



Programme Area: Carbon Capture and Storage

Project: Mineralisation

Title: Carbon Capture & Storage by Mineralisation: Analysis of UK Opportunities – Request for Proposal

Context:

CCS by mineralisation has been identified as a promising additional method of sequestering CO₂ emissions. Minerals and CO₂ can react together to permanently store CO₂ as a solid carbonate product, which can then be safely stored, used as an aggregate or turned into useful end products such as bricks or filler for concrete. This £1m project, launched in May 2010 carried out a detailed study of the availability and distribution of suitable minerals across the UK along with studying the technologies that could be used to economically capture and store CO₂ emissions. The project consortium involved Caterpillar, BGS and the University of Nottingham. The objective was to investigate the potential for CCS Mineralisation to mitigate at least 2% of current UK CO₂ emissions and 2% of worldwide emissions over a 100- year period. The project has found that there is an abundance of suitable minerals available in the UK and worldwide to meet these mitigation targets. However, challenges remain to make the capture process economically attractive and to reduce its energy use. Significant niche opportunities exist where waste materials are used as feedstock and/or the process produces value-added products, but markets would not be at the level required to meet the mitigation targets.

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Request for Proposals (RfP)



Title of Services for which Proposals are Requested:

Carbon Capture & Storage by Mineralisation: Analysis of UK Opportunities

Request Issue Date:

15 June 2009

Deadline for Notification of Intention to Submit a Proposal:

10 July 2009

Closing Date:

Proposals must be received before 5pm on 16 July 2009

Contact for Enquiries:

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1. Introduction and Overview of the Services Required

1.1. Introduction to the Energy Technologies Institute

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

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

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

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

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

1.2. Background to the Project

Carbon Capture and Storage (CCS) by mineralisation (or mineral carbonation) has been identified by the Intergovernmental Panel on Climate Change (IPCC) as a promising additional technology in the CCS portfolio. The carbonate structures resulting from the reaction of CO₂ with metal oxides are inherently stable and therefore do not incur any long-term liability or monitoring commitments. The IPCC highlights that the “highly verifiable and unquestionably permanent” nature of this storage mechanism is likely to lead to mineralisation enjoying greater public acceptance than traditional CCS approaches. Although the UK appears to be well-served with potential sites for geological storage of CO₂, a risk remains that these may turn out to be insufficient, uneconomic or impractical. Mineralisation is therefore an important risk mitigation strategy for the UK’s CCS activities.

As a pre-cursor to potential technology development projects in mineralisation, the ETI wishes to commission a project to assess the technology development needs for CCS mineralisation, especially technologies which will allow CO₂ to be captured directly from flue gases without a separate capture step. This study will also provide an evaluation of the availability and distribution of mineral deposits in the UK in detail and more broadly worldwide and suitable magnesium- and calcium-containing waste arisings in the UK. The project should cover both ‘wet’ and ‘dry’ mineralisation techniques, but exclude in-situ mineralisation (ie within a geological storage site).

1.3. Outline Scope of the Project

The proposed project comprises four work packages (see Section 3 for details).

WP1: Mineralisation Resource Assessment – UK and Worldwide

This activity will provide a detailed assessment of the distribution of minerals suitable for CO₂ mineralisation in the UK and an estimate of how much of these reserves can be exploited at economic cost within technical constraints. A similar, but less detailed, analysis for worldwide resource availability is also required. Additionally an assessment of the quantities and locations of suitable magnesium- and calcium-containing waste materials (such as waste concrete) in the UK is required. WP1 will also identify the relative location of the reactants and major emitters in the UK.

WP2: Mineralisation Technology Landscape Review

In order for the ETI to plan its technology project(s) for mineralisation there is a need to identify the technologies which should be developed to meet UK requirements. This state of the art analysis is also necessary to quantify the gaps and opportunities for technology development to ultimately enable a full-scale demonstration. In particular, it is known that cost and scale-up issues are potential obstacles to mineralisation as a part of the CCS portfolio and so it is expected that this project will carry out desk studies and possibly some laboratory test work to identify and quantify potential development requirements to overcome cost and scale up issues.

WP3: Techno-Economic Assessment

A techno-economic assessment of mineralisation shall be conducted to determine the viability of the approach compared to 'conventional' capture/transport/geological storage. A whole-system approach needs to be taken, including consideration of infrastructure and potential revenue streams from carbonate products.

WP4: UK Roadmap and ETI Focus Areas

This Work Package shall assess the potential benefits to the UK which could be derived from the further development and deployment of the identified technologies and opportunities.

