

STFC Delivery Plan 2011/12 - 2014/15

Impact through inspiration and innovation



Science & Technology
Facilities Council

Contents

Executive Summary	1
1. Delivering impact for the UK 1.1. STFC's role 1.2. From inspiration to application 1.3. Towards a sustainable programme 1.4. STFC's funding allocation 1.5. A strategic approach	
2. World class research, innovation and skills – our programme to 2014/15 2.1. Astronomy, particle physics and nuclear physics programme 2.2. Enabling access to world-leading UK and international large facilities 2.3. UK Science and Innovation Campuses	7
3. Our focus for greater impact 3.1. Solutions for Global Challenges 3.2. Inspiring and Involving – public engagement with research 3.3. Providing Research Excellence and Leadership 3.4. Effective Knowledge Exchange 3.5. Building International Influence 3.6. Strengthening Strategic Partnerships	15
4. Transforming our organisation 4.1. Focussing our investment in science 4.2. Restructuring for greater efficiency and focus 4.3. Measuring our progress	19
Appendices Appendix A – Funding allocation Appendix B – Resource budget by funding mechanism Appendix C – Capital budget Appendix D – Resource budget by theme Appendix E – Contributions to cross-Research Council themes	23

Executive Summary

Seldom has scientific and technological innovation been so important to our society and to our nation. The 21st century brings new and serious challenges in areas like energy, the environment, an ageing population and major new security issues; while at the same time we must rebuild our economy around knowledge-based activities. To overcome these challenges, we must maintain the strength of our world leading science base, continue to attract young people into science, technology and engineering, provide access to world-class research facilities, and bring academia and industry together in novel partnerships. The Science and Technology Facilities Council is at the very centre of this mission.

We are pleased that the Government has acknowledged the importance of science and research and has been able to ring-fence the programme resource budget for the Research Councils. We welcome our settlement as an extremely strong vote of confidence in our activities, given the overall pressure on public spending at present.

STFC and its research communities are well positioned; we carried out a thorough prioritisation of our programme in 2009 which focused support on our highest priority activities. This process was a difficult one, involving significant reductions in research support for some of STFC's science areas, but the programme and priorities established a year ago form a strong basis for the next four years and are carried forward in this Delivery Plan.

Some of the highlights of this plan are:

- We will support a world-class research programme in astronomy, particle and nuclear physics, following the priorities established in consultation with our research communities a year ago
- We will operate the UK large national facilities to ensure agreed levels of access for the other Research Councils. This involves full exploitation of the Diamond Light Source and reduced operation of the ISIS pulsed neutron and muon source and the Central Laser Facility. As part of this we will ensure their continued sustainability as world leading facilities
- We will provide access to the International facilities operated by CERN, ESO, ILL and ESRF at levels agreed with international partners and our fellow Research Councils. We have worked with our international partners to restrict the planned spending of these organisations and achieved significant reductions in real terms in all of these subscriptions We have also agreed to reduce the UK's use of ESRF given the increase in Diamond's capabilities
- We will maintain resource spending on grants and keep studentship numbers constant, and will transition all our grant support to a new consolidated grants mechanism

- We will introduce a new Fellowships scheme and a new Studentship Enhancement Programme to nurture future research leaders. We will redirect £3.5m to fund these areas
- We will transform our organisation, aligning activities to our Strategy and restructuring to match priorities against activity levels.
- We will introduce new funding schemes to support Global Challenges, innovation, and collaborative R&D, redirecting £16m to these areas over the spending review period

We acknowledge that the next four years will bring significant challenges, but we believe that this Delivery Plan lays out a solid basis on which to move forward. With the enthusiasm and commitment of our staff, our research communities, and our partners, and their shared belief in the importance of what we do, we will face these challenges with determination and confidence.

1. Delivering impact for the UK

1.1. STFC's role

STFC is unique among the Research Councils. We cover three distinct but interrelated functions: firstly, sponsoring university-based research, innovation and skills in astronomy, particle physics and nuclear physics; secondly, ensuring access to world-leading, large-scale facilities across a range of physical and life sciences, enabling research, innovation and skills training in these areas; and thirdly, building the UK's Science and Innovation Campuses to promote academic and industry collaboration. No other UK research organisation has such a broad spectrum of engagement with research, innovation and skills, or breadth of collaboration with business and international partners. This makes us an inherently cross-disciplinary organisation, able to mine cross-sector boundaries for new ideas, new science and greater impact. Our work boosts and strengthens the UK research base, with significant contributions to the science output of many other Research Councils which is delivered using our world-class facilities and laboratories. These also play an important role in providing the best possible training ground for the advanced problem solving and engineering skills that the country needs.

1.2. From inspiration to application

Science plays a central role in the modern world. Scientific and technological innovation is essential to the delivery of continued advances in prosperity and increased quality of life while providing solutions to the key challenges facing society.

Science and innovation lie at the heart of the strategy for long-term economic growth in the world's leading economies, and all major nations are positioning themselves to boost their innovation output, particularly where nano-, bio- and information technologies converge. The race for technological and economic leadership has led all G8 nations to scientific investment portfolios in photon and neutron sources, high-power lasers, astronomy, particle physics and nuclear physics that closely match those of the UK. Our challenge now is to maintain our competitive research position, in the face of escalating competition, in order to sustain our potential for long-term prosperity, despite the tough economic times.

STFC is engaged in cutting-edge and high-profile science that leads the world, drives back technical frontiers and provides a rich source of innovation that has impact across the whole of society. Previous investment in STFC research disciplines has contributed towards delivering:

- £90 billion or 6.4% contribution to UK GDP and one million jobs from physics-based manufacturing industry, equivalent to financial services
- £125 billion contribution to UK GDP from innovation in these fields, eg digital economy underpinned by World Wide Web, computer animation and medical imaging technology and estimated to contribute up to 13% of GDP by 2015
- £78 billion contribution to GDP from the aerospace, automotive, consumer technology and defence industries which are underpinned by STFC-supported £23bn UK microelectronics sector, itself growing at 15% per year
- £8 billion contribution to UK GDP and 67,000 jobs from the pharmaceutical industry supported by STFC techniques; 15 of the world's current 75 best-selling drugs were discovered and developed in Britain using techniques pioneered by STFC

- £1 billion annual UK tax contribution by the high-tech graduates and postgraduates attracted and funded by STFC research

In addition, science and technology supported by STFC makes a real difference to the quality of life in the UK through the inspirational power of our fundamental science and its practical application in areas such as healthcare, environmental science, security applications and energy.

1.3. Towards a sustainable programme

This Delivery Plan sets out STFC's proposals to realise world-leading science, thereby fulfilling its responsibilities to Government by increasing our impact for the UK within the constraints of a challenging economic climate. In anticipation of tougher economic times ahead, we took action last year to reprioritise our programme within the framework of our Corporate Strategy, which we are publishing alongside this Delivery Plan. By aligning our operations with a strong strategy, we have already taken the first in a number of steps to refocus our research base and deliver a programme concentrating on top priority areas.

