

Scottish Hydro Electric Transmission Plc (SSEN Transmission)
Inveralmond House, 200 Dunkeld Road
Perth
PH1 3AQ

Direct Dial: 020 7901 7295

Email: Marzia.Zafar@ofgem.gov.uk

Date: 4 April 2023

Dear SSEN Transmission,

SIF Project Direction ref: SHET/REACT/SIFIESRR/Rd2 Discovery

SSEN Transmission submitted REACT (Rapid Evaluation Areal Connection Tool) (the Project) to be considered for SIF Funding in the round 2 Discovery Phase of the Strategic Innovation Fund (SIF). In our¹ SIF funding decision issued on 4 April 2023, we selected the Project² for conditional funding and as a result we are now issuing this SIF Project Direction to implement that decision.

SSEN Transmission 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 and rounds

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 2 Discovery Phase of the SIF.

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

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.

³ <https://www.ofgem.gov.uk/sites/default/files/2023-02/SIF%20Governance%20Document%20v2.1%20final%20clean.pdf>

recommendations to Ofgem on operational matters, supporting third-party innovators and, where possible, 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.

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.

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

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

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

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

⁸ 'Annex 1 – Project Budget.

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

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

¹¹ The meaning 'Eligible SIF Project' is described in Chapter 2 of the SIF Governance Document.

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

Marzia Zafar

Deputy Director of Strategy & Decarbonisation

For and on behalf of the Authority

Schedule to SIF Project Direction

1. PROJECT DETAILS

SIF Project Direction reference: SHET/REACT/SIFIESRR/Rd2_Discovery

Application number: 10058535

Project title: REACT (Rapid Evaluation Areal Connection Tool)

Innovation Challenge/Project Phase: Improving energy system resilience and robustness
/ Discovery Phase round 2

Project start date: 3 April, 2023

Project end date: 30 June, 2023

SIF Approved Amount for SIF Funding: £149,320

Total Compulsory Contribution¹²: £20,089

2. PREAMBLE

This SIF Project Direction is issued by the Gas and Electricity Markets Authority (the "Authority") to SSEN Transmission (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 REACT (Rapid Evaluation Areal Connection Tool) (the "Project") as a condition of it being funded under the SIF Funding Mechanism.¹³

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 condition(s):

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 Compulsory Contribution is defined in the SIF Governance Document.

¹³ The SIF Funding Return Mechanism is defined in the SIF Governance Document.

Table 1. Project Partners

ICEBREAKER ONE LIMITED
OLWG LTD
MAPSTAND LIMITED

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 participate in all meetings related to the Project that they are invited to by Ofgem, UKRI and DESNZ (formerly BEIS) during the Project Phase.

Condition 4

Prior to the end of the Discovery Phase, the Funding Party must provide to the monitoring officer a summary of how it envisions the Project's pathway to business as usual, and how the Funding Party plans to incorporate or take into consideration other technologies with the tool, such as for heat and transportation. Additionally, the Funding Party must include as part of this summary, an explanation as to whether additional Project Partners will be required.

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 £149,320 (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) undertake the Project in accordance with its Application,
- (ii) complete the Project on or before the Project completion date as detailed under section 1 of the schedule of this SIF Project Direction, and
- (iii) 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.

Each Project not intending to submit an Application to the next Project Phase must submit an end of Project Phase report to the monitoring officer. Projects which are not successful at the next Project Phase must either retrospectively complete an end of Phase report and publish it on the Smarter Networks Portal, or publish their unsuccessful Application (redacted where necessary) and close out meeting slides for this Project Phase on the Smarter Networks Portal.

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 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 Triage Process 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 GDPR (General Data Protection Regulation)¹⁴ and DPA (Data Protection Act) 2018¹⁵. 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 verify in its end of Project Phase meeting with the monitoring officer whether the Project milestones have been achieved or explain why they have not been.

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

Table 3. Project milestone¹⁶

Reference	Project milestone	Deadline	Evidence	SIF Funding Request (100%) ¹⁷
Milestone 1	Work package 0: Project management	June 30, 2023	Overall work package objectives: - Co-ordination of all internal meetings with partners to ensure the project is on track - completion of timesheets and ensuring the project is on track financially - Securing internal agreement for the project to proceed to Alpha application Key tasks:	£7,000.43

¹⁴ https://ec.europa.eu/info/law/law-topic/data-protection/data-protection-eu_en

¹⁵ <https://www.legislation.gov.uk/ukpga/2018/12/contents/enacted>

¹⁶ As outlined in the Application or Project Plan appendix.

¹⁷ Where Project Applications were not explicit on milestone(s) as a percentage of total SIF Funding Request, milestone(s) as a percentage of total project costs were applied to the SIF Funding Request. In some circumstances where the information needed to complete this table was not available in an Application, Funding Parties were requested to provide this information separately.

