

EPSRC Big Ideas

EPSRC's Big Ideas initiative seeks adventurous and exciting ideas that will have the ability to enthuse the public and Government, and that will be transformative or enabling if successful.

We are looking for ideas that are developed with a fundamental science perspective, as well as those that are more challenge-driven, and encourage submissions from both academia and business.

Please note that Big Ideas is not a call for proposals, and the initiative does not have any dedicated funding associated with it. We are looking to generate and prioritise a pipeline of ideas that will be used in the development of research strategy, and could potentially attract investment at a later stage as opportunities arise. Please ensure that when completing the form, you write with this in mind (i.e. we are not looking for full research proposals).

A Big Idea is something that will need to be championed and driven with the support of the relevant community or communities, and submissions should be able to demonstrate that they are community-driven endeavours, rather than individual research projects. Please note that once an idea has been submitted you are giving EPSRC permission to develop the idea in any way we see fit. This may include further development by EPSRC staff and inviting other people to lead or be involved in its development.

As the aim of a Big Idea is to benefit the community as a whole and thus strengthen the UK research landscape, it is important to note that the original submitter may not be the ultimate direct beneficiary of any funding that may arise. Should the development of your Big Idea lead to a funding call informed by the idea, submissions to that call will be assessed in open competition, adhering to the principles of fair, transparent Peer Review.

A number of [Frequently Asked Questions](#) are provided at the end of this document, for further information. **Please read these before completing the [submission form](#).**

Completing the EPSRC Big Ideas Smart Survey

The following guidance is provided to clarify what is required when completing the submission form, and details each of the sections you'll be asked to complete. The form is accessible from the [Big Ideas web page](#), and if you have any questions, please email bigideas@epsrc.ukri.org.

General points of guidance to remember throughout are as follows:

- **Please use non-technical language and consider the audience.** The language that is used in the form should be wholly accessible to a wide range of audiences, such as: a member of the public, Government, Research Council staff members, non-experts (including other researchers who are not working in the field/s described).
- Ensure that when describing this opportunity you convey the **excitement, vision and inspiration** of the idea. We are looking for ideas with a '**wow factor**' that will enthuse the general public, Government and the media.
- These ideas will develop over time with the support and expertise of both EPSRC and the Science, Engineering and Technology Board (SETB). Therefore, the initial submission should capture the basic principles of the idea to allow EPSRC to assess its fit to the Big Ideas framework.

Guidance for completing each question:

Q1 Title (maximum 10 words)

Please give your idea a short title. Please avoid any jargon or technical language.

Q2 Pitch (maximum 30 words)

This is an opportunity to give a concise 'elevator pitch' to convey what the proposed idea is and to emphasise the excitement and inspiration of the idea. If you had just 30 words with which to convince someone to support your idea, what would you say to them?

Q3 WHAT is the 'Big Idea'? (maximum 300 words)

- *Give a description of the proposed opportunity, in non-technical language*
- *How could this big idea have the ability to enthuse the Government and the public?*
- *Highlight the transformational aspirations of the idea*
- *Explain how this idea is 'Big', how it moves from beyond an individual research project/proposal to a larger endeavour.*

Clearly describe the idea itself, outlining the vision and aims. Remember to use non-technical language (for a general, non-expert audience). Ensure that you highlight both the excitement and the transformational aspects of the idea.

Please describe the overarching idea, and any component aspects within this. **Focus on the science and the research challenges involved.** Also describe whether this Big Idea is:

- an opportunity that involves many research strands working together to lead to one key output;
- an enabling idea, where successful completion would lead to multiple outputs or breakthroughs across many other areas.

Q4 WHY does this matter? WHAT impact would it have if successful? (maximum 300 words)

- *What would the 'big win' be for the UK if the idea is realised and what other benefits can be realised (both scientifically and non-scientifically)?*
- *How is this idea likely to lead to significant impact e.g. through people, knowledge, society, economy?*

Describe clearly and concisely why the idea should be prioritised, by outlining **what difference it will make** (both scientifically and non-scientifically) if successful. Please consider what impact it will have in the broadest sense – e.g. people, academic, knowledge, society and economy.

