



Programme Area: Smart Systems and Heat

Project: WP1 HEMS Development and Trial

Title: Request for proposals

Abstract:

A request for proposals to undertake the trials of the Prototype Home Energy Management Systems (HEMS) system.

Context:

ETI's research highlights that a Home Energy Management System (HEMS) should be a key component of a future smart energy system, but given the fact that most consumers do not willingly engage with their energy system any product solutions need to be consumer focused if they are to be effective. Therefore this project to design an advanced HEMS is a core component of the ETI's Smart Systems and Heat programme (now delivered by the Energy Systems Catapult) to make energy and heat consumption more consumer focused. As part of the two year project, the system that is developed will be installed and tested in homes during the winter of 2016/17 and the results analysed to give an insight into consumer patterns, their electricity and gas use and the building and heating system performance. This will provide a significant dataset of consumer behaviours, energy use and building characterisation to develop further future products. Providing a secure and scalable platform will also help to integrate more appliances in the home and allow valuable services and applications to be developed, deployed and managed.

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Request for Proposal (RfP)

Title of Services for which Proposals are Requested

Smart Systems and Heat (SSH) Programme:

Prototype Home Energy Management System (HEMS) Field Trial

Request Issue Date

13th August 2014

Request for Proposals Submission Date

1st October 2014

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SUMMARY OF KEY CONTRACT INFORMATION

The Smart Systems and Heat (SSH) Programme will create future-proof and economic local heating solutions for the UK. It will connect together an understanding of consumer needs and behaviour, with the development and integration of new technologies and with new business models. The associated insight will deliver enhanced knowledge across industry and the public sector, resulting in industry and investor confidence to implement SSH informed solutions from 2020 and thereby enable a UK heat transition, within an appropriate policy and support environment to deliver a cost-effective UK energy system transition.

Home energy management is a key component of any future smart energy system, enabling the delivery of added value and cost-effective consumer offerings, together with improved supply side asset utilisation. Insight gained from the deployment of HEMS will inform energy service providers of the requirements of consumers and the characteristics of their domestic environment. Furthermore advanced HEMS could provide the functionality necessary to control more complex low carbon energy solutions in the future.

The ETI is launching simultaneous Requests for Proposals (RfPs) to develop and evaluate through a field trial a Home Energy Management System (HEMS) prototype that is capable of addressing future consumer energy management needs in domestic dwellings out to 2030 and beyond. **This RfP aims to secure the services for a successful bidder to deliver field trial services which could reach a scale of 300 properties during the 2015/16 heating season.** The other RfP will secure a successful bidder to develop the HEMS Prototype System. The prototype HEMS developed and evaluated through these simultaneous contracts, or a variant thereof, is expected to form the basis of the HEMS system to be deployed in the subsequent and significant SSH Phase 2 demonstration activities.

The ETI believes that participation in this work will provide the successful Participant with the opportunity to develop significant capability in the evaluation and co-development of an advanced HEMS product.

The ETI is prepared to receive combined proposals which cover both the development of a HEMS Prototype System (Contract 1) and Field Trial Services (Contract 2), but we will evaluate joint proposals against proposals which cover only one of the elements. The ETI intends to manage Contract 2 as a Service Level Agreement whereby packages of work are called off by the ETI when there is an appropriate level of confidence to do so.

The ETI expects to appoint the successful bidder primarily on the basis of the value to the ETI of the skills, expertise and resources which can be mobilised to deliver this contract, full details of the selection criteria against which proposals will be assessed are described in section 7.1 of this RfP.

A bidder workshop for the Prototype HEMS Field Trial and Prototype HEMS Development contracts will be held on 2nd September, Respondents are requested to submit an NDA by 24th August to register their attendance. Respondents are required to provide to the ETI a formal notification of their intention to submit a Proposal using the form in Appendix E by 12th September.

The Contract is expected to commence in January 2015 and build in scale to the deployment of circa 300 HEMS systems ahead of the 2015 / 16 heating season.

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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 has 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 are observers on the 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 C Section 8 of this RfP.

The ETI requires:

- the highest standards in Health and Safety (throughout the field trial): excellence not merely legal compliance;
- Robust and secure procedures for dealing with personal data in full compliance with the law;
- The application of safety in design, whereby opportunities to design out Health and Safety risks associated with proposed works are incorporated into designs and plans; and
- So far as reasonably practicable the successful Respondent shall demonstrate, communicate, manage and exceed Health, Safety and Environment compliance whilst dealing with all stakeholders including, specific to this Contract, the homeowner and or the home occupants whilst undertaking the contract of work within any home.

2. OVERVIEW

2.1. Background to the SSH Programme

The UK government has set a legally binding target of an 80% reduction in greenhouse gas emissions by 2050, with interim targets through the major transition that this implies. Over 40% of the UK's energy demand currently is for heat, with approximately half that amount arising from heat demand in domestic properties. The vast majority of domestic heat demand results from comfort requirements in the form of space heating and hot water. Mitigating emissions from domestic heat is a key component therefore of a future affordable, secure and sustainable national energy system.

The predominant issues include:

- The relatively low thermal performance of the current building stock (much of which will still be in use over the coming decades);
- Finding the economic balance in any one area between effective demand reduction and switching to a lower carbon energy supply (including distribution network reinforcement costs);
- The scale and highly variable nature of heat demand;
- The significant upfront capital costs inherent with any new solution coupled with policy/regulatory uncertainty and unclear return on investment; and
- The capacity and capability of the UK supply-chain to support the transition and consumers experience and general satisfaction with the high performance and low cost of the incumbent gas solution.

These issues are further exacerbated by lack of certainty about the nature of the rest of the energy system.

The ETI commissioned a major two-phase Smart Systems and Heat (SSH) programme in 2012. The SSH Programme will create future-proof and economic local heating solutions for the UK. It will connect together an understanding of consumer needs and behaviour, with the development and integration of new technologies and with new business models. The associated insight will deliver enhanced knowledge across industry and the public sector, resulting in industry and investor confidence to implement SSH influenced solutions from 2020 and thereby enable a UK heat transition, within an appropriate policy and support environment to deliver a cost-effective UK energy system transition.

The two distinct phases of the Programme are:

- **Phase 1:** Creation of the tools, technologies, delivery capability, consumer value propositions and business models needed to implement a future affordable, secure and sustainable energy system; and
- **Phase 2:** The second phase will validate the solution(s) developed in Phase 1 with a significant system level demonstration.

2.2. Context

Home energy management is a key component of any future smart energy system, enabling the delivery of added value and cost-effective consumer offerings, together with improved supply side asset utilisation. Insight gained from the deployment of Home Energy Management Systems (HEMS) will inform energy service providers of the requirements of consumers and the characteristics of their domestic environment. Furthermore advanced HEMS could provide the functionality necessary to control more complex low carbon energy solutions in the future.

The market for Home Energy Management is being shaped by the following factors:

- The introduction of Smart Meters will drive innovation in the supply and pricing of energy related services;

- The increased power and reducing cost of ICT Technologies is changing consumer expectations and enabling more powerful and responsive service delivery to them; and
- Energy prices in the UK have been low by global and historic standards. It is expected that energy supply will change due to global political and economic factors, not least increased electrification and district heating driven by the need to significantly reduce CO₂ emissions by 2050

The ETI has identified a gap between existing market developments in the area of HEMS and the functionality that is likely to be required. The ETI proposes to close this gap through the accelerated development and demonstration of a consumer focussed HEMS solution. This will be achieved through a single project: The ETI HEMS Development Project (the Project). The Project will comprise two Contracts: a Prototype HEMS Development Contract and a Prototype HEMS Field Trial Contract, to be delivered in the form of a Service Level Agreement.

2.3. ETI HEMS Development Project Outcome

At the conclusion of the ETI HEMS Development Project, the ETI will have:

- A significant dataset of consumer behaviours, energy use, building characterisation and HEMS interactions upon which to develop value propositions developed within the SSH Programme;
- Evaluation of the consumer value created by the prototype HEMS and evidence for further development; supported by a dataset from around 300 homes with a HEMS Prototype System installed;
- An emerging HEMS platform with a scalable architecture that could form the basis of the HEMS for Phase 2 of the SSH Programme (when developed further) and, eventually, a commercial product; and
- A potential pool of positively motivated participants in further work if requested by the ETI (subject to agreement).

These outcomes will be achieved through the execution of two contracts:

Contract 1 (the subject of a separate RfP): Prototype HEMS Development Contract

The development and test of an advanced, consumer centric, HEMS prototype focused on the customer experience of future smart energy systems. To do this, it should focus on supporting gas boilers operating in conjunction with hot water storage tanks, but with a flexible architecture to enable other heating system types to be controlled later. The HEMS Prototype System should:

- Enable the household to feel more in control of their heat use whilst fundamentally breaking the conceptual link that has traditionally existed between the demand for heat (heated spaces and hot water) and the supply of energy to meet that demand. By breaking this link the HEMS will enable energy to be supplied at the optimal time to reduce costs within the wider system whilst also ensuring the customer is in full control and able to satisfy their broader requirements;
- Enable the household and an energy supplier to ‘negotiate’ a service transaction that increases customer confidence and satisfaction; a dialogue to balance expectations for heated spaces and hot water on the one hand with the price for those services on the other. This capability could open new market opportunities, for example business models that include the provision of equipment, those that use hybrid gas / electric energy vectors, those that use home heat storage to balance the electricity grid; those that enable a consumer to directly compare and choose between energy supplier offerings against a known demand ‘requirement’; and those which offer to take some risks (such as the impacts of variation in the weather) away from the consumer to give guaranteed pricing; and
- Enable the household to identify and value investments in modifying their home or changing their heating system. This capability will facilitate the appropriate information environment required to enable consumers to find the best route for energy services that suits their individual

needs. This will require a “whole system” approach to heating systems and the related building fabric.

- The successful participant will be expected to manage the dataset acquired through Contract 2.

Contract 2 (the subject of this RfP): Prototype HEMS Field Trial Contract

The development of a field trial methodology in collaboration with the Prototype HEMS Development contractor and with the ETI that when executed will lead to the acquisition of a large dataset on the building characteristics and physics, occupancy, consumer behaviours, energy use and HEMS interactions from circa 300 homes. The delivery of Contract 2 will encompass:

- The recruitment then management of the Trialists and installation of the infrastructure needed to create the field trial dataset, this will include:
 - Physical sensor measurements logged by the HEMS, revealing: building and heating system dynamics, times and zones / rooms of occupancy, heating system usage, energy consumption, system efficiency, etc;
 - Consumer attitudes from logging interaction with the HEMS, revealing aspects such as: relative importance of heating time, target temperature, responsiveness to requests for more space heat or hot water, etc;
 - Physical surveys of circa 300 properties and their heating systems, to the extent required to validate HEMS estimates of building and heating system modifications.
- The acquisition of operational experience in the installation and support of the HEMS Prototype System; and
- The creation of a service level agreement to expedite provision of future trials in homes if and as required.

