



A Consultation on the UK Civil Space Strategy 2007 – 2010

This consultation document seeks the views of stakeholders on the themes of the new UK Civil Space Strategy 2007-2010 currently being developed.

This is likely to be of particular interest to members of (i) the UK space industry, (ii) UK space academia, (iii) other Government Departments which are current or potential users of space applications, and (iv) the UK public with an interest in UK space policy.

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Foreword by Malcolm Wicks, Minister for Science and Innovation

Space matters. Year by year, it forms an ever greater part of everyone's life. Sometimes this is obvious, as in weather satellites; sometimes it isn't, as in satellite communications. Space is helping us to learn about our solar system. The Stern Report showed the relevance of space to understanding climate change. Information from space is used by farmers and disaster relief workers, helps to protect fish stocks, supports sustainable development and may soon aid the management of road congestion. More and more, public authorities are seeing the benefit of using space applications as a viable solution for developing policy and providing services. Space is the great adventure of the coming millennium.

For the UK, space is a success story. The world space market is large and growing fast, and the UK has a healthy share. Space contributes £7bn to UK GDP and supports 70,000 jobs. Our scientists are world-leaders. Our successes in space strengthen us as a country in technology and science. Exploration helps us towards answers to fundamental questions about life. Young people who are inspired by space can develop a commitment to science.

The Government has an important role in fostering the space sector, to support and develop our strengths in space but also for the benefits which

flow to the economy and country as a whole. We want to make choices that achieve this. So every few years we invite views on what the country's space priorities should be. At a time of rapid change it is appropriate to do this now.

I therefore warmly invite you to consider this consultation document. It aims to set out the range of issues and activities that we need to think about in setting our future direction. Whether you are in the space community, or have an interest in space, please let us know what you think. We will consider your views carefully and prepare a new strategy for the UK towards the end of the year.

Thank you for your help.

Malcolm Wicks

List of abbreviations used in this consultation document

ARTES	Advanced Research in Telecommunications
BNSC	British National Space Centre
CCLRC	Council for the Central Laboratory of the Research Councils
CSR	Comprehensive Spending Review
Defra	Department for the Environment, Food and Rural Affairs
DfES	Department for Education and Skills
DfT	Department for Transport
DTI	Department of Trade and Industry
EO	Earth Observation
ESA	European Space Agency
ESP	European Space Policy
EP	European Parliament
EU	European Union
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FCO	Foreign and Commonwealth Office
GEOSS	Global Earth Observation System of Systems
GIFTSS	Government Information from the Space Sector
GMES	Global Monitoring for Environment and Security
GSTP	General Space Technology Programme
HSPG	High-level Space Policy Group
Met Office	Meteorological Office
MoD	Ministry of Defence
NERC	Natural Environment Research Council
NCP	National Contact Point
OSI	Office of Science and Innovation
PPARC	Particle Physics and Astronomy Research Council
RDA	Regional Development Agency
SSTL	Surrey Satellite Technology Ltd
YF	Yorkshire Forward

Responding to this consultation

When responding, please state whether you are responding as an individual or representing the views of an organisation. If responding on behalf of an organisation, please ensure it is clear whom the organisation represents and, where applicable, how the views of members were assembled.

A list of those organisations and individuals consulted is in Annex B. We would welcome suggestions of others who may wish to be involved in this consultation.

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We do not intend to acknowledge receipt of individual responses unless explicitly requested by respondents.

Any enquiries about this document may be sent to the same address. If enquiries are from a representative body, please summarise the persons or organisations represented. Please see section on confidentiality and data protection below.

Additional copies

You may make copies of this document without seeking permission. Further printed copies of the consultation document can be obtained from the address above.

An electronic version can be found at on the BNSC website at <http://www.bnsc.gov.uk/content.aspx?nid=6180> or on the DTI website at <http://www.dti.gov.uk/consultations>.

We will arrange for alternative formats to be provided if necessary.

Confidentiality and data protection

Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes (these are primarily the Freedom of Information Act 2000 (FOIA), the Data Protection Act 1998 (DPA) and the Environmental Information Regulations 2004). If you want other information that you provide to be treated as confidential, please be aware that, under the FOI, there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

In view of this, it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

The Department will process your personal data in accordance with the DPA and in the majority of circumstances this will mean that your personal data will not be disclosed to third parties. Any comments or complaints about the conduct of this consultation should be addressed to:

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A copy of the Code of Practice on Consultation criteria is attached at Annex A.

1. The consultation

The UK's civil space strategy supports the Government's aims of achieving excellence in science, supporting industry in key areas of wealth creation and encouraging innovation. The UK's objectives in space are also influenced by five long-term challenges, identified by HMT Treasury in a recent report¹, which will impact policy making and public service delivery:

- Demographic and socio-economic change
- The intensification of cross-border economic competition
- The acceleration in the pace of innovation and technological diffusion
- Continued global uncertainty and poverty
- Increasing pressures on our natural resources and global climate

This consultation is part of the process of updating the UK space strategy which is scheduled for publication in Autumn 2007.

