SIF Alpha Round 3 Project Registration

Date of Submission

Nov 2024

Project Reference Number

10128804

Initial Project Details

Project Title

Nature4Network - Alpha R3

Project Contact

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Challenge Area

Whole system network planning and utilisation to facilitate faster and cheaper network transformation and asset rollout

Strategy Theme

Net zero and the energy system transition

Lead Sector

Electricity Distribution

Other Related Sectors

Electricity Transmission

Project Start Date

01/10/2024

Project Duration (Months)

6

Lead Funding Licensee

SSEN-D - Scottish and Southern Electricity Networks Distribution

Funding Licensee(s)

SSEN-D - Scottish and Southern Electricity Networks Distribution

Funding Mechanism

SIF Alpha - Round 3

Collaborating Networks

SP Energy Networks Transmission

Technology Areas

Asset Management

Carbon Emission Reduction Technologies

Resilience

Environmental

Project Summary

Our electricity network faces significant challenges from climate change including flooding, overheating and frequent storm-force winds. Traditional grey engineered solutions (e.g. concrete flood defences or cooling systems) are effective but carbon-intensive and provide limited additional benefits. The Nature4Networks project explores Nature-based Solutions (NbS) as innovative, sustainable and resilient alternatives for use with GB energy networks. Nature4Networks will not only deliver network resilience and reliability and financial efficiencies that positively impact customer bills. It will also deliver wider ecosystem service benefits, including flood resilience, carbon removal, biodiversity enhancement, social benefits, and asset regulation, e.g., noise abatement and temperature control.

Add Preceding Project(s)

10105122 - Nature4Networks (R3 Discovery)

Add Third Party Collaborator(s)

Frontier Economics

GHD

Project Budget

£554,648.00

SIF Funding

£499,148.00

Project Approaches and Desired Outcomes

Animal testing (not scored)

- ○ Yes
- ◉ No

Problem statement

Our electricity network faces significant challenges from climate change, including flooding, overheating and frequent storm-force winds. Traditional grey engineered solutions (e.g. concrete flood defences or cooling systems) are effective but carbon-intensive and provide limited additional benefits. The Nature4Networks (N4N) Project explores Nature-based-Solutions (NbS) as sustainable, resilient alternatives, offering co-benefits including enhanced biodiversity, carbon sequestration and social wellbeing. During Discovery, we set out to demonstrate the feasibility of applying NbS to address climate change impacts on electricity network assets.

Through stakeholder engagement and further research, we recognised that NbS could also offer broader applicability and significant potential benefits beyond addressing the effects of climate change. We now understand that NbS can enhance resilience and sustainability for many day-to-day issues that Distribution Network Operators (DNOs) face (e.g. substation security or visual amenity).

Through Discovery, we developed a Nature4Networks Catalogue, identifying 14 NbS intervention options for DNOs to address climate related asset risks, as well as day to day asset interventions. A Cost-Benefit-Analysis (CBA) toolkit was also created to assess the value of environmental, social and visual impacts of NbS, over and above financial benefits. This CBA toolkit utilised the existing SIF CBA structure, adding in valuations (e.g. biodiversity net gain) not present by default.

In Discovery, Stakeholder Engagement on the Catalogue led us to select two initial use cases (UC) for deeper investigation based on their broad applicability to the network: UC1 - Linear Woodlands and UC2 - Sustainable Drainage Systems (SuDS). These investigations used data from SSEN-D's investments to demonstrate the potential to deliver significant social value through carbon reduction, visual amenity, biodiversity net gain and others. Outcomes of the investigations were used to infer general opportunities and barriers for NbS to DNOs.

Nature4Networks aligns with Innovation Challenge 1 focusing on whole-system planning and network transformation to meet net zero. By incorporating NbS into DNO investment decisions, Nature4Networks supports faster, cheaper and more resilient network transformation and an accelerated journey to net zero goals. Additionally, Nature4Networks demonstrates how value can be unlocked from NbS through engagement with other stakeholders and utilities (e.g., water networks).

