



Energy Networks Grand Challenge: Preparing the UK's Energy Infrastructure for 2050

Invitation for Proposals

Closing date for proposals: 16:00 29 September 2010

1. Introduction

The RCUK Energy Programme, led by the Engineering and Physical Sciences Research Council (EPSRC), invites proposals that address the Grand Challenge of:

Preparing the UK's Energy Infrastructure for 2050.

The ambition of a Grand Challenge should be far greater than what can be achieved by a single research team or in the span of a single research grant. Applicants are encouraged to look 20-40 years in the future and think what could be achieved on this timescale if researchers from different research groups, disciplines or institutions, were to work together.

Grand Challenge proposals will need to show how they meet the following requirements:

- Lead to a step change in current knowledge
- Lead to a positive societal and/or economic impact
- Focus on long term goals
- Adopt a multidisciplinary approach

There is up to £8 million available for this call and we expect to make up to two awards, depending on quality.

2. Background

This call is a result of scoping activities with a range of stakeholders that were carried out by the RCUK Energy Programme in the first quarter of 2010. These included an open Submission of Ideas for Grand Challenges and a scoping workshop that used the ideas as input.

Following these activities, a key role for the RCUK Energy Programme was identified as de-risking the 2050 energy system through technical, economic and social understanding of the key issues. As a result of this "**Preparing the UK's Energy Infrastructure for 2050**" has been identified as an overarching Grand Challenge that should be addressed through a combination of four research strands, shown in Figure 1, that arose from the Submission of Ideas:

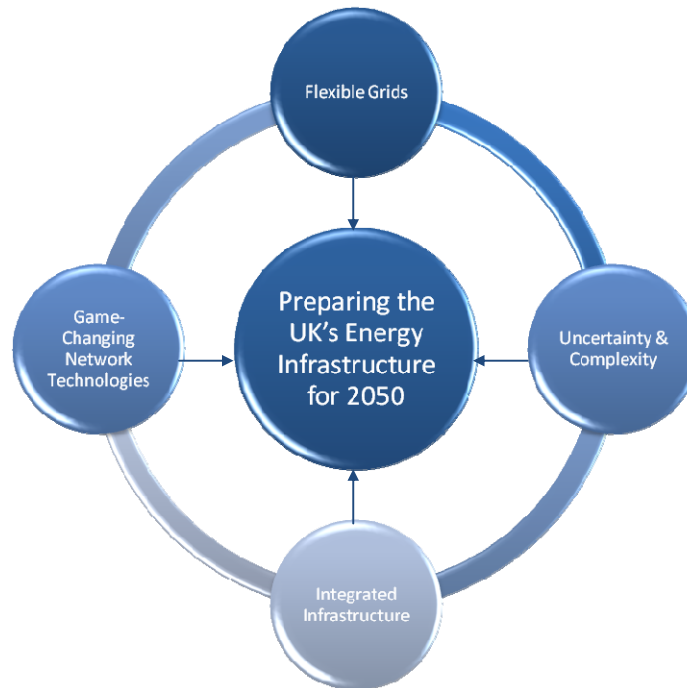


Figure 1: Structure of Grand Challenge

3. Scope of the Call

Applicants should adopt a collaborative, multidisciplinary approach to a combination of the four strands identified above and show clearly how their approach will address the Grand Challenge from a technical, economic and social perspective.

Flexible Grids – this strand should look to go beyond Smart Grids (taking into account likely developments to current network infrastructure and commercial and regulatory arrangements) and consider longer-term research challenges from a technical, commercial and regulatory perspective to deal with the changes to energy networks over the next 20-40 years. Synergies with the other themes should also be considered.

Game-Changing Network Technologies – in order to deliver benefit to future network development it is not sufficient to be novel; we are looking for technologies that will lead to a potential step-change in impact on the UK's energy infrastructure. Synergies with the other themes should also be considered.

Integrated Infrastructure – this strand includes issues relating to the integrated supergrid (offshore international connections); and integrated infrastructure networks which considers the integration of different vectors within the same infrastructure. Synergies with the other themes should also be considered.

Uncertainty and Complexity – this strand should be looking to address issues of uncertainty and complexity arising from changes to energy networks caused

by the other three strands and should look at how we maintain a stable and robust energy system and inform policy in the short and long term.

