



# **INTERNATIONAL CENTRE FOR AI, ENERGY & CLIMATE**

## **DELIVERY PLAN**



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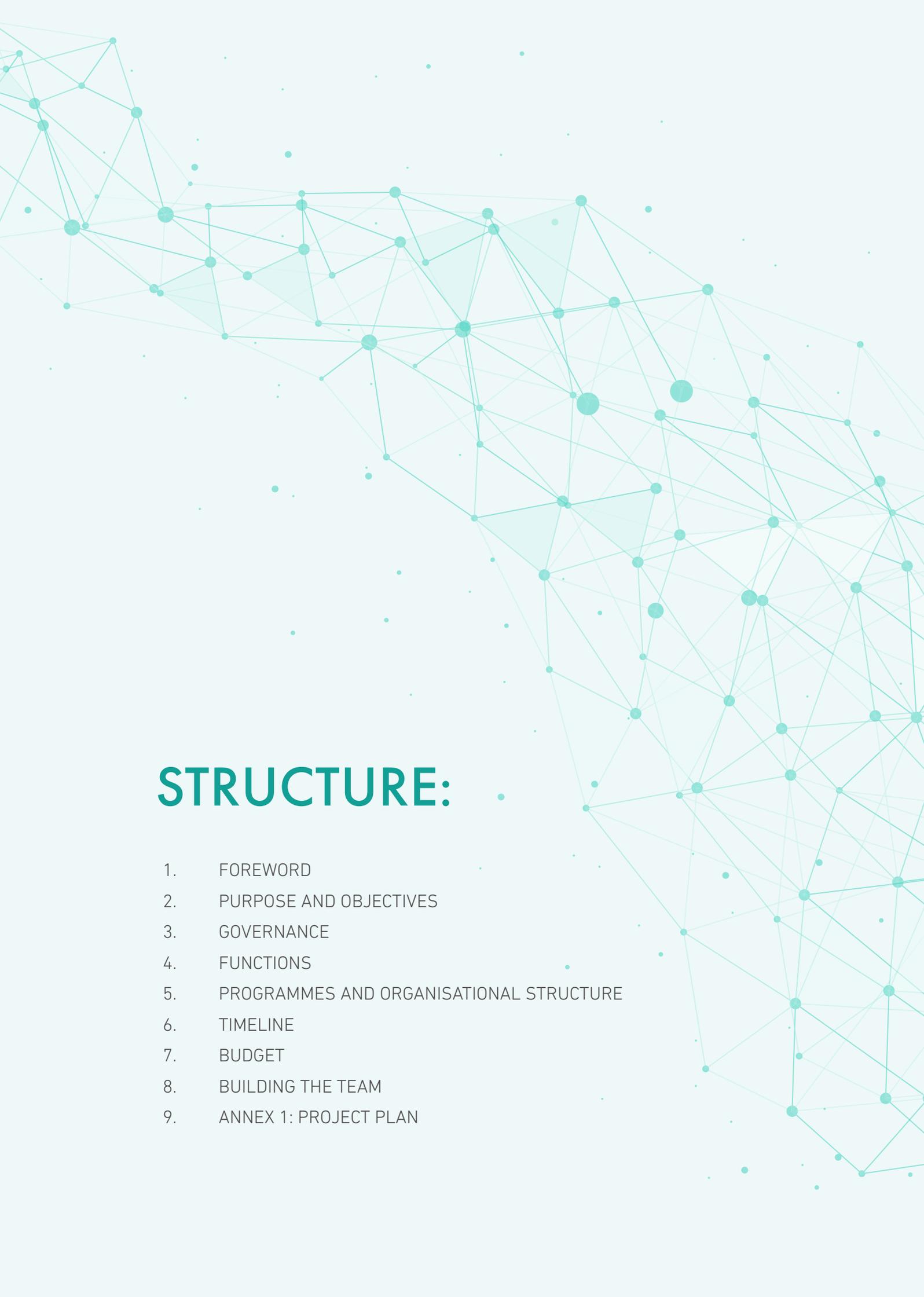
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# STRUCTURE:

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# FOREWORD

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Over the course of human history there have been inflection points in technological development that have profoundly impacted human civilisation. These changes have not just impacted how our economies work, but they have fundamentally changed the scope of what is possible and have reshaped our societies as a result.

The agrarian revolution 10,000 years ago represented a transition from foraging to farming and allowed for larger human settlements and led to the rise of cities. More recently we have seen a series of industrial revolutions that began in the second half of the 18th century. The first industrial revolution spanned 1760 to 1840 and was triggered by the construction of railroads and of the steam engine. It represented a shift from muscle power to mechanical power. The second industrial revolution started in the late 19th century and continued on into the 20th century and made mass production possible. It was supported by the advent of electricity grids and the assembly line. The third industrial revolution began in the 1960's and is usually called the computer or digital revolution and was catalysed by the development of semi-conductors, mainframe computers, personal computing and the internet.

We are now undergoing two new economic and industrial revolutions at the same time. Firstly, the transition to zero carbon requires changes across the economy and society and represents a fundamental shift. We are seeing the prices of renewables come down rapidly and are potentially on the cusp of an inflection point as a result. At the same time the starting gun has also sounded for the race to develop useful forms of Artificial Intelligence that have the power to revolutionise how we live and work.

