



## Atmospheric Pollution and Human Health in a Chinese Megacity A UK-China Collaboration

### Announcement of Opportunity (AO) – Call for Expressions of Interest

Closing date for Expressions of Interest: 8:00 UK time and 16:00 China time on 6 March 2015

Closing date for Full Proposals: 8 May 2015 (TBC)

#### 1. Summary

The Natural Environment Research Council (NERC), the Medical Research Council (MRC) and the National Natural Science Foundation of China (NSFC) are investing in a strategic research programme on urban air pollution in the megacity Beijing and impacts on health. This will be delivered by research partnership between UK scientists and Chinese scientists.

Urban air pollution is a severe problem in China with significant impacts on the economy and the health of the population. This programme will support research on the sources and emissions of urban air pollution in China and the processes underlying and impacting on this, and how air pollution impacts on health. This will be combined to understand the effect of interventions and thus form cost effective and appropriate solutions for the benefit of the population.

NERC and MRC have a budget of £5.5m (£3m of which is from the Newton Fund) for the overall programme and NSFC have 40m YUAN. NERC/MRC funds will specifically be used to support UK researchers, while NSFC funds will fund Chinese researchers. The programme is split into four themes:

- sources and emissions of urban atmospheric pollution;
- processes affecting urban atmospheric pollution;
- exposure science and impacts on health; and
- interventions and solutions.

It is expected that there will be one collaborative grant within the sources and emissions theme; one collaborative grant within the process theme; two collaborative grants on the exposure science and health theme; and one collaborative grant on the integration and solutions theme. In order to allow integration between the different themes, it is expected that research will be based in Beijing.

**All applications must be collaborations between UK and Chinese researchers.** Applications to this call must be in English.

This delivery of this programme is part of a three stage process. This is a call for Expression of Interest which will be submitted via email and will be sifted based on remit. Successful applicants will then be invited to submit a Full Proposal which will go through external peer review and then to a Moderating Panel. Leading members of the successful Full Proposal teams will attend a kick-off workshop in advance of the award of grants where they will identify integrative and coordination activities between the different grants and themes and develop a detailed implementation plan. Grants will start in January 2016 and will be up to four years long.

## 2. Background

### 2.1 Science background

Worldwide, populations are rising and more people are living in cities. This increase will be most dramatic in Asia and Africa, which are least urbanised at present, leading to the development of more “megacities”. A megacity is usually defined as a metropolitan area with a total population in excess of ten million people. Although the definition depends on where the line is drawn in terms of boundary (built up area, urban area, administrative area) and whether population estimates are accurate, especially with rapid growth as is seen in many Chinese cities

Megacities hold many challenges, including social and cultural change, crime and terrorism, homelessness, traffic congestion, urban sprawl and environmental issues. In China, urban air pollution is a severe problem with occurrence of haze increasing in severity and frequency between the 1950s and 2000s, caused by the particular weather conditions and increasing pollution. Five hundred million people in 86 cities are thought to be affected by haze in China. As a consequence, there is an increased prevalence of asthma and other respiratory problems in children. China is faced with one of the highest particulate matter concentrations, and in particular PM<sub>2.5</sub> concentrations, which regularly exceed World Health Organisation (WHO) air quality guidelines in Beijing, Shanghai and Guangzhou. This has been linked to higher health risks to the cardiovascular system, cerebrovascular system and an increase in the probability of cancer and premature death. The Chinese government has acknowledged the problems and made various responses, but to date the improvements are small.

Huge progress has been made in improving air quality in the developed western world and the sulphur-based smogs of the 19<sup>th</sup> and 20<sup>th</sup> centuries no longer afflict UK cities. There is a strong temptation to assume that the approaches taken to improve air quality in the developed world will also be those most appropriate to improvement of air quality in the cities of China. Such a view is, however, naive as the causes of pollution are likely to be different from those in the western world of the 1950s and 1960s when air quality policies first became established. For example, if wind-blown soil and dust, biomass burning or secondary organic compounds formed from natural emissions are major contributors to airborne particulate matter, mitigation measures would be very different to those required if the major source is from coal combustion or road transport. Furthermore, it would be very difficult to transfer mitigation strategies of sources acting in isolation in other countries where the co-presence of different sources and interactions of different pollutants will result in a very different situation in China. Additionally, the specific weather and climate of China, and the physical structure of these megacities (e.g. numerous very tall buildings) make for a very different situation. It is therefore unwise to use expensive monitoring and compliance technologies designed many decades ago for US and European cities.