In the spring of this year, Government undertook a major review of our structural and funding arrangements to address the budgetary tensions between STFC's subscriptions to International organisations, large UK-based scientific facilities, and our science programme and grant-giving roles. The outcome was a set of new arrangements to provide future budgetary stability, including a recommendation that STFC's budget should be partitioned in future spending reviews, and a Government commitment for the seven Research Councils to develop a new model to jointly fund STFC's UK-based large science facilities. The three budgetary partitions for STFC's programme announced by Government; international subscriptions, UK large facilities and our core programme - have been used by BIS in establishing our allocation and by us in developing this Delivery Plan. This approach protects each resource partition and avoids the transfer of financial pressures to other parts of the programme.

STFC is heavily dependent on capital. A large proportion of our capital budget in the last spending review period was spent on maintaining and developing facilities that support the UK research base, while very little was spent replacing old infrastructure. We have worked closely with BIS to re-evaluate the capital needs of our programme; reassessing priorities, identifying funds to sustain our world leading facilities and the changing requirements of the international subscriptions. The reassignment between capital and resource funding in our allocation reflects the changing profile of those requirements over time.

1.4. STFC's funding allocation

This section focuses on the breakdown of our funding allocation (Appendix A). Details of our proposed programme that will be funded by this allocation are contained in sections 2, 3 and 4 (Appendices B, C and D).

1.4.1 Resource funding

Our overall baseline allocation for 2011/12 for resource funding is £375.8m[excluding administration, see below], rising to an allocation of £384.7m in 2014/15. This is significantly less than our allocation for the previous spending review period, reflecting the transfer of the European Space Agency subscription and elements of the domestic space programme to the UK Space Agency.

Each of STFC's three budgetary partitions received its own allocation (Appendix A). Government has added a further partition for administration to all Research Council budgets, to reflect its objective to reduce these costs across the public sector.

International subscriptions - Working with our European partners, the UK was able to secure significant savings on planned budgets of the international facilities over the spending review period. Resource funding for the international subscriptions of £108.6m for 2011/12 rising to £123.1m for 2014/15 has been included in our allocation. The increase over the period is predominantly as a result of the thorough review of the balance of investment between capital and resource and the consequent shift towards resource funding.

UK large facilities - The seven Research Councils jointly recommended the level of facility access that would be required by the research base over the spending review period. Our allocation of £77.2m in 2011/12 rising to £89.5m in 2014/15 reflects these requirements, and the increase over the period reflects the increasing operational costs of Diamond's Phase II and III beamlines.

Core programme - Funding for our core programme, which includes project and research grants to universities, technology support and infrastructure, R&D, the operational costs of our laboratories, Campuses, innovation initiatives and corporate management etc, is £190.1m in 2011/12 and £172.2m by 2014/15.

Administration - This partition covers the traditional administrative support functions such as Finance, Human Resources and Procurement and also covers the administration component of our Science Programmes Office. Much of this transactional work has been transferred to the RCUK Shared Services Ltd (SSC) which will be expected to make proportionate savings. Our resource allocation will be augmented by this administration partition at a later date, this is anticipated to add around £19m to our total allocation in 2011/12.

1.4.2 Capital funding

Our overall capital allocation for 2011/12 is £100.4m, including £8.9m for Diamond Phase III and £4.6m for Diamond VAT from the LFCF (Appendix A). As with resource, the capital allocation is partitioned between International subscriptions, facilities as recommended by the Research Councils and the core programme.

International subscriptions - Capital funding for the international subscriptions is £46.2m for 2011/12 including £10.4m for the final instalment of our ESO joining fee. Our capital allocation falls to £27.7m for 2014/15; this fully funds the capital requirements after the rebalancing between resource and capital.

To provide a high degree of certainty and to minimise foreign exchange exposure, we have bought forward 90% of our currency requirements for the first two years of the spending review period and 60% for the last two years. The impact of this compared with the CSR07 exchange rates has been reflected in our allocation. The remainder will carry some risk and we will manage this working closely with BIS.

UK large facilities - In making their recommendations to BIS, the Research Councils stressed the requirement for sufficient operating capital to make the running of these facilities fully sustainable. The allocation reflects this recommendation.

Core programme – Capital funding for our core programme is £19.63m in 2011/12 and £14.17m by 2014/15.

1.4.3 Large Facilities Capital Funding (LFCF)

BIS confirmed on 9 December 2010 that Ministers have approved the £98m funding for Diamond Phase III from the Large Facilities Capital Fund (£64.7m in this spending review period). The Wellcome Trust will be contributing £16m towards the project (£8.9m in this spending review period).

1.5. A strategic approach

This Delivery Plan has been developed to realise our Vision of maximising the economic and societal impact of our facilities, knowledge and unique capabilities. Our three strategic goals, world-class research, innovation and skills, are essential to sustain the UK's position as a global scientific nation, by strengthening the potential of the UK's physics sector to provide economic growth, high-value employment and inward investment. It is through the delivery of these three long-term, durable goals that we generate knowledge, solutions and skilled people, thus underpinning the UK's future competitiveness.

It is a key part of our role to ensure that the public investment in science and research has ever increasing impact on issues that matter most to society. Technology is a particular strength of our organisation and will be a major thrust of our enhanced contribution to the Global Challenges of energy, security, environment and an ageing population. British industry has reported a growing unfilled demand for physics graduates and science, technology, engineering and mathematics (STEM) skills, and STFC's science programme is key to meeting this demand: astronomy and particle physics research areas are cited by 90% of current physics students as the inspiration for them to pursue STEM careers.

UK leadership in research is a vital theme. This Delivery Plan focuses on research excellence, but excellence alone is not enough. We must work in close collaboration with the other Research Councils, TSB, Government, academia and commercial partners, and align resources behind shared goals and core capabilities. The UK has an outstanding record in academic knowledge exchange and we are building on this to establish new ways of working through the Science and Innovation Campuses at Daresbury in Cheshire and Harwell in Oxfordshire. Research, innovation and skills have become increasingly internationalised and our links with Europe and other leading economies are strong; in times of limited funding it is even more important that we use these links to gain the best possible outcomes from European and international science and investment decisions.

Excellence in science sustains the UK in its ability to have more universities in the world's top 50 than any other country bar the United States – attracting the world's best researchers and students and valuable foreign direct investment. STFC-funded universities produce physics postgraduates with outstanding high-end scientific, analytic and technical skills, who expand the technical knowledge of the UK's industrial base and sustain national capability. These researchers of tomorrow are the bedrock of the UK's scientific excellence. For this reason STFC has made national capability its key priority in developing this Delivery Plan, by maintaining PhD and Fellowship funding and sustaining the level of resource funding for grants. It is also our role to bring our skilled people and research together, to stimulate high-potential, high-growth technologies, and to strengthen the links between academics and industry so as to increase innovation. In doing all this we will increase the efficiency of research investment and leverage additional funding.

We will only achieve our strategy by reforming our own operations and encouraging universities to do the same. This Delivery Plan sets out how we will transform STFC, both in our internal operations and in the way with work with others, to build an organisation that is financially sustainable, maximises efficiencies across our three functions, and provides the necessary leadership in this time of change.

This strategic approach has enabled us to develop a credible and sustainable programme to deliver excellence and increase our impact on the economy and society, while being strong on reform, prioritisation and efficiency.

2. World class research, innovation and skills – our programme to 2014/15

This section sets out our programme until 2015 within each of our three functions.