During the run-up to the ESA Council Meeting at Ministerial level in November 2005, BNSC asked for views on the UK Space Strategy 2003-6 (<http://www.bnsc.gov.uk/content.aspx?nid=5550>) and on UK priorities for the European Space Policy. There is no need to repeat any comments you provided at the time but you may wish to refer to any you made.

The Government-wide 2007 Comprehensive Spending Review (CSR) will set Departmental spending plans for 2008-11. Along with other Departments, BNSC Partners are formulating their priorities and desired expenditure for this period which they will then feed into the wider CSR process. BNSC is co-ordinating the various space-related inputs of the main BNSC partners in order to maximise synergies and avoid duplication. The development of the inputs to the CSR process across the partnership is being closely co-ordinated with the development of the new UK Space Strategy.

You may respond to as many or as few questions as you wish. BNSC welcomes your views on any or all of the issues detailed in this document.

¹ Long-term opportunities and challenges for the UK: analysis for the 2007 Comprehensive Spending Review, pages 5-6. HM Treasury. November 2006.
http://www.hm-treasury.gov.uk/media/298/55/csr_longterm271106.pdf

2. Vision and Focus for the UK Civil Space Strategy 2007-10

The UK approach to space is user-led, and driven by focusing on activities which will enhance scientific knowledge and bring benefits to the UK economy and society.

The UK Civil Space Strategy 2007-10 currently being developed proposes three primary objectives:

- a. *Delivering world-class science by exploiting the UK's space activities and expertise;*
- b. *Delivering public benefits in partnership with Government bodies and institutions to exploit the full potential of space activities;*
- c. *Maximising the potential for wealth creation from space activities by facilitating a progressive business environment.*

The new UK civil space strategy will outline our plans for maximising these benefits by focusing on key areas such as:

- **Enabling a suitable space business environment** to maximise the economic potential of space activities
- **Supporting excellent scientific activities** by maximising synergies and UK influence in international fora
- **Extending partnerships** within Government, the regions and internationally to harness available resources and to widen the applications of space in solving societal and environmental challenges
- **Facilitating key UK capabilities** by strengthening horizon scanning activities and where necessary supporting early risk reduction in commercial systems and developing a strong technology programme
- **Continuing to play a central role in ESA and EU fora** to ensure fit-for-purpose policies, programmes and best returns on subscriptions
- **Using space to enthuse young people** about science and technology

In the existing programme of activities, the UK believes there is an adequate market capable of ensuring access to space for the UK and hence support for launchers is minimal. There are no current plans to become involved in the International Space Station or manned space activities, as no funding partner currently believes that the potential benefits justify the costs involved.

Question 1: Are there additional primary objectives that would help to drive the UK programme and maintain excellence in space?

3. Science

“Delivering world-class science by exploiting the UK’s space activities and expertise”

Introduction

Within the BNSC partnership, the responsibility for funding space-related science activities lies with the Particle Physics and Astronomy Research Council (PPARC) and the Natural Environment Research Council (NERC). The UK is a leading player in a wide range of space-related scientific activities and the BNSC Partnership helps to ensure maximum UK influence in European and wider science fora.

a) Space Science

Responsibility for funding space science lies with PPARC. Its space science remit includes space-based astronomy, planetary science, solar and solar-terrestrial physics and fundamental physics in space.

The majority of the space science activities are undertaken through subscription to the ESA Space Science Programme, supported by national funding of selected instruments. There are also bilateral contributions to the missions of other agencies such as NASA and the Japan Aerospace Exploration Agency, JAXA, when they are in line with the UK’s space science aims.

PPARC’s space science goals are encapsulated in its science agenda and the associated roadmap (<http://www.pparc.ac.uk/roadmap/rmhome.aspx>). PPARC is developing a space science strategy document which links its overall science goals to the broader BNSC remit and includes eight inter-related themes for achieving them:

Theme One: Delivering the science

Exploiting past investment through missions in orbit:

Operating existing space science missions and their instruments either directly or via international agencies as long as they remain scientifically viable and of sufficient priority.

Theme Two: Building the new generation

Instrument and data projects in build:

Delivering a programme of instruments and data systems to address key questions in the PPARC science agenda.

Theme Three: Future science

Preparing the next family of projects:

Selecting new instruments and supporting new technologies that will enable the next generation of space science missions.

Theme Four: New frontiers

Shaping new opportunities:

Evaluating potential programmes for space science that offer new possibilities for national and international collaboration.

Theme Five: Space for education

Educating and inspiring the next generation:

Training the next generation of space scientists and bring the excitement of British space science to the widest possible audience, thus inspiring young people to train in science, technology, engineering and mathematics.

Theme Six: Industry and knowledge transfer

Innovation for science and beyond:

Helping UK industry maximise the commercial and technological benefit from UK investment in space science through supporting technological innovation and transferring knowledge and skills into the wider economy.

Theme Seven: Working together

PPARC's Relationship with the UK space science community:

Working with its partners in BNSC and across the UK to build a vigorous space science community.