While it is assumed that the exposure-response functions for air pollutants determined through epidemiological studies in the western world are applicable to the situation in China, there have been rather few studies to cast light on this question. It is likely that important differences exist, especially for particulate matter, as the sources and chemical composition are likely to be very different to the mix which prevails in western cities. In addition, diets and genetic predisposition to certain health outcomes will likely be very different in other regions of the world, affecting the susceptibility of the population to air pollution related health effects. Recent medical advances in systems biology, toxicology and monitoring of human population environmental exposures could allow strong interdisciplinary links to be made between research in air pollution and human health, for example in vulnerable groups such as children and the elderly.

Consequently, studies are urgently needed in Chinese megacities in order to: understand the sources and emissions of urban air pollution; understand the chemical and physical processes affecting air pollutants; explore associations between air pollutant exposure and disease; provide predictive capability for the impact of mitigation measures; and create sustainable monitoring and compliance technologies. This needs to then feed into feasible solutions both in technology and policy for the benefit of the population.

## *2.2 Programme background*

Atmospheric Pollution and Human Health in a Chinese Megacity is a strategic research programme jointly supported by the UK's Natural Environment Research Council (NERC) and the Medical Research Council (MRC), and the National Natural Science Foundation of China (NSFC). This programme will be delivered by research partnership between UK and Chinese scientists. NERC and MRC have jointly made available £5.5m for this programme (including support from the Newton Fund) and NSFC have 40m YUAN. As an initial step to help build partnerships and facilitate collaboration, NERC, MRC and NSFC, with support from RCUK China and the Chinese Academy of Sciences (CAS) Institute of Atmospheric Physics, held a joint workshop on 14-16 July 2014 in Beijing. The aim of the workshop was to discuss the key science challenges that relate to the aims of this programme and how they could best be addressed. It facilitated networking and discussion, and also enabled researchers to share ideas on key research questions relevant to a research call. The outcome of the workshop has been used to shape the scope of this call for research proposals. The full information on this workshop can be found on the NERC programme pages<sup>1</sup>. All potential applicants are encouraged to read the information about the workshop in order to be fully informed before submitting an application to this call.

In the UK, NERC is the leading public funder of environmental science with the vision to place environmental science at the heart of responsible management of our planet. The NERC strategy "The Business of the Environment" identifies three strategic priority areas for research to meet society's needs: 1) benefiting from natural resources; 2) resilience to environmental hazards; and 3) managing environmental change. This programme addresses the second area in particular, but also has relevance to the other two.

MRC's mission is to: encourage and support high-quality research with the aim of improving human health; produce skilled researchers; advance and disseminate knowledge and technology to improve quality of life and economic competitiveness, UK and worldwide; and promote dialogue with the public about medical research. MRC's strategic plan 2014-2019 "Research Changes Lives" aims to support medical research which increases the pace of the transition to better health. This includes environment and health research which will explore the impact of our environment on health and wellbeing, as is being delivered through this programme.

NSFC is a funding agency for basic research across China, with a remit covering all research areas, except social science and humanities.

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<sup>1</sup> <http://www.nerc.ac.uk/research/funded/programmes/atmospollution/#xcollapse4>

### 2.3 Newton Fund

Part of the NERC funds and all of the MRC funds for this programme have been received directly from the Department for Business, Innovation & Skills (BIS) as part of the Newton Fund<sup>2</sup>. The Newton Fund intends to strengthen science and innovation partnerships between the UK and emerging knowledge economies. 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)<sup>3</sup>. ODA funded activity focuses on outcomes that promote the long-term sustainable growth of a sub-set of countries on the OECD Development Assistance Committee list<sup>4</sup> and is administered with the promotion of the economic development and welfare of developing countries as its main objective. The fund covers three broad categories of activity: i) people: improving science and innovation expertise (known as "capacity building"), student and researcher fellowships, mobility schemes and joint centres; ii) programmes: research collaborations on development topics; and iii) translation: innovation partnerships and challenge funds to develop innovative solutions on development topics. Of these, this programme relates partially to the first and more majorly to the second activity. Collaborations under the call will contribute to economic development and social welfare China, in line with the Newton Fund's aims. All applications under this call must be compliant with these specifications (see this point under section 6.2.2).

