AI for Net Zero
13th December 2022

UK Research and Innovation
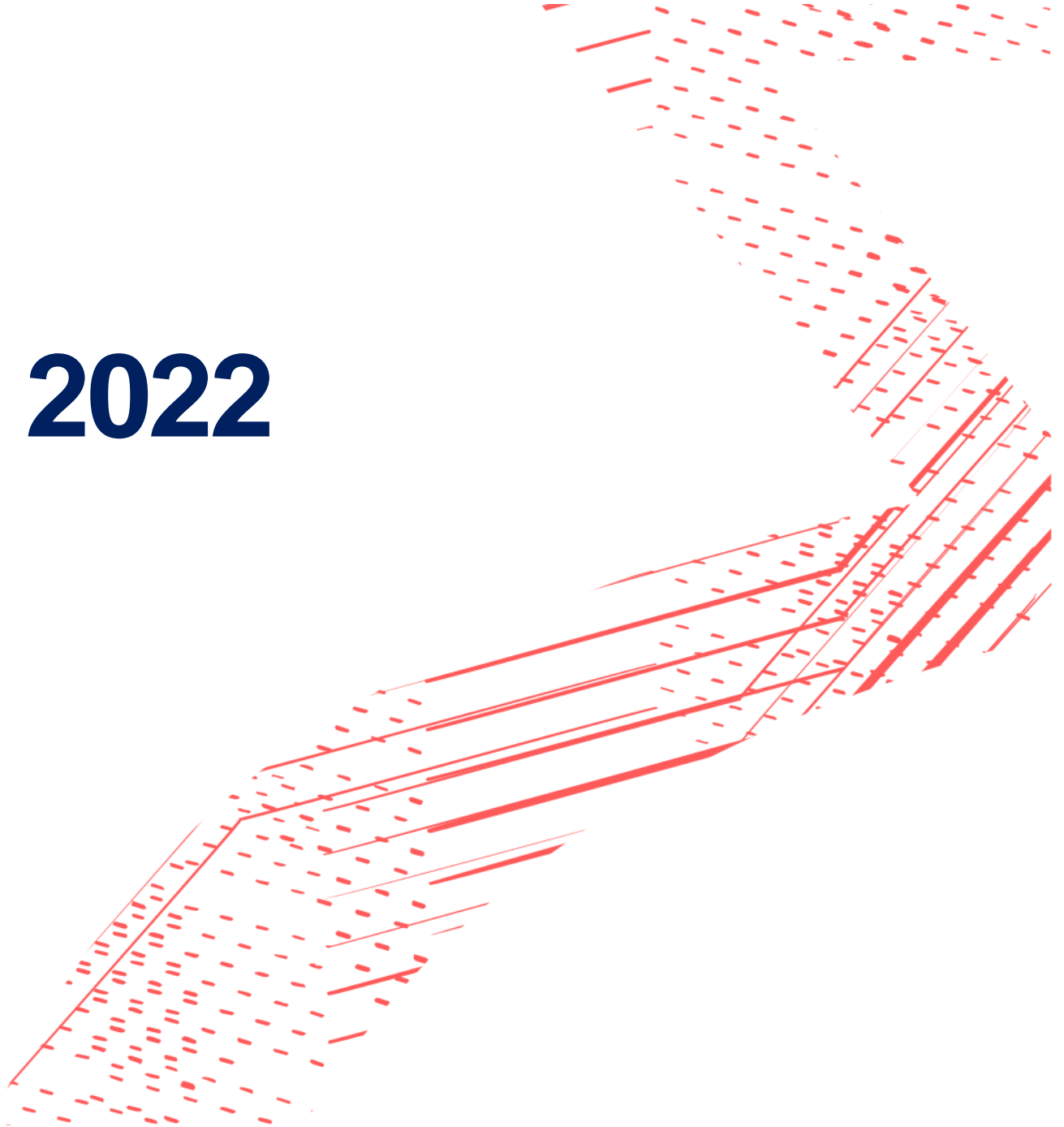
Agenda

1. Welcome
2. AI landscape
3. Aim and background of "AI for Net Zero"
4. Call information
   I. Transport
   II. Energy
   III. Environment
   IV. Agriculture and Food systems
   V. Social perspectives

5. Q and A

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Our vision for AI

Our vision is for advances in UK Artificial Intelligence to benefit society, provide skilled employment, and deliver significant economic growth. The UK currently has an opportunity to position itself as a leader in AI research and innovation internationally. UKRI has a key role to play in realising this opportunity working in partnership across the ecosystem.