2.1. Astronomy, particle physics and nuclear physics programme

STFC is the UK sponsor of astronomy (including solar and planetary), particle physics and nuclear physics research areas, shaping the programme and providing the funding that allows the UK's outstanding universities to provide research, innovation and the training of PhD students. The UK is a world leader in these areas, has a strong academic base and holds a high proportion of leadership positions in international collaborations and experiments. STFC's astronomy grants programme continues to support the exploitation of the space-science projects that are now funded through the UK Space Agency.

We will support a world-class research programme in astronomy, particle and nuclear physics following the priorities established a year ago in consultation with our research communities

The curiosity-driven research we support expands the frontiers of human knowledge and scientific understanding. It underpins the strength of our university sector and attracts young people into science. It also stimulates the UK's economy and delivers real world benefits in the medium and longer term. One of the primary means by which we achieve these benefits is by driving the development of new technologies in our laboratories and through our university funding, which then find broad application. They also catalyse the development of a national technical and technological skills base and a pool of highly-trained analysts, problem-solvers and innovators. This kind of research attracts young people into STEM subject areas, inspires and provides the next generation of researchers, and delivers a high-tech workforce to drive the thriving physics-based sector.

The relationship between STFC as commissioner and the universities as deliverer of research in astronomy, particle physics and nuclear physics is a mature one that works well. Since 2007 there has been a substantial prioritisation and focusing of our activities in these areas. We will continue to align the programme to our Corporate Strategy, and will work to achieve continued improvements in the efficiency of our own operations and those in the universities, as recommended in the recent Wakeham Report on 'Financial Sustainability and Efficiency in Full Economic Costing of Research in UK Higher Education Institutions', whilst working in partnership with our universities to focus resources and remove unnecessary duplication between the universities and STFC's national laboratories. More details on our efficiency proposals can be found in section 4.

2.1.1 Science projects and research grants

During 2009, STFC carried out a full prioritisation and a challenging restructuring of its programme, in consultation with our research communities. We targeted support on the very highest priority projects in each subject area. This produced a focused and affordable programme. The process was difficult, involving significant reductions in research support for

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some of STFC's science areas, but the programme and priorities established a year ago form a strong basis for the next four years and are carried forward in this Delivery Plan.

Our commitment now is to maintain resource spending on science projects and grants, limiting any programme reduction to 2% in recognition of the contribution already made from these areas to past

budget reductions. The substantially reduced capital funding will be addressed by working with our communities to reshape the way that we fund our programme.

Our research programme will continue to build and sustain national capability and scientific leadership in astronomy, particle physics and nuclear physics by playing a leading role in the key global collaborations at CERN and ESO, and in experiments at FAIR. This will allow us to:

- Transform our understanding of the fundamental laws of the universe and reveal how nature operates at the energy scales where our current understanding breaks down
- Make use of the world's leading astronomical observatories to understand what the universe is made of and how it evolves
- Use the new ability to make beams of highly unstable nuclei to explore the origin of the chemical elements and the forces holding the atomic nucleus together

We will foster a complementary partnership between STFC and universities by increasingly focusing the capabilities of STFC's in-house researchers on technology, instrumentation and detector development, leaving university scientists to concentrate on scientific research.

(a) Reforming grants administration

Recognising the need to streamline our processes and achieve greater efficiency, we have already completed a radical review of our research grant funding mechanisms. An entirely new grants scheme has been developed following consultation with our communities during the summer of 2010 and will be rolled out during 2011. Key features of the new grants are:

- The old system of a mixed portfolio of Standard and Rolling grants will be discontinued. All our funded researchers will be moved to a single consolidated grant mechanism providing support for up to four years
- We will limit applications to one every three years per university department per subject area, where the subject areas correspond to the existing STFC grants panels
- This is estimated to reduce the number of proposals to be handled from 600 every three years to between 100 and 200
- We will simplify and standardise costs wherever possible to reduce administrative work

In parallel with this exercise, we are reviewing our scientific advisory committee structure with the goal of reducing cost and complexity, and we have initiated a restructuring plan for our Science Programmes Office to improve programme management and oversight and to deliver efficiency savings in the administration of projects and grants.

(b) Demand management

We are committed to achieving improvements in the efficiency of the science funding system and have agreed with our fellow Research Councils a core set of principles to guide our approach to demand management. We will work in close partnership with universities to support them in self-managing demand, delivering quality control of research proposals and sharing good practice whilst working towards continual improvement.

We are committed to ensuring award rates are as high as possible while remaining competitive. However, we also recognise that our grants portfolio is already highly concentrated; just six institutions receive half of our grant funding, while 80% goes to the top sixteen institutions. This concentration reflects the nature of STFC's research areas and our continuing policy of focusing resources. Our grants awarding panels have placed a premium on critical mass in research groups and over the past three years rolling grant support has been withdrawn from some of the smaller groups. We expect this policy of focusing resources to continue over the next four years, however we will not impose explicit targets for greater concentration of funding.

2.1.2 Astronomy, particle physics and nuclear physics skills training

STFC plays a key role in attracting young people into science through the inspirational nature of its research and by educating a technically skilled workforce. Science PhDs enter the employment market with some of the highest graduate salaries. The UK wishes to be one of the foremost knowledge economies in the world, attracting inward investment, companies, and a thriving high-technology culture to secure jobs at the top of the global value chain. This requires that we continue to support universities to train physics postgraduates, whose outstanding high-end scientific, analytic and technical skills expand the capability of the UK's industrial base. These scientifically literate workers of tomorrow are the bedrock of the UK's economic recovery and despite the growing supply, UK demand for graduates with physics and other STEM skills is expanding, and industry continues to report that there is still un-met demand. For this reason we have made national capability our key priority in these difficult times.

In support of this goal, we will work with HEFCE, EPSRC and other partners to retain and develop talent in priority areas, help to sustain physics undergraduate teaching and ensure the skills we are delivering are relevant and cutting edge. Our PhD students enjoy almost full employment with half continuing in research, whilst the remainder, much valued for their numerical, problem solving and project management skills, choose equally important industrial, commercial or government careers.

A new fellowships scheme will be aimed at future leaders. Holders of these fellowships will have access to a dedicated fund to support their research to allow them to establish a distinctive track record.

We will contribute to advanced skills training by maintaining the number of new PhDs at around 220 per year over the spending review period. We will introduce a new elite research

fellowship scheme aimed at individuals with future leadership potential, replacing our existing advanced fellowships. We will offer up to twelve fellowships per year and all will be able to bid for an annual research bursary for five years. We will make a fund of £3m available for the full complement of fellows by the end of 2016. This will allow these new researchers to establish themselves and should attract considerable new talent to the UK.

We will target our studentship allocations towards the best research training environments by continuing to monitor and adjust our allocation algorithm, incorporating quality measures of studentship training into the process. We will continue to monitor students' perceptions of the quality of their training to enhance its relevance and effectiveness, and will review our policy regarding PhD duration. We will also implement a new "STEP" (Studentship Enhancement Programme) award scheme to help 15 of the best academic-track students per year in the first stages of their postdoctoral research careers.

In parallel, we will improve our understanding of the extent to which STFC-funded students are able to transfer their skills and make an impact in the wider economy by progressing continuous career tracking, and by working with employers to understand their skills requirements and identify skill shortages. We will use this information to guide studentship training policy and to develop shared programmes between university departments and our laboratories where appropriate.

