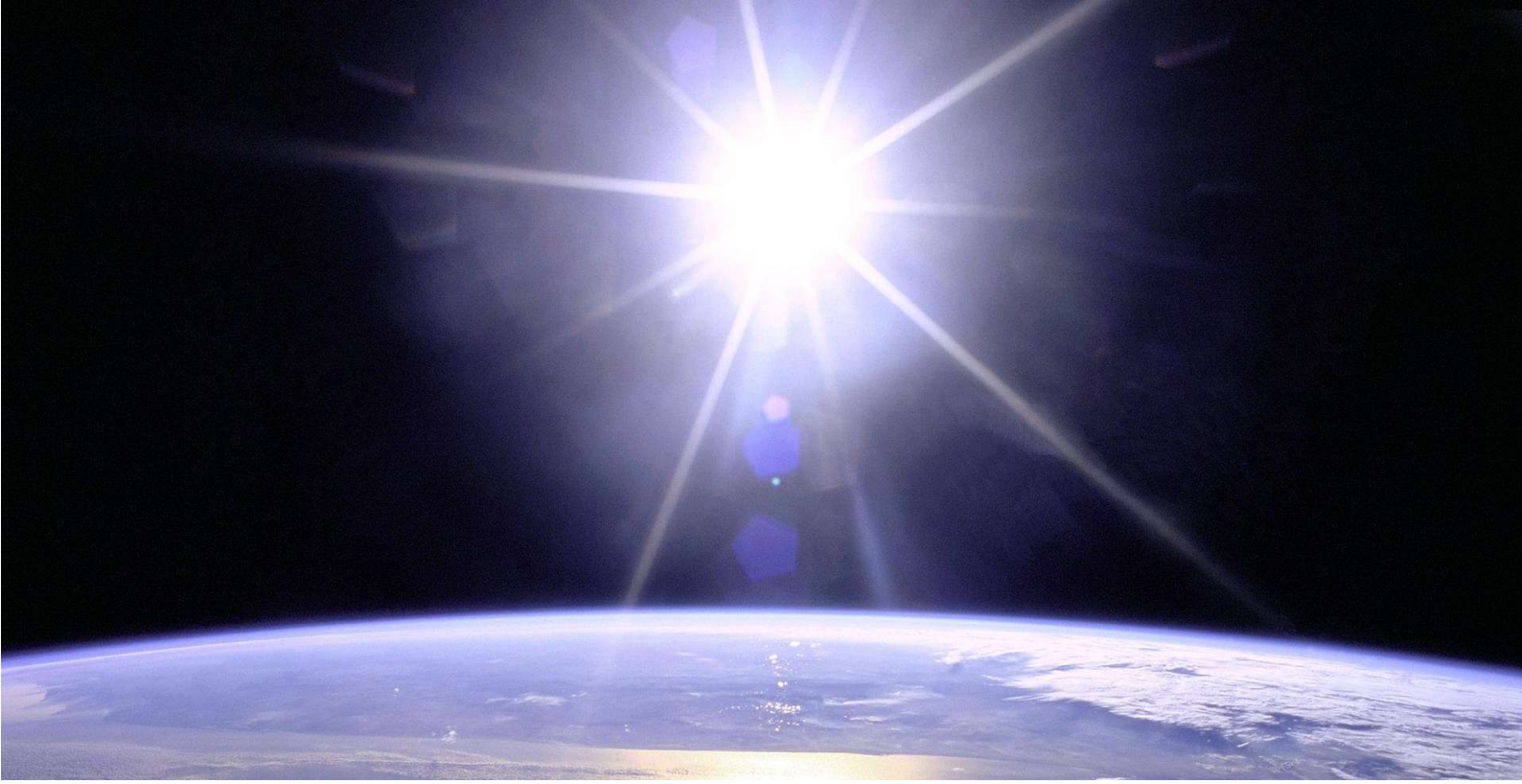

International Bilateral Fund Monitoring & Evaluation

Impact and Economic Evaluations

Final Report

FINAL

know.space for the UK SPACE AGENCY

May 2025

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to understand clearly and with certainty

About us

know.space[1] is a specialist space economics and strategy consultancy, with offices in London and Edinburgh. Founded by leading sector experts, it is motivated by a single mission: to be the source of **authoritative economic knowledge for the space sector**.

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Cover image: *Sunburst over the Earth.* Credit to NASA.

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Executive Summary

Introduction

The International Bilateral Fund (IBF) is the first UK Space Agency programme targeted at **establishing and strengthening bilateral and multilateral partnerships**. It is aimed at addressing a funding gap regarding collaborations with strategically-important, non-European Space Agency (ESA) countries. £20.6m was provided by the UK Space Agency for competitive (two-phase) and Direct Award projects, concluding by March 2025. Including matched contributions from project partners, total project spend is £29.8m.

This report provides the key findings from **know.**space's independent Monitoring & Evaluation (M&E) support for the IBF under Call 1 (Phase 1 and Phase 2). It presents a **concise overview of the impact and economic evaluations** (with a process evaluation developed for UK Space Agency internal use). Findings are based on the outcomes of detailed primary and secondary research, including 94 interviews and a survey.

Context

At present, the majority of the UK Space Agency's expenditure is channelled through the European Space Agency (ESA). Despite the significant benefits this brings to the UK, this has created a funding gap regarding **collaborations with other (non-ESA) regions** – a gap that the IBF aims to address. The IBF has focussed on establishing and reinforcing collaborations with countries such as the USA, Canada, Australia, and Japan, Singapore, the UAE, India and Bahrain. More specifically, the IBF has sought to:

- **Build stronger relationships with priority countries** and ensure the UK becomes a trusted space partner of choice;
- **Increase UK space sector inward investment and exports**; and
- **Develop UK capabilities** in collaboration with our international partners.

In total, £20.6m has been spent under the IBF, covering Phase 1 and 2 competitive projects and Direct Award projects until March 2025. On top of that, organisations were required to provide match funding contributions, as per UK subsidy control regulations. The Australian Space Agency (ASA) committed a further ~£1.5m (3m AUD) to the programme (for Phase 2), for projects that support UK-Australian collaboration. IBF funding has been delivered in two forms:

- **Direct Awards:** five projects were awarded funding outside of the competitive 'phased' process, per UK Space Agency commercial approvals

(e.g. due to only one sole supplier or extreme urgency). These projects thus have individualised timelines.

- **Competitive Awards:** projects were awarded funding through two distinct phases. In *Phase 1* (August-November 2023), 32 projects were awarded up to £75k in grant funding to establish or strengthen relationships with international partners and to develop a proposal for Phase 2 funding. In *Phase 2 (*March 2024-March 2025), 11 projects from Phase 1 received funding of up to £1.75m each to undertake a development activity that builds or strengthens an international partnership, delivers on UK strategic objectives, and catalyses investment in the space sector.

Aims of Monitoring and Evaluation support activities

know.space has been commissioned by the UK Space Agency to conduct **Monitoring and Evaluation (M&E) and benefits management for the IBF**. These activities are providing greater understanding of the programme, its effectiveness, and the impacts it is producing.

Activities are designed to feed into and support the UK Space Agency's wider M&E efforts and benefits management, which help the Agency assess progress, maintain accountability, and adjust programme strategies through evidence-based decision-making. It helps ensure optimal use of public funds to benefit stakeholders across industry, academia and public sectors, and to contribute to strategic national objectives set out in the National Space Strategy. Comprehensive M&E also provides vital evidence for success metrics, such as the UK Space Agency's North Star Metric.

Overall, our M&E activities **aim to capture the full scope of realised and anticipated impacts generated by the UK Space Agency's IBF investments and the value for money associated with the fund**. Through the deliverables from April 2023 to March 2025, we have been monitoring the progress of all competitively awarded projects funded under Phases 1 and 2 of the IBF, as well as the Direct Awards. This encompasses all funded activities under IBF Call 1. Throughout our M&E activities, impact of funded projects is collated across four categories:

- **Competitiveness and Reputation**;
- **Innovation and Commercialisation**;
- **Skills and Knowledge**; and
- **Science**.