Our vision is founded on:
- Building ambitious new UK AI **capability**
- Sustainably growing UK AI research and innovation **capacity**.
- Enabling adventure and **creativity** in AI research and innovation
- Building high **connectivity** in the landscape

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UKRI's Approach to AI

AI is a key **strategic priority technology for the UK**, it shows huge potential to transform society, the economy, and help us tackle environmental challenges

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Through the **UKRI AI Review** we have sought to understand the complex UK AI R&I landscape, and to set out a clear vision and ambition for the role of the research and innovation community and our plans to support AI research

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The **UKRI Statement of Opportunities on AI** in conjunction with the **National AI strategy** sets our vision and aspirations to support a world leading, highly interconnected & interdisciplinary UK research & innovation ecosystem

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Now we will build on our existing investments, working with stakeholders to **deliver Critical mass investments to connect the ecosystem** for supporting AI research and innovation, and build towards a unified UKRI AI Programme

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Our strategy

Innovation, Adoption & Diffusion

Supporting the development of the UK's AI Sector and the Adoption of AI Across Sectors.

Delivering immediate and near-term impact in AI industry and broader sector adoption of AI via innovation programmes

Challenge/Mission AI

Bringing the potential of AI to bear on societal, economic, and environmental challenges, with a particular focus on key pressing challenges where we have existing strength (health), where there are pressing needs (net zero), or where basic capability development is critical to sovereign capability (AI for Security and Defence and Government), and opportunities which only UKRI will deliver (AI for science).

New AI Capabilities

Building new capabilities and next generation AI technologies the knowledge, tools and techniques that solve the future challenges in AI that will keep the UK ahead of the game intellectually and will attract industry to and keep it in the UK.

Developing AI that is sustainable, interacts differently with humans, and can work with challenging (small, sparse, distributed) data sets

Supporting the environment for AI

Supporting collaborative ecosystems spanning basic and mission driven AI, skills, and innovation

Building pools of skilled people at all levels to fuel UK academia and industry

Seeking to prevent access to skills, data, and infrastructure becoming barriers to AI research and innovation

Responsible Trustworthy AI

Building the new technical and sociotechnical capabilities needed for responsible trustworthy AI

Integrating understanding of the societal impacts and implications of technology into its development

Leading the way in research informed regulation and standards
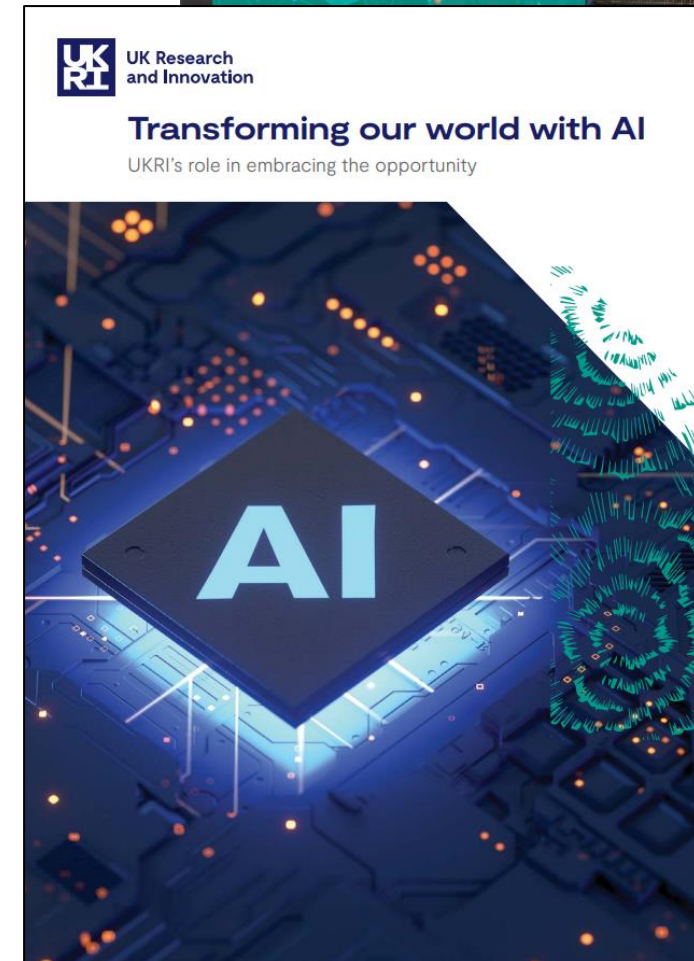
Connectivity across the AI ecosystem

