Programme Area: Energy Storage and Distribution

Project: Offshore Connection 1

Title: Request for Proposal

Context:

This project examined the specific challenges and opportunities arising from the connection of offshore energy to the UK grid system and considered the impact of large-scale offshore development. It also looked into the novel electrical system designs and control strategies that could be developed to collect, manage and transmit energy back to shore and identified and assessed innovative technology solutions to these issues and quantified their benefits. The research was delivered by Sinclair Knight Merz, a leading projects firm with global capability in strategic consulting, engineering and project delivery. The project was completed in 2010.

Request for Proposals (RfP)

Title of Services for which Proposals are Requested:

Assessment of New Approaches to the Connection and Integration of Offshore Renewable Energy Farms into UK Power Systems

Request Issue Date:

20th March 2009

Deadline for Notification of Intention to Submit a Proposal:

31st March 2009

Closing Date:

Proposals must be received before 5pm on **9th April 2009**

Contact for Enquiries:

Justina Zurawliw
Programme Support Officer
Tel: +44 (0)1509 202040
Email: justina.zurawliw@eti.co.uk

Address for Submission of Proposals:

Energy Technologies Institute LLP
F.A.O.: Justina Zurawliw
Holywell Building
Holywell Way
Loughborough
LE11 3UZ
Email: justina.zurawliw@eti.co.uk

1. Introduction and Overview of the Services Required

1.1. Introduction to the Energy Technologies Institute

The Energy Technologies Institute LLP (the ETI) is a private organisation formed as an innovative Limited Liability Partnership between international industrial energy companies and the UK government.

Our mission is to accelerate the development, demonstration and eventual commercial deployment of a focused portfolio of energy technologies, which will increase energy efficiency, reduce greenhouse gas emissions and help achieve energy and climate change goals.

We will do this by leveraging the skills, capabilities and market access routes of our members, working with other organisations worldwide, to take the most challenging large-scale energy projects to full system demonstration, thus bridging the gulf between laboratory proven technologies and full scale commercially tested systems. Our projects will also develop knowledge, skills and supply-chains, and will inform the development of regulation, standards and policy. Hence we aim to overcome major barriers, de-risk the future development and shorten the lead times to market for secure, affordable, low-carbon energy systems for power, heat and transport.

Our portfolio includes programmes in areas such as Wind, Marine, Distributed Energy, Transport, Energy Networks and Carbon Capture & Storage.

Further information can be found on our web-site at www.eti.co.uk

1.2. Background to the Project

Large-scale offshore renewable energy farms, including wind, tidal stream and wave energy systems, are likely to play an increasingly significant role in enabling the UK to meet its long-term CO_2 emissions reductions targets. However, the development and installation of large renewable energy farms off the coast of the UK provides a number of challenges in terms of:

- The collection of electrical energy offshore from individual and multiple renewable energy devices
- The transportation of bulk electrical energy generated by these offshore farms to the UK shoreline
- The connection and integration of these offshore farms into the onshore power system.

The ETI has identified an opportunity for the development of innovative solutions to address these issues. The purpose of this project is therefore to identify and assess new technology solutions to these issues, quantify their benefits, and provide guidance to the ETI in respect of technology development opportunities.

1.3. Outline Scope of the Project

The project consists of two related Work Packages:

- Analysis at Individual Farm Level: Identification of the challenges and resultant technology opportunities that could arise in respect of the connection of individual large-scale offshore wind or marine energy farms to the UK grid system, and provision of recommendations for connection solutions worthy of further development and analysis.
- Analysis at Multiple Farm Level: Evaluation of the optimal architecture(s) that could be developed to collect, manage and transmit back to shore the electrical energy produced by multiple, large-scale offshore renewable energy farms. This will specifically include an assessment of the opportunities for multi-terminal offshore HVDC systems, and their technical and economic performance compared with HVDC solutions dedicated to individual farms.

Refer to Section 3 of this RfP for a more detailed description of the scope of work and deliverables.

1.4. Required Outcomes and Critical Success Factors for the Project

This Project shall provide the following outcomes:

- A clear understanding of the key issues concerning the connection of individual and multiple renewable energy farms off the UK coast.
- Assessments of the likely technical limits concerning the integration of offshore renewable energy systems into the UK power system.
- Recommendations for new, optimised solutions for the grid connection of individual and multiple offshore renewable energy farms, including the provision of design concepts for offshore HVDC electrical systems.
- Identification of technology development opportunities for the industry, and specifically the ETI, and the preliminary identification of potential ETI development and demonstration activities in respect of the grid integration of offshore renewable energy farms.

Critical Success Factors, which either characterise a successful Project outcome or which are required to facilitate a successful Project outcome, include the following. Any additional factors identified should be described in the Proposal.

- The Project must provide a sufficiently comprehensive and thorough analysis, and present it in such a manner, as to enable the ETI to make decisions at the end of the Project regarding future programme scope. The Participants shall review with the ETI, at least at each relevant stage gate, whether this criterion has been met for the work to date and whether it is expected to be met by the detailed plans for forthcoming work.

1.5. Anticipated Project Organisation Structure

It is anticipated that a number of Participant organisations / entities will be required to work together in order to provide all the necessary knowledge, skills, experience and inputs to complete the Project (as detailed in Section 2.2).