Key findings

A central conclusion of this report is that **IBF-funded activities have demonstrated strong progress across a range of impact metrics**. The programme has successfully provided a vehicle for UK organisations to progress

partnerships with non-ESA countries and is **seen by stakeholders as helping to address the gap it was created to fill**. However, securing follow-on funding to support the international relationships after IBF has often proved tricky, with multiple projects teams concerned with how to progress newly-formed relationships over the longer term.

Impacts will take years to fully unfold, and funded projects are still concluding at the time of writing this report. It is therefore **too early to definitively conclude whether programme objectives have been met** (e.g., increasing UK space sector inward investment and exports). The benefits story is positive though and should be interpreted as **laying the foundations for more sizeable longer-term impacts**, such as opening new export markets or UK participation in significant non-ESA space missions, which are likely to only begin to fully materialise in coming years, or even decades.

Nevertheless, there are **tangible examples of investment events and drivers of UK socio-economic benefit** stemming from IBF funding, contributing over £4m in UK benefit in real, discounted terms. The net return is currently negative, with costs exceeding benefits, but we view that this is to be expected at this stage. **Ongoing M&E will be important for continuing to track emerging benefits** as they arise, particularly as new partnerships deliver tangible outcomes.

We view that relatively few observed outcomes would have materialised without IBF Phase 2 (or Phase 1) funding, and that the **programme has high additionality** in terms of its impact – both already-realised and expected in the future. The IBF was consistently described by stakeholders as **being a 'catalyst' for activities**, including formulating key partnerships, increasing reputation, accelerating routes to market, expanding access to new markets and customers, upskilling team members, facilitating knowledge exchange, and improving business know-how that could underpin future export opportunities. There is an **inherent complexity in running projects with international partners**, which should be considered when designing future programme calls. The findings in this report reinforce and enhance those from the Phase 1 and Interim evaluations.

Overarching performance against the evaluation questions (as set out in the IBF M&E framework) is broadly positive, with **our Red, Amber, Green (RAG) ratings** (with 'green' being positive, and 'red' being negative) **all either 'amber' or 'green'**. This reflects that for some elements, not enough time has elapsed to come to a definitive view, whilst others represent good initial progress for future outcomes, but that momentum can easily be lost.

Impact evaluation

Competitiveness & Reputation

IBF has been widely perceived by stakeholders as being successful in catalysing and strengthening bilateral and multilateral relationships with international partners. This is laying the foundations for long-term collaborations, although stakeholders often regarded this as contingent on future funding and

support. Through the programme and UK Space Agency's 'stamp of approval', project teams reported enhanced reputation, sharing many experiences of increased credibility and international leadership within their sub-sectors.

- **The IBF created at least 59 new international partnerships**, in nations including the USA, Canada, Australia, Japan, Singapore, the UAE, India and Bahrain, alongside deepening many pre-existing relationships.
- Phase 2 stakeholders unanimously agreed that IBF has **helped strengthen their international partnerships**, citing enhanced knowledge sharing and technical assistance.
- The programme **includes a broad range of partnering countries**. 61 international organisations from 17 countries partnered with UK leads in Phase 1, and after the Phase 2 down-selection process, 38 overseas organisations from 11 countries progressed to Phase 2. **Across Call 1, USA was the most represented, followed by Australia, Singapore, Canada and Japan** (with the majority of Singaporean representation in Phase 1).
- The IBF supported a **diverse range of partnerships** across different types of organisations, with three quarters of projects involving **multiple organisation types within their consortia**. Partners were roughly evenly split between industry (30%) and academia (28%), with partnering space agencies (23%) and other public organisations (19%) also well-represented.
- **31 potential follow-on collaborations**, including **nine future mission opportunities**, were identified by UK organisations.

The program has helped build relationships beyond immediate project teams, leading to informal partnerships with space agencies, private companies, and other research organisations. Although these entities could not formally commit to the IBF due to complexities such as internal governance processes and subsidy control mechanisms, they **offered valuable mutual learning opportunities with UK organisations**. Additionally, they provided unquantified in-kind support to projects, despite the lack of formal agreements. Projects that facilitated team-building challenges and led conferences also presented the opportunity for a wider pool of participants to network and collaborate, **supporting second-order partnerships**.

UK and international stakeholders showed intentions to continue collaborations over longer timescales. However, **uncertainty around future funding was cited as a key barrier**, especially as the IBF is regarded as a unique programme in the funding landscape. The competitive projects from Phase 1 that did not progress to Phase 2 (which for the most part have stalled as a result) serve as an early indicator that without further funding, partnerships may lose momentum.

Across both IBF phases, UK project teams **unanimously agreed or strongly agreed that their reputation and leadership within their relevant sub-sector had increased**. Again though, lasting reputational improvements are likely to be contingent on whether future follow-on opportunities materialise. **International**

partners were equally positive about the reputational gains for their UK partners.

Some international stakeholders mentioned how IBF **had increased their awareness of the UK space ecosystem and supply chain**. They expressed positive views on the UK's capabilities in relevant sub-sectors, highlighting a combination of visibility-raising through IBF and a well-established reputation in areas such as space nuclear power and AI applications. There are **early indications that IBF is enhancing UK's soft power internationally**, by providing a tangible means for new and ongoing bilateral and multilateral cooperation.

Despite promising early progress, **it is too early to determine IBF's role in establishing the UK as a 'trusted space partner of choice'**. Sustained, rather than ad hoc, international collaboration is required to enable UK organisations to respond to emerging opportunities in an agile manner and plan on longer timescales. While the IBF is designed to initiate international relationships, rather than undertake long-term space missions, there is a risk that the UK may be viewed as an unreliable partner if it fails to successfully deliver projects or missions beyond IBF support, or if it needs to withdraw from them.

Innovation and commercialisation

While impacts are unfolding, the **IBF has begun to create new commercial opportunities for the UK, with organisations expanding into regions offering complementary capabilities or new potential customer bases**. The programme has also catalysed technology development, and has created and supported employment, which are all key steps for future commercial exploitation. There is limited evidence of IBF-funded products and services reaching market to date, though **project teams generally expect more sizeable market opportunities to arise in 2027 and beyond**, highlighting the long-term nature of the commercialisation process.

Although the objectives of IBF projects vary and not all are commercially focused, each project generated investment benefits through matched funding and in-kind contributions, supported employment in the UK space sector, and generated potential user applications.

- **£15.8m in matched funding and in-kind contributions** from UK and international organisations has been leveraged. Some organisations provided more than the obligatory minimum.
- Contributions from international partners often consisted of staff time given in-kind, but other examples include UK organisations receiving access to cutting-edge facilities, software licences and key datasets, which allow for cost-savings.
- **£584k of realised internal investments** have been catalysed, largely attributed to hiring staff, with a further **£1.2m expected from 2025/26 to**

beyond 2027/28. This demonstrates limited internal investment impacts to date.

- Project teams have **secured £3.05m in follow-on external investment**, much of this stemming from foreign public investments (USA and Canada). Survey respondents hope to secure a much more sizeable £105m beyond 2025/26 (both private and public).
- An additional **£840k of ESA funding** has also been leveraged by UK organisations, in part attributable to their IBF activities.
- To date, **£900k of revenue has been linked to IBF activities**, with teams **forecasting much larger revenues of £161m beyond 2027/28**, assuming projects continue as envisaged post-IBF (we view that there is likely to be **courtesy and optimism bias** here).

Several stakeholders noted challenges in valuing investments and were unable to provide quantified estimates. This suggests a likely underestimation in figures, with varying levels of uncertainty around projected future investments and revenue.

The programme's funding is concentrated in the South East of England, with 43% of funding, followed by 35% to London. Mirroring this distribution, 38% of projects were led by organisations in the South East and 47% of partners were also located in this region. While not a programme objective, we do not view that the IBF current exhibits strong UK local growth impacts.

The IBF has created 35 jobs, while supporting an additional 51, as measured in Full-Time Equivalent terms. Despite this identified job creation, **many stakeholders felt the length of the programme was too short to hire new staff**, with academic institutions in particular viewing this as a significant barrier for long-term recruitment.

