Energy Networks Innovation Process

Project Closedown Report Document

Date of Submission:	25/07/2025

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Project Title (*This cannot be changed once registered*)	Project Reference
New Approach to Losses	NIA_SSEN_0068
Funding Licensee(s)	**Project Start Date**
Scottish and Southern Electricity Networks Distribution	September 2023
Project Duration	**Year**
1 year and 2 months	2024-2025
Nominated Project Contact(s)	
Tim Sammon, Innovation Programme Delivery Manager at SSEN	

1. Scope

The project will investigate the accuracy of the current losses apportionment methodology by using a new approach to calculate and apportion network losses. If the current model is found to not be accurate, then the project will create a new losses apportionment methodology, underpinning engineering models and prepare them to a standard where they can be submitted to Elexon for approval.

It is not envisioned that this project will produce net benefits to customers as a whole, some customers will benefit from a lower apportionment of losses while others will have a higher level. However, it may result in a more equitable process for the apportionment of losses across all network users.

2. Objective(s)

The objectives of the project are to

1. Calculate losses on the SHEPD network using a new approach.
2. Compare the results with those from the newLAF model.
3. If required, construct a new losses apportionment methodology along with supporting engineering model.
4. Gain internal approval for submission to the BSC Panel, for the new methodology (if required).

3. Success Criteria

The project will either demonstrate that the current losses apportionment methodology produces accurate results or it will produce a new methodology that will gain internal approval for submission to the BSC Panel for the project, if either of these points are achieved the project will be a success.

4. Performance compared to the original project aims, objectives and success criteria

Details of how the Project is investigating/solving the issue described in the NIA Project Registration Pro-forma. Details of how the Project is performing/performed relative to its aims, objectives and success criteria.

As electricity is transported across the distribution network some of it is lost. The volume of lost electricity is apportioned across network users according to their responsibility for those losses. The current losses apportionment model, 'newLAF', was created in 1995 when distribution networks were almost entirely demand based systems. As more generation connects to the distribution networks, regions such as SHEPD are becoming increasingly generation dominant with periods of net export to the transmission network. There is an emerging risk that the current model was not designed for this background. This project proposes to develop a new losses apportionment model and supporting engineering models using best available data to ensure the apportionment of losses across network users remains accurate and fair.

Further details of the project are in Section 9 below, but in summary

1. Calculate losses on the SHEPD network using a new approach.

   A new approach was taken to modelling the power flows on the network to take account of the impact of distributed generation. This involved analysing the relative influence of demand and generation on losses. This approach was designed to work for 'traditional' demand dominant networks as well as generation dominant networks such as SHEPD.

   The underlying engineering models were not changed as it was determined that these were still appropriate to meet the requirements of the BSCP128 guidance from Elexon governing what a losses apportionment methodology should deliver.

2. Compare the results with those from the newLAF model.

   The results generated by the new model are different from those generated by newLAF despite using the same inputs. Significant testing of this proved that the new results were still accurate and were as a result of the differing methodology.

3. If required, construct a new losses apportionment methodology along with supporting engineering model.

   This was done based on the work done in Objective 1

4. Gain internal approval for submission to the BSC Panel, for the new methodology (if required).

   This was gained from the Head of Commercial Operations. It was also submitted to Elexon for approval, which was gained and was used to calculate the loss adjustment factors for 2025/2026 which were then published.

5. Required modifications to the planned approach during the course of the project

The Network Licensee should state any changes to its planned methodology and describe why the planned approach proved to be inappropriate. Please confirm if no changes were required

The project required a seven-month extension to allow additional testing and evaluation of the new model. This ensured that the results were fully validated and could be demonstrated to Elexon, an important factor as the results that were produced using the new model were different from those that would be generated by the old model (for SEPD).

Other than that, the project proceeded in the order that was originally planned.

6. Lessons learnt for future projects

Describe how the project (methodology, stakeholder engagement etc.) changed, or provided opportunities, from your expectation at the start of the project and therefore could be useful for a future project. In addition, please discuss the effectiveness of the research development or demonstration undertaken.