We remain committed to the development of early-career researchers, both to develop the skills to benefit the wider economy and to ensure the continuing pipeline of excellent researchers for the nation. As a result we will continue to invest in the RCUK Research Careers programme, supporting the implementation of the Concordat for Researcher Development and managing the transition of the Vitae programme towards a self-sustaining position. We will augment this as part of STFC's strategic relationship with university departments.

We will share our experience of schemes and evaluation methodologies to enhance post-graduate training, capture impact and to promote good practice across the Research Councils. We will continue to seek feedback from STFC-funded students on the quality of their training and supervision and their career intentions during their PhD, and identify any disparities in experiences, in particular, between men and women. We will consult with our Women in SET Focus Group and work to remove barriers that might exist for researchers seeking to return to research after a career break. In support of this we will continue to ensure that our Fellowship scheme offers a route for returning to research after a career break. Recognising that involvement in STFC boards, committees and panels supports career development of researchers, we will monitor annually the diversity of these bodies, as well as participation as investigators in grants by people from different equality groups.

2.2. World-leading UK and international large facilities

STFC enables access for UK researchers to a range of large-scale facilities covering neutron scattering, synchrotron radiation, high-power lasers, astronomy, particle physics and nuclear physics. The UK has invested significant human and capital resources in the construction, development and operation of these major research infrastructures to enable university and industrial researchers, in concert with the outstanding intellectual input of our scientists and technical staff, to perform cutting-edge science using some of the best tools in the world.

The breakthroughs and developments of 21st century science and technology will be dominated by our ability to manipulate and image matter at the scale of atoms to living cells, and resolve dynamics on atomic timescales. This requires large-scale infrastructures and

analytical facilities that are beyond the means of any single university or research group, or often any single nation. STFC's role is to provide the UK research base with timely and sufficient access to world-leading tools and facilities to keep UK research, innovation and skills training at the forefront. As such facilities can take a decade or more to develop and commission, considerable foresight, planning and development is required to ensure that UK researchers continue to have access to the very best facilities into the future.

STFC's intense light sources, lasers and neutron sources find application across the entire research base and are key to delivering advances in priority areas such as biomedical research, material sciences, chemistry, pharmaceuticals, fundamental biochemistry, cell biology, energy and engineering. These are multi-application research facilities that build on the cutting-edge technologies often developed for fundamental investigations at, for example, CERN. Without access to STFC's facilities, the range of all the scientific Research Councils' programmes – including STFC's own – would be severely restricted, producing less focused science, fewer PhDs and a smaller contribution to innovation and the challenges of the day.

International subscriptions to CERN, ESO, ILL and ESRF will be supported at levels agreed with our partners; we have worked with our partners to restrict their planned spending and achieved significant reductions in real terms in all of these subscriptions and have agreed to reduce the UK's use of ESRF given the increase in Diamond's capabilities

2.2.1 Large facility access

The Research Councils, along with the Wellcome Trust, are working together on a new model for funding their usage of these large facilities. This model will match the funding Councils' scientific priorities and requirements to the provision by STFC of appropriate facility access. Although the project formally covers the UK facilities (ISIS, Diamond and CLF), the project will take account of requirements for ILL and ESRF access because of their complementarity to ISIS and Diamond. This is a new and innovative approach to facility funding that will more closely link the access requirements of our fellow Research Councils to the facilities we provide and the quality and extent of that provision. Our budget allocation for this partition was awarded on the basis of these agreed access requirements and this Delivery Plan reflects those requirements.

The Research Councils' preferred level of access to the large facilities, balances their research needs and affordability over this spending review period. Their collective view is based on a key principle that where facilities are supported the UK must ensure that they remain world class. Based on this collective view and budgetary allocation we will provide access to the following:

- Full Diamond operations, including the operation of all the Phase 2 and 3 beamlines available for operation within the spending review period
- ISIS operations, 120 days per year at Target Stations 1 and 2
- Central Laser Facility operations
- Continued access to the ESRF, our contribution to the ESRF budget will be reduced from 14% to 10% over the next three years with the resulting decrease in beam time being

managed by the Research Councils. There is a potential option to further revise our contribution in the future

- Continued access to the ILL as a full partner. Our contribution will decrease in line with the budget reductions agreed with our partners

UK Facilities will be operated at levels agreed with the other UK research councils and reflecting their priorities. This involves full exploitation of the Diamond Light Source and operation of the ISIS spallation neutron source and the Central Laser Facility at agreed levels

Ideally ISIS should operate for a higher number of days to maximise its world-leading science output and the return on UK investment. Recognising the outstanding contribution ISIS makes to the UK's capability in soft matter, materials science and energy research and the demonstrated potential of ISIS to deliver against the Global Challenges facing us today, we will optimise the efficiency and effectiveness of the ISIS programme to achieve maximum impact in these key areas. Interactions with international partners and with relevant

leading industries will be further developed and synergistic savings sought with facilities and technologies across STFC.

Under ideal circumstances, the Central Laser Facility should also operate at a higher capacity to maximise its world-leading science output supports a wide range of research, generating a large scientific output relative to its funding. The effectiveness of its contribution particularly stands out in relation to the Global Challenge areas, such as energy, security and the life sciences. We will work with international partners and others to optimise the science output and effectiveness of this unique facility, thereby increasing the return on public investment and Global Challenge the research and innovation outcomes.

As the Facilities Funding Model matures, the Research Councils' joint science requirements will provide the base data with which to plan future levels of access and service. To assist, we are currently refreshing our Science Road Map to identify, focus and capture the scientific questions, opportunities and milestones to guide the future programme and hence our shared investments.

For the international subscriptions that mainly support the work of STFC funded researchers (CERN and ESO) we have worked with our partners to continue to provide access to these facilities at current levels, whilst achieving efficiency and programme savings that constrain these budgets to affordable levels over the spending review period, and encourage return on investment to the UK. This strategy will enable UK researchers to maintain access to the best facilities in the world for astronomy and particle physics.

2.2.2 Large facility skills training

In addition to directly funded training activities, we will deliver unique skills training through our large facilities, jointly sponsoring PhD students with universities, charity funders or commercial enterprises; running facility training events, and providing more than 6,000 PhD training days every year to 460 students funded by other Research Councils.

We will capitalise on the unique training ground the facilities provide and increase the relevance and breadth of all our PhD training by developing shared programmes between university departments and our laboratories.

2.3. UK Science and Innovation Campuses

The challenges facing us in the 21st century are increasing in complexity and require interdisciplinary approaches, not only across disciplinary boundaries but also collaborative working between academic and commercial partners. In 2006 the Government announced the creation of the two National Science and Innovation Campuses at our Harwell and Daresbury sites. The Campuses offer a unique combination of world-leading research facilities and expertise, and provide an ideal platform to exploit the commercial potential of any research by matching problems in one area with solutions from another.

Since 2006 we have worked with potential university, business, public sector and international partners to develop the Campuses' science, technology and innovation offerings and orient them towards a much more outward-facing and commercial direction. We are developing the necessary estates environment through partnerships with the private sector. Both sites are now attracting significant international interest and investment that will strengthen the UK economy by providing skilled employment and generating new products and techniques, while bolstering the basic science that underpins competitiveness.