### 3. Investments to build on

NERC has made previous investment in urban atmospheric science and health research, including the Urban Atmospheric Science programme which funded the ClearFlo (Clean Air for London) project<sup>5</sup> which used long-term integrated measurements complemented by modelling to improve predictive capability for air quality. With other funders, including MRC, NERC led the Environmental Exposure and Health Initiative (EEHI) which funded new knowledge on the interconnections and pathways between pollutants and interacting stressors, exposure routes and health effects in humans. This included the TRAFFIC project<sup>6</sup>, which aims to better understand the health problems caused by air pollution and noise from traffic in London, and the AWESOME project<sup>7</sup> (Air pollution and WEather-related health impacts: methodological study based on Spatio-temporally disaggregated multi-pollutant models for present-day and future), which is examining the effects of air quality and climate policies on air pollutant exposures and health. The MRC-PHE Centre for Environment and Health also carries out work on urban air pollution and health, as well as the exposome and health. More broadly, the MRC also funds research in this area, including research grants exploring environmental exposure and chronic disease, and strategic investments, in particular the MRC-Public Health England Centre for Environment and Health in London. The Centre brings together leading research groups in environment and health to support diverse themes including Air Pollution (Noise and Health), the "Exposome", Small Area studies, Systems Toxicology, Biostatistics and Cohort studies. In particular, the "Exposome" concept is a new paradigm in systems biology 'omic' techniques (metabolomic, epigenomic, transcriptomic, proteomic, adductomic, etc.) that seeks to develop and validate biomarkers as measures of the totality of individual human exposure (including chemical and biological agents, radiation, psychosocial, etc.) to improve understanding of the links between environment and chronic disease. More broadly, this includes the European Commission (EC) funded EXPOSOMICS project<sup>8</sup> that includes development of personal

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<sup>2</sup> <https://www.gov.uk/government/publications/newton-fund-building-science-and-innovation-capacity-in-developing-countries/newton-fund-building-science-and-innovation-capacity-in-developing-countries>

<sup>3</sup> <http://www.oecd.org/>

<sup>4</sup> <http://www.oecd.org/dac/stats/DAC%20List%20used%20for%202012%20and%202013%20flows.pdf>

<sup>5</sup> <http://www.clearflo.ac.uk/>

<sup>6</sup> <http://www.kcl.ac.uk/biohealth/research/divisions/aes/research/ERG/research-projects/traffic/index.aspx>

<sup>7</sup> <http://awesome.lshhtm.ac.uk/>

<sup>8</sup> <http://www.exposomicsproject.eu/>

exposure monitoring systems to continuously assess exposure to the individual. There are also numerous cohorts in Europe looking at air pollution and health, including the ESCAPE network (European Study of Cohorts for Air Pollution Effects)<sup>9</sup> and the SAPALDIA study (Swiss Cohort Study of Air Pollution and Lung Disease in Adults)<sup>10</sup>. There have also been investments by the EC in air pollution in China, including MARCO POLO (Monitoring and Assessment of Regional air quality in China using space Observations, Project Of Long-term sino-european co-Operation) and PANDA (Partnership with ChiNa on space Data)<sup>11</sup>.

#### **4. Scientific scope of themes**

This section sets out the scientific objectives of the individual themes for this call and also includes the specification of context and approaches. Applicants should address all of the scientific objectives laid out in the theme for which they wish to apply and should also adhere to the specification of the context and approaches. If applicants fail to meet any of the specifications outlined below then the funders reserve the right to reject their application.

##### *4.1 Sources and emissions of urban atmospheric pollution theme*

###### 4.1.1 Delivery

It is expected that there will be one grant funded to deliver this theme. The UK has a budget of £2.1m (at 80% FEC) for this theme and NSFC has a budget of 15m YUAN. Grants will start in January 2016 and be up to four years in duration.

