



Programme Area: Smart Systems and Heat

Project: WP3 EnergyPath Operations

Title: Request for proposals

Abstract:

A request for proposals for the EnergyPath Design Tools project.

Context:

DNV GL and a partnership between Hitachi & EDF worked independently on a functional specification to develop the first phase of EnergyPath Operations - a software tool that allows designers to better understand the information and communications technology (ICT) solutions they will need to implement to deliver new home heating solutions. A first version of this tool is now being developed by DNV and the EnergySystems Catapult. EnergyPath Operations will provide knowledge to users on how to design ICT systems, the cost implications of such designs and the viability of various systems.

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Request for Proposal (RfP)

Title of Services for which Proposals are Requested

Smart Systems and Heat (SSH) Programme: EnergyPath Design Tools

Request Issue Date

20th June 2013

Deadline for Notification of Intention to Submit a Proposal

12th July 2013

Closing Date

Proposals must be received before 12:00 noon on the 16th August 2013

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Request for Proposal:- WA2 EnergyPath

SUMMARY OF KEY PROJECT INFORMATION

The ETI's Smart Systems and Heat (SSH) programme has a requirement to create a fully functional suite of design tools by August 2014 that will enable the ETI, as an expert user, to work with local authorities in the UK to answer the following questions.

1. *For each area across the UK, using a rough order estimation approach, what is its optimum contribution to the UK's 2050 energy and climate change goals?*
2. *For a given area, what is the optimum plan for transitioning its local energy supply networks to meet the location's needs within a national energy system evolving both economically and commercially to meet the UK's 2050 energy and climate change goals?*

In outline, answering these questions will require the ETI to have three key design tools with the functionality described in Appendix E.

1. The ETI's existing national Energy System Modelling Environment (ESME), which the ETI will use to create a set of distributions of costs for providing energy in given locations as inputs to this Project. ESME will not be provided to the successful bidder, but the distributions will be, for use in (2) (post contract award)
2. An Energy Supply Network Planning Tool, which this Project will need to deliver (together with the supporting databases) with the full level of functionality described in Appendix E.
3. A Building Design tool, capable of operating in Representative Building Mode. The full functionality eventually needed is described in Appendix E, but this Project only needs to develop functionality to the extent to converge on robust solutions to the above questions.

The analysis the ETI envisages undertaking for a local authority using this suite of design tools is described in Appendix F.

Beyond the above questions, the ETI has a long-term vision for further development of this suite of design tools to address additional questions for other stakeholders. Although not part of this Project, our vision is described in Appendix E, so bidders can consider the implications in early development.

This Project will consist of two stages with additional milestones and review points in-between; regular engagement with the ETI, its Members and its advisors will be critical to project success.

- Stage 1 – Detailed functional specification and development plan for Stage 2; and
- Stage 2 – Delivery of the fully functional suite of tools to address the above questions.

The functional specification created in Stage 1 is expected to set the detailed scope for the suite of design tools and will become the key acceptance document for the tools delivered in Stage 2 by August 2014. A formal Stage Gate Review will be held before Stage 2 commences.

The ETI is seeking to appoint a successful bidder to create this suite of design tools. The ETI expects to appoint the successful bidder primarily on the basis of:

- A firm proposal for Stage 1 (to develop a detailed functional specification and development plan);
- An outline proposal for Stage 2 (to deliver a fully functional suite of tools by August 2014); and
- Bidders' capabilities, experience and access to existing data and software.

The timeline for Project Commissioning is described in Section 5.3. Respondents are required to provide to the ETI a formal notification of their intention to submit a Proposal using the form in Appendix B and sign and return the NDA at Appendix C by 12th July 2013. A briefing workshop will be held in Birmingham during the week commencing 1 July 2013.

CONTENTS

1.	ETI Introduction	1
1.1.	Introduction to the Energy Technologies Institute	1
1.2.	ETI Approach to Health, Safety and Environment (HSE)	1
2.	Programme Overview	2
2.1	Background to the SSH Programme	2
3	The Project – EnergyPath Design Tools	4
3.1	Project Objectives	4
3.2	Project Scope	4
3.3	Project Management Methodology	5
4	Commercial and Legal Requirements	6
4.1	Exploitation	6
4.2	Technology Contract	6
4.3	Participant Contracting Structure	6
4.4	Project Milestone Payment Structure	6
4.5	State Aid	7
4.6	Intellectual Property	7
4.7	Due Diligence	8
5	Project Commissioning Process and Estimated Time Scales	9
5.1	Step 1: RfP Issue and Respondent Selection	9
5.2	Step 2 - Project Shaping and Contract Negotiation	11
5.3	Estimated Project Commissioning Timeframes	12
6	Contents and Format of Submission	14
7	Statement Of Compliance	15
8	Important Notices	16
	Appendix A - Proposal Content and Format	18
	Annex A1 - Due Diligence Information Requirements	27
	Annex A2 - General Due Diligence Requirements	29
	Annex A3 - Statement Of Compliance	30
	Appendix B - Notification Of Intention To Submit A Proposal	31
	Appendix C - Non Disclosure Agreement	32
	Appendix D - Terms and Conditions of Technology Contract	39
	Appendix E – Functionality for the Suite of Design Tools	40
	Appendix F – Analysis ETI Envisages Undertaking for Local Authorities	45
	Appendix G - Glossary	47

1. ETI INTRODUCTION

1.1. Introduction to the Energy Technologies Institute

The Energy Technologies Institute (ETI) is a public-private partnership between global industries (BP, Caterpillar, EDF, E.ON, Rolls-Royce and Shell) and the UK Government. Hitachi have joined the ETI as a Programme Associate for the SSH Programme.

Public sector representation is through the Department for Business, Innovation and Skills, with funding channelled through the Technology Strategy Board and the Engineering and Physical Sciences Research Council. The Department of Energy and Climate Change is an observer on the ETI Board.

The ETI is focused on accelerating the deployment of affordable, secure low-carbon energy systems for 2020 to 2050 by demonstrating technologies, developing knowledge, skills and supply-chains and informing the development of regulation, standards and policy.

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

1.2. ETI Approach to Health, Safety and Environment (HSE)

The Health and Safety of those who may be affected by ETI projects and the protection of the environment that may be impacted by ETI projects is of paramount importance to the ETI and its Members. It is ETI policy to pursue best practice in the health, safety and environmental management of its projects. The ETI therefore expects those who receive ETI funding to demonstrate a commitment to best practice in health, safety and environmental management as well as demonstrating that all applicable legal requirements are met.

The ETI requires certain HSE-related information as part of a Proposal. See Appendix A - Section 9 of this RfP.

2. PROGRAMME OVERVIEW

2.1 Background to the SSH Programme

The UK has committed to an 80% reduction in greenhouse gas emissions by 2050. CO₂ is the primary issue. Energy use in buildings accounts for around a significant proportion of the UK's CO₂ emissions, and the majority of that is used for space and water heating.

The ETI commissioned a major three-phase Smart Systems and Heat programme in 2012, the objective of which is to design, develop and demonstrate a cost-effective, smart energy system suitable for future roll out within the UK.

The three distinct phases of the programme are:

- Phase 1: The first phase will develop the toolkit and capacity to deliver the prototype “product” to mass market consumers.
- Phase 2: The second phase will validate this with a significant system level demonstration.
- Phase 3: The third phase will focus on commercialisation.

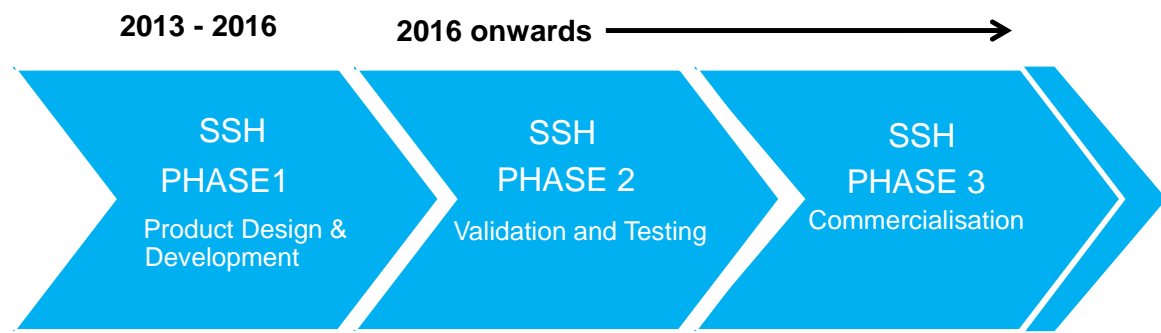


Figure 1: ETI SSH Programme Phases

The aim of the system will be to deliver efficient heat and comfort to meet local requirements.

An indicative system boundary is shown in Figure 2. The SSH programme is a consumer led programme, with the focus on efficiently and cost effectively delivering space heating and hot water to meet local needs.

Integration across the programme is done by an in-house ETI team. A number of projects are being delivered across a number of Work Areas (WAs) which all contribute to the development of the SSH solution.

- WA1 – Enabling technologies
This Work Area will identify, analyse and develop component technologies that enable the implementation and operation of Smart Systems.
- WA2 – EnergyPath design tools
The subject of this RfP.
- WA3 – Data management and overall system architecture
This Work Area will specify the data system functionality and proposed architecture that fulfils the information and service requirements of the smart energy system, including data security and privacy aspects.

- **WA4 – Value management and delivery**
This work area will establish how smart systems might be configured and operated to deliver sufficient consumer and commercial value to all likely market participants, making commercial deployment more likely.
- **WA5 – Consumer response and behaviour**
This Work Area will develop an understanding of consumer behaviour and insights into the context of the consumer in an energy systems context
- **WA6 – Supply chain engagement**
This Work Area will develop an understanding of the Smart Energy Systems supply chain, identify key supply chain needs and develop solutions

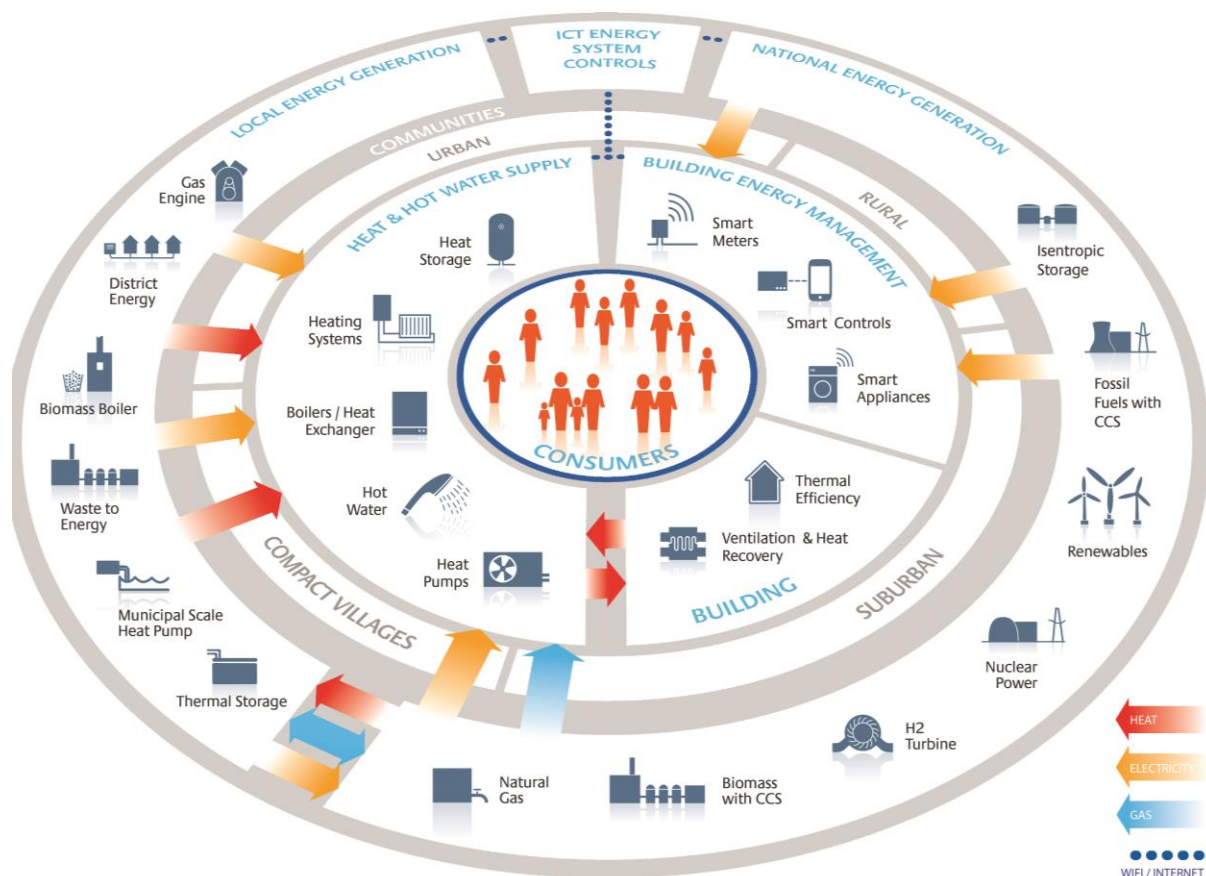


Figure 2: Indicative Boundary of a Future Smart Energy System

3 THE PROJECT – ENERGYPATH DESIGN TOOLS

3.1 Project Objectives

The ETI has a long term development vision for a suite of design tools with a number of levels of functionality which are outlined in Appendix E. However, this specific Project is intended to focus on creating the first level of functionality by August 2014 and setting the ETI on a trajectory to creating the further levels of functionality thereafter. The key objectives for this specific Project are to:

- Enable the ETI to set appropriate targets for major regions across the UK by aggregating up local areas and linking them with other ETI design tools: *“For each area of the UK, using a rough order estimation approach, what is its optimum contribution to the UK’s 2050 energy and climate change goals?”*
- Identify for a given area, what the optimum plan is for transitioning its local energy supply networks to meet the location’s needs within a national energy system evolving both economically and commercially to meet the UK’s 2050 energy and climate change goals
- Enable the ETI to produce sufficient supporting analysis for clusters of buildings in a location to converge on robust solutions to the above objective. Essentially, this is partially answering the question: *“For a given building, what is the optimum plan for transitioning its heating, hot water, storage, insulation and controls over time and within the constraints set by its owner’s preferences and the energy supply network transition plan?”*
- Create a scalable architecture for the tools and databases to set the ETI on the trajectory towards building the full level of functionality and capability described in Appendix E.