1.4. Required Outcomes and Critical Success Factors for the Project

The project will provide the following outcomes:

- Identification of accessible mineralisation reactant quantities and locations in the UK and potential power and industrial applications where mineralisation could be applied based on the relative locations of the reactants and CO₂ sources.
- Assessment of the specific technology development needs to overcome the barriers to implementation of mineralisation CCS
- A techno-economic case for mineralisation so that an economic determination of the suitability of further research can be made
- Identification of ETI focus areas
- Technology development roadmap to demonstration stage including cost/benefit and risk analysis

Critical to the success of the project will be the assembly of an effective consortium with the necessary skills and experience relevant to the field of CCS Mineralisation to deliver the required outcomes against the challenging schedule required.

1.5. Anticipated Project Organisation Structure

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

These Participants may choose either:

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

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

2. Request for Proposals Process and Terms

2.1. Content and Format of Proposals

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

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

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

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

2.2. Acceptance, Review and Selection of Proposals

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

- Completeness of information content, structure and quality of Proposal (against areas listed in Appendix A)
- Compliance with technical specification (i.e. Sections 1.3, 1.4 and 3 of this RfP)
- Knowledge, skills and experience, which must include ALL of the following. A table should be provided to identify which Participant(s) is/are proposed to satisfy each of the following criteria:
 - (a) Generic Criteria:
 - Availability and stability of deployable resources to mobilise sufficiently rapidly and for sufficient durations
 - Record and ability in quality, timely and on-budget delivery (of technology programmes) to the full satisfaction of the main stakeholders
 - Knowledge and previous experience of industry, environment, technologies, and of this type of study, etc
 - Ability and experience in collaborative working
 - Appropriate health, safety and environment management systems
 - For the lead organisation particularly, project management expertise
 - (b) Specific Technical Criteria:
 - Access to data showing the distribution of minerals suitable for CO₂ mineralisation. For the UK this data should include suitable waste materials and greater granularity than for the rest of the world
 - Experience of developing CCS mineralisation technologies
 - Experience in chemical process development, scale up and commercialisation
 - Expertise in gas-solid and gas-liquid reaction kinetics and thermodynamics
 - Test benches for carrying out mineral carbonation research at various conditions (flow, temperatures, gas phase composition) including required analytical and laboratory equipment (if considered appropriate – see Section 3.2)
 - Capability for techno-economic analysis, particularly in relation to mineral extraction and chemical process development & operation
- Effectiveness of the contracting, organisational, governance and control structures and processes proposed for the participating entities / organisations
- Project approach and plan, including Gantt chart, suitable stage gates & payment milestones, and proposed management of specific risks and issues
- Compliance with terms and conditions, including any intellectual property issues (such as acceptance of ETI IP terms, or the existence of any IP issues which may affect the ability to carry out the Project and exploit the results)
- Value for money

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

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

2.3. Estimated Time-Frames

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

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

Event	Anticipated Date(s)
Deadline for Notification of Intention to Submit a Proposal	10 July 2009
Closing Date for Responses to RfP	16 July 2009
Preferred Bidder Identified	7 August 2009
Project Detailing and Contract Agreement	August 2009 (*)
Contract Approval	September 2009
Project Start	ASAP after approval
Project Duration	Approx 5 - 6 months

(*) With their bid, respondents should indicate whether they foresee any issue around the availability of technical and legal/commercial staff during this period to conclude any contract which might arise.

2.4. Ownership of Proposals and Confidentiality of Information

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

3. Specification of Project Scope of Work and Deliverables

This project will assess the economic and carbon mitigation opportunity and potential for mineralisation in the UK and around the world. It will not consider in-situ mineralisation.

3.1. Work Package 1: Mineralisation Resource Assessment – UK and Worldwide

Sufficient mineral resources have been identified¹ (Zevenhoven *et al*, 2006; Lackner, 2003; Zevenhoven & Kohlmann, 2001; Ziock *et al*, 2001) globally to capture all of the possible CO₂ emissions possible from fossil fuel use. What is lacking at this stage is a more detailed assessment of the distribution of those minerals in the UK and a suitable estimate of how much of these reserves can be exploited within technical constraints at economic cost.

This work package shall commence with a thorough review of the existing mineral resource (location, effectiveness for mineralisation and realistic potential for extraction) and relevant industrial & construction waste data (location, effectiveness for mineralisation and accessibility) in the UK;

- to assess its suitability as the basis for the deliverables described below, and
- to identify any specific gaps in the existing data which should be filled during this Work Package in order to enable the analysis to be completed

The Participants shall provide information on the location of major power station and industrial CO₂ emitters and associated mineral requirements and relate this to potential sources.