We have made excellent progress but have much more work to do if we are to succeed in realising the full potential of the Campuses in these times of financial constraint.

2.3.1 Campus development

We will continue in our ambition to deliver increased innovation outcomes from our science and technology capabilities through the Campuses by:

- Maximising the discovery potential of our world-leading facilities by continued promotion to non-expert users
- Promoting the rapid translation of research to the marketplace
- Providing suitable locations for appropriate university and public sector functions and bodies
- Developing new models of industrial/academic cooperation using both public and private sector funding

We expect that these initiatives will generate increased levels of funding from external sources and become substantially self supporting.

The Harwell Campus has established a Joint Venture with Goodman International, which is responsible for developing the opportunities for business and other organisations wanting to locate on site. Harwell already hosts 140 thriving organisations with more than 5,500 employees, and has become a focus of commercial collaboration, and a hub for advanced technologies skills training for SMEs in the south-east region. The Daresbury Campus has been transformed from one with an uncertain future after the closure of the Synchrotron Radiation Source, into an internationally recognised, award-winning Science and Innovation Campus hosting more than 100 enterprises. Daresbury's Innovation Centre is experiencing impressive growth rates amongst its private sector tenants, even during recession, and the Innovation Technology Access Centre (ITAC) is attracting new business tenants to do science. We are pleased that this Campus is now ready for private investment and we together with Halton

Borough Council and the North West Development Agency have recently completed an agreement with Langtree to take forward a Joint Venture on this site.

2.3.2 Campus Centres of Expertise

We plan to develop a series of Centres of Expertise on the Campuses that will act as vehicles for private sector research support through collaboration or service provision, and will attract international activity and inward investment. Our aim for the Centres is that they will become portals for close collaboration between Research Council facilities, academia and industry. Our goal is that by reconfiguring STFC capabilities around the Centres, we will encourage the growth of high-potential, high-growth technologies and provide new levels of commercial engagement with world-leading scientists, technologists and innovators.

Phase I of our first Centre of Expertise, the International Space Innovation Centre (ISIC) at Harwell, was launched in 2010. It has attracted £12.5m of funding from the Government's Strategic Innovation Fund and will bring more than £20m of private sector investment and a further £10m from the public sector to the Campus. It is a collaborative venture between STFC, NERC, the UK Space Agency and other UK public sector agencies, universities and private sector companies. ISIC is the leading example of our new partnership model that will leverage private sector and international funding to benefit UK science and the economy. We anticipate that RAL Space, our space science and technology department, will play an important and integral role under the ISIC umbrella. ISIC plans to develop new science and new business, building on the critical mass provided by the opening of the first UK-based ESA Centre, also at Harwell. Our leadership has established the Centre and our support is necessary to ensure its initial success. We will reduce that support over the spending review period and establish ISIC as an independent and self-supporting entity to encourage flexibility and partnership.

The complement of Centres will evolve over the spending review period. We have a number of strong ideas under development for our Daresbury and Harwell sites, including the Hartree Centre for advanced computational science, a Detector Systems Centre to optimise emerging technologies on application areas such as energy and security, an Imaging Solutions Centre to broaden facilities access and, potentially, a Centre for Advanced Laser Technology to commercialise next generation laser technologies whilst underpinning international projects. Another candidate Centre is the RAL Space Centre which would broaden our technology development programme to play an increasing role in cross-council initiatives including climate change and security. It is our intent that some Centres will be self-funding, whilst others that demonstrate clear benefits for core activities will receive core funding; all candidate Centres will only be supported beyond concept stage where a robust business case can demonstrate future financial sustainability. To enable this process, we will make provision for a £20m start up fund over the spending review period to allow candidate Centres to seek early support.

2.3.3 Collaborative R&D programme

We will also allocate £4m of additional funding over the spending review period to establish a new collaborative R&D programme to stimulate engagement with industry, by bringing new ideas to market more quickly and increasing industrial awareness and use of STFC-supported capabilities. This programme will fund targeted and business-focused collaborative research to accelerate commercialisation of products and

We will establish a collaborative R&D programme to stimulate engagement with industry and increase use of STFC supported capabilities

services, with matching funding from an industrial partner being a requirement. A major aim of this programme will be to increase and broaden industrial use of major facilities like ISIS, Diamond and the Central Laser Facility. It could offset the cost of beamtime, or support expert scientists and engineers in the planned Imaging Solutions Centre who can work with non-expert users to solve their problems. The fund will also be used to stimulate industrial partnership on specific R&D activities, to build a platform for long-term relationships that bring in significant external funding.

2.3.4 Campus-based skills training

The Campuses also provide a unique training ground for skills development both for national demand and for Campus-based companies.

We will seek external funding partners to support the creation of Technology and Innovation Skills Training Centres on the Campuses to provide new and prestigious advanced apprenticeship frameworks that are internationally recognised and accredited by leading professional bodies, and offer a vocational career development route for young people and individuals employed in high-tech industries. We will also support regional initiatives such as the OXETA partnership at Harwell to deliver skills needs to local businesses and will continue to work with educational partners in the North West to establish a strategic partnership around the Daresbury Campus.

3. Our focus for greater impact

STFC has identified six strategic themes to guide the way it delivers its programme.

3.1. Solutions for Global Challenges

There is broad and international consensus that the “Global Challenges” of energy, the environment, healthcare and security are pressing and merit increasing research focus. The UK must be, and be seen to be, driving change in these areas, both because of our position as a leading scientific nation and because of the huge potential to benefit the UK economy by capturing technological innovation. Our programmes already contribute greatly to the Global Challenges through technology solutions and through facilities access; 60% of experiments on our ISIS neutron source and Central Laser Facility are relevant to this agenda - and we will continue to use our unique skills, facilities and capabilities such as computational science and engineering to advance research in these areas.

We will introduce new funding schemes to support Global Research challenges, innovation, and collaborative R&D; the total fund for these initiatives over the spending review period is £16m

We have established a Futures Programme to ensure that skills and technologies originally developed to address fundamental research questions are harnessed effectively to provide solutions to Global Challenges. We will make available £6.5m of new funding over the spending review period to enable our Futures Programme increase its output:

- **Futures Fellowships and Studentships** - Full-time or part-time placements will be established for mid-career researchers to work at the STFC/Global Challenge interface. Each Fellow will also be allocated a research student

- **Global challenge networks** - Cohesive community networks will be created in each of the Futures Programme areas to exploit our investment in skills, technology and research infrastructure, provide input to our strategy, facilitate the formation of challenge-led project teams and share knowledge and expertise
- **Global Challenge Innovation Fund** - A Global Challenge Innovation Fund will be established to bring innovative technology and applications from STFC's programme relevant to the Global Challenge areas to a 'proof of concept' stage, in readiness to access external funding

Over the period we will also work closely with the other Research Councils to align current activities to the value of £39m to support the cross-Research Council programmes (Appendix E), through access to facilities such as Diamond, ISIS, the Central Laser Facility, and computational modelling in the following ways:

Global uncertainties – security for all in a changing world - STFC is leading the development of the CBRNE (chemical, biological, radiological, nuclear and explosive) detection technologies core strategic theme. We are establishing a Security Futures Laboratory to develop a broad range of security scanning technologies.

Living with environmental change - STFC is working towards becoming a full partner in the programme and is providing access to relevant technologies to accredited programmes through its Environment Futures Programme.