A number of cross-cutting themes have also been identified as being key to delivering the Grand Challenge and should be considered in any application. These cross-cutting themes are:

- ICT-Energy Interface
- Storage
- Social understanding of key issues
- Ability to influence / advise policy making
- Internationalisation

The Grand Challenge project(s) will be expected to work with the SuperGen Hub in Networks and those proposals that are invited to interview will be asked to provide details of how they plan to interact with the Hub ahead of the panel meeting.

In recognition of the long-term nature of this Grand Challenge it is expected that this will be the first stage of this activity. Any future stage will be dependent on successful progress in this first stage and will be contingent on future budget availability.

4. Eligibility

Standard eligibility rules for targeted funding apply to applicants and organisations, as specified in the EPSRC Funding Guide.

The EPSRC Funding Guide is available at:

<http://www.epsrc.ac.uk/funding/apprev/basics/pages/fundingguide.aspx>

A full list of organisations currently eligible to apply to the EPSRC can be found at the following link: <http://www.rcuk.ac.uk/research/eligibility.htm>

5. Application Procedure

Applications submitted against this call must follow the format of an EPSRC Programme Grant full application and will be assessed using the same procedure used to assess Programme Grant proposals. Details on the Programme Grant scheme can be found at the following link:

<http://www.epsrc.ac.uk/funding/grants/capacity/programme/Pages/default.aspx>

The requirements for this process are not standard and applicants **must** contact Andrew Wright (contact details at end of call document) to discuss their interest and suitability in applying against this call. **If you are intending to submit a proposal you must send an e-mail of intent to apply to Andrew Wright by Wednesday 01 September 2010.**

Proposals must be submitted on one common Je-S form even if they are multi-institutional bids.

Format of Case for Support

The case for support must include the following sections - you should ensure that you address all the assessment criteria in your application:

- Two-page track record that demonstrates the international standing of each named investigator and details the relevant expertise that they will bring to the research programme. For the Principal Investigator there should be evidence of leadership and management skills.
- Six-page case for support. This should address the following:
 - Background
 - Vision and Ambition
 - Research Objectives
 - Research Programme and Methodology
 - Added value
 - Relevance to Academic and Other Beneficiaries
 - Advocacy for Engineering and the Physical Sciences
- Technical support annexes to provide additional information on the science specifically for the postal reviewers - maximum number of pages to equal four times the number of research strands. The format of the technical annex within this page limit is up to the applicant to decide.

In addition, there should be four separate annexes:

- Management strategy. This should be a maximum of pages and needs to be attached as an additional document and should include:
 - How the individual research strands will meet the Grand Challenge.
 - Day-to-day management strategy.
 - Details of external advice.
 - Monitoring strategy which should include how this will be used to reassess the direction of the research programme.
 - Strategy of using the flexibility of the resources (both staff and finance).
 - Resources for the project management aspect of the programme.
- Two-page Justification of resources. This should be a narrative description of the need for the resources requested. See the section on how to write a justification of resources for more information.
<http://www.epsrc.ac.uk/funding/apprev/preparing/Pages/jor.aspx>
- Two-page work plan. It is not expected that this will be a Gantt chart for the whole time of the project. It is expected though to include a comprehensive plan for the start of the project and then to relate to the management strategy to give appropriate milestones for when important decisions on the direction of the research will be taken.
- Pathways to Impact (up to two pages) explaining who may benefit from the research, how they may benefit and what will be done to make sure

they have the opportunity to benefit. The definition of impact and further details can be found in Economic Impact – Guidance for Applicants.
<http://www.epsrc.ac.uk/funding/apprev/preparing/Pages/economicimpact.aspx>

The other standard attachments should also be annexed as appropriate -e.g. CVs for named research staff, equipment quotes and project partner letters.

Submitting your Proposal

You should submit your proposal using the Research Councils' Joint electronic Submission (Je-S) System (<https://je-s.rcuk.ac.uk/>). When adding a new proposal, you should select Council 'EPSRC', document type 'Standard Proposal' and the 'Programme Grant' Scheme. On the Project Details page you should select the 'Energy Networks Grand Challenge' Call.

Note: clicking 'submit document' on your proposal form in Je-S initially submits the proposal to your host organisation's administration, not to EPSRC. Please ensure you allow sufficient time for your organisation's submission process between submitting your proposal to them and the Call closing date. EPSRC must receive your application by 16:00, 29 September 2010. Proposals received any later will not be considered.

For further information on the Je-S system please see:
<http://www.so.stfc.ac.uk/jes/jes1/jes1system.asp>, and for online help see
<https://je-s.rcuk.ac.uk/jesHandBook/jesHelp.aspx>.