Theme Eight: A global endeavour

PPARC working with international partners:

Working with international partners to deliver its science, technology and knowledge transfer agenda.

b) Earth Observation-related science

Observations from space are used to help understand many fundamental processes on Earth, from the behaviour of the atmosphere to ocean circulation and geological processes.

The main responsibility for funding Earth observation-related science lies with NERC. This includes the development of new techniques for exploiting Earth observation (EO) data, related satellite instrumentation and training EO specialists.

Implementation is primarily through ESA supported by national programme activities. There are also bilateral activities with other agencies (such as HIRDLS with NASA).

NERC maintains a vigorous and effective EO Programme as part of its 'Science for a Sustainable Future' strategy, providing a vital contribution to many of NERC's scientific priorities.

EO generates large and complex data sets, which require the concentration of technical expertise to use the data effectively.

The EO Programme is structured to meet these requirements through supporting the following areas of activity:

- **Exploiting current satellite observation systems** through the integration of data and models, and through data access, management and archiving; the planned NERC national Centre for EO; post-launch support; enabling / supporting schemes
- **Acquiring new satellite observations** and contributing to global Earth observations through participation in ESA's science-driven Earth Explorer missions within the Envelope Programme and through the development of new satellite instruments
- **Securing future satellite observations** by supporting and developing technology and instrument systems (e.g. through the planned Centre for EO Instrumentation) with LIDAR, low-frequency SAR and far-infrared radiometry technology being identified as priorities

BNSC will facilitate these activities by providing a strategic lead and developing relationships, particularly in relevant international fora.

In addition some funding for research into climate change is provided by Defra and the Met Office carries out research into the science of weather (see section 4).

Question 2: Do the current areas of activity in space science and EO science allow the UK to enhance its current level of excellence?

Question 3: Are there new and emerging areas of scientific activity using space-based systems in which the UK should take the initiative in order to develop a leading position?

c) International collaboration in space exploration and exploitation

In January 2004, the United States announced a fundamental re-direction of US space policy towards a Vision for Space Exploration. NASA is charged with implementing:

“...an integrated, long-term robotic and human exploration programme structured with measurable milestones and executed on the basis of available resources, accumulated experiences, and technology readiness. NASA will focus on six major Strategic Goals over the next ten years to achieve this Vision of extending humankind’s presence across the solar system, developing innovative technologies and promoting international and commercial participation in exploration to further U.S. scientific, security and economic interests.”

All space agencies have been invited to participate in developing a global space exploration strategy encompassing scientific, technological, economic and societal goals. Initially focussed on the Moon with Mars as a subsequent objective, the emphasis for the ‘return to the Moon’ is currently on acquiring knowledge and capabilities for establishing long-term (scientific) settlements and learning about extracting resources.

ESA has been involved in discussions and are looking at how this initiative sits alongside its existing programmes.

The UK currently excels in robotic missions and satellite technology. BNSC is participating in these discussions, particularly with a view to exploring potential collaborative areas, for example the involvement of UK science expertise.

Question 4: What do you consider to be the technological and economic opportunities for exploitation through space exploration?

Question 5: In pursuing UK interests in exploration and exploitation, are there limits to robotic missions that the UK should consider ?

4. Societal benefits

“Delivering public benefits in partnership with Government bodies and institutions to exploit the full potential of space activities”

Space activities benefit society in a diverse range of areas from understanding the processes underlying climate change to monitoring the environment, weather, natural resources and land usage. The UK is working with partners in government and internationally to exploit existing space systems and to encourage the development of new ones with benefits for transport, security, health and disaster management.

Space missions play a critical role in the monitoring and understanding of **climate change**. In addition to the economic effects highlighted in the recent Stern Report², there are related effects that will have obvious impacts on society and on the environment which space techniques will help to address. These include ice cover, coastal erosion, habitat loss, ozone depletion, flooding, forest fires and sea level change. In addition, space techniques will be vital in assessing progress in meeting targets for reduced carbon emissions around the world.

Since climate change is an international issue, collaboration with other countries is vital. The UK is playing an important role in developing the Global Earth Observation System of Systems (GEOSS), which is intended to drive and coordinate international efforts in EO. Furthermore Defra coordinates UK involvement in the Global Monitoring for Environment and Security (GMES) initiative. This is a joint EU-ESA programme to provide data sets for climate change as well as a range of other services and information for environment and civil security policy in Europe.

Satellite data plays an increasing role in accurately predicting **weather** which in itself is of significant economic value. Weather prediction is undertaken by the UK Meteorological Office (Met Office). By working with European partners through EUMETSAT, the Met Office able to secure basic and sustained observations to help develop its weather prediction models and improve its forecasting. The observations from these satellites are also useful for many other areas of interest, in particular the monitoring of climate trends and some oceanographic applications.

Space systems are well suited to monitor natural and man-made **disasters** (for example through the Disaster Monitoring Constellation built by SSTL), and can assist aid workers in planning responses, monitoring damaged infrastructure (such as roads, bridges and dams) and providing communications to remote or cut-off areas.

² Report of the Stern Review on the Economics of Climate Change, October 2006.
http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

In addition to these areas, satellites are useful in monitoring **land usage** (for such purposes as agricultural regulation), **flooding** (for prediction, monitoring and management), and **natural resources** (such as minerals, water and energy).