3.2 Project Scope

The scope of the suite of tools to be developed in this Project is described in Appendix E and the anticipated application in Appendix F.

The Project will consist of two stages with additional milestones and review points. The two stages are a requirement against which proposals should be structured. Proposals should contain a firm proposal for Stage 1 and an outline proposal and indicative cost for Stage 2.

3.2.1 Key Deliverables – Stage 1

In the first stage, the key deliverables are:

- a) A functional specification of sufficient detail that a user can see what tasks the tools will be able to perform and a software engineer can develop code without needing to seek further detail. Although the ETI expects bidders to have sufficient experience to understand this requirement, we will make the functional specification for ESME available under NDA after contract award, this is for information and in order to check that expectations are aligned.
- b) A design architecture which shows how the tools are structured and inter-relate in order to deliver the functional specification and how they will be coded, for example using different applications, programming languages and operating environments. Any reuse and modification of existing tools would be covered under this. The architecture will also include target hardware and operating system requirements and an estimate of running costs and time against a typical representative case study location.
- c) A data architecture and requirements specification in sufficient detail that a third party could collect and provide the data required for operation of the tools to deliver their functional specification. This will also show how the data will be held, modified, controlled and validated, including case data, such as the inputs and outputs of previous runs.

- d) A data acquisition plan showing what data will be required for the ETI to fully utilise the tool together with evidence of the Participants ability to procure the data for the ETI (this may include heads of terms or letters of intent from the data provider). The plan will also show how the ETI will be able to use the data procured by the Participant during the second stage to do outline designs for all areas of the UK to check national energy systems design against the aggregate area strategies. For data which is not readily available in the public domain, or for which datasets do not exist, the respondents will provide a fully costed plan describing how these data gaps would be filled.
- e) A proposal for the delivery of the second stage in sufficient detail to facilitate a timely transition into Stage 2. This is not intended as a new bidding process, but agreement on a joint plan on a basis set out in the Technology Contract. The proposal shall include coding, data acquisition, documentation and the testing and validation of the tools, including intermediate testing by ETI and on selected real-world case studies to be nominated by the ETI. The development proposal shall include a detailed and fully costed plan describing how the work will be delivered and the associated level of confidence (quantified through Monte Carlo analysis or comparable technique) in said delivery. The proposal will also include a resource plan, key risks and their mitigation.
- f) An Intellectual Property statement, which describes the basis on which ETI will own Arising IP, have necessary rights to Background IP and what Third Party IP licences will be required and the associated costs.

3.2.2 Key Deliverables – Stage 2

In the second stage the key deliverables will be:

- The tools and data which deliver the agreed functional specification.
- Fully documented and quality assured source code
- Fully documented successful completion of the testing and validation process.
- A user's manual and guide.
- Training of up to six suitably skilled and experienced staff in the use of the tools.
- Documentation, installation and support on up to three installations.
- A proposal for ongoing support and incremental development of the tools and data alongside ETI use on real Local Authority cases.

In making the specific proposal for the first stage and the outline proposal for the second stage bidders should be mindful of the need to interface with ETI and third parties for data acquisition.

3.3 Project Management Methodology

Bidders are invited to propose suitable approaches to the Project that deliver functionality and value incrementally during Stage 2 and hence minimise risk to the ETI receiving a fully functional suite of tools and completing the Project by August 2014.

The Respondent shall describe in their submission, how they intend to Project manage both Stages of the Project.

4 COMMERCIAL AND LEGAL REQUIREMENTS

4.1 Exploitation

The ETI intends to exploit and further develop the tools developed in this Project through its own staff, through its Members and through third-party relationships. This is more fully described in other parts of this Request for Proposals.

The extent to which Proposals provide assurance on the ETI's ability to exploit the tools as delivered and their further development is a key Selection Criterion (Section 5.1.6)

4.2 Technology Contract

The Project will be governed by a Technology Contract. A draft Technology Contract will be made available to Respondents following receipt by the ETI of a signed NDA in accordance with Section 5.1.2 and Appendix C.

The Technology Contract will be negotiated following selection of the preferred Respondent(s) (Sections 5.1.5 and 5.1.6), during the Project Shaping and Contract Negotiation Stage of the Project Commissioning Process (Section 5.2).

Any issues that any Respondent has with the terms of the Technology Contract must be set out in the Statement of Compliance to be provided as part of the Proposal (see Section 7 and Annex A3).

Specific areas of the Technology Contract have been highlighted by the ETI in Appendix D of this RfP. The ETI expects Respondents to provide an initial detailed view on these areas in their Statement of Compliance.

4.3 Participant Contracting Structure

The ETI requires Respondents to make a Proposal as **Sole/Prime Contractor** – a single Respondent will enter into the Technology Contract with the ETI and undertake the Project either as:

- a) Sole Contractor, illustrating that the Respondent has the skills, capability and capacity to undertake the Project entirely within its organisation (including testing and verification); or
- b) Prime Contractor, with specified parts of the Project being performed by Sub-contractors (including, as appropriate, companies within the same group as the Respondent). The ETI will require that there are Sub-contracts in place between the Prime Contractor and its Sub-contractors that are consistent in all material respects with the Technology Contract. The appointment and use of Sub-contractors by the Prime Contractor will be subject to prior ETI approval and the ETI reserves the right to approve the terms of Sub-contracts.

In either case, the Sole/Prime Contractor (only) will enter into the Technology Contract with the ETI and act as primary interface with the ETI. A Prime Contractor will need to demonstrate an effective project organisation and structure.

For this Project, the ETI does not consider that a consortium structure would be appropriate (although the ETI has accepted bids from consortia on other projects).

The ETI will only select Respondents who can demonstrate the required skills, experience and capability (either themselves or within their Sub-contractors) to complete all parts of the Project.

4.4 Project Milestone Payment Structure

Payments will be made by the ETI against agreed Milestones for stage 1 and, further to the successful Stage Gate review, against the agreed milestones for Stage 2. Payment for a Milestone will be subject to (amongst other things) the deliverables within the Milestone meeting agreed acceptance criteria and to the Participants complying with the ETI's reporting requirements in relation to the Milestone.

Payment will only be made in respect of Eligible Costs actually incurred by a Participant in the

performance of the Project. One or more accountant's reports shall be required to support selected financial reports and invoiced amounts, dependent upon the amount of the ETI Investment to be paid to each Participant.

Details of the Project payment structure and related requirements will be set out in the draft Technology Contract and agreed during the Project Shaping and Contract Negotiation Stage (Section 5.2).

4.5 State Aid

A proportion of the ETI Investment for this Project will constitute State Aid. The ETI has a specific State Aid clearance from the European Commission. A copy is available on request. Respondents should note:

- a) Respondents may be required to provide further information during the Project Commissioning Process to support any specific state aid requirements of the Project;
- b) Respondents are required to provide full transparency of costs throughout the Project to ensure both the Participant(s) and the ETI comply with EU state aid law;
- c) Respondents are required to agree to certain obligations in the Technology Contract related to the state aid requirements including the duration of the retention of records, and obligations to return ETI Investment monies in certain exceptional circumstances (including in the event the European Commission adopts a decision that there has been a grant of illegal state aid or misuse of state aid); and
- d) Respondents are required to confirm in their Proposals that there are no potential, threatened, pending or outstanding recovery orders by the European Commission in respect of any ETI Investment monies received by any Respondent or proposed Sub-Contractor (Appendix A, Annex A1- Section 1).

4.6 Intellectual Property

Background IP

Where a Participant has Background IP that is required to carry out the Project or for the subsequent exploitation of any Project results, the Participant is expected to make this Background IP available on a non-exclusive basis; typically, this licence will be royalty-free where the Background IP is required for the Project, but may, if appropriate, be subject to a fair and reasonable royalty where the Background IP is required for exploitation of Project results. If Participants (or their proposed Subcontractors) fail to meet this expectation, the Proposal is unlikely to be acceptable to the ETI.

The Respondents will be required to provide warranties and indemnities that they own their Background IP.

Due diligence on Background IP will be required both in the Proposal (as requested in Section 11 of Appendix A of this RfP) and during the Project Shaping and Contract Negotiation Stage (see Annex A1 - Section 1.2).

Respondents selected to proceed to the Project Shaping and Contract Negotiation Stage will be required to undertake and demonstrate detailed intellectual property due diligence at their own expense.

Arising IP - Ownership

The ETI expects to own all Arising IP. Participants should not fetter the ETI's rights in the Arising IP (for example, by using open source software in the deliverables).

Clarity is required as to the scope of Background IP and Third Party IP, and how the necessary rights will be acquired. This will also apply to Background IP of Subcontractors.

Academic Organisations

Generally, if requested, the ETI will grant rights to Respondents who are academic institutions for the purposes of academic research and teaching. Publication of appropriate parts of the Project results will generally be permitted subject to an approval process.

4.7 Due Diligence

The ETI requires Respondents to provide due diligence information at two stages of the Project Commissioning Process: (i) as part of a Proposal and (ii) during the Project Shaping and Contract Negotiation Stage of the Project Commissioning Process (Section 5.2).

Further details of the ETI's due diligence requirements are set out in Appendix A / Annex A1.

Please note that successful completion of all elements of the required due diligence is a pre-requisite for selection of a Proposal. Failure to meet due diligence requirements at any stage may result in exclusion of a Proposal from the ETI's Project Commissioning Process.

5 PROJECT COMMISSIONING PROCESS AND ESTIMATED TIME SCALES

The ETI is using a two-step approach to commission the Project:

Step 1 - RfP Issue and Selection of preferred Respondent(s); and

Step 2 - Project Shaping and Contract Negotiation.

5.1 Step 1: RfP Issue and Respondent Selection

5.1.1 Briefing Workshop

Following the release of this RfP, potential Respondents are invited to attend a Smart Systems and Heat EnergyPath Design Tools Project briefing workshop. The objective of this workshop is to further describe the Project requirements and to provide an opportunity to ask questions prior to making a Submission in response to this RfP.

This will be held at a location close to the ETI offices in Birmingham during week commencing 1st July 2013.

Interested Participants are to notify the ETI with their request to attend the briefing workshop no later than 28th June 2013. Upon notification, a briefing workshop package (including agenda) will be distributed. See Section 5.3 for the full (estimated) Project commissioning timeframe.

5.1.2 Notification of Intention to Submit a Proposal / NDA

Prior to making a Submission in response to this RfP, Respondents are required to provide to the ETI (i) a formal notification of their intention to submit a Proposal, in the form set out at Appendix B, and (ii) a Non-Disclosure Agreement (NDA) in the form provided at Appendix C, signed and returned to the ETI in accordance with the instructions at Appendix C. Both documents must be received by the ETI no later than the closing date specified on the front page and at Section 5.3 of the RfP.

5.1.3 Submissions in Response to the RfP

Respondents are required to provide Submissions in response to the RfP to the ETI no later than the closing date specified on the front page and in Section 5.3 of the RfP. Submissions shall comprise of a Proposal, the form and contents of which are set out at Appendix A, and supporting documentation set out at Section 6.

5.1.4 Questions and Clarifications

The ETI will be available to meet with potential Respondents before the Proposal deadline to answer questions and provide further clarifications.

Respondents should note that the ETI will not meet with Respondents unless they have submitted signed NDAs.

