

# Task Force on Space Interim Report (Draft 1)

---

## 1. Key Recommendations

### Establish an “Innovation (Science) and Growth Team” to:

- Define the UK’s world-leading space capabilities and a strategy to sustain this world leadership in areas such as telecoms, navigation, space science and exploration.
- Establish a National Space Technology Strategy, with a Public and Private sector road-map with a clear ownership process that identifies the key technologies opportunities and strengths, opportunities and the route to growth in the Space sector industrial to maximise the return on public sector investment and procurement.
- Define and develop capabilities and opportunities at a regional level to maximising growth opportunities from the Space sector
- Create a “space aware” culture and knowledge across the public sector (including regulations and procurement policies) to maximise the potential for wealth creation in the UK
- Develop the evidence-base demonstrating the need, and commitment to develop an overarching UK strategy for space, bringing together civil, military and security needs, and identifying the required decision-making mechanisms
- Develop a space career roadmap for young people across the UK and highlight the contribution to the UK skills base

### Consider the establishment of a UK Space Agency

Confirming the importance of the Space sector, as distinct from Aerospace, to the UK economy , bringing stronger, longer term strategic direction and focus to the sector and contributing solutions to real challenges.

### Maximise the return from the UK/ESA Space Facility, Harwell

Use the opportunity presented by the new facility to create a funded clear focal point for Space in the UK in Harwell, in a “hub and spoke” approach to maximising the benefits from other space clusters/centres in the UK

Encourage inward investment /collaboration in the Space sector, through re-location to Harwell

Develop the opportunities presented by integrated applications (e.g. with the activities on “Robotics” and “Climate” at Harwell) to provide a clear opportunity for the UK to maintain and improve its leadership in these key areas.

### Next Steps

Further develop and disseminate the evidence for the national and regional impact and opportunities in the Space Sector, and articulate the role of the “IGT”. (See also Section 7)

## 2. Summary of Task Group Findings

### Economic Impact

The UK Space Sector has continued to grow at around 9% per year, more than three times faster than the UK economy as a whole. R&D investment in Space results in substantial benefits to the UK economy across all regions.

With a turnover of £5.9 billion and a contribution to UK GDP of £2.8 billion (06/07), the industry supports around 68,000 jobs and a further £3.7 billion to the UK economy through direct and economic multiplier effects.

With 7% of the global market the UK punches above its weight,

Productivity per employee in the Space sector is more than four times the UK average, enabled by high levels of capital and R&D investment within the industry and a highly skilled workforce.

R&D investment is approximately 5% of the Industry's direct value added and is the key driver to high productivity.

The Space Industry enables global communications, broadcasting, satellite navigation, weather forecasting, climate monitoring and a host of other key services.

### Growth in the Economic Downturn

Even with the current economic climate, growth prospects are good (low scenario 2.8%, Industry forecast 4.8%) and can be substantially enhanced through increased external R&D investment (high scenario 6.8% with sustained increased R&D)

### Strategy

The Space sector should be seen as clearly distinct from Aerospace and will improve performance through strengthening of strategic planning to take advantage of current and future opportunities for the sector.

The Harwell facility presents an excellent opportunity to strengthen, focus and re-launch the UK Space strategy

Investment in a National Technology Strategy will yield high returns to the UK economy and attract inward investment to maximise UK return.

Coordinated Regional Space strategies will optimise UK regional development and overall UK returns from the Space Sector.

## Contents

1. Key Recommendations .....	1
2. Summary of Task Group Findings .....	2
3. Background .....	4
4. Task Force Members .....	5
5. Summary of Activities .....	6
6. The Economic Case for Space .....	9
7. Recommendations for the Continuation of the Task Force.....	12

### 3. Background

In September 2008, RDA Chief Executives met with Ian Pearson (then Minister for Science and Innovation) and David Williams (Director, British National Space Centre) and agreed that SEEDA would set up a Joint Task Group with DIUS, BNSC and RDAs to scope better engagement on promoting the space industry in regions and to help inform the business case for the specific requests for funding.