At least 13 new international markets have been entered by UK companies, supporting internal expansion and creating additional opportunities for collaboration and investments. The majority of these are attributable to Phase 1, where initial networks were established in new countries and regions, whilst Phase 2 focused on deepening relationships within these markets. Alongside this, **two universities are establishing spin-out companies** as a result of activities under the IBF. Highlighting IBF's alignment with wider UK Space Agency objectives, **21 concepts** (e.g. technological concepts and prototypes) **in Phase 2 relate to emerging sectors** (including space travel and habitation, space-based power, and in-orbit servicing and manufacturing), as identified in the National Space Strategy.

IBF has accelerated the route to market for technologies and services, but has not led to significant revenues or exports yet. Technological Readiness Level (TRL) data has been identified for 17 technologies across 11 projects, with an **average starting TRL of 2.7 and an average increase of 1.3** (to TRL 4) through

the programme. However, this represents projects before they were finalised, with several stakeholders noting that **further TRL raising was likely in the final stages of their projects**.

We have found **no evidence of registered patents, copyright and trademarks held in the UK (yet) associated with IBF funding**. This should be considered in the context of a lengthy patent process. Despite this, stakeholders held mixed views on their intentions to patent, with some prioritising open-source publications and others balancing the costs of patenting and risks of disclosing design details in the public domain.

Skills and knowledge

The IBF has had a positive impact on enhancing skills and knowledge development, including a range of technical and managerial skills, as well as increased business know-how. The programme also provided a pathway for early-career workers to get involved in space projects, exposing them to the stringent requirements of developing technologies in the space environment, and helping build a pipeline of skilled workers in funded UK space companies.

- In total, the IBF has supported at least **63 early career workers, students and apprentices to receive hands-on experience** working on international space projects. Some teams highlighted IBF's positive role in attracting talent to their organisations.
- 80% of leads across both IBF phases agreed that **their project management skills had developed as a result of IBF**. The IBF provided unmatched learning opportunities for those who have not managed international projects previously. For some organisations, new tools and processes were implemented to manage consortia, including project management software.
- UK Phase 2 project leads **unanimously agreed that IBF had helped improve or develop relevant technical skills**. These include engineering, testing design and qualification skills applicable to specific hardware components, as well as enhanced software, modelling and data-intensive science capabilities. While the project teams only make up a small component of the UK space industry, the type of technical skills developed are highlighted as key skills gaps within the wider sector.

The programme's funding has **facilitated knowledge exchange/transfer across world-leading institutions**. Both UK and international stakeholders cited this as a key route to upskilling, with organisations able to share their complementary capabilities and expertise across consortia.

Business know-how has improved within UK organisations as a result of delivering IBF projects, which could underpin future export opportunities. This was driven largely by its internationally collaborative nature, where project teams had to navigate complex international environments, such as export control

compliance, international regulations, collaborative agreements, and US International Traffic in Arms Regulations (ITAR) and dual-use restrictions between companies. Moreover, SMEs and universities leveraged the phased approach to the programme to undertake early market research, present to potential investors and customers, and conduct in-person meetings in new regions.

Outreach and engagement activities in some projects have the potential to sow the seeds of future impacts on the UK space sector. Seven projects held outreach and engagement activities for student audiences, the majority of which were targeted at post-graduate levels. Initiatives have included in-person workshops and presentations, as well as online educational materials. This could lead to impacts beyond the timeframe of our evaluation - inspiring the younger generation, or providing knowledge of space-sector-specific business practices to new entrants to the sector.

Science

Evidence of realised scientific impact of the IBF is relatively limited at this stage of the evaluation, although the programme's support could play an enabling role for benefits that will unfold over future years.

Nine future mission opportunities have been identified by project teams, including from NASA, ISRO and ESA. If these materialise, they could enhance the UK's strategic position as a 'trusted space partner of choice', ensuring longevity of IBF partnerships through long-term mission roadmaps. Stakeholders outlined reputational, value for money and time efficiency advantages for participating in international missions beyond ESA, stressing how these would require relatively small investments from a UK perspective, with large potential scientific and strategic returns.

However, **these potential benefits are contingent on the prospect of future grant funding**, whether from the UK or other nations. Without the continuation of IBF support, there are limited avenues to pursue projects that align with the objective of securing non-ESA mission involvement, although the UK Space Agency Science and Exploration Bilateral Programme is a recent exception. **Absent of these opportunities, we have begun to see a shift back towards the more familiar ESA routes** to continue activities, which risk losing the partnerships progressed within IBF, as some of these countries will be unable to participate.

The IBF has shown strong support for academia, with **34 academic institutions involved across the programme**. While university representation alone does not signify scientific impact, close cooperation and knowledge exchange can help strengthen the competitiveness of the UK space science research community. **8 peer-reviewed papers and 12 conference papers have been published** with links to the work undertaken for the IBF thus far. This number will grow in the future, as several papers and publications are currently under development.

Beyond the space domain, **several projects explored technologies that could have useful applications in terrestrial fields of research in the longer-term**. These applications include environmental and climate sciences, biomedical science, food and rural affairs and clean energy. Ultimately, these impacts may take years of decades to come to fruition, making them difficult to measure at present, but they are a key element of the IBF's impact narrative.

Economic evaluation

While it is too early to conclude whether the IBF will offer good value for money, we view that the early signs demonstrate a promising evolution, especially once we bring in qualitative evidence. There are **tangible examples of investment events and other drivers of UK socio-economic benefit** that have materialised as a result of IBF funding.

The real discounted and attribution-adjusted UK benefit of the IBF is at least £4.2m to date. **Benefits are driven by a few large foreign public funding events providing inflows of capital to the UK**. If we include expectations over the next three years, the real, discounted, attribution-adjusted UK benefit of the IBF rises to at least £16.5m, with totals driven by expected private investment. **Many key benefits of IBF are intrinsically non-monetisable**, notably the building of strong partnerships (which will take time to translate to quantifiable socio-economic impact), so our quantitative totals will underestimate the benefits of IBF. These could translate to new commercial opportunities and investment further down the line, however. **Longer term value for money will ultimately hinge on the success in bringing new products, services and missions to fruition**.

The real terms UK economic cost of IBF is expected to be £26.4m, of which £20.6m has come from grant funding, £5.1m from matched funding and £0.6m from additional UK Space Agency programme costs.

The Net Present Social Value (NPSV) from the IBF is currently -£22.2m, indicating that costs currently exceed benefits. Reflecting this, the NSPV/Departmental Expenditure Limit (DEL), a measure of the return per pound of public funding, is also negative at -1.04. The Benefit/Cost Ratio (BCR) is currently 0.16, indicating that total benefits are around 16% of total costs at this stage. Again, this should not be taken as an indication that IBF is not offering good value for money given the early nature of this evaluation and the limited potential to monetise key benefits at this stage.

Table 1 *List of funded Phase 1, Phase 2, and Direct Award IBF projects*

Phase 1 Competitive Awards
University of Glasgow
Rolls-Royce
University College London
University of Leicester

Satellite Applications Catapult
University of Exeter
Frontier Space Ltd
Seraphim Space Camp Accelerator Ltd
Deimos Space Ltd
Telespazio UK
Earth-I Ltd
Vertical Future Ltd
University of Bradford
Astroscale Ltd.
The Open University
Iota Technology Ltd
University of Surrey
AstroMagnetic Systems Ltd
Highlands and Islands Enterprise
Strathclyde University
Surrey Satellite Technology Ltd (SSTL)
Frontier Space Ltd
University of Southampton
Assimila Biosecurity Ltd
LENA Space
AstroAgency Ltd
University College London
Reaction Engines
InSpace Missions
The Open University
University of Leicester
D-Orbit
Phase 2 Competitive Awards
Rolls-Royce Submarines Limited
University of Leicester
Vertical Future Ltd
XCAM Ltd
Iota Technology Ltd
University of Strathclyde
Surrey Satellite Technology Limited (SSTL)
University of Southampton
In-Space Missions Limited
The Open University
University of Leicester
Direct Awards
The Open University
Inmarsat Global Ltd
Challenge Works
Physical Mind London
The Science and Technology Facilities Council (STFC)

1 Impact evaluation

Our impact evaluations throughout the duration of the programme have collected, analysed and synthesised a combination of primary and secondary data and evidence to develop our findings. We draw upon indicator insights, qualitative contextual information, and quantitative non-indicator information to report outcomes and impacts across **four broad categories: UK Competitiveness & Reputation, Innovation & Commercialisation, Skills & Knowledge and Science.**

1.1 Performance against evaluation questions

Below, we provide a high-level overview of the performance of the IBF against the evaluation questions set out in the original Data Monitoring Framework report[2]. Not all evaluation questions are fully addressed – and this is to be expected, since some of the benefits will only emerge in the longer-term, and hence it is too early to capture these in our evaluation to date.