Any advice or clarifications of ETI requirements requested by and provided to any Respondent may (at the ETI's discretion) be made available to all Respondents to ensure parity of information. Respondents should therefore consider presenting requests for advice and clarifications in a way that the ETI can respond to all Respondents without revealing confidential information.

5.1.5 Selection Process

Following the closing date for Submissions, the ETI will convene a selection panel as part of its evaluation process to recommend which Respondent(s) should proceed to the Project Shaping and Contract Negotiation Stage. In addition to ETI staff, this panel may include experts selected by the ETI (typically including individuals drawn from ETI Member organisations and third parties) to provide the necessary expertise to consider the technical, commercial, legal and

financial aspects of each Submission.

Respondents may be requested to make a presentation to the Selection Panel to support information provided in their submission. The Selection Panel may also request further clarifications following the meeting of the Selection Panel and as part of the Project Shaping and Contract Negotiation Stage.

In the event that the ETI receives a large number of Submissions, the ETI may make an assessment to select a manageable shortlist of Respondents for consideration by the Selection Panel.

In any event, the ETI may in its discretion decide to negotiate with more than one Respondent (as appropriate) to ensure that all key issues are resolved fully and promptly, before making a final selection decision.

5.1.6 Selection Criteria

The ETI expects that the capabilities and experience listed below will be critical to the successful execution of the Project; Respondents are free to identify additional capabilities and experience which they consider to be critical or important to success or to provide reasoned arguments why capabilities identified by ETI are not required.

The ETI's experience of evaluating Proposals has shown that specific and objective evidence of capabilities and experience is more convincing than general statements about previous projects executed by the organisation.

Proposals will be reviewed and judged primarily against the criteria listed below and the supporting evidence supplied. Failure to meet minimum standards in any criterion may result in the ETI rejecting a Proposal. The expected capabilities and experience to be detailed in the Respondent's Proposal include:

- a) Generic Criteria:
 - Willingness of Respondent(s) to materially comply with the terms and conditions of the proposed Technology Contract;
 - Willingness of Respondent(s) to support the contracting process as laid out in Section 5.2 and the contracting timeline as laid out in Section 5.3;
 - Completeness of information content, structure and quality of the Proposal (against the areas listed in Appendix A);
 - Record and ability in quality, timely and on-budget delivery (of complex software developments) to the full satisfaction of their main stakeholders;
 - The suitability and capability of the Chief Engineer and Project Manager assigned to the Project (as per Appendix A - Section 3.2);
 - The terms on which access is proposed to Background IP which is required for Project execution and the Arising IP being exploited by the ETI;
 - Project approach and plan, including project management methodology, Gantt chart, proposed management of specific risks and issues and (as appropriate) suitable Stage Gates, Milestones and deliverables; and
 - Suitability and quality of proposed project management and co-ordination approach, taking account of the interactions with ETI staff and stakeholders.
- b) Technical Criteria:
 - Access to the skills and knowledge to conduct the work proposed, including

buildings physics, human factors, energy technologies, techno-economic evaluation, network design and geospatial analysis, large data set manipulation and analysis, systems design and optimisation under uncertainty, software architecture design, especially for computational efficiency and future upgradeability and scalability;

- Software engineering quality management systems;
 - Previous experience and relevant access to related data and models, combined with commercial approach to their use in this Project;
 - Quality of detailed proposal for Stage 1; and
 - Quality of outline proposal for Stage 2.
- c) Commercial Criteria:
- Cost and time for both stages of the Project.
 - Proposed commercial framework for agreeing a specific proposal for the second stage.
 - Certainty of terms of licences for access to Background IP and Third Party IP required for exploitation of the Arising IP and the scale of costs together with details of previous experience in delivering such licences.

The ETI believes that this Project can only be effectively executed by a small core team of highly capable people (who may be co-located) and can draw on advice, expertise and information from others.

5.2 Step 2 - Project Shaping and Contract Negotiation

Following selection, the ETI will invite the preferred Respondent(s) to enter into negotiations with the ETI to shape the Project and finalise the terms of the Technology Contract. An overall period of 5 weeks has been allowed for this Project Shaping and Contract Negotiation Stage. See Section 5.3 for further details relating to anticipated dates.

The ETI may decide to negotiate with more than one Respondent (as appropriate) to ensure that all key issues are resolved fully and promptly, before making a final selection decision.

The Project Shaping and Contract Negotiation Stage will include the following activities (as required and dependent on the level of detail provided in the Respondent's Proposal):

- a) detailing of the proposed technical programme, including definition of deliverables and acceptance criteria;
- b) negotiation and agreement of the Technology Contract;
- c) detailing and due diligence relating to the breakdown of costs of the Project;
- d) further intellectual property due diligence activities as required (see Annex A1- Section 1.2);
- e) agreement (and approval as required by the ETI) to terms of other key contractual arrangements (e.g. Sub-contracts,);
- f) gaining all necessary Respondent and ETI approvals to undertake the Project; and
- g) any further information or assessment that may be necessary to meet state aid requirements.

As part of the above process, Respondents may be required by the ETI to present a Final Detailed Offer to the ETI, addressing all technical, commercial, legal and financial issues.

Some initial technical and legal/finance meetings have also been scheduled as per Section 5.3. Further meetings will be required to complete the Project Shaping and Contract Negotiation Stage and

Respondents are required to commit to provide legal, technical, commercial and managerial resources as required to achieve the target contract execution date shown.

5.3 Estimated Project Commissioning Timeframes

The following tables outline the anticipated schedule for the Project Commissioning Process. They also include anticipated dates when Project resources will be required to attend Project shaping and contract negotiation meetings with the ETI as well as the timing of the Stages 1 & 2 and the Stage Gate Review (SGR).

The timing and the sequence of events resulting from this RfP may vary and shall ultimately be determined by the ETI.

Request for Proposal and Selection	Dates
Issue of Request for Proposal	20 June 2013
Deadline for notifying the ETI with a request to attend briefing workshop.	28 June 2013
Project briefing workshop	Week commencing 1 st July
Deadline for notifying the ETI of an intent to submit a proposal (via return of signed Non-Disclosure Agreement)	12 July 2013
Closing date for submission of proposal	16 August 2013
Selection Panel:	06 September 2013

Project Shaping and Contract Negotiations	Anticipated Dates
Total duration for project shaping and contract negotiations	5 weeks
Technical meeting 1	20 September 2013
Technical meeting 2	27 September 2013
Legal/Finance meeting 1	20 September 2013
Legal/Finance meeting 2	27 September 2013

Project Start	Anticipated Dates
Contract signature target date	By 25 October 2013
Project start	By 04 November 2013

Project Start	Anticipated Dates
Project Completion Date	August 2014

EnergyPath Design Tools Stage 1	Anticipated Dates
Milestone 1: Completion of Stage Gate Review, supported by approval of: <ul style="list-style-type: none"> • Functional Specification • Stage 2 development plan 	February 2014 (to be agreed)
EnergyPath Design Tools Stage 2	Anticipated Dates
Milestone 2: Approval of fully functional V1.0 EnergyPath Design Tools	August 2014

6 CONTENTS AND FORMAT OF SUBMISSION

Respondents are required to make a Submission comprising the following components:

- a) Detailed Proposal, arranged according to the structure set out in Appendix A. The content must clearly demonstrate how the proposed Sole/Prime Contractor will meet the requirements and criteria set out in Sections 3 to 7 of this RfP. The Proposal must be written in a succinct manner and must not include imprecise statements, generalities or repetition. The Proposal must be easily readable with appropriate font sizes (10pt or larger), margin widths, and **shall not exceed a maximum of 52 pages, plus appendices.**
- b) Any supporting information as specifically set out in Appendix A.
- c) Risk Register, as described in Appendix A - Section 7 (Risk Management).
- d) Initial due-diligence information, as set out in Section 1.2 of Annex A1 ((including in relation to State aid, insurance, intellectual property, health, safety and the environment and general due diligence) Annex A2).
- e) Statement of Compliance and, if appropriate, supporting information, confirming compliance with or identifying exceptions to the requirements of this RfP and/or the draft Technology Contract, as set out in Annex A3. This must be signed by each Respondent.

Additional information (such as organisational brochures, etc.) may be provided to accompany the Submission, but such additional information will not be taken into account when reviewing Proposals.

The Submission shall consist of **three (3) hard copies, separately bound, and an electronic copy.** The latter shall be provided in both PDF and Microsoft Word formats.

7 STATEMENT OF COMPLIANCE

The ETI's full requirements for the Statement of Compliance are set out in Appendix A, Annex A3.

Respondents are required to provide a statement confirming that the Proposal is fully compliant with the Request for Proposals, or stating clearly any exceptions, deviations, alternative approaches or additions, with justification. 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.

In relation to the draft Technology Contract (Section 4.2), Respondents are required to confirm in the Statement of Compliance the extent to which the provisions of the draft Technology Contract will be accepted by the Respondents.

The extent of compliance with the RfP and the draft Technology Contract is one of the key Selection Criteria against which a Proposal will be assessed (Section 5.1.6).

8 IMPORTANT NOTICES

- a) The ETI at its discretion may request clarification of a Proposal, and may reject any Proposal which is unclear.
- b) Neither the issue of any documentation in the Project Commissioning Process nor any of the information presented in it should be regarded as a commitment or representation on the part of the ETI or any other person to enter into a contractual arrangement. The issue of the RfP is not an agreement or offer to purchase goods or services, and the ETI is not bound to enter into any contract with the Respondent. By responding to this Request for Proposals, the Respondent does not commit itself to entering into a contract with the ETI.
- c) All decisions made by the ETI relating to the acceptance, review and selection or otherwise of Proposals are final.
- d) 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 terms of the Non-Disclosure Agreement (Appendix C). No part of a Proposal, or other documents provided by Respondents, shall be returned.
- e) The ETI reserves the right to (i) withdraw the RfP at any time; (ii) change the basis and / or requirements of, or the procedures for, the Project Commissioning Process, including the timetable or closing date for receipt by the ETI of Proposals/Submissions, (iii) make modifications to, or alter any of the information within, the RfP at any time until the execution of the Technology Contract, (iv) reject any or all of the Proposals received, and (v) not invite any Respondent(s) to proceed further.
- f) Neither the ETI nor any of its agents or advisers accepts any liability or responsibility for the accuracy, adequacy or completeness of any of the information provided or any opinions contained in this RfP or of any other information made available during the Project Commissioning Process. No representation or warranty, express or implied, is or will be given by the ETI or any of its agents or advisers with respect to such information provided or opinion given therein. Any liability is thereby expressly disclaimed.
- g) Respondents must assess the information and terms contained in this RfP independently, having taken professional advice if necessary. Each Respondent will be deemed to have examined all the documents enclosed with this Request for Proposals and by its own independent observations and enquiries will be held to have fully informed itself as to the nature and extent of the requirements of the RfP. Each Respondent must rely on its own enquiries and on the terms and conditions contained in any agreement, when and if finally executed, subject to such limitations and restrictions as may be specified therein.
- h) Respondents shall be wholly responsible for the costs they incur in the preparation and submission of their responses to the RfP. The ETI shall not be responsible for, and shall not pay, any costs and expenses which may be incurred by the Respondent in connection with its participation in the Project Commissioning Process, including but not limited to any costs or expenses incurred up to and including the execution of the Technology Contract.
- i) The ETI may, at its discretion, shortlist Respondents for the next stage (Project Shaping and Contract Negotiation Stage). The ETI does not undertake to accept the lowest bid or to accept part or all of any Proposal and the acknowledgement of receipt of any Proposal (and / or any invitation to any Respondent(s) to proceed to the next stage) shall not constitute any actual or implied agreement between the ETI and the Respondent.
- j) The copyright in the documentation and any other materials supplied by the ETI and/or its advisers in this Project Commissioning Process, in whatever format, belongs to the ETI or its appointed advisers. Such documentation and materials may not, either in whole or in part, be copied, reproduced, distributed or otherwise made available to any other third party or used

without the prior written consent of the ETI, except in relation to the preparation of the Proposal in the course of the Project Commissioning Process. All documentation supplied by the ETI in relation to this Project Commissioning Process must be returned on demand, without any copies being retained by the Respondent.

- k) In this RfP, any phrase introduced by the term “include”, “including”, “in particular”, “for example” or similar expression shall be construed as illustrative and shall not limit the sense of the words preceding that term.
- l) This RfP, and any dispute or claim arising out of or in connection with it (including any dispute or claim relating to non-contractual obligations), shall be governed by and construed in all respects in accordance with the laws of England and Wales and the parties agree that the Courts of England and Wales shall have exclusive jurisdiction to settle any dispute or claim arising out of or in connection with this document (including any non-contractual disputes or claims).
- m) The submission of a Proposal will confirm acceptance of the foregoing provisions by the Respondent without qualification. Any attempt to qualify any of the foregoing provisions in this Section 8 (Important Notices), either expressly or by implication, may result in a Respondent being disqualified.