The Participants shall carry out a brief worldwide survey of mineralisation opportunities (on a major country-by-country or region-by-region basis), taking into account availability (and relative ease of extraction) of mineral resources, CO₂ emissions and availability of potential geologic storage.

The Respondent shall identify in their proposal which sources of data they propose to use and how the Participants intend to interface with third party organisations holding relevant data, including any existing relationships with said organisations, or any other related studies.

Deliverables:

- Identification of locations and quantities of mineral and magnesium- and calcium-containing waste resources suitable for use as CO₂ mineralisation reactants within the UK, including estimated costs (expressed in terms of cost per tonne of CO₂ captured) of exploiting identified mineral deposits
- Identification of locations and mineral requirements of major UK CO₂ emitters
- An analysis of existing data for the global distribution of minerals resources suitable for use as CO₂ mineralisation reactants, including estimated costs of exploiting identified mineral deposits
- Report including all data gathered and used for this project with detailed analysis findings. This shall be structured and presented such that it is suitable to be used as the basis for the economic case assessment in Work Package 3

3.2. Work Package 2: Mineralisation Technology Landscape Review

This Work Package shall establish the state of the art in mineralisation technology and quantify the gaps and opportunities for technology development to ultimately enable a full-scale demonstration, which will facilitate commercial deployment. The analysis should cover both 'wet' and 'dry' mineralisation techniques, but exclude in-situ mineralisation (ie within a geological storage site). The Respondent should state broadly which technologies it believes would be included in the review, and how many technologies/technology categories the review is expected to cover.

Particular issues the respondents will be expected to address include (but are not limited to):

- Minimisation of power input for grinding and/or milling
- In slurry processes:
 - Minimisation of water losses
 - Robust high concentration slurry handling equipment
- Gas-mineral contact in 'wet' and 'dry' systems particularly when reacting directly with flue gas
- Scale-up, solid handling, erosion and corrosion issues
- Opportunities to improve kinetics and storage capacity per tonne of mineral
- Detailed speciation of carbonation products formed by the various processes and operating conditions
- Establish the thermal stability of the captured CO₂
- Exergy analysis to determine quantity and quality of heat available from the reaction so that options for heat use can be evaluated
- Known - HSE issues associated with products of the mineralisation reactions
- Trade-off between capture efficiency and plant cost & energy use/efficiency reduction, including an initial assessment of the likely maximum capture efficiency
- Likely size, order of magnitude capital costs and estimated operating costs of power station-scale mineralisation plant

This shall be achieved by:

- Identification of technologies, components and sub-systems
- Literature survey and theoretical analysis of performance against the above parameters
- If considered necessary by the Respondent, basic benchtop laboratory assessment of performance to confirm, and/or address gaps in, the literature survey and theoretical analysis. It is not anticipated that this activity will form a major part of the assessment at this stage.
- Technology performance assessment
- Brief, initial patent search to identify current landscape of IP ownership in technologies relevant for mineralisation (note – a detailed patent study around any technologies selected for development by ETI would form part of future activities, beyond this project)
- Identification of potential component and sub-system development opportunities

Deliverables:

- Detailed technical report covering the results of Work Package 2, including an assessment of the specific technology development needs to overcome the barriers to implementation of mineralisation CCS

3.3. Work Package 3: Techno-Economic Assessment

This Work Package shall assess the business/economic case for mineralisation to determine the viability of the approach. The assessment should take a 'whole system' approach to application of CCS by mineralisation in the UK, and compare this to 'conventional' capture/transport/geological storage (eg as presented in the 2008 McKinsey report). In addition to feeding in results from WP1 & WP2, the infrastructure implications (eg mining and mineral transport; storage of carbonates) should be considered. Possible revenue streams for the resulting carbonate products of mineralisation should be considered, taking into the account the realistic extent of such markets compared to the amount of carbonate produced. A range of scenarios should be considered, ranging from niche application (eg based on specific reactant availability and/or product opportunities) to wide-scale application.

