

National Grid Electricity System Operator Limited
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Date: 16 February 2024

Dear National Grid Electricity System Operator Limited,

SIF Project Direction ref: NGESO/Network Security in a Quantum
Future/SIFNADSPS/Rd3_Discovery

National Grid Electricity System Operator Limited submitted Network Security in a Quantum Future (the Project) to be considered for funding through the Discovery Phase of round 3 of the Strategic Innovation Fund (SIF). In our¹ SIF Funding Decision finalised on 16 February 2024, we selected the Project² for conditional funding for the round 3 Discovery Phase and as a result we are now issuing this SIF Project Direction to implement that decision.

National Grid Electricity System Operator Limited must comply with the conditions contained in this SIF Project Direction as a condition of the Project receiving funding through the SIF. These conditions can be found in the Schedule to this document.

Progression through SIF Phases

The SIF consists of a multi-phase approach for Projects in order to mitigate the risk associated with innovations. The Discovery Phase focuses on feasibility, the Alpha Phase on experimental development, and the Beta Phase on deployment and demonstration. This Project Direction is for the round 3 Discovery Phase of the SIF.

¹ The terms 'we', 'us', 'our' refer to the Gas and Electricity Markets Authority. Ofgem is the office of the Authority.

² Unless otherwise specified, defined terms in this SIF Project Direction have the meaning given to them in Appendix 1 of the SIF Governance Document.

Role of UK Research & Innovation (UKRI)

As per Chapter 1 of the SIF Governance Document³ the role of UKRI is to deliver the SIF in line with the SIF Governance Document - administering the funding programme, monitoring the delivery of Projects, collating data from Projects on benefits, making recommendations to Ofgem on operational matters, supporting third-party innovators and, where possible, supporting successful Projects to become 'business as usual' activities. To support the success of the Projects and the SIF programme, we expect that the Funding Party and Project Partners collaborate with Ofgem and UKRI.

SIF Project Direction

Paragraph 5.14 of the SIF Governance Document states that a SIF Project Direction will:

- Set out the Project-specific conditions, to which the Funding Party is committing in accepting SIF Funding.⁴
- Require the Funding Party to undertake the Project in accordance with the commitments made in the Application. Where appropriate, the SIF Project Direction may therefore include extracts from the Application or refer to specific sections of the SIF Application.⁵
- Where applicable, set out conditions (such as Project stage gates) linked to milestones and deliverables, which Projects must meet.⁶
- Set out the SIF Approved Amount for the Project, that will form part of the calculation contained in the SIF Funding Direction issued by the Authority under chapter 7 of the SIF Governance Document.⁷
- Set out the Project budget that the Funding Party must report against and how variations in the Project budget will be reported.⁸
- Where applicable, set out special information sharing requirements applicable to the Project.⁹
- Set out the mechanism for the Funding Party receiving the SIF Approved Amount as set out in the SIF Funding Direction.¹⁰

All SIF Project Direction requirements are detailed in the Schedule to this SIF Project Direction.

³ <https://www.ofgem.gov.uk/publications/updated-sif-governance-document>

⁴ 'Project specific conditions' detailed under Point 3 – 'Condition Precedent' of this SIF Project Direction.

⁵ 'Project specific conditions' detailed under Point 3 – 'Condition Precedent' of this SIF Project Direction.

⁶ 'Project specific conditions' detailed under Point 3 – 'Condition Precedent' of this SIF Project Direction.

⁷ 'SIF Funding Amount' detailed under Point 5 – 'Condition Precedent' of this SIF Project Direction.

⁸ Annex 1 – Project Budget.

⁹ 'Project specific conditions' detailed under Point 3 – 'Condition Precedent' of this SIF Project Direction.

¹⁰ 'SIF Funding Amount' detailed under Point 5 – 'Condition Precedent' of this SIF Project Direction.

Decision

Provided the Funding Party complies with the SIF Governance Document and with the Schedule to this SIF Project Direction, the Project is deemed to be an Eligible SIF Project¹¹.

This SIF Project Direction constitutes notice pursuant to section 49A (Reasons for decisions) of the Electricity Act 1989.

Marzia Zafar

Deputy Director, Decentralisation & Digitalisation

For and on behalf of the Authority

¹¹ 'Eligible SIF Project' is a defined term in the SIF Governance Document. See also, paragraph 5.13 of the SIF Governance Document.