2.4. ETI HEMS Development Project Integration

The ETI is simultaneously releasing RfPs for both Contract 1 and Contract 2. The ETI is prepared to receive proposals from the same organisation for both contracts. The ETI will evaluate these against any proposals which only address one of the contracts. Respondents therefore need to address the specific requirements of each RfP clearly and separately.

The ETI HEMS Development Project is an ambitious piece of work which is expected to produce emerging insight during its delivery. Whilst it is expected that the two contracts will need to collaborate with one another, it is unrealistic for the ETI to delegate full accountability to the contractors for the successful delivery of the Project outcomes. It is intended to structure the Prototype HEMS Field Trial Contract as a **Service Level Agreement**, whereby packages of work are called off by the ETI as and when there is an appropriate level of confidence at a Project level to do so.

The ETI proposes to put in place a Project Steering Group chaired by the ETI and made up of the Project Managers from each contract, the Contract 1 Chief Engineer and Contract 2 Field Trial Manager, together with ETI staff. This would be the steering body to direct the overall Project and its integration, the ETI would be the principal decision maker for the overall Project. In support of this the ETI would propose to initiate specific actions associated with the management of the field trial based on the recommendation of the Project Steering Group. .

2.5. Outline Requirements for Contract 2

The ETI recognises it will be difficult for Respondents to provide firm timescales and costs for the delivery of the field trial to be executed under Contract 2, without detailed knowledge of the functionality to be included in the HEMS Prototype System and agreement of the testing requirements with the Participants of Contract 1.

This detail will be finalised in conjunction with the ETI and the Contract 1 Participants as the scope of the HEMS Prototype System is developed. For the purposes of this tender the ETI would like to provide

Respondents with the ability to submit proposals which can be assessed on a like for like basis, as such the ETI has developed an outline scope for the Field Trial which Respondents are requested to use as a basis for developing their proposals. The ETI will use this and the capabilities evidenced by the Respondents to inform its selection of Participant(s).

The outline scope of the Field Trial is described in the following sections:

- Appendix G – Prototype HEMS Field Trial Requirements;
- Appendix I – Suggested HEMS Field Trial Design;
- Appendix J – HEMS Field Trial Survey Criteria; and
- Appendix K – Equipment to Be Installed.

A table of costs to be completed for the activities described in the above appendices is included in Appendix C.

2.6. Potential Project Participants, Benefits and Expectations

The ETI anticipates that responses to the RfP may be received from a number of organisation types such as energy service providers, facilities management and M&E contractors. The RfP has been structured such that responses can be received from the full range of organisation types.

The ETI believes that participation in Contract 2 could provide Participants with a route to participation in the large scale demonstration of advanced HEMS in Phase 2 of the SSH Programme.

3. PROTOTYPE HEMS FIELD TRIAL

3.1. Prototype HEMS Field Trial Contract Aim

The aim of the Prototype HEMS Field Trial Contract is to develop a field trial methodology in collaboration with the Prototype HEMS Development contractor and with the ETI that when executed will lead to the acquisition of a large dataset on the building characteristics and physics, occupancy, consumer behaviours, energy use and HEMS interactions from circa 300 homes.

The detailed requirements of the Prototype HEMS Field Trial Contract are described in Appendix G.

The aims of Contract 2 will be achieved through the execution of a range of activities in collaboration with the ETI and with Contract 1. It is proposed that the activities to be undertaken by Contract 2 are planned and costed in advance and then at suitable decision points the activities are initiated by the ETI in-line with pre-agreed lead times and costs.

3.2. Prototype HEMS Field Trial Scope

Contract 2 is expected to consist of 3 Work Packages. Due to the nature of the field trial, elements of the 3 stages may overlap with one another.

Work Package 1 – Development of Field Trial Approach

Work Package 1 will define the approach and requirements for the Field Trial. It will be developed in collaboration with Contract 1 reflecting the data and insight needed from Trialists to support the development and evaluation of the HEMS Prototype. The following deliverables (described in Appendix G) and associated Key Performance Indicators are expected to be included:

- Health and Safety plan;
- Prototype HEMS Field Trial Methodology and Plan;
- Data Protection Protocol;
- Field Trial Recruitment Plan;
- Installer Training Plan;
- Survey Process and Plan;
- Material Defects Management Approach;
- Regulatory approval (as required);
- Procurement and Installation Plan;
- Trialist Support Approach and Plan;
- Execution of the field trial;
- Field Trial Exit Plan;
- Field Trial Lessons Learnt Plan;
- Ad Hoc Visits to Site Approach; and
- Additional Services.

Once the detailed requirements for the HEMS Prototype Field Trial are defined in Work Package 1 then an amendment to the Field Trial Services Contract which describes the terms, conditions and scope of the contract will be agreed.

Work Package 2 – Execution of Field Trial

Work Package 2 will deliver the field trial services in line with the requirements agreed in Work Package 1. These services are expected to include, but not be limited to:

- The training of installers;
- The recruitment of Trialists, and the replacement of any Trialists who elect to leave the Field Trial;
- The installation, test and commissioning of HEMS Prototype Systems;
- The training of Trialists in the use of the HEMS Prototype Systems and up-grades in functionality of the HEMS Prototype implemented during the Field Trial;
- The arrangement of interviews between Trialists and representatives of Contract 1; and
- The resolution of technical issues with the HEMS Prototype Systems once installed.

It should be highlighted that the roll-out of HEMS Prototype Systems is expected to be done on a scaled basis, called off by the ETI. First deployments involving Trialists are expected to be to a small cohort of circa 10 ‘friendly Trialists’ suitably briefed and accepting of the fact that they will be evaluating early software releases. Subsequent deployment of HEMS Prototype Systems would be in line with direction from the ETI.

Respondents should provide cost estimates, lead times and Key Performance Indicators (KPIs) for the execution of individual elements of the field trial in line with the requirements listed in Appendix C.

Work Package 3 – De-Commissioning and Closure of the Field Trial

At the instigation of the ETI, Work Package 3 will bring the Field Trial to a managed conclusion. As described in Appendix G, two options for the de-commissioning of the Field Trial are anticipated, in option 1 the HEMS Prototype Systems are left in situ and the Contract 1 Participant provides a warranty to the Trialist. In option 2 the HEMS Prototype System is removed and a pre-agreed commercially available HEMS solution is installed, with the manufacturer’s warranty passed on to the Trialist.

These same two options are applicable should a Trialist elect to leave the Field Trial at any point during its execution.

For the avoidance of doubt, once a Trialist has exited from the Field Trial then the Contract 2 Participant should cease to collect any data from the Trialist and / or their property.

4. PROTOTYPE HEMS FIELD TRIAL - CONTRACT DETAIL

4.1. Timescales

The ETI recognises the challenging timescales of this project and the importance of using the window of opportunity associated with the 2015/16 heating season effectively. Consideration should be given to the location of the Field Trial to ensure availability of sufficient heating days to provide meaningful field trial data.

A key challenge for Respondents to address in their proposal is how to organise to deliver rapid progress and ensure it can recruit the required number of domestic properties. The ETI strongly recommends that participants address this question directly, creatively and in some detail.

Given the challenging window of opportunity, the ETI will place significant weight in its selection process on the detail in the proposals of how to get to contract and mobilise activity rapidly with a fully effective team.

4.2. Contract Management Methodology

The ETI proposes to manage the HEMS Prototype Field Trial Contract as a Service Level Agreement with the Participant, where costs and lead-times to carry out packages of work (e.g. recruitment of Trialists) are agreed in advance and then initiated at the direction of the ETI when there is an appropriate level of confidence at a Project level to do so.

4.3. Risk Management and Benefit Sharing

In addition to managing the Health & Safety and technical risks associated with the Project, the ETI is keen to mitigate risks effecting the cost and duration of the Project. In the case of Contract 2, two key risks are; a high level of churn of Trialists and excessive numbers of visits to the homes of Trialists. The ETI is keen to explore suitable mechanisms to share the benefit of successfully managing these risks with the Participant.

The ETI requests Respondents to propose suitable KPIs and mechanisms associated with the retention of Trialists and the number of visits to Trialists properties, together with a benefit share mechanism should churn on Trialists be lower than an agreed KPI, or the number of visits to a Trialists home during the execution of the Field Trial be less than budgeted for. The benefit share mechanism should make clear:

- The role (if any) of the ETI in achieving the proposed KPIs;
- The role (if any) of Contract 1 in achieving the proposed KPIs;
- The baseline assumptions on costs associated with the recruitment and replacement of a trialist;
- The assumptions behind costs associated with visits; and
- How any benefit would be shared between Contract 1, Contract 2 and the ETI.

4.4. Organisation Structure

A number of participant organisations / entities may be required to work together in order to provide all the necessary knowledge, skills, experience and inputs to complete the Project. **In this instance the ETI has a strong preference for a Prime Contractor approach** and will only accept proposals on such a basis.

A **Prime Contractor** is a single organisation who shall form a contract with the ETI, and shall manage the Contract and act as primary interface with the ETI with other organisations (as appropriate) contracting as Subcontractors to the Prime Contractor.

The proposed Prime Contractor shall act as the Respondent for the purposes of this Request for Proposals. This organisation shall appoint a Project Manager to lead and coordinate all activities of the Participants, and to liaise regularly with the ETI's Project Manager to whom he/she is accountable on

behalf of the Participants. The Respondent must also appoint a Field Trial Manager. The ETI places great emphasis on two critical roles in the delivery of contracts – Project Manager and Field Trial Manager.

- **The Project Manager** is responsible for managing and progressing the project team and programme of work 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; and
- **The Field Trial Manager** 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 position has the responsibility to assure the technical quality of the Contract and its outcomes.

The ETI will assess the competence, experience and authority of these people and their ability to work together as critical to Contract success.

4.5. Governance

Throughout the duration of the Contract the ETI expects to hold review meetings with the Project Manager and Field Trial Manager which may be at the premises of the ETI, the Participant or the Contract 1 Participant as appropriate, typically monthly or at other points which may be agreed. These meetings may be held jointly with Contract 1. The ETI may involve advisors, external consultants, key industrial stakeholders, or representatives from the ETI Members as appropriate.