Deliverables:

- A techno-economic assessment of mineralisation in a UK context so that an economic determination of the suitability of further research can be made
- Economic model including all assumptions and references in an appropriate format

3.4. Work Package 4: UK Roadmap and ETI Focus Areas

This Work Package shall assess the potential benefits to the UK which could be derived from the further development and deployment of the identified technologies and opportunities. For each opportunity, the assessment shall include:

- Scope for potential improvements
- Materiality of the impact of such improvements on CO₂ emissions, affordability and security of energy supply
- Present status of technology development, preferably measured against the NASA Technology Readiness Level (TRL) scale, and acceleration potential
- Preliminary economic analysis to show how much of the UK opportunity for CCS Mineralisation could be accessed.
- Identification of specific opportunities for the ETI to undertake development work in mineralisation, taking into account the state of development, current IP ownership and potential value for ETI Members.

Deliverables:

- Report detailing the UK benefits case for development and deployment of the identified technology opportunities including analysis of the lowest possible mineralisation cost which could be achieved by combining the strongest elements of the various mineralisation technologies
- Technology development and deployment roadmap (according to standard ETI structure, which shall be provided) and identification of ETI focus areas through to demonstration stage including cost/benefit and risk analysis

3.5. Project Schedule

It is anticipated that the project will be completed within 5 - 6 months. The project plan should include a Stage Gate Review after approximately 3 months. This will require a written Stage Gate Report and presentation to the ETI, following which a decision will be taken whether UK opportunities and potential for mineralisation technology development justify continuing with and completing the project. It is anticipated that WP1 & 2 will be substantially complete and initial results from WP3 available at this Stage Gate. Respondents should provide a clear indication of the information which would be delivered for this Stage Gate (see Appendix A for details).

4. Price and Payment

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

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

Respondents should note the ETI’s financial and technical reporting requirements set out in Appendix A, Section 5, and ensure that sufficient resource is budgeted to meet these requirements.

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

5. Terms and Conditions for Project Contract

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

If the Project is to be undertaken by a Consortium, then the Consortium members will be required to execute a Consortium Agreement between themselves prior to signature of the Project Contract with the ETI. The extent and format of this agreement is to be determined by the consortium, but a Model Consortium Agreement is available from the ETI. The ETI will require a copy this Agreement for review / approval, to ensure that no conflicts exist with the Project Contract.

Appendix A – Content and Format of Proposals

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

1. Executive Summary *[maximum 1 page]*

A summary of the Proposal, describing briefly:

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

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

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

3. Background to Proposed Participants

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

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

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

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

4. Project Organisation *[typically 2 pages]*

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

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

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

5. Programme of Work *[typically 5 – 10 pages]*

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

- the Task leader
- other Participants involved
- key dependencies
- the technical approach (including use of any specific methodologies, techniques or tools)

- Task objectives
- deliverables, including for each deliverable a specification (e.g. quality, appearance, scope, function and purpose as appropriate) and proposed Acceptance Criteria

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

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

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

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

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

6. Deliverables & Payment Milestones [typically 1 page]

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

Refer also to Section 11.

7. Project Schedule [typically 1 page]

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

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

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

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

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

The Participants will retain responsibility for the management and reporting of HSE aspects of the Project.

Please note, therefore, that during Project Detailing each Participant will be required to demonstrate competence relevant to their part of the Project by providing (inter alia) detailed information on their HSE management approach including details of policies, systems, and training.

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

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

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

(a) Arising IP

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

(b) Background IP

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

- which is needed, either by the ETI or to be licensed from one Participant to another Participant, to carry out the Project or which may be used during the Project; or
- which may be needed by the ETI to exploit the Arising IP.

The description of any such Background IP should detail:

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

(c) Academic Institutions

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

11. Project Payment [typically 1 – 2 pages]

(a) The Respondent should provide:

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

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

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

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

Notes on Category Breakdown table:

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

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

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

- A. ALL Participants shall confirm that there are no potential, threatened, pending or outstanding recovery orders by the European Commission in respect of any funding received by any Participant.
- B. All Participants (except ETI Members, universities / higher education institutions and UK/EU government laboratories / agencies) which provide more than 20% of the resources for the Project or which provide an input which is critical to the Project's success, shall provide Due Diligence Information to the ETI according to the table overleaf.