Schedule to SIF Project Direction

1. PROJECT DETAILS

SIF Project Direction reference: NGESO/Network Security in a Quantum

Future/SIFNADSPS/Rd3_Discovery

Application number: 10103996

Project title: Network Security in a Quantum Future

Innovation Challenge/Project Phase: Novel technical, process and market approaches to deliver an equitable and secure net zero power system / Discovery Phase round 3

Project start date: 01 March 2024

Project end date: 31 May 2024

SIF Approved Amount for SIF Funding: £149,621

2. PREAMBLE

This SIF Project Direction is issued by the Gas and Electricity Markets Authority (the "Authority") to National Grid Electricity System Operator Limited (the "Funding Party") pursuant to the SIF Governance Document issued pursuant to Special Condition 9.19 of the Electricity Transmission Licence (the "Licence"). It sets out the conditions to be complied with in relation to Network Security in a Quantum Future (the "Project") as a condition of it being funded under the SIF Funding Mechanism.¹²

Unless otherwise specified, defined terms in this SIF Project Direction have the meaning given to them in the Licence or Appendix 1 of the SIF Governance Document.

References to specific sections of the Funding Party's Application in this SIF Project Direction are, for ease of reference, made by referring to the section number in the Funding Party's Application.

3. PROJECT SPECIFIC CONDITIONS

In accepting funding for the Project, the Funding Party is subject to the following Project-specific conditions:

Condition 1

The Funding Party must not spend any SIF Funding until contracts are signed with the Project Partners named in Table 1 for the purpose of completing the Project.

¹² The SIF Funding Return Mechanism is defined in the SIF Governance Document.

Table 1. Project Partners

UNIVERSITY OF WARWICK
CAMBRIDGE CONSULTANTS LIMITED
UNIVERSITY OF EDINBURGH

Condition 2

The Funding Party must report on the financial contributions made to the Project as set out in its Application. Any financial contributions made over and above that stated in its Application should also be reported and included within the Project costs template.

Condition 3

The Funding Party must make reasonable endeavours to participate in all meetings related to the Project that they are invited to by Ofgem, UKRI and DESNZ during the Discovery Phase.

Condition 4

Prior to completion of the Discovery Phase the Funding Party to the Monitoring Officer must outline proactive measures for Critical National Infrastructure which are necessary to maintain high security standards against evolving threats.

4. COMPLIANCE

The Funding Party must comply with Special Condition 9.19 of the Electricity Transmission Licence (the "Licence"), the SIF Governance Document and with this SIF Project Direction.

5. SIF APPROVED AMOUNT

The SIF Approved amount of £149,621 (as detailed under Section 1: Project details of this Project Direction) will be recovered by National Grid Electricity System Operator from GB customers and transferred to the Funding Party. The Funding Party is responsible for notifying National Grid Electricity System Operator of the bank account details to which transfers must be made, in addition to completing Annex 2 of this SIF Project Direction. If a Funding Party is required to return funding to National Grid Electricity System Operator, the reverse applies. The Funding Party must provide bank account details to National Grid Electricity System Operator within two weeks of accepting this SIF Project Direction.

6. PROJECT BUDGET

The Project budget is set out in Annex 1 of this SIF Project Direction.

The Funding Party must report on expenditure against each line under the category total in the Project Budget and explain any projected variance against each line as part of its detailed report which will be provided, in accordance with Chapter 7 of the SIF Governance Document. The Funding Party must report variations in the Project budget as outlined in Chapter 6 of the SIF Governance Document.

7. PROJECT IMPLEMENTATION

The Funding Party must undertake the Project in accordance with the commitments it has made in the Application and with the conditions of this SIF Project Direction. These include (but are not limited to) the following:

- (i) To undertake the Project in accordance with its Application,
- (ii) To complete the Project on or before the Project completion date as detailed under Section 1 of the Schedule to this SIF Project Direction, and
- (iii) To disseminate the learning from the Project at least to the level described in chapter 3 of the SIF Governance Document. Dissemination of learning must be carried out whether the Project was concluded successfully or otherwise.

8. REPORTING

Ofgem and UKRI may issue guidance (and amend it from time to time) about the structure and content of the Project reporting required by Chapter 6 of the SIF Governance Document. The Funding Party must follow this guidance in preparing the reports.

As set out in chapter 6 of the SIF Governance Document, the Funding Party may be required to submit an end of Phase report to the UKRI monitoring officer for the round 3 Discovery Phase. An end of Phase report is required for the round 3 Discovery Phase if the Project is not planning on submitting an Application to the round 3 Alpha Phase and, if the Funding Party submits an Application for the Project for the round 3 Alpha Phase but is not successful. Within this report, the Funding Party must submit information related to questions on Project delivery as detailed in chapter 6, table 6 of the SIF Governance Document.

9. MONITORING

The Funding Party must comply with any reasonable request for information by its monitoring officer at UKRI and related deadlines. Ofgem, with the support of UKRI, will together monitor Project delivery, impacts and benefits. Throughout the term of the Project, progress is monitored by UKRI through a monitoring officer. The monitoring officer is the first point of contact for official notifications, queries and correspondence with UKRI and the Authority, unless otherwise required by this SIF Project Direction.

