



Science & Technology  
Facilities Council



# Greenhouse Gas Removal from the Atmosphere

## Announcement of Opportunity

### 1. Summary

Proposals are invited for a new four year research programme on Greenhouse Gas Removal (GGR) from the Atmosphere, with a planned budget of around £8.3m jointly supported by the Natural Environment Research Council (NERC), the Engineering and Physical Sciences Research Council (EPSRC), the Economic and Social Research Council (ESRC), and the Department for Business, Energy and Industrial Strategy (BEIS), with in-kind contributions from the Met Office/Hadley Centre and the Science and Technology Facilities Council (STFC).

The programme will undertake research to improve our knowledge of the options for removing carbon dioxide (CO<sub>2</sub>) and other greenhouse gases from the atmosphere at a climatically-relevant scale, giving attention to the environmental, technical, economic, governance and wider societal aspects of such approaches on a national level and in an international context.

Research proposals are sought at two levels:

- **Consortium bids that comprehensively assess the feasibility of broadly-grouped greenhouse gas removal approaches through consequential life cycle analyses carried out on an interdisciplinary basis. Such bids should also include 2-5 original research components that address specific knowledge gaps and uncertainties, and the capacity to engage in programme-wide intercomparisons and assessments.** Support is expected for four multi-institution consortium bids, that may include research studentships, with support totaling up to £2.0m each (100% FEC, of which the funders will pay 80% FEC) and up to four years' duration. All proposals are expected to take an interdisciplinary approach, bringing together environmental science with social science and engineering and physical sciences.
- **Topic-specific projects of a stand-alone nature addressing novel features of greenhouse gas removal.** Support is expected for six topic-specific bids which are encouraged to be interdisciplinary but can be discipline-focused where the need is sufficiently demonstrated. Awards for topic-specific projects are expected to collectively cover the range of funders' interests, addressing issues not covered by consortium bids, **with single or multi-institution** support up to £300k each (100% FEC, of which the funders will pay 80% FEC) and up to three years' duration.

Proposals are expected to build on, but not duplicate, other relevant work, including that previously or currently supported by the [AVOID2 programme](#), the EPSRC-led [UK CCS Research Centre](#), the [Supergen bio-energy hub](#), the Biotechnology and Biological Sciences Research Council's [Sustainable Bioenergy Centre](#), the ESRC [Centre for Climate Change Economics and Policy](#), and the ESRC and AHRC-led [Climate Geoengineering Governance project](#). Complementarity with the recently-announced NERC-BEIS programme on [1.5°C impacts and pathways](#) is also an important consideration. The geological storage of CO<sub>2</sub>, and its potential use as a feedstock for chemical engineering applications, are relevant to the greenhouse gas removal programme, but are not its central thrust.

Proposals for this call are invited from eligible UK researchers (see [RCUK eligibility for Research Council funding](#) for criteria). Wider partnerships and collaborations are welcome, particularly if additional co-funding is thereby made available.

**Proposals must be submitted via the UK Research Councils' Joint Electronic Submission (Je-S) system before 16:00 GMT/UTC on 10 November 2016.**

## 2. Background

The large-scale removal of greenhouse gases from the atmosphere is assumed in nearly all scenario-based climate models that succeed in “holding the increase in the global average temperature to well below 2 °C above pre-industrial levels” as well as the more ambitious pursuit of “efforts to limit the temperature increase to 1.5 °C above pre-industrial levels” – as agreed in Paris in December 2015 at the 21<sup>st</sup> Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC)<sup>1</sup>. Furthermore, such ‘negative emissions’ by greenhouse gas removal (GGR) are also almost certainly necessary to achieve “a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty”. Thus some anthropogenic emissions, (e.g. those from agriculture) which will be extremely difficult to eliminate, will need to be balanced by active uptake to achieve emission neutrality. The feasibility, mechanisms and implications of GGR are, however, insufficiently understood. Thus it is currently highly uncertain that any single GGR technique, or combination of techniques, can be implemented at the scale likely to be required to avoid dangerous climate change – with such deployment being in addition to, not as an alternative to, the priority actions of reducing emissions at source, maximizing energy efficiency, and protecting natural carbon sinks.