At the beginning of November 2008, SEEDA, BNSC and Astrium discussed the wider implications of this initiative and concluded that a two track approach for a Space Industry Task group would be required. The first element involved providing short term support as and when possible to BNSC in preparation for the ESA Ministerial level meeting in late November 2008. The longer term second track, following on from the ESA ministerial, included a range of topics identified below. The Task Force on Space is established to address these longer term, second track issues.

#### Stakeholders

The key stakeholders in the Space Sector in the UK include; Industry, the Regional Development Agencies, Government departments (including the Department for Innovation, Universities and Skills<sup>1</sup>, DEFRA, the Department for Transport, the Ministry of Defence, the Department for Business, Enterprise and Regulatory Reform), Industry Associations (including UKspace, BARSC and Intellect and the Broadband Stakeholders Group) and the UK Knowledge Base.

As such, the principal stakeholders in the Task Force are the RDAs, DIUS and Industry.

#### Purpose and Objectives

A number of recent events have impacted on the Space Sector in the UK – the ESA Council meeting at Ministerial level and the achievements of Lord Drayson at that meeting, the agreement in principle to establish an ESA facility in the UK, the re-organisation and relocation of BNSC, the recognition of some of the merits of the recently published “case4space”, the current economic climate and governmental plans to manage the challenging economic circumstances. It is therefore most appropriate to re-evaluate how the UK can maximise opportunities and minimise any downturn in the sector. The considerations of the Task Force on Space are therefore wide ranging.

Maximising opportunities will depend heavily on how the UK space sector is organised, managed and progresses. The role of the Task Force on Space is therefore to consider potential changes which could provide added stimulus to this key market sector.

---

<sup>1</sup> Primarily through its partner organisations; the Science and Technologies Facilities Council, the British National Space Centre, the Natural Environment Research Council and the Technology Strategy Board

## Scope of the Task Force

The Task Force set itself the following aims:

- a. Consult with other government departments and associations
- b. Consider the merits of a properly funded, long term UK space strategy
- c. Economic Case – OEF report update – subject of separate terms of reference.
- d. Initiate a longer term strategy and road map.
- e. Consider funding mechanisms.
- f. Advise on
  - i. how RDAs and government can better make the case for national support for industry competitiveness.
  - ii. Regulatory Considerations
  - iii. Government procurement practices
  - iv. Skills needs of the space industries

Clearly, some of these activities will take longer to complete and given the recommendations of this first phase of the Task Force Activities, some are best address in the context of the recommended IGT (see Section 5.3)

## 4. Task Force Members

The current Task Force members represent a balance of participation from the Key Stakeholders.

<b>Regional Development Agencies:</b>	<b>DIUS, Partner Organisations and other Government Departments:</b>	<b>Industry:</b>
Ed Metcalfe (SEEDA)	Nick Cox (BNSC)	Richard Peckham (Astrium)
John Gallimore (SEEDA)	Ian Gibson (BNSC)	Pat Norris (Logica)
Tony King (EMDA)	David Parker (STFC)	Phil Curtis (Vega)
Simon Chater (EEDA)	Michael Lawrence (TSB)	
Richard Male (SWRDA)	Robert Sharman (BERR)	
Paul Spenser (YF)		
Ryan Donaghey (NWDA)		
Advisers – Adrian Cooper / Sam Moore – Oxford Economics		

## 5. Summary of Activities

The Task Force on Space began with a focus on the following specific activities:

### 5.1. Economic Assessment (summary of the final report included in Section 6 of this document)

“Building on the OEF report, make the case for the importance of space industries to the economy across the UK and all regions, through a more detailed analysis of types and locations of businesses and supply chains.”