Further questions to address in describing the potential impact are:

- How would the impact described provide a major benefit to the UK in terms of: scientific advancement, furthering knowledge and/or technologies, making a difference to people's lives, potential return for the UK economy?
- What is the UK opportunity in pursuing this idea? Would investment in this idea create an opportunity for the UK to get ahead, in relation to potential international competitors?

Also describe **who will benefit** from the opportunity being realised. Think: public, academic, business, government etc. Describe both **who** will benefit and **how** – i.e. how each of the different groups identified will benefit.

Q5 WHY is the idea timely now? (maximum 200 words)

- *What has changed (in the development of the science, in the research landscape, and/or the political landscape) to make the realisation of this idea more attractive / likely or possible now?*
- *What are the risks for the UK of not supporting this opportunity now?*

Describe the timeliness of the idea: Why is this timely **now**? What has changed in the science, the research landscape and/or the political landscape, to make this timely? What would the **risk** for the UK be if we did not support this idea in the near future?

Further questions to consider when completing this section include:

- Is it an 'old' challenge or question that is now becoming possible to address?
- Is this a new challenge or question? Why has it become important now if so?
- Is it time critical?
- Why can it not be achieved currently? What kind of breakthrough is required to achieve this idea? What are the barriers? (*E.g. does it require co-ordination of several areas of research that may be strong individually, but need to be brought together with significant focused effort?*)

Q6 WHAT is the current investment landscape, both in the UK and globally? HOW does the idea relate to other priorities in the UK landscape? (maximum 200 words, to cover both aspects)

- *Does the UK currently have the capacity and infrastructure needed to address this opportunity?*
- *Describe the international investment landscape and the UK's position in relation to this opportunity?*
- *How does the idea fit with other current UK strategic investments and priorities?*

This section should provide a comprehensive description of the current landscape in the UK and globally. Please include details of the current **equipment, capabilities, skills and people** in the UK, and describe any relevant initiatives outside of the UK.

Does the UK currently have the capacity and infrastructure needed to address this opportunity?

- Please **quantify your answer** by describing the number and value of relevant, significant investments that align to the opportunity presented. Please list the relevant infrastructure and investments as brief bullet points.
- Also **describe any gaps** in people capacity, skills and infrastructure that would make addressing this opportunity difficult.

Describe the international investment landscape and the UK's position in relation to this opportunity

- How does the UK compare internationally for this opportunity?
- What is the international investment landscape in relation to this idea? Please quantify the number and value of relevant investments, groups and organisations where known.

How does the idea fit with other current UK strategic priorities?

- Describe how the idea fits with other current UK strategic priorities. Other priorities in the research landscape to be considered may include (but are not limited to):
 - Institutes (e.g. Alan Turing, UKCRIC, Henry Royce)
 - Sector deals
 - Industrial Strategy – in particular in relation to the Industrial Strategy Grand Challenges

Q7 WHAT will it take to deliver this big idea? (maximum 400 words)

- *Will this idea galvanise communities to work together to realise the opportunity presented?*
- *Highlight the underpinning research challenges that are required to support the realisation of this opportunity*
- *Who else would be interested in supporting the initial development of this idea?*
- *What are the potential pathways and mechanisms to achieving the impact described previously?*
- *Give an initial indication of the expected time to delivery (in years) and scale of investment required to deliver this idea.*

Please describe the resource and effort required to deliver this idea, in terms of **skills, people, groups, universities, and businesses**. Also describe any key interdependencies that are required to achieve the idea.

Will this idea galvanise communities to work together to realise the opportunity presented?

- A Big Idea is something that will need to be championed and driven with the support of the relevant community or communities. It is not necessary to name individual researchers (unless you wish to do so); please name **the groups and/or universities** that will need to be involved to progress the idea further.