Important knowledge gaps for GGR include those relating to technological efficiency, environmental impacts (that may be both positive and negative), cost-effectiveness, governance, geo-political equity, social impacts, financing and public acceptability. As a result, the constraints on the effective future implementation of GGR are only poorly (if at all) characterized in model pathways. Coordinated research on such topics will advance scientific understanding whilst also contributing to policy-relevant assessments, providing evidence for decisions on which GGR approaches warrant the next level of Research & Development investment to implement effective climate change mitigation. Whilst potential co-benefits (e.g. with regard to maintaining biodiversity, flood prevention, air quality and meeting the UN Sustainable Development Goals) are an important consideration for some GGR techniques, most research effort is expected to address the ‘weakest links’: the key uncertainties, knowledge gaps and trade-offs likely to be involved, with implications for societal legitimacy.

Technical, economic, societal and environmental perspectives of GGR research were considered at a community [workshop](#) held in London on 28 April, attended by researchers and stakeholders representing a wide spectrum of interests. This call document should be read in conjunction with the workshop report. That meeting identified the need for both comprehensive comparative studies and more topic-focused research. Scalability was a generic concern: successful deployment at a local level does not necessarily translate to feasibility at a climatically-relevant scale.

## 3. Programme content

### 3.1 Objectives

The co-support by NERC, EPSRC, ESRC and BEIS of the GGR programme reflects its interdisciplinary and strategic purpose, not only to advance scientific understanding in those funders’ remits, but also to provide information and evidence relevant to UK climate policy needs and more widely. Overall programme objectives reflect that strategic purpose, as follows:

- To better define the ‘real world’ feasibility of GGR techniques that might significantly assist in achieving climate policy goals from a range of technical, economic, societal and environmental perspectives
- To synthesise and assess existing and newly-acquired information on potential GGR techniques, making those informed assessments easily available and useful to the national and international

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<sup>1</sup> [Adoption of the Paris Agreement](#)

policy-making community for maximum impact.

The outcomes are expected to be of particular value to:

- UK national climate change policy, providing evidence and advice to BEIS and the UK Committee on Climate Change, with regard to the latter body's statutory advice on national carbon budgets and the future UK reporting requirements (through Nationally Determined Contributions) of the Paris Agreement of the UN Framework Convention on Climate Change, working closely with the Met Office/Hadley Centre
- The Intergovernmental Panel on Climate Change, in the context of its 6<sup>th</sup> Assessment Report tentatively scheduled for publication in 2021 (the cut-off date for literature which can be considered is yet to be decided) and Special Reports, also other intergovernmental bodies, such as the Convention on Biological Diversity (CBD) with particular interests in the impacts of unconventional climate mitigation.

Outcomes may also be of interest to the private sector.

### **3.2 Programme structure**

The above objectives will be achieved through a programme structure involving projects at two levels:

**Consortium projects** (up to 4 years' duration for multi-institutional bids; maximum £2.0m support at 100% FEC), each of which will comprehensively assess the feasibility and implications of a broad grouping of GGR approaches through consequential life cycle analyses (LCAs). Such LCAs will not only cover the 'cradle to grave' processes necessarily involved in implementing specific GGR techniques but will also assess their wider, indirect/unintended impacts and implications, from all disciplinary perspectives and giving particular attention to the identification of weakest links, social implications, potential bottlenecks and knowledge gaps; i.e. areas of greatest uncertainty. All proposals are expected to take an interdisciplinary approach, bringing together environmental science with social science and engineering and physical sciences.

Two levels of global scale implementation are expected to be covered in the consortium-based LCAs: deployment at a level that would annually achieve the net removal of 1 Gt CO<sub>2</sub> or CO<sub>2</sub> equivalent from the atmosphere, and at a level achieving net removal of 10 Gt CO<sub>2</sub> or CO<sub>2</sub> equivalent (if considered achievable). The time period for achieving those removal levels would be between 2050-2100, recognizing that removal ramp-up would need to start earlier than 2050, (in many pathways, much earlier) and removal may need to continue after 2100.