This activity has been addressed in the update to the Oxford Economic Report “The Case for Space: The Impact of Space Derived Services and Data - Final Report - May 2009”. The national picture is well described within the report, showing the clear importance of the sector in contributing to the UK economy. At a regional level, estimates of the distribution of the industry in the different regions is based on the distribution of certain classifications of companies within the UK, rather than on clear evidence of where the activities currently take place. Further work at a Regional level is necessary to confirm the regional relevance and importance of the Space Sector:

- i. Clarify the economic distribution of the sector in the Regions
- ii. Optimise UK regional involvement in the UK and Global Space sector
- iii. Assess regional capability and capability gaps
- iv. Identify Regional Strategies to maximise Regional and UK economic benefit from the Space Sector

### 5.2. Strategy

The Task Force began with the consideration of “the merit of whether there should be a UK funded space strategy”. This phrase initiated great debate about the current UK Space strategy.

BNSC has developed a UK Space strategy. This is developed in a series of internal documents and published in the BNSC document “UK Civil Space Strategy, 2008 – 2012 and beyond”. There is funding associated with this strategy, largely focused on the UK’s international collaboration through involvement in ESA programmes and with the European Union.

The high level vision stated in the strategy document is to:

- Win an increasing share of the global market in space systems, services and applications in the race to develop tomorrow’s economy
- Deliver world-leading exploitation of space systems for managing our changing planet
- Be a partner of choice in global scientific missions to explore the Universe
- Benefit our society by strengthening innovation from space, and stimulate the creation of new products and services for everyday use
- Develop a major channel for skills development and outreach for a high technology future, and improve public and political recognition of the value of space systems as part of the critical national infrastructure

The Task Force considered the funding mechanisms that are currently in place to support this vision and some members expressed concern that more needs to be done. Whilst the level of funding

committed through BNSC to ESA programmes can certainly make a major contribution to delivering the vision, it was considered that a number of elements are missing.

In order to optimally position UK Space industry in the global space market and take advantage of opportunities to increase share of the global market, a better understanding of current capabilities and gaps in capabilities is needed. In the past, national capability assessments have been conducted which have identified, where appropriate, the needs and focus of a National Technology Programme to support UK industry's competitive position. The Task Force concluded that a similar activity is required, but rather than limited to a national level review, this should be at Regional level to provide valuable evidence and data to the RDAs. This could identify the need and appropriateness of a funded National Technology Programme and other regional initiatives as appropriate.

Further, it was felt that the establishment of a National Technology Strategy alone is not sufficient. There is a real desire within the industry to identify opportunities for a step change in growth of the sector in the UK. This requires a more complete understanding of opportunities. A strategy must cover not just civil space, but also military and security matters in an overarching UK Space Strategy. It also requires a better understanding of potential commercial opportunities.

The best opportunities to stimulate growth will, in many cases, leverage the UK's world-leading space capabilities and a clear strategy to sustain this world leadership in areas such as telecoms, navigation, space science and exploration can be underpinned by a National Technology Strategy. In order to maximise this leverage, a Public and Private sector road-map must be developed with a clear ownership process that identifies the key technologies, opportunities and strengths, and the route to growth in the Space sector. Definition and development of capabilities and opportunities at a regional level will also maximise regional opportunities in the Space sector.

With a comprehensive UK strategy for growth, a long term strategy and road map to leverage investments through the European Space Agency can then be developed.

These issues are wide ranging and the strategy development must involve stakeholders from a number of areas. An innovation and Growth Team can more than adequately provide a forum for the development of this growth strategy. It is therefore recommended by the Task Force that an "Innovation (Science) and Growth Team" be established to further develop the opportunities and strategy for growth in the sector.

