

Exploring Climate Cooling

Call for proposals

Date: 13 September 2024

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SECTION 1: Programme Thesis and Overview

This solicitation is derived from the programme thesis [Exploring Options for Actively Cooling the Earth](#), in turn derived from the ARIA Opportunity Space: [Future Proofing Our Climate and Weather](#).

Climate change, largely caused by anthropogenic greenhouse gas emissions, could cause the global temperature to increase by several degrees by the end of the century, precipitating climate tipping points with serious consequences [1,2]. The only sustainable solution to this problem is to cease the burning of fossil fuels and to eliminate excess greenhouse gases from the atmosphere. However, on account of the amount of carbon dioxide already in the atmosphere, a certain amount of continued global warming is almost certainly locked in [3,4]. In this context, there is a risk that the essential work of lowering atmospheric greenhouse gas levels – even under the most aggressive scenarios – does not happen fast enough to prevent the onset of temperature-induced tipping points.

Were such a temperature-induced climate tipping point to become apparent, our current level of understanding provides us with no options for how we might actively intervene to cool the relevant regions on the timescales required to avert or delay that tipping point. Approaches such as stratospheric aerosol injection [5], marine cloud brightening [6], increasing the reflectivity of the Earth's surface (e.g. by re-growing ice sheets), [7] and constructing space-based reflectors to shade the Earth from a proportion of incoming sunlight [8] have been proposed as potential methods by which to cool the Earth on a global or regional basis. However, an enormous amount of research is required on all these approaches: even basic questions as to whether they could work, what their immediate effects and side-effects might be, and whether they could ever be used safely and predictably remain unanswered. Informed debate as to the risks and impacts of such approaches requires resolution of these uncertainties.

Accordingly, following a 12-month discovery and engagement process, ARIA is now launching a programme aimed at answering fundamental questions as to the practicality, measurability, controllability and possible (side-)effects of approaches for actively cooling the Earth through indoor and (where necessary) small, controlled, outdoor experiments. In answering these questions, ARIA will fund not only the experiments themselves, but also the necessary modelling, simulation, observation and monitoring required to support the experiments, as well as research into the ethical, governance, law, and geopolitical dimensions of the approaches under investigation. Successful outcomes from this programme could include ruling particular options out from further study as technically infeasible, ruling them out as infeasible due to risks that cannot be adequately constrained, or highlighting which approaches show promise and would benefit from further research and development.

Acknowledging that this is a complex and ethically-challenging area of research, ARIA will be applying a particular set of governance and management principles in this programme, which are described in detail in the [programme thesis](#) and the [programme oversight and governance document](#).

SECTION 2: Programme Objectives

The programme aims to develop a scientific framework to underpin strong predict → test → monitor → validate loops for a range of approaches (Figure 1). The “predict”, “monitor” and “societal aspects” nodes in Figure 1 have received some (although arguably insufficient) interest in recent years. However, research into how approaches for cooling the Earth might work in practice, how their effects would be demonstrated with statistical confidence, and how any resulting technology might be scaled effectively has received much less attention. Therefore, whilst further research across all of the areas shown in Figure 1 is vital, we see that the “test” and “validate” nodes are particularly underserved.