Highlight the underpinning research challenges that are required to support the realisation of this opportunity

- Describe the research challenges that will need to be involved to realise the idea and particularly any interdependencies or multidisciplinary working that will be required to deliver the idea successfully.

Who else would be interested in supporting the development of this idea?

- Is there any potential leverage expected from other stakeholders?
- If there are specific groups, or types of industry, that would potentially be interested in developing and supporting the idea, please describe who these are, e.g. SMEs; specific sectors such as pharmaceutical, automotive, defence industries

What are the potential pathways and mechanisms to achieving the impact described previously?

- Describe the ways in which the potential impact within this idea will be realised – what routes, pathways and mechanisms will be used to fulfil this?

Give an initial indication of the expected time to delivery (in years) and value of investment that is required to deliver this idea

- Please **quantify your answer** to describe the scale of effort that will be required to support the realisation of the idea
- The nominal value (to the nearest £5M) should be appropriate to the estimated resources and effort required. This information will not be used for decision making purposes when prioritising ideas in the first instance

Q8 Which of the following does this idea fit with (you may select multiple boxes):

Please indicate which aspects the idea fits with: *industrially-driven research, challenge-driven research, fundamental research and/or multidisciplinary research*

Answering this question will help us to match those ideas that are prioritised for further development to the most appropriate funding opportunities, at a later stage.

If you select the 'multidisciplinary research' box then please highlight what the relevant disciplines are, and whether the idea is multidisciplinary across engineering and physical sciences, or whether it also crosses other Research Council remits as well. For the latter, please highlight which other Research Councils may be interested in this idea. EPSRC may communicate with these Councils as appropriate.

Q9 Whilst recognising that Big Ideas may cross several disciplines, please choose between one and three of the following EPSRC themes that you believe are closest in terms of the research challenges being posed.

This will help us ensure we get the most appropriate input from across EPSRC to allow your submission to progress. Please choose up to three from: *Advanced Materials, Artificial Intelligence and Robotics, Circular Economy, Digital Economy, Digital Twins, Energy and Decarbonisation, Engineering, Healthcare Technologies, ICT, Manufacturing Technologies, Mathematical Sciences, Physical Sciences, and Quantum Technologies*

- There is also the option to specify cross-cutting themes at EPSRC (for example, Business Engagement, or Equality, Diversity and Inclusion) if these are of direct, specific relevance to the research proposed in the submission

Please list up to ten keywords that relate to your submission:

- This will help us to assess the portfolio coverage we have across our pipeline of Big Ideas

Q10 Who has been involved in the development of this big idea? (maximum 100 words)

This can be academics, industry, charities and any other relevant research organisations in the UK.

We are encouraging collaborative submissions from groups and networks, in addition to individual submissions. Please be aware that EPSRC may put you in contact with others who have submitted similar ideas in order to develop the idea(s) further.

Q11 Have you already engaged with anyone at EPSRC about this idea? If so, who? Have you engaged with other Research Councils, other than EPSRC, about this? If so, which ones, and who have you spoken with?

Please let us know if you have already engaged with anyone from UKRI about the submission. This could range from an informal conversation to making a submission to another Council's Big Ideas initiative.

Q12 Contact details for further discussion, if required:

Please provide contact details for one person for correspondence, further information and discussion.

Q13. Is there any additional information that is relevant to your application that EPSRC staff and those who are part of the decision making process should be made aware of, such as a conflict of interest or related submissions?

Frequently Asked Questions

Q: Is this a call for proposals?

No, this is not a call for proposals. This is an opportunity for the community to pitch their Big Ideas to EPSRC. We are looking for visionary, adventurous and inspirational ideas that will enthuse the public and Government. These will be on a larger scale than an individual research proposal or programme grant. There is no guarantee of funding.

Q: What is a Big Idea?