### **Recommendation:**

Establish an "Innovation (Science) and Growth Team" to

- Define the UK's world-leading space capabilities and a strategy to sustain this world leadership in areas such as telecoms, navigation, space science and exploration.
- Establish a National Space Technology Strategy, with a Public and Private sector road-map with a clear ownership process that identifies the key technologies opportunities and strengths, opportunities and the route to growth in the Space sector industrial to maximise the return on public sector investment and procurement.
- Define and develop capabilities and opportunities at a regional level to maximising growth opportunities from the Space sector

- Create a “space aware” culture and knowledge across the public sector (including regulations & procurement policies) to maximise the potential for wealth creation
- Develop the evidence-base demonstrating the need, and commitment to develop an overarching UK strategy for space, bringing together civil, military and security needs, and identifying the required decision-making mechanisms
- Develop a space career roadmap for young people across the UK and highlight the contribution to the UK skills base

### 5.3. Sector Profile

Currently, Space is seen as part of the Aerospace Sector, but the differences between the two industry sectors can be clearly seen.

From the economic assessments of the Space sector it can be seen that the sector is important in its own right. Productivity per employee in the Space sector is double that of Aerospace, the economic return on R&D expenditure in Space is much higher and the recommendations proposed here can contribute to a higher growth rate than for Aerospace as a whole.

The Task Force believes that some aspects of the strategic vision set out by BNSC and some of the aspirations for a step change in the rate of growth could be better achieved with a clearer, separate recognition of the Space Sector. Furthermore, this will help to highlight that fact that Space is a key component of many cross sector challenges, opportunities and solutions rather than simply a part of Aerospace.

### Recommendation

The Task Force therefore recommends consideration of the establishment of a UK Space Agency

### 5.4. Maximising Investment return

The development of a capability/capability gap analysis at Regional level, coupled with the identification of the optimum institutional programmes and commercial market opportunities can go a long way to helping to achieve maximum return on investment. For example, maximum leverage advantage can be gained from a National Technology Programme, ESA and EC R&D opportunities as well as internally (industry) funded R&D.

The UK has made an important commitment to ESA to establish the new Space Facility at Harwell. The focus of the ESA activities on robotics, climate and integrated applications are in fields of particular strength in the UK Space sector. Equally importantly, these are not duplicated elsewhere by ESA and UK companies are therefore optimally placed to maximise the return on this investment.

The Task Force considers that the new Harwell facility can create a clear focal point for Space in the UK in a “hub and Spoke” approach and can contribute to maximising the benefits to other space clusters/centres in the UK. Harwell also represents an excellent opportunity to attract inward investment and stimulate further collaboration in the Space sector. The commercial opportunities that the Integrated Applications activity should create are exceptionally well suited to the UK Space sector.

### Recommendation

Strategies must ensure that the return on the investment in the Harwell Space Facility are maximised.

## 6. The Economic Case for Space

Oxford Economic Forecasting performed an independent study in 2006, a “Study of the Impact of Space Derived Services and Data” (the previous study). This previous study considered the then state of the UK space industry and its social and economic impacts on the UK as well as the potential for support to government policy making and implementation. It took, as one of its inputs, the BNSC document “Size and Health of the UK Space Industry” which considered the industry up to the period 2004/5. It also took further inputs from industry and other sources to consider the wider impacts of the space industry in such areas as R&D spillovers, communications, navigation, earth observation and broadcasting. It concluded with a forecast of the prospects for the UK space industry.

The Task Force initiated, and SEEDA funded an update to this previous study, firstly to validate and/or improve on the assumptions and methodology of the previous study by comparing the 2006 forecasts with the reality of 2006/7 and secondly to update and expand on the study and forecasts to reflect the current and expected future situation.

Of particular interest to the RDA members of the Task Force is the Social and Economic Impact at a Regional level. This was included in the scope of work defined for the study update by Oxford Economics.

The full report “The Case for Space: The Impact of Space Derived Services and Data, Final Report - May 2009” is published as a stand-alone document. The key findings and comparisons with the previous report are summarised here.

### UK Space Sector Performance 2004/05 to 2006/07

The previous (2006) report was based on data up to and including financial year 2004/05.

The updated report is based on data up to and including financial year 2006/07. The comparison in Table 1 below is therefore based on changes over a two year period.