###### 4.1.2 Scientific objectives

In this theme it is expected that proposals address the following scientific objectives:

- Implement an urban atmospheric pollution measurement campaign at an appropriate scale, both spatially and temporally, in particular to align with the objectives of research on air pollution and human health. This measurement campaign will be linked to other measurements required as part of the other objectives, below.
- In-situ characterisation of the nature (both chemical and physical components) of urban atmospheric pollution/pollutants, considering relevance to individual exposure.
- Understand source apportionment of urban atmospheric pollution/pollutants and link this back to the chemical composition of urban atmospheric pollution/pollutants.
- Improve and verify appropriate existing emission inventories in the context of the sources, relevance to health, and future scenarios.

Applicants are encouraged to ensure that there are links between the different objectives. It is expected that applicants will address in approximately equal amounts the regulated pollutants of PM, NO<sub>2</sub> and ozone, although other pollutants can be included also.

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<sup>9</sup> <http://www.escapeproject.eu/>

<sup>10</sup> <http://www.sapaldia.net/en/>

<sup>11</sup> <http://www.marcopolo-panda.eu/>

## *4.2 Processes affecting urban atmospheric pollution theme*

### 4.2.1 Delivery

It is expected that there will be one grant funded to deliver this theme. The UK has a budget of £1.4m (at 80% FEC) for this theme and NSFC has a budget of 10m YUAN. Grants will start in January 2016 and be up to four years in duration.

### 4.2.2 Scientific objectives

In this theme it is expected that proposals address the following scientific objectives:

- Implement an urban atmospheric pollution measurement campaign at an appropriate scale, both spatially and temporally, in particular to align with the objectives of research on air pollution and human health. This measurement campaign will be linked to other measurements required as part of the other objectives, below.
- Understand the chemical processes of importance for controlling regional haze and individual exposure.
- Understand the physical processes of importance for controlling regional haze and individual exposure.
- Use the above data to create new and improved existing predictive modelling capability of urban atmospheric pollution.

Applicants are encouraged to ensure that there are links between the different objectives. It is expected that applicants will address in approximately equal amounts the regulated pollutants of PM, NO<sub>2</sub> and ozone, although other pollutants can be included also.

## *4.3 Exposure science and impacts on health theme*

### 4.3.1 Delivery

It is expected that there will be two approximately equal sized grants funded to deliver this theme. The UK has a budget of £1.2m (at 80% FEC) for this theme and NSFC has a budget of 10m YUAN. Grants will start in January 2016 and be up to four years long.

### 4.3.2 Scientific objectives

The aim of this theme is to enhance our understanding of the impact of environmental exposures on human health, capitalising on novel measurement technologies and advanced research approaches in environmental epidemiology and internal signatures of exposure. In this theme it is expected that proposals address the following scientific objectives:

- Building on understanding of the health threats from air pollution in the urban setting, define and measure the key atmospheric pollutants present, and their speciation.
- Develop improved personal measures (e.g. personal monitoring; metabolomic, proteomic, epigenetic, etc.; biomarkers) of spatial and temporal exposure to these key pollutants that can be applied in the population setting.
- Explore the causal relationships between exposure and health/disease of individuals in the population setting.

Collaborative partnerships between the disciplines required to tackle the development of these measures are strongly encouraged; for instance, between population health scientists and physical/engineering scientists (e.g. in the development of innovative sensors), toxicologists, chemical biologists and fundamental biomedical researchers.

#### *4.4 Interventions and solutions theme*

##### 4.4.1 Delivery

It is expected that there will be a single grant funded to deliver this theme. The UK has a budget of £0.6m (at 80% FEC) for this theme and NSFC has a budget of 5m YUAN. Grants will start in January 2016 and be up to four years long.

##### 4.4.2 Scientific objectives

In this theme it is expected that proposals address the following scientific objectives:

- Test interventions which provide cost-effective, context specific, whole system and long sighted solutions for air quality challenges which demonstrate potential for positive impact on people's lives. Interventions must be appropriate to the situation but may consider tackling the pollution at source, exposure to pollution or further upstream looking at preventative or precautionary approaches. They should consider health benefits, cost-benefit more broadly, risk, legal and policy, and other social and economic factors.
- Build capacity and establish long-term infrastructure for future investments, including sustainable monitoring and compliance technologies, and a platform for further collaborations.

This theme is strongly dependent on the other themes and thus to feed into the research above, the applicants must consider how they could draw together and integrate the science outputs from the other projects. In preparing their application, this framework should be considered at a project level and relate to the research plan. When the programme begins there will be a kick-off workshop for successful projects and a proposal will be submitted on additional activities for coordination and integration (see section 5.3) but this will differ from the project in this theme because it will be at a programme level and be additional activities which add value at this level.