Each of the consortium proposals should demonstrate an interdisciplinary approach and assess wider issues associated with the potential technical solution(s), including, but not limited to, the environmental impact, economic feasibility, governance related issues, and ethical and wider societal aspects. Examples of broadly-grouped GGR approaches are as follows, each of which could form the basis for a consortium bid – and each of which also may involve several different specific techniques, with different implications for removal potential and rates of deployment:

- Soil carbon, forestry and land management, to include biochar
- Bioenergy with carbon capture and storage (BECCS; may include forest-based feedstock)
- Enhanced weathering and ocean alkalinity enhancement
- Direct air capture (DAC)

These topics were considered at the community workshop from an environmental science, social science and engineering and physical science perspective; further details are available in the workshop report. The above groupings are examples, and are not prescriptive; other groupings at a similar level

could also be considered. Whichever grouping of approaches is used, it is expected that the consortium will produce an interim report at the end of the second year of award, summarising the provisional main outcomes of its LCAs, and highlighting environmental, technical and socio-economic issues. In the third (and fourth if applicable) year of award, effort will be directed at inter-consortium comparisons, to increase the overall added value of the GGR programme, with submission of results for publication in time for consideration by the 6<sup>th</sup> Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) where possible.

Within each consortium bid, up to 50% of the budget is expected to be used for LCA assessments, with the remaining budget directed at 2-5 more focused components that address specific knowledge gaps and uncertainties, as identified in the consortium case for support with proposed objectives and methods. Such studies need to improve understanding and provide new information in key areas; they may be theoretical (using quantitative models), or involve national case studies, or laboratory or field experiments, or other data gathering, including public surveys. They should be interdisciplinary in approach and look at the wider feasibility issues (environmental and socio-economic) of the techniques under consideration. Research studentships may be included if they constitute a project distinct from the core research objectives yet provide added value, and involve high-quality training and meet other criteria identified in paragraph 5.3 below.

**Topic-specific projects of a stand-alone nature** (up to 3 year duration for single or multi-institutional bids, maximum £300k support at 100% FEC) are also expected to be supported by the GGR programme. Projects are encouraged to be interdisciplinary but can be discipline-focused where the need is sufficiently demonstrated, and are expected to address novel features, e.g. proof-of-concept studies or cross-cutting exercises less likely to be covered by consortium bids. Additional areas for consideration are both longer term and shorter term issues relating to energy policy, infrastructure, permanence of sequestration, climate system behavior, the timescale for establishing a benchmark by which a ‘worthwhile’ contribution can be established for any particular GGR technique, public/political acceptability, as well as knowledge gaps in political, economic, social and environmental perspectives. It should be stressed that these topics are not exclusive; applicants may go beyond these areas or include dimensions of multiple topics as fits the research.

In addition to scientific excellence and impact, a factor in determining proposal success will be the balance across the project portfolio to collectively address the key aims of the programme. Linkage with relevant studies supported elsewhere in the programme will subsequently be encouraged, after awards are made.

### **3.3 Scientific scope**

**The relatively broad considerations and issues identified above and covered by the 28 April [workshop](#) provide the interdisciplinary scientific framework for the programme.**

Additional specific scoping and programme boundary issues are as follows:

**Linkage with ‘conventional CCS’:** Successful GGR necessarily involves net sequestration of CO<sub>2</sub> (or another greenhouse gas) on a long-term basis. Much relevant research on this problem has already been conducted in the context of conventional (fossil fuel) carbon capture and storage, CCS. Improved CO<sub>2</sub> capture processes and assessments of the global capacity for geological storage of CO<sub>2</sub> are important considerations for several potential GGR techniques, and there are engineering issues relating to combustion processes for BECCS that could justify a topic-specific component or project. However, many of the assumptions relating to negative emissions are untested, with risk of over-optimism regarding their deployment scale and effectiveness. From a policy perspective, it is therefore important to not only improve assessments of feasibility of BECCS, but also to consider the viability of alternative techniques and their implications, taking into account environmental, social and political considerations.

Geotechnical and engineering considerations relating to sub-surface CO<sub>2</sub> injection and the environmental risks of reservoir leakage are not priority topics for the GGR programme. Furthermore, research on the potential for using CO<sub>2</sub> as a feedstock for synthetic biofuels, or for enhanced oil recovery, are also considered out of scope (on the basis that they are unlikely to result in net negative emissions).

