

Low Carbon Cities Research

UK (EPSRC) - China (NSFC)

Call type: Invitation for proposals

Closing date: 16:00 on 28 April 2015

Related themes: Energy, Urban Living

Summary

Building on five years of successful collaborative research programmes funded jointly by the Natural Sciences Foundation of China (NSFC) and the UK Engineering and Physical Sciences Research Council (EPSRC) in Energy research, we are inviting proposals to our latest joint call in the area of Low Carbon Cities research between China and the UK. A scoping workshop was held in Chengdu, China in January 2015 to identify themes for this call.

Low Carbon Cities combines research to reduce the carbon emissions of existing technologies and fundamental research into alternative energy sources and a reduction of energy demand, all with a focus on future urban environments.

Such research requires a multi-disciplinary approach, combining technological expertise with an understanding of societal factors including public policy that govern uptake. Significant sub-themes include:

- Low Carbon Transportation
- Smart and Efficient Buildings
- Low Carbon District Heating/Cooling

This is a call for proposals that aims to foster collaboration between UK and Chinese academics who work in the field of Low Carbon Cities. Proposal should include at least one academic from both the UK and China and should demonstrate truly collaborative working which will lead to impactful outcomes.

The proposals will be **assessed using an expert panel** which will include key academic and industrial researchers who work in the Low Carbon Cities space. This call is expected to address key challenges that were identified at the scoping workshop attended by leading UK and Chinese researchers, held in Chengdu, China.

The call **closes at 16.00 on 28 April 2015** with the first part providing **up to £3.3M**, for **grants up to £800K** available from EPSRC for this call and the second part providing **up to £1.2M** available for a specific research area from Newton funding. Applicants must choose to apply for **either** the EPSRC funded or Newton funded streams.

Please note that significant interest in this call is expected. Please bear this in mind and think very seriously when considering how and whether to develop your proposal, and only take it forward if

you are very sure that it will be competitive at this level. This call is subject to EPSRC demand management policy.

Background

In order to continue the excellent collaborative work already carried out through joint EPSRC, through the Energy Programme, and NSFC have agreed to initiate a joint programme focused on Low Carbon Innovation. This programme is designed to fulfil the following aims:

- Reduce worldwide CO₂ production
- Ensure energy affordability and security for each country
- Build lasting best with best academic relationships between China and the UK in an area vital to both countries

This call is intended to tackle emerging issues associated with achieving low Carbon Cities. By using comparative research to examine social, political and technical challenges, this will help the UK and China to successfully transition towards future low carbon cities.

A workshop to scope the challenges facing low carbon cities was held in Chengdu, China in January 2015 and the remit of the call was developed at the workshop.

A sister call is being run by Economic and Social Research Council (ESRC) in parallel to this, on Urban Transformations. For further details, please search for 'Urban Transformations in China' on the ESRC website (<http://www.esrc.ac.uk/>).

For more information about EPSRC's portfolio and strategies, see our website: <http://www.epsrc.ac.uk/research/ourportfolio/>

Funding available

Up to £3.3M from EPSRC and up to £1.2M from Newton funding (details below) available to support proposals under this call. EPSRC expects to fund up to 6 projects in total (up to 4 from the EPSRC funded challenges and up to 2 from the Newton funded challenges). Projects may be for **up to 3 years**. For each project there should be a single Je-S form submitted although the project can be multi-institutional. Each proposal must include at least one UK and Chinese academic.

In order to focus effort applicants are only permitted to be involved in a maximum of two proposals; as a Principle Investigator (PI) on one proposal and a co-investigator on another proposal or as a co-investigator on a maximum of two proposals.

The Newton Fund

The Newton Fund was launched by the Chancellor in April 2014, and will deliver £375 million of funding over the course of five years. The Fund forms part of the UK's Official Development Assistance (ODA) commitment which is monitored by the Organisation for Economic Cooperation and Development (OECD). ODA funded activity focuses on outcomes that promote the long-term sustainable growth of countries on the OECD.

For information about the Research Councils' activities under the Newton Fund, please see the RCUK Newton Fund webpage for a list of calls and links to the relevant Research Council website, as well as relevant contact details for each initiative: <http://www.rcuk.ac.uk/international/newton/>

Remit of the call – part one (EPSRC funded)

At the workshop, socio-technical multi-disciplinary research was acknowledged as an important part of answering the challenges which were subsequently identified. This is of particular importance when considering and understanding the impact of policy interventions and forms of governance, understanding how history and context matter for low carbon transition as well as identifying trends of socio-technical change and their implications.

Proposals should be focused on one of the following three challenges:

1) Delivering economic and energy-efficient heating and cooling to city areas of different population densities and climates.