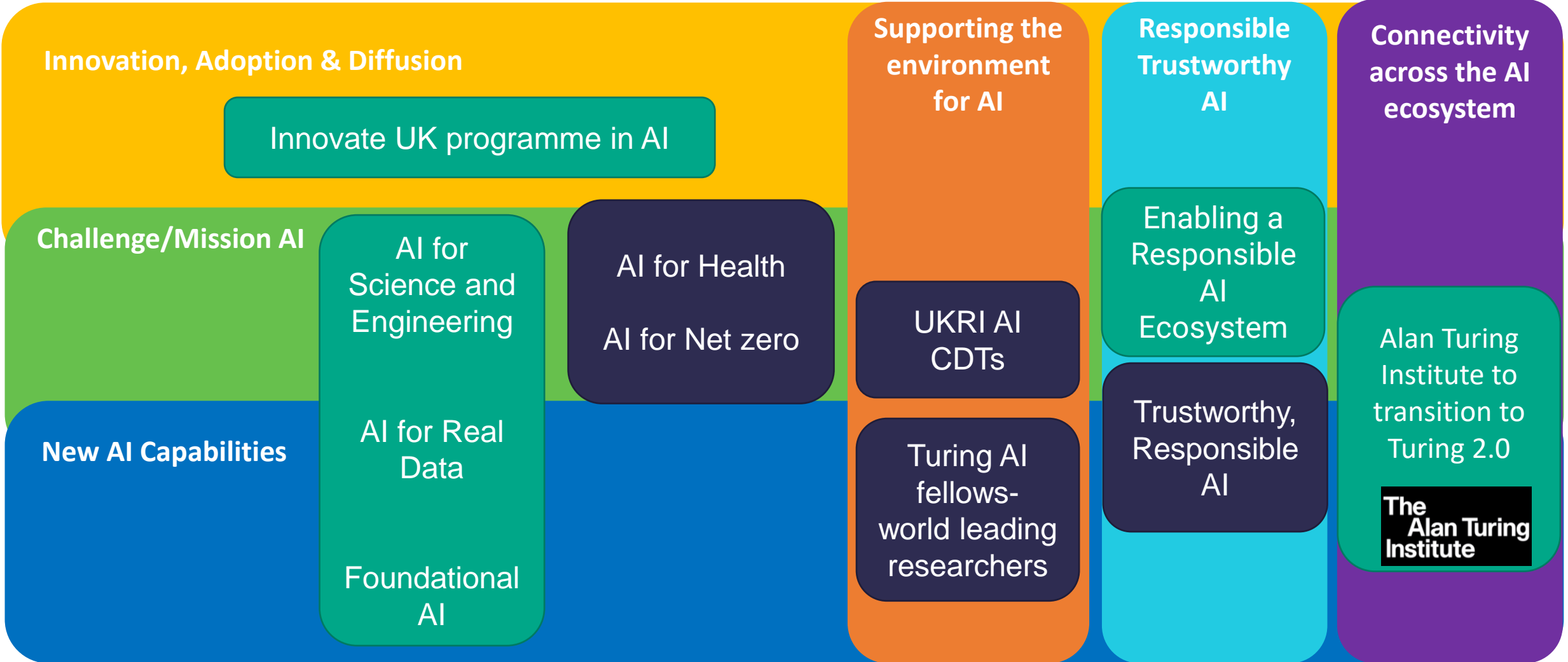Enabling convening and connectivity across the UK AI research and innovation landscape

Building on the leadership role of the Alan Turing Institute as the National Centre for AI and Data Science

Building an ecosystem

- For the UK to remain at the forefront of AI research and deliver on it's promise for society, the whole ecosystem needs to work to connect AI researchers, innovators and practitioners.