To clarify the kind of ideas that EPSRC is looking for during this process, the following qualities may provide a helpful starting point:

- Articulates a vision and has a 'wow factor' - will enthuse the public and Government alike
- Adventurous but also potentially achievable (*given the right people, resources and collective effort*)
- Transformative *and/or* enabling (i.e. it can be either of these qualities)
- Requires significant support, in terms of both the value of investment required, and the number of people that will have to be involved to achieve it
- An idea that can deliver impact, in all of its forms (*people, knowledge, society, economy*)
- An idea proposed by an individual, or a group, but that will require significant support from the relevant community or communities, to champion the idea and drive it forward.
- An idea that is likely to *generate* the support of the research community - both in intellectual terms, and in terms of securing the involvement of people working in the relevant areas. The idea should galvanise communities to work together to realise the opportunity presented.
- Either:
 - A challenge with a defined problem, but no solution as yet (*as one type of big idea*), or
 - An idea that does not currently have a defined outcome or end target but is driven by the question: 'Wouldn't it be really great if we could.....?', *and/or*
 - An idea that would be enabling (if successful) and would generate further breakthroughs and outputs in multiple other areas of science

Q: What is not a Big Idea?

The following qualities give an indication of what EPSRC is not looking for during this process:

- An idea that is completely undeliverable (regardless of the level of investment and resource provided)
- Something that is scientifically impossible, i.e. something that is - and always will be - science fiction because it breaks fundamental laws of physics
- A research proposal
- Something that could be achieved now (through existing funding routes), or something that is a 'safe bet' (i.e. it is unadventurous)
- A collection of projects or outcomes which are desired by a community but do not form a unified endeavour as a whole
- An idea pursued by an individual (or single group) working independently, without any further engagement from the relevant research community / communities
- 'The obvious' – something that is generally well known already as a challenge
- An idea solely addressing a market need

Q: What is the difference between a Big Idea and a Grand Challenge?

In simple terms: a Grand Challenge usually describes an ambitious goal where there is a defined output or end target, and where the application of science and technology is needed to reach the goal.

Some Big Ideas could be framed as Grand Challenges; however, they could also be either of the following:

- an opportunity that involves research strands working together without a defined outcome, but more focused on trying to answer questions;
- an enabling idea, where successful completion would lead to multiple outputs or breakthroughs across many other areas - some of which may be known, but some of which are currently unknown.

Q: How does EPSRC Big Ideas fit with additional funding streams, such as the Industrial Strategy Challenge Fund (ISCF) or the Strategic Priorities Fund (SPF)?

- The EPSRC Big Ideas initiative aims to create a pipeline of fundamental and multidisciplinary research ideas, some of which will be suitable to feed into a variety of funding schemes arising from the Industrial Strategy, such as SPF or ISCF. There is the potential for Big Ideas to be developed into firm business cases for when additional funding opportunities arise

Q: Is it possible to submit things at the interfaces of remits with other funders?

Yes, however we would expect EPSRC Big Ideas to be majority engineering and physical sciences remit, i.e. something that would be led by EPSRC if submitted through the usual routes.

We will engage with colleagues in the other Councils, as appropriate, on submissions that cut across Council remits.

Q: Is it possible to submit things outside my usual area of expertise?

Yes - please provide as much information as possible within the form.

Q: What happens to Big Ideas once submitted?

A summary of the process is shown below. Submitted ideas will be batched for consideration by an internal panel, who will check for validity and eligibility, taking into account alignment to EPSRC strategies and the broader strategic context. This internal review takes place three times a year.

Ideas that progress will then be considered by EPSRC’s Science, Technology and Engineering Board (SETB), who will select ideas for further development, assessing whether the concept is in line with the Big Ideas aims, and providing advice about its further development. For example, this could involve assigning mentors, redirecting an idea towards other funding routes, or encouraging wider links and facilitated discussions to create a compelling case. By maintaining an overview of, and contributing to, the pipeline of ideas to identify strategic opportunities for additional funding streams, SETB provides assurance to support decision making by the Executive and by EPSRC’s Council

Please note that once an idea has been submitted you are giving EPSRC permission to develop the idea in any way we see fit. This may include further development by EPSRC staff and inviting other people to lead or be involved in its development. Should this lead to a funding call informed by the idea, submissions to the call will be assessed in open competition.