Our Project demonstrates innovation as there are uncertainties associated with these potential opportunities. During Alpha, Nature4Networks will:

1. Expand on initial feasibility studies to understand how NbS can be rolled out at scale -- including basic designs and conceptualisations and high-level GIS analysis to determine where NbS can be deployed to enhance system planning and resilience.

2. Develop innovative business models to engage stakeholders (e.g. landowners). In Beta, the Project proposes to incorporate the use of modelling and computer simulations to evidence effectiveness of NbS compared to the grey engineering solutions, based on real life data from the trial schemes.

Key users of our innovation include DNOs and Transmission Operators (TOs); landowners. During Stakeholder Engagement our understanding of needs has expanded. Of importance is the need for cost-effective solutions that can be justified within current regulatory and operational frameworks. E.g., introducing vegetation around assets needs to be considered in terms of the increased vegetation management costs, probability of faults and operational safety and proximity policies.

The Nature4Networks framework can also be adapted to other regulated industries, including water, gas and telecoms, demonstrating cross-industry applicability. For example, SuDS as a solution to flood events is independent of the asset it is protecting.

For Alpha we have partnered with SP-Transmission to evidence applicability of these solutions beyond the Distribution network.

No related projects have been carried out by this team. Learnings have, and will be, taken from other nature-based projects both GB and US based.

Innovation justification

Presently, energy networks rely exclusively on engineered solutions to overcome challenges and problems (e.g. flooding, overheating, and visual impact). Nature4Networks seeks to explore the potential of using NbS as alternatives to engineered BAU approaches. NbS approaches have not yet been trialled for use with GB energy networks and therefore represent an ambitious, innovate alternative which could provide effective, sustainable, and resilient solutions to safeguard assets and enhance network reliability and performance, whilst delivering various co-benefits.

Whist NbS is no longer an especially novel concept, with coastal protection, water treatment, and urban greening approaches widely deployed, the specific characteristics presented by electricity networks are unique and need to be accounted for and factored into planning and design of potential NbS options. For example, the linear nature of overhead lines, coupled with their elevation, and relative sensitivity to physical disturbances, requires any potential NbS approach to function in a way unlike its application in other sectors. Furthermore, strict safety standards and requirements associated with electricity networks presents additional considerations and potential limitations for NbS approaches. Addressing these considerations and challenges represents the key areas of innovation.

In Discovery, the Nature4Networks Project scoped out a range of potential NbS approaches for use with specific network assets to overcome the challenges and problems they face -- these have been captured in the Nature4Networks Catalogue (referred to in Appendix_1). The NbS included represent a theoretical and conceptual appraisal of approaches which could be deployed to deliver specific benefits.

In Alpha we will drill down into the specifics of on-the-ground practicalities, limitations and constraints, third party considerations, and detailed costings for implementation, maintenance and management.

As such, in Alpha, it is proposed that we expand our investigations on initial Discovery use cases (UC1 and UC2) by adding UC3-Asset Screening, and UC4- Use of Thorny Planting. All four will be investigated more fully, to advance them towards readiness for deployment. By developing and enhancing the supporting evidence base for NbS use in conjunction with electricity network assets it's anticipated the TRL, IRL, and CRL will be advanced by the end of Alpha, in preparation for in situ testing in Beta.

Stakeholder Engagement across SSEN-D in Discovery identified specific barriers and opportunities for the four NbS use cases. In Alpha we propose to address these by:

· Reviewing relevant safety and engineering standards and drafting NbS equivalents.

· Drafting installation, maintenance, and decommissioning guidance for NbS use with electricity networks.

· Reviewing the skills and supply chain requirements needed to deliver and maintain the NbS approaches described in proposed use cases.

· Reviewing what regulations, policies, and investment methods might be relevant to the proposed NbS use cases.

· Including NbS metrics in investment appraisal methodologies [CBA].

· Evidencing NbS effectiveness for use in future price controls as verified intervention methods.