Examples of other areas include spin-offs from space instruments (to both **medical technology** and **security**), and **telemedicine**. In addition the development of new services and products for consumers such as in-car **navigation systems** and improved **communication systems** may be seen as benefits to society as well as assisting the UK's commercial competitiveness.

BNSC believes that there is significant potential for further exploiting space applications to benefit society. Through its initiatives such as the Government Information from the Space Sector (GIFTSS) initiative, it is seeking to develop partnerships with other Government Departments and local and regional agencies to investigate and develop the use of satellite-based data to address key challenges. Examples of potential pilot studies are in areas such as intelligent transport, long-term monitoring of land use, and disaster monitoring and humanitarian aid distribution.

Question 6: For what new applications can space-based systems and services deliver greater benefits to society?

Question 7: Have you any views on ways in which we could improve coordination of activities in climate change and environment between different government bodies?

Question 8: How important is it to sustain basic sets of key observations over long periods of time?

5. Wealth creation

“Maximising the potential for wealth creation from space activities by facilitating a progressive business environment.”

Space activity has significant potential for contributing to economic growth in a variety of ways. Firstly, it provides an excellent platform for providing a diverse range of high value business services such as broadcasting, telecommunications, navigation and environmental services. Secondly its challenging environment not only makes it a valuable high technology sector in its own right but helps it to act as an ‘incubator’ for spinning out technologies and applications into other sectors.

The UK space industry is growing strongly with an increase in real turnover of 5% seen in the last year³. In the last two years, there has been an increase in turnover of 17%⁴. Furthermore, a recent study by Oxford Economic Forecasting⁵ has highlighted a number of factors illustrating the economic contribution to the wider economy made by UK space activities.

For example, the UK space industry:

- contributes around £6.8 billion a year to UK GDP including indirect, induced and spill-over effects
- employs directly more than 16,000 people
- invests 12% of revenue on R&D (including external sources).

The UK has an impressive track record in exploiting the diverse range of commercial applications in telecoms, broadcasting, navigation and in small satellite technology. The Government wishes to build on this position in order to enable the UK space industry to maximise its potential for wealth creation. Industry itself has a major role in this but Government too is keen to play its part.

Despite its growing maturity, space activity retains an element of inherent risk and expense, particularly in the development stages of projects. Many countries recognise the value of space technology and are investing heavily. This can lead to market failures in the early research and development phase, which Government funding can assist to overcome.

Furthermore the resulting benefits from space activity tend to be spread across many areas both commercial and non commercial. For this reason public funding continues to play an essential role in financing space activities.

³ Size and Health of the UK Space Industry: 2006 edition. Bramshill Consultancy Limited.

⁴ Ibid¹.

⁵ The Case for Space. The Impact of Space Derived Services and Data. Oxford Economic Forecasting, 2006.

The global space market is growing and international competition is very strong. The number of countries participating in space activities is also increasing. It is therefore vital for the UK to remain competitive so it can benefit from this expanding global market.

In particular, the Government aims to promote wealth creation by:

- facilitating a suitable business environment
- horizon scanning
- building partnerships with other Government departments, regional agencies and private finance
- identifying and facilitating strategic technological capabilities⁶.

The largest opportunities for wealth creation from space in the UK are in the areas of communications, broadcasting and navigation. The UK already has a strong position in this field, for example in satellite TV and mobile satellite communications, as well as secure communications for military purposes. Much of this strength is a result of previous Government funding of research in key technology areas. Investment in underpinning technologies for future expansion areas will be important in retaining the UK's strong global position in this sector (see section 6).

Expected areas of opportunity include the Broadband Global Access Network (which will open up new markets through increasing the data rate available for mobile satellite services), the growth of digital, high-definition and interactive TV services, communication services for civil protection and security applications, and environmental services based on satellite information. In addition, the Location and Timing Knowledge Transfer Network is helping to develop applications using navigation satellites.

Question 9: What areas offer the best commercial opportunities to maximise wealth creation, considering both upstream and downstream?

Question 10: How can BNSC best deploy its resources to ensure that industry is well placed to exploit these opportunities?

⁶ See also Section 6

6. Technology Programme

In both European and world markets, early stages of technology development and risk reduction are assisted by government funding. In particular, within Europe individual countries have an underpinning technology programme, enabling industry to bid more successfully for contracts within ESA and elsewhere.

The UK recognises the importance of ensuring that UK companies are in a position to successfully compete for international contracts. The new strategy therefore proposes a national technology programme which will bring together all existing programmes. This would coordinate existing activities to establish critical mass and manage the generic technology aspects of the UK's user-led approach to space. Such a programme would provide for the efficient management of the knowledge transfer process for space technologies to the benefit of all the BNSC partners and UK industry.

The core activities in the programme could be:

- To identify opportunities for knowledge transfer and the exploitation of established and emerging space technologies
- To perform technology risk reduction, from initial 'proof of concept' to flight heritage, to establish the viability of candidate technologies and systems
- To exploit opportunities for collaboration and to stimulate private investment
- To offer advice to partners to inform their investments and the delivery of services.