This challenge will require cross-disciplinary research and is wide ranging from measurement of real performance in new and existing buildings to investigating the use of passive and active systems within integrated design, for example.

When answering this challenge, applicants should focus their efforts on the following deliverables:

- Improve living conditions and comfort levels within buildings for people.
- Developing / encouraging uptake of economic and energy-efficient Low carbon district heating and cooling systems.
- Understanding the current heating and cooling behaviour / practices in buildings, leading to smart considerate solutions.
- Develop systems modelling for the built environment, including energy simulations as well as monitoring, surveying and measuring peoples comfort.

2) Integration of monitoring and modelling to achieve better operational performance of built assets (which includes transport and buildings infrastructure)

This challenge requires a holistic systems modelling (People, buildings, infrastructure, technologies) approach, which may including a historical analysis. Monitoring, measurement and analytics will be crucial in informing anything from socio-technical research to city scale architectural or urban design.

This research should deliver any of the following to answer the overarching challenge:

- Build and manage datasets on a district scale, which may include aggregation of existing historical datasets.
- Deliver accurate modelling of human behaviour on a city / district scale
- Provide support tools to understand the operational performance of built assets.
- Understanding on what needs to be measured, which could inform 'install and forget' sensor deployment strategies
- Provide guidance to asset owners, manager and operators and inform policy

3) Mitigating the impact of localised climate change through built assets (which includes transport and buildings infrastructure), the urban environment and low carbon transport systems within cities

The rapid urbanisation of China, similarly to Britain of the late 1800s, has had serious implications for the urban environment, particularly in relation to carbon emissions. In addition to the environmental impact, there is a significant and unequal impact on population health and wellbeing in cities making this an important issue for socio-technical study. Especially considering, environmental problems transcend national boundaries.

In order to answer this challenge, research will be required in a range of areas, including: The correlation between urban form and microclimate, option appraisal against various scenarios including extreme events as well as understanding and mitigating against the effect of short term vulnerability (5-10 year) and long term change (up to 100 years) on built assets. In addition, research could be carried out in order to enhancing city wide health and wellbeing.

This research could lead to a number of outcomes, including: Mitigation and adaptation strategies, the impact on local urban climate of build asset design as well as deliver robust built assets that are resilient, flexible and adaptable.

Proposals may also investigate low carbon transport, smart / intelligent traffic management systems (including Internet of Things (IoT) usage) as well as ways to retrofit existing systems to make them less carbon intensive. This research could deliver a range of outcomes, including: Road maps for science and technology policy, understanding and managing transitions, recommendation for demonstration and monitoring as well as providing evidence of the potential of alternative low carbon transport deployment.

Remit of the call – part two (Newton Fund)

Proposals submitted under this strand must comply with requirements under the Newton Fund. Proposals that do not do this sufficiently will be rejected (please see additional annex). The proposals for this part of the call must be focused on the following challenge:

4) How can we develop new built assets (which includes transport and buildings infrastructure) that allows flexibility to meet future needs in China

Chinese urban development continues to grow at an enormous rate. It is estimated that 1 billion people will live in an urban environment in China by 2025. The research required to fulfil this challenge includes: Investigating green infrastructure of urban space / parks, rain and waste water management which could inform policy and city planning; Modelling simulations on a city scale; Understanding historical perspective, uptake studies and future needs.

When answering this challenge, applicants should consider focusing their efforts on the following deliverables:

- Design guidance and software tools
- Use of new materials
- Resilient and adaptive building fabric
- Consider how current infrastructure will produce future needs

Due to this strand being funded under the Newton Fund, proposals cannot address this challenge alongside any other challenges addressed in part one. Up to £1.2M will be available for this strand. EPSRC expects to fund 2 proposals in this section.

Please note: When applying for this strand, the proposal must include up to 150 words describing how the proposed research fits the ODA requirements of the Newton fund.

Equipment

Where possible, researchers are asked to make use of existing facilities and equipment, including those hosted at other universities. If equipment is needed as part of the research proposal, applicants must follow EPSRC's rules for requesting equipment over £10,000 in value. Individual items of equipment up to the current OJEU (Official Journal of the European Union) procurement threshold can be included on research proposals submitted through this call, but research organisations will be expected to make a contribution to the cost. All requests for single items of equipment above the current OJEU threshold will need to go through a separate process which will assess the strategic need for the equipment and how to ensure maximum usage. These proposals will be assessed through the separate Strategic Equipment peer review process.