Details of organisation
Full name:
Registered Office:
Type of Business (sole trader, limited company, partnership etc):
Names of directors/partners/owner:
VAT number:
Details of directors, partners or associates
Have any directors, partners or associates of the organisation been involved in any organisation which has been liquidated or gone into receivership? (Yes/No)
Have any directors, partners or associates of the organisation been convicted of a criminal offence relevant to the business or profession? (Yes/No)
Please give (and attach if necessary) full details if you have answered 'Yes' to either of the two previous questions.
Audited Financial Accounts
Please supply Audited Financial Accounts for the last 3 years for the organisation, or relevant part thereof.
Claims or litigation
Please provide (and attach if necessary) details of any claims or litigation against the organisation, outstanding and/or anticipated.
Insurance
Please confirm that you have insurance cover for the following risks, and confirm levels of cover and expiry for each. ETI will require evidence of these during the Project Detailing phase. <ul style="list-style-type: none"> • Property damage • Business interruption • Employer's liability • Public liability • Product liability (or justify its exclusion if not appropriate) • Professional Indemnity

Appendix B – Summary of Terms and Conditions for Project Contract

Introduction

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

Structure

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

Project Management

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

Finance

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

Confidentiality

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

Audits and Records

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

Sub-contracting

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

Variation

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

Liability

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

Withdrawal

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

Termination and Suspension

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

Intellectual Property

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

Appendix C – Glossary

Term	Definition
Consortium	The group of organisations described in Section 1.5 which may decide together to submit a Proposal to carry out the Project and be governed by a Consortium Agreement between themselves. This will not include the ETI itself.
Consortium Agreement	The agreement to be entered into between the organisations together forming a Consortium, as described in Section 1.5, which governs the execution of the Project within the Consortium.
Lead Coordinator	The organisation which is a member of the Consortium, and which manages and coordinates the activities of all the Consortium members, and which acts as the primary interface between the Consortium and the ETI, as described in Section 1.5.
Participant	An organisation which is responsible for the delivery of part of the Project scope and which is therefore the Prime Contractor, or is Subcontracted to the Prime Contractor, or is a member of the Consortium, or is a subcontractor to any of these organisations, as appropriate, as described in Section 1.5.
Payment Milestone	A contract milestone with defined constituent deliverables, associated deliverable acceptance criteria, and milestone value (all to be detailed in the Respondent's Proposal and agreed in the Project Contract) which should be completed in order to reach the said milestone, and at which, subject to acceptance by the ETI that the milestone has in fact been reached, payment may be claimed from the ETI on the basis described in Section 4 and on the Terms in Appendix C,
Prime Contractor	The organisation which manages and coordinates the activities of all the Subcontract Participants, as described in Section 1.5.
Programme Manager	The individual appointed by the ETI to manage the overall ETI programme to which this Project is affiliated, and to whom the Project Manager is accountable.
Project	The project for which the purpose, scope of work and other details are described in this Request for Proposals.
Project Contract	The contract, as described in Section 5, to be entered into between the ETI and the Participants (whether as a Consortium, Prime Contractor or single contractor)
Project Detailing Stage	The stage of Project commissioning carried out by the ETI if and after it has decided to take forward a Proposal, during which full and final Project details are established and a Project Contract is agreed.
Project Manager	The individual who is appointed by the Lead Coordinator or Prime Contractor, or is otherwise agreed by the Project Participants, to carry out its responsibilities.
Project Organisation	The entity or group of entities / organisations, and the contracting and management structure which they adopt, as described in Section 1.5, which together will carry out the Project if commissioned by the ETI.
Proposal	The proposal for the Project submitted to the ETI, as described in Section 2.1, in response to this Request for Proposals.
Respondent	The organisation submitting a Proposal to the ETI, as described in Section 2.1, on behalf of themselves and of any Consortium or Subcontract Participants.
Subcontract	A contractual arrangement between the Prime Contractor (described in Section 1.5) and another Participant organisation to which work has been subcontracted. This includes Participant organisations subcontracted in turn by other Participant organisations, but the Prime Contractor is not defined as a Subcontractor to the ETI.
Task	A significant activity or group of activities (within a Work Package) which results in completion of a deliverable or a significant part of one, or which represents a significant step in the process towards one.
Work Package (WP)	A major section of the Project scope of work, which may be identified in this RfP or in the Respondent's Proposal, in order to break up the scope of work into separate manageable parts. A Work Package will usually consist of a number of Tasks.

Appendix D – References

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- ⁱ Zevenhoven, R., Eloneva, S. and Teir, S. (2006). Chemical fixation of CO₂ in carbonates: Routes to valuable products and long-term storage. *Catalysis Today*, 115, 73-79
- Lackner, K.S. (2003). A guide to CO₂ sequestration. *Science*, 300, 1677-1678
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- Ziock, H.-J, Lackner, K.S. and Harrison, D.P. (2001). Zero emission coal power, a new concept. In: *Proceedings of 1st National Conference on Carbon Sequestration*, Washington, DC, 14-17 May 2001, US DOE NETL