The timing and scope will be confirmed in discussions after the Proposal has been reviewed. Preliminary arrangements are as follows:

- a) **Contract Kick Off:** This will be held within one week of the Contract start date. The purpose of the meeting is for the Participants and the ETI to review the scope of the Contract, planned timescales, deliverables, and the way of working and interfacing with the ETI and Contract 1 to ensure a common understanding of how the overall Project will be delivered. It is anticipated that this review will be held at ETI offices in Birmingham and will take no longer than one day;
- b) **Contract Reviews:** These will be at key agreed points during Contract delivery. It is anticipated that these reviews will take no longer than one day each; and
- c) **Stage Gate Review:** This is a major Review Point involving Participants and ETI representatives at which the overall performance of the Contract will be critically reviewed and following which a formal decision will be made whether to continue with the Contract, based on whether agreed Stage Gate Criteria have been met. It is expected that Stage Gate Reviews will be combined across Contract 1 and Contract 2 to ensure that progress towards the overall ETI HEMS Development Project goals is being maintained.

4.6. Funding and Payment Structure

In developing their proposal, respondents need to consider:

- In principle the ETI only pays for work done, typically against agreed metrics. In the case of this Contract which will be run as a Service Level Agreement, the Respondent should propose costs, lead times and key performance indicators for activities described in Appendix G. As described earlier, it is expected that the detailed requirements for the packages of work will be finalised during the execution of Work Package 1 in conjunction with the Participants of Contract 1; and
- The ETI operates a formal contract variation process, subject to internal governance, with appropriate levels of delegated authority.

4.7. State Aid

Funding from the ETI for this Contract will constitute state aid. The ETI has a specific state aid clearance

from the European Commission. A copy is available on request. In relation to their Proposals, Respondents should note:

- a) Further information may be required to support the specific state aid requirements of any Proposal during the procurement process;
- b) Successful Respondents will be required to provide full transparency of costs throughout the Contract to ensure both the Contractor and the ETI comply with EU state aid law; and
- c) Successful Respondents will need to agree to certain contractual obligations related to the state aid requirements including the duration of the retention of records, and obligations to return ETI funding in certain exceptional circumstances.

Each Respondent must confirm that there are no potential, threatened, pending or outstanding recovery orders by the European Commission in respect of any funding received (either by the Respondent or any proposed Subcontractor).

4.8. Terms and Conditions for the Field Trial Services Contract

The Contract will be governed by a Field Trial Services Contract, a draft of which will be made available to Respondents on signature of a non-disclosure agreement (Appendix F). The final Field Trial Services Contract will incorporate appropriate information from the ETI's RfP, the Respondent's Proposal and information drawn up and agreed during the shaping and contract negotiation.

5. COMMERCIAL AND LEGAL REQUIREMENTS

The most important issues that the ETI would like to highlight for initial consideration are as follows:

5.1. Insurance

The Respondent should confirm that liability and indemnity insurance cover is held and should confirm levels of cover and expiry for each. See Appendix B for further detail.

5.2. Intellectual Property (IP)

Arising IP – Ownership

The ETI expects to own all Arising IP from this Contract.

Background IP

Where a Participant has tangible Background IP that is required to carry out the Contract or for the subsequent exploitation of any Contract 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 Contract, but may, if appropriate, be subject to a fair and reasonable royalty where the Background IP is required for exploitation of Contract outputs. If Participants (or their proposed Subcontractors) fail to meet this expectation, the Proposal is unlikely to be acceptable to the ETI. The Respondents are to outline their IP proposals to the ETI as part of their submissions.

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 Appendix A of this RfP) and during the Shaping and Contract Negotiation Stage.

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

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 Participant and / or Subcontractors or otherwise) to carry out the Contract or which may be used during the Contract; or
- Which may be needed by the ETI to exploit the Arising IP.

Academic Organisations

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

5.3. Statement of Compliance

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

In relation to the Field Trial Services Contract, the statement should set out as a minimum:

- a) Acceptance by each Respondent of the terms and conditions of the Field Trial Services

Contract; and

- b) Any exceptions to the terms and conditions of the Field Trial Services Contract issued by the ETI.

The exceptions set out will both be considered as part of the selection process to determine whether there is material compliance of the terms and conditions. Respondents should note that compliance with ETI terms and conditions is one of the selection criteria for this Request for Proposal. The ETI will not consider any further exceptions post selection which has not been identified in the statement.

5.4. Non-Disclosure Agreement

Respondents are required to enter into a Non-Disclosure Agreement with the ETI before attending the bidders workshop. NDAs should be returned by the deadline outlined in Section 7.3.

A draft Field Trial Services Contract shall be made available upon the successful execution and submission of an NDA. Signed NDAs should be returned to the ETI following the instructions provided in Appendix F.

For further information on the release of the draft Field Trial Services Contract and other information, please refer to the Terms and Conditions in Appendix D.

5.5. General Due Diligence

All Respondents (except ETI Members, Programme Associates, universities / higher education institutions and UK/EU government laboratories / agencies) which provide more than 20% of the resources for the Contract or which provide an input which is critical to the Contract's success, shall provide due diligence Information to the ETI according to the table in Appendix A.

Please note that successful completion of all elements of the due diligence is a pre-requisite to any contract award: Failure to meet due diligence requirements at any stage may result in the exclusion of that Respondent or the Proposal from the ETI's selection process.

5.6. Warranties

The Field Trial Services 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 Contract which relates to IP and the IP warranties. The wording of any warranties may be amended to reflect due diligence performed.

5.7. Indemnities

The ETI will contribute funding to this Contract but has no control over any risks and associated liabilities that may arise from the Contract. Therefore the Field Trial Services Contract contains a number of indemnities for the ETI including for third party claims and for IP infringement. Respondents should review and comment on the indemnity position in the Submission.

6. DISCLAIMERS

- 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 Request for Proposals 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 Request for Proposals is not an agreement 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. No part of a Proposal, or documents provided by Respondents, shall be returned;
- e) The ETI reserves the right to (i) change the basis of, or the procedures for, the Request for Proposals process, including the timetable or closing date, (ii) make modifications to, or alter any of the information within, the Request for Proposals at any time until the execution of the Field Trial Services Contract, (iii) reject any or all of the Proposal received, and (iv) not invite any Respondent to proceed further. In cases (i) and (ii) the ETI shall provide a minimum of five working days written notice;
- 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 Request for Proposals or of any other information made available during the Request for Proposals 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 Request for Proposals independently, having taken professional advice if necessary. The 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 Request for Proposals. The 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 Request for Proposals. 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 Request for Proposals process, including but not limited to any costs or expenses incurred up to the execution of the Field Trial Services Contract;
- i) The ETI may, at its discretion, shortlist Respondents for the next phase. 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 shall not constitute any actual or implied agreement between the ETI and the Respondent;
- j) 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 Disclaimer Notice, either expressly or impliedly, may result in a Respondent being disqualified;
- k) The copyright in the documentation and any other materials supplied by the ETI and/or its advisers in this Request for Proposals 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 Request for Proposals process. All documentation supplied by the ETI in relation to this Request for Proposals process must be returned on demand, without any copies being retained by the Respondent; and

- l) This Request for Proposals, 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).

7. PROCUREMENT AND SELECTION

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

- Step 1 – RfP Issue and Selection of preferred Respondents; and
- Step 2 – Contract Shaping and Contract Negotiation

7.1. Step 1: RfP Issue and Respondent Selection

7.1.1. Briefing workshop

Following the release of this RfP, potential Respondents may apply to attend a briefing workshop, to be held jointly across the Prototype HEMS Development Contract and the Prototype HEMS Field Trial Contract. The objective of this workshop is to further describe the requirements for both contracts and to provide an opportunity for Respondents to ask clarifying questions prior to making a Submission in response to this RfP. The ETI anticipates that valuable networking opportunities will also be available throughout the day.

The briefing workshop will be held in on 2nd September 2014 at a venue to be confirmed.

Interested Participants are to notify the ETI with their request to attend the briefing workshop no later than 24th August 2014. Upon notification, a briefing workshop package, including agenda, will be distributed.

7.1.2. 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 E, and (ii) a non-disclosure agreement in the form provided at Appendix F, signed by all Respondents involved in the Proposal and returned to the ETI in accordance with the instructions at Appendix E. The NDA is required for attendance at the bidders workshop, both documents must be received by the ETI no later than the closing date specified on the front page and at Section 7.3 of the RfP.

7.1.3. Questions and Clarifications

The ETI will endeavour to answer any questions or provide clarifications for potential Respondents before the Proposal deadline.

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.

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 at Section 7.3 of the RfP. Submissions shall comprise of a Proposal, the form and contents of which are set out at Appendix C, and supporting documentation set out in Section 7.4.

7.1.4. Selection Process

The ETI expects that the capabilities and experience of the Participant will be key to the successful delivery of the Contract. It is expected that the Participant will be familiar with the holistic energy system challenge that the SSH programme is seeking to address. Specific areas of expertise and experience have been identified and listed below, these are felt to be critical to the successful execution of the Contract; 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.

A Selection Panel will be held at the ETI's Birmingham office on w/c 13th October 2014, to which respondents may be invited for interview.

The ETI's experience evaluating Proposals has shown that specific and objective evidence of capabilities and experience is more convincing than general statements about previous contracts 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 Field Trial Services Contract;
- Willingness of Respondent(s) to support the contracting process as laid out in Section 7.2 and the contracting timeline as laid out in Section 7.3;
- Completeness of information content, structure and quality of the Proposal (against the areas listed in Appendix C);
- Record and ability in quality, timely and on-budget delivery (of related domestic field trial projects or similar) to the full satisfaction of the main stakeholders;
- The suitability and capability of the Field Trial Manager and Project Manager assigned to the Contract 2 (as per Appendix C Section 3.2);
- Access to any third party information or technologies required to execute the Contract 2 and any risks or limitations placed on ETI exploitation of outputs as a consequence; and
- Contract 2 approach, costs, lead times and KPIs for the activities proposed in Appendix G, and proposed management of specific risks and issues.

b) Technical and Delivery Criteria:

- Access to the skills and knowledge to conduct the work proposed, including
 - Experience and capability in recruiting trialists for technology evaluation and consumer research activities;
 - Approach, track record and personal employed in managing Health and Safety;
 - Product evaluation and trial services;
 - Access to suitably skilled and certified resources to execute work in Trialists properties, especially heating systems, control and sensor selection and installation, and consumer engagement and research. Evidence of experience in managing and interacting with consumers should be provided; and
 - Data security and protection.

c) Commercial Criteria:

- Cost, time and value for money for all stages of the Contract;
- The commercial approach and plan associated with consumer recruitment (i.e. least cost recruitment sold on value proposition rather than incentives);

- Day rates and hourly rates of key staff and operatives;
- Approach to managing the Field Trial;
- Levels of assumptions and risk taken within pricing schedule;
- Identification of risks and potential liabilities and the availability of suitable insurances and warranties; and
- Support and collaboration with any exploitation potential.

