3D model of our entire overhead line network. The data shows the exact location of each tree that grows alongside our overhead line network and the exact distance of these trees to our overhead line assets. We have 100% coverage of every single span that makes up our overhead line network and can demonstrate the affection of each of these spans directly if required.

The images below **show two examples of the quality of our current LiDAR data** and the detailed visibility it gives to our Tree Cutting and Asset Management teams. **The first example** shows the 3D model that is generated using our LiDAR data and the location of each tree alongside the spans. We have this level of data for every single span that makes up our overhead line network.

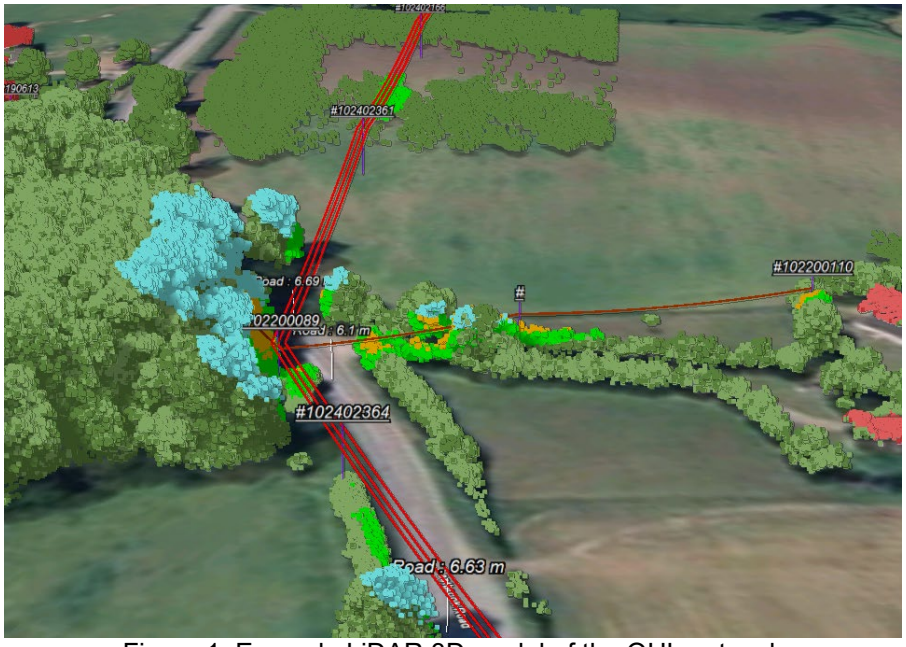

Figure 1: Example LiDAR 3D model of the OHL network

The second example shows the safety benefits associated with the LiDAR data. In this example the LiDAR data has identified a 33kV pole that has been damaged and is leaning severely towards the ground leaving the conductor dangerously close to the ground. As demonstrated by the images, this pole is located is an extremely rural location so it is unlikely that this pole would have remained undiscovered until it either resulted in an outage or until the circuit was next scheduled for inspection. The LiDAR data allowed us to intervene much sooner and make this circuit safe.

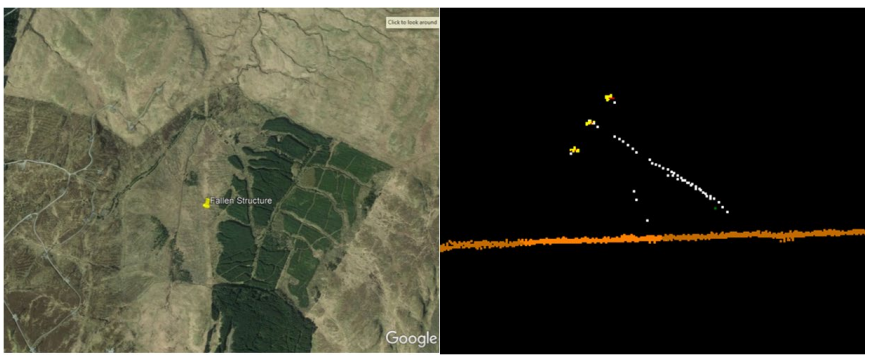

Figure 2: 33kV Leaning Pole Discovered using LiDAR

The **primary driver for this intervention is the safety** of our overhead line network for both the public and our employees. It is therefore critical that we are allowed to intervene upon the volume of spans we have identified within our submission. Given our access to the LiDAR data described above, we now have a precise understanding of exactly how many "spans cut" are required during RIIO-ED2 to maintain the compliance of the network with mandatory Health & Safety Executive (HSE) legislation (ESQCR).