These Participants may choose either:

- to form a Consortium, contracted with the ETI, governed by its own Consortium Agreement and led by a 'Lead Coordinator' to manage the Project and act as primary interface with the ETI, or
- to form sub-contracts between themselves and one of their number who shall act as 'Prime Contractor', shall form a contract with the ETI, and shall manage the Project and act as primary interface with the ETI.

Either of these contracting arrangements is acceptable to the ETI, but there must be a single organisation (Lead Coordinator or Prime Contractor) leading and acting as the primary interface with the ETI. This organisation shall appoint a Project Manager to lead and coordinate all activities of the Project Participants, and to liaise regularly with the ETI's Programme Manager to whom he/she is accountable on behalf of the Participants. This organisation shall also act as the Respondent for the purposes of this Request for Proposals.

2. Request for Proposals Process and Terms

2.1. Content and Format of Proposals

Interested organisations are requested to submit a collective Proposal through their nominated Respondent as described in Section 1.5 above. The Proposal shall be arranged according to the structure detailed in Appendix A and shall include all the information listed therein.

The Proposal must be written in a succinct manner and must not include imprecise statements, generalities or repeated information. The Proposal must be easily readable with appropriate font sizes, margins, etc, and **shall not exceed a maximum of 25 pages** (excluding the due-diligence information required under Section 12 of Appendix A).

Additional information (such as organisational brochures, etc) may be provided to accompany the Proposal if this is expected to add value (although it is not necessarily required by the ETI), but such additional information will not usually be taken into account when reviewing Proposals.

The Proposal shall consist of **three (3) complete hard copies and one (1) electronic copy**. The latter shall be provided in both PDF and Microsoft Word formats.

2.2. Acceptance, Review and Selection of Proposals

Proposals will be reviewed and judged primarily against the criteria listed below.

- Completeness of information content, structure and quality of Proposal (against areas listed in Appendix A)
- Compliance with specification
- Value for money
- Project Organisation including Consortium or Subcontract Participants engaged
- Knowledge, skills and experience, which must include ALL of the following. A table should be provided to identify which Participant(s) is/are proposed to satisfy each of the following criteria:

  (a) Generic criteria:
    - Availability and stability of deployable resources to mobilise sufficiently rapidly and for sufficient durations
    - Record and ability in quality, timely and on-budget delivery (of technology programmes) to the full satisfaction of the main stakeholders
    - Knowledge and previous experience of industry, environment, technologies, and of this type of study, etc
    - Acceptance of ETI IP Terms
    - Ability and experience in collaborative working
    - For the lead organisation particularly, project management expertise

  (b) Specific Technical Criteria:
    - Robust understanding of the UK-specific T&D context, UK market and UK-specific technical details of the T&D systems – THIS IS A CRITICAL AND ESSENTIAL PRE-REQUISITE OF ANY SUCCESSFUL PROPOSAL
    - Understanding of offshore wind and marine energy farm connection design and operation (including current and potential new approaches), including variations in practice both in the UK and across the world
    - Expertise in steady-state and dynamic modelling of electrical systems and offshore wind & marine energy systems, including the use of modelling tools to study behaviour
    - Expertise in HVAC and HVDC system design, in particular their application to offshore renewable energy farm connection
    - Expertise in the design and assessment of potential new control strategies for offshore renewable energy farms taking account of electrical network and farm operation
    - Thorough understanding of existing UK Grid Code requirements, their application and the implications of proposing new grid code approaches
    - Thorough understanding of potential offshore network architectures (specifically including multi-terminal HVDC systems), their sub-components, control strategies and criteria for evaluating optimal solutions, in a UK-specific context

- Project approach and plan, including Gantt chart, suitable stage gates, and proposed management of specific risks and issues
- Existence of any IP issues which may affect the ability to carry out the Project and exploit the results

The ETI at its discretion may request further information in order to assess a Proposal, and may reject any Proposal which does not provide sufficient information.

This RfP is not an agreement to purchase goods or services, and the ETI is not bound to enter into a Contract with any Respondent. All decisions made by the ETI relating to the acceptance, review and selection or otherwise of Proposals are final. The ETI will be under no obligation to explain or justify any such decisions at any time.

2.3. Estimated Time-Frames

Respondents shall notify the ETI of their intention to submit a proposal. This notification shall be in writing to the Address for Submission of Proposals, no later than the Deadline, all as listed on the front cover of this RfP.

The following timetable outlines the anticipated schedule for the contract process. The timing and the sequence of events resulting from this Request for Proposals may vary and shall ultimately be determined by the ETI.

Event	Anticipated Date(s)
Deadline for Notification of Intention to Submit a Proposal	31st March 2009
Closing Date for Responses to RfP	9th April 2009
Preferred Bidder Identified	24th April 2009
Project Detailing and Contract Agreement	from 7th May 2009
Contract Approval	July 2009
Project Start	ASAP after approval
Project Duration	approx 6 months

2.4. Ownership of Proposals and Confidentiality of Information

All documents, including Proposals, submitted to the ETI become the property of the ETI. They will be received and held in confidence by the ETI, subject to the ETI reserving the right to provide such documents to third parties engaged by the ETI in its assessment of them. Organisations selected by the ETI to be taken forward to the Project Detailing Stage will be required to sign non-disclosure agreements.