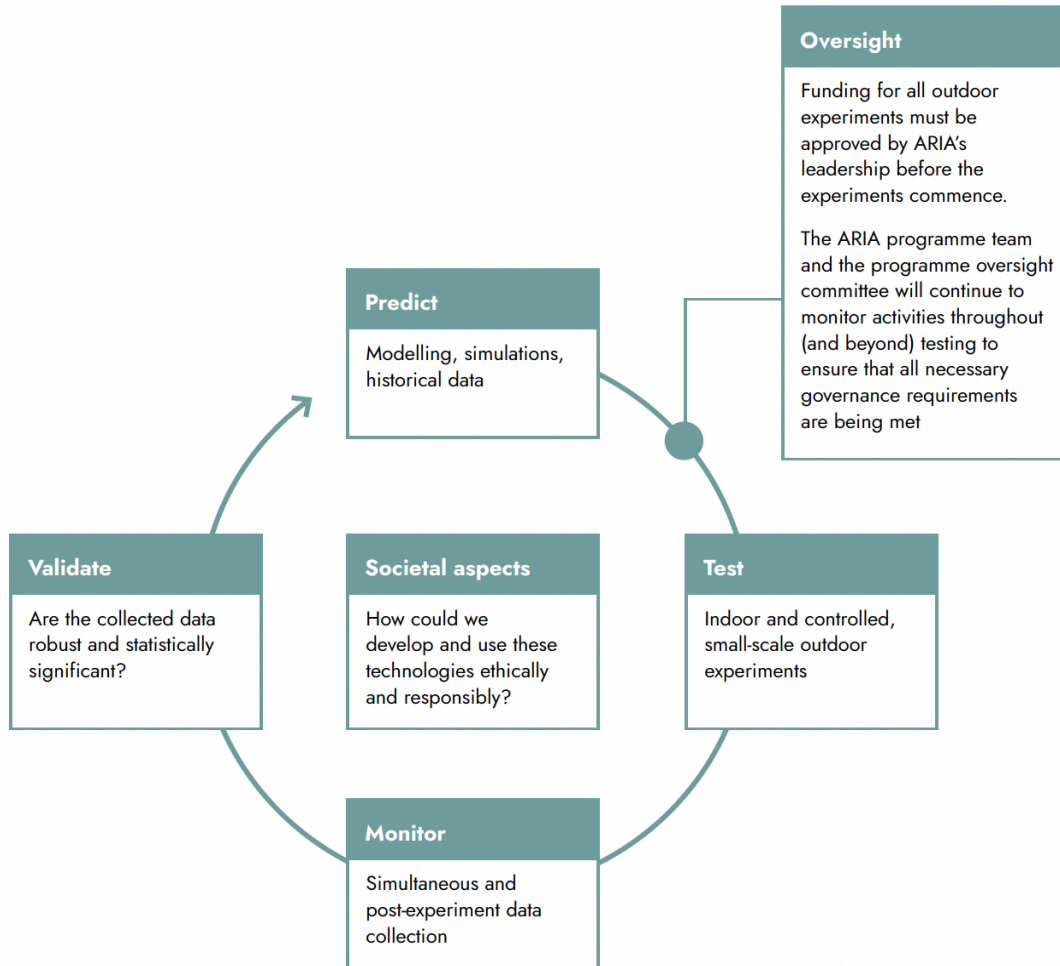


Figure 1: A technology research loop showing the “predict”, “test”, “monitor”, “validate” and “societal aspects” nodes. Details on the oversight mechanisms are described in the programme thesis and in the programme oversight and governance document.

Computer modelling and indoor testing are essential and necessary first steps in establishing the basic science behind how (or whether) a particular approach might work. However, modelling and indoor testing alone cannot provide all the data necessary to predict the effects of a given approach on the real world with a suitable level of confidence. Controlled outdoor experiments are therefore likely to be required to truly advance our understanding of the phenomena underlying potential approaches.

The overarching goal of this programme is to answer the most critical technical and fundamental questions on the practicality, measurability, controllability, and likely (side-)effects of approaches that might one day be used to actively cool the Earth. Projects will therefore need to demonstrate how they align with this goal.

SECTION 3: Technical Metrics

A very simplified estimate of the equilibrium temperature at the Earth's surface (T_{surf}) is provided by the equation below [9]:

$$T_{surf} = \sqrt[4]{\frac{S(1-\alpha)}{2\sigma(2-\varepsilon)}}$$

Where S is the solar constant (the power per unit area impinging on the Earth from solar irradiation), α is the planetary albedo (a measure of how much short-wave radiation is reflected from the Earth without being absorbed), σ is the Stefan-Boltzmann constant, and ε is the effective emissivity of the atmosphere (σ and ε together give a measure of how much long-wave radiation is emitted by the Earth back out to space).

In order to be in-scope for this programme, projects will need to demonstrate how the research they are proposing meets at least one of the following criteria:

1. The approaches being researched have the potential to alter T_{surf} (at any scale) by affecting at least one of the variables α , ε or S (see Table 1) in a manner that is statistically distinguishable from the background
2. The approaches being researched have the potential to alter parameters that map directly onto the variables α , ε or S (applicants will be required to justify explicitly how the parameters being perturbed map onto α , ε or S) in a manner that is statistically distinguishable from the background
3. The research proposed has direct bearing on the prediction, modelling, measurement, monitoring, validation, governance, education, public perception, ethics or other research questions related to approaches or experiments that could alter at least one of the variables α , ε or S (or parameters that map directly onto those variables)
4. The research proposed has direct bearing on open questions or uncertainties about the ecological or other environmental impacts, risks or side-effects related to approaches or experiments that could alter at least one of the variables α , ε or S (or parameters that map directly onto those variables).

ARIA encourages research plans that build in careful attention to measuring possible unintended side-effects and understanding possible risks. Where physical experiments are being proposed, applicants will need to consider testability and statistical significance in

their proposals (for example, can any parallels or lessons be drawn from some of the ways in which statistical methods have been employed to evaluate field trials of cloud seeding [10-12]?). **For physical experiments, project teams will need to convince the reviewers as to why the measurements/perturbations that they intend to make are the right things to measure/perturb, and how the results would substantially advance the validation or invalidation of the approach on the grounds of practicality, scalability, safety or impacts.**

ARIA will require publication of the results of the work that we fund (including negative results) in an accessible form, except if their publication would be likely to lead to public harm.

Table 1: Variables for study in this programme. The examples of approaches that could address these variables are not exhaustive, and neither should they be construed as use cases that ARIA considers to be more or less valuable than any others that can be imagined.