Ageing: life-long health and well being - STFC is developing a growing portfolio of technologies relevant to ageing and cancer care, and promoting business development opportunities on the Science and Innovation Campuses through its Healthcare Futures Programme. STFC is not currently a formal partner in this programme but will wish to greater involvement if activities reach a sufficient level.

Research Councils' Energy Programme - STFC supports the Energy Programme as a full partner supporting projects in hydrogen storage, fuel cell, fusion and battery technologies. The potential for these facilities to make an even greater impact will be enhanced by a more targeted approach through the Energy Futures Programme.

Global Food Security - Opportunities also exist to contribute to the Global Food Security programme through the use of our facilities and technology.

3.2. Inspiring and Involving – public engagement with research

STFC has an invaluable role to play in engaging the public, as our research areas are responsible for attracting 90% of physics undergraduates to their studies and STEM-related careers. As noted, UK industry reports growing and un-met demand for graduates with physics and other STEM skills, and the goal of growing the UK's knowledge economy will only be possible if even more young people follow STEM careers. We will support this ambition by increasing our contribution to the STEM skills pipeline, linking schools and colleges with our inspiring science, achieved particularly through stronger partnership working.

We remain committed to a distinct STFC-led programme focused on our research areas given their acknowledged effectiveness in stimulating engagement with inspiring science. We will continue to support public engagement with our science through funding projects and personal fellowships, particularly supporting researchers via facilitation and training. We will also work in partnership with the UK Space Agency because of the thematic closeness of astronomy and space science. To increase public awareness of the role of the large facilities in

research discovery, and their applications and benefits to society and the economy, we are developing new programmes, co-ordinated through RCUK. In implementing the Concordat we will move towards embedding public engagement in our facilities, laboratories and Centres of Expertise, including making better use of in-house resource and expertise.

We will work with RCUK in evaluating the collective programme and the distinctive STFC activities. We will measure our impact by tracking public attitudes to science and young people's study choices, and by working with employers to understand their skills requirements and identify skill shortages. We will use this information to guide our programme policy and to develop shared programmes between university departments and our laboratories where appropriate.

3.3. Providing Research Leadership and Excellence

Excellence in research is the bedrock of STFC; it underpins the economic and societal impact we make and creates technological challenges whose solutions facilitate further excellent research and impact. It is essential that STFC sustains, as far as possible, the core UK technical and engineering innovation capabilities to underpin the design, building and operation of scientific facilities.

To assist the other Research Councils in identifying their science requirements, and therefore their access requirements to large facilities, we are currently refreshing our Science Road Map to identify, focus and capture the scientific questions, opportunities and milestones to guide our future programme and investment.

We are developing our Technology Strategy to ensure that we are driving important developments to advance our science and facilities. This will inform the way that we reshape and deliver different technology areas.

3.4. Effective Knowledge Exchange

STFC has an excellent track record of disseminating technical knowledge. Our scientists and engineers work closely with their international peers, and our technology showcases, workshops and conferences bring together thousands of public and commercial researchers. Collaborative activity with university and commercial researchers currently stands at £30m. We are building on these strengths and setting up formal structures to promote open innovation at our Campuses.

We will continue to ensure that innovative ideas, technology and techniques are translated into commercial applications both to deliver economic prosperity for the country and to make a real difference to people's lives. We will augment our existing innovation schemes by releasing £5.5m of new funding over the spending review period to support the development of research ideas and to build on STFC's considerable commercialisation success. We will also develop the work programmes of our laboratories to double the innovation work carried out for commercial companies, targeting activities in line with our technical strengths.

To consolidate and share information and strategies, develop bids, exploit synergies and create even more opportunities, we are building a team of business development managers who are embedded within our Departments and managed at a corporate level. A similar approach is being adopted for international activity.

3.5. Building International Influence

Research success is increasingly international, and UK success depends on our ability to influence and participate in international research investment and programmes. Most of our funded researchers play a major role in international collaborations, for example around 25% of ISIS use is by such partnerships.

We maintain strategic relationships with the key international research organisations in astronomy and particle physics. Through the European Strategy Forum on Research Infrastructures (ESFRI), we are taking a leading role in setting European policy for large facilities. We also hold regular bilateral meetings with our European and US partner organisations, and with other European facilities, to coordinate our plans for future initiatives and ensure our plans are aligned. Through the e-infrastructure Reflection Group (eIRG) we are taking a similar role in setting European policy on e-infrastructure to exploit advances in ICT to optimise benefits from the full range of European and international research facilities.

STFC supports the Research Councils' international offices in the USA, India and China, and the UK Research Office in Brussels. STFC has particularly benefited from new initiatives in India, the political support of the US office in developing relationships with key agencies, and the ability of the UKRO in Brussels to deliver analysis of European policies and build contacts with key officials.

3.6. Strengthening Strategic Partnerships

We maintain close links with university departments in our core disciplines and will extend this approach by establishing a more strategic relationship at Vice Chancellor level with the universities which receive significant funding across our portfolio. We are strengthening our links with business partners and are making good progress with our plans to expand the sources of funding and investment for our science and technology through commercial opportunities. We will also develop deeper strategic relationships with facility providers and partners, to strengthen clarity and delivery of our broader strategic objectives with CERN, ESO and the Wellcome Trust.

STFC will maintain active membership of the various RCUK coordination groups and will support RCUK's goal of developing consistent solutions and working collectively to add value in areas such as skills, career development, engagement with partners, and monitoring of impact. We will lead those activities where we have particular skills and experience.

We work closely with many UK Government Departments and with the NHS, usually through modest joint funding of initiatives and secondment of staff. Our objectives for innovation and partnership with industry map closely to those of the Technology Strategy Board and we will develop these themes, particularly on space and instrumentation. STFC will align the £39m from our Global Challenges activities with TSB/RCUK priorities over the period. This is a roughly 20% increase from the current spending review period; additional funding will come from our Global Challenges fund proposal. We are also working closely with TSB in a number of other areas including the Knowledge Transfer Partnerships (KTP) programme, where we want to make sure that companies can access STFC and our new Centres as a knowledge base. An important contribution to this work will be the realignment of our activities with TSB's restructured KTN's to optimise our support of these initiatives, providing innovation-rich hosting venues. We have identified a further £1m of existing funding that we will use to support KTP activities linked to our university groups and KTN partnerships to maximise the exposure to industry of our technologies and Campus opportunities.

Given the Government's public commitment to our Science and Innovation Campuses in the National Infrastructure Plan 2010, we consider these to be highly appropriate locations for future Technology Innovation Centres (TICs). In addition to the International Space Innovation Centre, the Campuses are natural homes for TICs in areas such as high performance computing, materials, life sciences, and electronics/nanofabrication because of the proximity to large facilities, existing technology strengths and the status of the Campuses as natural hubs for university-industry collaboration.

4. Transforming our organisation

STFC has made substantial changes since its formation in 2007 releasing savings for reinvestment in science. We have improved administrative effectiveness, streamlined our systems and processes while reprioritising our programme to deliver the highest scientific, economic and international benefit for the UK. We will build on this to deliver further efficiencies and have an ambitious programme to transform our organisation to meet our future commitments; this Delivery Plan sets out how we will continue with these reforms.