3. Specification of Scope of Work and Deliverables

This project comprises two Work Packages, both of which shall be addressed by the Proposal:

3.1. Work Package 1: Analysis at Individual Farm Level

This WP shall consist of:

(a) An identification and assessment of novel offshore electrical infrastructure solutions to connect individual large-scale offshore renewable energy farms to the onshore transmission network (e.g. DC v AC, novel design, control and operational philosophies, etc).

(b) An assessment of the impact of the integration of individual large-scale offshore renewable energy farms on the operation of the onshore transmission and distribution systems in the UK, and how this is affected by the design and selection of connection infrastructure.

A key component of both activities is the identification of the technology challenges and resultant opportunities for technology development programmes in these areas.

This Work Package shall include the following:

- Modelling of the components of offshore renewable energy farms and their electrical infrastructure (e.g. HVDC components, AC or DC cables, transformers, offshore wind turbines, tidal stream energy systems, wave energy systems, etc).
- Development of integrated offshore renewable energy farm system models using the component models derived above. These system models shall include typical interconnection approaches used for existing offshore farms, and more novel configurations and approaches relating to future large-scale individual offshore farms (e.g. HVDC, etc), both for connections within the farm and for connections to the onshore system.
- Studies of the steady-state and dynamic performance characteristics of the individual offshore renewable energy farms with each connection configuration, including their delivered power quality (e.g. voltage fluctuations, harmonics, flicker), their contribution to short-circuit current, their compliance with Grid Code requirements, and other related performance aspects.
- Proposed methodologies for the optimal design and selection of the electrical infrastructure for individual offshore renewable energy farms, both for connections within the farm and for connections to the onshore system, (e.g. comparison of HVDC versus HVAC solutions) and the derivation of new grid connection specifications relating to these.
- Assessment of the control system implications of the individual offshore renewable energy farm configurations derived above, and control strategy proposals for these novel systems.
- Development of aggregated steady-state and dynamic models for individual offshore renewable energy farms which can be used by Transmission and Distribution System Operators in planning studies.
- Modelling and assessment of the impact of the individual offshore farms on the onshore transmission network, and interactions with it. This will include consideration of issues such as fault ride through capability, voltage and frequency stability, power system imbalance implications, system reserve and ancillary service provision, etc, and how these are affected by the design and selection of connection infrastructure.
- Proposals for new and/or revised Grid Code requirements relating to the connection of individual offshore renewable energy farms, arising from the analysis above.
- Preliminary economic analysis relating to the large-scale integration of offshore renewable energy farms into the onshore grid (e.g. cost implications, value of performance benefits, etc for each connection solution).

- The identification of technology development opportunities for the industry as a whole, and for the ETI specifically, in respect of the grid integration of individual offshore renewable energy farms. Each opportunity shall be assessed, considering the items above, to determine:
  - Scope for potential development.
  - Materiality of the impact of deployment of such developed technology solutions, including improvements in performance, CO_2 emissions, affordability and security of energy supply, etc, and any subsidiary benefits identified.
  - Present status of technology development, preferably measured against the NASA Technology Readiness Level (TRL) scale, and risks to being brought to market.
  - Acceleration potential.
  - Preliminary economic analysis.

Deliverables:

Technical reports detailing the above activities, as follows. Preliminary reports shall be submitted at appropriate stage gates throughout this WP.

- A technical report describing all of the modelling activities and studies undertaken in Work Package 1. This shall contain a detailed description of the approach taken towards the modelling activities, detailed descriptions of the models developed (including technical parameters, mathematical representations, etc) and the software tools utilised, an overview of the studies performed (including performance, impact on the onshore system, etc), details of the raw outputs of the studies, and an interpretation of these outputs including the implications for the remaining activities of Work Package 1 and for the activities of Work Package 2. In addition to this technical report, all the software models developed or sourced during this WP shall be provided to the ETI in original electronic format for potential re-use by the ETI.
- A technical report detailing proposed methodologies for the optimal design and selection of the electrical infrastructure for individual offshore renewable energy farms, both for connections within a farm and for connections to the onshore system. This shall include proposals for new grid connection specifications relating to these infrastructure approaches and proposals for new and/or revised Grid Code requirements.
- A technical report describing the control system implications of the selected individual offshore renewable energy farm configurations and connections, and proposals for the most suitable control strategies to address these.
- A technical report that provides a preliminary economic analysis of the integration of individual offshore renewable energy farms into the onshore UK grid, and that identifies the technology development opportunities for ETI.

3.2. Work Package 2: Analysis at Multiple Farm Level

This WP shall identify and evaluate the optimal architecture(s) that could be developed to collect, manage and transmit back to shore the electrical energy produced by multiple, large-scale offshore wind and marine energy farms. This shall include the assessment of optimal offshore electrical network configurations, focussing specifically on the opportunities for offshore multi-terminal HVDC systems and their technical and economic performance compared with HVDC solutions dedicated to individual farms (per WP1).

It is recognised that there are many potential scenarios for the location of offshore renewable energy farms around the UK, and that covering all of these would not be practical for this study. Therefore, for the purposes of this Request for Proposals, the three (3) offshore renewable energy farm location case studies detailed in Appendix C shall be considered.