Variable	Examples of approaches that could address this variable (non-exhaustive)
Planetary albedo (a)	Marine cloud brightening [6]; ice sheet thickening [13]
Effective solar constant (S)	Space-based reflectors [8]
Effective emissivity of the atmosphere (ϵ)	Cirrus cloud thinning [14,15]

SECTION 4: What are we looking for/what are we not looking for

Funding across silos

We anticipate funding research into approaches for reducing global temperatures across the full range of science and engineering disciplines, in accordance with the framework presented in Figure 1.

Therefore, we expect to support projects across the social sciences that are of direct relevance to those approaches (including, but by no means limited to, consideration of public perception, potential legal, ethical, regulatory and governance frameworks, ethics, community engagement, and the economic impact of those approaches). ARIA is aware of previous and ongoing initiatives that have considered some of the ethical and societal issues around governance, stakeholder engagement and perceptions related to approaches for actively cooling the Earth over the last few years (see, for example: [16-19]). It will be

incumbent on proposers to demonstrate how any proposed research avoids duplication of effort with previous studies, be this in regards to technical or social research.

ARIA aims to provide as much flexibility as possible in terms of how the social sciences and humanities are represented in this programme. For example, ARIA may fund social scientists, ethicists, legal scholars, or humanities researchers to work specifically on certain technical research teams. In addition, ARIA may also fund a dedicated social science, law, and governance strand that works across the full range of approaches under investigation, in a manner that complements the efforts of social scientists that are embedded in specific research teams.

ARIA's ultimate aim is to integrate aspects of all the nodes in Figure 1 (including relevant societal aspects) into each project, but we appreciate that different projects will have different requirements and that such integration may take time. Therefore, ARIA is open to receiving proposals for (and indeed funding) projects that focus solely on one node of Figure 1 in the first instance, with a view to encouraging greater cohesion between the different nodes as projects progress. Encouraging cohesion might also include suggesting that various teams combine their efforts at full proposal submission or award negotiation stage. If ARIA identifies areas that are especially poorly represented in submissions to the initial call, then we may issue a further call for relevant expertise in those areas.

Programme scope

Table 2 gives a breakdown of areas that are **out of scope** for this programme, along with the reasoning we have taken in coming to these decisions. **Approaches that are not explicitly listed as out of scope will be considered** (provided that their specific intent relates to the controlled perturbation of one of the variables given in Table 1, or altering parameters that map directly onto those variables).

Table 2: *Out of scope areas for this programme*

Topic or activity	Reasoning and comments
Removal, sequestration and/or utilisation of carbon dioxide	Multiple other public and private funders are already funding carbon dioxide removal and utilisation
General weather/climate simulation or monitoring activities that do not provide insights into the effects of altering one	Only simulation or monitoring activities that could be relevant to the temperature-reducing approaches being researched in this

<p>of the variables in Table 1 (or parameters that map directly onto those variables).</p>	<p>programme will be in scope. This programme is distinct from the work of the Natural Environment Research Council and their Research programme to model the impact of solar radiation management [20], and has been developed independently. ARIA will continue to engage with NERC as development of both programmes progresses.</p>
<p>Outdoor experiments where analysis via Figure 2 indicates that such experiments cannot be supported by this programme</p>	<p>Outdoor experiments that Figure 2 indicates cannot be supported will not be funded through this programme</p>
<p>Large-scale trials of climate engineering technologies continuously or over extended durations</p>	<p>This programme will only fund activities at research scale</p>

A framework for outdoor experiments

There is the potential for unintended negative consequences in any outdoor experiment. Therefore, it will be important to define a transparent set of principles from the outset that can guide the programme’s consideration of whether and how outdoor testing can proceed. ARIA has incorporated lessons from previous projects where outdoor experiments have been cancelled before commencing [21-24] and those where outdoor experiments have gone ahead [25,7] in developing these principles, with the aim of supporting the development of best practices for safe and transparent outdoor experiments.

Our guiding principle for outdoor experiments is that these should be conducted on the smallest possible length and timescales required to validate with statistical confidence that the approaches under test can affect the parameters under investigation. These scales will be approach-specific. A discussion on scale and duration of outdoor experiments is provided in the [programme thesis](#), and applicants are strongly encouraged to refer to this document when proposing outdoor experiments.

The magnitude of the intended perturbation should be limited so that it is within the bounds of known and benign natural phenomena (or anthropogenic phenomena that are considered harmless), so that there is precedent for the size of the effect that will be produced. The experiments should be designed so that as far as possible the effects either dissipate

through natural mechanisms within hours, or can be localised with very high certainty, or else that there should be an obvious and reliable mechanism for switching off the effect at any time, on demand. These features should minimise the risks of negative unintended consequences by confining the effects in space and/or time.

A combination of considerations on the size, duration and reversibility of outdoor experiments leads to the following suggested decision tree for assessing whether a particular outdoor experiment might be supported through this programme (Figure 2). Applicants proposing outdoor experiments are strongly advised to refer to this decision tree in their proposals, and to state explicitly how the experiments that they are proposing comply with the considerations listed.