SIF funding is sought as NbS approaches are not currently BAU solutions. Furthermore, the application and efficacy of the proposed NbS approaches in conjunction with network assets are untested, there are currently no mechanisms to value NbS as investment options, and there are currently no regulatory mechanisms to fund NbS as BAU solutions.

There is substantial potential for NbS application for electricity networks. Considering primary substations alone (GB total = c. 4,800), if 10% were at risk of flooding which could be mitigated by NbS approaches, approximately 4,800,000 customers could benefit from NbS interventions.

Nature4Networks aligns with Innovation Challenge 1. Incorporating NbS into DNO investment decisions supports faster, cheaper, and more resilient network transformation and an accelerated journey to net zero, in addition to unlocking value through engagement with other stakeholders and utilities (e.g. water networks), as well as wider social benefits and value.

Impact and benefits (not scored)

Financial - future reductions in the cost of operating the network

Financial - cost savings per annum on energy bills for consumers

Environmental - carbon reduction – direct CO2 savings per annum

Environmental - carbon reduction – indirect CO2 savings per annum

Revenues - creation of new revenue streams

New to market – processes

Others that are not SIF specific

Impacts and benefits description

Investigation into UC1-SuDS illustrated that the use of vegetated swales instead of BAU solutions like physical barriers to address flooding was particularly cost effective, in the order of £637k social Net Present Value (NPV).

This represents ongoing reductions in network operating costs -- as an illustrative example, we estimated that this translates into approximately £1.53 m/yr social NPV across GB if it's applied to 10% of sites. Potential for scale will be investigated further in Alpha.

Investigations into UC2-Linear Woodland to address Visual Amenity showed similar cost to the BAU alternative of undergrounding, but with more environmental and social benefits (identified below).

In Alpha, we will carry investigations on additional two use cases: UC3-Asset Screening, and UC4-Use of Thorny Planting having been assessed to have potential to reduce costs associated with cooling, pest control and security maintenance, as well as continuing deeper analysis of UC1 and UC2.

Such savings are expected to lead to consumer bill in the long run.

The alternative to proposed NbS for most of the 14 possible use cases identified in Discovery is the use of traditional grey engineering solutions. As 'do nothing' was not an option for UC1_Linear Woodland, and UC2-SuDS, it was not included in the CBA scenarios for our Discovery investigations.

Environmental Benefits

NbS inherently produce more environmental benefits than any grey BAU solutions. Our case studies illustrated environmental benefits in terms of:

Carbon -- reduced direct emissions, increased sequestration and reduced indirect carbon embedded in traditional solutions like concrete or steel barriers; and

Biodiversity -- increased biodiversity net gain.

Particularly, the linear woodland CBA showed significant environmental benefits in the order of £216k (social NPV). Performing the same high-level illustrative example as the SuDS investigation (applying this to 10% of sites across GB), we estimate this translates into approximately £4m/yr across GB.

Our SuDS investigation also had a significant benefit (£76k social NPV) from not utilising physical barriers with embedded carbon.

Additional Alpha use cases have potential for carbon sequestration, habitat creation, erosion control and air filtration.

Revenues and New Market Offerings

We have identified ways in which the external benefits (carbon, biodiversity etc.) may be monetised according to markets and schemes throughout GB, allowing the DNO to offset its costs and presenting greater value-for-money for consumers. We will continue to work on feasibility of engaging with these markets and schemes in Alpha.

We also started to identify various external parties that may be willing to pay for, or jointly maintain, NbS (e.g., landowners that would also benefit from installed flood prevention measures such as SuDS) or other sources of funding available like grants for the development of woodland. We will engage further with such stakeholders and develop business models to facilitate engagement in Alpha.

Alpha will explore development of new offerings that would enable multiple stakeholders to contribute to and benefit from NbS projects.

Additional Benefits

There are several social benefits associated with NbS like health benefits and improved Visual Amenity.