This Work Package shall consist of the following Tasks, and shall address each of these case study examples throughout the Work Package:

- An assessment of the criteria necessary to evaluate the most favourable electrical system architectures for the collection of electrical energy from multiple offshore renewable energy farms and the transmission of this bulk energy back to the shoreline. This analysis shall include the requirements of energy producers, the onshore transmission system operators and other stakeholders.
- A detailed review of the possible architectures and electrical component requirements likely to offer most benefit to the connection and integration of multi-terminal offshore networks.
- Modelling of the identified multi-terminal offshore network configurations, and studies of their steady-state and dynamic performance characteristics, including their delivered power quality (e.g. voltage fluctuations, harmonics, flicker), their contribution to short-circuit current, their compliance with Grid Code requirements, and other related performance aspects.
- A detailed analysis of the control system issues and strategies that will be required for multi-terminal offshore electrical networks.
- Modelling and assessment of the impact of multi-terminal offshore networks on the performance, operation and management of the onshore transmission network (e.g. dynamic behaviour, ancillary services, congestion and reserve management, power system balancing).
- Identification of the potential impacts of multi-terminal offshore electricity networks on European electricity markets.
- The identification of technology development opportunities for the industry as a whole, and specifically for the ETI, in respect of multi-terminal offshore electricity networks. Each opportunity shall be assessed, considering the items above, to determine:
    - Scope for potential development.
    - Materiality of the impact of deployment of such developed technology solutions, including improvements in performance, CO_2 emissions, affordability and security of energy supply, etc, and any subsidiary benefits identified.
    - Present status of technology development, preferably measured against the NASA Technology Readiness Level (TRL) scale, and risks to being brought to market.
    - Acceleration potential.
    - Preliminary economic analysis.

Deliverables:

Technical reports detailing the above activities, as follows. Preliminary reports shall be submitted at appropriate stage gates throughout this WP.

- A technical report that:
    - Describes the criteria necessary to evaluate the electrical system architectures that offer most benefit towards the connection of multiple offshore renewable energy farms.
    - Provides a detailed review of the possible architectures and electrical component requirements likely to offer most benefit to the connection and integration of multi-terminal offshore networks using the criteria defined above.
    - Describes the control system issues and strategies that will be required for multi-terminal offshore electricity networks.
- A technical report describing the all of the modelling activities and studies undertaken in Work Package 2. This shall contain a detailed description of the approach taken towards the modelling activities, detailed descriptions of the models developed (including technical parameters, mathematical representations, etc) and the software tools utilised, an overview of the studies performed (including performance, impact on the onshore systems, etc), details of the raw outputs of the studies, and an interpretation of these outputs. In addition to this technical report, all of the software models developed or sourced during this WP shall be provided to the ETI in original electronic format for potential re-use by the ETI.

- A technical report identifying the potential impacts of multi-terminal offshore electricity networks on European electricity markets.
- A technical report that identifies the technology development opportunities for the industry as a whole, and specifically for ETI, in respect of multi-terminal offshore electricity networks.

3.3. Exclusions

If there are any items of scope which could reasonably be assumed from the RfP to be included but which are excluded from the Respondent's proposed scope then these shall be explicitly identified in the Proposal.

4. Price and Payment

This Project will be paid on a ***"capped cost plus" basis***. The Project Contract will include defined deliverables, with acceptance criteria, and defined Payment Milestones by which one or more deliverables will have been completed. Payments will be made against each defined Payment Milestone according to actual costs incurred by the Participants (plus an agreed profit margin), up to the agreed maximum for each Payment Milestone, subject to ETI acceptance of the Milestone Completion Report. Unless otherwise agreed as part of a formal contract variation process, the ETI shall not be liable for any payments above the maximum stated in the Project Contract.

Further information is contained in the Summary of Terms contained in Appendix B.

An Accountant's report shall be required to support selected financial reports and invoiced amounts, dependent upon the total contract value to be paid to each Participant. Details of these requirements will be agreed during the Project Detailing phase.

5. Terms and Conditions for Project Contract

During the Project Detailing phase, a Project Contract will be drawn up by the ETI based on its standard contracts for such work and incorporating appropriate information from the ETI's RfP and the Respondent's Proposal. Full terms and conditions will be agreed at that time, but a Summary of Terms is included in Appendix B.

If the Project is to be undertaken by a Consortium, then the Consortium members will be required to execute a Consortium Agreement between themselves prior to signature of the Project Contract with the ETI. The ETI may request a copy this Agreement for review / approval, and a Model Consortium Agreement is available from the ETI.

Appendix A – Content and Format of Proposals

The Proposal shall be arranged according to the structure defined below and shall explicitly include all the information listed.

1. Executive Summary *[maximum 1 page]*

A summary of the Proposal, describing briefly:

- The organisation / Consortium undertaking the work
- Summary of the technical approach and ***key*** deliverables
- Confirmation of compliance with the Specification detailed in the Request for Proposals and/or brief summary of ***key*** exceptions/deviations
- Total Project cost and duration.

