NIA Project Registration and PEA Document

Date of Submission

Apr 2024

Project Reference Number

NIA2_NGESO071

Project Registration

Project Title

AI Centre of Excellence – GB Energy Industry Data Science Fellowship

Project Reference Number

NIA2_NGESO071

Project Licensee(s)

National Energy System Operator

Project Start

February 2024

Project Duration

0 years and 5 months

Nominated Project Contact(s)

innovation@nationalgrideso.com

Project Budget

£230,000.00

Summary

The success of the Net Zero transition requires attracting and retaining individuals with specialist data science skills and capabilities, as articulated in the UK's National AI Strategy. The current ESO data science talent pipeline is decentralised and lacking coordination among industry, academia, tech partners and other various stakeholders. This project will aim to establish the design of an enduring and mutually beneficial fellowship to create a steady pipeline for data science skill and capabilities for ESO and the energy sector. This will create a mechanism for industry engagement and support addressing the skills gap across private, public, and academic institutions required for the net zero transition.

Preceding Projects

NIA2_NGESO0021 - AI Centre of Excellence

Nominated Contact Email Address(es)

box.so.innovation@nationalgrid.com

Problem Being Solved

The transition to Net Zero is the primary objective for the UK, and data and digitalisation has been identified as a key enabler for successfully delivering our net zero future. The UK is experiencing a shortage of data science capability, and there is significant competition to hire and retain data science talent. A 2021 study by UK Parliament estimated that the supply of data scientists from UK

universities was unlikely to exceed 10,000 per year; yet there were potentially at least 178,000 data specialist roles vacant across the country.

The ESO are looking to deliver bold initiatives like the Virtual Energy System and Flexible Markets to address the net zero requirements, and having data science expertise is critical to the delivery of these, amongst others. The current data science talent pipeline is decentralised and chaotic, with no clear coordination or collaboration among industry, academia, technology partners, and other stakeholders in the energy industry.

The AI Centre of Excellence (AI CoE), including work completed in NIA2_NGESO021, has laid the foundations for ESO to support programmes that can address these challenges for both ESO and the sector.

Method(s)

The overall programme of work for the development of an energy data science fellowship scheme has been developed as a series of phases, delivering knowledge and experience as it progresses. This project forms the first of these programme phases and will establish the fellowship programme design. The programme design will be completed across three core work packages as follows:

WP1 – Discovery
Stakeholder mapping: Identify stakeholders critical to design and delivery of the fellowship programme and conduct an assessment to determine which engagement approach is most appropriate for each stakeholder.
Review of existing programmes: Complete desktop research exercise to identify global best practise and benchmark of successful programmes and collate existing programmes within the sector that can be adapted to suit this scheme. Summarise lessons learnt from identified existing programmes to inform the design of this new energy data science fellowship programme.
Needs assessment: Define the needs of the fellowship and assess why these cannot be covered by existing programmes identified.
Vision definition: Define the vision and guiding principles to establish the purpose and key intent of the programme.
WP2 – Stakeholder Engagement
Engagement planning: Design the engagement approach for each stakeholder as identified in WP1 and identify key stakeholder contacts.
Engagement execution: Gather initial feedback on the programme, collate any applicable lessons learnt, and gather ideas on priority projects for the programme. This task will also identify the best parties for involvement in the first and subsequent future iterations of the programme.
Initial partnership agreements: Develop high level agreements for participation to input into mobilisation of the programme.
Engagement communications: Develop a communication framework that will define how stakeholders are engaged, including frequency and by what medium of engagement.
WP3 – Programme Design
Design options: Develop a long list of options for the programme using the outputs of WP1 and WP2.
Design assessment framework: Design an assessment framework with KPIs that will be used to refine the long list into a short list of options.
Conduct feasibility assessment: Conduct an assessment against the short list of design options to determine which is most likely to deliver against requirements and can be established within the desired timeframe.
Conduct developed design: Develop the chosen option by designing the operating model by which it will be administered and delivered.

