Energy Networks Innovation Process Project Closedown Report Document

Date of Submission: 16/07/2024

Project Closedown Report Document

Notes on Completion: Please refer to the NIA Governance Document to assist in the completion of this form. Please use the default font (Calibri font size 10) in your submission. Please ensure all content is contained within the boundaries of the text areas.

Project Title (*This cannot be changed once registered*)	Project Reference
VFES - Vulnerability Future Energy Scenarios	NIA_SSEN_0063
Funding Licensee(s)	**Project Start Date**
Scottish and Southern Electricity Networks Distribution	August 2022
Project Duration	**Year**
20 Months	2024
Nominated Project Contact(s)	
Tim Sammon, Innovation Programme Delivery Manager at SSEN	

1. Scope

VFES statistics, foresight and predictions will be modelled within both SSEN regions. The findings will be shared in a format which can be replicated by other DNOs. As the findings will relate to people, communities, and lifestyle changes, as opposed to network assets and distribution equipment, the methodology and principles for VFES should be replicable for other industries.

In scope will be:

- working with academia to use tried and tested foresighting techniques for assessing potential changes to communities and the lifestyles of consumers which could affect their energy usage patterns and potentially greater reliance on electricity giving rise to new forms of vulnerability
- partnering with data analytics, mathematicians, and machine learning experts to spot trends in consumer vulnerability data and PSR statistics using innovative machine learning technology to better forecast where vulnerability is likely to occur
- reviewing of the findings and suggestions uncovered during the project and validating reportable outcomes
- a report detailing the learnings and opportunities for further insight to enable more robust vulnerability forecasting

2. Objective(s)

The objectives of the VFES project are to explore how the use of new foresighting techniques, along with data analytics and expert validation can be used to identity and forecast consumers in vulnerable situations as we move toward net zero. The project will produce a report detailing how far, and how accurately, foresighting and machine learning can predict network requirements based on customer, community, and wider societal factors.

3. Success Criteria

VFES will be a success if the partners produce:

- a combined report detailing how far, and how accurately, foresighting, machine learning, and expert validation/stakeholder engagement can predict network requirements based on customer and community factors

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.

The original aims, objectives and success criteria have all been achieved and surpassed.

The project team spotted the opportunity to embed the principals of VFES directly into our business-as-usual Distribution Future Energy Scenarios (DFES) reports by keeping the project open longer. This was funded by business-as-usual budgets however, without further innovation funding.

Delivering the VFES project recommendations into DFES was conducted with SSEN Distribution DSO and DFES teams to deploy VFES principals into our DFES reports for 2024. Forecasting future needs of the network - SSEN.

As well as two individual reports from The Smith Institute and Imperial College London, National Energy Action delivered a final VFES Project Report bringing together the findings from academia and machine learning.

The project extension and subsequent further SSEN funded work into DFES has also produced a report which provides more insight about how vulnerability data could and should be used in creating a truly just transition to a low carbon future at the same time as enabling more robust networks for less resilient communities.

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.

We can confirm that no changes were made to the planned methodology.

VFES has been a success to the extent that we had the opportunity to embed the principals of VFES into our business-as-usual DFES reports by keeping the project open longer.

Doing so enabled the VFES project to work with the SSEN Distribution DSO and DFES teams as well as with Regen to deploy VFES workings into our DFES reports for 2024.

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.

VFES has shown that the principal of combining new foresighting techniques, along with data analytics and expert validation can be used to identity and forecast consumers and communities in vulnerable situations as we move toward net zero.

Recommendations and learnings for future projects, and business as usual processes, can be found in the three VFES reports from The Smith Institute, Imperial College London, and National Energy Action.

The three VFES project reports can be seen here by clicking on Project Documents.

The further work delivering VFES into DFES has produced its own report which gives yet more insight and learning. This report, produced by Regen, is titled "Just transition, vulnerability and future energy scenarios. Planning for a fairer net zero future". Once complete, the report will be available here on the Project Documents tab.

7. 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.

VFES project outcome reports can be seen here by clicking on Project Documents. The Regen "Just transition, vulnerability and future energy scenarios. Planning for a fairer net zero future" Report will be seen here by clicking on Project Documents when submitted. In summary, the project successfully demonstrated that we can incorporate information on vulnerability as part of forecasting future network needs.

8. 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/.

9. Foreground IPR

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

Not applicable

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.

We have gone further than the original scope so that the next steps and implementation could be progressed immediately.

The outputs from the project have been further developed, with the publication of the "Just Transition, Vulnerability and Future Energy Scenarios" report produced for SSEN by Regen." Report will be seen here by clicking on Project Documents when submitted. This report sets out recommendations on how the principles and analysis developed in the VFES NIA project supports the vital role than Network Planning has in delivering a socially just energy transition.

11. Other comments

Net Benefit Statement:

a) the net benefits the Project delivered so far up to the point of issuing the net benefit statement:

VFES was a project to test if academic foresighting, machine learning and expert validation could work together to add vulnerability factors into DFES calculations. As such, net benefits were never in scope for VFES.

b) the net benefits the Project is forecast to deliver, should the innovative solution be implemented more widely.

The main outcome for VFES was to be a report. VFES went further by producing three reports. None of these reports will directly lead to net benefits.

The project did however lead to more research, funded by SSEN Distribution, and delivered by Regen. This Regen report looks further at the benefits which may be possible by implementing factors suggested during VFES. This report will be available by August 2024.

VFES has reached the expected TRL of, Bench Scale Research. Should the findings for VFES be implemented into the SSEN DFES Heat scenario the benefit could be felt by consumers in areas of low resilience and low income alike. The level of benefit would depend on the depth of embedment and the scale at which the VFES calculations are implemented. Further consumer benefits would come if the findings were added to other areas of DFES calculation and yet more if other DNOs and even ESO were to embrace the VFES principals and use them in their DFES and FES publications and calculations.

12. Standards Documents

Identify any industry standards that may require updating due to the outcomes or understanding developed from this innovation project. If no standards will need to be updated, please state - not applicable

Not applicable