Forecast growth in the UK Space industry had been estimated to be between 5% (low scenario) and 10% (high scenario) with global growth between 2005 and 2007 expected to be 6%. UK growth achieved in the same period was 7.6%, midway between the two forecasts and higher than global growth.

UK growth was expected to be driven in part through increased productivity. The table below confirms this and shows the additional growth through increased direct employment in the sector.

	2004/05	2006/07	Total Change	Equivalent Annual Change
Turnover	£5.1bn	£5.9bn	15.7%	7.6%
GDP Contribution (Direct)	£2.4bn	£2.8bn	16.7%	8%
Direct Employment	17,560	19,100	8.8%	4.3%
GDP Contribution per Employee	£135,000	£145,000	7.4%	3.6%
GDP Contribution (Direct and economic Multiplier)	£5.2bn	£5.6bn	7.7%	3.7%

Table 1:- Economic Comparison 2004/05 to 2006/07

This comparison between the earlier forecasts and the actual growth in the sector serves as confirmation of the validity of the methodology and assumptions of the earlier study

## Conclusions of the Updated Economic Report

The Case for Space: The Impact of Space Derived Services and Data - Final Report - May 2009

The report supports the evidence that the sector is still among the UK's fastest growing, growing in real terms by around 9% a year since 1999/00 – more than three times faster than the economy as a whole. It has the potential to continue to grow as rapidly over the next decade as new technologies and applications are developed that rely on space derived data and services, including location based services for mobile phones, improved satellite data for weather forecasting and integrated applications involving more than one aspect of space data and services together with terrestrial complements. Strong growth in R&D investment will be needed to underpin future growth.

The sector is one of the most productive in the UK with GDP per worker around £145,000 in 2006/07, more than four times the UK average. In part, the space industry's high productivity reflects the very high levels of capital investment undertaken by firms in the sector. But the industry's labour force is also highly skilled, with more than 60% of workers being qualified to at least graduate level - compared to 30% for the UK active population.

On a turnover of £5.9 billion, the UK space industry directly contributed around £2.8 billion to UK GDP in 2006/07, directly employed 19,100 people and supported almost 68,000 jobs, contributing about £5.6 billion in GDP through direct and economic multiplier impacts.

The presence of an upstream industry in the UK is likely to have stimulated benefits from the downstream sector that would not otherwise have materialised.

Despite the space industry being concentrated in a few regions (mainly the South East), it supports a high number of jobs in other UK regions through its purchases from suppliers and spending throughout the value chain.