Table 2 *RAG Rating[3] assessment of performance against impact evaluation questions*

Evaluation Question	RAG rating	Performance
To what extent has the programme helped the UK become a trusted partner of choice in space activities?	**A**	The IBF has successfully catalysed a range of international partnerships, which all stakeholders believe have been created and / or strengthened thanks to IBF support. In interviews, international partners were unanimously positive in their perceptions of their UK partners. It is too early to determine the extent to which the UK is a 'trusted partner of choice', since it requires sustained, rather than ad hoc, international collaboration. There are several leads for follow-on opportunities (including future phases, missions and launch opportunities) which have been identified, upon which more sizeable commercial, scientific and strategic impacts are based. However, the longevity of these relationships is ultimately dependent

[2] The Data Monitoring Framework was submitted to the UK Space Agency, containing the methodological approach set out for this study, including indicators, evaluation questions, the Theory of Change, and a forward plan for measurement, analysis and reporting.

[3] To evaluate the success of the programme against our evaluation questions, we developed a Red-Amber-Green (RAG) tiered assessment system – with Red (R) meaning 'not addressed', Amber (A) meaning 'partially addressed', and Green (G) meaning 'mostly addressed'.

		on future funding opportunities, and uncertainty around continuation of funding is cited as a key barrier for determining the longevity of partnerships.
How has the programme contributed to the development and international competitiveness of the UK space sector?	**G**	Across projects, the IBF has enabled technology development within a range of sub-sectors, including those applicable to nascent sectors. These could bring key socio-economic benefits in the future, although it is too early to be able to measure these opportunities. The programme has enabled the UK to collaborate as a standalone entity (as opposed to through ESA), raising the profile of the UK space sector internationally. Organisations from both UK-based and strategically important countries agreed that the IBF had improved the UK's global reputation in specific sub-sectors. Individual projects generally met objectives, although some delivered with slight changes to milestones and the breadth of project objectives due to delays. The IBF has had minimal impact on the competitiveness of the UK space sector to date, although it could strengthen competitiveness over the longer term, as niche solutions develop into products, and services which reach market.
To what extent has the programme developed UK capabilities in collaboration with international partners?	**G**	The IBF is highly collaborative as a programme, with a total of 152 partnerships progressed between UK leads and partners. While tensions around IP and data sharing agreements were mentioned, knowledge exchange between leads and partners were cited by stakeholders as key sources of mutual learning and capability development between organisations. For example, UK teams have been able to leverage testing facilities not available in the UK as a result of their international partnerships, helping to mature and validate technologies developed through the IBF. The IBF has also been key in developing other capabilities in UK organisations, such as technical and project management skills, as well as business-know how essential to operate in an international environment.
To what extent has the programme created new commercial opportunities for UK organisations?	**A**	Most stakeholders cited the IBF as crucial in reducing the expected time to market for new technologies and services. However, there are minimal products and services which have reached market to date. This is generally seen as a longer-term aim for IBF projects, where commercialisation and associated revenues are expected to materialise more towards 2027 and beyond. The IBF has led to no formal IP or patents being developed to date, although this is to be expected, given they can take years to register. IBF projects have secured relatively modest levels of investment so far, primarily from public sources. While

		private investment is expected in the future, project teams generally felt further public funding was required in the coming years, which would be replaced by larger levels of private investment once technologies were more mature. A total of two startups are being established as a direct result of IBF. Companies are operating in new geographic regions, as well as within emerging space markets. Roughly half of IBF projects also have dual-use or security applications.
How have different stakeholders been impacted by the programme?	**A**	The majority of impacts (and potential future benefits) reported above have accrued at an organisational level (i.e. UK project leads and partners). For instance, key benefits include reputational enhancement, skills development and technology maturation, which have positioned UK organisations to exploit the commercial potential of future products and services being developed under the programme, as well as potential future mission involvement. There have also been some benefits at an agency level. For instance, UK Space Agency International Relations team members have cited the IBF as a catalyst for ongoing discussions with other international space agencies. International partners within the IBF have benefitted from the IBF through knowledge exchange and technology development in collaboration with UK partners. This has included providing routes into the space sector for spin-ins, as well as the opportunity to work towards mutual objectives with UK partners.
Would these projects have gone ahead without UK Space Agency funding?	**G**	Stakeholders were largely of the view that without IBF support, these projects would not have gone ahead. This view is supported by an assessment of Phase 1 projects who did not progress to Phase 2, as the majority of these projects have stopped entirely, and will only resume if alternative funding sources become available. As projects end, there is a high risk that many Phase 2 projects will struggle to continue in absence of UK Space Agency support. For instance, there may be job losses (particularly those on fixed-term contracts) as a result of a lack of continuation plans for funding. Others have highlighted that products and services are not close enough to commercial exploitation to attract private investment to continue these activities. In pursuing alternative funding sources, there is also a risk that follow-on activities unfold in a different direction to the strategic objectives of the IBF. For instance, some UK leads are seeking ESA funding to develop technologies

		further, thereby limiting potential for continued collaboration with international partners.
What lessons about the programme's impact can be learned (e.g., profiling/timing of benefits/impact)?	**A**	Several of the objectives of the IBF, such as the generation of new exports, FDI and becoming a trusted space partner of choice are only likely to materialise in the longer term, if follow-on funding or investment can be secured. While crucial early progress has been made towards these objectives, the IBF (it its current form) is not sufficient from a time or resource perspective to deliver on these objectives by the end of the programme. Given the risk of potential long-term benefits not materialising as a result of a lack of continuation funding, many stakeholders felt that IBF support should tail off gradually, to be replaced by private investment at higher levels of technological maturity.

1.2 Competitiveness & Reputation

The IBF's primary goal is to expand and deepen bilateral and multilateral partnerships with strategically-important international countries and partners from emerging space nations. The IBF aims to make the UK a trusted space partner of choice in these countries, strengthening UK leadership and in turn enhancing UK influence in future bi/multilateral opportunities.

IBF has built and strengthened relationships both between UK organisations and with international partners. This is laying the foundations for stronger long-term collaborations, though stakeholders often regarded this as contingent on future funding and support. Through the programme and UK Space Agency 'stamp of approval', project teams reported enhanced reputations, sharing experiences of increased credibility and international leadership within their sub-sectors.

Summary of key takeaways

- **The IBF has been key in strengthening international partnerships -** all stakeholders across the programme unanimously agreed that IBF has helped to strengthen their international partnerships, citing enhanced knowledge sharing, technical assistance and mutual alignment across the consortium as key examples of stronger partnerships.
- **The IBF has helped to build new international partnerships -** overall, the IBF has supported at least 59 new partnerships with strategically-important international partners, i.e. partnerships which project teams confirm would not have materialised without IBF support, as well as deepening many more pre-existing relationships.
- **There is a broad range of partnering countries; the USA and Australia are partnered with the most -** 61 international organisations from 17 countries

partnered with UK leads in Phase 1, and after the down-selection process, 38 overseas organisations from 11 countries progressed to Phase 2. Across both phases, most partnerships were with organisations from the USA, followed by Australia, Singapore, Canada and Japan.