If we can connect these two revolutions together, not only is there an opportunity to help accelerate the transition to net zero emissions, there is also vast economic potential waiting to be unlocked.

A handwritten signature in black ink, appearing to read 'Pete Clutton-Brock', with a long horizontal line extending to the right.

**Pete Clutton-Brock**  
Project Director

# 1. INTRODUCTION

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The climate and tech community have called for the government to support the establishment of an International Centre for AI, Energy & Climate. The rationale for the Centre has been set out in detail in *The Rationale for International Centre for AI, Energy & Climate*<sup>1</sup>. This paper represents a delivery plan for how such an institution could be delivered.

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<sup>1</sup> *The Rationale for International Centre for AI, Energy & Climate, 2020 (PDF)*

## 2. PURPOSE

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The purpose of the International Centre is to accelerate the development and deployment of data science and AI technology to help reduce GHG emissions in line with the Paris Agreement's 1.5°C target, and to support adaptation and climate risk management.

# 3. FUNCTIONS

Despite the potential opportunity that data science and AI offer, a more systemic use of these technologies to address climate change is being held back by existing data sharing models, market incentive structures and business models. The heavily regulated nature of incumbent market institutions creates a series of market failures in applying new technologies, and there is a need to ensure market incentive structures support the application of machine learning and AI.

The aim of the Centre is to address the barriers that make it harder than it should be for new AI-for-climate initiatives to be developed. In seeking to address the barriers identified, five key functions will be required:

## Pillar 1:

**POLICY DESIGN:** to address some of the policy and market power failures, a locus of expertise is needed to advise governments around the world on how to upgrade energy and climate-related policy to be AI-friendly and to align the incentives of market incumbents to support its adoption.

## Pillar 2:

**DATA & TOOLS LAB:** thousands of people are passionate about using AI to mitigate climate change. But many of these people are stuck because they cannot access the necessary data. The Data & Tools Labs will open the floodgates by enabling the community to work on high-climate-impact problems. The Lab will work with data owners to release datasets, and build tools to make these datasets easy to handle & combine. The Lab will also help industry & the Centre's startups to translate research into products and services, including a digital twin of the UK's energy system.

## Pillar 3:

**ACCELERATOR:** The under-investment in R&D projects in this area, could usefully be addressed with bespoke innovation funding to support initiatives that wouldn't otherwise be attractive to commercial investors. The accelerator will seek to support early stage application development with Technology Readiness Levels (TRL) of 1-8. There will be a need for private sector co-funding with the higher TRL support levels.

## Pillar 4:

**RESEARCH COORDINATION:** This pillar would help address the need for improved coordination and cooperation in the development of academic research on AI for energy and climate, and support to build the talent pipeline needed.

## Pillar 5:

**MARKET FACILITATION:** this pillar involves supporting knowledge sharing on the opportunities for AI to support decarbonisation in a range of energy system contexts, via industry events, country engagement, tech delegations, MOOCs, jobs/projects board and engagement at international fora.

A more systemic use of data science and AI to address climate change is being held back by existing data sharing models, market incentive structures and business models.

# 4. THE CENTRE WILL SUPPORT THE GOVERNMENT'S CLIMATE AND AI POLICY OBJECTIVES

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The UK Government is committed to achieving net zero emissions. However, this transition requires an unprecedented level of economic transformation over the coming years. The role of digital technologies and in particular data science and AI will be a key part of this transformation. Whether to support the ability of the electricity grid in managing greater percentages of renewable generation, or optimising the use of batteries and industrial processes, AI will be a fundamental pre-requisite to the transition to zero carbon. The Centre will seek to align closely to future UK policy as it is developed.

The UK has also set out its ambition to lead the world on AI in the Industrial Strategy and designated AI as one of four Grand Challenges. However, the AI Grand Challenge focused exclusively on AI for healthcare. The UK cannot afford to maintain such a limited AI support focus given the opportunities in other sectors. Wider innovation support for smart systems and data science applications for energy and climate has been very limited to date. What little there is has been delivered through a fragmented landscape of financial support processes which have splintered funding into small awards for recipients with none reaching the scale necessary to compete with the leading institutes and clusters globally. It is imperative to improve the coordination of UK innovation in this space to improve excellence, retain and attract the best researchers and develop the best technology.

The Centre will work with existing structures and organisations in the UK. In particular:

**The Alan Turing Institute (ATI):** the Centre will seek to work closely with the ATI in the development of the Virtual Research Centre.

**The Energy Systems Catapult (ESC):** given the ESC's work on energy data, the Centre will seek to work closely with the ESC on energy data policy.

**The Office for AI:** the Centre would seek to work closely with the Office for AI in developing and delivering parts of the UK's AI strategy specific to energy and climate.

**Innovate UK:** The Centre will seek to work closely with Innovate UK, in particular in delivering finance through the Accelerator.

**Research councils:** The Centre will seek to coordinate closely with research councils on research priorities and coordination via the Virtual Research Centre.

**The Met Office**

**National Grid and the distribution networks**

# 5. GOVERNANCE

The governance structures for the Centre will seek to ensure that the organisation is accountable for the fulfilment of its overall purpose and bring in a wealth of external expertise and experience to advise on the strategic direction of the organisation.