The benefits of the programme could include:

- A more competitive UK industry better positioned to participate in activities that directly contribute to the three overarching objectives and to participate in international programmes, enabling the UK to maximise the benefit of its investment in those programmes
- Increased knowledge transfer and innovation through improved exploitation of the UK science and technology base
- Increased and accelerated private investment in the space value chain
- Quantified socio-economic benefits of individual emerging technologies across the three objectives
- Greater scientific return to the UK space science community
- A more stable supply of trained scientists and engineers for the wider economy

- Ability to respond strategically to a range of issues of national interest such as climate change, natural hazards, space weather and infrastructure security
- Increased confidence for Partners and the public in the quality of the decisions made on the use of space enabled systems

The programme would provide a focus for industrial and academic research.

Question 11: What priorities for technology would best enable the UK to achieve its programmatic goals across science, wealth creation and the public good?

7. Education

It is widely acknowledged that space activities are highly effective in inspiring young people to pursue an interest in science and technology as well as increasing understanding of scientific and technological concepts among the general public.

To this end, BNSC and its partners have developed a range of space-related education outreach activities aimed at young people and teachers and also the general public to help raise the awareness of UK space policy and the value and benefits of UK space activity. For example, the BNSC website, www.bnsc.gov.uk, includes an area specifically aimed at teachers and young people. Visitors can download space education resources including lesson plans and worksheets, created with input from teaching professionals, to help support learning both in the classroom and at home.

Through its attendance at a range of exhibitions and events, the BNSC partnership aims to engage young people's interest in science, engineering and technology.

There are also education activities being carried out by many organisations throughout the UK. Greater coordination of these activities would bring considerable value.

The European Space Agency has also been seeking to raise awareness of space within member states through the establishment of European Space Education Resource Offices. Earlier this year extensive discussions resulted in ESA asking Yorkshire Forward (YF, the Yorkshire and Humberside RDA) to take forward the arrangements for the UK, in conjunction with BNSC.

Looking forward, a comprehensive website resource is planned, providing education professionals with a "one-stop-shop" for space education information and material. It will also act as a forum to share best practice.

BNSC will continue working with partners to develop educational materials which will be available on this web site. A longer-term objective is to improve young people's engagement with space, for example through exhibitions at a local and regional level.

Question 12: What further mechanisms for education and outreach do you think are important to inspire young people and encourage them to take up science and technology?

8. Security and dual-use

In Europe there is an increasing debate on the institutional role of the EU and ESA in dual-use applications of space. Satellite technology (for example in Earth observation, communication and navigation) is inherently capable of 'dual-use', meaning it can be used in both civil and military applications.

Where significant technological and operational synergies exist between civil and military applications, industry and national governments should exploit them. However it can be questioned whether the EU and ESA (which by constitution have a civil remit) should become involved explicitly in military applications of space.

In addition, the use of space systems for civil security and counter terrorism purposes is gaining importance, whilst the UK Met Office, an agency of the MoD, funds meteorological satellites which are a largely civilian application.

BNSC through its partners MoD, FCO and DTI will continue to be closely involved in the crucial debate on whether Europe should have a role in developing and exploiting harmonised security applications.

The UK position supports European exploitation of space for civil security and counter terrorism purposes. However the UK is opposed to the broadening of the EU and ESA remits to fund and develop space systems specified for military use.

Question 13: How can BNSC improve its approach to the issue of security and dual-use to ensure UK participation in space activities brings maximum benefit to the UK?

9. Delivery structures

a) The BNSC partnership

The British National Space Centre (BNSC) was set up in 1985 to co-ordinate civil space activities across a number of Government Departments and Research Councils that have interests in space. It also acts as the UK point of contact with the European Space Agency (ESA), the European Commission, and space-faring countries.

It is a voluntary partnership of 11 Government departments and Research Councils: the Department of Trade and Industry (DTI); the Office of Science and Innovation (OSI); the Department for Education and Skills (DfES); the Department for Transport (DfT); the Ministry of Defence (MoD); the Foreign and Commonwealth Office (FCO); the Department for Environment, Food and Rural Affairs (Defra); the Council for the Central Laboratory of the Research Councils (CCLRC); the Natural Environment Research Council (NERC); the Particle Physics and Astronomy Research Council (PPARC); and the Met Office.

BNSC's overall steering and strategic decision making is provided by the UK Space Board whose members are composed, at Chief Executive/Director level, of the five main funding partners: PPARC; NERC; DTI; the Met Office and MoD.

The UK Space Board is advised by the Space Advisory Council, whose members consist of senior representatives from each BNSC partner; the chairs of the BNSC Advisory Boards; the trade association of the UK space industry and UK academia.

The five Advisory Boards advise the Director General of BNSC and include representation from BNSC partners, industry and academia. The current Boards are: the European Union Advisory Board; the Earth Observation Programme Board; the Telecommunications and Navigation Advisory Board; the Space Science Advisory Committee; and the Space Technology Advisory Board.