- We will build connections between existing investments and fund new centres of excellence and hubs to create cross disciplinary and cross sector ecosystem, connecting researchers, innovators, and practitioners of AI. **We must aim to solve problems once.**

- **We will invest in critical mass investments (hubs) across the landscape in priority areas. We will work with the Alan Turing Institute to drive facilitation of the ecosystem in partnership with other actors. We will invest in business facing investment in priority sectors and unleashing regional strengths.**

Investment model

Innovation, Adoption & Diffusion

Innovate UK programme in AI

Challenge/Mission AI

AI for Science and Engineering

AI for Health

AI for Net zero

New AI Capabilities

AI for Real Data

Foundational AI

Supporting the environment for AI

UKRI AI CDTs

Turing AI fellows- world leading researchers

Responsible Trustworthy AI

Enabling a Responsible AI Ecosystem

Trustworthy, Responsible AI

Connectivity across the AI ecosystem

Alan Turing Institute to transition to Turing 2.0

The Alan Turing Institute

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Plus within additional cross cutting programmes, and BAU activities.

AI for Net Zero background

In 2021, the UK enshrined a new target in law to reduce emissions by 78% by 2035. Reaching net-zero greenhouse gas (GHG) emissions will requires extensive changes across the economy.

The development and application of AI technologies can provide the solutions to support society in delivering greenhouse gas emission reductions, and create innovative solutions for net zero challenges across a range of sectors.

We are progressing the **multidisciplinary approach** to the development and application of AI outlined in the UKRI publication **transforming our world with AI**

AI for Net Zero funding call

Funding is available to support research into finding solutions for **net zero challenges through the development and use of AI.**

UKRI are seeking proposals to develop tools, techniques and capabilities in AI that:

- **address greenhouse gas emissions to meet net zero targets**

- **focus on supporting activities that can make substantive progress towards delivery of real-world solutions**

- **working closely with end users such as industry and policymakers**

Co-creation between the AI community and other disciplines and sectors, creating novel and bespoke solutions which can progress both the technology and its application to net zero.

What we are looking for

- Up to £13 million is available for projects funded by this opportunity.

- Projects are invited between £1 million and £2.5 million at 80% full economic cost.

- Projects have a fixed start date of 1 May 2023 and end date of 31 March 2025.

- Projects must be interdisciplinary, with research across at least 2 research councils remits.

- Projects may use current AI or develop and apply new AI capabilities to address net zero challenges

    - energy
    - transport
    - environment
    - agricultural and food systems
- with social science cutting across all projects
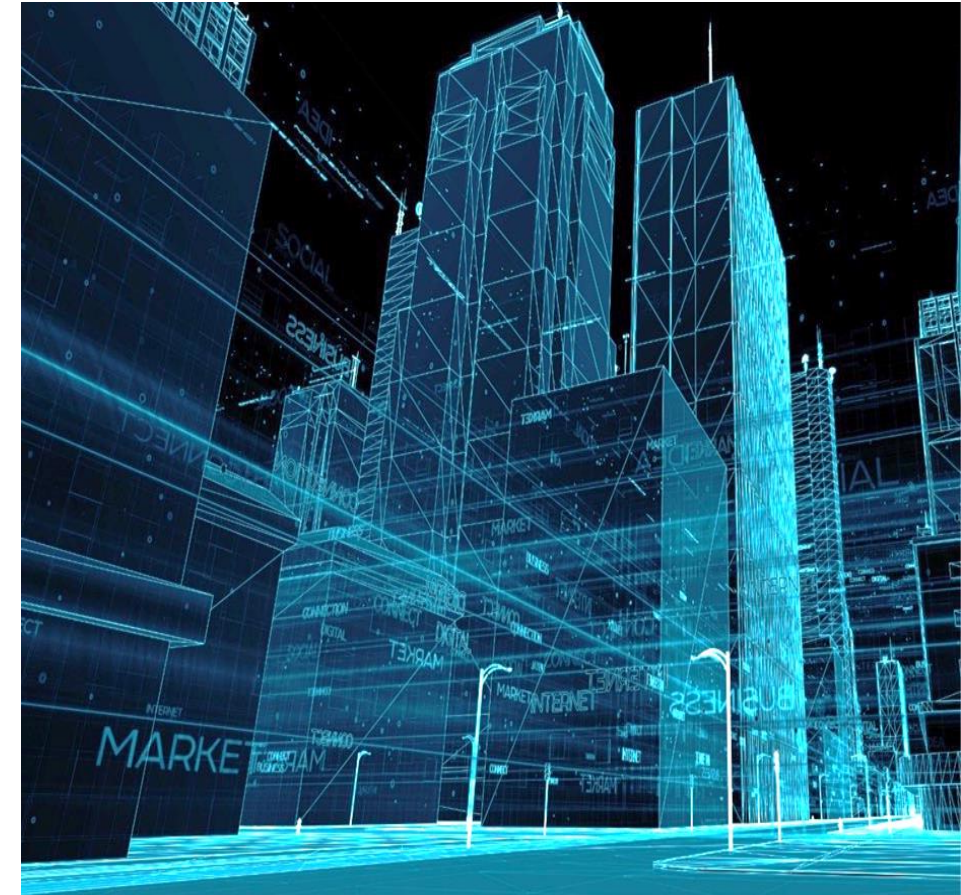
AI for Net Zero funding call