7.2. Step 2: Shaping and Contract Negotiations

Following selection, the ETI will invite the preferred Respondent(s) to enter into negotiations with the ETI to shape the Contract scope and finalise the terms of the Field Trial Services Contract. An overall period of up to 10 weeks has been allowed for this Shaping and Contract Negotiation Stage. See Section 7.3 for further details relating to anticipated dates.

The ETI reserves the right to subsequently take up negotiations with other Respondents under the Shaping and Contract Negotiation Stage should negotiations with the initial preferred bidder(s) not produce an outcome acceptable to the ETI. The 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) Detailing and agreement of Stage Gate(s);
- c) Negotiation and agreement of the Field Trial Services Contract;
- d) Detailing and due diligence relating to the breakdown of costs of the Contract;
- e) Further intellectual property due diligence activities as required (see Appendix A);
- f) Agreement (and approval as required by the ETI) to terms of other key contractual arrangements (e.g. Subcontracts);
- g) Gaining all necessary Respondent and ETI approvals to undertake the Contract; and
- h) Any further information or assessment that may be necessary to meet state aid requirements.

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

Further meetings will be required to complete the Shaping and Contract Negotiation Stage and the Respondents are required to commit to provide legal, technical, commercial and managerial resources as required to achieve the target contract execution date shown. The ETI reserves the right to cancel the commissioning of the Contract should this not occur.

7.3. Estimated Procurement and Contract Timeframes

The following tables outline the anticipated schedule for the Contract Commissioning Process. They also include anticipated dates when resources will be required to attend shaping and contract negotiation meetings with the ETI.

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

Request for Proposal and Selection	Anticipated Dates
Issue of Request for Proposal	13 th August 2014
Deadline for notifying the ETI of a request to attend a briefing (via return of signed Non-Disclosure Agreement)workshop	24 th August 2014
Project briefing workshop	2 nd September 2014
Deadline for notifying the ETI of an intent to submit a proposal	12 th September 2014
Closing date for submission of proposal	1 st October 2014
Selection Panel	w/c 13 th October 2014
Preferred Respondents Notified	24 th October 2014

Shaping and Contract Negotiations	Anticipated Dates
Total duration for Project shaping and contract negotiations	Up to 10 weeks
Shaping and contract negotiation meeting 1	30 th October 2014
Shaping and contract negotiation meeting 2	14 th November 2014
Shaping and contract negotiation meeting 3	1 st December 2014

Contract Start	Anticipated Dates
Contract signature target date (Note: this is dependent on the ETI selection process and an agreement on contractual terms and conditions being in place)	By 19 th December 2014
Completion	April – July 2016

7.4. Submission Content and Format

The Submission shall comprise five components:

- a) Detailed Proposal, arranged according to the structure set out in Appendix C. The content must demonstrate how the bidding organisation will meet the requirements set out in this Request for Proposal. 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), margins, and shall not exceed a maximum of 45 pages (excluding appendices);
- b) Supporting information as specifically set out in Appendix C;
- c) Risk register, as described in Appendix C, part 3.4;
- d) Due-diligence information (as set out in Section 5.5);
- e) Costs, lead times and KPIs for activities identified in this RfP (reflecting the information as known at this stage); and

- f) Statement of compliance and, if appropriate, supporting information, confirming compliance with or identifying exceptions to the specification or contractual requirements (as set out in Section 5.3). This must be signed by the 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 one (1) electronic copy which shall be provided in both PDF and Microsoft Word formats.

The ETI at its discretion may request further clarification of a Proposal, and may reject any Proposal which is unclear.

8. POST-SELECTION PROCUREMENT PROCESS

8.1. Shaping and Contract Negotiation

Following selection, the ETI will invite Respondents to enter into a phase of shaping, which includes due diligence and contract negotiations. An overall period of 10 weeks has been allowed for this phase.

The shaping and contract negotiation phase 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 programme of work, including definition of activities and KPIs;
- b) Detailing and agreement of payment points;
- c) Other due diligence activities if required;
- d) Agreement of any identified contractual issues (note that compliance with the ETI's contractual conditions is a key selection criterion and the ETI does not anticipate that any significant exceptions to its contractual conditions will be agreed);
- e) Agreement (and approval by the ETI) to terms of other key contractual arrangements (e.g. Subcontracts);
- f) Gaining all necessary Respondent and ETI approvals to undertake the Contract; and
- g) Any further information or assessment that may be necessary to meet state aid requirements.

8.2. Contract Detailing & Negotiation Requirements

These are only required if a Proposal is selected to proceed to the shaping and contract negotiations phase, and will include:

- a) The ETI may ask for evidence of the organisation's health, safety and environmental management systems and specific technical competence to manage the risks in this Contract;
- b) Further intellectual property due diligence: This will primarily comprise detailed Background IP questionnaire;
- c) Copies of insurance policies; and
- d) Any other information that the ETI reasonably requires in order to fund the proposed Contract including any information necessary to meet state aid requirements.

APPENDIX B - INSURANCE REQUIREMENTS

The Respondent should confirm that insurance cover for the following risks is held, and should confirm levels of cover and expiry for each. The ETI will require evidence of these during the shaping phase:

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

The Respondent should identify if it self-insures for any of these risks.

The Respondent should identify if it is intending to take out any Contract-specific insurance for the Contract and the scope and intended beneficiaries of such insurance.

In relation to the Professional Indemnity Insurance, Respondents should note that the ETI requires that the Participant is required to have in place at the start of a Contract a professional indemnity insurance policy (with at least a 6 month unexpired term):

- The policy should have a limit of indemnity of not less than £1,000,000 each and every loss;
- The 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);
- The Participant will need to agree to maintain a professional indemnity insurance policy in force for 6 years from the date of completion of the Contract; and
- 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.

APPENDIX C - CONTENT AND FORMAT OF PROPOSALS

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 45 pages. Appendices are in addition to this but these may not be reviewed by the selection panel.

1. EXECUTIVE SUMMARY [approximately 1 page]

A summary of the Proposal, describing briefly:

- The organisation(s) undertaking the work and the contract organisation structure;
- Summary of the predicted cost of outcomes, approaches taken and key activities; and
- Confirmation of compliance with the Request for Proposals and brief summary of key exceptions/deviations.

2. BACKGROUND TO PROPOSED PARTICIPANTS [approximately 3 pages, plus appendices if required to include:]

2.1. Participants

This section should identify all participants to include all subcontractors, partners and suppliers of services as applicable.

2.2. Key Individuals and Roles

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 nominated Project Manager and Field Trial Manager.

The proportion of each individual's time dedicated to the Contract should be identified and their skills and expertise summarised; (CVs should be included in an appendix).

2.3. Organisation

An organisation diagram showing the organisations and their roles (complete with key individuals) should be included.

3. CONTRACT DESCRIPTION [maximum 32 pages, plus appendices if required to include]

3.1. Programme of Work

The programme of work to be undertaken in the Contract should be described in line with the requirements described in Appendix G. The description should include an activity by activity breakdown with detail of the proposed work aligned to the requirements provided within this document, identifying for each activity:

- The activity leader and others involved;
- The activity objectives;
- Dependencies, including external dependences on Contract 1 and the ETI;
- The technical approach to delivering each activity (e.g. qualitative and quantitative approach or design methodologies;
- Description of Deliverables produced;
- Lead time to initiate the activity;
- Key Performance Indicators to assess the success or otherwise of the activity;

- Any issues or assumptions; and
- Any alternative approaches.

The inter-dependencies between activities should also be identified.

3.2. Contract Schedules

A top level schedule should be submitted, along with a Gantt which includes the timeline of work packages and review points based on the information included in Appendices G, I J and K.

3.3. Activities, Deliverables and Payments

The Respondent should provide a summary of the costs and lead times for the activities described in Appendix G.

This section should also propose Key Performance Indicators to demonstrate that the activities have been completed to the required standard.

3.4. Risk Management

The Respondent should describe the proposed risk management strategy (i.e. how risks to the successful delivery of the Contract will be identified and managed throughout the Contract). The Respondent should also separately provide a summary of key risks should be included in this section, with a risk register as described above provided as an appendix. This risk register should highlight risks not only for Contract 1 but also risks associated with Contract 2 and the broader Project, highlighting owners as appropriate (e.g. Contract 1, Contract 2 or the ETI).

4. INTELLECTUAL PROPERTY [minimum 1 page] (Respondents should also refer to Section 5.2.)

Arising IP

The Respondent should provide a brief overview of the nature of any anticipated Arising IP from each stage of the Contract.

In this Contract, the Arising IP will belong to the ETI. Any licensing of Arising IP from the ETI to the Participant may be discussed if appropriate. If Respondents wish to discuss any licence to use the Arising IP, Respondents should note that under state aid rules profit cannot be paid for the Project in addition to the grant of a licence of Arising IP.

Background IP

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

- Which is needed (whether by the ETI, or to be licensed from the Participant or a Subcontractor, or to be licensed by a Subcontractor to the Participant or to another Subcontractor, or otherwise) to carry out the Contract or which may be used during the Contract; or
- That 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; and
- Ownership and control, whether this is by the Participant, Subcontractors or by any third parties.

Third Party IP

The Respondent should describe any Third Party IP:

- Which is or may be needed (whether by the ETI, or to be licensed between the Participant and / or Subcontractors or otherwise) to carry out the Contract or which may be used during the Contract; or
- Which may be needed by the ETI to exploit the Arising IP.

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

Costs

As described elsewhere in this RfP, the ETI proposes to manage the HEMS Prototype Field Trial Contract as a Service Level Agreement, where packages of work are called off by the ETI when the appropriate level of confidence is available at the level of the Project. To support this approach the following information should be provided by the Respondent as part of their response to the RfP. The Activities and Activity References align to those in table 1 in Appendix G. When providing the information, all assumptions should be clearly stated, together with dependencies between activities as well as dependences on Contract 1 and the ETI.