The governance structures that will be put in place will include the following:



## Board of Directors

The board of directors will have a mandate to ensure the organisation's strategic direction supports the fulfilment of its overall purpose. The Board will be comprised of senior management and independent non-executive directors and will operate in line with best practice private sector corporate governance guidelines. Its responsibilities will include:

- ▶ **Setting strategy and plans:** Annually review the strategy and business plan for the Centre, developed by the Executive Management.
- ▶ **Monitoring performance:** Monitor and evaluate the Centre's progress towards accomplishing its strategy and business plan.
- ▶ **Overseeing key management issues:** Set senior management and CEO compensation and evaluate their performance.
- ▶ **Ensuring the safety and soundness of the business operation:** Oversee risk management and auditing, ensure ethical behaviour and compliance with laws and regulations and accounting principles.
- ▶ **Overseeing other governance issues:** Propose new candidates for the Board, set Board governance processes, and input into personnel strategy.



## The Executive Management

Executive Management: The Executive Management will be responsible for day-to-day operations. Its specific responsibilities will include:

- ▶ **Developing long- and short-term strategy:** Developing and proposing the strategy which would include decisions around the Centre's priorities (e.g., at a sector level) and outputs.
  - ▶ **Building the team:** Recruiting and managing the team needed to deliver on the organisations strategy.
  - ▶ **Managing the team:** Managing the organisation to deliver against the business plan, including creating and building appropriate processes and taking appropriate human resource decisions.
- External reporting:** Providing performance reports according to an agreed reporting framework.



## Advisory Council

The Advisory Council will bring together experts in AI, energy, transport, land-use and climate change to advise the Board and CEO both on the strategy of the organisation, as well as on more specific operational issues.



## Investment Committee

The Centre will include an accelerator with a mandate to offer grants and semi-commercial equity finance. Decisions regarding investments will be overseen by the Investment Committee.



## Key documents

The Centre's purpose and governance processes will be captured in various key documents that will support transparent and effective governance. These key documents will include:

- ▶ **Articles of Association:** setting out organisational purpose and imposing general Company Law framework on the Centre.
- ▶ **Corporate governance code:** setting out principles of good governance, including the board structure.
- ▶ **Budget/grant allocation letter from government:** formally delegating budget and delineating any conditions.
- ▶ **Terms of Reference** for each of the three main governance structures
- ▶ **CEO appointment letter:** setting out the roles and responsibilities of the CEO in delivering the Centre's objectives.



# 6. OPERATING PRINCIPLES

## **Climate impact:**

The Centre's work will focus on deploying resources to achieve maximum climate impact on both mitigation and adaptation.

## **Partnership with private sector:**

The Centre will work with the private sector to facilitate the application of data science and AI solutions to climate challenges.

## **Community impact:**

The Centre will seek to support the development of an AI for climate tech ecosystem of startups and initiatives.

## **Enduring impact:**

Providing support in such a way that projects and initiatives supported are able to achieve financial self-reliance.

## **Alignment with government:**

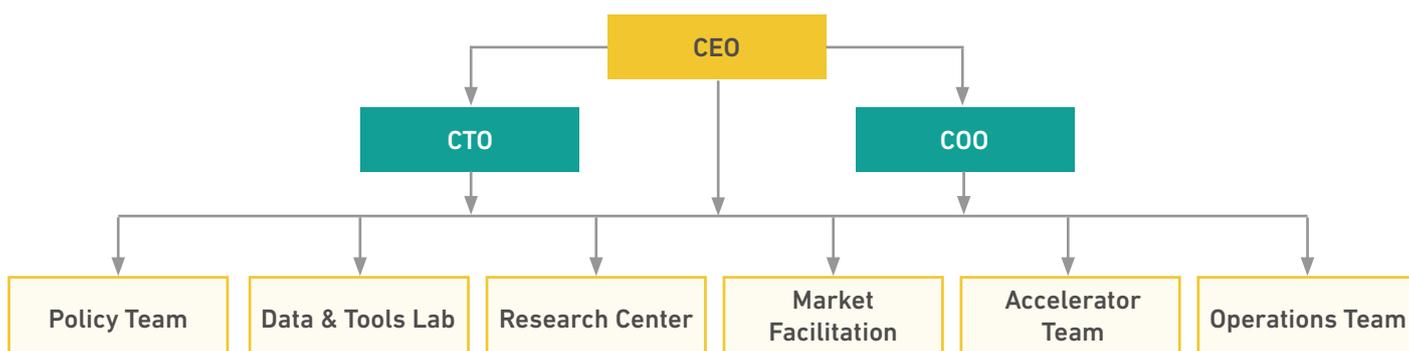
The Centre will seek to align with government initiatives and priorities.

## **Minimising distortions:**

The Centre will avoid working in areas which the private sector can already deliver.

# 7. PROGRAMME AND ORGANISATIONAL STRUCTURE

Whilst the five pillars identified above represent the functions needed to address the barriers that have been identified, the context for these will vary considerably depending on the sector to which they are applied. As such there will be a need for interdisciplinary teams to work together to deliver the functions needed in a way that cuts across existing community silos. To ensure accountability is aligned with delivering against climate-focussed objectives, teams will be aligned with the sectors they are seeking to support. This approach will ensure the policy, research coordination, market facilitation and data & tools lab functions work together to deliver on sectoral objectives.