We will refocus our communications efforts to support and enable the enhanced skills, commercialisation and innovation work across the organisation, and link existing outreach programmes to our new Skills Centres to provide greater awareness and thus take-up of the wider STEM opportunities available to school leavers.

We will build on this commitment with a transformation agenda that reforms our internal operations, including the way we work with others, to build an organisation that is financially sustainable, maximises efficiencies across our three functions and provides the necessary leadership in this time of change. Our ambition is to be recognised as a continuous improvement organisation, placing our stakeholders and customers at the heart of our operations.

A sound financial base is fundamental to STFC's future success. Maintaining a sound financial position in an increasingly challenging economic climate requires a strategic approach to the management of our financial resources, where research and financial affordability are closely aligned. Our 2007 and 2009 programme prioritisation exercises were the first major steps in implementing this approach. Since then we have implemented a series of reforms to strengthen our financial planning and work within robust budget partitions where activity and funding are aligned. Future work will continue this drive, with plans to rationalise budgetary processes including overhead allocation from the first year. World class science is supported by our ability to provide safe, healthy and well managed laboratory sites. We are revising our plans to ensure a sustainable approach to future building refurbishment, maintenance backlog, space utilisation and equipment and will publish a revised Asset Management Strategy as a matter of priority.

We have a strong commitment to developing our staff to achieve their potential and contribute to STFC's success. STFC's scientists and engineers are recognised the world over for their expertise and contribution to major projects; external reviews have commended staff passion and commitment. Our ambition to transform STFC into a more diverse and responsive organisation with the breadth of skills and knowledge required to deliver our future commitments means that in future we will structure our activities and programmes in a different way.

4.1. Focussing our investment in science

4.1.1 Encouraging greater efficiency in university research

RCUK will work with universities to develop methods of concentrating and pooling medium-sized research facilities and equipment in order to make the best use of national resources. We will build on the direction of travel, already existing in certain areas, to provide more of our future capital as funding for shared facilities serving several universities, investing in facilities in the best location, and only where it is clear that there is a significant need.

The Research Councils have accepted the recommendations contained in the Wakeham report and are committed to working with universities to drive down the full economic cost of research whilst retaining their commitment to funding research on the current Full Economic Cost (FEC) basis. In the light of the recent spending review, the Research Councils are examining further options for driving efficiency savings that will in turn be reinvested in research. It is expected that these recommendations will be implemented from April 2011. Further work will be carried out to investigate any scope for additional savings. Actions we have taken and further proposals are set out in section 2.

4.1.2 Maximising synergies between large facilities

It is essential that STFC delivers efficiency savings from its own facilities and laboratories whilst improving strategic capability and impact for the nation. The full scientific potential of the scientific complementarity between ISIS, Diamond and the Central Laser Facility is yet to be realised. Over the next four years we will develop the operational synergies between them and reduce the intrinsic inefficiencies in operating co-located facilities separately, whilst expanding their use. We will do this by seeking greater cooperation and efficiencies in the operations and administration of these facilities, working in close partnership with the Wellcome Trust. We will collaborate with university partners to develop an Imaging Solutions Centre to offer expertise and solutions to a broad range of businesses and expand the use of the large facilities, particularly by non-expert users in industry, who have yet to realise the major competitive advantages that these machines could bring.

4.1.3 Reshaping technology support

We will also deliver increased efficiencies across the research base by fostering a complementary partnership between STFC and universities. We will focus the capabilities of STFC's in-house researchers, especially in astronomy, particle physics and nuclear physics, on technology, instrumentation and detector development, allowing university scientists to concentrate on research. STFC's technology capabilities will be run as a national resource from which university-based projects and programmes in these subject areas can bid for support. University scientists will be encouraged to work at our laboratories on these projects and we will provide opportunities for postgraduate students to be based there.

4.2. Restructure for greater efficiency and focus

We are both the commissioner and the operational provider of our different functions, sometimes contracting out delivery to external providers but often providing services directly in-house. We will look to achieve greater separation and clarity in these roles. Recognising the above distinctions, we will restructure our organisation, and examine options to transfer operations to alternative ownership or operational models where such a transfer would improve the delivery of our strategic objectives. The development of the Facilities Funding

Model with the other Research Councils strengthens the need for STFC to approach commissioning and delivery of large facility access separately.

We will internally reorganise, with a tighter focusing of our laboratory activities, establishment of new Campus Centres of Expertise, and staff restructuring to match these priorities

In order to deliver this, and achieve greater focus and impact from our investment, we will radically reconfigure our operations over the next four years. We will move away from a 'traditional' departmental organisation to one based increasingly on highly interactive facilities, centres and support groups that will have the flexibility to form partnerships with universities, industry and other organisations as appropriate, and thus drive ideas more

rapidly between academia and the private sector to the benefit of the UK economy. Centres and facilities will still be able to draw on corporate STFC capabilities such as human resources, finance, legal, business development, outreach and marketing, communications, and health and safety. Overall strategic planning and oversight will be provided centrally.

Our new organisational model will be driven by the need to enhance clarity of responsibility, improve alignment between strategy and delivery, and ensure that activity levels and service standards are better linked to budgets and other resources. This will release efficiencies whilst delivering programmes focused on greater collaboration, output and impact. Restructuring the organisation gives us the opportunity to deliver savings in a strategic and cost effective way; we are planning to implement this in the first year of the spending review period.

We have developed the Daresbury site from one with an uncertain future to an internationally recognised, award winning Science and Innovation Campus based around our plans to develop Centres for accelerator R&D, and computational science and engineering. We are proud that the site is now ready for private investment and have recently finalised the Daresbury Joint Venture with Langtree to ensure its future success. We will realise opportunities to realign the ownership, management and operation of the site to generate efficiencies whilst achieving our long-term vision of the Campus and our strong science and engineering offering.

Our UK Astronomy Technology Centre based at the Royal Observatory Site in Edinburgh is a key part of the UK's technical capability in ground- and space-based astronomy. We are also examining alternative models for the ownership, management and operation of this site.

We have not assumed that any short-term financial savings will accrue from these changes as the goal is more to reduce our long-term risk and exposure at each site.

4.2.1 RCUK Shared Service Centre

Our administrative baseline includes the costs of activities that will be delivered by RCUK's SSC over the spending review period. We are working collectively with the Research Councils to achieve a comparable level of savings, whilst minimising the impact on service delivery, and to develop a more equitable charging model. A key element will be the scope of future services and associated charges. However until all the Research Councils have migrated into the SSC, it will not be possible to complete this work. As the SSC is a key element of our ongoing administrative expenditure, it will be subject to close scrutiny and management to ensure we receive maximum value for money.

4.3. Measuring our progress

STFC's Corporate Strategy was developed to deliver our Vision of maximising the economic and societal impact of our programme. As well as delivering impact, the capture and reporting of this impact to stakeholders is a key part of our remit and we are committed to demonstrating how our research, facilities and technology improve everyday lives across the UK.

Monitoring our direction of travel against our Corporate Strategy will become a regular feature of our Annual Report and will allow us to describe our success in delivering our long term vision. Our ability to demonstrate our impact will be improved over the spending review period by the quality of our data capture, analysis and evaluation and in particular by developing the e-Val data capture system in partnership with the MRC. We will also be strengthening metrics across the organisation to illustrate the broad spectrum of impacts that arise from our activities.