#### *4.5 Specification of context and approaches*

To allow for integration between the different grants in the themes, proposals should focus on the Chinese megacity Beijing. There would be value in approaching the research via contrasting studies, either different cities in China or with UK/Europe. However, it would be expected comparisons with locations outside of Beijing would be based on existing data, rather than new observations.

Where regional and broader scale processes (such as emissions, removal and secondary chemistry) beyond the boundary of the megacity influence urban air quality these can be included in the application. However, the focus of this call and therefore any proposals submitted must be on the need for measurements and modelling at a local scale relevant to personal exposure and thus health.

It is expected that there be some form of measurement campaign in Beijing as part of this programme. However, applicants can include elements of chamber studies and other experiments and laboratory research to broaden the approach if they deem it necessary.

The funders recognise the importance of the inclusion of social and economic sciences in order to achieve the desired impact of the research. However, as this falls outside the remit of any of the funders it would be expected that any application submitted does not have more than 10% of their research activity covering basic social or economic research. There would not be an issue with using tried and tested social or economic science approaches (e.g. cost-benefit analysis) in order to set

results in a whole system viewpoint as this would not be considered as basic social or economic research.

The focus of this programme is outdoor urban atmospheric pollution. However, in order to understand the full picture of individual exposure, indoor measurements can be taken, but this should not be the emphasis of the research.

The focus of this programme is impacts of urban atmospheric pollution on health. While impacts on other issues such as agriculture and climate can be cited and explored if deemed necessary in order to set the work in a broader context, these should not be the main considerations, and these should not be investigated at the expense of looking at impacts on health.

## **5. Process and assessment**

### *5.1 Expression of Interest stage*

The Expression of Interest stage will be used to identify projects that will be invited to submit a Full Proposal. Only applicants successful at the Expression of Interest stage will be eligible to submit Full Proposals.

One Expression of Interest is required for each proposed project, giving information of both the UK and the Chinese applicants. Applicants must complete an Expression of Interest form, following the given specifications. The Expression of Interest form can be downloaded from <http://www.nerc.ac.uk/research/funded/programmes/atmospollution/news/ao/>.

Expression of Interest forms must be submitted via email as a word document both to NERC at [atmospheric@nerc.ac.uk](mailto:atmospheric@nerc.ac.uk) by 8:00 UK time (GMT) and NSFC at [xoc@nsfc.gov.cn](mailto:xoc@nsfc.gov.cn) by 16:00 China time on 6 March 2015. Applications received after this date and time will not be accepted.

Any Expression of Interest which does not use the template provided, comply with these specifications or exceeds the stated limits will be rejected. Applicants must fill in the specified boxes in the Expression of Interest form.

Expressions of Interest will be sifted by the funders based on the fit to the call specifications. On the NSFC side there will be a panel organised to review and rank the Expressions of Interest. Applicants will be given brief feedback summarising the reasons why the application was successful/unsuccessful. No further feedback will be available.

Applicants will be informed in March 2015 if they are to be invited to proceed to the Full Proposal stage.

The funders reserve the right not to fund up to the limit allocated to the call. The funders reserve the right to make changes to the budgetary limits of the grants, and to the process of commissioning grants if deemed necessary following the submission of Expressions of Interest.

### *5.2 Full Proposal stage*

Only applicants successful at the Expression of Interest stage will be invited to proceed to the Full Proposal stage.



Details on the submission and assessment procedures for Full Proposal will be provided to the PIs of successful Expressions of Interest in due course. It is expected that the call for Full Proposal will be open from March 2015 and the closing date for applications will be 8 May 2015 (TBC).

As an indication of expectations for this stage, UK applicants will be required to submit through JeS in a similar format to NERC Discovery Science Standard Grants. There will be some additional sections to the JeS application relating to the Newton Fund. UK applicants will be expected to submit their associated costs in JeS and Chinese applicants will be expected to submit through NSFC's system with their associated costs. Each project will have the same Case for Support document which will be attached in both JeS and NSFC's system.

There will be some additional travel and subsistence funds available to help support members from the UK to develop their partnerships with China in advance of submitting their Full Proposal. These will follow usual NERC T&S policy. Please contact NERC for further information.