Activity Ref	Activity	Cost (£)	Duration (wks)	Lead Time (wks)	Proposed KPI Metrics	Notes
A1	Project Management of the Field Trial					Respondent to propose milestones associated with the management of the Field Trial
A2	Health and Safety Plan					
A3	HEMS Pre-Deployment Test Plan					
A4	Prototype HEMS Field Trial Methodology and Plan					KPIs associated with pro-active and reactive maintenance required
A5	HEMS Proposition Development					
A6	Data Protection Protocol					
A7	Field Trial Recruitment Plan	Costs, duration and lead time to recruit Trialists in the following quantities to be provided: 1, 10, 30, 50, 100, 300				Assumptions relating to house archetype to be stated
A8	Training Plan for the Installation, Testing and Commissioning of the HEMS Prototype					Assumptions relating to the number of installers required to be trained to be stated, together with assumptions about existing skill levels
A9	Survey Process and Plan	Costs, lead time & duration to survey properties in the following quantities to be provided: 1, 10, 30				
A10	Material Defects					Approach and

	Management Approach					associated budget for the management of material defects identified during HEMS installation and commissioning
A11	Procurement and Installation Plan	Costs, lead time & duration to install, test and commission HEMS Control Unit and associated sensors in batch sizes of 1, 10, 30, 100, 300, 500 Cost and lead time to procure HEMS specific sensors in batch sizes of 1, 10, 30, 100, 500 Cost and lead time to procure ancillary sensors in batch sizes of 1, 10, 30, 100, 500				
A12	Trialist Support Approach and Plan	Costs, lead time & duration to develop the Trialist Advice Pack Costs per month associated with the provision of support to Trialists during the execution of the Field Trial, based on trial sizes of 10, 30, 100, 300, 500				SLAs for consumer support to be proposed. Costs, approach, KPIs and SLAs for the replacement of faulty HEMS systems to be proposed.
A13	Field Trial Exit Plan	Costs, lead time & duration to de-commission properties for both Option 1 and Option 2 to be provided, for the following quantities: 1, 10, 30, 100, 300, 500				
A14	Field Trial Lessons Learnt					
A15	Ad Hoc Visits to Trialists					
A16	Additional Services					

Where:

- Cost: refers to the cost to deliver the services;
- Duration: refers to the elapsed time to deliver the services;
- Lead time: refers to the period of notification required by the Participant to mobilise the services once instructed to do so by the ETI; and
- KPI Metrics: refers to the measure of performance proposed by the Participant to assess the success / quality of the services provided.

It is acknowledged that cost, lead time, duration and KPI metrics may not be applicable to all of the

services described above.

To supplement the above information and to assist the ETI in the selection of a Participant for Contract 2, the Respondent is request to complete the following table to quantify the costs for each of types of tradespeople expected to be utilised in the delivery of Contract 1.

Trade & Level of Competence	Call Out Charge (£)	Hourly Rate (£)	Day rate (£)

In addition the Respondent is requested to provide costs to procure and install the sensors and equipment described in Appendix K.

6. **INSURANCE** [approximately ½ page]

The Respondent should confirm that insurance cover is held and should confirm levels of cover and expiry for each. The ETI will require evidence of these during the Contract detailing phase. Refer to Appendix B for full requirement.

7. **PLAN FOR SHAPING AND CONTRACT FINALISATION** [approximately ½ page]

Respondents must clearly confirm in the submission that their key technical, commercial and legal resources will be available to meet the Contract signature target date.

8. **HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT** [approximately 5 pages]

The ETI's approach to the management of HSE in contracts 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 contract.

Respondents will be expected to be able to demonstrate that their approach for managing health and safety is intended to deliver excellence, not merely legal compliance.

- As a minimum, the ETI expects for this contract that any respondent proposing to act as a prime contractor and any respondent (or subcontractor) proposing to act as a principal contractor will have:
 - A comprehensive and fully documented Health and Safety management system. The system should be certified to OSHAS 18001 or, be consistent with OSHAS 18001 (with no omissions of any significant elements) or, be consistent with HSE's HS(G) 65 (with no omissions of any significant elements). Documentation outlining the Health and Safety management system, or the complete documentation of the Health and Safety management system, should be submitted with the proposal; and
 - Arrangements in place that implement the essential principles of leadership in health and safety, as detailed by HSE.
 - Arrangements in place that implement the "worker engagement initiative", as detailed by HSE.

Respondents should ensure their Proposal makes the nature of Contract 2 clear, demonstrates and evidences their competence to undertake Contract 2, and describes how they intend to organise themselves and their approach to manage and coordinate health, safety and environmental issues in the Contract 2. Specifically respond to the following:

- a) Respondents should identify any specific HSE issues related to specific facilities or sites to be used in the Contract 2. To the extent that parts of the Contract 2 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.
- b) Details of the Respondent's proposals to appoint a Construction Design and Management Regulations (CDM) Coordinator and/or a Principal Contractor should be included in the Proposal.

HSE has published proposals for significantly changing the requirements of the CDM Regulations; these changes are due to come into effect in April 2015. Respondents who are invited to the contract selection panel will be expected to discuss how the current proposals might affect the management of health and safety.

- c) The ETI expects that the Lead Coordinator or Sole/Prime Contractor (as appropriate) will elect to act as Client and Designer and details should be included in the Proposal to confirm which Participant will elect to be the Client and Designer.
- d) Respondents should demonstrate their experience of identifying and managing HSE issues in Projects of equivalent complexity and scale, including:

- i. coordination of HSE across multiple participants and contractors, if applicable; and
- ii. incorporating safety into design, if applicable.
- iii. details of relevant previous experience of managing health and safety in similar projects (e.g. a simple record of recent projects/contracts, with the phone numbers/addresses of contacts who can verify details of how the health and safety aspects of the work were managed).

Where there are significant shortfalls in Respondents previous experience, or there are risks associated with the Contract 2 which Respondents have not managed before, Respondents should explain how these shortcomings will be overcome.

- iv. details of relevant accreditation (for example numbers of Respondents staff accredited to the CSCS card scheme).
- e) Participant(s) will be required to provide evidence throughout the Contract 2 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.
- f) Respondents should provide details on their previous health and safety performance including:
 - i. a brief summary of any health and safety accidents or incidents including fatalities, major and minor lost time injuries which were reportable to relevant regulatory authorities over the last three years and details of near misses over last 12 months.
 - ii. Brief details if the Respondent has been the subject of any regulatory enforcement action (which includes prohibition and improvement notices) over the last 5 years in relation to health and safety or environmental matters?
 - iii. Accident Frequency Rate (AFR) for the Respondents group.
- g) Respondents should set out their approach to managing Sub-contractors. This should include key roles and responsibilities of different Participant(s) in the Contract 2.

- i. Sub-Contracting Procedures:

Respondents should provide details of each contractor, subcontractor or consultant and their scope (including outline details of any work where the subcontractor/consultant is not yet identified) together with a summary of your procedures for screening and evaluating those organisations' health and safety management competencies and arrangements. Respondents should provide any relevant supporting information e.g. a copy of a contractor management procedure, and examples of subcontractor assessments carried out.

Respondents should detail how they will monitor contractors, subcontractors or consultants health and safety performance, where relevant.

ii. Specific Risk Control Measures:

It is anticipated that work on Contract 2 will involve entering domestic premises or otherwise engaging with members of the public. Respondents should provide details of their arrangements for managing specific risks arising from this.

Where respondents propose to carry out electrical work which will be subject to the requirements of Building Regulations, they should briefly set out how that comply with the requirements of Approved Document P-Electrical Safety-Dwellings (2013 edition).

Where respondents propose to carry out any work on gas installations or appliances, they should briefly set out how they comply with the requirements of Gas Safety (Installation and Use) Regulations 1998.

Respondents should also set out how they will comply with the Building Regulations.

Respondents should note that:

- Specific HSE requirements will be included in the Field Trial Services Contract including reporting against HSE performance on a periodic basis.
- The ETI will carry out a full HSE competency assessment against the selected Respondents (the Prime Contractor) prior to (and HSE competency being pre-condition of) execution of the Field Trial Services Contract.

The ETI may wish to explore the management of environmental issues with the Respondent prior to contract award.

APPENDIX D - TERMS AND CONDITIONS OF THE CONTRACT

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

In addition to this general requirement, there are aspects of the Field Trial Services 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.

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

1. 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 Contract in Section 5.2 of the RfP.

2. IP WARRANTIES AND DUE DILIGENCE

The Field Trial Services 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 Contract which relates to IP and the IP warranties. The wording of any warranties may be amended to reflect IP due diligence performed.

3. INDEMNITIES

The ETI will invest funds in this Contract but has no control over any risks and associated liabilities that may arise from the Contract. Therefore the Field Trial Services 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.

4. STATE AID REQUIREMENTS

The Field Trial Services Contract has requirements that relate to State aid (through the provision of public monies to the ETI and therefore to the Contract). 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 - 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 7.1 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 "Prototype Home Energy Management System (HEMS) Field Trial" issued on 13th August 2014.

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 Contract.

- 1. [Enter Name]
- 2. [Enter Name]
- 3. [Enter Name]
- 4. [Enter Name]
- 5. [Enter Name]
- 6. [Enter Name]
- 7. [Enter Name]

Signed: _____
For and on behalf of the Respondent(s)

Name: _____

Date: _____

APPENDIX F - NON-DISCLOSURE AGREEMENT

The Non-Disclosure Agreement protects the confidential information of the Respondents and the ETI during the bidding process through to the conclusion of contract negotiations. For the successful Respondents, the confidentiality provisions in the Field Trial Services Contract will supersede this NDA.

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

Instructions for completing the Non-Disclosure Agreement

1. The Respondent should arrange to complete a single electronic NDA with its company details in Schedule 1;
2. The Respondent should print and sign TWO copies of the NDA. The NDA **must not be dated**;
3. Both copies of the signed NDA are to be sent to the ETI by post and scanned by email to the address on the front of the RFP;
4. On receipt of the NDA fully signed by the Respondent, the ETI will execute and date both copies of the NDA. The ETI will then send a copy of the now fully executed NDA to the Respondent.; and
5. The Respondent should then arrange for non-disclosure agreements to be entered between it and any proposed Subcontractors in order to comply with the NDA.

A separate version of this NDA is available on the ETI website.



TWO WAY CONFIDENTIALITY AGREEMENT

THIS AGREEMENT is made on _____ of _____ 2014

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 parties named in Schedule 1 of this Agreement** (the "**Respondents**"),
(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;

"Contract" means the proposed contract under the ETI's Smart Systems and Heat Programme entitled "Prototype HEMS Field Trial Testing";

"Contract Commissioning Process" means the ETI's commissioning process for the Contract as defined in the RfP and as set out at Section 7 of the RfP or as later may be notified or published by the ETI;

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

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

“RFP” means the request for proposals relating to the Contract, issued by the ETI on 13th August 2014.

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, Subcontractors, proposed Subcontractors, 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, subcontractors, proposed subcontractors 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, Subcontractors 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

Signed 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 Respondent. 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 G – PROTOTYPE HEMS FIELD TRIAL REQUIREMENTS

As described in section 2.5 of this RfP, the ETI recognises that it will be difficult for Respondents to provide a firm scope of work and supporting costs and timescales for the Field Trial. This detail will be finalised in conjunction with the ETI and the Contract 1 Participants as the scope of the HEMS Prototype System is developed. For the purposes of this tender the ETI would like to provide Respondents with the ability to submit proposals which can be assessed on a like for like basis, as such an outline scope of work (described in this appendix) has been developed.