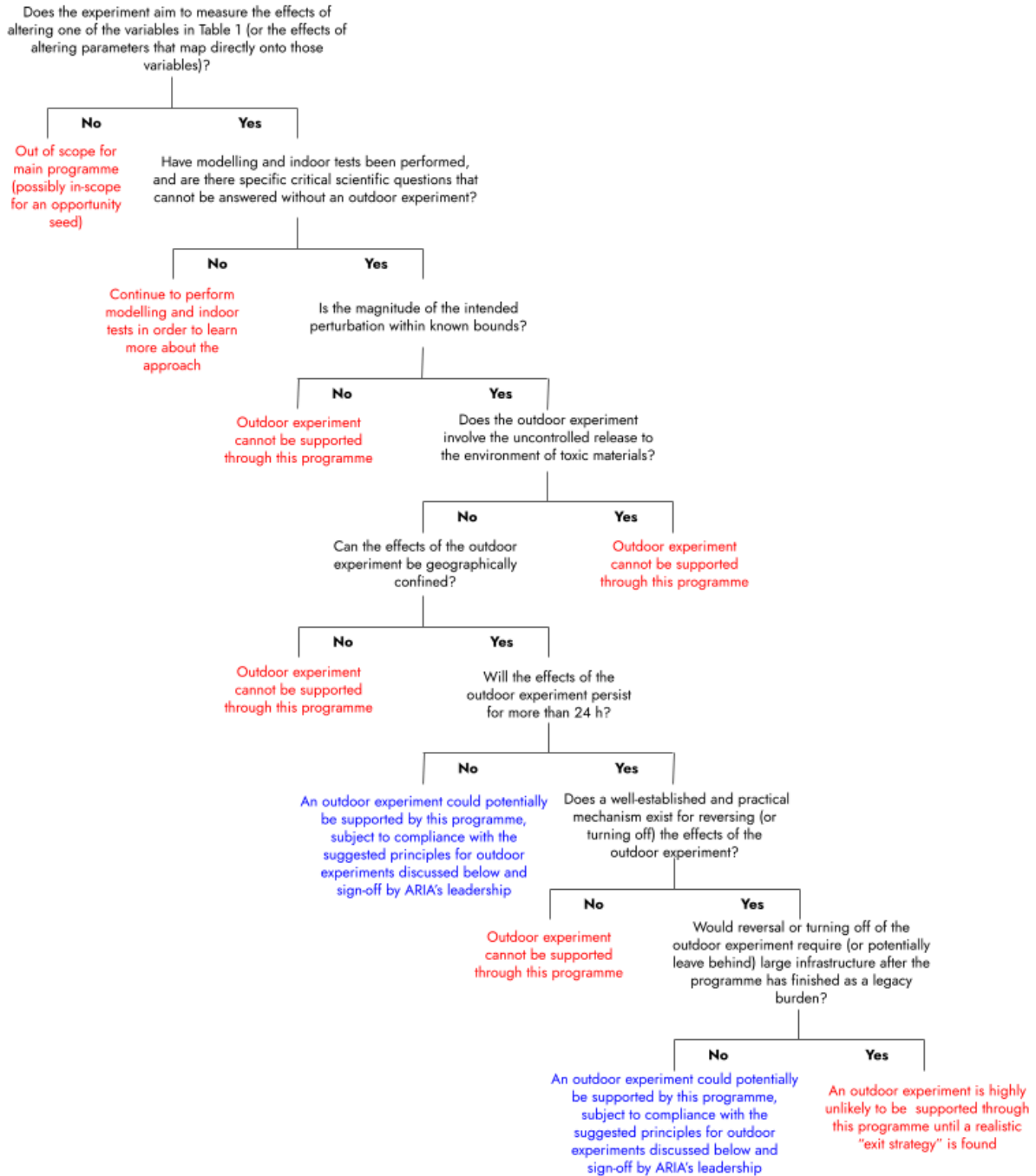


Figure 2: The outdoor experiment technical consideration decision tree for guiding applicants towards outdoor experiments that could be funded through this programme. Please refer to Table 1 for a description of the relevant variables.

In addition to this basic technical information, all outdoor experiments will need to comply with the following oversight and governance principles, which are given here so that project teams can see what will be required for any outdoor experiments:

1. **ARIA will not fund experiments where the activities proposed are prohibited by domestic or international law.** Project teams will be required to show how their tests comply with all applicable laws.
2. **A risk assessment will be performed and the findings made publicly available before any outdoor experiment.** This will be conducted by experts who are independent of the team performing the experiment, and will include relevant potential technological, environmental and socio-economic risks.
3. **Minimising risk by design.** Outdoor experiments should be designed at the minimum viable scale required for the generation of robust data, and where the magnitude of any perturbation has a natural analogue or commonly accepted anthropogenic precedent (and therefore where the effect of the perturbation is within the range of known and benign phenomena). Such considerations are summarised in Figure 2.
4. **Transparency, public participation and consultation.** Wherever possible, those conducting outdoor experiments will be required to notify and consult those who could reasonably be considered as likely to be affected by the experiments. ARIA sees consultation and engagement with the public as processes that will be sustained for the lifetime of projects. To facilitate informed decision making, detailed plans for the outdoor experiments, and the key decisions taken in developing these plans, will be consulted upon as transparently as possible well in advance of any experiment. The specific protocols for transparency will be developed in consultation with the Oversight Committee, and will include provisions for transparency regarding what the experiments involve, why the experiments are necessary, who is conducting the experiments, and who might be impacted by the experiments. The results of the experiments (including negative results) will also be made publicly available in an accessible form.
5. **Independent impact assessment.** Post-experiment, the environmental and any socio-economic impacts will be assessed by experts who are independent of the team performing the outdoor experiments, and the results of these assessments will be made publicly available. ARIA may also commission assessments of the broader implications of the experiments as appropriate.

6. **Limited scope.** Activities in this programme will be limited to research scale – ARIA will not fund deployment or any demonstration beyond the approved experiments.

ARIA intends to apply stage-gates to projects based around compliance with these principles, including undertaking sufficient engagement and experiment co-design with local communities and key stakeholders prior to funding being released for any outdoor experiment (or series of outdoor experiments). Details on the steps that project teams will be required to take for approval of funding for an outdoor experiment (or a series of linked outdoor experiments) is provided in the section 'A suggested framework for outdoor experiments' in the [programme thesis](#), and ARIA will provide specialist support to assist project teams with these steps. Information on ARIA's processes for approving funding for outdoor experiments can also be found in the programme thesis and the [programme oversight and governance document](#).

ARIA's leadership will be ultimately responsible for governance oversight and the release of funding for outdoor experiments, leveraging input from an independent programme oversight committee (see Figure 1 of the [programme oversight and governance document](#) for information on the role of this committee and its relationship to other actors in the programme). ARIA has also established a Committee of the Board for ethical and social responsibility, which will have visibility across all of ARIA's programmes.

A key aim is to earn and maintain trust in the research that is being undertaken. This will be underpinned by a culture of transparency. Our aim is to establish a culture of complete openness for outdoor experiments in terms of what activities are undertaken and their outcomes, similar to that which the International Civil Aviation Organization champions for the sharing of best practices in the aviation industry [26]. The principles above are designed to embed this mindset from the beginning of the projects supported by this programme.

SECTION 5: Programme Duration and Project Management

Programme & Project Management

We will fund early-stage and conceptual ideas through to more developed capabilities, across a portfolio of different approaches. Applications may therefore be initially highly speculative and may constitute one or more individuals or teams working together at the point of application. As projects develop, we would expect additional partners to join project teams to add their expertise; in some cases, ARIA may make the continuation of funding contingent on adding additional expertise to the project team. We also expect that some projects may fail to meet their agreed assessment criteria, which could result in a

managed phase-down of funding or a pivot in a new direction. Project teams will be able to bid for additional funding during the course of ongoing projects in order to bring in new members, explore new avenues, or undertake scale up or other activities which were not anticipated at application stage, but for which a strong case can be made. A schematic illustrating how this could work in practice is shown in Figure 3.

There will be a single call for proposals, with applicants able to request funding for durations ranging from a few weeks to five years. We aim to be as flexible as possible with our funding and to make additional funds available to successful projects. Projects opting to specify durations towards the longer end of the five-year maximum and requesting larger sums at initial application stage will be required to supply stronger justification for their requests. Conversely, more speculative projects may wish to request a shorter duration at application stage, with the possibility that ARIA will follow up with more substantial funding in the event that the project meets its objectives. The aim is to allow projects to “fail fast”, to reward success, and to help ARIA manage risk across the portfolio of funded projects. In cases where project teams ask for large awards of long duration at initial application stage, but ARIA considers the overall project to be too high risk, ARIA reserves the right to fund only the first stages of the proposed scheme of work, with the possibility of releasing further funding later on if progress de-risks the later stages of the project sufficiently.