# 8. PROGRAMME OUTPUTS

## SECTORAL PROGRAMMES (Energy, Industry, Transport, Lands Use, Adaptation & Climate Science)

### POLICY

**OUTPUTS:** Conduct a series of reviews of the current state of data collection, data access and data standards for each sector. This will include an assessment of existing data sets, gaps in data collection, any restrictions to data access and recommendations for rapidly improving data collection, access and standards specific to supporting key climate challenges. The end result will be a climate data policy blueprint for countries around the world to follow.

**OUTPUTS:** Building on the climate data reviews, the next steps will be to assess how sectoral market structures and designs need to be transformed to make the most of data science and AI. This will cover smaller short- and medium-term amendments, as well as the potential for and benefits of more fundamental shifts in market design.

**OUTPUTS:** Develop data standards and golden datasets for each sector.

**OUTPUT:** develop a report looking at how to ensure data science and AI are applied in a trustable and ethically responsible way to climate-related challenges, with a focus on areas of specific risk.

**OUTPUT:** deliver a workshop series looking at very specific climate data science projects and delivering support and advice to project teams on policy related issues and challenges.

### DATA & TOOLS LAB

**OUTPUTS:** Data sprints, to support the release of data and the development of tools to enable the wider AI community (both researchers and industry) to work on high-climate-impact problems.

**OUTPUTS:** Machine learning competitions. (ML competitions will be a regular occurrence of ICAIEC activity).

**OUTPUTS:** Series of blogs to communicate to the data science community which problems industry needs help solving, and how they can get involved.

**OUTPUT:** Develop an index of energy and climate related data, that will direct organisations to available datasets. Assess the potential for this to be developed into a market for energy and climate data.

**OUTPUT:** Conduct an assessment of the need for public interest models to be developed.

**OUTPUT:** Subject to further assessment the Centre plans to develop a digital twin of the UK electricity system. This will be broken down into multiple steps.

## ACCELERATOR

**OUTPUT:** develop and launch ongoing competition for grant finance for AI for climate projects. This programme will be the central funding pot for the accelerator. The guidance will note specific areas that the accelerator would be interested in seeing proposals for but would be open to all applicants.

**OUTPUT:** develop and launch early-stage seed equity fund to help teams that have a proof of concept to further develop their project into a commercial offering.

**OUTPUT:** Develop and launch an incubator programme with initial support for 5-10 project teams.

**OUTPUT:** develop and launch a match-making process for potential founders.

**OUTPUT:** Develop and deliver an investor-day, where commercially viable projects can pitch their proposals to investors.

## RESEARCH COORDINATION

**OUTPUT:** Develop and launch a virtual research centre of academics from leading institutions working on data science and AI for climate.

**OUTPUT:** develop a series of reports highlighting the state of academic research on AI-for-climate in various sectors and where the key areas of focus need to be in the future.

**OUTPUT:** Develop and launch a funding programme for [X] PhD places for priority AI-for-climate research areas.

**OUTPUT:** Develop and launch a series of focused academic workshops to support knowledge sharing and research coordination on key areas.

## MARKET FACILITATION

**OUTPUT:** Develop and launch an annual flagship AI-for-climate conference

**OUTPUT:** Develop and launch a programme of tech-delegations, taking teams of data scientists to countries that are interested in developing better data science and ML capabilities for specific challenges.

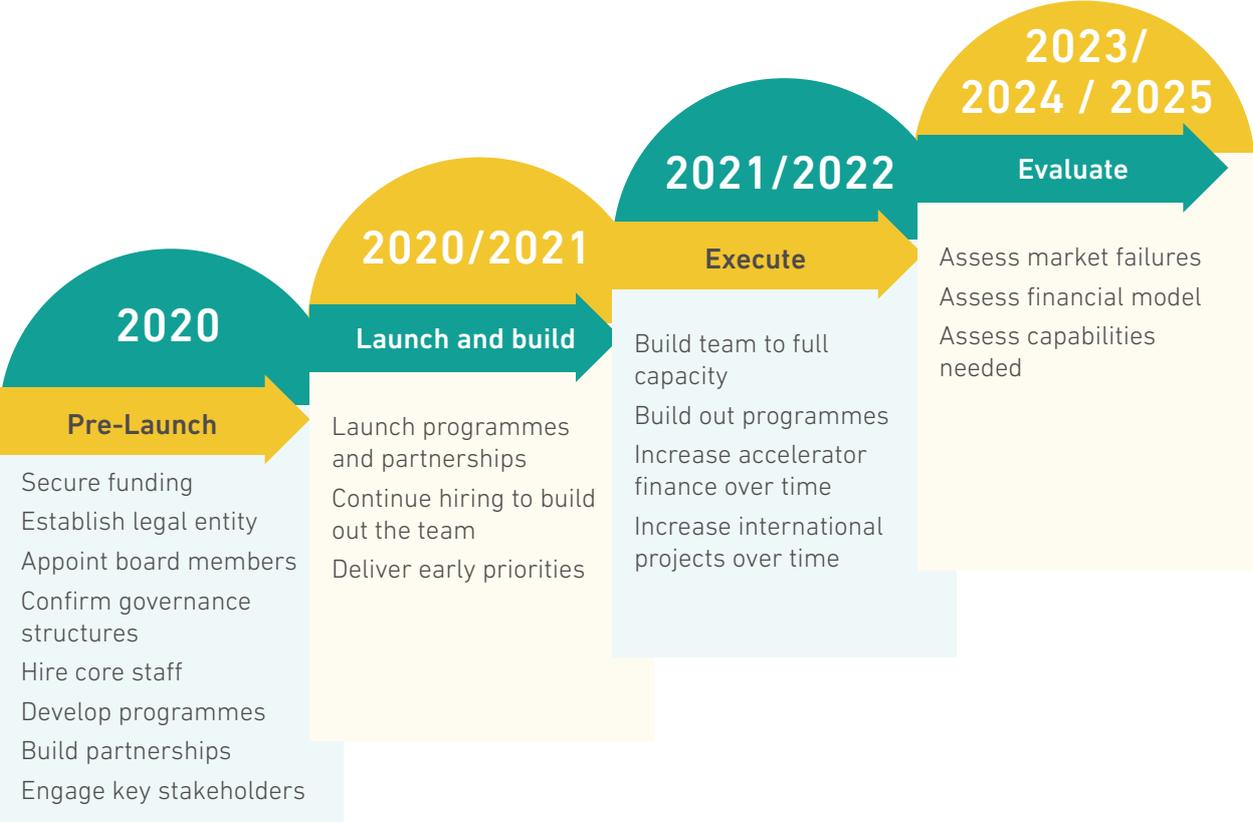
**OUTPUT:** Develop and launch a data science and ML for climate, jobs and projects board hosted on the ICAIEC website.