Proposals could employ AI to:
- advance understanding
- develop novel solutions
- make or improve decisions
- inform and enhance policy
- enable rapid progress towards net zero

In doing so, it is anticipated they are likely to also address key underpinning barriers to AI in a net zero context, such as the need to:
- increase adoption
- deliver improved interoperability and labelling of datasets
- de-risk adventurous approaches
- integrate across data sources and types, enabling better use or reuse of data
- crowd-in diverse expertise, disciplines and stakeholders needed to achieve a step-change in the field

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AI for Net Zero funding call

This funding opportunity seeks to support agile projects creating strong foundations for the sector and invites applications that include high emitting areas highlighted (where it is noted that it is hard to reduce emissions).

Please note that the following themes, highlighted areas are not an exhaustive list.

Applications for AI to net zero challenges aligning with 1 or more of the 4 key areas, will be considered.

Energy Theme

What we are looking for

- grid operation or balancing

- demand management

- data analytics to understand customer energy usage, manage energy flow and optimise energy usage

- predictive data for energy trading

- blockchain technology for power purchase agreements

- create virtual power plants to understand future deliver options

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Transport theme

What we are looking for

•demand management across modalities understand how they interlink on demand

•AI-enabled transport logistics, maintenance and journey optimisation

•tools for efficient route planning

•AI systems to analyse travel planning and maintenance

•harmonised digital reporting for ships

•electronic freight transport information

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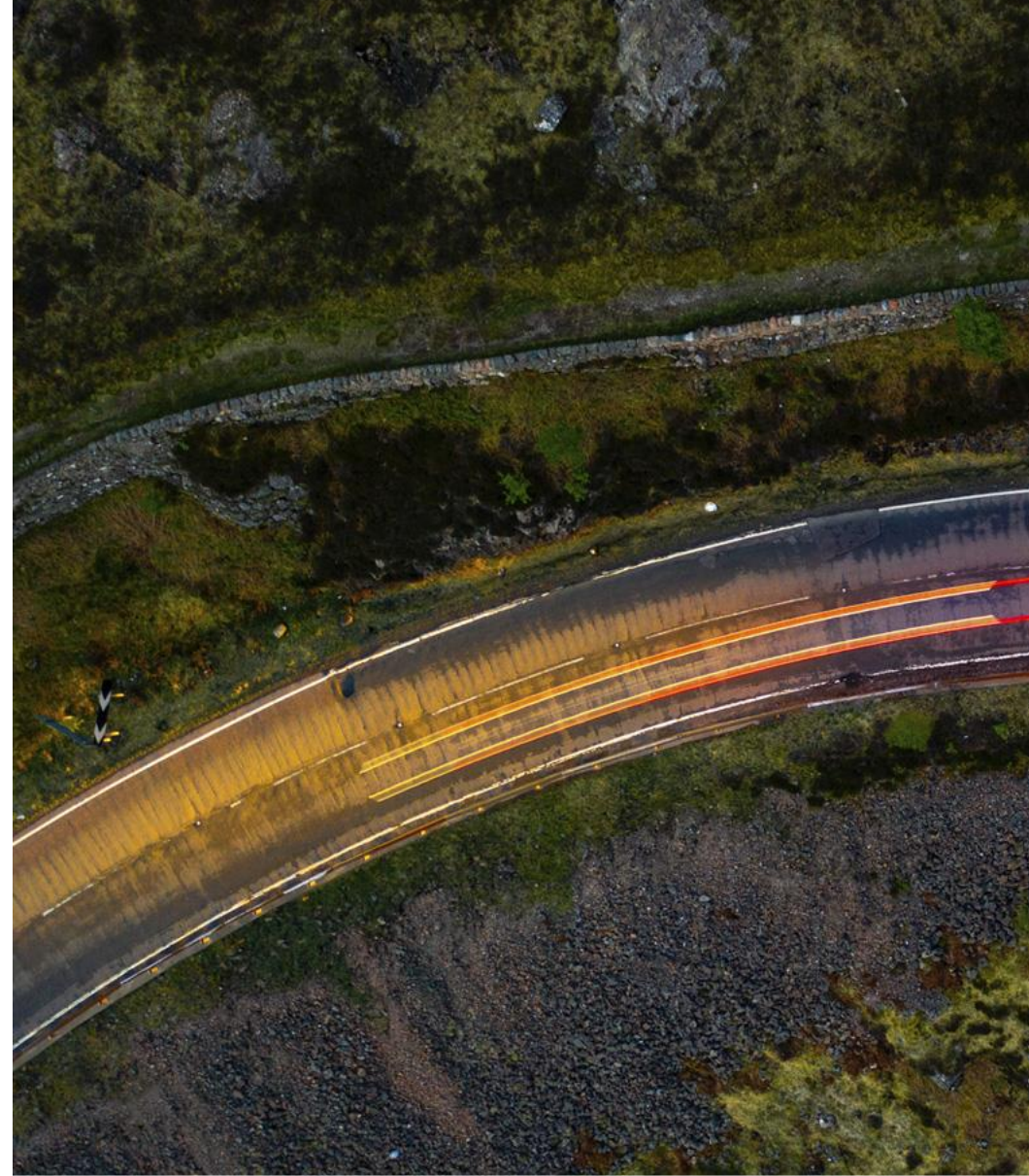
AI represents an important and game-changing role in the path to net zero!