2. Project Objectives *[typically ≤ ½ page]*

The overall Project objectives will be as specified in the Request for Proposals. The Respondent may provide subsidiary objectives if they think this is appropriate. The Respondent should also describe any Critical Success Factors which either characterise a successful Project outcome or which are required to facilitate a successful Project outcome.

3. Background to Proposed Participants

The Respondent should provide a brief description of each of the proposed Participant organisations, including any major Subcontractors, ***[maximum 1 page per Participant]***, including:

- Key skills, knowledge, experience and previous track record in the area (technical, commercial and project management, including any UK-specific issues such as technology applicability to UK systems, UK industry practice, UK market/industry knowledge, etc)
- Key staff members involved (including a designated Project Manager), with the amount of each individual's time which will be dedicated to the Project, and detailing their experience – with CVs included in an Appendix (maximum 2 pages per individual)
- Alternate resources available to be deployed in the event that the above key members become unavailable
- Relevant quality, health, safety and environment management systems.

If the Project is to be undertaken by a group of organisations (whether as a Consortium or as Subcontractors), a table ***[typically ½ page]*** should also be provided to identify which Participant(s) is/are proposed to satisfy each of the specific criteria (skills, experience, etc) listed in the 'Criteria for Review and Selection of Proposals' section of the Request for Proposals.

Also if the Project is to be undertaken by a group of organisations (whether as a Consortium or as Subcontractors), evidence of previous collaborative working (or subcontract management as appropriate) should be provided, both within and outside the Participant group ***[typically ½ page]***.

4. Project Organisation *[typically 2 pages]*

The Respondent should provide Project organisational, governance and control structures and processes (particularly for Consortia).

The Respondent should indicate in the structure each Participant (including the ETI) and the position of the key individuals identified in Section 3 (including the Respondent's Project Manager).

The Respondent should identify in their Proposal any foreseen issues or difficulties in respect of the details of such an Agreement or of the process of executing one.

5. Programme of Work *[typically 4 – 6 pages]*

The Respondent should provide a summary of the overall approach to delivery of the Project, and a Task-by-Task breakdown of the proposed work, identifying for each Task:

- the Task leader
- other Participants involved
- key dependencies

- the technical approach (including use of any specific methodologies, techniques or tools)
- Task objectives
- deliverables, including for each deliverable a specification (e.g. quality, appearance, scope, function and purpose as appropriate) and proposed Acceptance Criteria

The Respondent should be specific about the activities within the Task, e.g. including test/simulation matrices or stating a number of tests/simulations.

Any issues or assumptions in defining the programme or schedule (e.g. inputs required from the ETI or other projects) should be explicitly stated.

A specific project management Task (or Tasks) should be identified describing all the activities in this area (e.g. regular meetings, reporting, Stage Gates etc). ***Note that throughout Project delivery the ETI will require reports of monthly progress with supporting financial data, reports to substantiate completion of each milestone, etc.***

If appropriate, a work flow diagram should be provided to illustrate the relationships between Tasks.

Any relevant activities related to but not included within this Project, and the relationships with these activities, should also be described.

6. Deliverables & Payment Milestones *[typically 1 page]*

Following the detailed specifications of each deliverable in the previous section, a summary table should be provided here listing all the Project Payment Milestones (i.e. key points in the Project where one or more Deliverables will have been provided and payment is requested from the ETI), and their constituent deliverables, with due dates for each deliverable and Payment Milestone.

Refer also to Section 11.

7. Project Schedule *[typically 1 page]*

The Respondent should provide a time schedule for the Project (e.g. in the form of a Gantt chart) showing the main Work Packages, Project stages and main Tasks within each Work Package and stage. This should clearly identify:

- Task durations and dependencies (including any inputs required from the ETI or other parties and any other external dependencies)
- Project Deliverables
- Payment Milestones and other relevant milestones
- Project Stage Gates, if appropriate (i.e. major review point(s) in the Project).

8. Risk and Health, Safety & Environment (HSE) Management *[typically 3 pages]*

The Respondent should describe the proposed Risk Management Strategy (i.e. how risks to the successful delivery of the Project will be identified and managed throughout the Project). They should also provide a Risk Register, identifying the key challenges, risks (including any assumptions or dependencies identified earlier), issues and opportunities which may affect the successful delivery of the Project outcomes and identifying planned activities to address / mitigate each item.

Further to the summaries of each Participant's HSE management systems provided in Section 3 of the Proposal, The Respondent should provide here a register summarising the main anticipated HSE issues potentially affecting the Project and proposed strategies to address / mitigate each item.

9. Statement of Compliance *[typically 1 page or less]*

The Respondent shall provide a statement that the Proposal is fully compliant with the Specification and all other aspects of the Request for Proposals, or shall state clearly any exceptions, deviations, alternative approaches or additions to the required Specification, with justification. ***Note that in the absence of any specifically-stated deviation in this section of the Proposal, in the case of any subsequent dispute, the ETI's specification will take precedence over the Proposal.*** Additional comments and clarifications should also be listed where appropriate (for example to clarify interpretation of requirements), but these must be differentiated from any deviations / exceptions above.

10. Intellectual Property (IP) *[typically 1 – 2 pages]*

Any Project commissioned by the ETI will be subject to the appropriate ETI terms and conditions, (a summary of which is included in Appendix B), which state that all Arising IP will belong to the ETI. (Any necessary licensing from the ETI to the Participants may be discussed if appropriate). The Respondent should provide a brief overview of the nature of any anticipated IP Arising from the Project.