Visual Amenity is a significant cost area and one that is allowed for within the current RIIO-ED2 framework. We will investigate Visual Amenity further in Alpha by:

1. Investigated Willingness-to-Pay (WTP) for different solutions to visual dis[1]amenity; and

2. Considering an additional NbS case study involving visual screening of network infrastructure other than overhead lines.

We have identified health benefits in the linear woodlands use case in terms of improved air quality -- we will carry out further research into benefits in Alpha on further second order dimensions such as reduced burden on health services.

Teams and resources

SSEN-D: As a DNO, SSEN-D have a responsibility to contribute to tackling climate and nature crises through more sustainable operations, reduction of carbon emissions and improving biodiversity. SSEN-D's ambitions and commitment are demonstrated through our ED2 Environmental Action Plan, underpinned by our Sustainability and Climate Resilience Strategies (https://www.ssen.co.uk/about-ssen/sustainability/). SSEN-D are committed to investigating Nature-based-Solutions as alterative investment and intervention options, which would contribute to achieving our environmental ambitions and to wider environmental and societal benefits.

SSEN-D's core team include:

· Carbon & Nature Strategy Manager

· Project Manager

· Innovation Manager

SSEN will consult relevant Subject Matter Experts (SMEs):

· Visual Amenity Investment Manager [UC1_Linear Woodland]

· Tree Cutting and Vegetation Management Innovation Manager [UC1_Linear Woodland; UC3_Asset Screening; UC3_Use of Thorny Planting]

· SSEN-D's flood protection teams [UC2_SuDS]

· Asset Investment and Asset Policy teams

Frontier Economics (FE): is one of the largest economic consultancies in Europe. While energy is their largest sector specialism, they also bring a thorough understanding of the regulatory and commercial environment in which energy networks operate, and experience in delivering successful innovation projects. The economics of climate change and environment are a key area for

Frontier. Their portfolio includes projects identifying how to unlock benefits of NbS and related interventions for organisations like the Committee on Climate Change, water networks, and regulators.

FE's core team include:

- Associate Director.
- Project Director Senior Consultant.
- Project Manager, co-ordinating the delivery of the Project, analysis and writing up results.
- Consultant with a focus on net zero and nature recovery.
- Project oversight will be provided by a Director.

FE will draw on additional support from across the firm -- e.g., from consultants specialising in the water sector, regulatory economics, and survey design.

GHD has a reputation for successfully tackling projects with complex biodiversity ramifications, like sensitive habitats, performing species-specific surveys, conducting natural resource inventories, or developing resources and providing support to develop organisational understanding and capability. Their team of professionals have field experience, extensive biodiversity and ecological knowledge across our global operations. Their range of natural resources, ecology, biodiversity, nature-based solutions, sustainability, and circular economy experience and expertise across their operations means they have the relevant technical know-how and capabilities.

GHD's core project team include:

- Nature-based Solutions Lead for the Europe, the Middle East and Africa region
- Principal Consultant in GHD's UK Energy Solutions

GHD will also consult with relevant SMEs:

- Technical Director, UK Water Services [SuDS]
- Technical Director [Landscape Design and Masterplanning]
- Senior GIS Consultant
- Service Group Manager [Strategy and Innovation]
- Environmental Services Business Group Sustainability and
- Resilience Technical Service Line

SP Transmission have ambitious plans to scale up the networks' resilience to climate change, they aim to prioritise Nature-based-Solutions due to the long-term resilience they provide and the multiple outcomes to nature and the community. However, this is an area of low maturity for SP-Transmission, and they need to build knowledge and experience to ensure readiness for the RIIO-T3 price control. SP-Transmission has an innovative mindset and previous innovation projects such as Predict4Resilience and the landslide mitigation project demonstrate their strengths in delivering innovation in climate resilience.

SP-Transmission core team include:

- Lead Sustainability Specialist
- Head of Civils Operations
- Lead Engineer Substation Design Manager

In Alpha we expect to be engaging with subcontractors to carry out Willingness To Pay surveys for Alpha use case investigations.