**Non-CO<sub>2</sub> greenhouse gases:** Nearly all GGR techniques proposed to date have focused on CO<sub>2</sub> removal, with the overall approach frequently referred to as CDR (carbon dioxide removal). However, none of the proposed approaches are well characterized, and the wider implications of their large-scale application are highly uncertain. Important knowledge gaps include those relating to environmental impacts, cost-effectiveness, governance, financing and public acceptability. Whilst the focus on CDR is likely to continue, the potential for climatically-significant removal of other greenhouse gases (such as methane, CH<sub>4</sub> or nitrous oxide, N<sub>2</sub>O) also warrants scientific attention. Implications for air quality should also be considered. Such research may be suited to topic-specific projects within the GGR programme.

**Field experiments:** There is the opportunity to include experimental fieldwork as part of a stand-alone GGR bid or as a consortium component, provided that: i) scientific justification is provided; ii) such experiments are carried out with due care, diligence and stakeholder engagement, meeting all relevant national and international legal constraints<sup>2</sup> and full compliance with applicable community-based guidance, e.g. the Oxford Principles for Geoengineering Research and the RCUK Principles of Responsible Innovation; and iii) there is expectation of spatially-constrained and limited adverse impacts. For agricultural or forestry-based studies, or those involving biochar, no additional approval processes are anticipated. However, for potentially more controversial experiments, an additional impact assessment may be requested (post-proposal submission) and such work may need to be phased, with a requirement to pass stage gates to demonstrate social and ethical acceptability. The overall need would then be to show responsible analysis of risk coupled with unbiased evaluations to inform appropriate governance.

**Non-UK collaborations:** Scientific partnerships with relevant non-UK research groups in both developed and developing countries are encouraged within GGR proposals, recognizing the global nature of climate change and its mitigation. The expectation is for such partnerships to provide co-funding and added-value, but without formal Co-I status, i.e. overseas collaborators will not receive funding directly from the grant. The GGR programme is not an Official Development Assistance (ODA) initiative, nor is it supported through the Research Council's Global Challenges Research Fund (GCRF); nevertheless, such linkages may be given further attention by RCUK if future programmes in this area are developed.

## 4. In-kind contributions

### 4.1 Met Office

The Met Office has been co-developing with the NERC community the UKESM1 earth system model and the Joint UK Land Environment Simulator (JULES), which will be available for use during the lifetime of projects funded under this call. The Met Office can also make available modelled climate scenarios that include carbon dioxide removal, and if a project is aligned with the Met Office Hadley Centre programmes there are likely to be opportunities for the funded project to work closely alongside the Met Office team to develop and/or analyse the climate response of new scenarios. Contact: Chris Jones ([chris.d.jones@metoffice.gov.uk](mailto:chris.d.jones@metoffice.gov.uk)) or Jason Lowe ([jason.lowe@metoffice.gov.uk](mailto:jason.lowe@metoffice.gov.uk))

### 4.2 STFC

Employees of the Science and Technologies Facilities Council (STFC) Laboratory sites are eligible to apply

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<sup>2</sup> Any proposed marine experiments should comply with the marine geoengineering amendment of the London Convention/London Protocol, as recently ratified by the UK; see [summary](#)

for the call as a principal or co-applicant under normal eligibility rules.

To encourage involvement in the call, STFC is providing up to £450k (spread over the duration of the projects) of funding from the STFC 21<sup>st</sup> Century Challenges Programme (21CCP) to enable access to technology and expertise within the STFC's laboratories under this call. STFC operates five UK laboratory sites; [Chilbolton Facility for Atmospheric and Radio Research](#), [Daresbury Laboratory](#), [Rutherford Appleton Laboratory](#), the UK [Astronomy Technology Centre](#) and the [Boulby Underground Laboratory](#). Examples of how the STFC could contribute to the GGR programme include but are not limited to:

- Design and construction of sample environments to enable novel measurements on the large experimental facilities that STFC manages ([ISIS Neutron and Muon Source](#), [Diamond Light Source](#) and the [Central Laser Facility](#))
- Computer modelling, analysis of large datasets and complex visualisation

The STFC contribution will be up to £450k spread over the duration of the projects and can fund direct and indirect staff costs, travel and subsistence costs incurred by STFC staff and the design and construction of sample environments. The £450k would be on top of the £8.3m available from the other funders.