- **The IBF has supported academic-industry knowledge exchange, and strengthened strategic partnerships with other national space agencies -** partners were roughly evenly split between industry (30%) and academia (28%) throughout the IBF, with the proportion of academic institutes rising slightly in Phase 2. There were also space agencies (23%) and other public organisations (19%) partnered with IBF projects.
- **It is too early to assess the longevity of these partnerships. The foundations are established, but there is considerable uncertainty around future funding -** IBF support has laid foundations for continued collaboration over longer timescales, although uncertainty around future funding was cited as a key barrier to sustained collaboration. Without it, partnerships could lose momentum and fade over time.
- **To date, the IBF has strengthened the reputation of funded UK organisations in priority countries, with wider reputational benefits for the UK and UK Space Agency -** UK leads and partners unanimously agreed that the IBF has enhanced their organisations' reputation, with international partners also agreeing. Stakeholders mentioned the unique role of IBF in enhancing the UK's reputation as a standalone entity (i.e. relative to ESA funding), and the UK Space Agency international relations team have cited the IBF as a useful marker in strengthening partnerships internationally.
- **Uncertainty about the future of IBF projects brings a reputational risk of the UK being perceived as unreliable -** some stakeholders felt that uncertainty around continuation introduces risks of the UK not 'seeing activities through', although most acknowledged that all parties knew the contingencies when they agreed to participate. Several stakeholders (including international partners) expressed concerns that continuation of funding is crucial for realising the more sizeable long-term impacts which the IBF has positioned organisations to secure.
- **International partners have reflected positively on the UK's leadership –** perceiving the UK to have strengths in specific fields of technical expertise, while IBF projects have enabled UK organisations to play a leading / coordinating role across international consortia.
- **Despite promising early progress, it is too early to determine IBF's role in establishing the UK as a trusted space partner of choice –** project leads felt that partnerships have been established and strengthened, but several reported that if they are not sustained, they could quickly fade. Sustained, rather than ad hoc international collaboration is required to enable UK organisations to respond to emerging opportunities in an agile manner, and plan on longer timescales. In our view, the UK is unlikely to be perceived as a trusted partner if it is unable to commit to (or must withdraw from) the successful delivery of international projects or missions.

IBF has catalysed important competitiveness and reputation-related impacts, by supporting UK organisations to establish, maintain, and strengthen bilateral and

multilateral partnerships in targeted regions. Below, we assess current performance against relevant impact evaluation questions, providing evidence to identify whether the UK Space Agency's objectives for the IBF have been, or are on course to be met. We have designed these questions to track progress in benefits realisation from the UK Space Agency's investment into the IBF, but recognise that many impacts from the funding emerge only in the long-term, and hence are likely to occur beyond the timeframe of this study.

Has the programme led to new bilateral or multilateral partnerships that otherwise would not have occurred?

While several projects leveraged existing connections to form IBF project consortia, **there is strong evidence across both phases that the IBF has led to the creation of some partnerships which would not have existed otherwise**. In total, the programme has helped to establish at least 59 new partnerships within project teams. As demonstrated with the Open University COSPAR case study, the IBF has also helped to progress 'second order' collaborations beyond the immediate project team, providing a platform to strengthen bilateral and multilateral collaboration networks.

How has the programme strengthened existing bilateral or multilateral partnerships?

In Phase 1, all 31 interviewed project leads **agreed that their international partnerships were strengthened as a result of the programme**, including with existing international partners. This sentiment continued in Phase 2, with all project leads (14) and both UK-based and international partners (13) agreeing with the same statement, based on responses they provided through interviews and surveys. Stakeholders have commonly referenced in-person meetings and workshops as key in solidifying these relationships. Moreover, we have identified early evidence that the IBF may be strengthening UK relationships with other national space agencies in priority countries, acting as a marker of UK intention to collaborate internationally. By providing dedicated resource to work and meet in-person, as well as a concrete project focus, the IBF has strengthened bilateral and multilateral partnerships in priority regions.

What is the expected longevity of these new partnerships / collaborations?

As funded projects draw to a close, **there is considerable uncertainty around the longevity of these partnerships**. Many stakeholders have identified follow-on opportunities with their international partners, including upcoming launch opportunities, further project phases, and potential mission roles. However, without IBF support, emerging opportunities can be missed, and without a project focus, the strength of these relationships can quickly fade. Several stakeholders also mentioned that the IBF fills a crucial gap in grant funding opportunities to maintain these relationships, since private investment is easier to leverage at later stages of the commercialisation process. While project teams are pursuing

multiple avenues (e.g. partner country funding, ESA funding, potential future UK Space Agency funding), uncertainty around future financial resource makes it difficult to assess the longevity of these partnerships at this stage.

What attributable differences has this programme made to HMG's National Space Strategy objectives to become a trusted partner of choice?

Across the all projects, UK organisations have leveraged UK Space Agency support to establish and strengthen partnerships in a bottom-up/decentralised manner. This is also coupled with early signs that agency-level relationships are strengthening as a result of the programme. However, as noted by several stakeholders, **it can take years to build trust with international partners and yet it can be lost almost immediately**. Crucial early progress has been made in strengthening frameworks for bi/multilateral collaboration with international partners, often enabling UK organisations to work in new regions for the first time, and navigate legislative and regulatory challenges associated with market entry.

However, if these relationships are not sustained, they could quickly fade. Becoming a *trusted partner of choice* requires sustained, rather than ad hoc international collaboration. Sustained relationships can enable UK organisations to respond to emerging opportunities in an agile manner, and plan on longer timescales. The UK is unlikely to be perceived as a trusted partner if it is unable to commit to (or must withdraw from) the successful delivery of projects or missions on the grounds of insufficient resources.

1.3 Innovation and commercialisation

Some IBF projects are designed to commercialise technologies, capture market share and export products to new international markets over the longer term, while others are primarily focused on scientific or strategic objectives (e.g. securing roles on international space science missions). Despite variety in objectives, all projects generate investment benefits through matched funding and in-kind contributions, support employment in the UK space sector and have valuable potential user applications.

Summary of key takeaways:

- **The IBF has generated significant matched funding and in-kind contributions from UK and international organisations, with several providing more than the obligatory minimum –** a total of £15.8m has been leveraged from project teams to deliver IBF activities, indicating widespread commitment to the programme.
- **The IBF has had limited impacts on catalysing internal investment -** with £584k captured to date, largely for hiring staff. Around half of survey

respondents expect internal investment in the coming years, which should be tracked over time to see if this has materialised.

- **The IBF has had modest impacts on catalysing external investment to date -** So far IBF projects have secured a total of £3.05m in investment, with most coming from foreign public sources in the USA and Canada. £810k of private investment has been secured, and an additional £840k has been leveraged in ESA follow-on funding. 8 out of 12 respondents expected private investment in the future, although several felt public funding in the short-term will be essential to bridge this gap.
- **IBF has accelerated the route to market for technologies and services, but has not led to significant revenues or exports yet -** At least 11 project leads felt IBF funding will lead to a reduction in time to market for their technologies and services, although minimal revenues have been secured by IBF projects. £900k of revenues has been linked to IBF activities. Project teams felt sizeable revenue benefits are likelier to arise beyond 2027/28, assuming projects continue as envisaged post-IBF.
- **IBF funding is highly concentrated in the South East of England -** with 43% of funding allocated to organisations in the region. Regional distribution was not an IBF objective; however, IBF has been disproportionately concentrated in the South East relative to the wider UK space sector.
- **The IBF has created and supported employment across the project teams, although some of these impacts may not be sustainable –** overall, the IBF has created a total of 35 jobs, as measured by FTE. It has also supported a wider 51 jobs, protecting high value-added roles in the UK economy. Stakeholders cited the short timeframes as a key barrier to recruitment of staff, and some anticipate job losses following IBF, due to uncertainty around follow-on funding for fixed-term contracts.
- **While not an objective for all projects, we have seen evidence of technology maturation through the IBF -** with projects moving TRL levels from a starting average of TRL 2.7 to TRL 4 during the course of the programme. Four technologies are currently at TRL 7, with several teams securing flight and launch opportunities beyond the duration of their IBF projects.
- **The IBF has enabled UK organisations to expand their presence in new markets, although these are early-stage developments -** UK companies have begun to enter at least 13 new international markets, which they had not operated in previously, and two UK universities are in the process of establishing spin-out companies to pursue these opportunities. Moreover, IBF projects are aligned with each of the six emerging sectors outlined in the National Space Strategy, with 21 concepts being developed which are directly related to these sectors. Around half of IBF projects also have dual-use and security potential.
- **While impacts are only beginning to unfold, IBF has begun to create new commercial opportunities for the UK -** as organisations have expanded into regions offering complementary capabilities or large potential customer bases. The IBF has also catalysed technology development, and has created and supported employment, which are all necessary steps for future commercial exploitation.

