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Summary and Highlights

The Science and Technology Facilities Council’s (STFC) 10 year Strategy provides a clear framework towards achieving our Vision; to maximise the impact of our science and technology for the benefit of the UK and its people. Our three strategic goals of delivering world class research, innovation and skills are how we are delivering this impact. This is a vitally important mission at any time, but especially so now, given the challenges the UK faces to rebuild the economy and the important role that science must play in this task. STFC is distinctively placed within the research community to contribute to these challenges.

“Our research programmes uncovered new scientific knowledge in subjects as diverse as nuclear reactors, bird flu and tooth decay and we continued to develop technology that delivered long term benefits for the UK and global economies”

STFC is a cross-disciplinary organisation with a uniquely broad remit. Our mission is delivered through three distinct but interrelated functions –

- Funding research in particle physics, astronomy, nuclear physics and space science through UK universities.

- Managing, building and enabling access to world-leading, UK and international large-scale facilities for the physical and life sciences.

- Developing the UK’s Science and Innovation Campuses to promote academic and industry collaboration.

STFC creates impact for the UK in research, innovation and skills through each of these delivery functions. Moreover different parts of our programme are delivered in collaboration with key stakeholders such as the other Research Councils, UK and international universities, industry and public sector organisations. As a result, the map of STFC impact reveals a broad array of outcomes delivered through multiple partners and routes; with outcomes ranging from the development of novel medical detectors and vaccines for viruses like bird flu, to working with industry to deliver more competitive mobile telephone components and inspiring young people to follow scientific careers.

In research we deliver impact by investing in high quality research programmes which create new scientific knowledge in our university and large scale facility research programmes. In 2010/11 the quality of our university funded research programmes remained world class – sustaining the UK’s leading global position for citation impact in astronomy and particle physics and our 2nd place in nuclear physics. Our research programmes uncovered new scientific knowledge in subjects as diverse as nuclear reactors, bird flu and tooth decay and we continued to develop technology that

The UK Astronomy Technology Centre builds instruments for the world’s most advanced telescopes and shares the excitement of astronomy with the public.

1 STFC Corporate Strategy – http://www.stfc.ac.uk/288.aspx
2 STFC vision - http://www.stfc.ac.uk/10713.aspx
delivered long term benefits for the UK and global economies; for example, technology underpinning the internet sector supported a contribution of £100 billion this year to the UK economy. We also focussed our research and technology programmes to address the global challenges of energy, health, security and climate change; whilst not traditionally STFC research areas, we are growing our contribution to the national effort to deliver vibrant research and identify solutions for these challenges.

STFC also plays a major role in innovation which directly influences growth in the UK. We deliver innovation impact through six different routes across our portfolio of activities; these are outlined in this report.

For example, our support of UK industry on our Science and Innovation Campuses in Cheshire and Oxfordshire help to create an environment where innovative companies flourish, helping to drive dynamism in the economy. This year’s Daresbury Science and Innovation Campus company survey shows that our efforts to minimise business failure and accelerate business growth have been well rewarded with companies significantly outperforming those of a similar size in terms of sales growth and business survival rates.

In the area of skills, we create impact by training some of our brightest minds so they can improve and influence society. We do this through our PhD funding in universities, by utilising the expertise developed in our own laboratories to collaborate with industry, by developing our own technically skilled workforce and by encouraging young people into science. This year, we have sustained our PhD levels in the face of a difficult funding environment and are pleased to report that applications for physics courses at university in 2010/11 were up by more than 17% on the previous year and in astronomy by 40%. We are also partnering with skills providers to target industrial training in areas where it is most needed. For example, our participation in the Oxeta partnership aims to address the skills gap in the advanced engineering sectors across the UK.

This, STFC’s first Research Performance & Economic Impact Report (RPEIR), illustrates our impact in each of our strategic goals of world class research, innovation and skills. Each section contains illustrations and associated metrics that demonstrate how STFC is delivering economic benefit to the nation. The agreed cross Council impact statistics are given in appendix 2.

We continue to improve our approach to impact evaluation, and are using our newly published Strategy to frame our programme, develop methodologies and refine our approaches in this area. The final section of the report contains information on these methodological developments and outlines the impact evaluation programme that we will be undertaking to address future challenges.

The scientists of the future experiencing science hands-on.

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1. The Daresbury Science and Innovation Campus – 2010 company survey, DSIC JV, 2010
World Class Research

Introduction

Independent surveys have repeatedly shown that the UK is second only to the United States in science, with UK institutions regularly appearing in the top 10 global science universities. STFC makes a distinctive contribution to this UK research excellence by giving grant support to researchers in universities, by providing access to facilities across a wide range of scientific disciplines both within our own laboratories and overseas, and by developing the Science and Innovation Campuses as focal points for industry and academia to work together.