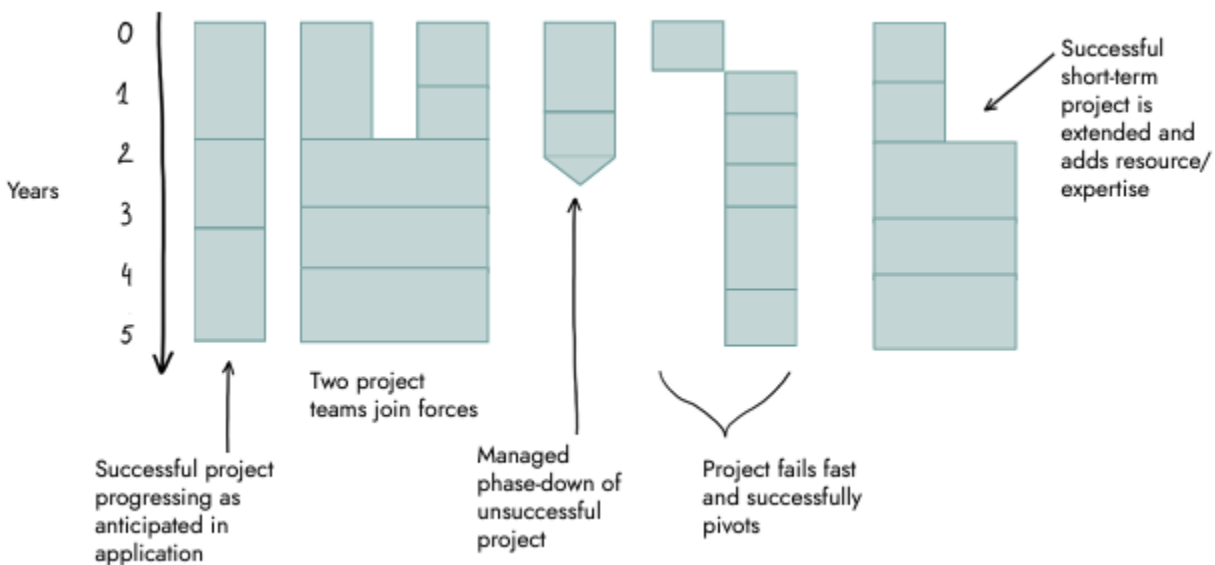


Figure 3: Illustration of the adaptive funding structure. Horizontal bars indicate project review points.

Project Milestones

ARIA will engage in negotiations with shortlisted applicants and will work together with those teams to develop their suggested success criteria into a rigorous set of staged performance metrics by which to gauge project progress. ARIA expects that each funded project will therefore have its own unique set of testable hypotheses, with a number of associated predefined and quantifiable key performance targets. For each project that is funded, ARIA will require the project teams to make public their hypotheses and key performance targets, together with a short discussion on how these are expected to lead to a step-change in understanding of the approach under consideration, as soon as realistically possible after project kick-off (most likely as part of the project's Q1 milestones). ARIA may then make use of third-party independent validation and verification at project review points in order to ensure rigour in the assessment of project performance.

Timelines for outdoor experiments and the steps that would need to be taken before these could take place will be discussed on a case-by-case basis during the project negotiation phase. For each outdoor experiment (or series of linked experiments), we will work with the project teams to provide a public statement on what the tests are attempting to achieve, and why those specific activities are critical, for publication during the outdoor experiment engagement/co-design phase. This document will then continue to be updated and iterated as a result of the engagement and co-design process.

There will be a programme-wide kick-off workshop for the projects selected for funding in the first half of 2025. Details will be provided to successful applicants.

Approach to Results and Intellectual Property

We are pursuing a very open approach to intellectual property (IP). Work under this programme should be undertaken with the intention of making project outcomes open-source and freely available. This means that the results from the work that we fund (including negative results) should be made available in a publicly available, open-access form, unless such publication would be likely to lead to public harm. As part of this, project teams will be required to give as much detail as possible on methodology and experimental data to ensure openness and transparency.

Intellectual property created by projects funded as part of this programme shall be published under creative commons or open source licences as appropriate. Our default position will be that project teams will not be permitted to file for patents in respect of inventions resulting from work that has been funded as part of this programme. We'll be asking all successful applicants and their team members to sign a public pledge not to seek patents on any work that is funded by this programme. This approach is designed to

enhance the public good by maximising the accessibility, usability, and collaborative potential of the funded projects, ensuring that the benefits extend to a wider community and fostering a culture of open innovation.

International partnerships

The impacts of climate tipping points (and the effects of actively cooling the Earth to delay or avoid the onset of these) are likely to be felt globally. Therefore, ARIA sees the need for a coordinated international effort led by public institutions to research approaches for actively cooling the Earth, what the effects and impacts of these approaches might be, and how their use might be governed.

To aid international collaboration and cooperation in this space, ARIA intends to:

1. Fund projects and researchers globally as part of this programme
2. Create opportunities for sharing best practice and learning with representatives of international and public benefit funding agencies, including annual workshops and invitations to observe the outdoor experiments that we fund.

For more detailed information on our approach to international partnerships with other funding organisations please see 'International partnerships with other funding organisations' in [the thesis](#). To further these aims, ARIA commits to being fully transparent across our programme design, management, and disclosure of the results of the research that is funded, by:

1. Requiring that the results from the work that we fund (including negative results) are available in a publicly available, open-access form, unless such publication would be likely to lead to public harm.
2. Making supporting documentation related to our outdoor experiments publicly available on the ARIA website (including pre-experiment risk assessments, post-experiment impact assessments, recommendations from our oversight committee, and results from our public engagement and co-design activities).
3. Continuing to update and iterate our (publicly available) governance and oversight procedures, calling out why any changes are being made and why we have made them.

Community events

In addition to programme workshops and in an effort to foster a collaborative research environment, ARIA will host regular community events to allow all programme teams to exchange updates, ideas, and feedback on the best paths forward. ARIA will also host annual in-person workshops where teams can showcase their work to a wider research community.