This project was looking to take a long-standing process and update it for a modern electricity system. Because of the length of time *newLAF* had been in place, a lot of the detail about the functioning of the apportionment methodology had been lost.

Therefore, when looking at improving existing processes, it is worth ensuring that there is a detailed understanding of the process that is being replaced so that the differences and similarities can be properly evaluated.

7. Data Access & Quality Details

A description of how any network or consumption data (anonymised where necessary) gathered in the course of the Project can be requested by interested parties. Please include a link to the publicly available data policy.

For information how to request data gathered in the course of this project, see Network Innovation Competition (NIC) and Network Innovation Allowance (NIA) Data Sharing Procedure at https://ssen-innovation.co.uk/innovation-strategy/.

8. Foreground IPR

A description of any foreground IPR that have been developed by the project and how this will be owned.

A methodology for apportioning losses has been created and can be shared with relevant interested parties.

9. The outcomes of the project

When available, comprehensive details of the Project's outcomes are to be reported. Where quantitative data is available to describe these outcomes it should be included in the report. Wherever possible, the performance improvement attributable to the Project should be described. If the TRL of the Method has changed as a result of the Project this should be reported. The Network Licensee should highlight any opportunities for future Projects to develop learning further.

The Engineering models work package determined that the engineering models that are currently used are suitable for use going forward and give an accurate indication of power flows on the network for use in a losses apportionment methodology.
A report has been created discussing these and giving examples of approaches that could increase the accuracy of the modelling in further work in this area. However, work was already underway to improve the calculation of losses on the network so this was not pursued by the project.

For the losses apportionment methodology, a new approach has been taken. The existing 'newLAF' model was built for a distribution system where predominantly, power entered from the Transmission system and was consumed by demand customers, leading to a very top-down approach to losses apportionment.

For the new model, both upward and downward power flows were considered. This allows generation driven losses to be accounted for as well as demand driven losses. It means that the methodology is appliable for networks that have demand dominant Grid Supply Points (GSPs) as in the 'newLAF' model and, also, networks that have generation dominant GSPs.

Additional engineering input was required to help model how losses for more unusual or legacy network arrangements should be treated. This led to the introduction of some rules that may be SSEN specific and will need to be considered by anyone wishing to adapt this for their own purposes. An example is where the transformation of power is from 132kV to 33kV in most instances, however, it is 132kV to 11kV on occasion. This affects the modelling of power flows when looking at the system as a whole.

The testing of the completed model caused some issues. The initial expectation had been that the results from the SHEPD region would be different from the newLAF model given this network has significant export of generation onto higher voltage levels, but that the SEPD region would show similar results to newLAF given it is a demand dominant network that does not display any export onto higher voltages. This was not the case.

This required careful reassessment of the model to understand if it was correct and why. Ultimately it was determined that the model was correct, but because it handled the data in a different way, it was going to produce different results.
In the end we were satisfied that the model was correct and that we understood how it handled the data.

The new model was presented to Elexon for use in last year's losses apportionment submission, it was approved and was used to develop the submission.

As a result this project was deemed to have met its objectives.

10. Planned implementation, recommendations or next steps

Please describe the next steps to implement this innovation project. What policies and standards need to be updated or created as part of this implementation.

The new methodology has been approved by Elexon who administer the Balancing and Settlements code which mandates that DNOs have an approved losses apportionment methodology in place. It was used for the 2025 Loss Adjustment Factor submission.

11. Net Benefit Statement

A qualitative and quantitative statement of whether the Project has delivered and is expected to deliver any net benefits. This will provide an update to the statement of projected net benefits required at project registration (as set out in table 3.1). Where a completed Project is expected to deliver benefits, the statement should detail:
a) the net benefits the Project delivered so far up to the point of issuing the net benefit statement, and
b) the net benefits the Project is forecast to deliver, should the innovative solution be implemented more widely.

As detailed at Project Registration, the project was not expected to deliver any financial benefits, but it has however, created a more equitable distribution of the value of losses across the connected customers on the distribution system.

12. Other comments

N/A