Extensive Stakeholder Engagement is expected to take place, which will include engaging contracting teams and supply chain.

Project Plans and Milestones

Project management and delivery

SSEN-D will lead on all Project Management activities. We will use tools provided by UKRI (Risk Register, Project Plan), as well as tools developed internally (Gantt Chart, Project Costs, Finance Tracker) to regularly monitor project performance.

The Project Team worked really well together through Discovery and will continue to meet weekly to review progress and collaborate. We will support team sessions with focused Workpack collaborations, as well as face-to-face sessions (if/when required) to stimulate thinking and provide effective performance while developing outputs.

Weekly sessions and use of PM tools will also allow the Project Team to monitor across milestones and deliverable dependencies, ensuring key outcomes complement each other. As shown in the Gantt Chart, although Workpacks have their own distinct objectives, they are all complementary to each other, and together will provide a comprehensive set of deliverables. For example:

*Outcomes of WP2 -- Stakeholder Engagement on Willingness to Pay will inform the recommendations within the Business Case and Business Models within WP5 - Business Models and BAU Readiness.

*Processes undertaken (and their results) in WP3 -- Use Case Analysis and Trial Site Selection will inform the shape and structure of the recommended standard tools and procedures being developed in WP4 -- 'NbS for Networks' methodology and tools for BAU adoption.

A number of risks and barriers have been identified to the implementation of NbS in the context of electricity distribution. The top scoring items can be seen below. A full list of risks and barriers, including mitigating actions and owners is available in the PM Book.

Regulatory: Economic regulations and engineering rules may not allow for NbS. It may be difficult to make the case for investment to regulators or financers.

Novelty: The novelty of NbS means that there is a lack of concrete data on their costs and effectiveness. This has been acknowledged above in regard to the barriers this poses in meeting regulatory and engineering standards. However, this issue is transitory and can be addressed through enhanced research, pilot projects and ongoing evaluation.

Context Dependency: The context dependent nature of NbS means that they will always be harder to generalise both in terms of scheme design and outcomes. This variability complicates the process of cost assessment, requiring detailed, site-specific evaluations. The extent of variation from one site to another, and the predictability of these differences, will ultimately determine the magnitude of this barrier.

Coordination: Given the dependence of NbS on externalities like carbon sequestration and biodiversity enhancement, their implementation often involves wide-ranging ecological and social systems, necessitating engagement with a diverse group of stakeholders. This engagement is essential but can be highly complex.

Although this Project is not expected to require any regulatory changes throughout the Alpha phase, one of the key outputs of Alpha will be a set of recommendations on regulatory and policy changes and derogations needed to make 'Nature-based Solutions for Networks' BAU-ready. These activities can be viewed within WP4 - 'NbS for Networks' methodology and tools for BAU adoption.

The Project is not expected to impact on customers reliability of supply during the Alpha phase. This Project will not have any direct or adverse impact on existing or future energy consumers and their premises during Alpha. However, as 'on-the-ground' application of some of the NbS options may require access and use of land not owned by the DNO, Alpha phase will identify how this may impact on the premises of energy consumers both in Beta phase, and if NbS was scaled up to BAU readiness -- outputs of this targeted Stakeholder Engagement will be captured in WP2 deliverables.

Key outputs and dissemination

Key outcomes of Alpha:

· Full feasibility study of four use cases to select the most suitable ones for 'on-the-ground' trials during Beta, including site selection in SSEN-D's and/or SP-Transmission's areas.

· Assessment of current DNO investment and intervention methodologies, policies and regulations, and recommendations on how NbS can be dove-tailed into those methodologies.

· Creating straw models of generic tools for identification, assessment and appraisal of NbS as intervention options on electricity networks to enable BAU-readiness.

· Further development of the value case for application of NbS on electricity networks-- both for the selected use cases, as well as an assessment of size of NbS opportunity at GB level.

· Development of NbS business models and supply chain review to assess BAU-readiness.