SECTION 6: Eligibility & Application process

Eligibility

We welcome applications from across the R&D ecosystem, including individuals, universities, research institutions, small, medium and large companies, charities and public sector research organisations.

ARIA can award funding to applicants who are based outside of the UK and/or whose projects will primarily take place outside of the UK for this Programme, provided these projects boost the net impact of the programme. Collaborations between UK and non-UK researchers are encouraged.

Finding potential collaborators and teaming

For those seeking specific expertise to support their proposal, we have created a teaming platform to facilitate finding potential team members who have registered their interest in this programme. By following the link to the [sign up form here](#) you will be able to register, submit your details, and gain access to a list of other individuals seeking to find/share their expertise. All requests are screened via ARIA's internal team prior to access, after which connections will be made by individual users based on aligned expertise.

Application Process

The application process consists of two stages:

Stage 1 - Concept paper

Concept Papers are designed to make the solicitation process as efficient as possible for applicants. By soliciting short concept papers (no more than three pages) ARIA reviewers are able to gauge the feasibility and relevance of the proposed project and give an initial indication of whether we think a full proposal would be competitive. Based on this feedback

you can then decide whether you want to submit a full proposal. If you miss the deadline for submission of concept papers you can still submit a full proposal. You can find out more about ARIA's review process [here](#).

To ensure the process is quick and open we do not require your organisation's consent prior to submission of a concept paper.

You can find guidance on what to include in a concept paper [here](#).

Following review of concept papers, applicants will either be encouraged or discouraged from submitting a full proposal. For more details on the evaluation criteria we'll use, click [here](#).

Stage 2 - Full proposals

This step requires you to submit a detailed proposal including:

- **Project & Technical information** to help us gain a detailed understanding of your proposal
- **Information about the team** to help us learn more about who will be doing the research, their expertise, and why you/the team are motivated to solve the problem
- **Administrative questions** to help ensure we are funding R&D responsibly. Questions relate to budgets, IP, potential conflicts of interest, etc.

You can find more detailed guidance on what to include in a full proposal [here](#). You can submit a full proposal even if you did not submit a concept paper.

More information on the evaluation criteria we will use to assess your answers can be found later in the document, or [here](#).

If you are a non-UK applicant we have provided some additional guidance in our [FAQs](#), including available visa options.

Use of Natural Environment Research Council (NERC) Facilities

We're working with the NERC to establish how their facilities may support the programme.

If your proposed research requires the support and use of a [NERC facility](#), you should do the following at each stage of the application process:

Stage 1 - Concept Papers

You should contact the [NERC facility](#), service and/or High Performance Computing (HPC) consortia lead to notify them of a potential dependency before submitting your concept paper. If applicable you should also notify Marine Planning via marineplanning@nerc.ukri.org directly if your proposal requires use of NERC's marine [facilities](#). For facilities relating to arctic services please contact arctic@bas.ac.uk

In submitting your concept paper, you must note potential use of the facility by detailing the relevant facility(ies) in the concept paper application portal. Details and facility costs do not have to be included at concept paper stage. You can find guidance on what to include in a concept paper [here](#).

Stage 2 - Full proposals

If encouraged to submit a full application, you should contact the NERC facility, service or HPC consortia lead as soon as possible to discuss your research proposal, and where applicable to complete any necessary HPC or facility form/application process as requested by the facility/marine planning, following the facility's normal access request procedures. As part of this process, NERC will provide a costed quotation for the services. The costing methods for this activity are currently being established with NERC and may not be finalised in time for the deadline for submission of proposals. As such, in submitting your full proposal, you should:

- Note the potential use of the NERC facilities in your proposal by completing the specific question included in the full proposal application portal. You can find guidance on what to include in a full proposal [here](#).
- For proposals that are assessed as compliant and in scope (in accordance with our project [review process](#)) you will be asked to submit a quotation from the HPC Consortia lead or facility, and evidence of prior agreement from the facility that your request is feasible and deliverable in the timeline indicated in your proposal. This should be submitted to ARIA no later than 16th January 2025. You will be notified by email that this information is required to be submitted via the application portal.

In any case you must ensure that you have discussed your proposal with the facility in good time prior to full application submission. Further discussion may be needed with any

successful projects in order to determine the most effective usage for delivery of the fieldwork aspects of the programme.