It is expected that proposals will evolve between the Expression of Interest and the Full Proposal stage. Teams may wish to expand their partnerships and this will be acceptable, although it is expected that the UK PI and the Chinese PI remain the same. It is also expected that projects may wish to change the resources requested and this is acceptable providing they remain within the upper limits set by the call. Significant changes from the Expression of Interest or if there is any doubt then applicants should get in touch with NERC/NSFC to discuss.

The Full Proposals will go out to external peer review, before going to a Moderating Panel. The primary assessment criteria will be Excellence and Fit to Scheme (both Scientific and Non-scientific objectives).

### *5.3 Kick-off workshop*

The successful Full Proposals will be required to attend a kick-off workshop in China in October/November 2015 (specific date to be confirmed). It is obligatory that successful projects (at least two UK and two Chinese attendees per proposal) attend this workshop. The aim of this workshop is for project teams to come together and work with other successful proposals to explore opportunities to network, learn from each other and develop collaborative work that could add value to the initial investments. This integration might include various mechanisms such as: project integration (joint initiatives, meetings, regular communication, etc.); linking project plans/timelines/data dependencies/data flows; and possible exchange of staff. These follow-on activities are not intended to re-shape existing strategies but help refine and adapt where there is value and to build in additional research activities that could not be delivered by a single award alone. It will also allow for important agreements to be put in place regarding data sharing and access between the UK and China.

Following this workshop, a proposal of these activities will be prepared and then assessed. The final award of grants will not happen until the funders are satisfied with the proposal for this integration and coordination. Applicants should be aware that there will be no funds for these activities added to grants and therefore a degree of flexibility should be incorporated within the original application budget in order to allow for this integration and coordination.

## 6. Requirements

### 6.1 Grant requirements

It is expected that there will be:

- one collaborative grant on the sources/emissions theme;
- one collaborative grant on the process themes;
- two collaborative grants of roughly equal size on the exposure science and health theme; and
- one collaborative grant on the integration and solutions theme.

The budgets for each theme are:

- £2.1m from the UK and 15m YUAN from China for the sources/emissions theme;
- £1.4m from the UK and 10m YUAN from China for the processes theme;
- £1.2m from the UK and 10m YUAN from China for the exposure science and health theme; and
- £0.6m from the UK and 5m YUAN from China for the intervention and solutions theme.

**All UK funds are listed at 80% FEC.**

Applicants should remember to incorporate flexibility into their application budget in order to carry out activities for integration and coordination at the programme level (i.e. between different grants and themes) which will not be decided until after the decision on the successful Full Proposals (see section 5.3). There will be no additional funds for these activities. The final award of grants will not happen until the funders are satisfied with the proposal for integration and coordination.

Grants will start in January 2016 and will be up to four years long.

### 6.2 Fit to scheme

#### 6.2.1 Scientific objectives

The scientific objectives for each theme have been given in section 4. The applicants should make clear in their application how these are being addressed. As part of the scientific objectives, it is also a requirement that applicants follow the specifications laid out in section 4.5.

#### 6.2.2 Non-scientific objectives

There are several non-scientific objectives that applicants are expected to address:

1. Expression of Interest must include a UK lead and a Chinese lead and therefore there needs to be at least one UK and at least one Chinese researcher on every application. Furthermore, it is expected that the collaborations represent genuine and meaningful partnerships between the UK and China.
2. It is expected that individual projects will give some consideration to linking up with other projects/themes funded as part of this call so that the programme is an integrated and cohesive investment. This should include some funds set aside for integration, coordination, joint knowledge exchange, etc. and some suggestions for mechanisms and activities to approach this. The costs for these mechanisms and activities should be included in the application, but the applicants should remember to incorporate flexibility into their

application budget in order to fit in with the final plan for integration and coordination which will not happen until after the successful Full Proposals are decided (see section 5.3).

3. Part of the NERC funds and all of the MRC funds are from the Newton Fund and thus it is a requirement that funding be awarded in a manner that fits with ODA guidelines. All applications must therefore be compliant with these guidelines. Note that this applies to UK funding only, and not Chinese, but as these are collaborative projects, it is expected that the project as a whole is ODA compliant and make clear that its primary purpose is to promote the economic development and welfare of China.

