

Innovation through Partnership

BAS Strategy for Innovation and Impact

SUMMARY

Innovation and impact are firmly embedded in British Antarctic Survey's (BAS's) Vision and Mission. Considerable potential exists for BAS to create impact through outward-facing innovation, and to innovate within through adopting novel technologies and processes. BAS will convert this potential through forming fruitful partnerships with those who complement our strengths. A strong innovation culture, sound self-awareness and knowledge of the external landscape provide the foundation. Alignment of values, leveraging of assets and careful prioritising will ensure delivery of impact in a resource-constrained environment. The Aurora Innovation Centre at BAS is a key enabler for success.

Aim:

- To develop fully our potential to derive local, national and global impact from our expertise and assets
- To collaborate with others who complement our strengths to create external and internal benefit

SETTING THE SCENE

What do we mean by innovation, and how is it linked to impact?

Innovation comprises two key features: It introduces something *fresh* (new, original, or improved), which in turn creates *value* (benefit, [impact](#)).

In the context of BAS, innovation has a dual focus:

Outward facing:

Our aim is to generate new insights, processes, products and/or services and translate them into wider *benefit*.

Inward facing:

We endeavour to identify and develop new or improved ways of carrying out our research and operations to *increase effectiveness*, which in turn augments resource efficiency, safety and job satisfaction.

Hence innovation is a process that naturally leads to impact as a result. It opens up BAS's expertise and assets for the benefit of stakeholders and finds novel ways to address issues of global importance.

Impact from research and operations: Innovation through partnerships

Outward facing:

The most fruitful path to impact is to co-design research with stakeholders. A mutual understanding between BAS researchers and potential end users, enabled by relevant knowledge exchange, will ensure that research is conducted in a way that will enable its application in the future. BAS, as a research-focused organisation, will hence work in partnership with others from the public and private sector whose strength lies in the next steps towards application of BAS research outputs.

Inward facing:

As a polar operator in the midst of major infrastructure changes, BAS will communicate its innovation needs to the relevant communities and aim to co-design solutions that can find wider applications and will bring benefit to delivery partners.

Finding the right partners with compatible expertise and working patterns as well as aligned ethical priorities is one of the key enablers for both outward- and inward-facing innovation. A key aim of the Aurora Innovation Centre is to facilitate such fruitful partnerships.

Government priorities

The UK government, through its [Industrial Strategy](#), [Clean Growth Strategy](#) and [25 Year Environment Plan](#), recognises innovation based on sound environmental understanding as a major driver for sustainable economic success in the UK. The government also recognises its global responsibilities under the [Global Goals for Sustainable Development](#) and, through measures such as the [Global Challenges Research Fund](#), supports cutting-edge research that creates impact by addressing the challenges faced by developing countries.

A high priority is hence given by the Department of Business, Energy and Industrial Strategy (BEIS) to providing investment that enables excellent fundamental science to be translated into application. BAS has benefited from a £5M investment for an Innovation Centre to facilitate increased impact with high significance and reach from its excellent research base. The Aurora Innovation Centre, comprising state-of-the-art conference and meeting facilities and a Collaboration Space for partners, was launched in July 2017 as a key enabler to achieve impact on local, national and global scale from BAS research and operations.

Innovation and impact in the UKRI and NERC families

A foundational principle of UK Research and Innovation (UKRI), which the Natural Environment Research Council (NERC) and BAS are part of, is to enable an agile response to new challenges and opportunities across disciplines, pulling research through to application and co-creating solutions between business and academia.

NERC's current strategy, "[The business of the environment](#)", highlights the relevance of NERC-funded research and operations to economy and society. BAS research is applicable beyond the polar regions, and is relevant to a spectrum of industries, from fisheries to satellite operators, from

pharma to insurance companies. Like NERC as a whole, BAS aims at increasing its visibility to and interaction with business for mutual benefit, within the ethical boundaries of environmental stewardship.

Changes in governance across the UKRI- and NERC-families also require inward-facing innovative thinking, for increased agility and cost effectiveness. Innovation at BAS aims to lead the way in creating best value for public and other funds.

The Cambridge ecosystem

Cambridge is renowned for having developed one of the most vibrant innovation communities in the UK. With the expansion of the West Cambridge site, BAS's headquarters have become an integral part of this energetic Campus, which it shares with an increasing number of Cambridge University departments and companies. BAS's Aurora Innovation Centre, a joint project with the University of Cambridge, forms a valuable addition to the network of innovation and incubation facilities in the greater Cambridge area, and is a key enabler for fruitful interaction.