The Respondent should describe any Background IP (e.g. patents, proprietary data, computer algorithms, knowhow or other IP):

- which is needed to carry out the Project or which may be used during the Project; or
- which may be needed by the ETI to exploit the Arising IP.

The description of any such Background IP should detail:

- the nature of the IP,
- rights to that IP, and
- ownership and control, whether this is by any of the Project Participants or by any third parties.

11. Project Payment *[typically 1 – 2 pages]*

(a) The Respondent should provide:

- a figure for the ***maximum (capped) total contract value***, and
- a ***breakdown*** between Tasks and (for consortia or other Participant groups) ***between Participants against each Task***.

If there are any assumptions or limitations to this price, these should be clearly stated.

(b) The Respondent should also provide a ***breakdown of the total contract value (only) by category***, as specified in the Table below.

	Participant 1 (Lead Coordinator or Prime Contractor)	Participant 2	Participant 3	Participant 4	Participant 5	Total
Number of Person-days						
Base Labour						
Materials						
Capital						
Subcontractors						
Travel & Subsistence						
Overheads						
Other						
Profit						
TOTALS						
Profit Margin, %						

Notes on Category Breakdown table:

1. Base Labour should include direct add-ons (eg NI, pension etc)
2. Capital costs should be based on depreciation during the Project x % usage on Project
3. Participants will be required to provide justification of overhead calculations during the Project detailing stage. ETI can provide a spreadsheet to calculate overheads on request
4. Participants are required to declare their profit margins
5. Academic Participants should determine their costs using the JeS system. Note that ETI funds Academic Participants at 100% Full Economic Cost.

Please note that during Project Detailing (prior to contract signature) the ETI will require more detailed cost breakdowns, including a schedule of payments against the Payment Milestones identified in Section 5 above.

12. Due Diligence Information *[this is excluded from the page limit]*

A. ALL Participants shall confirm that there are no potential, threatened, pending or outstanding recovery orders by the European Commission in respect of any funding received by any Participant.

B. All Participants (except ETI Members, universities / higher education institutions and UK/EU government laboratories / agencies) which provide more than 20% of the resources for the Project or which provide an input which is critical to the Project's success, shall provide Due Diligence Information to the ETI according to the table overleaf.

Details of organisation
Full name:
Registered Office:
Type of Business (sole trader, limited company, partnership etc):
Names of directors/partners/owner:
VAT number:

Details of directors, partners or associates
Have any directors, partners or associates of the organisation been involved in any organisation which has been liquidated or gone into receivership? (Yes/No)
Have any directors, partners or associates of the organisation been convicted of a criminal offence relevant to the business or profession? (Yes/No)
Please give (and attach if necessary) full details if you have answered 'Yes' to either of the two previous questions.

Audited Financial Accounts
Please supply Audited Financial Accounts for the last 3 years for the organisation, or relevant part thereof.

Claims or litigation
Please provide (and attach if necessary) details of any claims or litigation against the organisation, outstanding and/or anticipated.

Insurance
Please confirm that you have insurance cover for the following risks, and confirm levels of cover and expiry for each. ETI will require evidence of these during the Project Detailing phase. • Property damage • Business interruption • Employer's liability • Public liability • Product liability (or justify its exclusion if not appropriate) • Professional Indemnity

Appendix B – Summary of Terms and Conditions for Project Contract

Introduction

The following represents a summary of the key contractual terms which the ETI would expect to be included in the Project Contract for a project under which the ETI owns all arising IP. This summary assumes that any projects will be carried out by a multi-party consortium with one of the consortium members acting as a lead co-ordinator.

Structure

1. The project participants shall be represented in dealings with the ETI by a lead co-ordinator, who shall, in the majority of instances, be the intermediary for any communication between the ETI and the project participants. This role includes providing notices of meetings and other activities to the ETI, reviewing and commenting on project reports (as required under the project) and administering payment of invoices for all project participants.

Project Management

2. The project participants will be required to appoint a project manager for the day-to-day management of the project. The ETI will appoint a programme manager to act on behalf of the ETI with regards to the project.
3. The project participants shall form a steering committee to make decisions on day-to-day matters (excluding decisions affecting the overall scope, structure and timing of the project). The frequency of meetings of the steering committee will be agreed. The ETI and its members shall be entitled to attend any meetings of the steering committee.
4. The project participants must fulfil various reporting obligations. The requirements for reports will depend upon the nature of the project, the deliverables under it and the duration of the project but are likely to include monthly reports, milestone reports, annual reports and a final report. Each report must address a specified list of topics required by the ETI.
5. The ETI will require the right to carry out a stage gate review on completion of a "stage" (or at least once a year) in order to assess whether the project continues to deliver against ETI outcomes and also in order to carry out a validation exercise against the business case. The ETI may carry out stage gate reviews more frequently if the project is in jeopardy. The need for stage gate reviews and the definition of a stage will depend upon the nature of the project.