The Government has announced that PPARC will merge with CCLRC to form the Science and Technology Facilities Council with responsibility for many large UK science facilities. The new Council will inherit the space science work of PPARC and CCLRC but its exact role will be a matter of the new Council.

b) The European Space Agency

For the UK, membership of the European Space Agency (ESA) is the primary delivery mechanism for space programmes in Europe as we believe it offers best value for money and allows the UK to participate in programmes which it does not have the resources to carry out alone.

ESA Member States are required to contribute to its mandatory programme in proportion to their GNP; the UK contribution currently stands at 17.7%, the second largest contribution to the mandatory activities.

Member States may also contribute to ESA's optional programmes according to their own national priorities. For the UK, the five main areas are the Earth Observation Envelope Programme, telecommunications-related programmes (ARTES), Galileo, Aurora and GMES.

c) The European Space Policy

The European Space Policy (ESP) will be a framework for the future governance and management of European space activities and it is expected to be endorsed at a Space Council meeting⁷ in May 2007.

The European Space Policy (ESP) will comprise:

- a strategy outlining objectives
- a programme listing priority activities and projects
- a commitment by the main contributors to their roles and responsibilities
- key principles for implementation

The UK believes that the ESP should aim to use space to provide services to EU citizens where it makes economic sense to do so and not as an end in itself. The ESP is currently being developed within EU/ESA institutional fora.

The UK, through BNSC, is an active participant in each of these groups and plays an influential role, seeking to ensure a user-driven approach and a clear and appropriate split of roles between the EU and ESA (e.g. on flagship projects such as GMES and Galileo).

The EU has also opened negotiations with EUMETSAT with a view to securing a framework agreement similar to that between the EU and ESA. Following that agreement, EUMETSAT interests are likely to be incorporated into any future European Space Policy and BNSC partners will work to ensure a sensible approach is taken.

⁷ Joint EU / ESA Space Councils at Ministerial Level have been organised periodically to guide the development of the European Space Policy.

d) 7th EU Framework Programme for Research and Development 2007-13 (FP7)

The EU's framework programmes are its main source of funding for research and technological development activities and cover almost all scientific disciplines, including space.

It is hoped that the final content and budget for FP7 will be agreed by the end of 2006. It is expected that the first calls for proposals will then be published early in 2007.

BNSC is seeking to influence the drafting of the work programmes which have potential for funding space-related activities; primarily the Space thematic priority but also the Security, Environment, and Information and Communication Technologies thematic priorities.

BNSC has been active in informing and influencing negotiations of space-related aspects of FP7 in EU fora.

e) International Relations

Bilateral agreements are established with other countries and international organisation to achieve benefits for the UK space community, and where they are in accord with wider government policy.

The main reasons for pursuing such international collaboration are:

- to assist companies in securing access to markets
- to develop good relations on broad policy grounds
- to facilitate access to specific projects, especially where opportunities are not available within ESA

In the future, BNSC will continue to consider agreements on their merits. BNSC partners will also continue to assess proposals for their own collaboration according to their priorities.

Furthermore, BNSC partners will continue to play a full part in the development of global collaboration, through such bodies as the United Nations Committee on the Peaceful Uses of Outer Space; the International Astronautical Federation; the Inter-Agency Space Debris Co-ordination Group; and the Committee on Earth Observation Satellites.

Question 14: How do you think that BNSC could improve its ability to direct programmes to meet its objectives?

Question 15: How can these delivery structures in the UK and internationally best be used to meet the UK's objectives?

Question 16: What can BNSC do to assist the space sector in exploiting FP7 funding lines?

10. Trade promotion

BNSC works closely with UK Trade and Investment, the FCO and OSI to support UK companies doing business overseas. Such activities are tailored to specific initiatives such as co-ordinating government support for companies bidding for projects overseas, inviting and arranging visit programmes to the UK for key space industry decision makers, and taking part in international exhibitions.

In addition, BNSC has recently established an advisory group on International Relations and trade promotion involving partners and industry. The group's remit is to advise the Director General of BNSC on these issues.

Question 17: What opportunities do you think exist for BNSC to assist industry in increasing its share of international markets?

11. New opportunities

We look forward to receiving your responses to the questions raised in this consultation. We will use them to inform our thinking as we draft the new UK Civil Space Strategy 2007-10.

This consultation aims to cover the key areas of importance to the UK. However, if you believe there are any other opportunities that will help the UK deliver its objectives as set out in Section 1, we would welcome your views.

Question 18: Are there any other opportunities that would help the UK maintain its excellence in any aspect of space activity?

Consultation response sheet

Please answer the questions using the boxes below. When answering, it would be helpful if you could explain the reasons for your view.

You may respond to as many or as few questions as you wish. BNSC welcomes your views on any or all of the issues detailed in this document.

Vision and Focus for the UK Civil Space Strategy 2007-10

Question 1: Are there additional primary objectives that would help to drive the UK programme and maintain excellence in space?

Answer 1:

Science

Question 2: Do the current areas of activity in space science and EO science allow the UK to enhance its current level of excellence?