All key outcomes will be led and informed by extensive internal and external Stakeholder Engagement.

Stakeholder Engagement activities will be carried out at both use case level (e.g. engaging with Woodland Trust on the Linear Woodland use case and engaging with water companies on the SuDS use case); as well as at a methodology level (e.g. with the regulator to identify how NbS can be funded through the RIIO framework).

SSEN-D will continue to provide Project Management oversight to ensure efficient outcomes delivery, finance management and appropriate innovation dissemination through URKI and other channels.

The Project has been designed around 5 work packages. While each Workpack has an assigned Lead Partner, all deliverables are expected to be developed in a collaborative manner.

WP1 -- Project Management

Lead: SSEN-D

Purpose: Day to day project management and coordination, management of UKRI engagement and project Governance.

Key Outputs:

1. Project Management
2. Project Governance
3. UKRI Engagement

WP2 -- Stakeholder Engagement

Lead: SSEN-D

Purpose: Internal and external stakeholder engagement, Use Case specific engagement and concept-level engagement.

Key Outputs:

1. Internal and external SE on: selected Use Cases. NbS Methodology, Policy and Regulation.
2. Consumer engagement on solution acceptability and Willingness to Pay.

WP3 -- Use case analysis and trial site selection

Lead: GHD

Purpose: Full feasibility study of four use cases to select the most suitable ones for 'on-the-ground' trials in the Beta phase, including site selection in SSEN-D's and/or SP-Transmission's areas.

Key Outputs:

1. Full feasibility study of 4 use cases to select most suitable ones for 'on-the-ground' trials in the Beta phase, including site selection in SSEN-D's and/or SP-Transmission's areas.

2. For selected trial use cases, identify potential installation, maintenance and decommissioning requirements to inform trial design.

3. Validate structure of existing NbS catalogue and update following Alpha development. Update Catalogue as required.

WP4 -- Generic 'NbS for Networks' methodology and tools for BAU adoption.

Lead: GHD

Purpose: Creating straw models of generic tools for identification, assessment and appraisal of Nature-based-Solutions as intervention options on electricity networks to enable BAU-readiness.

Key Outputs:

1. Assessment of current DNO investment and intervention methodologies; Recommendations on how NbS methodologies can be dove-tailed into those methodologies.

2. For the shortlisted Use Cases:

· document the process of assessing site suitability.

· recommend approach for design and specifications of NbS - similar to current engineering standards and regulation.

· provide a framework of assessing effectiveness of the NbS [evidencing NbS].

WP5 - Business Models and BAU-Readiness

Lead: Frontier Economics

Purpose: Further development of NbS value case -- both for the selected use cases, as well as an assessment of size of NbS opportunity at GB-level. Development of NbS business models and supply chain review to assess BAU-readiness.

Key Outputs:

1. Development of an additional 2 high-level CBAs.

2. Revised GB SIF CBA or NbS.

3. Develop 'business models' for NbS [financing NbS].

4. Supply Chain assessment for BAU Readiness.

Commercials

Intellectual property rights, procurement and contracting (not scored)

To ensure clarity is provided to the Project partners, UKRI and Ofgem regarding the intellectual property (IP) landscape, the Project is using an IP register to track the Background IP provided to the Project, the Foreground IP the Project generates, and the use and access rights to all this IP. The main contract governing the Project (the Collaboration Agreement) will include detailed, mutually agreed terms governing IP that are in line with the SIF Governance Document. For the Alpha Phase, all the IPR arrangements will follow the default recommendations of Chapter 9 SIF Governance Document.

Commercialisation, route to market and business as usual

Commercialisation Plan: Our commercialisation plan aims to integrate NbS into BAU operations within SSEN-D's network and across other networks following successful completion of Beta phase. This involves:

Stakeholder Engagement: During Alpha phase, we will engage with key stakeholders to understand the current appraisal processes for selecting solutions.

Process Integration: Integrate NbS into existing decision-making and investment processes to ensure these solutions are considered alongside traditional methods.