APPENDIX A - PROPOSAL CONTENT AND FORMAT

The Proposal shall be arranged according to the structure defined below and shall explicitly include all the information listed. **Proposals should be a maximum of 52 pages.** Appendices are in addition to this but may not be reviewed by the Selection Panel.

1. EXECUTIVE SUMMARY [approximately 2 pages]

A summary of the Proposal, describing briefly:

- The organisation(s) undertaking the work and the Project organisation structure.
- Summary of the proposed approach, key Milestones and key deliverables.
- Confirmation of compliance with the RfP and brief summary of key exceptions/deviations.
- Basis of access to required data, software etc. to execute and exploit the Project.
- Total Project Cost, broken down between a proposed fixed cost for Stage 1 and a capped estimated cost for Stage 2 (with the basis of estimation).
- Proposed Project duration for each Stage.

2. PROJECT OBJECTIVE [maximum 1 page]

The overall Project objective is as specified in Section 3.1 of this Request for Proposal. Respondents should provide subsidiary objectives if they think these are appropriate. Respondents should also describe any critical success factors which characterise a successful Project outcome or which are required to facilitate a successful Project outcome.

3. PROJECT PARTICIPANTS AND STRUCTURE [approximately 7 pages, plus appendices if required]

3.1. Project Participant [approximately 2 pages]

Respondents should provide a brief description of each of the proposed Participant organisations, including any proposed Subcontractors including: -

- Key skills, knowledge, experience and previous track record in the area (technical, commercial and Project management).
- Relevant quality, health, safety and environment management experience and systems.

3.2. Key Individuals and Critical Roles [approximately 2 pages]

This section should identify all key roles and all associated key individuals (including deputies and alternates where appropriate). As well as key technical and other specialists, this should specifically include (in detail) the Project Manager and Chief Engineer.

The ETI places great emphasis on two critical roles in major projects – Project Manager and Chief Engineer.

The Project Manager is responsible for managing and progressing the project team and programme to time and cost, handling information flows and commercial issues, ensuring effective team-working and the continued engagement and support of key stakeholders. In essence this responsibility is to make sure that the ETI benefits from a result at the end of the programme of work that meets the agreed outcomes within time and cost.

The Chief Engineer is responsible for the technical quality and content of the work, ensuring the competence of key technical staff allocated to individual work packages, the effective review of key outputs and the effectiveness of detailed technical planning to ensure that the emerging results of work are fed back into the forward plan. In essence this responsibility is to assure the technical quality of the Project and its outcomes.

The ETI will assess the competence, experience and authority of these two people and their ability to work together as critical to project success. The ETI expects these two roles to be filled by the same people throughout the life of the Project.

Respondents should identify specific individuals for these key positions, including deputies, and other key roles as appropriate. Respondents should state the amount of each individual's time which will be dedicated to the Project, and detail their experience – with CVs included in an Appendix (maximum 2 pages per individual).

The proportion of each individual's time dedicated to the Project should be identified and their expertise briefly summarised;

3.3. Participant Contracting Structure [approximately 2 pages]

This section should briefly explain the intended contracting/Project organisational structure.

For a Prime Contractor structure, the Prime Contractor should be clearly identified along with any additional Sub-contractors whom are expected to be involved in the Project.

Respondents should provide Project organisational, Project management, governance and control structures and processes.

Respondents should indicate in the structure each Participant and the position of the key individuals identified in Section 3.2 of Appendix A above (including proposed Project Manager and Chief Engineer).

An organisation diagram showing the organisations and their roles (complete with key individuals) should be included – for each Phase if appropriate.

Respondents should identify in their Proposal any foreseen issues or difficulties in executing Subcontracts and Licences.

3.4. Collaborative Working [typically 1 page]

If Respondents propose a Prime Contractor / Subcontractor structure, a table (typically ½ page) should also be provided to identify (if appropriate) which Respondent(s) is/are proposed to satisfy each of the Project delivery requirements listed in Section 3 of the RfP. Evidence of previous collaborative working (including Subcontract management, as appropriate) should be provided, both within and outside the proposed Participant group (typically ½ page).

4. TECHNICAL APPROACH [approximately 10 pages, plus appendices]

Respondents should set out how they expect the suite of tools to be designed, developed and operated. The quality of this section of the Proposal will be important in selecting the successful Respondent. In particular the Proposal should address the key conceptual, data, programming and computational challenges and how the Respondent proposes to address them. Critical details should be provided and explained. As a minimum it would be expected that this would include (but not be limited to):

- Requirements capture and management
- Software development, integration and test
- Software quality assurance approach
- Data management
- Configuration management

5. PROGRAMME OF WORK [approximately 9 pages, plus appendices if required]

5.1. Project Approach [approximately 5 page]

Respondents should provide a summary of the overall approach to the Project, including a work flow description which clearly identifies the key Work Packages, their interdependencies and how they

contribute to the overall Project outcome. This work flow should identify Stage Gates and other key Review Points where overall progress on the Project will be critically reviewed.

The ETI have described the objectives and the scope in Sections 3.1 and 3.2 respectively. Respondents should follow this for defining Stage 1 and Stage 2 of the Project.

Each Work Package should be broken down into Tasks and a Task-by-Task description of the proposed work provided, identifying for each Task:

- The Task leader and others participants involved.
- The Task objectives.
- Key Dependencies / Interdependencies between tasks.
- The technical approach (e.g. methodologies, tools, techniques).
- Deliverables produced (labelled D1, D2 to Dn, where n = the total number of deliverables).
- Issues or assumptions (including HSE risks and constraints).
- Key resources (specific software tools, validation test rigs etc.).

As far as possible, Respondents should be specific about the activities within the Task. Where Work Packages involve experimental work, Respondents should identify the proposed test facility/site and provide a high-level justification for its use.

Any issues or assumptions in defining the schedule (e.g. inputs required from the ETI or other projects) should be explicitly stated. Key HSE risks and constraints must also be clearly 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.**

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

5.2. Deliverables and Milestones [approximately 2 pages]

ETI policy is that payments from the ETI Investment are made only following successful completion of Project Milestones. Milestones are points in the Project where significant value has been delivered to the ETI, typically by submission of deliverables representing the completion of major Project Tasks/Work Packages/reports. Payment of ETI monies in respect of a Milestone is subject to acceptance by the ETI of the Milestone deliverables against agreed acceptance criteria (terms and conditions of payment will be included in the draft Technology Contract (see Section 4.2 of the RfP).

Following the detailed specifications of each deliverable in accordance with Section 3.2, a summary table should be provided detailing the proposed Milestones and their constituent deliverables together with the proposed costs and delivery dates for each Milestone and constituent deliverable.

See also Section 8 of Appendix A (Project Finances).

5.3. Project Schedule [approximately 2 pages, plus appendices]

Respondents should provide a summary time schedule (preferably in the form of a Gantt chart) for the Project, highlighting:

- Work Packages and Tasks (including duration, inputs required from the ETI or other parties, other external dependencies, timing for required permissions and consents);
- Project deliverables;
- Project Milestones;

- Stage Gates;
- Contingencies and critical path.

6. EXPLOITATION AND FURTHER DEVELOPMENT [approximately 2 page]

This section should explain how the Respondent will address:

- Enabling the ETI to work with Local Authorities from August 2014 to develop local energy system strategies for 3-5 areas around the UK.
- Enabling the ETI to estimate at a high level local energy strategies across the UK in order to inform the further development of national energy strategies and refine the structure and data within ESME.
- Enabling the ETI to further develop the tools provided in order to meet the future steps set out in our vision.

Issues that we would expect to be covered in this section include:

- Documentation.
- Training and support.
- Access to data.
- Software design and scalability.
- Target operating systems and hardware and scalability.
- Development planning and pathway, both for increased functionality and different classes of user.
- Software and data licences.
- Fixed and operating costs involved in exploitation.
- Estimation of confidence limits on outputs, robustness and validation.

The ETI recognises the significant challenges implied by these points and will place significant weight on the quality of thinking demonstrated by Respondents in this section of their Proposals.

7. RISK MANAGEMENT [approximately 1 page, plus Risk Register as an appendix]

The Respondent should describe in full 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 separately provide a Risk Register as an appendix, 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.

Whilst not being prescriptive about the style and format of the Risk Register, it is expected that it will:

- a) show clear evidence of triage into: those risks which are so serious in terms of frequency and impact that they need to be kept under review by the Project leadership (and regularly shared with the ETI); those risks that are sufficiently serious that they need to be managed within the Project team; and those risks which have been recognised but which are not judged as material;
- b) identify the causes of the risk and the likelihood of them occurring during the Project;
- c) identify the consequences of the risk and the scale of impact on Project delivery and key stakeholders;
- d) identify the degree of knowledge or uncertainty about the risk;

- e) identify who is the risk (or issue) manager;
- f) identify key HSE risks and constraints (note however that the Risk Register shall not replace specific HSE legal requirements for risk assessment for Project tasks and activities);
- g) identify any privacy and/or data protection risks and constraints;
- h) show what actions are in place to reduce the likelihood of the risk materialising (controls);
- i) show what precautions or provisions will be implemented to reduce the impact of the risk, should it occur (mitigation);
- j) identify any actions in place to investigate or increase knowledge of poorly understood risks; and
- k) identify any systems or actions that will be implemented to detect that a specific risk is developing, has started to occur or its likelihood or impact has increased (monitoring).

It is expected that no more than ten risks would be managed by the top team, rather more at the next level and many more that have been recognised, but with no further action planned. The ETI will only consider the top two categories, but Respondents may provide the complete register.

A summary of key risks should be included in the Proposal, with a complete Risk Register as described above provided as a separate document.

8. PROJECT FINANCES [approximately 2 pages, plus appendices if required]

Respondents should provide:

- Fixed Cost for Stage 1
- A capped cost for Stage 2 (given the duration of Stage will be fixed).
- a breakdown of the Costs against Milestones for Stage 1 and
- the envisaged number of Milestones and their titles as part of the outline proposal for Stage 2

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

	Date	Participant (Sole/Prime Contractor)	Subcontractor 1	Subcontractor 2	Subcontractor 3	Total
Milestone 1						
Milestone 2						
Milestone 3						
Milestone n						
TOTALS						

Respondents should also provide a breakdown of the proposed Total Project Cost as specified in the table below.

	Participant (Sole/Prime Contractor)	Sub contractor 1	Sub contractor 2	Sub contractor 3	Total
Number of Person-days					
Base Labour					
Materials					
Subcontractors (minor) (see note ii below)					
Travel & Subsistence					
Overheads					
Profit					
Other					
TOTAL PROJECT COSTS (ELIGIBLE COSTS)					
ETI Investment					
ETI Investment (%)					
Own Funds (Participant Funding)					
Third Party Funding (Private Funding)					
Third Party Funding (Public Funding)					

Notes on Category Breakdown table:

- i. Base Labour should include direct add-ons (e.g. NI, pension etc.).
- ii. Since a Prime Contractor/Subcontractor Project structure is proposed, major Subcontractors should be detailed in a column in the table.
- iii. Participants will be required to provide justification of overhead calculations (including that of major Subcontractors) during the Project Shaping and Contract Negotiation Stage. ETI can provide a spreadsheet to calculate overheads on request.
- iv. Participants should note that under State Aid rules profit cannot be paid to Participants if they wish to receive a licence for Arising IP.
- v. Academic Subcontractors should determine their costs using the JeS system. Note that ETI funds academic Subcontractors at 100% Full Economic Cost.
- vi. Please note that during the Project Shaping and Contract Negotiation Stage (prior to

Technology Contract signature) the ETI will require a more detailed cost breakdown including a schedule of payments against Milestone identified in Section 5.2 of Appendix A). This will require completion of the ETI's financial monitoring forms. Whilst not compulsory; it is strongly recommended that Participants use these forms to produce the Project costings.

9. HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT [approximately 1 pages]

The ETI's approach to the management of HSE in Projects is based on three key elements:

- Competency Assessment.
- Performance Assurance.
- Project Incident Protocol.

How the ETI applies this approach to a specific Project depends upon the nature and content of the Project.

Respondents should ensure their Proposal makes the nature of the Project clear, demonstrates and evidences their competence to undertake the Project, and describes how they intend to organise themselves and their approach to manage and coordinate health, safety and environmental issues in the Project. Specifically:

- a) Respondents should advise if any work to be undertaken during the Project is not desk based (e.g. site visits, field trials, experimental or laboratory work). In general the ETI expects that the Project will be desk based and the safety management should be appropriate to the risks involved. Failure to identify any risks involved in non-office activities at the Proposal stage will cause difficulties during Project execution.
- b) Respondents should identify any specific HSE issues related to specific facilities or sites to be used in the Project. To the extent that parts of the Project take place outside of the UK, the Respondents should deal with the analogous issues as they apply in the local laws of the relevant country.
- c) Respondents should demonstrate their experience of identifying and managing HSE issues in Projects of equivalent complexity and scale, including:
 - coordination of HSE across multiple participants and contractors, if applicable; and
 - incorporating safety into design, if applicable.
- d) Respondents are required to provide evidence throughout the Project that HSE is being managed and that such arrangements are adequate. The Respondents are required to set out in their Proposal how their management arrangements will enable such evidence to be provided.
- e) Respondents should set out their approach to managing contractors. This should include key roles and responsibilities of different Participants in the Project.