1. SCOPE AND OBJECTIVES OF THE PROTOTYPE HEMS FIELD TRIAL CONTRACT

The objective of the Prototype HEMS Field Trial Contract is to evaluate the functionality embodied in the HEMS Prototype System developed in Contract 1.

This objective will be achieved through the execution of a range of activities in collaboration with the ETI and with Contract 1, including:

- Design of a field trial methodology;
- Management of a cohort of circa 300 trialists through the whole life of the project from initial recruitment to de-commissioning of the Field Trial; and
- Installation, test, commissioning and on-going maintenance of the HEMS Prototype Systems developed in Contract 1.

2. CURRENT ETI ASSUMPTIONS ON THE STRUCTURE AND APPROACH TO THE HEMS DEVELOPMENT AND FIELD TRIAL

The following assumptions should be used by the Respondent in the development of their response to this RfP:

- Contract 1 will develop a HEMS Proposition with support from the Contract 2 Participant. The HEMS Proposition will describe the market offering of the HEMS Prototype System, i.e. the capability and services offered by the HEMS. It is expected that this proposition will be used as the basis for recruiting Trialists;
- The development of the Field Trial Methodology to evaluate the HEMS Prototype System will be led by Contract 2 and supported by the Contract 1 Participant;
- The current thinking of the ETI in relation to the early testing and evaluation of the HEMS Prototype System is intended to be a staged process designed to manage risk, it is described below. This approach is not frozen and is dependent on the capabilities and approach of the Contract 1 Participant.
 - The HEMS Prototype will be tested in a laboratory or similar controlled environment by the Contract 1 Participant prior to being released to the Contract 2 Participant for deployment in a property;
 - It is expected that the HEMS Prototype will be installed, commissioned and set to work in an unoccupied building, where it will control a real heating system, before deployment in occupied properties. The unoccupied home would be provided by Contract 2. The intention of this activity is to evaluate the performance and safety of the basic platform;
 - Once satisfied with the performance and safety of the basic platform, the HEMS Prototype will be deployed in ~ two, occupied trial dwellings; and
 - Once appropriate system stability, functionality and bug rate are demonstrated, then the HEMS Prototype will be deployed to a small cohort of circa 10 “friendly” Trialists for further evaluation prior to any larger scale deployment;
- The Contract 2 Participant will be directed by the ETI as to when and in what quantities to deploy HEMS Prototype Systems to Trialists;

- Software up-upgrades to the deployed HEMS Prototype Systems will be managed and carried out by the Contract 1 Participant. Training in the use of new functionality released to Trialists would be carried out by the Contract 2 Participant;
- Interviews with Trialists for the purposes of consumer research will be arranged by the Contract 2 Participant, but carried out by the Contract 1 Participant;
- The Contract 1 Participant will provide a 24/7 helpline for Trialists to call in the event of problems with the HEMS Prototype system installed in their home. The Contract 1 Participant will act as a triage for reported issues and recommend actions to address them. For reported issues which collectively require less than 1 day of on-site activity to resolve then the Contract 1 Participant will have the delegated authority from the ETI to direct the Contract 2 Participant to resolve them, for any issues which collectively require greater than 1 day of on-site activity then only the ETI may direct the Contract 2 Participant to address such issues. In the case of site visits representatives from the Contract 1 may accompany Contract 2 as required; and
- At the conclusion of the Field Trial, or when a Trialist elects to leave the Field Trial, there are two anticipated exit routes:

Option 1 – Leave HEMS Prototype Systems in Situ

Should the Contract 1 Participant agree to provide a warranty for the HEMS Prototype System equivalent to that of a commercially available HEMS, then the Trialist may be given the option to retain the HEMS Prototype System installed in their property. The Contract 2 Participant would be expected agree and document the handover of the system and formal exit of the Trialist from the Field Trial, such that there would be no on-going liability to the ETI or to Contract 2. As part of this process the Trialist's property would be 'made good' and returned to its original condition.

If the Contract 1 Participant is not able to provide a suitable warranty then Option 2 would be followed.

Option 2 – Remove HEMS Prototype Systems

Should the Contract 1 Participant not be able to provide a warranty for the HEMS Prototype System equivalent to that of a commercially available system, or if the Trialist does not want to retain the HEMS Prototype System in their property, then the Contract 2 Participant would be obliged to supply a pre-agreed, commercially available HEMS system for installation in the Trialists property. The warranty associated with the commercially available system would be passed on to the Trialist. The Contract 2 Participant would be expected to agree and document the handover of the system and formal exit of the Trialist from the Field Trial, such that there would be no on-going liability to the ETI. As part of this process the Trialist's property would be 'made good' and returned to its original condition. The provision of a commercially available HEMS product is felt to be a more effective solution than to re-install the HEMS system originally in the Trialist's property prior to the start of the Field Trial.

- For the avoidance of doubt, once a Trialist has exited from the Field Trial then no further data should be collected either from Trialist or their property.

3. TECHNICAL REQUIREMENTS FOR THE PROTOTYPE HEMS FIELD TRIAL

It is planned that specific elements of the Field Trial will be 'called off' in different scales at the instigation of the ETI. The ETI has sought to describe the expected activities required to develop, deliver and exit the Field Trial in table 1.

Activity Ref	Activity
A1	<p>Project Management of the Field Trial</p> <p>Develop and maintenance of the overall Field Trial project plan, risk register and budget, including as a minimum:</p> <ul style="list-style-type: none"> • Health and Safety plan;

	<ul style="list-style-type: none"> • Prototype HEMS Field Trial Methodology and Plan; • Data Protection Protocol; • Field Trial Recruitment Plan; • Installer Training Plan; • Survey Process and Plan; • Regulatory approval (as required); • Procurement and Installation Plan; • Trialist Support Approach and Plan; • Execution of the field trial; and • Field Trial Exit Plan.
A2	<p>Health and Safety Plan</p> <p>Development of a HSE plan in accordance with the requirements set out in Appendix C, section 8. The successful bidder will also be required to attend a hazard study workshop within 30 days of contract start.</p>
A3	<p>HEMS Pre-Deployment Test Plan</p> <p>Working collaboratively with the Contract 1 team, input into the development of the HEMS prototype design and test plan that will demonstrate the safety, functionality, usability and stability of the HEMS prototype prior to deployment in domestic properties.</p> <p>The successful execution of the test plan will confirm that the prototype HEMS is acceptable to be installed into domestic properties.</p>
A4	<p>Prototype HEMS Field Trial Methodology and Plan</p> <p>Working in collaboration with Contract 1, develop a methodology, plan and budget to evaluate the functionality embodied in the HEMS prototype to be developed in Contract 1.</p> <p>The Field Trial Methodology should reference the Field Trial Recruitment Plan, the Trialist Support Approach and Plan and include as a minimum:</p> <ul style="list-style-type: none"> • Justification as to how the proposed Field Trial Methodology will support the delivery of the ETI HEMS Development Project objectives; • The approach to the management and co-ordination of consumer research activities to be carried out by the Contract 1 Participant • The approach to training Trialists in the use of the functionality included in the original version of the HEM Prototype Systems deployed, any new functionality subsequently deployed; and • The approach to pro-active and re-active maintenance of the HEMS Prototype Systems deployed with trialists. The Respondent should proposed Key Performance Indicators (KPIs) against which performance can be assessed. Call out time would be an example of a KPI. <p>Contract 2 would be expected to maintain an appropriate level of spare systems to support the delivery of the Field Trial, Respondents should include the scope of this spares holding in their response to this RfP.</p>
A5	<p>HEMS Proposition Development</p> <p>The Respondent is expected to collaborate with the development of the HEMS Proposition developed by Contract 1. For the purposes of developing the response to this RfP, this activity is expected to involve up to four man weeks of effort from Contract 2.</p>
A6	<p>Data Protection Protocol</p> <p>Reflecting the data requirements of Contract 1, this encompasses the delivery of a protocol for the acquisition, control, retention and transfer of any personal data (as defined under Data Protection Law) to be acquired during the execution of Contract 2. For the avoidance of doubt it is expected that the role of data controller across Contract 1 and Contract 2 will be fulfilled by the Contract 1 Participant.</p>
A7	<p>Field Trial Recruitment Plan</p>

	<p>Reflecting the requirements of the Prototype HEMS Field Trial Methodology and Plan, develop a plan and budget to recruit the targeted consumer segments and housing archetypes.</p> <p>The plan should address the following</p> <ul style="list-style-type: none"> • The most cost effective approach to recruiting the right Trialists whilst minimising fallout; • The provision of a suitable proposition to trialists to take part in the field trial, including any associated incentives to Trialists and their management; • The approach to managing the risk of recruiting Trialists with properties that have material issues (e.g. an unsafe gas or electrical system); • The need to provide assurance to the ETI that required volume of Trialists will be recruited and maintained throughout the life of the contract, as such it should take account of trialist drop-out. To this end the Respondent should propose a suitable KPI on the churn of Trialists together with benefit sharing mechanisms (see section 4.6) whereby the financial benefit of maintaining a stable cohort of Trialists is shared between the Participant, Contract 1 and the ETI as appropriate; • An example form and approach to Trialists formally executing a Field Trial Agreement that documents their agreement to take part in the trial; • The approach to achieving and maintaining service performance levels; and • The approach to managing claims, liabilities and how insurances associated with Trialists.
A8	<p>Training Plan for the Installation, Testing and Commissioning of the HEMS Prototype</p> <p>Working in collaboration with Contract 1, develop a fully costed plan that identifies the training required to install, test and commission the Prototypes HEMS and ensures that all installers are fully trained prior to deployment of Prototype HEMS into properties. The plan should also describe how the installer will be trained to train Trialist in the operation and usability of the HEMS Prototype following installation and commissioning.</p>
A9	<p>Survey Process and Plan</p> <p>A risk to the successful delivery of the Field Trial Contract is the failure to identify material reasons for not deploying HEMS Prototype Systems in certain properties. Examples this could be the condition of the building fabric and / or heating system or of the suitability of the Trialist to take part in the field trial. The failure to identify these risks could lead to significant liabilities and delays to the Participants of Contract 1 and Contract 2.</p> <p>The Respondent should provide proposals on their approach and plan to assess the pre-installation risks, suitability of the recruited Trialists and their properties prior to the deployment of HEMS Prototypes.</p> <p>The capacity and capabilities and (if required) training required to appropriately carry out the survey should be identified.</p> <p>The timing of the survey is at the discretion of the Respondent, it could be during recruitment or prior to the installation of HEMS Prototypes.</p>
A10	<p>Material Defects Management Approach</p> <p>There is a risk that material issues with properties not identified during the survey process will become apparent during the installation and commissioning of the HEMS Prototype Systems, for instance unsafe electrical or gas systems. In such cases the ETI philosophy is that the issues should be remedied in a way that the Trialist is left in a safe state and given the option to continue in the Field Trial. It is not acceptable that the Contract 2 Participant has the option to withdraw immediately and leave the Trialist property in an unsafe condition.</p> <p>The Respondent should propose how such situations will be managed.</p>
A11	<p>Procurement and Installation Plan</p> <p>Note: it is expected that HEMS Control Unit will be provided via free issue from Contract 1 to Contract 2. All associated sensors, actuators and other components will be specified by</p>