Supply Chain Development: Engage with suppliers and partners to build a robust supply chain capable of supporting NbS deployment at scale.

Activities in WP4 - 'NbS for Networks' methodology and tools for BAU adoption as well as WP5 - Business Models and BAU Readiness will contribute to developing the BAU-readiness and commercialisation plans.

The activities will include:

· Assessment of supply chain readiness to deliver installation, maintenance and decommissioning of NbS (skills, materials, etc).

· Creating straw models of tools for identification, assessment and appraisal of Nature-based-Solutions as intervention options on electricity networks to enable BAU-readiness

· Developing 'business models' for NbS (financing NbS)

Commercial Readiness and Investment Requirements: The Project is currently at technology application readiness level (3). Work in Alpha will aim to bring the Project to the value proposition level (4) and partially into the market alignment readiness level (5):

· Further understanding of suitability and value of NbS to DNO issues;

· Conducting surveys to determine the customers' Willingness-to-Pay for these solutions;

· Develop business models for engagement of multiple stakeholders in a NbS; and

· Identifying how NbS can be included in DNO investment decisions.

Work in Beta will seek to run trials in the field and develop the Project to a solution optimisation level (6).

Work post-Beta would cover readiness levels 7-9, specifically:

· complete product design;

· validate financial models;

· secure supply and customer agreements; and

· introduce products to market and achieve widespread deployment.

Senior Sponsor Involvement: SSEN-D are committed to contributing to tackling climate and nature crises through more sustainable operations, reduction of carbon emissions and improving biodiversity as evidenced in our Environmental Action Plan and other sustainability and environmental strategies. The Project has received support from SSEN-D's senior leadership team, notably from the Director of Asset Management, Head of Asset Policy and Sustainability, as well as Head of Future Networks.

Integration Strategy: Existing Systems Integration: We will conduct detailed assessment of current DNO investment and intervention methodologies. This involves recommendations on how NbS methodologies can be dove-tailed into those methodologies.

Barriers to Integration:

· uncertainty around their effectiveness will be addressed by undertaking further design work and investigate the development of standards.

· coordination issues will be addressed by the development of business models.

· regulatory barriers which favour BAU solutions will be addressed by identifying how these can be changed to allow NbS to become a credible investment option in future price controls

Scaling Plan:

· Field Testing: Beta phase is anticipated to conduct field testing to address uncertainties such as operational performance) and validate NbS in real-world conditions.

· Scaling: If successful, NbS can be quickly integrated into DNO investment decisions. Building NbS should not face significant supply chain barriers, as activities like digging ditches or planting trees are standard. The main challenge will be regulatory changes, like allowing linear woodlands for visual amenity under the RIIO-ED2 framework (by way of a derogation for example).

· Timelines: Post-Beta trials, scaling to BAU is expected within 3 years, though this may vary by solution and associated barriers.

Competitive Markets Our Project will not undermine the development of competitive markets. By creating frameworks and blueprints for integrating NbS, we support a level playing field where various suppliers and service providers can compete to offer innovative solutions.

Policy, standards and regulations (not scored)

Any government policy changes or decisions needed for your Project to progress into business as usual.

The Nature4Networks Project would not require government policy changes to allow BAU deployment. In fact, this Project stands to be an enabler to DNOs meeting government policies and legislation on net zero and sustainability, which have been reflected in RIIO-ED2 environmental targets captured in e.g. SSEN-D's Environmental Action Plan or Science Based Targets.

Any standards, (...) which would need to change, and may sit outside Ofgem's remit, in order to progress into the next phase or business as usual. Any work packages your Project plans to undertake as part of the upcoming phase to mitigate or better understand any policy, standards, and regulatory barriers.

As the Nature4Networks Project recommends use of novel interventions on, and in proximity of, the electricity network, all solutions will need to comply with strict safety and operational standards, e.g., the Electricity Safety, Quality and Continuity Regulation (ESQCR). Each solution will also require clear standards to which it needs to perform -- similar to standards each of the grey engineering solutions need to meet. Alpha phase will propose straw models for engineering standards for those NbS which are assessed as eligible for Beta trials.