Respondents should note that:

- Specific HSE requirements will be included in the Technology Contract including reporting against HSE performance on a periodic basis.
- The ETI will carry out a full HSE competency assessment against the selected Respondents prior to (and HSE competency being pre-condition of) execution of the Technology Contract, except to the extent that a Respondent's proposed scope of work under the Project is entirely desk-based. (See also Section 2a of Annex A1)

10. INTELLECTUAL PROPERTY [approximately 3 pages]

Respondents should read Section 4.6 (Intellectual Property) of the RfP before completing this section.

Background IP

Respondents should describe any Background IP (e.g. proprietary data, computer algorithms, know how or other IP such as patents) only to the extent there is Background IP:

- which is or may be needed (whether by the ETI, or to be licensed between the Prime Contractor and / or Subcontractors or otherwise) 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 (including the legal nature of the IP right);
- rights to that IP;
- ownership and control, whether this is by any of the Project Participants or by any third parties; and
- whether there is any reason that such Background IP will not be made available as and for the extent needed to carry out the Project and/or exploit the Arising IP.

Arising IP

Respondents should provide a brief overview of the nature of any anticipated Arising IP from each stage of the Project, including the form of the anticipated intellectual property rights. This should expressly include reference to development of any innovations, any results and know-how.

Respondents should identify any proposed exceptions to the principle that ETI should own the Arising IP in order to be the sole organisation that exploits it.

Third Party IP

Respondents should describe any Third Party IP:

- which is or may be needed (whether by the ETI, or to be licensed between the Prime Contractor and / or Subcontractors or otherwise) 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

Academic Institutions

Generally, the ETI will grant rights to Participants who are academic institutions for the purposes of academic research and teaching if requested. Publication of appropriate parts of the Project results will generally be permitted subject to an approval process. Participants should include details of their desired requirements in relation to academic research, teaching and publication in their Proposal.

11. DUE DILIGENCE REQUIREMENTS [maximum 5 pages, plus appendices if required]

The ETI's due diligence requirements in relation to the submission of a Proposal are set out at Annex A1 - Section 1 (Submission of Proposal).

12. PLAN FOR PROJECT SHAPING AND TECHNOLOGY CONTRACT NEGOTIATION [approximately 1½ page]

Respondents should, in this section, identify key issues to resolve during the Project Shaping and Contract Negotiation Stage, before Technology Contract Execution, for example:

- detailing of the technical proposal: what further actions are needed;
- Technology Contract – key provisions to resolve (based on draft Technology Contract; see Section 4.2 of RfP main body);

- timing sequences for the setting up of the selected Project organisational structure (e.g. subcontracts etc.), including any dependencies or other factors which could impact or delay the Project;
- Provide details with planning
 - for handling the Technology Contract negotiation phase;
 - to transition from Stage 1 to stage 2 given there is a Stage Gate Review
- internal approvals - confirm what internal approvals will be required for all Participants in the bid in order to enter into contract;
- Patent Study/Background IP rights.

The Plan for Contract should be structured and link clearly back to the previous sections set out in this RfP.

Respondents should explicitly confirm that all key technical, commercial and legal resources, across the Participants, required to meet the Technology Contract signature target date (see Section 5.3 of the RfP), will be available to achieve a signed contract by that date. A table should be included providing names and contact details (phone and email addresses) of key contacts for Project Detailing and Contract Negotiation. This should include the main technical, legal/commercial and finance contacts.

Any key risks or issues which may impact on meeting the Technology Contract signature target date should be identified.

13. PROJECT REVIEW, CURTAILMENT AND EXIT [approximately 1 page]

Although the ETI is fully committed to the completion of this Project, there may be circumstances where either of the parties agree that continuing with the Project is not justified or where external circumstances prevent completion.

Respondents should set out their view of the events or circumstances which might cause them to propose Project curtailment and the basis on which this would then occur and how any liabilities would be shared between the parties.

In addition to ongoing termination rights relating to non-performance or breach of contract, the Technology Contract will include specific termination rights relating to Stage Gate, should agreed Stage Gate criteria not be met. For the Stage Gate (see Project Approach in Section 5.1 of Appendix A), the Respondent should propose outline criteria against which Project progress towards the desired outcomes should be reviewed, in respect of:

- Project performance against plan (including time, cost, quality and HSE management);
- Inability to deliver the key outcomes of the Project or an immitigable risk identified in the plans for Stage 2.

14. STATEMENT OF COMPLIANCE

Respondents are required to provide a Statement of Compliance in accordance with Annex A3 (see also Section 7 of the RfP).

ANNEX A1 - DUE DILIGENCE INFORMATION REQUIREMENTS

The ETI requires due diligence information during two stages of the Project Commissioning Process:

- Submission of the Proposal. Certain information is required with the Proposal as part of the first stage of the Project Commissioning Process; and
- Project Shaping and Contract Negotiation. Further information will be required if any Proposal is selected to proceed to the Project Shaping and Contract Negotiation Stage.

Please note that successful completion of all elements of the ETI's required due diligence is a pre-requisite to any contract award: failure to meet any due diligence requirements may result in the exclusion of the Respondent(s) and/or the Proposal from the Project Commissioning Process.

1. SUBMISSION OF THE PROPOSAL

1.1. State Aid

All Respondents shall confirm that there are no potential, threatened, pending or outstanding recovery orders by the European Commission in respect of any ETI Investment monies received by any Respondent (all proposed Participants).

1.2. General Due Diligence

All Respondents (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 in Annex A2.

1.3. Insurance

Respondents should confirm that insurance cover for the following risks is held by all proposed Project Participants, and should confirm levels of cover and expiry for each. The ETI will require evidence of these during the Project Shaping and Contract Negotiation Stage (see Section 2 of Annex A1).

- Property damage (both any property occupied by the Participants and any third party properties)
- Business interruption
- Employer's liability
- Public liability
- Product liability (or justify its exclusion if not appropriate)
- Professional Indemnity

Additionally, each Respondent should identify:

- if it or any other proposed Participant(s) self-insures or intends to self-insure for any of these risks;
- if it or any other proposed Participant(s) is intending to take out any project-specific insurance for the Project and the scope and intended beneficiaries of such insurance; and
- how (to the extent not already identified) each proposed Participant intends to insure against risks in the Project.

In relation to professional indemnity insurance, Respondents should note that the ETI has the following requirements.

Each Participant is required to have in place at the start of the Project a professional indemnity insurance policy (with at least a 6 month unexpired term).

- Each policy should have a limit of indemnity of not less than £1,000,000 each and every loss.
- Each policy should provide an indemnity at least as extensive as the ETI's policy (the ETI will make this assessment). For example, the cover needs to include cover for negligent acts or omissions, and dishonest or fraudulent acts or omissions by the insured).
- Each Participant will need to agree to maintain a professional indemnity insurance policy in force for 6 years from the date of completion of the Project.
- The ETI will require sight of the insurance policy provided by the Participant or a copy of a letter of confirmation from the Participant's insurance company or broker summarising the policy.

1.4. Health Safety and the Environment

A full competency assessment will be carried out on each proposed Project Participant at the Project Shaping and Contract Negotiation Stage (see Section 2a) of this Annex A1, below).

Please see Section 9 of Appendix 1 for the ETI's HSE requirements in relation to the Proposal.

2. PROJECT SHAPING AND CONTRACT NEGOTIATION STAGE – FURTHER DUE DILIGENCE REQUIREMENTS

These are only required if a Proposal is selected to proceed to the Project Shaping and Contract Negotiations Stage, and will include:

- a) a full health and safety competency assessment, which will be required by the ETI, except to the extent that a Respondent's proposed scope of work under the Project is entirely desk-based, to assess each Participant organisation's health & safety management systems and specific technical competence to manage the risks in this Project. The ETI competency assessment process requires Respondents to complete a detailed questionnaire, the contents of which follow closely the competency assessment guidance set out in the Health and Safety Executive's Approved Code of Practice – managing health and safety in construction – construction (Design and Management) Regulations 2007;
- b) further intellectual property due diligence. This will include a detailed Background IP questionnaire which will be issued by the ETI for completion to identify Background IP and third party IP relevant to the Project and (where appropriate) the Programme. Respondents and Subcontractors (if any) may be asked to provide evidence of ownership or rights to use the relevant intellectual property for the Project / Programme and/or for exploitation of the results of the Project / Programme;
- c) financial due diligence on the breakdown of costs for the Project to enable the ETI to assess value for money and ensure that it meets state aid requirements;
- d) copies of insurance policies; and
- e) any other information that the ETI reasonably requires in order to invest in the proposed Project including any information necessary to meet State aid requirements.

ANNEX A2 - GENERAL DUE DILIGENCE REQUIREMENTS

A stand-alone copy of this form is available to download from the ETI website.

Details of Organisation		
Full name:		
Registered Office:		
Type of Business:		
<input type="checkbox"/> Sole Trader	<input type="checkbox"/> Limited Company	<input type="checkbox"/> Partnership
<input type="checkbox"/> Other – please describe:		
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?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Have any directors, partners or associates of the organisation been convicted of a criminal offence relevant to the business or profession?		
<input type="checkbox"/> Yes	<input type="checkbox"/> 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 of Litigation		
Please provide (and attach if necessary) details of any claims or litigation against the organisation in the last 3 years (including any which are outstanding) and/or any anticipated claims.		

ANNEX A3 - STATEMENT OF COMPLIANCE

Each Respondent shall provide a Statement of Compliance which confirms:

- that the Respondent has full authority to submit a Proposal on the basis of this Request for Proposal;
- that the Submission has been appropriately reviewed by the Respondent's technical, commercial, financial and legal representatives; and
- the level of internal approval obtained by key Subcontractors in order to make the Proposal (letters of support from each key Subcontractor should be included).

Each Respondent shall provide a statement that the Proposal is fully compliant with all aspects of the RfP and also the terms and conditions of the draft Technology Contract (Section 4.2), or shall state clearly any exceptions, deviations, alternative approaches or additions to the requirements of the Request for Proposal and/or draft Technology Contract (as appropriate), with justification. 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 (etc.) above.

With respect to the terms and conditions of the draft Technology Contract, each Respondent must either:-

- expressly confirm that the Proposal is made on the basis of the terms and conditions of the draft Technology Contract; or
- expressly confirm that the Proposal is made on the basis of the terms and conditions of the draft Technology Contract subject to clarifications and exceptions. In these circumstances, the Respondent must include in their Submission:
 - a copy of the draft Technology Contract, marked up with the Respondent's proposed clarifications and exceptions; and
 - a separate commentary against the clarifications and exceptions setting out the reason for those clarifications and exceptions.

Respondents should note that, in addition to the foregoing, the ETI expects that each of the Respondents will provide in their Statements of Compliance an initial detailed view on those areas of the Technology Contract set out in Appendix D of this RfP.

Any exception in relation to those matters set out in Appendix D of this RfP is considered a material issue and must be clearly and specifically identified in the Statement of Compliance.

Please note that the ETI may reject a Proposal if a material issue (including a non-compliance with the terms and conditions of the draft Technology Contract) is identified by a Respondent at any stage during the Project Commissioning Process.

APPENDIX B - NOTIFICATION OF INTENTION TO SUBMIT A PROPOSAL

The following form is to be completed and received at the address (postal or email) on the front cover no later than the date defined on the front cover and in Section 5.3 of this RfP.

NOTIFICATION OF INTENTION TO SUBMIT A PROPOSAL

Respondent Name: [Legal Name]

Address: [Registered Office Address]

Contact:

Email/telephone:

The above named Respondent hereby notifies the ETI of its intention to submit a Proposal in response to the ETI's Request for Proposal entitled ETI's Smart Systems and Heat Programme entitled "Work Area 2 – EnergyPath Design Tools" issued on 20th June, 2013.

The Respondent submits this notification on its own behalf and on behalf of the following proposed [Subcontractors]:

Please list below the legal names of the organisations / entities proposed to deliver the Project.

1. [Enter Name]
2. [Enter Name]
3. [Enter Name]
4. [Enter Name]
5. [Enter Name]
6. [Enter Name]
7. [Enter Name]
8. [Enter Name]
9. [Enter Name]
10. [Enter Name]

Signed: _____

For and on behalf of the Respondent(s).

Name: _____

Date: _____

APPENDIX C - NON DISCLOSURE AGREEMENT

The Non-Disclosure Agreement (NDA) protects the confidential information of the Respondents and the ETI during the period of the Project Commissioning Process. For the successful Respondent(s), the confidentiality provisions in the Technology Contract will supersede this NDA.