**OUTPUT:** Develop and launch a Massively Open Online Course (MOOC), on data science and machine learning for climate. This would help bridge the knowledge divide by explaining to incumbent industries how to go about using data science and AI, but also explaining to data scientists the priority areas that need support from data scientists.

**OUTPUT:** Develop and launch an international engagement programme, seeking to highlight opportunities for applying data science and AI to climate challenges at a range of international forums.

**OUTPUT:** In collaboration with the Data & Tools Lab, output market-testing assessments to determine interest from major private sector players in key areas of relevant sectors in developing collaborations to apply data science and AI to help reduce emissions. Further outputs will be developed based on the needs of these key players.

# 9. HIGH-LEVEL TIMELINE



# 10. BUDGET

The budget for the Centre will need to provide for a flagship institution to be established and run for at least five years to provide sufficient confidence in funding to allow for larger-scale projects to be initiated. The proposed budget would allow for the Centre to ramp up activities to ensure that good value for money is being achieved during the initial phases of the Centre’s activities.

Table 1: ICAIEC Budget

BUDGET	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Policy Unit	£575,000	£950,000	£950,000	£950,000	£950,000	<b>£4,375,000</b>
Data & Tools Lab	£1,975,000	£5,480,000	£5,480,000	£5,480,000	£5,480,000	<b>£23,895,000</b>
Accelerator	£2,265,000	£7,690,000	£11,690,000	£13,190,000	£16,690,000	<b>£51,525,000</b>
Virtual research centre	£465,000	£495,000	£495,000	£495,000	£495,000	<b>£2,445,000</b>
Market facilitation unit	£870,000	£1,020,000	£1,020,000	£1,020,000	£1,020,000	<b>£4,950,000</b>
HR, Operations and management	£2,830,000	£2,462,500	£2,422,500	£2,372,500	£2,517,000	<b>£12,604,500</b>
<b>TOTAL</b>	<b>£8,980,000</b>	<b>£18,097,500</b>	<b>£22,057,500</b>	<b>£23,507,500</b>	<b>£27,152,000</b>	<b>£99,794,500</b>

A significant proportion of the Centre’s finances will be delivered via the accelerator, which will in turn seek to leverage additional finance from the private sector. The extent of this leverage will differ depending on the type of finance that is being provided and the technology readiness level (TRL) of the project being supported.

The Centre will seek to maximise value for money by ensuring:

- *Business planning processes assess value for money in determining a preferred approach for delivering a particular output or function;*
- *Best practice procurement processes are put in place;*
- *Salaries are benchmarked to similar institutions;*
- *Best practice expenses policies are put in place;*
- *That processes are adopted to assess whether to develop internal resource to deliver a function or to outsource it;*
- *There is budget provision for external evaluation and independent audit.*

# 11. TECHNOLOGY READINESS LEVELS

Technology readiness levels (TRLs) are a method for estimating the maturity of technologies. The method was developed by NASA during the 1970s with the aim of enabling consistent assessments of technical maturity across different types of technology. TRLs are based on a scale from 1 to 9 with 1 being the least mature, and 9 being the most mature technology.

The TRL scale was introduced into the EU funded projects arena in 2014 as part of the Horizon 2020 framework program and has been used to inform state aid discussions.

Horizon 2020 used TRL levels to position project proposals in the program. The TRL level of a project, enabled applicants and reviewers to align with the expectations of a particular funding call. For example: a funding call for higher TRL technologies text clearly means that the funder is looking for more applied solutions in the scope of the project. Alternatively, a lower TRL in the call text indicates an expectation for a more basic research project.

In addition to being useful assessors of technology readiness for funders, TRLs are also a measure of technical risk, with lower TRL technologies representing a greater level of risk, and higher TRL levels representing a lower risk.