In line with the ENA's ENIP document, the risk rating is scored Low:
TRL steps = 1 (1 TRL step)
Cost = 1 (<£500k)
Suppliers = 1 (1 supplier)
Data assumptions = 1
Total = 4

Scope

This project will focus on the energy data science fellowship programme design and will set the overall vision and objectives for the scheme.

The project will conduct a review of existing related programmes to collate learnings and ideas, followed by a needs assessment to

establish which BAU activities, strategic initiatives and business units would most benefit from data science capabilities.

Development and implementation of a clear stakeholder plan will help to identify and engage with potential stakeholders and partnerships across public sector, private sector and academia who could contribute to this programme. The project will carry out desktop research and stakeholder engagement to identify appropriate incentives to attract and retain best and brightest talent.

The programme design delivered will include the delivery model, commercial model, operational model, high level agreements with programme partners, feasibility assessment, and a high-level business case in event of positive feasibility assessment.

Objective(s)

- Define the vision and principles for the energy data science fellowship programme.
- Identify and engage with stakeholders critical to design and delivery of the fellowship programme.
- Design the delivery model, commercial model, and operational model for the programme.
- If feasibility assessment is positive, complete high level business case for the programme.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

This project has been assessed as having a neutral impact on customers in vulnerable situations because it is a transmission project.

Success Criteria

- Vision and principles for the fellowship programme clearly articulated.
- Lessons learnt from similar existing programmes applied.
- Stakeholder engagement framework clear, with partners across the energy industry and academia identified and actively engaged in the fellowship design.
- Delivery model, commercial model, and operational model for the programme foundations defined.

Project Partners and External Funding

Arup is the primary partner on this project. They have the domain knowledge and digital expertise, including experts in energy and data science that will allow Arup to support ESO in designing the fellowship programme in a way that will best connect the needs of the energy sector to the digital talent coming out of university. Arup also has a wide network of industry and academic partners which will be used to leverage ideas throughout the programme development.
No external funding to be provided.

Potential for New Learning

This project is the first of its kind at the ESO and for the UK energy sector, there is currently no offering of this kind for data scientists across the sector.

This project will evaluate and consider existing fellowship and talent programmes, and how learnings from these can be leveraged to inform design and delivery of the energy data science fellowship programme within the AI CoE. The project will carry out desktop research and stakeholder engagement to identify appropriate incentives to attract and retain best and brightest talent. Overall, the project will outline how to successfully deliver the fellowship programme for the ESO and wider industry.
All reports and outputs developed will be published on the Smarter Networks Portal.

Scale of Project

This project will be delivered in three work packages, following an agile approach over 6 months and will require industrial and partner engagement throughout.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

This project is being delivered by UK based suppliers and funding by National Grid ESO, it therefore has a geographical scope of Great Britain.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

£230,000

Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

The transition to Net Zero is the primary objective for nations globally, and the most significant goal for the UK today. Internationally, data and digitalisation has been identified as a key enabler for successfully delivering our net zero future. The ESO and other organisations in the energy sector are leveraging partnerships with public and private sector alongside academia to commission projects to bridge the gap between academia and industry. These partnerships are often short term, resulting in slow progress, lost momentum, and lack of transition of solutions to deployment. The success of this transition is underpinned by a complete shift across the energy system which requires attracting and retaining individuals with specialist data science skills and capabilities, as articulated in the UK's National AI Strategy.

This project will aim to establish the design of an enduring and mutually beneficial fellowship to create a steady pipeline for data science skill and capabilities for ESO and the energy sector. This will create a mechanism for industry engagement and support addressing the skills gap across private, public, and academic institutions required for the net zero transition.

How the Project has potential to benefit consumer in vulnerable situations:

N/A

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

N/A

Please provide a calculation of the expected benefits the Solution

Given the stage of this project, it is not possible to quantify the expected cost benefits that can be delivered directly by having an established energy data science fellowship programme in Great Britain. If this project is not pursued the energy sector risks failing in attracting and retaining the data science talent that is required to support the net zero transition.

Please provide an estimate of how replicable the Method is across GB

This project will consider development of an energy data science fellowship which will be applicable for partners and stakeholders across the GB energy industry.

Please provide an outline of the costs of rolling out the Method across GB.