NOTES

In order to ensure parity across different groups of Respondents, the ETI will not enter into negotiations on the terms of this NDA.

NDA EXECUTION PROCESS / INSTRUCTIONS

A separate electronic version of the NDA is available on the ETI Website

http://www.eti.co.uk/request_for_proposals for completion and signature by Respondents in accordance with the following instructions:

- The Sole/Prime Contractor should complete Schedule 1 of a single electronic NDA with its company (legal) details and a postal address for return by the ETI of a fully executed NDA.
- The Sole/Prime Contractor should print and sign **TWO** paper copies of the NDA. **The NDA must not be dated on the front page.**
- The Sole/Prime Contractor should scan a copy of a signed and undated NDA and email it to the ETI at the address on the front of the RfP.
- The Sole/Prime Contractor should post both original signed and undated copies to the ETI.
- On receipt, the ETI will countersign and date the two original copies of the NDA. The ETI will retain one of these copies and post the other to the Sole/Prime Contractor at the address provided by the Sole/Prime Contractor at Schedule 1 of the completed NDA.

CONFIDENTIALITY AGREEMENT

THIS AGREEMENT is made on _____ of _____ 2013

BETWEEN:

- (1) **ENERGY TECHNOLOGIES INSTITUTE LLP**, a limited liability partnership (company no. OC333553) whose registered office is at Holywell Building, Holywell Way, Loughborough, Leicestershire, LE11 3UZ (the “**ETI**”); and
- (2) **The party named in Schedule 1 of this Agreement** (the “**Respondent**”),
(collectively the “**Parties**” and individually a “**Party**”)

BACKGROUND:

The Parties intend to exchange certain Information on or after the Effective Date for or in relation to the Purpose. The Parties agree to receive such Information, and to treat it as confidential information, on the following terms and conditions.

IT IS AGREED:

In consideration of the above and for other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound, the Parties agree as follows:

- 1 In this Agreement, unless the context requires otherwise, the following words shall have the following meanings:

“**Disclosing Party**” means any Party that discloses Information pursuant to this Agreement;

“**Effective Date**” means the date of execution of this Agreement;

“**ETI Affiliates**” means the Secretary of State for Business, Innovation and Skills (and any successor governmental department or agency from time to time) and any other entity which is entitled to appoint the directors or otherwise having the ability to direct management policies of the ETI (together with any affiliates of those entities), together with their respective officers, employees, agents and consultants;

“**Information**” means any and all confidential information or data exchanged, submitted or otherwise disclosed in respect of or further to the Purpose or prepared for or in relation to the Purpose, including but not limited to written proposal documentation, due diligence materials, contractual documentation, reports, and the fact that the Parties have entered into this Agreement and are discussing and considering a business relationship;

“**Project**” means the proposed project under the ETI’s Smart Systems and Heat Programme entitled “Work Area 2 - EnergyPath Design Tools”;

“**Project Commissioning Process**” means the ETI’s commissioning process for the Project as defined in the RfP and as set out at Section 5 of the RfP or as later may be notified or published by the ETI;

“**Technology Contract**” means a Technology Contract as such term is defined in the RfP;

“**Proposal**” means a Proposal as such term is defined in the RfP;

“**Purpose**” means:

- a the preparation and/or submission of any Proposals and related documents in response to the RFP;

- b the Project Commissioning Process;
- c any activities related to the assessment of any Proposals for the Project; and
- d any related exchanges of Information, clarifications, clearances, discussions, due diligence, meetings, and/or negotiations in respect of the RFP, the Project Commissioning Process and/or the Project;

“**Receiving Party**” means any Party that receives Information pursuant to this Agreement; and

“**RFP**” means the request for proposals relating to the Project, issued by the ETI on 20th June, 2013.

- 2 The Receiving Party shall with regard to any Information disclosed pursuant to this Agreement by or on behalf of a Disclosing Party on or after the Effective Date:
 - a hold the Information in confidence and, except as is otherwise stated herein or agreed in writing by the Disclosing Party, shall not disclose or make available the Information by publication or otherwise to any third party (including for the avoidance of doubt, disclosure in any patent application or to any patent office) and shall use any Information disclosed to it pursuant to this Agreement only for carrying out the Purpose;
 - b make copies of the Information (or any further information derived from the Information) in whatever form or medium only to the extent that the copies are reasonably necessary for the Purpose and clearly mark all such copies as confidential;
 - c take all necessary and proper security precautions (and at least as great as those it takes to safeguard its own information) to safeguard every part of the Information to prevent it from being disclosed or otherwise made available to any third party except as permitted by this Agreement; and
 - d at the request and direction of the Disclosing Party, and without delay, return or destroy any Information provided to it pursuant to this Agreement and any copies of such Information, except that one copy may be kept by the Receiving Party for archival purposes and for the purpose of defending itself against any claims arising in connection with this Agreement.
- 3 The obligations set out in clause 2 shall not apply to Information that:
 - a the Receiving Party can prove (using written or electronic records), was lawfully known to the Receiving Party or in its possession prior to its communication by or at the direction of the Disclosing Party and was not communicated to the Receiving Party subject to any restrictions on disclosure or use; or
 - b is or becomes a part of the public domain through no wrongful act of the Receiving Party or any person on its behalf, provided that this clause 3(b) shall only apply from the date that the relevant Information so enters the public domain; or
 - c the Receiving Party receives from a third party without similar obligations of confidence in circumstances where the third party did not obtain that Information as a result of a breach of an obligation of confidence; or
 - d subject to clause 4, is required to be disclosed or made available by the Receiving Party pursuant to any applicable law, governmental regulation, or decision of any court or tribunal of competent jurisdiction or any government body, agency or regulatory body.
- 4 If a Receiving Party believes it is required by law to disclose any Information under clause 3(d) above, the Receiving Party shall (in each case and to the extent not prohibited in law):
 - a provide the Disclosing Party with prompt written notice of such requirement or obligation (together with a copy of any relevant access request, court order or other evidence giving

- rise to such belief) in advance of the required disclosure, to enable the Disclosing Party to seek appropriate protective relief and/or to take other steps to resist or narrow the scope of any required disclosure;
- b where it is not permitted in law to notify the requirement for disclosure in advance of the required disclosure, notify the Disclosing Party as soon as reasonably practicable after the disclosure confirming the nature of and extent of the disclosure; and
 - c co-operate with the Disclosing Party with respect to such matters,
- and in any event disclose only such Information as it has ascertained, after taking legal advice, it is legally compelled to disclose.
- 5 The ETI shall be entitled to disclose or make available any Information it receives from the Respondents (or any of them) to:
- a such of the ETI Affiliates, and either the ETI's or the ETI Affiliates' employees, officers, secondees, agents, consultants, sub-contractors, proposed sub-contractors, professional advisers and proposed professional advisers where such disclosure is necessary for the Purpose, provided that all such aforementioned persons to whom any Information is disclosed by the ETI are bound by obligations of confidentiality and the ETI shall be responsible for breaches of the obligations by such persons. Each ETI Affiliate may enforce this clause in accordance with the Contracts (Rights of Third Parties) Act 1999; and
 - b the Department of Business, Innovation and Skills (or other relevant government department), the European Commission and such other bodies and/or individuals (including without limitation professional advisers) as may reasonably be required for the notification of, to seek advice in relation to, as part of an assessment of, or otherwise in relation to, State aid.
- 6 The Respondent shall be entitled to disclose or make available any Information it receives from the ETI to such of its employees, officers, consultants, sub-contractors, proposed sub-contractors and professional advisers where such disclosure is necessary for the Purpose provided that all such persons to whom any Information is disclosed are bound by obligations that are no less restrictive than those in this Agreement. The Respondent disclosing Information shall be responsible for breaches of the obligations by such persons.
- 7 Each Party as Receiving Party expressly agrees and accepts that except in the case of fraud, no representation or warranty, express or implied, is made by the Disclosing Party as to the accuracy, completeness, reasonableness or otherwise in respect of the use of the Information, and that neither the Disclosing Party or any of its affiliates nor any of its or their respective employees, officers, secondees, agents, consultants, sub-contractors and professional advisers (as applicable) shall have any liability to the Receiving Party as a result of the Receiving Party's possession or use of the Information.
- 8 The Parties agree that money damages would not be a sufficient remedy for any breach of this Agreement and that the Disclosing Party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach. Such remedy shall not be deemed to be the exclusive remedy for breach of this Agreement, but shall be in addition to all other remedies available at law or equity.
- 9 No rights or obligations other than those expressly set out in this Agreement are to be implied and nothing contained in this Agreement:
- a constitutes an offer by or on behalf of the Disclosing Party; or
 - b confers upon the Receiving Party a licence or other transfer of rights in respect of any Party's interest in any Information or in any present or future patent or patent application;
- or

- c affects the present or prospective rights of the Disclosing Party under the patent laws of any country or precludes the filing or prosecution of any patent applications by the Disclosing Party.
- 10 This Agreement represents the entire agreement between the Parties in relation to the subject matter contained herein and supersedes all other agreements and representations, whether oral or written, between the Parties relating to such subject matter. This Agreement may only be modified if such modification is in writing and signed by a duly authorised representative of each Party. Each Party also agrees that it shall have no remedies or claims under this Agreement for any innocent or negligent misrepresentation based on statements made prior to the Effective Date.
- 11 The Parties agree that the ETI may disclose that one or more of the Respondents are involved in discussions with the ETI and the subject matter of the discussions provided that the ETI will provide a copy of any press release or other announcement to the Respondents and seek the approval of the Respondents prior to its publication or release. Other than as set out in this clause, none of the Parties will make any public announcements, statements or otherwise publicise the subject matter of this Agreement (or its existence) without the prior written consent of the other Parties and no Party will use the business names or trademarks of any other Party in any way without that Party's prior written consent.
- 12 This Agreement shall come into force on the Effective Date and shall continue in full force and effect, notwithstanding the completion of the Purpose, for a period of seven years from the Effective Date unless extended, superseded or otherwise varied by a subsequent written agreement between the Parties.
- 13 It is not intended that a third party (other than an ETI Affiliate) should have the right to enforce a provision of this Agreement pursuant to the Contracts (Rights of Third Parties) Act 1999.
- 14 The rights of the Disclosing Party under this Agreement are in addition to and not exclusive of rights under the general law and may be waived only in writing and specifically. Delay in exercising or non-exercise of any right under this Agreement is not a waiver of that or any other right, partial exercise of any right under this Agreement shall not preclude any further or other exercise of that right or any other right under this Agreement and waiver of a breach of any term of this Agreement shall not operate as a waiver of breach of any other term or any subsequent breach of that term.
- 15 If any provision of this Agreement is or becomes illegal, invalid or unenforceable in any jurisdiction, that shall not affect:
- a the legality, validity or enforceability in that jurisdiction of any other provision of this Agreement; or
 - b the legality, validity or enforceability in any other jurisdiction of that or any other provision of this Agreement.
- 16 Nothing in this Agreement is intended to or shall operate to create a partnership or joint venture of any kind between the Parties (or any of them), or to authorise any Party to act as agent for another, and no Party shall have authority to act in the name or on behalf of or otherwise to bind any other in any way.
- 17 Except as provided otherwise, no person may assign any of its rights under this Agreement or any document referred to in it.
- 18 This Agreement may be executed in any number of counterparts, each of which when executed and delivered shall constitute an original of this Agreement, but all the counterparts shall together constitute the same agreement. No counterpart shall be effective until each Party has executed at least one counterpart.

19 This Agreement shall be construed in accordance with and governed by English law and the Parties hereby submit to the non-exclusive jurisdiction of the English Courts.

The Parties have caused this Agreement to be executed by their duly authorised representatives.

ENERGY TECHNOLOGIES INSTITUTE LLP

By: _____

Name: _____

Title: _____

Date: _____

SCHEDULE 1

Respondent	Signature
Company Name: Company No: Address of Company:	By: Name: Title:

The ETI will return a copy of the executed Non-Disclosure Agreement to the Sole/Prime Contractor. Please provide the relevant name and address for this correspondence below.

Contact for return of executed Non-Disclosure Agreement	Send to [name]: At postal address:
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APPENDIX D - TERMS AND CONDITIONS OF TECHNOLOGY CONTRACT

There is a general requirement that Respondents provide in their Statements of Compliance (Annex A3) information on any proposed clarifications and exceptions to the terms and conditions of the draft Technology Contract (see Annex A3). Each Respondent should mark-up and comment upon any areas of the draft Technology Contract that the Respondent considers to be problematic.

In addition to this general requirement, there are aspects of the Technology Contract that are of particular importance to the ETI and that the ETI wishes to highlight in this Appendix D. The ETI expects that each of the Respondents will provide an initial detailed view on these aspects in their Proposal, as part of the Statements of Compliance (see Annex A3).