Some funders have considered attaching requirements to different levels of TRL such that more mature technologies require greater levels of private sector co-financing than less mature technologies. In many instances this makes sense, however there may be instances where non-technology related risks or market failures require a more flexible approach. As a result, TRL levels and associated requirements can be applied effectively as a guide, but if applied too rigidly risk becoming a straitjacket.

The Centre will use the TRL methodology to inform its work. In particular the accelerator will focus primarily on supporting TRL levels 3-8. For higher TRL level projects, securing private sector co-funding will be an important aspect of bid evaluation. Further assessment is needed to determine whether co-funding should be a blanket requirement for such bids as there may be some projects that support the public interest and add significant value but may need more time to get private funding.

TRL 1 – Basic principles observed

TRL 2 – Technology concept formulated

TRL 3 – Experimental proof of concept

TRL 4 – Technology validated in lab

TRL 5 – Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)

TRL 6 – Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)

TRL 7 – System prototype demonstration in operational environment

TRL 8 – System complete and qualified

TRL 9 – Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

The TRL level of a project, enabled applicants and reviewers to align with the expectations of a particular funding call.



# 12. DELIVERING FOR AND WITH **THE PRIVATE SECTOR**

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## ***Facilitating the private sector:***

The Centre's functions and outputs are designed to address a series of market failures that currently make it harder than it should be for the private sector to deliver AI solutions to climate-related challenges. By addressing these market failures, the Centre will seek to support and facilitate startups and existing companies in the energy and climate space to deploy AI solutions. In particular:

- *The policy unit will seek to work closely with cutting edge startups to identify the barrier that they are experiencing and then work with policy makers and regulators to address these.*
- *The Data & Tools Lab, will seek to work with incumbent energy and climate companies and facilitate the application of data science and AI to address some of the key challenges for them in getting to net zero.*
- *The Virtual Research Centre will work with companies to identify the skills and capabilities that need to be developed to improve the UK's talent base on applied AI for energy and climate.*
- *The Market Facilitation unit will help bridge the silos between the data science community and the energy industry.*

## ***Delivering with the private sector:***

In addition to facilitating the private sector to deploy data science and AI solutions, the Centre will seek to work with the private sector in delivering the various functions identified as being needed. This approach will bring in private sector expertise and allow the Centre to deliver services in an agile manner. Specifically, the Centre will seek to:

- *Work with existing startup accelerator companies in delivering the Centre's accelerator;*
- *Work with VCs to create on going funding as startups begin to commercialise and grow.*
- *Work with private event companies in delivering some of the Market Facilitation Unit's functions;*
- *Work with private sector consultancies in developing AI policy advice;*

Further opportunities to work with private sector companies in delivering the Centre's functions will be assessed as they arise, based on a value for money assessment.

# 13. WORKING WITH INTERNATIONAL INITIATIVES

Given the growing awareness from the international community regarding the geopolitical importance of leadership on data science and AI, a range of initiatives have been developed that are seeking to shape policies, governance models and infrastructure investment priorities for the new digital ecosystem that is emerging. These processes range from international and regional initiatives to national and private sector plans.

## Key international initiatives include:

### *The Global Partnership for AI (GPAI):*

The GPAI is an initiative led by the French and Canadian governments. The idea is to create a standing forum involving government, industry and academia, to monitor and debate the policy implications of AI globally. Other countries have been invited to join. Under the blueprint discussed so far, the GPAI would have a ruling council that includes government ministers, overseeing public-private expert panels and supported by centres of expertise in Paris, Montreal and at the Organisation for Economic Cooperation and Development. Whilst the GPAI will have a mandate to assess the high-level policy and governance of AI, often the challenges in assessing AI governance and policy come when looking in detail at specific applied areas. We think the Centre could be a partner of the GPAI initiative, specifically contributing to international discussions on AI governance and policy, as they relate to energy and climate change.

### *UN Global Environmental Data Strategy:*

In March 2019 Environment Ministers committed to support a UN Environment Programme (UNEP) global environmental data strategy by 2025. The commitment aimed to achieve comparable international environmental data in cooperation with other relevant UN bodies. The Centre would seek to work with the UN to support this objective with a specific focus on climate and energy related data.

### *UNDP Accelerator Labs:*

The Accelerator Labs represent a new approach for UNDP to support development. Funded by the State of Qatar and the Federal Republic of Germany, UNDP expects to develop 60 labs serving 78 countries, working with national and global partners. The Centre will seek to collaborate with UNDP on overseas development as it relates specifically to energy and climate change.

### *Resilience Frontier Initiative:*

The Resilience Frontiers Initiative has been developed under the UNFCCC, and is an interagency effort coordinated by the UNFCCC secretariat in collaboration with Canada's International Development Research Centre, EIT-Climate-KIC, the Food and Agriculture Organization of the United Nations, the Global Water Partnership, the United Nations Educational, Scientific and Cultural Organization, the United Nations Environment Programme, and the United Nations Office for Outer Space Affairs. The Resilience Frontiers Initiative addresses how to maximize our resilience to climate change beyond 2030 by addressing opportunities and challenges in harnessing the potential of disruptive frontier technologies and emerging social trends towards sustainability. The Initiative represents a forum for discussing what is needed in applying frontier technologies to support climate adaptation and resilience. The Centre would seek to work with the RFI by drawing on its analysis to support specific applications.