Applicants are strongly encouraged to demonstrate how the main research outcomes will be specific to welfare and development of China, rather than merely creating the conditions where development might occur. Applicants should consider how their project will:

- address poverty and development issues;
- address the issue identified effectively and efficiently;
- use the strengths of the UK to address the issue; and
- demonstrate that the research component is of an internationally excellent standard.

UK applicants should address ODA compliance (economic development and welfare of China) in their Expression of Interest.

It is expected that through collaboration the projects should seek to increase the skills and knowledge base at the partners institutions in this area, improving their ability to undertake and disseminate research in order to maximise the countries impact on issues of poverty and economic growth.

Any benefit to the UK has to be the secondary consideration and should not lead to a project being funded if it does not primarily deliver the development objective.

4. Expressions of Interest must include a consideration of the partnership between the medical and environmental sciences.

### *6.3 Eligibility*

For the UK partners, eligibility for this call is restricted to UK-based researchers normally eligible for funding from NERC. Further information on NERC eligibility can be found on the NERC website and in the NERC Research Grants Handbook<sup>12</sup>. Individual researchers may be named on a maximum of two different proposals, but on only one as the lead Principal Investigator.

For Chinese partners, eligibility rules follow the standard for NSFC but applicants who are not clear on these should contact NSFC to discuss. Full Proposals which include Chinese applicants who are ineligible will be rejected.

### *6.4 UK specifications*

The following section is relevant only for UK applicants. For Chinese applicants, specifications will be standard for NSFC.

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<sup>12</sup> <http://www.nerc.ac.uk/funding/application/howtoapply/forms/grantshandbook.pdf>

These specifications will be expanded on in the guidance for Full Proposals, but applicants for the Expression of Interest stage should note:

- No associated studentships are being funded as part of this call.
- As per Newton Fund specifications, requests for capital will only be considered if the proposed equipment is to remain in China for use after the project is completed.
- UK applicants will not receive funding for any publication costs associated with peer-reviewed journal articles and conference papers but costs associated with research outputs other than journal articles/conference papers (books, monographs, critical editions, catalogues etc.) can be included.
- At the Full Proposal stage applicants will be required to submit an outline Data Management Plan (ODMP) to identify the data sets likely to be available to NERC Data Centres. Proposals should not include any charges to the project for a NERC Data Centre to accept and manage the data sets but any in-project data management activities should be costed and included.
- Applicants for NERC grants may also apply to NERC for access to any of the NERC services and facilities. Further information on NERC services and facilities can be found at: <http://www.nerc.ac.uk/research/sites/facilities/>. There is no need to contact the service/facility at the Expression of Interest stage but this will be required at the Full Proposal stage.

## 7. Timetable

Date	Event
January 2014	Call for Expression of Interest
8:00 UK time and 16:00 China time 6 March 2015	Expression of Interest call closes
March 2015	Office sift on NERC/MRC side and panel meeting on NSFC side
March 2015	Full Proposals invited Full Proposal call opens in JeS and NSFC system
8 May 2015 (TBC)	Full Proposal call closes
May 2015 – August 2015	External peer review
July 2015	PI response stage due (UK applicants only)
September 2015	Full Proposal Moderating Panel in London, UK
October 2015	Successful applicants informed
October/November 2015 (TBC)	Kick-off workshop in Beijing, China
January 2016	Grants start
January 2020	Grants end

## 8. Post award

Applicants should be aware that according to the Newton Fund requirements, there will be some additional terms and conditions associated with the UK grants which are awarded. This will include additional reporting requirements which will be confirmed in due course.

## 9. Contacts

For queries about this programme and call please contact:

NERC: Simon Howe

Email: [atmospheric@nerc.ac.uk](mailto:atmospheric@nerc.ac.uk)

Tel: (+44)1793 418015

MRC: Tim Cullingford

Email: [Tim.Cullingford@headoffice.mrc.ac.uk](mailto:Tim.Cullingford@headoffice.mrc.ac.uk)

NSFC: Xu Jin

Email: [xujin@nsfc.gov.cn](mailto:xujin@nsfc.gov.cn)

RCUK China: Maggie Hu

Email: [Zeying.Hu@rcuk.cn](mailto:Zeying.Hu@rcuk.cn)