Funds from this scheme cannot be used to pay for facility time at ISIS, Diamond or CLF; this should be requested through the normal academic access routes.

All STFC laboratory costs should be included on the Je-S form in the normal way, at 100% FEC. The STFC contribution will then pay for STFC laboratory costs on successful grants at 100% FEC (rather than 80% FEC), up to the £450k limit.

Further details are available from Katharine Hollinshead, 21<sup>st</sup> Century Challenges Programme Manager, [katharine.hollinshead@stfc.ac.uk](mailto:katharine.hollinshead@stfc.ac.uk)

## **5. Proposal requirements**

### **5.1 Eligible Research Organisations**

This opportunity is open to individuals and organisations eligible for research grant funding from NERC, EPSRC and ESRC, i.e. applicants in UK Higher Education Institutions (HEIs), RC-supported Research and Collaborative Centres, and Independent Research Organisations (IROs) approved by NERC, EPSRC and ESRC for managed mode support ([RCUK eligibility for Research Council funding](#)). If direct financial support for a non-eligible partners' involvement is considered necessary, this may be included as a sub-contract. Consortium bids should include researchers from at least three eligible institutions.

Potential applicants should contact NERC well in advance of the submission deadline if they have any queries concerning their eligibility.

### **5.2 Research roles and eligibility**

With the exception of project partners and 'staff' such as researchers and technicians, individuals may be named on a maximum of two proposals submitted to the GGR call, and may be named as a lead Principal Investigator (PI) on only one. The total time commitment across the applications with which they are involved should not exceed 100%. If individuals are named on more than two submitted proposals then additional proposals will be rejected.

Proposals will not be accepted where a student is the only dedicated research/staff member on a grant, including component grants of joint proposals.

Note that NERC rules apply on individual eligibility. Full information on individual eligibility and role descriptions can be found under Section C of the [NERC Grants Handbook](#).

### **5.3 Associated research studentships**

GGR consortium bids may include up to three associated studentships, which should be co-supervised by two or more of the proposal's co-investigators from different institutions. The cost for the studentship should be included within the total requested funds. Stipend and fees costs are funded at 100% as Exceptions and other costs supported at 80% FEC. Each studentship should constitute a distinct project providing added value to the parent proposal. The main consortium research should still be viable without the studentship and should have distinct objectives that are not reliant on the requested studentship.

The student is expected to be able to develop novel research ideas while benefiting from working in a group environment and we strongly encourage they are trained as part of a student cohort. This could, for example, be accomplished by integrating this student into an existing Research Council Doctoral Training Partnership Programme.

All research studentships must meet the following success criteria:

- Research excellence: the training and training environment must include scientifically excellent and original research within the remit of either NERC, EPSRC or ESRC.
- Training excellence: students are managed as a cohesive group and acquire both research and transferable skills. There is a strong and active community of students that are able – and encouraged – to integrate, work and learn together.
- Multidisciplinary training environments: the training is embedded in multidisciplinary training environments to enrich the student experience and to encourage the knowledge-sharing and interconnectivity, which benefits research within the environmental sciences. This does not mean that individual PhD topics are required to be multidisciplinary, but are encouraged.
- Excellent students: attracting the 'best-fit' student, whose previous training, experience and skills best suit the type of training being undertaken.

In order to be successful, applicants must demonstrate within their proposal how these success criteria will be met. Failure to meet these criteria will result in studentship funding being removed from any final award but will not impact the chances of success of the parent grant proposal.

Further information concerning Associated Studentships is available under Section D of the [NERC Grants and Fellowships Handbook](#).

### **5.4 Pathways to impact**

Both consortium and topic-specific proposals are expected to deliver both academic impact (for example research papers, significant new models/data and understanding) and a pathway to significant policy impact.