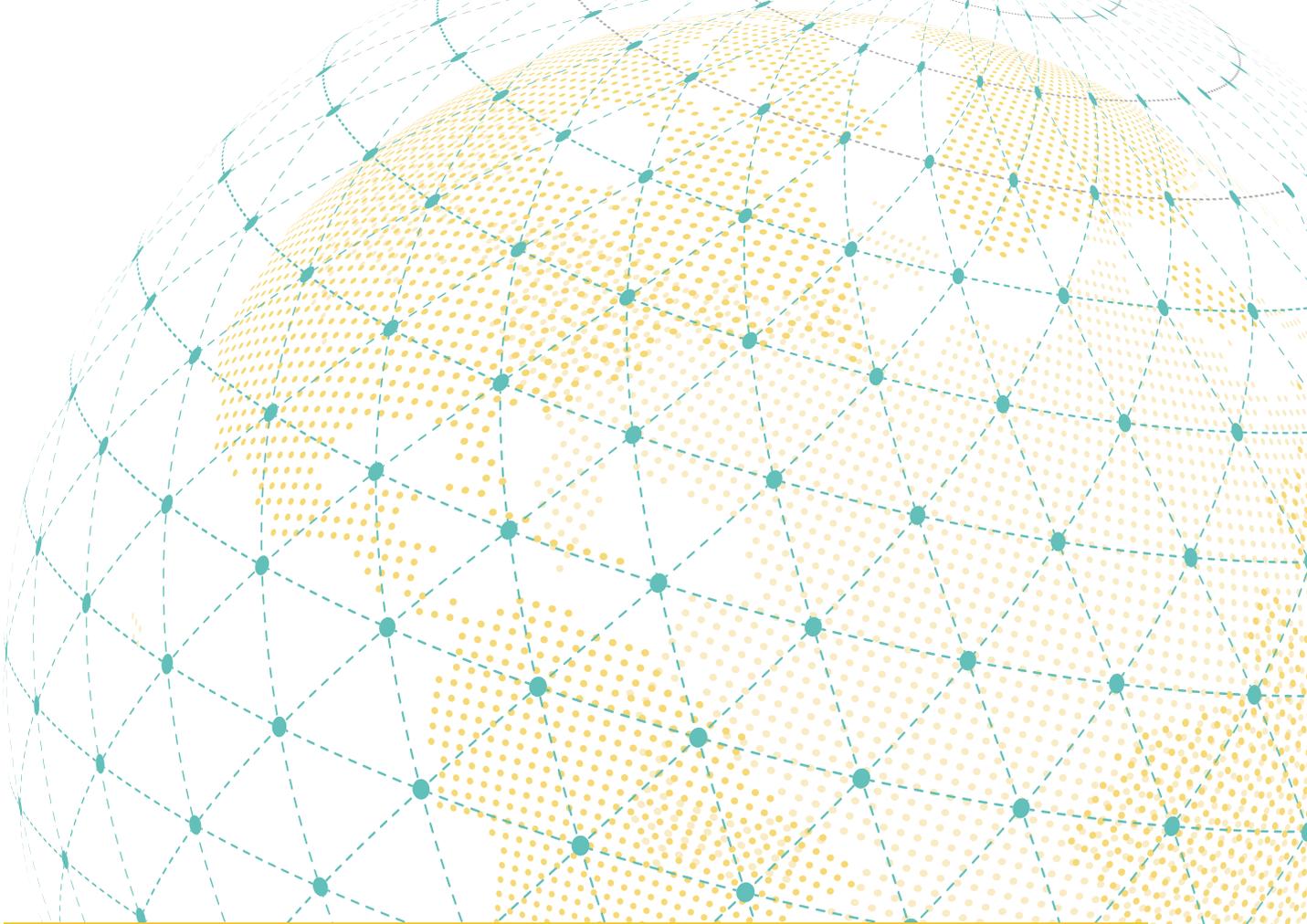
### **Group on Earth Observations (GEO):**

GEO is a unique global network connecting government institutions, academic and research institutions, data providers, businesses, engineers, scientists and experts. The GEO community is creating a Global Earth Observation System of Systems (GEOSS) to better integrate observing systems and share data by connecting existing infrastructures using common standards. The Centre would seek to work with GEO on specific areas of earth observation that are relevant to energy and climate change.

**WEF:** Centre for the Fourth Industrial Revolution: The Centre for the Fourth Industrial Revolution is a hub for global, multi-stakeholder cooperation to develop policy frameworks and advance collaborations that accelerate the benefits of science and technology. Specifically, the Centre seeks to support discussions on the governance frameworks needed for emerging technologies, including AI. Whilst the discussions are likely to be at a higher level than the Centre's more applied focus, there will be a need for ongoing knowledge sharing between organisations working in this space.

**Sustainable Digital Finance Alliance:** The objective of the Alliance is to leverage digital technologies & innovations to enhance financing for sustainable development. The Alliance plans to support research and pilot initiatives with fintech companies.