Answer 2:

Question 3: Are there new and emerging areas of scientific activity using space-based systems in which the UK should take the initiative in order to develop a leading position?

Answer 3:

Question 4: What do you consider to be the technological and economic opportunities for exploitation through space exploration?

Answer 4:

Question 5: In pursuing UK interests in exploration and exploitation, are there limits to robotic missions that the UK should consider?

Answer 5:

Societal Benefits

Question 6: For what new applications can space-based systems and services deliver greater benefits to society?

Answer 6:

Question 7: Have you any views on ways in which we could improve coordination of activities in climate change and environment between different government bodies?

Answer 7:

Question 8: How important is it to sustain basic sets of key observations over long periods of time?

Answer 8:

Wealth Creation

Question 9: What areas offer the best commercial opportunities to maximise wealth creation, considering both upstream and downstream?

Answer 9:

Question 10: How can BNSC best deploy its resources to ensure that industry is best placed to exploit these opportunities?

Answer 10:

Technology Programme

Question 11: What priorities for technology would best enable the UK to achieve its programmatic goals across science, wealth creation and the public good?

Answer 11:

Education

Question 12: What further mechanisms for education and outreach do you think are important to inspire young people and encourage them to take up science and technology?

Answer 12:

Security and dual-use

Question 13: How can BNSC improve its approach to the issue of security and dual-use to ensure UK participation in space activities brings maximum benefit to UK?

Answer 13:

Delivery structures

Question 14: How do you think that BNSC could improve its ability to direct programmes to meet its objectives?

Answer 14:

Question 15: How can these delivery structures in the UK and internationally best be used to meet the UK's objectives?

Answer 15:

Question 16: What can BNSC do to assist the space sector in exploiting FP7 funding lines?

Answer 16:

Trade promotion

Question 17: What opportunities do you think exist for BNSC to assist industry in increasing its share of international markets?

Answer 17:

New opportunities

Question 18: Are there any other opportunities that would help the UK maintain its excellence in any aspect of space activity?

Answer 18:

ANNEX A

The Consultation Code of Practice Criteria

1. Consult widely throughout the process, allowing a minimum of 12 weeks for written consultation at least once during the development of the policy.
2. Be clear about what your proposals are, who may be affected, what questions are being asked and the timescale for responses.
3. Ensure that your consultation is clear, concise and widely accessible.
4. Give feedback regarding the responses received and how the consultation process influenced the policy.
5. Monitor your department's effectiveness at consultation, including through the use of a designated consultation co-ordinator.
6. Ensure your consultation follows better regulation best practice, including carrying out a Regulatory Impact Assessment if appropriate.

The complete code is available on the Cabinet Office's web site, address <http://www.cabinetoffice.gov.uk/regulation/consultation/index.asp>

ANNEX B

List of organisations consulted

Organisations:

Advanced Composites Group
Advantage Business Group
Advantech AMT Ltd
AdvoTek Limited
AEA Technology Battery Systems Ltd
AEA Technology Plc
Aegis Systems Ltd
AEL Consultants
Aetheric Engineering Ltd
AI Satcom Ltd
ALSTOM Aerospace
Ampac – ISP (UK) Ltd
Analyticon Ltd
Antrak
Aon Ltd
APECS
AquaSat Ltd
Arqiva
AsCo Tech Ltd
ASTOS
ASTRA
Astro Pioneer Ltd
Auriga Astronomy
Avanti Screenmedia
AWS Electronics

Barclays Capital
BARSC
BHR Group Ltd
Birkbeck College University of London
BNSC Advisory Boards
Bristol Spaceplanes Ltd
Brit Space Consortium
British Antarctic Survey
British Geological Survey
British Interplanetary Society
British Telecom
British Rocketry Oral History Project
BSkyB

C2 RF Solutions Ltd
Callisto Ltd

CCLRC
Centre for Ecology and Hydrology
Centronic Ltd
Century Dynamics
Clyde Space
Coldon Engineering Co. Ltd
ComDev
ComSine Ltd
Cortex (South West) Ltd

DC-Sat Net
Delta Communications Ltd
Department for Education and Skills
Department for the Environment, Food and Rural Affairs
Department for International Development
Department for Transport
Department of Enterprise, Trade and Investment, Government of Northern
Ireland
Department of Trade and Industry
DIDEY Consulting Ltd
Drake Electronics Ltd
DYNEX Semiconductor Ltd

E2E Services Ltd
E2v technologies (uk) Ltd
EADS Space
EBC
EBIS Iotron Ltd
Electron Tubes
EM Technology
EMV Ltd
Engineering and Physical Sciences Research Council
Environmental Systems Science Centre
EOCI
ERA Technology Ltd
ERDAS (UK)
ESRIN
ESYS
ETL Systems Ltd
Europe*Star Ltd
European Antennas
European Centre for Medium Range Weather Forecasts

4Links
Field Fisher Waterhouse
Five Owls
Flow-Line Communications Ltd

Fluid Gravity Engineering Ltd
Foreign and Commonwealth Office
Frazer Nash

Gas Dynamics Ltd
GEO Group
Giant
Global Aerospace Underwriting Managers Ltd
Global Communications (UK) Ltd
Globec (UK) Ltd
Grafton Technology
Graphic Plc