PRESENTING A BLUEPRINT FOR ACTION

BAS Vision

Impact is firmly embedded in our vision:

To be a world-leading centre for polar science and polar operations, addressing issues of global importance and helping society adapt to a changing world.

BAS Mission

Innovation forms a crucial part of the BAS Mission:

A research-driven organisation recognised for:

- *Commitment to excellence in science*
- *Operational professionalism and innovation in everything we do*
- *A partner of choice for science, operations and business wherever polar expertise can be applied*
- *Safely delivering complex operations in extreme environments*
- *Commitment to environmental stewardship of the polar regions*
- *Developing our staff to reach their full potential*
- *Sustaining an active and influential presence in Antarctica on behalf of the UK and playing a leadership role in Antarctic affairs*
- *Engagement with policy-makers, government and the public*

Guiding Principles

The following principles guide our innovation activities:

- Impact potential
- Alignment with BAS core values
- Drawing on united strengths of science and operation
- Making best use of BAS assets
- Compatibility with BAS Brand and rhythm of polar work
- Financial sustainability

Strategic Priorities

These are synergistic with both the BAS Science and Operations Strategies, and comprise:

Outward- and inward-facing:

- Environmental stewardship
- Embedding innovation in organisational culture and all activities
- Environmental sensing and autonomy
- Deriving value from data and models
- Technologies and materials for cold, remote and challenging environments

Mainly outward-facing:

- Climate and space weather science for risk mitigation
- Sustainable bioproducts with novel functionalities

Mainly inward-facing:

- Systems approach and professionalism in all operations
- Supply chain resilience
- Health, safety and well-being

What is our starting point?

Strategic innovative work is enabled by a cultural mind-set and arises from the combination of organisational self-awareness and a full understanding of the landscape one operates in and how it is evolving.

BAS's strengths include

- the internationally recognised expertise (in science, engineering and operations) as well as the outstanding dedication of its staff
- the quality of its assets (including ships, planes, research stations, laboratory facilities and the Aurora Innovation Centre)
- the diversity of its R&D outputs (including data, models, processes, technologies, pipeline for (bio-)chemical products, images and educational resources)
- its strong, positive brand
- its location in the thriving innovation landscape of Greater Cambridge.

Boundaries for BAS work are set by government regulations, competition for resources as well as the requirement for compatibility with environmental stewardship and with the rhythm of polar operations. The latter makes swift reaction to short-term commercial opportunities challenging.

What are the drivers?

Impact

Innovation can and should produce a wide spectrum of benefits, including on economy, society, public policy or services, health, the environment, culture and quality of life. All of the above are highly valuable and are being pursued by BAS, in cooperation with a diverse range of delivery partners. Numerous impact examples already exist and we will further strengthen our portfolio.

Financial sustainability

A further driver is the financial reality of a research landscape where traditional public funding is under pressure. Delivery of benefits to stakeholders is dependent on BAS being able to maintain and develop its expertise base and first-rate assets. Through contributing to BAS's financial sustainability and competitiveness, innovation will ensure continued impact.

What does success look like?

Success means BAS has achieved thriving, collaborative, interdisciplinary, well-balanced, financially sustainable leading edge research and operations which build on its strengths, engage and enthuse its staff, and result in significant and diverse impact of local, national and global reach.

TAKING ACTION

How will we achieve success?

Outward- and inward-facing innovation are delivered through four fundamental steps:

i. Knowledge of internal strengths and needs

BAS seeks to build robust self-awareness:

- *of strengths and gaps in technical capabilities and capacity (hard skills):* This is being achieved through building a BAS Expertise Map as a living document.
- *of embedded attitudes, enablers and barriers for innovation (soft skills):* This requires extensive staff engagement and will be achieved through bespoke workshops, the work of Innovation Champions, as well as effective communication through line management.

An appraisal of current capabilities and capacity has identified the following areas of BAS activity as most fertile ground for creating impact through innovation; these are hence being prioritised in the period 2018-2020:

- Polar technologies for orthogonal applications, esp. in developing nations
- Plastic pollution
- Remote sensing applications
- Climate and space weather modelling
- Provision of testbeds under extreme conditions
- Novel biomaterials and -processes from extremophiles
- Human impact on ecosystems
- Data into art

Areas where BAS seeks to develop internal potential and attract partner expertise for inward innovation include:

- Automation and remote power provision
- Improving energy efficiency of
 - o existing infrastructure and practices in Antarctica
 - o planned new buildings
- Low- and zero-carbon technologies
- Systems approaches to logistics

ii. Knowledge of the external landscape

Equally essential is a full awareness of the landscape BAS operates in, including competition and emerging trends. This will be achieved through:

- partnering with strategic networks, such as the Knowledge Transfer Network, Catapult Centres, Local Enterprise Partnerships, Strategic Policy and R&D Initiatives, Industry Associations and Stakeholder Fora
- close cooperation with the NERC Innovation Advisory Board
- working with business schools at partner universities, as well as using NERC pathfinder funds for market analysis
- an active presence at key external conferences

iii. Formation of partnerships where values, strengths and needs are aligned

Fruitful partnerships will arise from:

- *Clarity of boundaries and priorities*: BAS will only target partnerships that are compatible with the remit of environmental stewardship and the [guiding principles](#) defined above.
- An *engagement programme* between BAS and stakeholder networks at the Aurora Innovation Centre in areas of overlapping values and interest: this will identify
 - o where BAS strengths are aligned with stakeholder needs, and/or
 - o where external expertise is capable of and interested in addressing operational and scientific challenges at BAS.

For each prioritised area, an engagement plan will be devised as a living document that will allow identifying and attracting the right partners and clients in a timely fashion, to develop collaborative or commissioned work. Thus, we endeavour to

realise the full potential for BAS's innovative work to create impact in the short, medium and long term.

iv. Joint translation of strengths into solutions for needs

Conversion into impact entails:

- *Targeted funding:* We will identify funding opportunities and provide pump-priming to build collaborative projects.
- *Delivery to highest standards:* BAS's mission is to be recognised for excellence in science and operational professionalism. Through delivering collaborative and commissioned work to the highest standards BAS aims to be, become and remain the partner of choice for science, operations and business wherever polar expertise can be applied.
- *Building lasting relationships and capturing impact:* Innovative work grows out of relationships of trust. BAS aims to foster strong and lasting relationships with partners to build on past and current work, develop new avenues of mutually beneficial interactions, and stay connected with further developments. As impact in many areas of BAS activities will arise downstream of direct BAS involvement, staying in touch will enable BAS to be aware of and communicate the full breadth of benefits its work has contributed to.

Future proofing

To stay ahead of the game, BAS will initiate and engage in horizon scanning. This will include a continuous search for new technologies, materials and systems that could revolutionize the way BAS conducts science and operations, for increased resource efficiency and development of novel applications with wider benefit.

Enabling people

The ultimate source of innovation in every organisation is its staff. All those employed at BAS are encouraged to initiate and participate in innovation activities. This will be facilitated and accelerated by providing appropriate training, including on

- entre-/intrapreneurial skills
- awareness of enablers and boundaries (incl. policies and procedures)
- building and maintaining fruitful relationships.

BAS will offer a suite of training options to nurture and develop staff at all levels, enabling them to build on their strengths, tap into their passion for making a difference, and further their careers through innovative work. The leadership will actively seek feedback from staff on how to improve the development opportunities, and how to make BAS an even more innovative place of work.

ASSESSING INNOVATION SUCCESS

The table below shows how BAS will measure its performance against the [success indicators](#) given above. The goals and assessment criteria will be reviewed regularly in the light of new developments, to ensure priorities remain relevant and new opportunities are seized.

Outcome	Measure
Research and Operations being	
- collaborative	<ul style="list-style-type: none"> - Number of projects involving collaborators - Number of collaborators per project - Number of UK partners travelling to stations through the collaborative gearing scheme - Number of international partner staff lodging at research stations
- interdisciplinary	<ul style="list-style-type: none"> - Number of funded research proposals with Co-Investigators from different disciplines - Number of Co-Investigators from different disciplines per proposal - Ratio of industrial to academic partners
- thriving	<ul style="list-style-type: none"> - Number, length and financial value of projects
- well-balanced	<ul style="list-style-type: none"> - Number, length and value of projects per BAS team
- financially sustainable	<ul style="list-style-type: none"> - BAS Balance sheet not showing deficit at year end
- built on BAS strengths	<ul style="list-style-type: none"> - Number, length and value of projects in areas defined as strong in Innovation, Science and Operations Strategies
Engaging staff	<ul style="list-style-type: none"> - Number of staff involved in innovation activities - Staff feedback in appraisals and staff surveys
Enthusiating staff	<ul style="list-style-type: none"> - Staff feedback in appraisals and staff surveys
Diverse impact of global reach	<ul style="list-style-type: none"> - Number of impact case studies - Number of disciplines contributing to impact case studies - Number of impact categories covered in case studies - Number of beneficiaries identified in impact case studies - Number of nation states / continents impacted through the case studies