Finance

6. ETI will pay against milestones and only in respect of actual costs incurred (or at pre agreed profit margin, if appropriate) for the work done under the project. Only eligible costs will be payable. Ineligible costs include interest charges, bad debts, advertising costs and legal costs incurred in finalising contracts and carrying on the project. Acceptance of milestones will be determined by the ETI, where appropriate, against agreed acceptance criteria. Any increase in costs in carrying out the project over and above the agreed contractual amounts will only be payable by the ETI when such charges are agreed in accordance with the contractual variation control procedure.
7. Costs are payable in Sterling and ETI will pay valid invoices within 30 days of receipt of invoice following acceptance of a milestone. An accountant's report will be required to support selected financial reports and invoices, in accordance with a standard ETI matrix.
8. The ETI reserves the right to require the return of funding in certain circumstances (such as in the event of corruption or fraud, overpayment, costs incurred in respect of unapproved project changes and failure to comply with State Aid obligations).

Confidentiality

9. Restrictions on disclosure of any other party's confidential information will apply. Any publication of results (if appropriate) will be subject to the confidentiality provisions in the agreement.

Audits and Records

10. ETI will require the right to audit the project and project participants during the project and, in certain circumstances, up to 7 years from the end of the project on financial or technical grounds.
11. The parties will be required to maintain the majority of project records for a minimum of 10 years from the project end date and for potentially more than 20 years where the records relate to registered intellectual property rights.

Sub-contracting

12. Sub-contracting is not permitted without consent. However, details of known subcontractors (and therefore the requisite consent) can be given in the agreement at signing.

Variation

13. Any variations to the project must be made via the variation control procedure.

Liability

14. The liability provisions relating to project participants will be tailored on a case-by-case basis but are likely to be several and capped at (or at a multiple of) the amounts payable or received under the project (except in the case of IP infringement claims, certain third party claims or other liabilities which cannot be limited or excluded by law. For these claims, no cap will apply). Recovery of indirect, consequential etc. damages will usually be excluded.

Withdrawal

15. Withdrawal from the project is only possible with the unanimous consent of all other contracting parties. Withdrawing participants cannot recover outstanding costs, unless otherwise agreed.