Recognising that the impacts of IBF could take decades to fully materialise, we assess the commercial opportunities that the IBF has supported to date, relative to the evaluation questions set out by the M&E framework. Enhanced tracking of long-term outcomes will be essential in fully understanding the programme's impact on innovation and commercialisation. Below, we evaluate current progress based on the relevant research questions we developed at the beginning of this study in order to track the impacts of IBF against UK Space Agency strategic objectives.

Has IBF led to new technologies coming closer to market?

While not all projects are developing a product or service intended to reach market, **we find evidence of progress in enhancing the market readiness of technologies across several projects**. At project inception, IBF-developed concepts had a low starting technological maturity, with five projects at TRL 1. Through assembly, testing, validation and development activities, UK teams have raised average TRL levels by 1.3. While many technologies are still at relatively low maturity (average of TRL 4), there are now four technologies at TRL 7.

Alongside technology development, the IBF has supported a broader range of activities to bring technologies and services closer to market. These include activities to ensure regulatory compliance, which are potentially crucial for future export opportunities. IBF funding has been leveraged to conduct market assessments, identify suppliers, meet potential customers, develop use cases, and outline objectives for commercialisation. Project leads generally regarded the IBF as key in reducing the overall time to market for new technologies and services.

Has IBF led to new products / services entering the market?

There is **limited evidence of IBF funded products and services reaching market** to date. A subset of projects are creating bespoke instruments, payloads and services which could be provided or sold in the shorter term. However, project teams generally expect the more sizeable market opportunities to arise in 2027 and beyond, highlighting the long-term nature of the commercialisation process. While new technologies and services have been brought closer to market, future testing, development, maturation and scaling will be essential for project teams to generate revenues from IBF funded activities.

Has IBF led to new Intellectual Property (IP) / patents?

To date, all IP developed by project teams as a result of IBF is informal, in the form of know-how, proof-of-concepts and digital assets. While project teams have brought background IP into projects, **we have found no evidence of registered patents, copyright or trademarks developed as a result of IBF support**. This is unsurprising, given the lengthy process to apply for a patent and have it granted. While several UK organisations noted that internal discussions were ongoing around registering IP, these are still in preliminary stages and may not materialise.

To what extent has IBF increased UK space sector inward investment and UK exports?

The IBF has generated contributions from project teams in the form of matched funding and in-kind contributions, to a total value of £15.8m. Beyond matched funding, there has been a handful of internal investment events from project teams (£534k), which have largely been committed to hire staff to deliver IBF projects. A total of £3.1m of external investment has also been leveraged from other sources. **The majority of this investment is from overseas public sources** (notably from the US and Canada), while an additional £840k was leveraged as follow-on funding from ESA (although this is not counted per North Star Metric guidance). Stakeholders generally felt that additional public investment was required in order to mature technologies further, while private investment was seen as a longer-term aim. To date, **£860k private investment has been leveraged, which project teams anticipate will rise in the coming years** (if projects continue) and overtake public investment in the longer term.

Have start-ups, spin-ins or spin-out activities been established through IBF?

IBF has supported bi-directional knowledge spillovers between organisations in the space sector and terrestrial markets, although three of the five known spin-ins to the space sector are international companies and universities. In terms of spin-outs, **the IBF has supported two universities who are currently in the process of establishing spin-out companies** to pursue commercial applications of their technologies. Both universities withheld from providing more information at this stage due to potential sensitivities. However, these companies could provide additional investment, employment and revenue benefits within the UK space industry in the long term, and are highly attributable to IBF support.

Has this unlocked new market domains / industries for UK space companies?

Through the IBF, UK organisations have begun to expand their presence to 13 new international markets, in which they had no prior presence. The majority of these were first established in Phase 1 through the formation of new partnerships in these regions, which were subsequently consolidated and strengthened in Phase 2. However, as the generation of new products has been limited to date, these should be interpreted as **preliminary steps which could enable future export opportunities** to materialise over the longer term, if development and commercialisation activities are followed through to market readiness. Beyond geographic markets, there is also close alignment with technologies developed under the IBF, and the 'emerging sectors' identified in the National Space Strategy. The IBF has supported enhanced UK activity in these nascent sectors, which could position the UK for early leadership in these areas over the longer term.

To what extent has the programme created new commercial opportunities for UK organisations?

The IBF has supported the development of a range of strategic partnerships, enabling organisations to undertake (in many cases) early R&D, which could lead to the development of cutting-edge products and services. The IBF has also allowed UK organisations to begin operating in new regions which offer strategic benefits, i.e. through access to complementary capabilities or large potential customer bases. The programme has also catalysed technology development, and has created and supported employment, which are all necessary steps for future commercial exploitation. However, this tranche of IBF funding is, in the broad view of stakeholders, not sufficient for larger commercial ambitions of attracting FDI, or the export of products and services. Even IBF projects with higher levels of starting technological maturity have not secured significant private investment or revenues to date, as these are ambitions which project leads expect to achieve several years following these initial activities.

1.4 Skills and knowledge

Throughout the IBF, UK organisations have reported a continuation of upskilling benefits. These skills include a range of technical and managerial skills, as well as increased business know-how. The IBF has also provided a pathway into space project involvement for early-career workers. This helps to build and maintain a pipeline of skilled workers in UK space organisations, who are beginning to gain exposure to the stringent requirements of working to develop technologies, products or services designed for the space environment.

Beyond benefits witnessed in UK project teams, there is also evidence of second-order impacts through a range of outreach and engagement activities, which could inspire and attract young people towards STEM subjects, or towards future careers in the UK space sector.

Summary of key takeaways

- **The IBF has enhanced project management skills in UK-based lead organisations -** while many have dealt with projects of a similar size or scope before, the IBF has provided unmatched learning opportunities for those who have not managed international projects previously. Overall, 80% of leads across both IBF Phases agreed their project management skills had developed as a result of IBF, alongside 40% of UK partners. This difference reflects the managerial responsibilities at a project level.
- **The IBF has also strengthened technical skills, especially in Phase 2 -** UK project leads unanimously agreed that IBF had helped to improve or develop relevant technical skills in Phase 2, in comparison to ~70% in Phase 1. While these individuals are only a small component of the UK space industry, the type

of technical skills developed under the IBF are highlighted as key skills gaps in the wider sector.

- **Knowledge exchange with international partners has been a key route to upskilling -** one key route to skills development was knowledge exchange / transfer between organisations. While there were tensions around IBF and data sharing restrictions, teams generally felt complementary capabilities led to mutual learning opportunities within projects.
- **The IBF has provided a pathway for strong early career development -** in total, the IBF has supported at least 63 early career workers, students and apprentices to receive hands-on experience working on international space projects. Some teams highlighted IBF's positive role in attracting talent into their organisations.
- **Business know-how has improved in UK organisations as a result of delivering IBF projects, which could underpin future export opportunities -** across both phases, business know-how was developed in navigating complex international environments, such as export control compliance, US ITAR and dual-use restrictions between companies. These lessons could underpin future export benefits. Moreover, Small and Medium-sized Enterprises (SMEs) and universities benefited from the phased approach to the IBF, which enabled them to present to potential investors and customers, undertake market research and conduct in-person meetings in new regions in Phase 1, before planning future Phase 2 activities.
- **Outreach and engagement activities in some projects have the potential to sow the seeds of future impacts beyond project teams -** seven projects held outreach and engagement activities for student audiences, potentially informing and inspiring the next generation to pursue careers in the space sector. Initiatives have included in-person workshops and presentations, as well as online educational materials. Two projects intend to publish outreach videos for students, although neither have to date. These could lead to additional impacts beyond the timeframe of our evaluation.