			<ol style="list-style-type: none"> 1. Maintain and track the project schedule, project actions, and project deliverables and expenditure forecast 2. Monitor and manage the risk register 3. Begin planning the Alpha phase and secure internal agreement to proceed to Alpha application 4. Prepare for Show and Tell webinar 5. Produce conclusion document for monitoring officer <p>Milestone(s):</p> <ul style="list-style-type: none"> - Internal stage-gate to agree on whether to proceed with Alpha phase application: A well-articulated justification for proceeding to Alpha is presented to the SSEN-T Innovation Governance Board. A decision is made confirming if the project should proceed. (£3,500.21). - Conclusion of Discovery phase: Conclusion document delivered on time detailing completion of work packages and milestones against the project scope and delivery plan. (£3,500.21). 	
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Milestone 2	Work package 1: Literature review	June 30, 2023	<p>Overall work package objectives:</p> <ul style="list-style-type: none"> -To understand what we can learn from other literature and studies carried out across the UK/World - Identifying hydrogen infrastructure plans in the north of Scotland and across the UK. - Collation of all studies on the potential future impact of hydrogen on electricity networks. <p>Key tasks:</p> <ol style="list-style-type: none"> 1. Create a list detailing the hydrogen developments being studied, initiated and delivered in SSEN jurisdiction and UK. (including both electrolytic and blue hydrogen). 2. Research power requirements (power demand, voltage levels and capacity factor etc for these hydrogen developments, and preference for grid vs private wire. 3. Research implications of grid vs. private wire on commercial viability of hydrogen projects. 4. Research suitable hydrogen use cases, demand scenarios and other potential predictors of developments achieving Final Investment Decision. 5. Alignment of development plans with national policy such as Sixth Carbon Budget, UK Hydrogen Strategy, Scotland Hydrogen Action Plan, British Energy Security Strategy. 	£24,063.75
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			<p>6. Research and map out existing power transmission expansion scenarios (e.g. Nat Grid ESO Pathway to 2030 Holistic Network Design) to accommodate Net Zero.</p> <p>Milestone(s):</p> <ul style="list-style-type: none"> - Initial Research Output for Review: Team provide review and feedback is received and incorporated. (£14,438.25). - Final Research Output: All feedback incorporated, summary note issued. (£9,625.50). 	
Milestone 3	Work package 2: User needs and data availability	June 30, 2023	<p>Overall work package objectives:</p> <ul style="list-style-type: none"> - Run an internal stakeholder engagement process to understand the user needs for a geographic impact planning tool - Investigate the data availability and data governance required for REACT - Make recommendations for reducing friction to promote future innovation <p>Key tasks:</p> <ol style="list-style-type: none"> 1. Identify key stakeholders to interview. 2. Icebreaker One to carry out one-to-one interviews with internal SSEN stakeholders to determine the main aims and data requirements for the REACT tool. 	£54,702.59

			<p>3. Create short report detailing main priorities and needs from a network perspective.</p> <p>Milestone(s):</p> <ul style="list-style-type: none"> - Early-stage user needs longlist: Longlist of user needs shared with project team for feedback. (£21,881.04). - Relevant dataset list: A list of datasets relevant to the use case and their licenses (or, indicate if unknown). (£21,881.04). - Final research output completed: Clear output document which includes project team feedback, produced on time. (£10,940.52). 	
Milestone 4	Work package 3: REACT tool planning	June 30, 2023	<p>Overall work package objectives:</p> <ul style="list-style-type: none"> - Understanding what we need to do to create the REACT tool - Collation of current tools available with Mapstand and Olsights - Investigation if SSEN Transmission modelling tools (Python scripts) can be incorporated into the impact planning tool as and when connection studies need to be carried out (on a rolling basis) - Planning for Alpha with the potential planning model 	£63,552.21

			<p>Key tasks:</p> <ol style="list-style-type: none"> 1. Examine tools + scripts currently used by SSEN engineers / analysts to currently analyse + predict power flow and grid constraints. Understand usage, limitations and opportunities for data connection. 2. Examine alternate / equivalent power flow modelling tools + data connectivity. 3. Research best in class modern data architecture, visualisation & User Interface frameworks, and compare against existing Mapstand & Olwg hydrogen visualisations. Gather examples of award-winning web modelling tools. 4. Review with Team whether alpha build should be internal-only planning tool, or have public/ external screening version. 5. Research network capacity/ demand datasets available for ML training, or create an array of 'standard' simulation run outputs for ML training purposes. 7. Research appropriate machine learning simulation packages for the job 8. Research & test incorporation of ML predictive modelling into front-end web apps 9. Develop work scope, resource plan & cost estimates for alpha build 	
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			<p>Milestone(s):</p> <ul style="list-style-type: none"> - Initial Research Output for Review: Review with team & receive feedback. (£12,710.44). - Intermediate Research Output for Review: Review with team & incorporate / receive feedback. (£19,065.66). - Final Research Completed: All feedback incorporated, alpha SOW issued. (£31,776.11). 	
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14. USE OF LOGO

The Funding Party and the Project Partners, External Funders and Project Supporters or subcontractors¹⁸ 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.

¹⁸ As detailed in the Application.

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 disseminating learning widely. The conference may be a single event for gas and electricity, or more than one event, as appropriate.

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 (the "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, 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 (the "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	165,310
Materials	0
Subcontracting	0
Travel and subsistence	600
Other costs	3,499
Total	169,409

Project finances				
Project Partner	Total project costs (£)	Project Compulsory Contribution (%) ¹⁹	Project Compulsory Contribution (£)	Total SIF Funding requested (£)
SCOTTISH HYDRO ELECTRIC TRANSMISSION PLC	20,998	33%	5,248	15,750
ICEBREAKER ONE LIMITED	61,011	11%	6,101	54,910
OLWG LTD	45,100	11%	4,510	40,590
MAPSTAND LIMITED	42,300	11%%	4,230	38,070
Total	169,409	13%	20,089	149,320

¹⁹ The Project contribution is calculated as percentage of the SIF Funding requested per Project Partner and for the Project.

ANNEX 2 TO SCHEDULE: TEMPLATE OF BANK ACCOUNT DETAILS TO BE PROVIDED TO 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)