At this stage the costs are unknown for rolling out a full energy data science fellowship programme for the GB energy industry, however the programme design will include investigation into a commercial model for the fellowship

Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System

Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☐ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☐ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☐ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

RIIO-2 Projects

☐ A specific piece of new equipment (including monitoring, control and communications systems and software)

☐ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☑ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☐ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

The project will be delivered with cross-sector and in-sector collaboration, building on wider initiatives driving changes in the energy sector. All reports and outputs developed will be published on the Smarter Networks Portal.

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

N/A

Is the default IPR position being applied?

☑ Yes

Project Eligibility Assessment Part 2

Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

This project is the first of its kind at the ESO and for the UK energy sector, there is currently no offering of this kind for data scientists across the sector. The work will however build upon the work delivered by the AI CoE, including within NIA2_NGESO021, and act as a mechanism of implementation across all 5 functions of the AI CoE:

1. Central Library
2. Academy
3. Resource Marketplace
4. Resource Exchange
5. Experimental Lab

This project will evaluate and consider existing fellowship and talent programmes, and how learnings from these can be leveraged to inform design and delivery of the energy data science fellowship programme. This will include developing a clear understanding of graduate programme and data science development pathways both within ESO and across the sector, including clear articulation of challenges to date in attracting and retaining data science talent.

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

N/A

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

The energy system is changing rapidly and there is a critical need for enhanced modelling and associated capability to deliver this. This project will provide the foundations for a programme that is the first of its kind to combine energy and data science to bridge the gap between public sector and data science. This project will test the feasibility of the energy data science fellowship programme through engagement, evaluation of existing programmes and programme design.

Similar fellowships have been developed between the data science academic community and technology startups, and between the data science academics and the UK government to serve other sectors. Although there is an opportunity to tap into the findings and learnings from these existing fellowships, there is a risk to the success of this programme if it is not tailored to the energy sector and the ways of working within the energy industry. On this basis, the project will seek to build upon other schemes, but must also develop novel aspects for the energy data science fellowship programme and continue to grow them. This will ensure that the programme can succeed in the context of the sector, given sector specific needs.

Relevant Foreground IPR

- Discovery report (WP1)
- Stakeholder engagement report (WP2)
- Programme design report and presentation (WP3)

Data Access Details

Data for this project and all other projects funded under the Network Innovation Allowance (NIA), Network Innovation Competition (NIC) or the new Strategic Innovation Fund (SIF) can be found or requested in a number of ways:

1. A request for information via the Smarter Networks Portal at https://smarter.energynetworks.org, to contact select a project and click 'Contact Lead Network'. National Grid ESO already publishes much of the data arising from our innovation projects here so you may wish to check this website before making an application.
2. Via our Innovation website at https://www.nationalgrideso.com/future-energy/innovation
3. Via our managed mailbox innovation@nationalgrideso.com
   Details on the terms on which such data will be made available by National Grid ESO can be found in our publicly available "Data sharing policy relating to NIC/NIA projects" at https://www.nationalgrideso.com/document/168191/download.

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

This project has a significant number of unknowns and requires cross-sector collaboration and specialist skills covering data science, learning and strategy to deliver it at pace to meet the needs of the energy sector. This is a cross-sector initiative, and not a named project with allocated business plan funding.

Given there is no existing programme in the energy sector of this kind, and the need for data science capability is relatively new, introducing a fellowship underpinned by a collaboration between data science and the energy sector comes with innovation risk. A partnership bringing together digital and a sector that is relatively early in this journey has not been done before, and consequently there will be a significant learning curve and need for innovative, interactive design to ensure the programme is built in such a way that it serves its purpose for the participants in the energy sector.

Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

The project will test the feasibility of the programme through engagement, evaluation of existing programmes and programme design. As the programme is the first of its kind to progress net zero and the critical actions required by the energy sector, it has a significant number of unknowns and risks associated with its delivery that will need to be addressed through this initial project and could result in

a negative feasibility assessment. Considering this, NIA funding is the most suitable for exploring a potential energy data science fellowship programme.

This project has been approved by a senior member of staff

☑ Yes