HCD Research
Headway Consultancy Ltd
Helios Technology Ltd
HILTech Developments Ltd
HISCOX Plc
Histar Solutions Ltd
HME Partnership
Hollycroft Associates
Holscot Fluoroplastics
Home Office
Hovemere
HPM Ltd
HTS Development Ltd
Highlands and Islands Enterprise

IGG Component Technology Ltd
Imperial College University of London
Infoterra Ltd
Inmarsat Plc
Institute of Cryogenics
INSYS Ltd
Integrated Engineering
Intellect
Intelligent Autonomous Systems Laboratory
International Aerospace
Invacom Ltd
Invest Northern Ireland
ISP International Space Propulsion Ltd

Jodrell Bank Observatory
JRA Technology Ltd

Keen Associates Ltd
Kudos Technology Ltd

Laser Transport International Ltd
Lobo Systems Ltd
Lockheed Martin STASYS Ltd
LogicaCMG Space and Defence
Logistica Telecom
Lola Composites Ltd
Loral SkyNet
LyonSpace Ltd

Mainstay Space Products
Mansat Ltd
Manufax Engineering
Marchbanks Measurements Systems Ltd
Mardale Technology Ltd
Maris Technologies Ltd
MarketStream Ltd
Marotta UK Ltd
Marsh Ltd
Maycast Nokes
McGinley Systems International
Meggitt Aerospace Components
MEP Aeroplastics
Met Office
Microlaunch Systems Ltd
Microsais Systems
Ministry of Defence
MKW Engineering Ltd
MOLTEK Consultants Ltd
Moreton Hall Associates
MT Aerospace Satellite Products Ltd
Mullard Space Science Laboratory
Multispark Erosion Ltd

National Maritime Museum
National Physical Laboratory
National Space Centre
Natural Environment Research Council
NCAS Centre for Global Atmospheric Modelling
Neal Ltd
NetSensors
Nohmia Ltd

Nottingham Scientific Limited
Nova Space Associates Ltd
NPA Satellite Mapping

Ocean Numerics Ltd
Ofcom
Office of Science and Innovation
ONELAN Ltd
Open University
Optimus Consulting Ltd
Orbit Research
Orbital Mechanics
Ordnance Survey
Oxsensis Ltd

Pabugi Ltd
PCI Geomatics Group Ltd
Peak Production
Pender Plating
PentaMedia (Europe) Ltd
Physics and Astronomy Research Council
Pinpoint Faraday
Plasma Antennas Ltd
Plymouth Marine Laboratory
Polymer Systems
Printech Circuits Laboratories
Proudman Oceanographic Laboratory
Psi-Tran Ltd

Qi3
QinetiQ
Quartzlock UK Ltd

Rapco Electronics Ltd
Raytheon Systems Ltd
Reaction Engines Ltd
Regional Development Agencies of England
Remote Sensing Applications Consultants Ltd
Resin Technical Systems
Reynolds Industries
Roke Manor Research Ltd
Rosenberger Micro
Roth Southwell Consulting
Royal Astronomical Society
Royal Meteorological Society
RPC Telecommunications Ltd

Rutherford Appleton Laboratory

SAIC Ltd
Salcey Precision Engineering
Sapienza Consulting Ltd
Satellite Observing Systems
SciSys
Scottish Enterprise
SELEX Sensors and Airborne Systems Ltd
Sematron UK Ltd
Semelab
Senior Design Associates
Serco Group plc
Silicon Valley Group
SimComm (Europe) Ltd
Space Connexions Ltd
Space System Engineer
Spectrascan (Emsworth) Ltd
Spectrum Metrology
Spirent Communications (SW) Ltd
SPL-ACT Wireless
Spur Electron Ltd
Sounding Rocket Services Ltd
Southampton Oceanography Centre
Space Education Council
SSTL
Sula Systems Ltd
Symban
Systemation Software
Systems Engineering & Assessment Ltd

21Net Limited
Technites Ltd
Teldis
Telesphere
Tessella
Thales ATM Ltd
Thales Avionics Ltd
Thales Research, Satellite Systems Division
Thales Space Technology
The 425 Company
The London Satellite Exchange
The Mathworks
Thompson Valves Ltd
Time Is Ltd
Tpoint Software
TRAK Microwave Ltd
Trinity House

TRL Technology Ltd

UKSEDS

UKspace

University College London

University of Aberystwyth

University of Birmingham

University of Bristol

University of Cambridge

University of Edinburgh

University of Glasgow

University of Kent

University of Reading

University of Leeds

University of Leicester

University of Manchester

University of Oxford

University of St Andrews

University of Sheffield

University of Surrey

University of Wales

Vector Electromagnetics

VEGA Group Plc

Vexcel UK Ltd

Vislink

VT Communications

Welsh Assembly Government

Wilde & Partners

Wired Ocean

World Wide Pictures

Wrekin Circuits Ltd

Zelinda Ltd