For SEPD we used the results from our 2021 LiDAR survey to inform our proposed RIIO-ED2 volumes. This is the second LiDAR survey that we have undertaken of our SEPD network providing us with a much greater understanding of the affection level of our overhead line spans. Since the first LiDAR survey was undertaken, we have learned a great deal on how to accurately use this data to drive an efficient tree cutting programme.

Meanwhile **for SHEPD**, **our RIIO-ED2 "spans cut" volumes were based upon a combination of our first LiDAR survey undertaken for SHEPD in 2017 and the data that has since been collected each year from our in-person inspection programme**, reported as 'spans inspected'. Given that we have continued to manually inspect our SHEPD licence area since the first LiDAR flight was undertaken in 2017, we believe we have an excellent understanding of the affection level across the network and the intervention volumes that will be required during RIIO-ED2. However, since the final submission we have finalised our 2022 LiDAR survey of SHEPD. The results of this survey are presented later within this document.

Future LiDAR Surveys

As quoted above Ofgem has highlighted concerns that our current LiDAR data cannot be relied upon as justification of the volumes we have proposed for RIIO-ED2 because another cycle of LiDAR surveys will be undertaken 4-years after the last.

We **disagree** within this conclusion and believe it is contrary to the position that the latest and best available data should be used by DNOs to inform their RIIO-ED2 submissions. The idea that current LiDAR inspection data cannot be used to justify our RIIO-ED2 volumes because a future LiDAR inspection may provide a different answer is not a credible argument to make. This is a circular argument given that in 2025 and 2026 the same argument could be made again about the next set of LiDAR surveys that would be scheduled for 2029 and 2030. This position would effectively mean that we could never justify our CV29 volumes because at all times there will be a future LiDAR survey scheduled for 4-years after the previous.

As described above, we now have 2 LiDAR surveys undertaken across both SHEPD and SEPD. We have developed a strong understanding of the data and how to use it effectively to drive an efficient tree cutting program. We also feel the current data provides an excellent and precise view of the affection level of our network and the intervention volumes that will be provided during RIIO-ED2.

This view is also held by Ofgem in its assessment of the approach taken by other DNOs for OHL clearances. For its assessment of Overhead Line Clearances as described within Ofgem's RIIO-ED2 Core Methodology document Ofgem has stated the following:

"We propose to accept the other DNOs' submitted volumes, based on the submitted supporting documents which detailed their volume forecast methodology. In this respect, we note that most DNOs have based their forecasts on previous volumes ***or have introduced the use of LiDAR into their inspection regimes which ensures greater data accuracy****."*

We believe this is a clear contradiction and proves that our existing LiDAR data can be used to justify the CV29 tree cutting volumes we have proposed and our EJP should not be considered as "Partially Justified" on this basis.

SHEPD LiDAR Data

As described within our Tree Cutting EJP, our SHEPD intervention volumes (spans cut) are based upon a combination of both the 2017 LiDAR survey that was completed and the in-person inspection data that has been collected each since.

Given that we have continued to manually inspect our SHEPD licence area since the first LiDAR flight was undertaken in 2017, we believe we have an excellent understanding of the affection level across the network and the intervention volumes that will be required during RIIO-ED2.

However, since the final submission we have finalised our 2022 LiDAR survey of SHEPD. The results of this survey are presented in the table below. Table 1 below shows the number of affected spans at each voltage level that need to be maintain over our 4-year tree cutting cycle compared with the volumes submitted within our final CV29 business plans:

Table 1: Comparison of SHEPD "spans cut" submitted vs volume required using 2022 LiDAR data

Voltage Level	No. of affected spans (FD)	No. of affected spans (2022 LiDAR data)	Change (%)
LV	11,633	14,715	+26.5%
HV	17,286	18226	+5.4%
EHV	3,974	4500	+13.2%

SEPD Unit Costs

Our LiDAR data has allowed us to better understand the density of trees alongside our overhead line network and the percentage of spans that are considered either Red, Amber or Green. This classification is a direct indication of the amount of physical tree cutting that is required on each span, and the justification of our higher unit cost in SEPD, as per our final plan BPDTs. If desired, this data can be used to be compared to the cost incurred by each DNO where LiDAR data has been collected.