As detailed in Chapter 6 of the SIF Governance Document, meetings with the monitoring officer will take place at regular intervals, as advised by Ofgem or the monitoring officer during the delivery of the Project, and at the end of each Project Phase.

10. EVALUATION

The Funding Party has acknowledged when it submitted its Application for this Project, that reporting information and data gathered during the Project's timescales (as detailed in Section 1 of the Schedule to this SIF Project Direction) will be used to evaluate Project performance. In addition, the Funding Party may be required to provide requested information outside of the Project timescales and, in particular, for the period from the Project end date to the end of the SIF Programme. Further data and reporting information may be requested (frequency and method based on requirement) outside of standard monitoring and reporting requirements as deemed necessary. Further data and information requirements must be complied with by the Funding Party and Project Partners.

11. DATA SHARING

As set out in Chapter 3 of the SIF Governance Document, the Funding Party must follow Data Best Practice Guidance with regards to all data gathered or created in the course of a Project. We expect the Funding Party to document any reasons, such as commercial sensitivities, for desensitising data. As defined by, and in accordance with, Data Best Practice Guidance, Funding Parties must have a data triage process. Where multiple Project Partners are collaborating on a Project, the consortium must adopt a consistent Open Data Triage for the data related to the Project. Ofgem may require that Project information and data is also shared with other specified parties, such as parties working on complementary innovation funding programmes (subject to redaction of sensitive data).

12. CYBER SECURITY

It is the responsibility of the Funding Party and all Project Partners to implement and maintain appropriate security measures to protect personal data in accordance with The General Data Protection Regulation¹³ and Data Protection Act 2018¹⁴.

Protection of computer systems from unauthorised access or being otherwise damaged or made inaccessible must be in place alongside effective working practices. These must be maintained in line with the Funding Party's IT Management Strategies and policies.

13. PROJECT MILESTONES

The Funding Party must provide an outline in its end of Project Phase meeting with its UKRI monitoring officer that verifies the Project milestones have been achieved or explains why they have not.

Project milestones are outlined below in Table 3, based upon details contained within Question 7 and Appendix Question 9 in the Funding Party's Application.

¹³ https://ec.europa.eu/info/law/law-topic/data-protection/data-protection-eu_en

¹⁴ <https://www.legislation.gov.uk/ukpga/2018/12/contents/enacted>

Table 3. Project milestone¹⁵

Reference	Project milestone	Deadline	Overall objectives and key tasks	SIF Funding Request
Milestone 1	Work package 1: Quantum Threat Assessment	31 May 2024	<p>Overall objective: Develop a methodology to assess and address the threat posed by developments in quantum computing.</p> <p>Key tasks:</p> <ol style="list-style-type: none"> 1. Kick off workshop - sharing of background knowledge and highlighting areas of investigation in quantum computing and threats. 2. Literature review - focussing on quantum state of the art and potential threats. 3. Mid -project workshop - sharing of background knowledge and highlighting areas of investigation in vulnerability gaps within the energy network. 	£59,768

¹⁵ As outlined in in the Application or Project Plan appendix.

			<p>4.Quantum gap analysis - study of arising areas from mid-phase workshop.</p> <p>5.Methodology outline - Creation of outline methodology for the assessment and mitigation of threats, with justifications for decisions.</p>	
Milestone 2	Work package 2: Information Model Design	31 May 2024	<p>Overall objective: Investigate and design an information model to define the timescales of both assets and information with respect to a cyber security threat.</p> <p>Key tasks:</p> <ol style="list-style-type: none"> 1. Kick off workshop - define terminology for methodology and outline test case. 2. Test case development - create a test case based on the National Grid ESO assets and infrastructure. 3.Threat model development - create outline threat model. 4. Mid -project workshop - design asset grouping framework. 5.Draft methodology - develop draft methodology for information assessment. 	£56,882

			<p>6. Methodology test case - use the test case to assess the feasibility of the draft methodology.</p> <p>7. Information model design - create outline design for the information model (to be developed in Alpha).</p>	
Milestone 3	Work package 3: Project Management and Communications	31 May 2024	<p>Overall objective: Delivery of Discovery phase, including alignment of research with involved stakeholders.</p> <p>Key tasks:</p> <ol style="list-style-type: none"> 1. Overall project management across each involved partner. 2. Arrangement of logistics for in-person and virtual workshops. 3. Execution of three steering meetings to align research across involved stakeholders. 4. Delivery and dissemination of project learnings and deliverables. 	£32,971

14. USE OF LOGO

The Funding Party, Project Partners, External Funders and Project Supporters including any of their subcontractors¹⁶ must not use the Innovate UK/UKRI and/or Ofgem logo for purposes associated with the Project in any circumstances.