	<p>Contract 1 and procured by Contract 2.</p> <p>Develop a fully costed plan to procure any equipment not free issued from Contract 1 to Contract 2, and to install, test and commission complete HEMS Prototype Systems</p> <p>The plan should further describe the process for managing the deployment and commissioning of HEMS Prototype Systems into the homes of Trialists, this should include reference to any activities felt appropriate by the Respondent to ensure that only one visit to each site is required to install and commission the HEMS Prototype and leave confident that the system will perform reliably without a requirement for further visits to site.</p> <p>The installation, test and commissioning plan should reference the Survey Process and Plan as appropriate and describe:</p> <ul style="list-style-type: none"> • The approach to liaising with the Trialist before, during and after installation, test and commissioning activities, including scheduling and re-scheduling (at the Trialists instigation) an installation visit; • The approach to identifying existing property state / issues both internally and externally relevant to the installation, i.e. dilapidation; • The approach to satisfying all permit, certification and regulatory requirements; • Expected time on site for installation, test and commissioning • Commissioning checks to ensure that the system is working correctly; • Verification that data acquisition is working correctly and reliably following installation, test and commissioning; • Verification that remote access to the HEMS Prototype System is working correctly following installation, test and commissioning; • Training and handover of the HEMS Prototype System to the Trialist; • Provision of handover packs to Trialists; and • How Trialist complaints would be dealt with, including associated KPIs. <p>The Plan should also include processes for the following dealing with the following:</p> <ul style="list-style-type: none"> • Accidental damage to the participants house and/or property; • Accidental damage that results in the loss of electricity, gas and / or water or would leave the house in an unacceptable and dangerous state • Damage to the HEMS Prototype System to be installed in the Trialist's home; and • Waste created as a result of the installation, including the management of any control system owned by the Trialist and removed to facilitate the Field Trial. <p>The ETI may require additional sensors to be installed into Field Trial properties to supplement the data acquired by the HEMS Prototype Systems, this could act as a back-up source of data and also as a quality check. Appendix K describes the scope of these additional sensors in section "Ancillary Sensors".</p> <p>Respondents are requested to provide a costed plan to procure, install and commission these sensors. In addition Respondents are requested to provide a costs plan to acquire and manage data from these additional sensors in each trial property for the duration of the field trial.</p>
A12	<p>Trialist Support Approach and Plan</p> <p>Delivery of an approach and plan to manage Trialists through the life of the Field Trial. The Trialist Support Approach is expected to include, but not be limited to:</p> <ul style="list-style-type: none"> • The ability to provide a provision for both pro-active and reactive responses to issues reported by Trialists to the 24/7 helpline provided by Contract 1. A Service Level Agreement associated with this activity should be proposed, lasting for the duration of the Field Trial; • Identify and document proposals for critical response criteria and the associated callout timeframes; • Trialist Advice Pack and training in the use of the HEMS Prototype System and up-grades in functionality;

	<ul style="list-style-type: none"> • Business continuity plan; • Approach to dealing with consumer emergency situations; and • Complaints process. <p>The Trialist Advice Pack should be comprehensive and easy to use and provide Trialists with all the necessary information required to ensure a hassle free experience during all stages of the Field Trial. Suggested non exhaustive contents are:</p> <ul style="list-style-type: none"> • How to participate in the trial; • What to expect and what will be provided during each stage; • Pictures of the hardware and sizes; • How it could affect them i.e. energy usage, costs; • What will be monitored; • What happens to the data that is collected; • How to access help during each stage and likely scenarios e.g. what to do if your house is accidentally damaged during installation, the equipment isn't working etc; • How to access user documentation / training material; • How to use the hardware installed during the trial; • Useful customer support and emergency contact numbers; • The SLAs for customer support; • Complaints procedure and escalation; • The Trialist's options and rights e.g. should the Trialist wish to exit the trial etc; • Clarity on what information will be provided back to the Trialist during and after the Field Trial, based on their usage of the HEMS Prototype Systems; and • What happens post trial including returning the home to its previous state and what to do with faults to workmanship etc. post-trial? <p>The Respondent should define their approach to the management of failures of HEMS Prototype Systems in the field, potential options considered by the ETI could include, but not be limited to:</p> <ul style="list-style-type: none"> • Change hardware in the event of a hardware failure; • Return to a prior 'known good' software release in the event of a software issue being identified; and • Replace with a commercially available HEMS to ensure ongoing control of the Trialist heating system should an immediate fix to the problem not be available.
A13	<p>Field Trial Exit Plan</p> <p>Two routes to the exit of Trialists from the Field Trial are anticipated:</p> <ul style="list-style-type: none"> • Formal closure of the Field Trial at the instigation of the ETI once the objectives of the ETI HEMS Development Project are achieved;, or • An individual Trialist wishes to leave the Field Trial at any stage of the activity. <p>At the conclusion of the Field Trial it is expected that the Trialists will be presented with two options, these should be reflected in the Field Trial Exit Plan:</p> <ul style="list-style-type: none"> • Subject to the Participants of Contract 1 providing a suitable warranty for the equipment installed, then the Trialist may elect to retain the HEMS Prototype System installed in their property • If the Participants of Contract 1 will not provide a warranty for the HEMS Prototype System then the Contract 2 Participants will offer an agreed commercially available HEMS system to be installed in the Trialists home. <p>The Respondent should develop of a plan and approach that sets out full details, costs and arrangements for both of the above options.</p>
A14	<p>Field Trial Lessons Learnt Plan</p> <p>The ETI HEMS Development Project is expected to be a precursor to larger scale activities</p>

	<p>undertaken in Phase 2 of the SSH Programme. The ETI is keen to minimise the risk associated with Phase 2 activities through learning from the execution of earlier activities.</p> <p>The Respondent is requested to propose a structure and approach to learn and document lessons throughout the execution of Contract 2, including reports at the following points:</p> <ul style="list-style-type: none"> • Following recruitment of Trialists; • Following installation, test and commissioning of HEMS Prototype Systems; • During the evaluation of the functionality and performance of the HEMS Prototype Systems; and • Following de-commissioning of the Field Trial. <p>The reports would be expected to include, but not be limited to:</p> <ul style="list-style-type: none"> • Lessons learnt; • Issues experienced and how they were managed; • Actual costs compared to predicted costs and reasons for any discrepancy; • Actual durations for activities compared to predicted and reasons for any discrepancy; • Estimated costs and durations for comparable activities in any mass-scale demonstration of smart energy system(s); and • Recommendations to improve future activities.
A15	<p>Ad Hoc Visits to Trialists Approach</p> <p>At certain points in the Contract, it may be necessary for the ETI or Contract 1 Participant to visit Trialists in their homes, e.g. to carry out interviews with Trialists. The Respondent is requested to propose an approach for the management of such activities.</p>
A16	<p>Additional Services</p> <p>The Respondent is requested to identify and propose any additional services to be added to Contract 1 that would add value to the ETI, with a description of the value added.</p>

Table 1: Draft Requirements for Prototype HEMS Field Trial

4. OUTSIDE THE SCOPE OF CONTRACT 2

The following should be considered outside the scope of Contract 2:

- Development of the HEMS prototype, both hardware and software;
- Manufacture of HEMS Control Units for use in the HEMS Prototype Field Trial Project. The HEMS Control Units are expected to be free-issued to the HEMS Prototype Field Trial Project.
- Certification of the HEMS prototype, where applicable;
- Analysis of data from the field trial properties;
- Fixing of software bugs and hardware faults;
- Development, testing and delivery of software releases to the deployed HEMS Prototype Systems;
- Development of user documentation; and
- Development of installer documentation.

APPENDIX H - GLOSSARY

Term	Definition
Activity	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.
Arising IP	Any intellectual property which is created by or for any party during the Project or for the purposes of the Project.
Background IP	Any intellectual property which existed prior to any party's commencement of the Project and which was created by or for the party.
Business Model	The way in which assets / commercial propositions are managed to deliver, create and capture value.
Contract 1	The Prototype HEMS Development Contract
Contract 2	The Prototype HEMS Field Trial Contract (the subject of this RfP)
Company Registration Number	Company number as registered at Companies House. Universities should enter their Royal Charter (RC) number in place of the Company Registration Number requested.
Field Trial Services Contract	The Contract, as described in Appendix E, to be entered into between the ETI and the Prime Contractor.
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.
ETI HEMS Concept Document	A document developed by the ETI which defines the functionality and requirements expected to be required in an advanced, consumer centric Home Energy Management System.
ETI HEMS Development Project	The overarching project to develop and demonstrate an advanced consumer centric HEMS product, supported by Contract 1 and Contract 2.
Field Trial Methodology	The methodology and approach to evaluate the functionality embodied in the HEMS prototype to be developed in Contract 1.
HEMS	Home Energy Management System(s).
HSE	Health, Safety and Environment.
ICT	Information and Communication Technologies.
HEMS Proposition	The market offering made to Trialists around the capability and services offered by the HEMS, to be used as the basis for recruiting Trialists into the Field Trial
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)).
Non-Disclosure Agreement or NDA	A non-disclosure agreement in the form provided at Appendix F.
Participant	The Respondent selected by the ETI to be the Prime Contractor. For the

	avoidance of doubt, references to “Participant” do not include any Subcontractors.
Prime Contractor	A sole organisation which contracts with the ETI to manage the Project. It may have Subcontractors.
Programme Associate	Programme associates of the SSH Programme (as identified on the ETI’s website from time to time).
Programme or SSH Programme	The ETI Smart Systems and heat programme that includes the Project.
Project Manager/Lead	The individual who is appointed by the Contractor to carry out its responsibilities and act as the prime point of contact with ETI.
Project Steering Group	A steering group chaired by the ETI and consisting of the Project Manager and Chief Engineer from Contracts 1 and Project Manager and Field Trial Manager from 2.
Proposal	The proposal for the Project submitted to the ETI, in response to this Request for Proposals.
Respondents	The organisations submitting a Proposal to the ETI.
Review Point	A Contract review involving the Contractor 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.
Stage Gate Review SGR (Stage Gate Review)	A major Contract Review Point involving the Contractor 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.
Subcontract	A contractual arrangement (described in Section 3.6) between the Contractor 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 Appendix C, including the Respondent’s Proposal submitted by the Respondent in response to this Request for Proposals.
Third Party 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 Participant.
Trialist	A member of the public, recruited by Contract 2 to take part in the Prototype HEMS Field Trial
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.