When comparing our SHEPD and SEPD distribution networks we can see that SEPD has a much greater proportion of spans that are classified as 'Red'. This reflects the must faster growth rate that our southern network experiences when compared to Scotland and other parts of the country. Historically we have managed the volume of affected spans in SEPD over a 4-year tree cutting cycle.

However, as a result of the faster growth rates we have learnt that a 4-year tree cutting cycle drives a higher unit cost per span given that more physical cutting is required when we revisit each span. Please see a table below which shows the percentages of Red, Amber, Green spans in SHEPD compared to SEPD. As seen, our SEPD area has a much greater proportion of 'Red' spans that are more costly to intervene upon.

Table 2: The percentage of spans classified as Red, Amber, Green in SHEPD vs SEPD

Voltage Level	SHEPD Split of Affected Spans			SEPD Split of Affected Spans		
	Red	Amber	Green	Red	Amber	Green
LV	**15.6%**	42.4%	42.0%	**56.8%**	13.0%	30.2%
HV	**12.3%**	25.5%	62.1%	**27.0%**	26.7%	46.3%
EHV	**11.8%**	10.0%	78.3%	**29.1%**	13.2%	57.6%
132kV	-	-	-	**30.9%**	30.2%	39.0%

It is for this reason that we intend to move to a 1-in-3-year tree cutting cycle for SEPD from the start of RIIO-ED2. However, until the first cycle is complete, we will still experience a higher unit cost due to the faster growth rate in the South of England and the additional cutting that is required.

As such, **we believe that the industry median unit cost is not appropriate for SEPD** due to the additional tree cutting that is required on each span when compared to other parts of the country. We believe that this regional difference should be reflected directly within the unit cost we are awarded for RIIO-ED2.

The LiDAR data shown in the table above also supports the independent data provided with the ADAS report that complements our Tree Cutting EJP as quoted below:

"Overall, the burden of managing the potential risk to the OHL network from trees in the SSE (Southern) region can be expected to become more complex, time consuming and costly as climate change continues to cause the region to experience warmer and drier conditions. The relatively high number of trees across the region, particularly of those species which are already being affected by known pests and pathogens, represents a larger responsibility for the DNO in terms of monitoring and cutting of trees when compared with the other DNOs in the UK."

"The SSE (Southern) region experiences the highest average USD (growth rate) at baseline. This will likely also continue to be the case into the next decade according to UKCP18 climate projections."

Tree Cutting Core Methodology

We do not agree with the core methodology Ofgem has used to assess each DNOs CV29 Tree Cutting costs and volumes. Our main objection to the methodology used is the use of ‘spans affected’ within the benchmarking and the exclusion of our LiDAR informed volumes. We also disagree with the decision to benchmark the costs associated with ‘spans cut’, ‘spans inspected’ and our LiDAR costs collectively against ‘spans affected’.

Our full response to the core methodology including the reasons why we disagree with the approach taken and our alternative view on how the Tree Cutting submissions should be treated is captured in Core-Q97.

Ash Die Back

We do not agree with the core methodology Ofgem has used to assess each DNOs CV29 Tree Cutting costs and volumes. Our main objection

In the Draft Determinations Ofgem has rejected the bespoke Uncertainty Mechanism that we proposed for Ash Dieback. Our full response to this decision is captured within SSEN-Q8 and Core-Q97.

However, we have calculated the potential incremental cost range associated with Ash Dieback. If the proposed uncertainty mechanism is rejected, we will need to work further with Ofgem prior to the Final Determination to establish an alternative CV29 baseline which fairly accounts for the scale of the potential risk for SSEN and our network customers.

The estimated cost range is provided below. The full calculations which underpin each of these scenarios are set out in detail within **SSEN-Q8.**

Table 3: Potential Ash Dieback Incremental Costs

	M13 Value (£m)	Very Low (£m)	Low-Mid (£m)	Mid-High (£m)	High (£m)	Very High (£m)
SEPD	38.0	52.0	98.9	157.5	225.5	307.6
SHEPD	10	11.2	16.1	26.0	31.0	31.0
SSEN	**48.0**	**63.1**	**115**	**183.5**	**256.5**	**338.6**