An acceptable pathway to impact strategy is required before a grant may start. This is expected to identify target beneficiaries from the proposed research over different timescales, how they will benefit, and what actions will be taken within the project to increase the likelihood of the research reaching the identified beneficiaries and maximise the likelihood of the identified benefits being achieved. This should include reference to the specific objectives and outputs of the programme, and consider how evidence will also be effectively communicated to a non-technical audience. For further information see [RCUK Pathways to Impact Guidance](#).

### **5.5 Data policy**

The funders require that all funded projects implement a data management scheme which covers practical arrangements during the project and subsequent long-term availability of the data sets. In

line with data policies the data from the projects will be lodged with the appropriate NERC designated Environmental Data Centre, with the UK Data Service or where appropriate at other publically available data repositories.

PIs have an obligation to ensure that data management is undertaken in a suitable way. Applicants are required to submit an Outline Data Management Plan (ODMP) to identify the data sets likely to be available for archiving and reuse at the end of the grant. There will be no charge to the project for a NERC Environmental Data Centre to accept and manage the agreed data sets at the end of the grant but any in-project data management activities should be costed with full justification and included within the proposal. If proposals do include any costs for a NERC Environmental Data Centre then these will be removed from the proposal; further information is provided on the NERC [data management planning webpages](#).

All relevant data sets suitable for long-term preservation should be lodged with the appropriate data centre by the end of the project. It is expected that all data sets lodged with the data centres will be openly available for use by anybody without any restrictions as soon as the project has completed. Requests to restrict access to the data beyond the end of the project must be discussed with, and approved by, the funders.

NERC has recently adopted new policies on open access publication. It is now required that all publications be open access. It is expected that all academic journal publications be open access (gold or green), and where possible this should include book and book chapters. Further information is available from the [RCUK Open Access Policy](#).

## **6. Application process**

### **6.1 Proposal submission**

The Greenhouse Gas Removal programme will provide funding at two levels, for consortium awards of up to £2.0m (100% FEC) for a maximum duration of four years (accepting some flexibility will be required if including PhD studentships to ensure they are completed within the lifetime of the parent grant), and up to £300k (100% FEC) for topic-specific proposals for a maximum duration of three years. The earliest proposal start date is 1 April 2017 whilst it is the expectation that projects start by 1 October 2017.

Funding contributions will be 80% of the FEC incurred to undertake the project, including overheads (except studenthip stipend and fees costs which are funded at 100%, see section 5.3).

**Proposals must be submitted via the UK Research Councils' Joint Electronic Submission (Je-S) system before 16:00 GMT/UTC on 10 November 2016.**

Joint applications are allowed within this call. Grant components must be a minimum of £65k (100% FEC); further details can be found in the [NERC Grants Handbook](#).

In order to prepare a Je-S proposal submission the person preparing the proposal has to create a new proposal. The process for this is as follows:

- On logging into Je-S select the Research Council – NERC
- Select the Document type 'Standard Proposal'
- Select Scheme – 'Directed'
- Select call "Greenhouse gas removal from the atmosphere"

All applications must be submitted in English and costed in pounds sterling (£/GBP)

All documents (including embedded references) should be completed in single-spaced typescript of minimum font size 11 point Arial font or other sans serif typeface of equivalent size to Arial 11, with



margins of at least 2 cm. Please note that Times New Roman, Arial narrow and Calibri are not allowable font types as they are smaller and any proposal which has used either of these font types within their submission will be rejected. Applicants referring to websites should note that referees may choose not to use them. Page limit restrictions apply and should be adhered to. Failure to adhere to these guidelines will result in rejection of your application.

Please note that on submission to council ALL non-PDF documents are converted to PDF, and the use of non-standard fonts may result in errors or font conversion, which could affect the overall length of the document. Additionally, where non-standard fonts are present, and even if the converted PDF document may look unaffected in the Je-S System, when it is imported into the Research Councils Grants System some information may be removed. We therefore recommend that where a document contains any non-standard fonts (scientific notation, diagrams, etc.), the document should be converted to PDF prior to attaching it to the proposal.