## Regional and national initiatives

### *EU White Paper on AI:*

In February 2020 the EU Commission published its White Paper on AI that set out both how the EU will be a leader on AI, and also how the technology should be regulated. The White Paper specifically references the potential for AI to support action on climate change in its very first paragraph. The paper goes on to highlight the EU's objective in building an ecosystem of AI excellence that can support the development and uptake of AI across the EU. To achieve this the Commission proposes to support the creation of a flagship EU AI centre of research, innovation and expertise that would coordinate AI efforts across the EU, and a network of sectoral centres with a focus on energy/environment, industry, health, transport, finance, agrifood value chains, forestry, earth observation and space. This vision has strong overlaps to the International Centre for AI, Energy & Climate, and there are risks that a network of EU centres could compete directly with it for talent and convening power. However, there is also the potential for collaboration on specific projects.

### *German Advisory Council on Global Change:*

Towards Our Common Digital Future: The German Advisory Council on Global Change is an independent, scientific advisory body to the German Federal Government, established in 1992 in the run-up to the Rio Earth Summit. The Council's remit is to analyse global environment and development problems, identify gaps in the German government's response to them and advise on how to address these gaps. The Council recently published a report called Towards Our Common Digital Future that suggests that there is currently a lack of alignment between the digitisation and climate agendas and that there is an urgent need to create the conditions needed to place digitalization at the service of sustainable development. The paper also called for the European Union to lead the way in integrating sustainability and digitalization. As Germany will have the Presidency of the EU Council in the second half of 2020, it is likely that the combination of Commission and Council support for this agenda will lead to large scale support for a series of initiatives in this space.

### **France:**

AI Strategy and Make the Planet Great Again: In 2018 the French government published 'For a Meaningful Artificial Intelligence: Towards a French and European Strategy'. The fourth section in the document is dedicated to how France will seek to use artificial intelligence to create a more ecological economy. France is looking for opportunities to align the digital and climate agendas and has been supportive of EU leadership in this space. Following President Donald Trump's announcement of the US withdrawal from the Paris climate agreement in June 2017, French President Emmanuel Macron launched the Make Our Planet Great Again (MOPGA) initiative to attract researchers from all over the world to France to develop cutting-edge research for fighting climate change. Through this programme they have attracted world leading data scientists and machine learning experts to come to France to work on climate projects.

### **China:**

China is on its way to becoming the first global superpower for Artificial Intelligence. In 2017, the State Council of the People's Republic of China (also known as the Central People's Government) published its Artificial Intelligence Development Plan. The plan involved huge capital injections into making China a leader in AI, through funding for talent development, innovation funding and the development of multi-billion-dollar AI clusters. The result is a holistic approach for creating a successful AI ecosystem. As a result, China has the largest capital market for AI start-ups, publishes the most research papers on AI, has developed some of the more advanced data regulation and trains the most AI talent. However, at the same time, China sees a need to increase the diversity and creativity of its AI talent pool, and for this reason several agencies have been given a government mandate to attract talent from Europe and to build relationships with European partners.

### **US:**

In September 2019 the US created the Artificial Intelligence & Technology Office (AITO) within the Department of Energy to serve as the central body responsible for the development, coordination and application of Artificial Intelligence, building upon the Department of Energy's capabilities as a world-leading enterprise in scientific discovery and technological innovation. The strong link the US sees between AI and energy demonstrates the degree of opportunity that the US sees for applying AI in the energy sector.

### **Canada:**

In 2017 Canada developed its Pan-Canadian Artificial Intelligence Strategy, led by CIFAR, in close collaboration with Canada's three national AI Institutes - Amii in Alberta, Mila in Montréal, and Vector Institute in Toronto. The plan described Canada's approach to increasing AI talent, developing global thought-leadership on the economic, ethical, policy and legal implications of AI, and supporting the Canadian research community. Canada has one of the strongest talent pools on AI, and is the originator of various machine learning techniques such as reinforcement learning. The concept team for the Centre have held positive discussions with the Canadian High Commission on the potential for collaboration.

There are a range of options for how the Centre could work with other countries, ranging from light-touch collaborations, through to collaborating on the development of the Centre. If the UK chooses to support the Centre part of the early work will be to engage potential partners to discuss in detail how such partnerships should be designed.

# 13. LOCATION

The location for the Centre will be chosen so as to enable it best to deliver its mission. As the Centre becomes an operational entity it will need to be based in a location that allows it to operate in an effective, efficient and scalable manner.

The government and the Board will consider a number of criteria before taking a decision on the Centre's location, including:

- ▶ **Ability to fulfil the Centre's mission: The Centre will be based in a location that best enables it to fulfil its mission. In particular it will need to be in close proximity to the following groups:**

- Tech companies
- Energy sector
- Project partners: Including the head offices of utilities, tech companies, large industrial companies and climate projects.
- Climate change thought leadership: To solicit third party advice on priorities – e.g. NGOs, trade associations, government agencies.
- Government: To engage appropriately with Government on opportunities of applying AI to government climate-related priorities.

**Ease of access to the talent pool: It is imperative that the Centre's location provides easy access to deep pools of talent with the necessary skills in data science and climate expertise.**

**Commercial costs: The major cost drivers are likely to include:**

- Building rental and infrastructure costs to host and support a small sized team (currently envisaged as a 50–70 employee operation).
- Costs of back office support, administration and maintenance.
- Travel costs

**How the Centre can support the government's desire to rebalance the UK economy and work with energy intensive sectors in the North of England.**

One option that should not be ruled out is for the Centre to have multiple offices that allow it to draw on a wider range of expertise and more easily support a wider range of projects.