As an alternative for use of both Ofgem and UKRI logos, all external Project communications must include the following standard form of wording:

- (i) "this project is funded by network users and consumers under the Strategic Innovation Fund, an Ofgem programme managed in partnership with UKRI."

For additional guidance, refer to the communications and media guidelines for competition winners, detailed as part of your delivery pack. These guidelines are designed to help with some suggestions and encourage you to take a proactive approach to communicating about your Project.

15. SHARING OF LESSONS LEARNED

The Funding Party is required to ensure that the sharing of lessons learned and the facilitation of knowledge transfer is conducted as effectively as possible, to ensure that all parties, and therefore all consumers including future consumers, can benefit from Projects.

As contained within Chapter 3 of the SIF Governance Document, we require the Funding Party to work collaboratively to maintain the ENA Smarter Networks Portal so that all reporting and dissemination of learnings on Projects (as required by chapter 6 of the SIF Governance Document) is available via the ENA Smarter Networks Portal.

16. COLLABORATION

The Funding Party must collaborate with third-party innovators as Project Partners, as well as work closely with other parties in the energy supply chain, as set out in Chapter 3 of the SIF Governance Document.

The Funding Party must collaborate with other parties and with UKRI to organise an annual conference in a format appropriate to enabling the building of consortiums and the dissemination of learning widely. The conference may be a single event for gas and electricity, or more than one event, as appropriate.

¹⁶ As detailed in the Application.

17. AMENDMENT OR REVOCATION

As set out in Chapter 7 of the SIF Governance Document, this SIF Project Direction may be amended or revoked under the following circumstances:

- (i) if the Funding Party considers that there has been a Material Change in circumstance that requires a change to the SIF Project Direction, and the Authority agrees; or
- (ii) to reflect amendments made to the Licence.

18. HALTING OF PROJECTS

This SIF Project Direction is subject to the provisions contained in Chapter 7 of the SIF Governance Document relating to the halting of Projects. By extension, this SIF Project Direction is subject to any decision by the Authority to halt the Project to which this SIF Project Direction relates and to any subsequent relevant SIF Funding Direction issued by the Authority pursuant to Special Condition 9.19 of the Electricity Transmission Licence.

Further to the requirements in Chapter 7 of the SIF Governance Document, in the event the Authority decides to halt the Project, to which this SIF Project Direction relates, the Authority may issue a statement to the Funding Party clarifying the effect of that halting decision as regards to the status and legal force of the conditions contained in this SIF Project Direction.

NOW THEREFORE:

In accordance with the SIF Governance Document issued pursuant to Special Condition 9.19 of the Electricity Transmission Licence of the Licence the Authority hereby issues this SIF Project Direction to the Funding Party in relation to the Project.

This constitutes notice of reasons for the Authority's decision pursuant to section 49A (Reasons for decisions) of the Electricity Act 1989.

Failure to comply with the conditions of this SIF Project Direction means that Ofgem may treat all or part of the SIF Approved Amount received by the Funding Party as SIF Disallowed Expenditure.

ANNEX 1: PROJECT BUDGET

SIF Project Direction costs	
Cost Category	Total Project costs (£)
Labour	167,757
Materials	0
Subcontracting	0
Travel and subsistence	2,100
Other costs	0
Total	169,857

Project Partner	Total Project costs (£)	Project contribution (£)	Total SIF Funding requested (£)	Project contribution (%)
National Grid Electricity System Operator Ltd	36,554	6,900	29,654	18.88
University of Warwick	15,403	1,543	13,860	10.02
University of Edinburgh	14,974	1,500	13,474	10.02
Cambridge Consultants Ltd	102,929	10,293	92,633	10.02
Total	169,857	20,236	149,621	11.91

ANNEX 2 TO SCHEDULE: TEMPLATE OF BANK ACCOUNT DETAILS TO BE PROVIDED TO EITHER NGT (BOX.GSOSETTLEMENTS@NATIONALGRID.COM) OR NG ESO (revenue.invoice@nationalgrideso.com)

Company name:

Primary Contact Details (only one contact permitted)

First Name:

Last Name:

Email address:

Mobile phone number:

Work phone number:

Address details

Address name:

Street address:

City:

State / region:

Post code:

PO box: (if applicable)

PO box post code: (if applicable)

Banking details

These should be evidenced in non-editable format. The evidence provided must show company name and bank details and it should be dated within the last 6 months.

Any of the below documents will suffice:

- Bank statement (scanned document)
- Void cheque
- Paying in slip
- Screenshot of online banking (showing a logged in account with bank account and sort code, with browser visible)