6. Assessment Procedure

Proposals will be sent to anonymous peer reviewers for their comments. Once at least 3 usable reviewers' comments have been received EPSRC will carry out an initial rejection of any applications with insufficiently supportive comments. Those proposals that make it through this initial process will be sent the reviewers' comments and will be allowed to respond to any factual inaccuracies in them. At this stage, depending on demand, a shortlisting panel will be convened that will prioritise the proposals based on the reviewers' comments and the applicants' responses and recommend to EPSRC which proposals should be invited forward to the final interview stage.

The proposals that are invited to interview will be asked to provide a position statement explaining how they will interact with the Supergen Networks Hub. The interview panel will use the reviewers' comments as their primary source of reference, particularly with respect to any technical aspects of the proposal. The panel will have leave to ask the applicants for additional information and clarification, concentrating primarily on the fit to the assessment criteria and the ethos of the Grand Challenge approach.

7. Assessment Criteria

Grand Challenge proposals will be assessed against the following criteria:

- **Quality of research**
The proposal must demonstrate that research of the highest quality will be undertaken by a world-leading team. The research programme must be ambitious, creative and innovative addressing a combination of the research strands in Figure 1 in such a way that deliver the Grand Challenge. It must clearly state why the challenges are ambitious; applicants should set the

proposed research in context in terms of the current state of knowledge and other work under way in the field. The research programme must also have significant impact beyond its immediate group.

The Principal Investigator must have brought together a world-class team with complimentary expertise so as to enhance the potential to address the Grand Challenge.

- **Added value**

The proposal must demonstrate the need for Grand Challenge funding, i.e. the advantages and benefits of supporting a coherent programme of inter-related research strands rather than individual project grants. It must also discuss the value of the longer-term funding and how the flexibility of both staff and other resources will be exploited.

Why it is important to undertake this research programme now, how it adds to or compliments other national and international research programmes and how it fits to the area of interest should be demonstrated. The importance and alignment of the research to the strategy of the respective Universities should also be articulated.

- **Overall Vision and Ambition**

The proposal must articulate how it will prepare the UK's energy infrastructure for 2050. It is expected that the research vision will be ambitious, transformative and would result in a significant step change in knowledge and understanding which will have a major impact on the research area. It should significantly raise the international profile of the UK in this area.

- **Leadership quality**

All recent reviews on EPSRC's critical mass activities stress the importance of good leadership skills. Effective leadership is essential to drive the projects forward to ensure all members of the team are focussed on the overall vision. Leaders need to not only be scientific leaders in their field but also be able to establish consensus, motivate their staff and take executive action to ensure the research objectives are met. The leadership skills needed to drive the research programme forward will primarily be assessed at the interview stage, but the core capability should be articulated in the proposal.

- **Management strategy**

The proposal must demonstrate that there is a clear management plan which will ensure that resources, including manpower are deployed in the most effective way to deliver high quality research outputs that address the Grand Challenge and have the potential to induce a step-change in the knowledge of the subject area. It is expected that the deliverables and milestones will be routinely reviewed to ensure that the exciting and promising lines of research are pursued, research no longer delivering the Grand Challenge vision is no longer funded through the grant, and that sufficient resources are assigned to ensure the project is professionally managed. For more advice, see Management of large research activities and centres

<http://www.epsrc.ac.uk/funding/managing/Pages/largeactivities.aspx>

- **Pathways to Impact**

The proposal must demonstrate that a strategy is in place to ensure maximum impact of the research is realised. Details of this route to impact should be contained in the Pathways to Impact document. For more information and advice please see Economic Impact – Guidance for Applicants, which includes the Research Councils UK definition of economic impact.

<http://www.epsrc.ac.uk/funding/apprev/preparing/Pages/economicimpact.aspx>

- **Advocacy for Engineering and the Physical Sciences**

The proposal must demonstrate how the group will be advocates for engineering and the physical sciences. Applicants should specifically address how they will influence policy makers on the importance of engineering and physical sciences. Advocacy through public engagement activities can also be considered, as long as these activities are directly related to the programme of research applied for. This criterion will solely be assessed at the interview stage.

8. Contact Details

Further details about the process and application procedures can be obtained from:

Dr Andrew Wright
Senior Energy Strategy Manager
RCUK Energy Programme
Phone: 01793 444356
Email: andrew.wright@epsrc.ac.uk

If you experience difficulties using Je-S or have questions regarding its use, the helpdesk can be contacted on:

Tel: 01793 44 4164
Email: JeSHelp@rcuk.ac.uk