Applicants should ensure that their proposal conforms to all eligibility and submission rules; otherwise their proposal may be rejected without peer review. More details on NERC's submission rules can be found in the [NERC research grant and fellowships handbook](#) and in the [submission rules](#) on the NERC website.

## **6.2 Documents required**

The grant application will comprise a Je-S pro-forma and a number of attachments - case for support, data management plan, justification of resources, pathways to impact, CVs, letters of support, and, if applicable, facilities application forms. Details of what is required in each document are given in this section, **noting that for some sections different page limits apply to consortium and stand-alone project bids.**

The **Je-S pro-forma** has a series of sections that need to be completed:

- Title of the proposal
- Objectives
- Summary
- Academic Beneficiaries
- Nominated referees
- Project Partners
- Letters of Support from Project Partners

**The summary section should clearly indicate which type of proposal is being submitted, either 'GGR Consortium' or 'GGR Topic-specific'.**

The **Case for Support** is comprised of two parts:

- a. *Previous Track Record* – up to 4 sides of A4 for consortium bids, 2 sides for topic-specific projects, to include the following aspects:
  - Describe the nature of the organisations named (i.e. university, research institute, etc.)
  - Information on the key named individuals/researchers, their role in the project and details of relevant experience and how they are best suited to conduct the research proposed within the described timescale. You may also wish to include details of any external funding held for key individuals and their organisations
  - Indicate where previous work has contributed to progressing the field of research, and/or providing impact, evidenced by including the top 3 – 5 relevant publications per PI and Co-I

- Outline the specific expertise available for the research at the host organisation and that of any associated organisations and beneficiaries, including the capacity for interdisciplinary working where appropriate

b. *Description of Proposed Research* – up to 8 sides of A4 for consortium bids, 4 sides for topic-specific projects, to provide the substance of the research application. It is essential that a coherent exposition of the proposed project is presented, addressing the following points:

- Underlying rationale, scientific, technological and developmental issues to be addressed
- Specific objectives, hypotheses and research questions of the project, including their potential relevance to global research work in the field, relevance to the programme aims, and anticipated achievements and outputs
- Methodology and approach; this should include methods and location of data collection, and details on the use and manipulation of data
- Interdisciplinary nature of the project, if appropriate
- How the proposed research addresses the programme aims
- A summary of the expected outputs of the research with evidence that the outputs can realistically be achieved within the timeframe of the programme
- Programme and/or plan of research

**Data Management Plan** – up to 1 page of A4. This plan should include information about how the project will manage the data produced. It must identify the datasets that the research will produce and which will be of potential long-term value, and which data centre (NERC Environmental Data Centre, UKDS or other appropriate data centre) will need to manage and make available the data to enable re-use after the end of the research.

**Justification of Resources** requested – up to 2 sides of A4. This should state the full cost of the project and explain why the requested resources are needed, including identifying why the proposal presents value for money. It should include a justification for all Directly Incurred Costs, Investigator effort, use of pool staff resources and any access to shared facilities and equipment being sought. No justification of Directly Allocated Estates and Indirect Costs is required. Please note that budgets may be reduced if considered excessive.

**Pathways to Impact** attachment – up to 2 sides of A4. The ‘Pathways to Impact’ describes how the proposed work will achieve impact and build capacity. This should include a proposal for clear communication of any policy-relevant results to a non-technical audience. Guidance on demonstrating a pathway to impact is given in Section 5.4.

A **Curriculum Vitae (CV)** for all named research staff: PIs, Co-Is, Researcher Co-Is, named Researchers and Visiting Researchers - up to 2 sides of A4 for each CV.

**Letters of support** from any project partners – up to 2 sides of A4 each. Each Project Partner must provide a detailed signed letter of support of up to 2 sides of A4. The letter of support should confirm the organisation’s commitment to the proposed project, identify the value, relevance and possible benefits of the proposed work to the partner, the period of support, the full nature of the collaboration and how the partner will be involved in the project and provide added value. Partner contributions, whether in cash or in kind, should be explained in detail in the case for support, including the equivalent value of any in-kind contributions. The letter should be written when the proposal is being prepared and targeted specifically to the project.