Across the programme, stakeholders have reported notable upskilling benefits, including both technical and managerial skills, as well as increased business know-how and an enhanced understanding of operating in new regions. Below, we summarise current progress against the relevant evaluation question developed at the beginning of this study.

To what extent were new skills, capabilities and/or knowledge developed?

Funded organisations began projects with varying levels of prior expertise and experience within technical domains, as well as varying heritage in delivering international space projects. While all teams possessed prior technical expertise, knowledge exchange with international partners who possessed complementary skillsets was cited as **a key source of learning**.

A range of technical skills were developed under the programme, relevant to both hardware and software development. These included testing and design certification skills, as well as broader systems, mechanical and thermal

engineering capability development, and AI / Machine Learning skills. These developments **indicate small contributions to addressing broader skills gaps within the UK space sector**.

The IBF also provided UK organisations with the chance to lead international space projects, offering a route for UK workers into leadership roles, and providing them with direct exposure to the management of international consortia. While this was not a new experience for some, it provided learning opportunities for others, especially the **63 early career workers, students and apprentices who worked across the IBF projects**. For some organisations, IBF led to the implementation of new tools and processes to manage these consortia, including project management software.

UK organisations also gained exposure to additional processes which will be crucial enablers for **future export opportunities**, enhancing know-how within organisations. Relevant areas of enhanced know-how include export control compliance, the navigation of other international regulation such as ITAR, dual-use restrictions and administrative barriers to collaboration.

Skills development was also evident beyond immediate project teams, as several teams hosted outreach activities such as workshops and events to inspire and inform student audiences. This has the long-term potential to inspire and inform future careers development within the UK space sector, although that cannot be captured within the timeframe of this evaluation.

1.5 Science

While there are several IBF projects focused on scientific research and innovation, much of the scientific impact linked to funded activities is likely to occur when projects are at a more advanced stage. This is highly dependent on the longevity of projects beyond the end of this IBF call, which remains uncertain.

Given many projects are still at an early stage relative to their longer-term objectives, **evidence of realised scientific impact is relatively limited at this stage,** although IBF support could play an enabling role for **benefits in future years**.

Summary of key takeaways

- **The IBF has enhanced the UK's strategic positioning for international missions, although these opportunities are contingent on future funding -** nine potential future missions have been identified by project teams, including NASA, ISRO and ESA opportunities. However, these are contingent on securing further grant funding. If these materialise, they could enhance the UK's position as a trusted space partner of choice.

- **The IBF has provided strong support for universities, funding space science research, alongside commercialisation opportunities -** there have been 34 academic institutions involved through the duration of the IBF, including 23 universities across Phase 2 and Direct Awards. While this does not signify scientific impact per se, it could illustrate support for the wider space science research community.
- **Several IBF projects developed technologies which could support R&D in non-space research and potentially help to address global challenges -** the IBF is supporting terrestrial research applications that could utilise the space technologies being developed under the programme, including climate, biomedical science, and clean energy. These could drive future productivity and welfare-enhancing impacts on the ground.
- **The IBF has supported the publication of some research papers, although more are likely to materialise in the longer term -** in total eight peer reviewed publications have been released which are in-part attributable to IBF support, in addition to 12 conference abstracts. A further 13 publications and abstracts are expected beyond the timeframe of the study, and citations, as well as wider media coverage, could grow in the coming years, although these have been limited to date.

Securing roles on non-ESA space missions is a central aim of the IBF, underpinning the broader objective of becoming a trusted partner of choice in space activities within two to five years. While many projects focus explicitly on commercialisation of technologies developed through the programme, space science is another area in which UK capabilities can be showcased and developed in collaboration with international partners.

To what extent has the programme helped the UK become a trusted partner of choice in space activities?

To date, we have identified at least nine space mission opportunities which are being pursued as a result of IBF, including roles with other national agencies, such as NASA and ISRO, as well as commercial missions. While progress has been made in securing greater involvement from UK organisations, the majority of these opportunities are still in the application stage, and the results are yet to be determined. Participation in these international missions post-IBF could create wider benefits, given that there is a well-evidenced link between UK participation in a mission and the scientific return that is generated for the UK. Moreover, stakeholders stressed that there are value-for-money and time efficiency advantages in securing roles on international missions beyond ESA. In general, stakeholders regarded these opportunities as relatively small investments from a UK perspective with large potential scientific and strategic returns.

However, these potential benefits are contingent upon future grant funding. Without continuation of the IBF, **there are relatively limited avenues to pursue projects which align with the objective of securing non-ESA mission involvement**, although the UK Space Agency's Space Science and Exploration

Bilateral Programme call is a recent exception. Absent of these opportunities, we have already begun to see a shift back towards more familiar ESA routes to continue development activities, meaning the progress made in establishing roles outside of ESA could be lost.

Have there been any unexpected and / or 'spillover' benefits?

While some IBF projects are focused explicitly on developing technologies which support future space science and exploration ambitions, several technologies could also benefit scientific research on Earth, helping to address global challenges through the use of space technologies. These include fields such as environmental and climate sciences, agriculture, marine biology, biomedical sciences and clean energy. However, aside from specific use cases, **these technologies have largely not been rolled out to wider research applications to date**. More development and refinement will be required for these spillover applications to materialise.

2 Economic Evaluation

Our economic evaluation builds upon the impact evaluation, to provide a **rounded view of the value for money of the IBF so far**. We combine a **quantitative assessment** of the benefits focussed on monetisable impacts, with the **qualitative insight** discussed in the proceeding sections to provide emerging answers to the key question, 'was it worth it?'.

Summary of key takeaways

- **While it is too early to conclude whether the IBF will offer good value for money**, we view that the early signs are promising, especially once we bring in qualitative evidence.
- **The real, discounted and attribution-adjusted UK benefit of the IBF is at least £4.2m to date**. Benefits are driven by foreign public funding into the UK. If we include expectations, then the real, discounted and attribution-adjusted UK benefit of the IBF rises to at least £16.5m, with totals driven by expected future private investment.
- **Key benefits of IBF are intrinsically non-monetisable**, at least at this stage, notably the building of strong partnerships. These could translate to new commercial opportunities and investment further down the line, however. Longer term value for money will ultimately hinge on the success in bringing new products, services and missions to fruition.
- **The real terms UK economic cost of IBF will be £26.4m**, of which £20.6m has come from grant funding, £5.1m from matched funding and £0.6m from UK Space Agency additional programme costs.
- The **Net Present Social Value** (**NPSV) from the IBF is currently -£22.2m**, indicating that total economic costs (private and social) currently exceed benefits. Reflecting this, the NSPV/Departmental Expenditure Limit (DEL) ratio, a measure of the return per pound of public funding, is also negative at -1.04.
- The **Benefit/Cost Ratio (BCR) is currently 0.16**, indicating that total benefits are around 16% of total costs at this stage. This should not be taken as an indication that IBF is not offering good value for money given the **early nature of this evaluation** and the **limited potential to monetise key benefits** at this stage.

2.1 Performance against evaluation questions

As in our impact evaluation, we provide a high-level overview of the performance of the IBF against the evaluation questions set out in the original Data Monitoring Framework report.