APPENDIX I – SUGGESTED FIELD TRIAL DESIGN

The following information should be used as a basis for Respondents to quantify their response to this RfP. The precise requirements for the Field Trial will be agreed in conjunction with the Participants of Contract 1 following execution of contracts:

- The location of the Trialists should be in an easily accessible area of the UK, ideally with a high incidence of cold days during the year;
- The Trialist homes should be of traditional wall construction (i.e. avoiding flats with reinforced concrete walls that could interrupt wireless signals);
- The Trialist homes should include gravity fed gas central heating systems with hot water tank, a working timer and thermostat controls. The boiler should have been serviced or installed within last 2 years;
- Gas system must be safe and have a valid gas safety certificate;
- Boiler must be accessible, not boxed;
- Housing types required for the trial may be segmented by archetype, with varying levels of renovation since construction (e.g. installation of cavity wall insulation). The Example archetypes could include:
 - Pre 1919 mid-terrace, 2 bedrooms;
 - Pre 1919 detached, 4 bedrooms;
 - 1919 – 1944 semi-detached, 3 bedrooms;
 - 1945 – 1964 semi-detached, 3 bedrooms; and
 - Post 1980 semi-detached, 3 bedrooms.
- Trialists should not be undertaking major renovations to their home during the trial;
- Radiator pipework must be in good condition, and TRVs (thermostatic radiator valves) must be fitted to main radiators and must be in good working order;
- Home's electrical wiring must be in good condition and the system fitted with a consumer unit (circuit breakers, trip switches) rather than an old-style fuse board;
- The Trialist homes should have a working broadband connection, a wireless router with a spare Ethernet port and spare power supply by the router;
- The broadband router and thermostat to be located in close proximity to each other (less than 15m, to avoid wireless communication issues);
- Trialists to be recruited for the Field Trial are expected to be segmented, in line with emerging insight from the SSH Programme, anticipated drivers for segmentation could include:
 - Age;
 - Income;
 - Co-habiting or living alone; and
 - Children and no children, with ranges of ages and numbers of children.
- The Trialists should consider themselves confident learning and using technology;
- The Trialist should own a home PC, running windows, which they are willing to use as part of

their participation in the Field Trial as required; and

- Excluded jobs for Trialists and close relatives include the following:
 - Energy industry;
 - Heating industry;
 - HEMS industry;
 - Electricians and plumbers; and
 - Media or market research.

APPENDIX J – SURVEY CRITERIA

The following information should be used as a basis for Respondents to quantify their response to this RfP. The precise requirements for the survey of properties will be at the discretion of the Respondent, however this appendix gives an illustration of the ETIs thinking in this area.

HSE

- Identify any HSE issues / risks including that of asbestos.

WIRING

- Locate position of existing control infrastructure:
 - Boiler, control unit, thermostat, junction box. Need to assess proximity of items to each other, and how they relate to new installation. The existing thermostat, if fitted, may / may not be located in correct position.
- Assess status of wiring quality. Certified installation or determine quality of general wiring and standards used.
- Accessibility of existing wiring connections. Are the following existing parts accessible and practical? Some people will not want new wires showing in channel guides etc.
 - Boiler;
 - Thermostat;
 - Control Unit;
 - Hot Water (2 or 3-way valve interface); and
 - Wiring box junction unit.

HEATING SYSTEM

- Assess status of existing system for service quality, functional operation, and position of any mechanical infrastructure that will require retrofit access and overall condition and age. Do all the radiators work?
- Have any special changes been made to the current system, for example, some people upgrade their home and may have used the hot water circuit in one or two radiators. These would pose difficulties to the trial; and
- Hot water tank fitted? Is a.c. supply available near tank (Heating wiring control box etc.).

HOME DECORATION ETC

- Assess impact on decoration, follow up work to tidy installation etc. Impact of any extra sensor location etc.

INSULATION STATUS OF HOME

- Assess if Loft Insulation fitted – what depth of insulation or date fitted;
- Double glazing fitted (including exterior doors); and
- Wall insulation fitted – internal / external / cavity wall / none;

INSTALLATION OF NEW HEMS

- Determine if new installation will be impacted by previous controller location;

- Determine if TRV replacement acceptable: Location, and operating position. Mechanical impact if physical size not compatible;
- Check that a new wireless TRV could be installed: Are the copper pipes flexible enough to facilitate a new valve base being fitted? Solid floors could pose a problem since there may be no movement available;
- Confirm a.c. outlet socket availability and access for HEMS communications control hub next to existing broadband router (and wired Ethernet interface);
- Signal quality assessment for wireless components. Approximate distances to rooms from Communications control hub; and
- Room suitability for sensors / monitoring equipment.

DILAPIDATION SURVEY

- Undertake a dilapidation survey of house.

APPENDIX K – EQUIPMENT TO BE INSTALLED

The following equipment is expected to be installed into the homes of Trialists, the HEMS Communications Control Unit and In Home Display will be provided as free issue equipment from Contract 1. The sensors which are required to interface to the HEMS Communications Control Unit will be specified by Contract 1 and procured by Contract 2. Contract 2 will be expected to install, commission and set to work the HEMS and associated sensors.

At this stage in the Project it is not possible to be specific about the precise sensors that will be required, this level of insight will only become apparent during the development of the HEMS. For the purposes of selection and identification of the Participant for Contract 2, Respondents are requested to provide costs to procure and install componentry.

All equipment to be deployed in Trialists properties should comply with the WEEE (Waste Electrical and Electronic Equipment) Directive and the RoHS Directive (implemented in the UK by The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012). The Respondent should describe their procedures for ensuring compliance.

Any devices powered directly from mains electricity should be housed in enclosures made from fire retardant or fire resisting materials, Respondents should propose the standards they would propose to adhere to.

HEMS Control Unit

The following components will be provided via free issue from Contract 1. They will be installed by the Contract 2 participant in line with documentation provided by Contract 1.

Item	Description	Quantity	Comments	Cost to install per home (£)
Communications Control Unit	Main control unit for the HEMS. Tamper-proof box, circuit board, software, interfaces to home router, Wi-Fi etc. Data storage capability for rolling 3 weeks sensor activity etc. via SD card or similar storage medium.	1 per property	Will be located next to existing broadband router and connected via 1m Ethernet cable.	
In Home Display/Control Unit	Touch Screen, colour, wall-mount / freestanding option with rechargeable battery for standalone application. Min 7" 16:9 widescreen, colour.	1 per property	Powered by a.c. mains adapter.	

HEMS Sensors

The following sensors are expected to be required to enable the delivery of functionality proposed for the HEMS Prototype System. They will be procured and installed by the Contract 2 Participant in line with documentation provided by Contract 1.

Item	Description	Quantity	Comments	Unit Cost per Component (£)	Unit Cost per Installation (£)
Boiler Control Interface	Wireless I/F, connection for standard UK Boiler Types.	1 per home	Located within 1m of existing boiler		
Boiler send / return water temperature sensors	Pipe temperature sensor – boiler inlet and inlet water. Accuracy $\pm 0.1^{\circ}\text{C}$. Sample interval 1 minute. Wireless interface.	2 per home	Located next to boiler.		
Hot Water Control Interface	Wireless I/F, connection for temperature sense of standard UK Hot Water tank. $\pm 1^{\circ}\text{C}$ min accuracy. a.c. power required.	1 per home	Applicable to Hot Water tank system only.		
Electric TRV	Wireless TRV with option for integrated / remote temperature sense. Target 2-year battery life minimum $\pm 0.1^{\circ}\text{C}$ accuracy. Sampling interval 5 min minimum	7 per home	Assess quantity via home survey.		
Internal Temperature / Humidity sense	Wireless operation $\pm 0.1^{\circ}\text{C}$ accuracy / $\pm 5\%$ RH Sampling interval 1 min minimum	7 per home	Required to interface to room electric TRVs and Communications control hub		
External Temperature / Humidity sense	Wireless operation, battery power Target 2-year battery life minimum $\pm 0.1^{\circ}\text{C}$ accuracy / $\pm 5\%$ RH Sampling interval 10 min minimum	1 per home	Locate on outside wall		
Luminance / radiance sensor	Wireless operation, battery power Detect luminance level for solar gain effects etc. Sampling interval 10 min minimum	2 per home	Locate on North and South sides of property (where possible)		
Appliance Usage monitor - Electric	Minimum 1-sec usage indication – I/F to Communications Control Hub / wireless $\pm 1\text{W}$ accuracy / 1 sec, $\pm 0.1\text{kW}$, sampling 5 min interval	1 per home	Will be located next to electric meter, with current clamp and transmitter unit.		
Gas Usage Monitor	Minimum 30-min usage indication – I/F to Communications Control Hub wireless	1 per home	Data from Gas smart meter or wireless pulse sensor		
Water Usage Monitor	Minimum 1-min usage indication – I/F to Communications Control Hub wireless	1 per home	Data from meter or wireless pulse sensor etc.		

Ancillary Sensors

The ETI may require additional sensors to be installed into the properties of Trialists to supplement the data acquired by the HEMS Prototype Systems, this could be used as a back-up source of data in the event of problems with the HEMS or to support the verification of data acquired by the HEMS.

Item Type	Description	Quantity	Comments	Unit Cost per Component (£)	Unit Cost per Installation (£)
Internal Temp / Humidity Sensor	Wireless operation, battery power Data logging with time stamp Provision for data storage of up to 1 week in the event of broadband connection failure, and the facility for remote access to download data Target 1-year battery life minimum $\pm 0.1^{\circ}\text{C}$ accuracy / $\pm 5\%$ RH Sampling interval 15min minimum	7 per property	Wireless data logger, wall mount on interior wall capability.		
Luminance / radiance sensor	Wireless operation, battery power Detect luminance level for solar gain effects etc. Target 1-year battery life minimum Sampling interval 15min minimum	2 per home	Locate on North and South sides of property (where possible)		
Door / Window open sensor	Wireless operation. Ability to detect open contact for attachment to door or window. Target 1-year battery life minimum	2 per home	Transmit data on state change. Locate in main room door / window		
Surface Temperature Monitor	Wireless operation, battery power Data logging with time stamp. Provision for data storage of up to 1 week in the event of broadband connection failure, and the facility for remote access to download data Target 1-year battery life minimum $\pm 0.1^{\circ}\text{C}$ accuracy Sampling interval 5 min minimum	2 per home	Locate on main living + bedroom radiators		