The current OJEU threshold can be found at:

<http://www.epsrc.ac.uk/research/facilities/equipment/process/>

Call criteria

In addition to the usual requirements proposals must:

- Demonstrate a true integrated, active and balanced partnership between research groups from both the UK and China.
- Show how the project will build new or substantially stronger links between UK and Chinese research groups.
- Involve personnel exchange between the UK and Chinese partners.
- Demonstrate transfer of knowledge between partners both ways throughout the project.
- Demonstrate the adventure and novelty of the research and its relevance to the broader relevant sustainable energy agenda.
- Demonstrate how the outputs of the project will be communicated to stakeholders in academia, industry and government, in both the UK and China.

Eligibility

All applications must be collaborations between UK and Chinese researchers.

For information on the eligibility of organisations and individuals to receive EPSRC funding, see the EPSRC Funding Guide: <http://www.epsrc.ac.uk/funding/howtoapply/fundingguide/>

As this call is a targeted funding opportunity provided by EPSRC, higher education institutions, and some research council institutes and independent research organisations are eligible to apply. A list of eligible organisations to apply to EPSRC is provided at:

<http://www.rcuk.ac.uk/funding/eligibilityforrcs/>

How to apply

As this is a joint application to EPSRC and NSFC applicants must ensure that identical proposals are submitted by the closing date to both EPSRC and NSFC. The UK application should be submitted through the Research Councils' Joint electronic Submission (Je-S) System as detailed below. The NSFC application should follow the instructions in their call document.

A **UK based lead partner** and a **China based lead partner**, should be identified each of whom will lead on interaction with the funding agency in their respective countries.

The **UK based lead partner** should ensure the application is submitted via the Je-S system. If the UK application comes from multiple institutions then the application should be made on a single Je-S form from the UK based lead partner's host institution.

The **China based lead partner** will submit the identical proposal using the same common proposal format to NSFC by the stipulated closing date – which is the same as the UK call.

Proposals involving industrial collaborators are welcomed but costs for these partners will not be covered by NSFC/ EPSRC through this call.

Please note: We **do not** require full CVs, supporting technical annexes or separate lists of publications. Any excess material will be removed from your application. If you wish to refer to additional supporting information, please use a web link in your case for support but we cannot guarantee that the reviewers will consider additional web material. Papers for the prioritisation panel (see further detail below) are converted and copied in greyscale/black and white, therefore colour material will not be accurately reproduced.

Both applications should feature an identical case for support written in English.

Submitting an application

You should prepare and 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'
- Scheme 'Standard'
- On the Project Details page you should select 'Low Carbon Cities Research Call UK (EPSRC)- China (NSFC)'.

Note that clicking 'submit document' on your proposal form in Je-S initially submits the proposal to your host organisation's administration, not to EPSRC. Please 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 on 28 April 2015.

Guidance on the types of support that may be sought and advice on the completion of the research proposal forms are given on the EPSRC website (<http://www.epsrc.ac.uk/funding/howtoapply/fundingguide/>) which should be consulted when preparing all proposals.

Guidance on writing an application

The proposal document should be a minimum font size of 11pt with the preferred typeface being Arial. The proposal should include the following sections:

Joint Case for support

For each collaborative project proposal, the UK and Chinese investigators should prepare a single case for support in English that should be submitted to both EPSRC and NSFC as detailed above. This common case for support will allow for EPSRC and NSFC to obtain reviews of the same document, coming together in a single joint expert panel decision meeting. Applicants to EPSRC will also need to include a pathway to impact plan, a work plan, a justification of resources and a joint proposal form.

The submission to EPSRC should provide full budget information for the UK costs and must have a single proposal form covering all UK partners. The submission to NSFC should include full budget information for the Chinese costs. We expect that each nation will request for travel and subsistence only for their own investigators and researchers.

Proposals should follow the standard EPSRC format and guidelines on proposal preparation, but should also include information tailored to this call as specified below.

Previous Track Record (maximum 2 sides of A4). Please ensure you also outline the specific expertise of all the UK and Chinese applicants in this subject area, and the expertise available at the UK and China host organisations.

Proposed Research and its Context section (maximum 8 sides of A4). Please prepare according to the standard guidance but you should ensure that the case covers the whole project and team such as:

- Introduce the topic of research and explain its academic and industrial context, demonstrating how it relates to leading research in the UK, in China and worldwide;
- Detail why the research proposed is of national importance to both the UK and China.
- Describe the overall programme of work, indicating the research to be undertaken, and the milestones that will be used to measure its progress. You should describe the roles of each member of the research teams in the UK and China;
- Detail how the proposed project will be managed across the two countries, with particular demonstration of the added benefits to each party due to the collaboration.