SECTION 7: Timelines

This call for project funding will be open for applications as follows (we may update timelines based on the volume of responses we receive):

Applications open	13 September
Concept paper submission deadline	07 October (12:00 Midday BST)
Concept paper review & notification of encouraged/not encouraged to submit full proposal sent	07 October - 08 November
<p>At this stage and based on your concept paper, you will either be encouraged/discouraged to submit a full proposal. If you receive feedback indicating that you are not encouraged to submit a full proposal you can still choose to submit a full proposal. You should note that this preliminary assessment/encouragement provides no guarantee of any full proposal being selected for award of funding.</p>	
Full proposal submission deadline	09 December (12:00 Midday GMT)
Full proposal review	09 December - 13 February
<p>If you are shortlisted following full proposal review, you will be invited to meet with the Programme Directors to discuss any critical questions/concerns prior to final selection. This discussion can happen virtually.</p>	
Successful/Unsuccessful applicants notified	13 February
<p>At this stage you will be notified if you have or have not been selected for an award subject to due diligence and negotiation. If you have been selected for an award (subject to negotiations) we expect a 1 hour initial call to take place between ARIA's programme director and your lead researcher within 10 working days of being notified.</p> <p>We expect contract/grant signature to be no later than 8 weeks from successful/</p>	

unsuccessful notifications. During this period the following activities will take place:

- Due diligence will be carried out
 - The programme director and the applicant will discuss, negotiate and agree the project activities, milestones and budget details
 - Agreement to the set Terms and Conditions of the Grant/Contract. You can find a copy of our funding agreements [here](#)
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SECTION 8: Evaluation Criteria

Concept Paper and Proposal Evaluation Principles

To build a programme at ARIA, each Programme Director directs the review, selection, and funding of a portfolio of projects, whose collective aim is to unlock breakthroughs that could impact society. As such, we empower Programme Directors to make robust selection decisions in service of their programme's objectives ensuring they justify their selection recommendations internally for consistency of process and fairness prior to final selection.

We take a criteria-led approach to evaluation. As such, all proposals are evaluated against the criteria outlined below. We expect proposals to spike against our criteria and have different strengths and weaknesses. Expert technical reviewers (both internal and external to ARIA) evaluate proposals to provide independent views, stimulate discussion and inform decision-making. Final selection will be based on an assessment of the programme portfolio as a whole, its alignment with the overall programme goals and objectives and the diversity of applicants across the programme.

Further information on ARIA's proposal review process can be found [here](#).

Proposal evaluation process and criteria

Proposals will pass through an initial screening and compliance review to ensure proposals conform to the format guidance and they are within the scope of the solicitation. At this stage we will also carry out some checks to verify your identity, review any national security risks and check for any conflicts of interest. Prior to review of applications, Programme Directors and all other reviewers are required to recuse themselves from decision making related to any party that represents a real or perceived conflict of interest.

Where it is clear that a proposal is not compliant and/or outside the scope, these proposals will be rejected prior to a full review on the basis they are not compliant or non-eligible.

Proposals that pass through the initial screening and compliance review will then proceed to full review by the Programme Director and expert technical reviewers.

In conducting a full review of the proposal we'll consider the following criteria:

- 1) **Worth Shooting For** – The proposed project uniquely contributes to the overall portfolio of approaches needed to advance the programme goals and objectives. It has the potential to be transformative and/or address critical challenges within and/or meaningfully contribute to the programme thesis, metrics or measures.
- 2) **Differentiated** – The proposed approach is innovative and differentiated from commercial or emerging technologies being funded or developed elsewhere.
- 3) **Well defined** – The proposed project clearly identifies what R&D will be done to advance the programme thesis, metrics or measures, is feasible and supported by data and/or strong scientific rationale. The composition and planned coordination and management of the team is clearly defined and reasonable. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed stage-gates and deliverables clearly defined.
- 4) **Responsible** – The proposal identifies major ethical, legal or regulatory risks and planned mitigation efforts are clearly defined and feasible.
- 5) **Intrinsic motivation** – The individual or team proposed demonstrates deep problem knowledge, have advanced skills in the proposed area and shows intrinsic motivation to work on the project. The proposal brings together disciplines from diverse backgrounds.

- 6) **Benefit to the UK and the wider world** – In order for this programme to succeed and provide benefit to the UK and globally it must be an international endeavour. Therefore, ARIA’s criteria around proposals from non-UK applicants being considered with regard to the next best alternative proposal from a UK organisation/individual have been adjusted for this call. Strong applications will therefore be those that benefit the UK and the wider world, and that will promote scientific innovation and invention with the ultimate aim of improving the quality of life in the UK and elsewhere.

ARIA may share a summary of the proposals encouraged to submit full proposals and information on proposals shortlisted following stage 2 full proposal review with NERC to prevent overlap with their [research programme to model impact of solar radiation management](#). Any information will be shared on a confidential basis.

SECTION 9: How to apply

Before submitting an application we strongly encourage you to read this call in full, as well as the [programme thesis](#) and [general ARIA funding FAQs](#).

If you have any questions relating to the call, please submit your question to clarifications@aria.org.uk.

Clarification questions should be submitted no later than 4 days prior to the relevant deadline date. Clarification questions received after this date will not be reviewed. Any questions or responses containing information relevant to all applicants will be provided to everyone that has started a submission within the application portal. We’ll also periodically publish questions and answers on our website: to keep up to date click [here](#).

Please read the portal instructions below and create your account before the application deadline. In case of any technical issues with the portal please contact clarifications@aria.org.uk.

Application [Portal instructions](#)

APPLY [HERE](#)

SECTION 10: References

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