**Application forms for any RCUK Facilities.** Applicants may apply for access to any [RCUK services and](#)

[facilities](#). Prior to submitting the proposal, applicants must first contact the facility to seek agreement that they could provide the service required and obtain a technical assessment (quote). Applicants should contact the relevant facility well in advance of the closing date to ensure that the facility can provide the quote in time to be submitted with the proposal. Applicants should refer to the point 229 of the [NERC Grants Handbook](#) for further detail. The cost of the facility must be included under other DI and be included within the maximum budget.

Use of Research Council Facilities must be recorded on the JeS proforma within the section 'Research Council Facilities' (found under the Resources heading), by selecting the 'Add New Research Facility' button. If ARCHER and/or MONSooN/RDF/JASMIN (as applicable) are selected, please use the 'Proposed Usage' field to state if the HPC form is submitted (>160 MAU in any one year).

**Differences to note between the two types of research proposal:**

	<b>Consortium projects</b>	<b>Topic-specific projects</b>
Maximum project budget (100% FEC)	£2.0m	£300k
Maximum duration of project	Four years	Three years
Minimum number of eligible institutions on proposal	Three	One
Research studentships allowance	Up to three	None
Keyword used to indicate the project type in summary section of pro-forma	GGR Consortium	GGR Topic-specific
Maximum length of Previous Track Record in Case for Support	4 sides of A4	2 sides of A4
Maximum length of Description of Proposed Research in Case for Support	8 sides of A4	4 sides of A4

**6.3 Project finances**

**All applicants are advised to consult their institutional finance officers when completing the financial parts of the application.**

All costs associated with the project must be itemised in the Je-S proforma and justified in the Justification of Resources document.

All applicants should enter the 100% full economic costs of the proposed research into the budget sections of the Je-S proforma, of which the funders will pay 80% FEC (except studentship stipend and fees costs which are funded at 100%, see section 5.3). All costs should be in pounds sterling (£).

**7. Assessment process**

All proposals received which meet eligibility criteria and submission rules will be subject to rigorous expert interdisciplinary peer review based on the following process:

- All proposals will undergo independent interdisciplinary external peer review, including an opportunity for the PI to respond to the reviewers' comments. All peer review will be

undertaken by NERC, with suggested reviewers requested from all funders.

- An expert moderating panel will be convened to meet in the UK, composed of experts nominated by all the funders, including representatives from science, business, policy and practice as appropriate. The panel will use the review and PI responses to prioritise the proposals and make their recommendations.
- The recommendations of the moderating panel will provide the basis for the funding decision by NERC, EPSRC, ESRC and BEIS. Note that the funders will select a balanced portfolio of projects that collectively best address the key aims of the programme.

The [assessment criteria](#) used to select and prioritise proposals for funding have equal weighting:

- Science Excellence; relates to the originality and quality of the proposed research and the importance of the questions being addressed; and
- Fit to Scheme; relates to the degree to which the proposed research addresses the objectives of the programme.

Applicants will be given feedback from the Panel summarising the reasons why the proposal was successful/unsuccessful. No further feedback will be available.

## **8. Post-award management**

Representatives from all the funded projects will be expected to attend a programme kick-off meeting in spring 2017 (date and venue tbc). This meeting will provide an opportunity for the project teams to meet each other, gain an overview of the funded research and initiate project engagement with BEIS and Climate Change Committee representatives to ensure that the outcomes of the research contribute to policy development.

Funded consortium projects will be expected to produce an interim report on their consequential LCAs in mid-2019 (date to be advised). Successful PIs will be informed of any additional within-award reporting or meeting requirements. Attendance costs for such programme-instigated meetings will be met centrally. All funded projects will also be required to produce a short final report, and may be required to respond to other ad hoc queries for information from NERC, EPSRC, ESRC and BEIS.

## **9. Timeline**

- September 2016 - Announcement of Opportunity
- 10 November 2016 - Closing date for proposals
- Late January 2017 - PI response (provisional)
- late February 2017 – Moderating Panel
- March 2017 - Award letters issued
- From April 2017 - Projects start
- Spring 2017 – Programme kick-off meeting

## **10. Queries**

All queries should be directed to the programme secretariat at [GGR@nerc.ac.uk](mailto:GGR@nerc.ac.uk)