Pathways to Impact Plan (up to two sides of A4). In this section you should describe how the potential impacts of the proposed research will be realised and this should cover the project as a whole.

Work Plan (one page diagrammatic work plan, for example, a PERT or Gantt chart). This should cover the project as a whole, detailing significant milestones and showing how different aspects of the project will link together and be managed.

Justification of Resources (up to two sides of A4). This should detail the resources requested for the UK-China project as a whole. You should justify everything requested on both proposals, so that peer reviewers have enough information on the project as a whole to understand why the resources requested are necessary for your proposed project.

CVs (up to 2 sides of A4 each) for named researchers, visiting researchers and researcher co-investigators

Statements of support from any project partners (no page limit).

Joint proposal form detailing the funding requested from NSFC and other details on the Chinese partners; this is available on both NSFC and EPSRC's website. This document enables reviewers to have an overview of the complete project. The form should be uploaded as an 'additional document' within Je-S.

For advice on writing proposals see: <http://www.epsrc.ac.uk/funding/howtoapply/preparing/>

Assessment

Assessment process

The common case for support across the whole UK-China project allows for a joint peer review and a single expert panel process for this call.

Proposals will be reviewed via an expert peer review panel, carried out by EPSRC and NSFC, and those that receive supportive responses from the reviewers will then be considered by a single joint UK-China assessment panel. The expert panel will be asked to assess the proposals against the fit to the call and the usual EPSRC assessment criteria. Please note: As this is an expert panel process there will be no right of reply for applicants as the peer review stage will happen at the panel, itself. The panel will rank the proposals using the assessment criteria and only the top ranked proposals will be funded. Please note that if two or more proposals are received in the same research area EPSRC and NSFC reserve the right to fund only the highest ranked of those proposals in order to avoid duplication of effort. Funding decisions will be made by June 2015.

Assessment criteria

The proposals will be assessed on their fit to the scope of the call and to the standard EPSRC criteria as follows:

Quality

- The novelty, relationship to the context and timeliness
- The ambition, adventure, and transformative aspects identified
- The appropriateness of the proposed methodology

Importance

- National importance of this research on a 10-50 year timescale
- Contribution to other research areas, societal challenges, success of the UK economy, emerging industries

Impact

- The relevance and appropriateness of any beneficiaries or collaborators
- Whether appropriate routes and resources have been identified for dissemination and knowledge exchange

Applicants' ability to deliver the proposed research

- Appropriateness of the track record of the applicants

- Balance of skills of the project team, including academic and non-academic partners

Resources and management

- The effectiveness of the proposed planning and management
- Appropriateness and justification of the requested resources

Fit to the call

Proposals should address one or more of the challenges detailed above.

Additional Grant Condition

Grants funded under the Newton Fund will have the following grant condition placed on their grant.

GAC 01 Newton Fund

This project was funded under the terms of the Newton Fund. The Newton Fund is part of the UK's Official Development Assistance (ODA). Its aim is to develop science and innovation partnerships that promote the economic development and welfare of developing countries. The investigators must ensure the research that is undertaken as part of this grant is compliant with ODA rules and regulations as set out under the Newton Fund programme. The investigators must acknowledge the Newton Fund and EPSRC in any publications or events associated with this grant.

Key dates

| Activity | Date |
|---------------------------|----------------------------|
| Call for proposals issued | 26 February 2015 |
| Deadline for proposals | 16:00 28 April 2015 |
| Panel Meeting | Week beginning 8 June 2014 |
| Grants issued | End of June 2015 |
| Expected start date | 01 September 2015 |

Contacts

If you have any enquiries about the scope of the call or the process for review, please contact:

Dr Glenn Goodall

EPSRC Energy Theme / RCUK Energy Programme

EPSRC, Polaris House, Swindon, SN2 1ET

Tel: 01793 444 427

Email: glenn.goodall@epsrc.ac.uk

If you have problems using Je-S or have questions regarding its use, the helpdesk contact details are:

Email: JeSHelp@rcuk.ac.uk

Phone: +44 (0) 1793 444 164

Please contact your organisation's research office for help with the application process. Allow enough time before the closing date for your organisation's submission process.

Change log

| Name | Date | Version | Change |
|---------------|------------|---------|--|
| Glenn Goodall | 17/02/2015 | 1 | N/A |
| Glenn Goodall | 04/03/2015 | 2 | Rewrote 'Fit to the call' section as this was misleading |
| Glenn Goodall | 06/03/2015 | 3 | Amended spelling error and clarified how many projects could be funded |
| Glenn Goodall | 18/03/2015 | 4 | Extended closing date to compensate for the Je-S down time due to a systems upgrade (16 – 22 April 2015) |