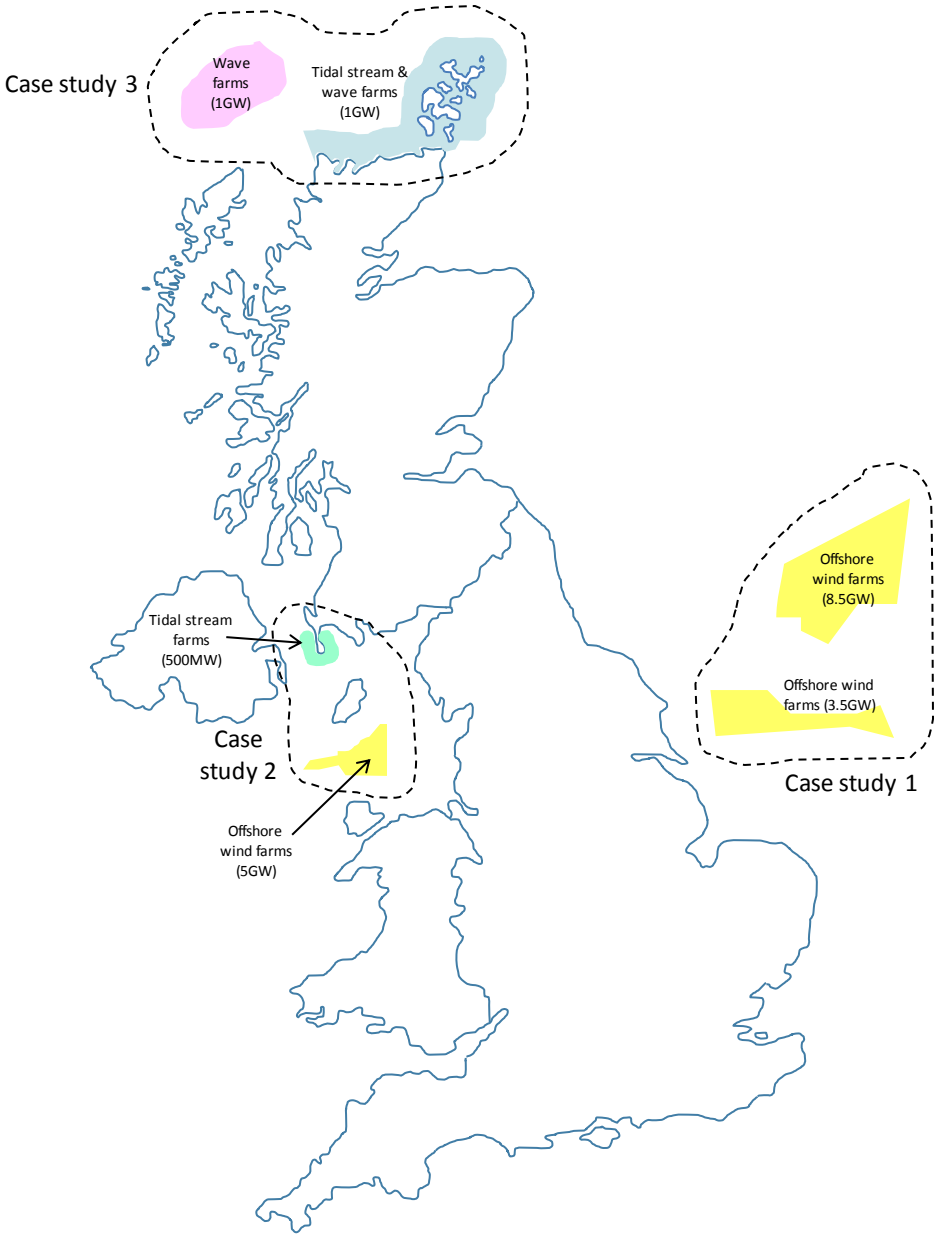
Termination and Suspension

16. The ETI reserves the right to terminate the agreement in certain circumstances (such as breach by a participant, withdrawal of a participant, insolvency, change of control of a participant etc.). The ETI also reserves the right to terminate the agreement unilaterally upon giving a (to be agreed) period of notice to the project participants. Upon termination, the ETI will pay the eligible costs incurred by the project participants up to the date of termination.
17. The ETI will reserve the right to suspend the project in certain defined circumstances.

Intellectual Property

18. All arising IP from the project will be owned by the ETI. The project participants will, to the extent required, be required to assign all relevant arising IP to the ETI.
19. The project participants will be required to licence their background IP: (i) to the other project participants on a royalty free basis where required for the purposes of the project; (ii) to the ETI or sub-licensees of the ETI, where required for the use or exploitation of the arising IP.

Appendix C – Offshore Farm Connection Case Studies (for Work Package 2)



The following three offshore renewable energy farm case studies apply for this Request for Proposals:

1) The connection of 12 GW of offshore wind farms off the east coast of England (Dogger Bank plus Hornsea). The offshore connection points are between 80 km and 250 km from the shoreline.
2) The connection of 5 GW of offshore wind farms in the Irish Sea (40-100 km from the shoreline), combined with 500 MW of tidal stream energy farms off the south-west coats of Scotland (10-20 km from the shoreline).
3) The connection of 1 GW of tidal stream and wave farms in the Pentland Firth area, combined with 1 GW of wave energy farms to the north of the Isle of Lewis (50-100 km from the shoreline).

Appendix D – Glossary

Term	Definition
Consortium	The group of organisations described in Section 0 which may decide together to submit a Proposal to carry out the Project and be governed by a Consortium Agreement between themselves. This will not include the ETI itself.
Consortium Agreement	The agreement to be entered into between the organisations together forming a Consortium, as described in Section 0, which governs the execution of the Project within the Consortium.
Lead Coordinator	The organisation which is a member of the Consortium, and which manages and coordinates the activities of all the Consortium members, and which acts as the primary interface between the Consortium and the ETI, as described in Section 0.
Participant	An organisation which is responsible for the delivery of part of the Project scope and which is therefore the Prime Contractor, or is Subcontracted to the Prime Contractor, or is a member of the Consortium, or is a subcontractor to any of these organisations, as appropriate, as described in Section 0.
Payment Milestone	A contract milestone with defined constituent deliverables, associated deliverable acceptance criteria, and milestone value (all to be detailed in the Respondent's Proposal and agreed in the Project Contract) which should be completed in order to reach the said milestone, and at which, subject to acceptance by the ETI that the milestone has in fact been reached, payment may be claimed from the ETI on the basis described in Section 4 and on the Terms in Appendix C,
Prime Contractor	The organisation which manages and coordinates the activities of all the Subcontract Participants, as described in Section 0.
Programme Manager	The individual appointed by the ETI to manage the overall ETI programme to which this Project is affiliated, and to whom the Project Manager is accountable.
Project	The project for which the purpose, scope of work and other details are described in this Request for Proposals.
Project Contract	The contract, as described in Section 5, to be entered into between the ETI and the Participants (whether as a Consortium, Prime Contractor or single contractor)
Project Detailing Stage	The stage of Project commissioning carried out by the ETI if and after it has decided to take forward a Proposal, during which full and final Project details are established and a Project Contract is agreed.
Project Manager	The individual who is appointed by the Lead Coordinator or Prime Contractor, or is otherwise agreed by the Project Participants, to carry out its responsibilities.
Project Organisation	The entity or group of entities / organisations, and the contracting and management structure which they adopt, as described in Section 0, which together will carry out the Project if commissioned by the ETI.
Proposal	The proposal for the Project submitted to the ETI, as described in Section 2.1, in response to this Request for Proposals.
Respondent	The organisation submitting a Proposal to the ETI, as described in Section 2.1, on behalf of themselves and of any Consortium or Subcontract Participants.
Subcontract	A contractual arrangement between the Prime Contractor (described in Section 0) and another Participant organisation to which work has been subcontracted. This includes Participant organisations subcontracted in turn by other Participant organisations, but the Prime Contractor is not defined as a Subcontractor to the ETI.
Task	A significant activity or group of activities (within a Work Package) which results in completion of a deliverable or a significant part of one, or which represents a significant step in the process towards one.
Work Package (WP)	A major section of the Project scope of work, which may be identified in this RfP or in the Respondent's Proposal, in order to break up the scope of work into separate manageable parts. A Work Package will usually consist of a number of Tasks.