As part of Discovery, we identified that to enable BAU readiness for NbS solutions, and to allow them to become part of the DNO intervention toolbox, current Cost-Benefit-Analysis and intervention appraisal options would need to be adjusted to allow NbS to become an option. We have already proposed adjustments to the CBA framework as part of the Discovery deliverables and are looking to propose standard valuations for some of the additional social and environmental benefits NbS will deliver e.g. biodiversity net gain, not present by default. These activities are captured within our 'Workpack 5 - Business Models and BAU Readiness'.

We have also carried out a high-level review of SSEN-Ds investment and appraisal tools (including the 'Distribution Networks Options Assessment', 'Engineering Justification Papers', 'Whole Systems CBA' and others), as well as asset health frameworks (e.g. 'Condition Based Risk Assessment'). Alpha phase will focus on providing recommendations on how NbS can dove- tail into the existing frameworks.

We have also identified that for NbS to be truly BAU-ready, they need to be accepted as credible investment options in future price controls by the regulator. To be able to engage the regulator on this, we will build an evidence base of NbS performance (to demonstrate these solutions provide the expected network protections) supported by Stakeholder Engagement on solution acceptability as well as Willingness to Pay.

Our 'Workpackage 4 - 'NbS for Networks' methodology and tools for BAU adoption', focuses on providing DNOs and other users with straw models of generic tools for identification, assessment and appraisal of Nature-based-Solutions as intervention options on electricity networks to enable BAU-readiness.

Our Stakeholder Engagement activities will go beyond engaging internal teams on policy and standards, or the regulator on any policy and regulatory changes. We will be working with an extensive range of stakeholders to understand how NbS impact a wide range of users to assess how such solutions can be financed, and how the benefits could be shared fairly. Workpack 2 - Stakeholder Engagement activities include internal and external stakeholder engagement both at Use Case level, as well as concept-level.

Any discussions you have already had with the relevant policy or regulatory body on possible derogations and exemptions:

The Project will not require any derogations to carry out Alpha work; we will assess that requirement for Beta phase as part of Alpha deliverables.

Value for money

Total project cost has been set at: £554,648, of which £55,500 will me met through compulsory contribution (10%) through 'time-in-kind'. We are requesting £499,148 of SIF Funding.

Funding is expected to be allocated to deliverables and work packages in the following way:

- WP1: Programme Management: Funding: £44,402 (9% of total).
- WP2 - Stakeholder Engagement: Funding: £105,060 (21% of total).
- WP3 - Use Case analysis and trial site selection: Funding: £122,094 (24% of total).
- WP4 - 'NbS for Networks' methodology and tools for BAU adoption: Funding: £120,037 (24% of total).
- WP5 - Business Models and BAU Readiness: Funding: £107,555 (22% of total).

The Project is expected to develop methodologies which will be applicable not just to the electricity network industry, but with relevant adjustment, could be applied cross industry -- Gas, Rail, Water and others.

This Project will not only deliver financial efficiencies which will be passed on to customer bills, but will also deliver wider ecosystem service benefits, including flood resilience, carbon removal, biodiversity enhancement, social benefits, and asset regulation, such as noise abatement and temperature control.

Further value for money may be delivered by providing consumers with increased resilience to supply interruptions and gives consumers peace of mind that they may not face the significant disruption of an outage. Customers may face fewer and shorter interruptions as a result of NbS solutions.

Associated Innovation Projects

- ○ Yes (Please remember to upload all required documentation)
- ◉ No (please upload your approved ANIP form as an appendix)

Supporting documents

File Upload

SIF Alpha Round 3 Project Registration 2024-11-12 9_57 - 87.3 KB
R3_Alpha_N4N_PortalApplicationPDF.pdf - 409.9 KB

Documents uploaded where applicable?

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