The particular aspects of the Technology Contract that the ETI would like to highlight for Respondents' initial consideration are as follows.

INTELLECTUAL PROPERTY

The ETI expects to own all Arising IP and to have rights to Background IP and Third Party IP such that it can use and commercially exploit the Arising IP at its discretion. In the event the Respondents wish to propose any alternative Intellectual Property mechanisms, **the ETI strongly recommends that the Respondents have an early discussion with the ETI.**

Respondents should note the minimum requirements for this Project in Section 4.6 of the RfP.

IP WARRANTIES AND DUE DILIGENCE

The Technology Contract contains a number of warranties and undertakings related to IP. The ETI will conduct an appropriate level of due diligence before the start of the Project which relates to IP and the IP warranties. The wording of any warranties may be amended to reflect IP due diligence performed.

INDEMNITIES

The ETI will invest funds in this Project but has no control over any risks and associated liabilities that may arise from the Project. Therefore the Technology Contract contains a number of indemnities in favour of the ETI, including for third party claims and for IP infringement. Respondents should review and comment on the indemnity position in their Submission.

R&D TAX RELIEF

The ETI's Industry Members (as partners in a limited liability partnership) and Programme Associates can claim R&D tax relief in return for investment funding provided to the ETI that is spent on research and development on ETI projects. Therefore the ETI requires that Project Participants provide details of the amount of the ETI Investment that is spent on R&D.

STATE AID REQUIREMENTS

The Technology Contract has requirements that relate to State aid (through the provision of public monies to the ETI and therefore to the Project). Please see Section 4.5 of the RfP (State Aid). This includes requirements to return ETI funds in certain exceptional circumstances and record keeping requirements. Please note, the ETI cannot award a contract to any organisation unwilling to accept these requirements.

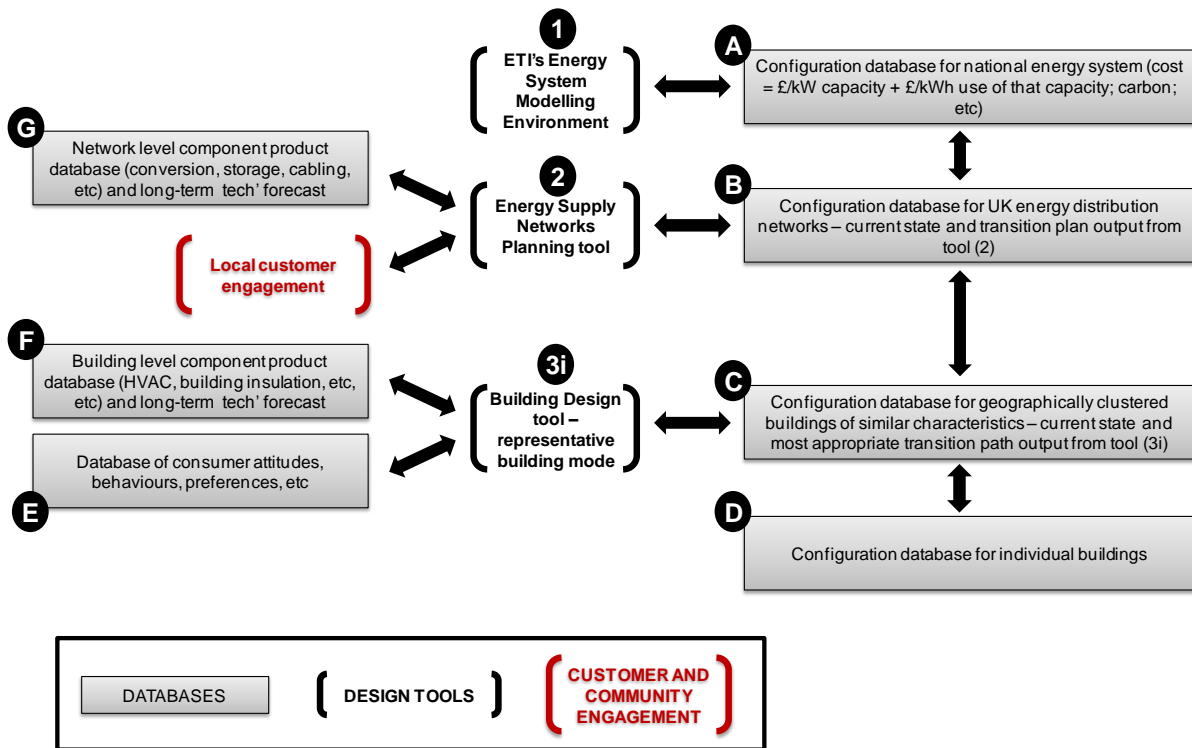
APPENDIX E – FUNCTIONALITY FOR THE SUITE OF DESIGN TOOLS

The ETI's Smart Systems and Heat (SSH) programme has a requirement to create a suite of design tools by August 2014 that will enable the ETI, as an expert user, to work with local authorities in the UK to answer the following questions. This is the purpose of the specific Project covered by this RfP.

- For each area of the UK, using a rough order estimation approach, what is its optimum contribution to the UK's 2050 energy and climate change goals?
- For a given area, what is the optimum plan for transitioning its local energy supply networks to meet the location's needs within a national energy system evolving both economically and commercially to meet the UK's 2050 energy and climate change goals?

The analysis the ETI envisages undertaking for a local authority using this suite of design tools is described in Appendix F. Ongoing support from the successful bidder may be requested for this.

The diagram below outlines a potential structure for the suite of design tools. However, the successful bidder is invited to propose alternatives or refinements.



Core to the suite of design tools is a set of common databases.

Database (A): A database holding data on the current, planned and potential development of the national energy system. It is anticipated that this will be generated and maintained using the ETI's Energy System Modelling Environment, ESME – *design tool (1)*. The primary purpose of this database is to enable the complex relationship between local choices and the implications on the national energy supply system to be 'decoupled'.

Database (B): A configuration database for distribution networks. Currently, data availability is an issue (especially for the existing electricity network) and there are no transition plans. Consequently, populating this database will require some analysis, assumptions and potentially new survey work as the tools are used on each location. It will need to include metrics for data uncertainty that can be used in the design tools. This database will also capture the network transition plan output from the Energy Supply Networks Planning tool – *design tool (2)*.

Database (C): A database of the building clusters aggregated from the individual buildings database - *database (D)* -. This database will contain the input data on the characteristics of the representative building for the cluster (e.g. heating, hot water, storage, insulation and control systems). It will need to include metrics for data uncertainty that can be used in the design tools. This database will also capture the appropriate solutions for each building cluster output from the Building Design tool – *design tool (3)* - operating in Representative Building Mode – *mode (i)*.

Database (D): A database of the individual buildings. Initially, this will be populated with data from sources such as the Valuation Office Agency (VOA), energy meters, etc. It may be enhanced with location specific data each time the tool is used. For this specific Project, this individual building data is only required for the purposes of characterising clusters of buildings.

Database (E): A database of consumer attitudes and preferences, which would contain parameters for use in the design tools such as coefficients on willingness to pay, probability of dissatisfaction, etc. Initially, this will be populated with data from consumer research – the ETI will be able to provide some input to this, from the Work Area 5 Consumer Response and Behaviour project of the SSH programme. The database should be designed for ongoing capture of additional consumer insight from real-world deployment.

Database (F): A database of component products and technologies at the buildings level (heat pumps, hot water tanks, insulation, etc.). This will be structured as ‘product classes’ (for example, a heat pump, a storage tank, a radiator, etc.) with appropriate parameterisation for each class. It will contain: (i) a long-term forecast of performance and cost generically for each product class; and (ii) performance and cost data on currently available specific products from the supply chain. For this specific Project, as the question is at the network level, the focus is on (i).

Database (G): A database of component products and technologies at the networks level (conversion, storage, cabling, etc.) in a similar structure to *database (F)*.

To use this data to answer the questions above (and to populate the databases with derived data), a set of three design tools are anticipated.

1. The ETI’s pre-existing Energy System Modelling Environment (ESME) – *design tool (1)*.
2. An Energy Supply Networks Planning Tool – *design tool (2)* - containing the following core functionality:
 - a) Automated clustering of the building stock into common network clusters.
 - b) Analysis of the potential competing local demands for ‘waste heat’ resources and optimisation of its exploitation (which may be outside the location of interest).
 - c) Automated outline network layout and sizing, including for conversion and storage assets, for heat, gas and electricity networks building on the existing asset base.
 - d) Estimation of the capital and operating costs for energy supply network options.
 - e) Estimation of annual CO₂ emissions given likely transition trajectories at the building clusters level.
 - f) Optimisation of the energy supply network choices to maximise local consumer satisfaction at minimum cost (drawing on the analyses for each building cluster).
 - g) Sensitivity testing and confidence appraisal for the output of the tool. This should include a financial assessment of the value of gathering additional input data.
 - h) Creation of a transition plan for the local energy supply network choices and visualisation in a standard Geographic Information System (GIS) software package.
 - i) Investment case analysis for any investor in the local energy supply networks (for example, a local authority, a distribution network operator, etc.).

3. *Design tool (3): A Building Design Tool operating in Representative Building Mode – mode (i) – with the following core functionality. More extensive functionality is envisaged for this tool in future development after this specific Project. The functionality needed at this stage is only to the extent required to converge on robust solutions to the above question. It is expected this will entail the use of existing buildings data from sources such as the Valuation Office Agency, since a degree of uncertainty and averaging can be accepted for this purpose.*
- a) Automated clustering of the building stock into similar physical and social types.
 - b) Calculation of a thermal comfort ‘score’ for each room or zone in the building¹. An approach such as Fanger’s Comfort Equation will be needed, covering the effect of surface temperature, air temperature, air flow, humidity and occupier behaviour. It will need to reflect:
 - The dynamic interaction between the thermal mass of the building fabric, the storage ‘buffer’ in the radiator system, storage in the hot water tank, etc.
 - The dynamic interaction between the room/zone and the external environment (such as solar gain in a conservatory).
 - The uncontrollable ventilation in the room/zone (such as a door’s air leakage) and the controllable ventilation in the room/zone (such as opening windows).
 - The uncontrollable interactions between the rooms/zones of the building (such as heat flow through internal walls) and the controllable interactions between the rooms/zones of the building (such as through internal doors).
 - Non variable energy demands (such as lighting, cooking, etc.) and variable energy demands (such as refrigeration, vehicle charging², etc.).
 - Options for adapting the space heating and hot water system components given how technology performance and cost may improve over the long-term.
 - Options for enhancing the thermal insulation of the building.
 - Options for different control strategies (such as running the heating system constantly to use the thermal mass to minimise peak energy demand).
 - c) Calculation of a hot water satisfaction ‘score’ in a similar manner to thermal comfort¹.
 - d) Calculation of ‘hassle’ metrics to be used in optimisation to meet consumer preferences (such as aesthetics, installation disruption, loss of space for storage, etc.).
 - e) Calculation of the peak energy demand requirement (kW_{peak}) and its likelihood of coincidence between buildings and average energy consumption (kWh_{average}).
 - f) Calculation of the capital, operating and maintenance costs for the options to adapt the building (insulation, addition of hot water storage, changing to a heat pump, etc). This will need to be sufficient to enable an optimisation trade-off.
 - g) Optimisation of the heating, hot water, storage, insulation and control system options (building on the existing assets) over the long lifecycle of the energy supply networks (25++ years) given anticipated technology performance and cost improvement. The

¹ The ETI’s Consumer Response and Behaviour project in the SSH Programme may provide some input to help on this subject.

² Plug-in vehicles are a potentially significant future energy demand in buildings. The ETI has completed extensive analysis on this subject, including on UK travel patterns and likely recharging energy demand. This will be available to the project team.

optimisation should be against specific design cases³ and constraints⁴ reflecting anticipated local consumer preferences.

- h) Calculate the cost saving (or additional cost) by removing (or adding) certain design cases to the optimisation or removing (or adding) certain owner preferences. For example, the cost saving by not sizing the system for fully heating the building on the very rare days of extreme cold or the cost impact by not installing hot water storage.
- i) Sensitivity testing and confidence appraisal for the output of the tool. This should include a financial assessment of the value of gathering additional input data.

It is anticipated that simple models will be used within each of these tools where appropriate, and more complex models only where required. It will be critical to balance scalability of the suite of tools with computational intensity to produce useful outputs. To minimise time and cost in building the suite of tools, it is also anticipated that existing models, tools and data will be used wherever possible (subject to ensuring the ETI has acceptable Intellectual Property access provisions).

The tools will have to allow for technologies to be developed over time and for building occupants to develop new and additional needs out to 2050; for example, increased use of display area for entertainment etc. The ETI adopts a rigorous approach to design and will require the tools to deal with uncertainty (for example in future costs, technology performance, etc.) and with distributions (for example in disposable income, building condition, time of energy use, etc.).