Actions and deliverables in this Delivery Plan will be incorporated into our Scorecard that will be published in Spring 2011. Progress on this and the Delivery Plan will be regularly reported to BIS, our sponsoring Department.

Appendix A – STFC’s funding allocation

Resource	2011/12	2012/13	2013/14	2014/15	Total
	£m	£m	£m	£m	£m
International Subscriptions	108.60	119.52	121.70	123.07	472.88
Facilities (DLS, ISIS, CLF)	77.17	79.28	81.41	89.47	327.33
Core Programme	190.06	172.20	172.20	172.19	706.65
Total Resource Allocation	375.83	371.00	375.31	384.73	1506.86

Capital	2011/12	2012/13	2013/14	2014/15	Total
	£m	£m	£m	£m	£m
International Subscriptions	46.22	30.29	28.53	27.67	132.71
Facilities	21.07	21.92	22.46	22.93	88.38
Core Programme	19.63	21.98	14.24	14.17	70.02
Diamond I & II VAT- LFCF	4.60	3.30	3.30	3.30	14.50
Diamond III - LFCF	8.90	16.70	19.90	19.20	64.70
Total Capital Allocation	100.42	94.19	88.43	87.27	370.31

Depreciation/ Impairment	2011/12	2012/13	2013/14	2014/15	Total
	£m	£m	£m	£m	£m
	75.26	74.21	76.09	78.21	303.77

Note All tables exclude Administration. At the time of preparing this Delivery Plan BIS has advised that they will provide the allocation for this as soon as possible.

Appendix B – Resource budget by funding mechanism

	2011/12			2012/13			2013/14			2014/15		
	Gross Resource	Income	Net Resource	Gross Resource	Income	Net Resource	Gross Resource	Income	Net Resource	Gross Resource	Income	Net Resource
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
Institute programmes costs	116.65	37.40	79.25	93.21	34.80	58.41	88.40	35.40	53.00	87.21	36.70	50.50
International Subscriptions	108.60		108.60	119.52		119.52	121.70		121.70	123.07		123.07
Studentships	19.54		19.54	18.49		18.49	18.11		18.11	18.48		18.48
Fellowships	9.20		9.20	8.70		8.70	8.52		8.52	8.70		8.70
Research Grants	69.38		69.38	67.22		67.22	71.78		71.78	74.90		74.90
Facilities	87.77	10.60	77.17	86.78	7.50	79.28	87.41	6.00	81.41	94.17	4.70	89.47
Innovations, Campus Development and Collaborative Programmes	13.69	1.00	12.69	20.27	0.90	19.37	21.69	0.90	20.79	20.60	1.00	19.60
TOTAL	424.83	49.00	375.83	414.19	43.19	371.00	417.60	42.29	375.31	427.14	42.41	384.73

Note All tables exclude Administration. At the time of preparing this Delivery Plan BIS has advised that they will provide the allocation for this as soon as possible.

Appendix C – Capital budget

	2011/12	2012/13	2013/14	2014/15	Total
	£m	£m	£m	£m	£m
International Subscriptions	46.22	30.29	28.53	27.67	132.71
Facilities	21.07	21.92	22.46	22.93	88.38
Core Programme	17.43	20.98	13.24	13.17	64.82
Diamond I & II VAT- LFCF	4.60	3.30	3.30	3.30	14.50
Diamond III - LFCF	8.90	16.70	19.90	19.20	64.70
Grants to HEIs	2.20	1.00	1.00	1.00	5.20
Total	100.42	94.19	88.43	87.27	370.31

Note All tables exclude Administration. At the time of preparing this Delivery Plan BIS has advised that they will provide the allocation for this as soon as possible.

Appendix D – Resource budget by theme

	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m
Astronomy (including Solar System)				
International subs - ESO	11.57	11.69	11.56	11.50
Development	5.04	7.35	8.84	9.76
Operations (inc PLS) & exploitation	45.44	37.88	33.15	32.45
Studentships and fellowships	15.25	15.09	14.91	15.22
Total Astronomy (including Solar System)	77.30	72.01	68.46	68.93
Particle Physics				
International subs - CERN	81.81	89.36	90.45	92.43
Development	11.12	11.44	12.97	14.15
Operations (M+O) & exploitation	30.50	30.56	30.87	31.84
Studentships and fellowships	9.80	9.70	9.59	9.79
Total Particle Physics	133.23	141.05	143.89	148.21
Particle Astrophysics				
Exploitation	2.97	2.74	2.62	2.69
Studentships and fellowships	1.09	1.08	1.07	1.09
Total Particle Astrophysics	4.06	3.82	3.68	3.78
Nuclear Physics				
Development	1.69	1.53	1.68	1.89
Exploitation	3.53	3.18	4.83	5.30
Studentships and fellowships	1.09	1.08	1.07	1.09
Total Nuclear Physics	6.31	5.79	7.58	8.28
Synchrotrons (DLS, ESRF)				
International subs - ESRF	5.41	4.78	5.61	6.42
Facility operations	36.45	38.93	41.42	49.85
Total Synchrotrons	41.86	43.70	47.02	56.27
Lasers				
Development	0.52	0.01	0.00	0.00
Facility operations	7.34	7.26	7.18	7.10
Total Lasers	7.86	7.27	7.18	7.10
Neutrons (ISIS, ILL)				
International subs - ILL	9.81	13.69	14.08	12.72
Facility operations	33.38	33.10	32.81	32.53
Total Neutrons	43.19	46.78	46.89	45.24

Other				
Accelerator Centre	3.82	3.82	3.82	3.82
Accelerator R&D	7.04	6.87	6.69	6.59
Project R&D	1.20	1.20	2.20	2.30
Technology, e-Science, CSE	4.44	4.44	4.44	4.44
Innovations	9.83	12.00	13.41	12.72
Centres	1.89	6.41	6.41	5.91
Futures Programme	0.70	2.60	2.40	1.70
Research Networks, Research Complex	0.97	0.97	0.97	0.97
HPC	0.54	0.26	0.00	0.00
Next Generation Facility Studentships	1.50	0.25	0.00	0.00
Science and Society	1.64	1.64	1.64	1.64
International Programme	1.06	1.08	1.09	1.11
Programme & Facilities Management	6.35	4.64	4.64	4.64
Estates, Corporate Services & Finance	21.03	4.40	2.90	1.09
Total Other	62.01	50.57	50.61	46.93
TOTAL	375.83	371.00	375.31	384.73

Note All tables exclude Administration. At the time of preparing this Delivery Plan BIS has advised that they will provide the allocation for this as soon as possible.

Appendix E – STFC in-kind contributions to cross-Council themes

	2011/12	2012/13	2013/14	2014/15	Total
	£m	£m	£m	£m	£m
Energy	4.25	4.25	4.25	4.25	17.00
LWEC	0.75	0.75	0.75	0.75	3.00
Global uncertainties	0.75	0.75	0.75	0.75	3.00
Lifelong health & wellbeing	4.00	4.00	4.00	4.00	16.00
Total	9.75	9.75	9.75	9.75	39

Note This represents a shift in funding to align with the relevant cross-council themes. Figures therefore represent “in-kind” rather than new cash investment. Investment assumes a “flat cash” outcome from the spending review.