Environment theme

What we are looking for:

- Adaptation and resilience to natural hazards and extreme events, including impact mitigation

- Prediction and management of water scarcity, droughts and flooding

- Improved weather and climate prediction

- Carbon capture and storage, including observations and modelling of greenhouse gas emissions to predict and understand the impact of mitigation efforts

- Use of nature-based solutions to deliver net zero

- Enhanced use of sensing systems, models and datasets, to gain understanding of mitigation and adaptation

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Environment theme: Exploring interrelationships between call themes

- Projects must be interdisciplinary, with research across at least 2 Research Council remits.

- There is the capacity within this call to focus on environmental systems-based research which focuses on interactions between the areas of energy, climate, and land-use (in alignment to the UKRI 'Building a Greener Future' strategic theme)

- We encourage the best of research and AI communities to come together to collaborate on proposals. Co-creation between these communities, to create novel and bespoke solutions which can progress both the technology and its application to net zero contexts, is vital.

- The data aspect of this call is important, as is the need to address key underpinning barriers to AI in a net zero context (for example, delivering improved interoperability and labelling of datasets; integrating across data sources and enabling better use or reuse of data).

- UKRI expects projects to embed careful consideration of environmental sustainability* at all stages of the research and innovation process and throughout the lifetime of the project.

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(Including consideration of reducing carbon emissions; protecting and enhancing the natural environment and biodiversity; waste or pollution elimination; and resource efficiency and a circular economy)

Agriculture and food systems theme

What the theme is about

- Development and application of AI tools and techniques which can immediately reduce emissions at one or more points across the agri-food system

- Proposals should also consider key health, nutrient, and food safety needs, and the need to maintain and improve the natural environment and biodiversity

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Agriculture and food systems theme

What we are looking for

Example areas may include:

- Strategies to reduce farm emissions in a range of climate scenarios

- Improved land use and soil carbon management

- Net zero-related trade-offs in agri-food systems

- Reducing waste

- Enabling better policy and supply chain interventions

- Improving decision making by industry, consumers and other stakeholders

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Embedding social perspectives

What we are looking for

- That your research aims to **deliver social and economic benefits**

- AI-enabled tools, techniques and capabilities are **situated in the broader social and environmental contexts/systems** they will be developed and adopted within

  - how they will be used?

  - by whom?

  - what are the challenges and opportunities?

- How can your research **support businesses?**

- Considers **behaviours, trustworthiness and privacy**

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Timeline

- 1st December 2022   Opening date

- 13th December 2022   Webinar

- 20th December 2022   Intent to submit

- 2nd February 2023   Closing date

- April 2023   Outcomes

- 1st May 2022   Awards start date

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Questions?

Contacts

Email:
- **neil.bateman@epsrc.ukri.org**

or

- **energy@epsrc.ukri.org**

- **Include 'AI for Net Zero' in the subject line**