Beyond the above questions, the ETI has a long-term vision for further development of this suite of design tools to address additional questions for other stakeholders. These are not part of this specific Project, but are described here so bidders can consider the implications in early development.

- *For a given building, what is the optimum plan for transitioning its heating, hot water, storage, insulation and controls over time and within the constraints set by its owner's preferences and the energy supply network transition plan?*
- *What would be the potential market size and timeframe of an improved performance or reduced cost heating, hot water, insulation or control system modular component product?*

Further development of the suite of tools after August 2014 will be required to answer these additional questions. It is anticipated that this may entail:

- Enhanced data in the individual buildings - *database (D)* to pre-populate the building design tool with as much data for individual buildings as possible and quantify data uncertainty.
- Extension of the Building Design Tool (*design tool (3)*) to:
 - Operate in an Individual Building Mode – (*not shown*). At this level, it needs to produce robust designs at the individual building level; averaging between buildings will not be acceptable so much more accurate input data and modelling will be required.
 - Include an interface to add additional data for a specific building.
 - Extend the optimisation to take into account the transition plan for the incoming energy supply networks – stored in *database (B)*.
 - Extend the optimisation to include the selection of specific component products rather than just generic technologies.

³ 'Design cases' is used to refer to the combinations of weather and occupier behaviour conditions the system is design to perform under. For example: extraordinarily cold day, whole house heated, limited level of clothing, a window open; extraordinarily cold day, house partially heated, increased level of clothing, windows all closed; etc. Careful thought by the successful bidder will be required to create the most useful set of design cases.

⁴ 'Constraints' refers to parameters such as availability of space for hot water tanks and owners' willingness to use that space.

- Create a transition plan for the building to be adapted over a period of time (potentially over several years) aligned with the preferences of the owner and the network transition plan.
- Translate complex technical output ('jargon') into language meaningful to consumers.
- Incorporate feedback from consumers on real-world performance and satisfaction.
- Extension of the individual buildings *database (D)* to capture the transition plan output from the Building Design tool operating in Individual Building Mode (not shown).
- Extension of the consumer attitudes *database (E)* to capture additional insight from real world design and deployment at the individual buildings level.
- The technology and product *database (F)* will need to be extended to include a diverse range of specific products from the supply chain in each product class.
- A Modular Component Product Development Tool – (*not shown*) – will need to be created with the core functionality to evaluate the competitiveness of 'virtual' products (options for development) in terms of both cost and performance compared to the other options and existing products.

The ETI foresees a number of potential channels for using and exploiting this suite of design tools and their databases. A potential series of increasing levels of functionality is outlined below, but this will develop as understanding of the suite of tools improves during creation (for example, it may or may not be viable to produce a simple enough tool for direct access by end consumers).

- Level 1: Network planning for local authorities (the purpose of this specific Project). The details of this step are described in this RfP.
- Level 2: Individual building level planning for owners of property portfolios (for example, housing associations, local authorities, large scale private landlords, etc.). At this step, the full functionality of the building design tool in individual building mode (not shown) - would be needed.
- Level 3: Individual building level planning for third party consultants/advisors (for example, by providing access to the suite of tools and the underpinning databases under licence). This is likely to be limited to a small number of large scale contractor organisations.
- Level 4: Advice to developers of modular component products to help inform optimisation of the performance and cost of individual components and aid better integration into systems. At this step, the Modular Component Product Development tool – (*not shown*) - would be needed.

APPENDIX F – ANALYSIS ETI ENVISAGES UNDERTAKING FOR LOCAL AUTHORITIES

The ETI will use the suite of tools delivered under this specific Project, as an expert user, to work with local authorities and other stakeholders to address the questions below. The analysis and report will be very specific to the needs of each stakeholder, but will include the following interrelated issues for each location. Robustness will be critical.

Design Target: *For each area of the UK, using a rough order estimation approach, what is its optimum contribution to the UK's 2050 energy and climate change goals?*

Design Solution: *For a given area, what is the optimum plan for transitioning its local energy supply networks to meet the location's needs within a national energy system evolving both economically and commercially to meet the UK's 2050 energy and climate change goals?*

- **Characterisation of the national energy supply system**

The ETI will use its existing Energy System Modelling Environment (ESME) to 'decouple' this complex issue from the location of interest. It is anticipated a table can be created to reflect the fixed cost per unit of capacity (£/kW – capital, operations, maintenance, etc.) and marginal cost of using that capacity (£/kWh – feedstocks, wear and tear, etc.). In this way, the implications of local decisions on the required peak capacity and utilisation of the national energy system can be inferred. ESME will be updated with insight arising from detailed analysis of buildings and networks.

- **Characterisation of physical and social geography for the location**

Characterisation of physical geography (location of residential and commercial buildings, potential waste heat sources, existing energy supply networks, etc.) and social geography (types of consumers and likely attitudes and preferences, building ownership profile, income profile, etc.). Existing assets need to be retained or upgraded wherever possible to minimise cost, so this characterisation will be critical to the design process. Any future redevelopment and/or expansion plans of the local authority will also need to be characterised.

- **Clustering of the building stock and analysis of the optimum building transition plans**

Clustering of the building stock (importantly covering residential and smaller commercial⁵) into similar physical and social types and analysis of the range of different integrated heating, hot water, storage, insulation and control solutions for each building cluster to maximise consumer satisfaction at minimum cost. This analysis only needs to be completed to the extent necessary to converge on a robust answer to the question above. As for networks, reuse of existing assets in the building will be critical to minimising cost, so detailed characterisation of the building and its existing heating, hot water, storage, insulation and control will be critical. This will include analysis of the trade-off between performance and cost, for which thoughtful design cases (covering weather and behaviour dimensions) will need to be developed for the suite of tools. The output will be used to inform long-term network choices, so it will need to be underpinned by a database of long-term component technology performance and cost forecasts. Control systems are almost certain to be a critical modular component, so the analysis will need to take into account the dynamic interaction between the rooms of the building, occupant behaviour, the heating system, the thermal mass, etc. Non heat related energy demands in the building and how they might change over time will also need to be reflected⁶. Clear recommendations on the range of appropriate designs for each building cluster will need to be produced, for use in the energy supply networks design. The peak power requirement (kW_{peak}) and its likelihood

⁵ Industrial process and manufacturing energy loads are not included in the scope of commercial buildings, but offices, shops, hospitals, schools, sports and leisure facilities etc. are in scope (up to defined building connection limits).

⁶ Plug-in vehicles are a potentially significant future energy demand in buildings. The ETI has completed extensive analysis on this subject, including on UK travel patterns and likely recharging energy demand. This will be available to the project team.

of coincidence between buildings and the average utilisation ($\text{kWh}_{\text{average}}$) will be key output parameters.

- **Clustering into common networks and analysis of the optimum transition plans**

Creating common network clusters from groups of building clusters. For each common network cluster, an optimised conceptual network layout (including the location and sizing of storage and conversion assets) will need to be automatically generated (building on the existing asset base) and its capital and operating costs calculated. It will be necessary to use the range of appropriate designs determined for each building cluster to enable the best compromise to be made between the needs of all the buildings in each common network area. The analysis needs to conclude with clear recommendations on the transition strategy (including which networks to phase-in and –out where and when) and the commercial, policy and social implications. These plans will be input to a standardised database for future use (for example, so building owners can access these plans and assess the impact on them).

- **Identification of data gaps, sensitivity testing and appraisal of confidence in the design**

Identification of data gaps, quantification of their impact on confidence in the design and recommendations on what additional data could be gathered and the potential cost reduction that the resulting design refinements might achieve. An overall appraisal of the robustness of the recommendations to uncertainties will be critical to the credibility of the design. A probabilistic approach to the input data for the suite of tools will be critical (for example, three point estimates for the performance and cost metrics for technology forecasts). The functionality to perform systematic sensitivity testing will be important.

- **Graphical visualisation for easy communication with diverse stakeholders**

Visualisation of the outputs in map form using a standard Geographic Information System (GIS) tool will be critical to effective communication of complex findings.

- **Investment case analysis for the many stakeholders critical to successful transition**

Creation of investment cases for the relevant stakeholders within the location of interest (especially the local authority, gas and electricity distribution network operators, potential district heat network providers, etc., etc.). Factors such as the cost of land, investment risk, cost of capital, cost of carbon, etc. are all likely to be critical to this analysis. Appraisal of the investment case under a range of different policy options will be critical to determining private sector investment risk and helping to guide local and national policy makers.

APPENDIX G - GLOSSARY

Term	Definition
Arising IP	Any intellectual property which is created by or for any Participant during the Project or for the purposes of the Project.
Background IP	Any intellectual property which existed prior to any Participant's commencement of the Project and which was created by or for the Participant.
Building Design Tool	Refer to appendix E
Chief Engineer	The individual as described in Appendix A
Eligible Costs	Those categories of costs incurred in the performance of the Project that are eligible for payment from the ETI Investment (to be set out in the Technology Contract).
ETI	The Energy Technologies Institute LLP, a limited liability partnership (Company no. OC333553) whose registered office is at Holywell Building, Holywell Way, Loughborough, Leicestershire LE11 3UZ.
Energy Supply Network Planning Tool	Refer to appendix E
ETI Investment	The amount to be made available by the ETI in respect of Eligible Costs of the Project, up to the amount of the Maximum ETI Investment.
Final Detailed Offer	A final and detailed offer to be made once all contractual issues have been negotiated and agreed. Typically, if required, this will occur at the end of the Project Shaping and Contract Negotiation Stage.
Her Majesty's Government / UK Government	Her Majesty's Government, including but not limited to all of its departments and executive agencies and the devolved administrations of Scotland, Wales and Northern Ireland.
HSE	Health, Safety and Environment.
Member	The ETI's industry members (as identified on the ETI's website from time to time - http://www.eti.co.uk/about/current_members), including affiliates of such members, and Her Majesty's Government (including but not limited to those public sector members identified on the ETI's website (above) from time to time and Associate Member(s)).
Milestone	A Project milestone with defined constituent deliverables, associated deliverable acceptance criteria, deliverable value and milestone value (all to be proposed in the Respondent's Proposal and subsequently negotiated/agreed in the Technology Contract) which should be completed in order to reach the said milestone, and upon successful completion of which, subject to acceptance by the ETI that the milestone has in fact been reached, payment may be claimed from the ETI.
Non-Disclosure Agreement	A non-disclosure agreement in the form provided at Appendix C.
Participant	Either the Prime Contractor or a Sole Contractor, as the case may be.

Term	Definition
Prime Contractor	A single organisation which contracts with the ETI to perform the Project, together with (subject to ETI approval) Subcontractors.
Programme	The ETI Smart Systems & Heat Programme that includes the Project.
Programme Manager	The individual appointed by the ETI to manage the Programme and to whom the Project Manager is accountable.
Project	The ETI project entitled the EnergyPath Design Tools project, for which the purpose, scope of work and other details are described in this Request for Proposals.
Project Commissioning Process	The ETI's process for commissioning the Project, including as described at Section 5.
Project Manager	The individual as described in Appendix A
Project Shaping and Contract Negotiation Stage	The Technology Contract negotiation stage of the Project Commissioning Process, as described at Section 5.2.
Proposal	The proposal for the Project submitted to the ETI, in response to this Request for Proposals.
Representative Building Mode	Refer to appendix E
Respondent	The organisation(s) submitting a Proposal to the ETI (i.e. a proposed Sole/Prime Contractor).
Review Point	A Project review involving Project Participants and ETI representatives at which the overall progress in Project or a specific Work Package will be critically reviewed and following which a formal decision will be made on the future Project programme.
RfP	This Request for Proposals.
Risk Register	See Section 7 (Risk Management) of Appendix A.
Stage 1 and Stage 2	Relevant Stages of the Project as described in the section "Summary Of Key Project Information"
Stage Gate	A major Project Review Point involving Project Participants and ETI representatives at which the overall performance and business case for the Project will be critically reviewed and following which a formal decision will be made whether to continue with the Project, based on whether agreed Stage Gate criteria have been met.
Selection Panel	The selection panel described at Section 5.1.5.
Sole Contractor	A sole organisation which contracts with the ETI to perform the Project on its own (without Subcontractors).
Statement of Compliance	The statement of compliance required by the ETI, as described at Section 7 and at Appendix A, Annex A3.

Term	Definition
Subcontract	A contractual arrangement between a Participant and another organisation to which work for the Project has been subcontracted.
Subcontractor	An organisation which has a Subcontract.
Submission	The components set out in Section 8 of the RfP, including the Proposal, submitted by the Respondent(s) in response to this Request for Proposals.
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.
Technology Contract	The contract, as described in Section 4.2, to be entered into between the ETI and the Participants (Consortium Members or Prime Contractor, as appropriate).
Third Part IP	Any intellectual property which is required for or used in the Project (other than Arising IP and Background IP) and which is owned by parties other than the ETI and the Participant,
Work Package (WP)	A major section of the Project scope of work, which may be identified in this Request for Proposals 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.