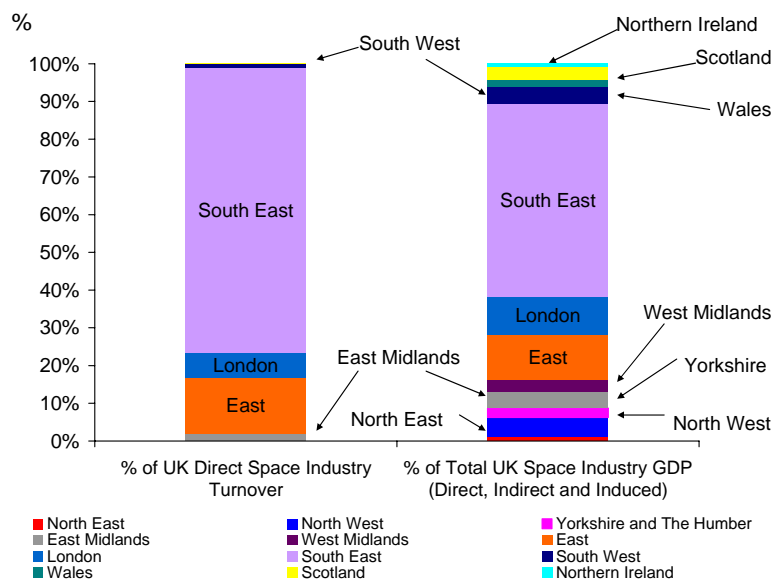


Figure 1:- Regional Summary of Space Sector Economic Activity

Overall research and development (R&D) expenditure in the space industry was £130 million in 2006/07. This level of investment is equivalent in monetary terms to almost 5% of the industry's direct value added (i.e., its GDP contribution). This means that the UK space industry is about three times more R&D intensive than the economy as a whole. The technological advances that come about as a result of R&D investment in the space industry can be transferred to firms in other sectors in the form of 'spillover' effects. Previous research by Oxford Economics suggests that such spillover effects are very large, with R&D investment by the aerospace sector generating a social return of around 70% - i.e. every £100 million invested in R&D leads to an increase in GDP of £70 million in the longer term.

The UK Space Sector makes significant contributions in many areas including global communications, weather forecasting, environmental monitoring and helping to protect the environment. Space also inspires people to study science (second most popular factor motivating physics degree involvement). The additional taxation revenues, from a science graduate compared with a non-graduate, to the Exchequer over a graduate's working lifetime is around £135,000.

### **Updated Forecasts for the UK Space Sector**

The report concludes that the UK space industry has a strong growth potential despite the current economic slowdown.

Externally sourced R&D expenditure has dropped over the period (gaps in ARTES funding through ESA and no National Technology Programme) and internal (industry) R&D has therefore increased as a percentage of the mix. If this decrease is sustained, or if the recession impacts even more severely on UK companies, growth could fall to just 3%. A return to previous levels of R&D could result in an industry forecasted growth of, on average by about 5% a year until 2020. Raising R&D intensity higher could help sustain even stronger growth of perhaps 7% a year – in line with growth in the last 3 years.

These forecasts should be considered in the context of the projected growth for the global space industry of around 5% p.a.

The scenario analysis shows that, under the current R&D spending patterns, the UK space industry in 2020 will support a further £1.3 to £2.2 billion of GDP in the UK due to spillover effects of the R&D it will undertake, and potentially much more if support to funding allows R&D intensity to be increased, by increasing productivity even further, and by allowing the UK space industry to remain competitive in the international marketplace.

## 7. Recommendations for the Continuation of the Task Force

The establishment of an IGT is seen as the optimum route forward to develop strategies for growth in the Space sector in the UK. It is in the context that an IGT is established that the following recommendations are made. (In the event that no IGT can be established, the scope of activities in a continuation of the Task Force would be different).

The Regional Development Agencies can contribute to and get value from an IGT. The capability/capability gap analysis proposed for the IGT can be broadened to a regional level analysis, hence providing more detail to the IGT and more feedback for the RDAs. The potential for stronger support for, participation in and use of space based solutions by the RDAs can lead to benefits both for the RDAs and the UK Space sector as a whole.

A number of RDAs already have significant Space activities in their Regions either in the form of Space oriented Companies, Space clusters/centres or within Academia. Others areas are potentially user of Space based solutions. In each case, stronger involvement by the RDAs in the Sector can lead to mutual benefits.

The Task Force has so far included representatives from Industry and government departments (DIUS, BERR), however these government departments will now play a key role in an IGT, working with Industry, the science community and Academia. The RDAs must establish the optimum route for interaction with the IGT.

### Recommendations

It is recommended that the Task Force continues to operate as an RDA Task Force and interacts with the IGT.

Amongst the RDA's, a representative should be proposed as part of the IGT Steering Group.

Below that level, one member of the RDA Task Force can act as an interface with the project office of the IGT to provide an overview of the IGT activities and keep RDAs fully informed of these activities and progress.

A number of members of the RDA Task Force, from different regions as appropriate, should participate in the activities of the IGT Working Groups.

Each RDA should be involved in the development of the Regional level capability / capability gap analysis.

In any event, the RDA should be involved in the planning of the IGT, including in particular the aims and objectives of the working groups.