***Table 3** RAG Rating assessment of performance against economic evaluation questions*

Evaluation Question	RAG rating	Performance
To what extent has the programme led to economic benefits for UK organisations?	**A**	There are strong examples of economic benefits for UK organisations, though we expect the largest economic benefits to accrue in future. Focussing on realised benefits, we estimate that the real, discounted and attribution-adjusted UK benefit of the IBF is at least £4.2m to date. It is still early days for benefit creation. We expect that the partnerships and collaborations progressed through IBF will deliver far greater benefits in future, if these organisations are able to keep working together and form trusted partnerships, commercialising the technologies developed. The programme is showing early signs of potential to contribute to the sustained growth of the UK space sector, but the monetisable benefits are not yet significant at a sector level. Still, the programme is demonstrating notable benefits at an organisational level, with evidence of at least 35 new UK jobs across teams.
What is the socio-economic benefit of the IBF to the UK?	**A**	We estimate the NPSV from the IBF is currently -£22.2m, indicating that costs currently exceed benefits. Still, there are substantial non-monetisable benefits from IBF funding, notably the value of the partnerships developed (a key aim of IBF) which are intrinsically non-monetisable. An amber rating reflects that while the NSPV is negative, we do not view that the programme is off course.
What were the total UK costs of delivering the IBF?	**G**	We estimate that the real terms UK economic cost of the IBF will be £26.4m, of which £20.6m has come from grant funding, £5.1m from matched funding and £0.6m from UK Space Agency additional programme costs. The DEL is estimated to be £21.3m (the sum of grant funding and additional programme costs). The green rating reflects that this is broadly in line with original expectations.
To what extent do the net social benefits from the IBF (those that have been realised to date and those that are expected) justify public investment?	**A**	It is too early to conclude whether the IBF will offer good value for money, but we view that the early signs are promising, especially once we bring in qualitative evidence of benefit. We estimate that the NSPV/DEL is -1.04, indicating that public investment currently exceeds monetisable benefits. We cannot comment on the extent to which the programme has been cost effective given the early nature of this evaluation and lack of a suitable comparator. Nonetheless, we note that a negative NPSV has been found in similar evaluations. In a recent evaluation of the Enabling Technologies Programme (ETP), another UK Space Agency grant funding programme targeting low TRL technologies, conducted at a similarly early stage, know.space found monetisable benefits of £1.9m to date, compared to £11m in

		costs. This is equivalent to a NSPV/DEL of -1.05 for the programme.
To what extent do the benefits from the IBF outweigh the costs?	**A**	The Benefit/Cost Ratio (BCR) is 0.16, indicating that total monetisable benefits are around 16% of total costs at this stage. We believe however that there are also substantial non-monetisable benefits from funding, notably partnerships developed through the programme, which are likely to generate real socio-economic benefits in future. It is challenging to compare non-monetisable benefits to programme costs, but given the substantial differential between monetisable costs and benefits, we believe that, at this stage, costs likely exceed benefits. Again, however, this is not unexpected given the early stage.
How do actual outcomes differ from anticipated costs and benefits?	**A**	Similarly, at this stage, IBF has not yet delivered the originally-expected lifetime monetisable returns, but nor would it have been expected to. Differences in methodology and limited economic appraisal at business case stage constrain our ability to make meaningful comparisons against expectations. The business case estimated that IBF could deliver a high rate of return, based on average lifetime rates of return in the space sector. No specific estimates were provided for the likely magnitude of costs and benefits, or their timing. An amber rating here reflects that we do not view current evidence of monetisable returns (or lack thereof) to be atypical for a programme at this stage.

Summary

Our evaluation of the IBF has highlighted its strategic value in fostering international collaboration, particularly in catalysing activities that could not have gone ahead without the tangible support of funding from the UK Space Agency. We note that the **programme has broadly been delivered as expected**, despite some of the challenges experienced by project teams due to the nature of collaboration with international organisations, especially when working together for the first time.

As part of the success of the programme, **there was strong interest from both UK and international organisations, spanning a wide geographic range**, with some participants (from academia and industry) expressing that the IBF was the first opportunity they had found to formalise collaborations with their overseas counterparts. The **act of offering funding was itself a key diplomatic signal, laying the groundwork for positioning the UK as a serious and trusted partner on the global stage**. This not only encouraged financial co-investment from other countries but also drew in partners who, while unable to contribute funds, saw value in association (e.g. those that continued through in-kind contributions, e.g. labour).

While ongoing collaboration with established space nations like the US and Japan remain important, this programme also played a vital role **in strengthening the UK's reputation among emerging space powers**. As nations such as India demonstrate growing capabilities in advanced space operations (e.g., landing on the Moon and conducting complex in-orbit rendezvous and proximity operations), **UK organisations have been able to position themselves as credible, expert partners**. This, in turn, presents **an opportunity to enhance the UK's soft power** by investing in these cooperative relationships at an early stage, positioning the UK to benefit as these countries continue to develop their capabilities.

Through the IBF, **the UK space sector has been able to demonstrate its role as both a convener and a leader**, not only by UK-based organisations serving as the lead organisation for each consortium, but also through specific projects that positioned the UK as an effective intermediary. This form of soft power plays a critical role in establishing the UK as a trusted global partner. Placing UK organisations in leadership roles also developed project management capabilities within the domestic space sector. Strengthening this knowledge base for managing international bilateral and multilateral projects supports long-term investment in the UK's globally-engaged space ecosystem.

The programme also **facilitated the integration of international expertise into the UK space ecosystem**, as well as helping to **showcase established UK**

expertise to international partners, particularly in areas such as nuclear power and AI. Aligning future initiatives with the UK's strengths and National Space Strategy could offer a clear and focused route for **deepening global partnerships and unlocking mutual value**.

Working with international organisations was not without its challenges, as **some project teams experienced delays from various unforeseen issues, including administrative barriers and cultural differences**. These challenges were heightened by the necessity to build partnerships and deliver project objectives within short timelines. **Despite these obstacles, projects were delivered with only a few instances of scope reduction**.

Notably, the **IBF's flexibility allowed for a diverse range of projects, spanning multiple disciplines, which also afforded the opportunity for certain disciplines to access space-related funding that is not always widely available** (e.g., agriculture). While this supported the continued development of the UK's diverse portfolio of space expertise, there is the risk that the programme can be seen as an international 'catch-all' for projects that are not typically funded through other routes.

The novelty of the funding, particularly with countries outside of the UK's generally accessible funding streams (i.e., outside of ESA), was key to supporting the development of relationships and strengthening them over the course of the programme. **This success is nonetheless precarious, as the difficulty of mapping follow-on funding to these new partnerships was a major challenge for multiple organisations**. This concern has been tested to an extent with the dissolution or delay of projects funded under Phase 1, which did not receive Phase 2 funding. These issues were compounded by the tight timeline, which meant that several project teams were not able to balance completing their deliverables whilst also considering next steps for follow-on funding.

In order to maintain and strengthen the relationships formed, **IBF alumni will often require additional financial support (which includes the funding bodies' 'seal of approval'), as well as Government administrative support to operate in new regions to maintain these relationships**.

Our evaluation shed light on **the important role that the UK Space Agency has to play in supporting international collaboration and cooperation**. The UK Space Agency acted as a key enabler in some instances to support travel and in-person working with international partners (e.g., by providing letters of support). **The UK Space Agency's continued support in developing and maintaining relationships with international agencies is key for the longevity of international cooperation**, despite the strong organisation-to-organisation relationships that have developed through IBF. While the 'New Space' economy has established a precedent for the role of commercial industry, the IBF has demonstrated that there is still a crucial convening role for space agencies, such as the UK Space Agency, to foster collaboration and support its domestic space ecosystem.

Whilst the projects funded through IBF are drawing to a close, the partnerships developed are still in the relatively early stages, as are the technologies under development. Therefore, **we would expect the greatest benefits from the programme to accrue in future**, as these relationships evolve into more mature, trusted partnerships and the technologies under development reach commercialisation.

Reflecting this, our economic evaluation finds that the costs from the programme currently exceed the benefits. However, this should not be cause for concern, given the early stage of this evaluation, and the fact that other evaluations of comparable grant funding programmes have identified similar results. Moreover, **key objectives of the IBF are intrinsically non-monetisable**, most notably building stronger relationships with priority countries. While some key benefits (e.g. reputation) will remain challenging to quantify, continued evaluation after programme completion is necessary to capture the full benefit of funding.

… now you **know.**