STFC works with and through its university partners to provide grant support to the UK’s world class particle physics, astronomy, space science and nuclear physics communities. We also devote significant funding to international subscriptions to guarantee long-term access to world leading research facilities at the European particle physics laboratory CERN, and the European Southern Observatory. UK researchers funded by STFC, are in scientific leadership positions and have steadily increased the quality and volume of research publications, establishing themselves as among the very best globally in these disciplines. We have sustained our world-leading positions in impact rating for research in astronomy, particle physics and nuclear physics for the 3rd year in a row.

STFC also operates three world-leading, multidisciplinary national facilities in the UK – the ISIS neutron facility, the Central Laser Facility and, in collaboration with the Wellcome Trust, the Diamond Light Source. We also provide access to two complementary overseas experimental facilities, ILL and ESRF, which are neutron and synchrotron facilities based in France. The researchers who utilise these facilities are often funded by the other Research Councils, and carry out hundreds of experiments in disciplines including medical, biological, materials science, and engineering. Recent experiments include modelling the behaviour of crude oil in pipelines which will lead to more efficient oil field extraction in the future.

Research data

- In 2010 STFC invested £98m in grant funding to UK institutions, supporting 439 Principal Investigators.
- In 2010/11 STFC funded-activities in astronomy, particle physics and nuclear physics produced over 3500 research papers. In terms of research quality, the UK was 1st in the world in citation impact\(^\text{v}\) in astronomy and particle physics and 2nd in nuclear physics in 2010, sustaining this performance from previous years. This demonstrates the world class quality of the UK’s research and is even more impressive given that we are 2nd, 4th and 7th respectively in terms of research volume in these subjects. This backs

\(^{v}\) STFC Annual Bibliometric Study 2010, Evidence Ltd, publication available on request

up the recent finding that the UK research base is most productive in the world. Further information on STFC funded publications can be found in Appendix 1.

• In 2010/11, over 2,000 users accessed STFC’s facilities, between them carrying out over 1,500 experiments, generating around 1,000 world-class papers in peer reviewed journals, and delivering significant impact for UK society. These papers were in the fields of medical, biological, materials, heritage science and engineering research.

The creation of new knowledge

In research we deliver impact by creating new scientific knowledge through our university grants and research programmes in our large scale facilities and scientific departments. Some examples from 2010/11 are outlined below.

Addressing Climate Change

Making observations of the land, sea and air from space allows scientists to develop and improve their models of our environment. Space instruments provide continuous global measurements for many years at a time, allowing events like El Nino to be studied. STFC scientists underpin UK and international programmes through the provision of research expertise, services and facilities. Every day weather forecasts in the UK use data collected by our space scientists.

One of the most important factors for meteorological models, weather forecasts and our understanding of climate change is sea surface temperature; the more precise these measurements are, the more reliable our models and forecasts. Sea surface temperatures are now measured remotely by satellite, which allows fast and comprehensive data collection but does not guarantee accuracy. To overcome this shortfall STFC, in partnership with the Carnival Group UK, installed monitoring equipment on the Queen Mary 2 to take direct sea surface temperature readings during transatlantic crossings and world cruises. By using these measurements to calibrate and validate the satellite data, we have improved forecasting and modelling of this important environmental variable.
The most distant galaxy ever discovered

STFC funded researchers helped confirm the most remote galaxy in the Universe observed to date. The galaxy, first spotted by the Hubble space telescope, was seen as it would have appeared 13.1 billion years ago, 8.5 billion years before the Earth was created and only 600 million years after the Big Bang.

The research was carried out by a European team of astronomers including UK scientists from the Universities of Durham and Bristol and STFC’s UK Astronomy Technology Centre. Using the European Southern Observatory’s Very Large Telescope (VLT), the team measured the distance to the remote galaxy by carefully analysing its faint glow. These are the first confirmed observations of a galaxy whose light is difficult to see because of a hydrogen fog that filled the Universe at this early time. Confirming the distances to such faint and remote objects is a huge challenge that currently can only reliably be done using spectroscopy from very large ground-based telescopes such as the VLT.

Improving Antibiotics

Research is being carried out to improve the antibiotic used to treat a strain of meningitis that results in over half a million deaths a year worldwide. Cryptococcal Meningitis particularly affects the world’s 33 million AIDS patients and it may become untreatable if new drugs cannot be found. With funding from the EPSRC, scientists have used STFC’s ISIS neutron source to characterise the current antibiotic, helping devise more effective treatments.
Creating long term impact

STFC also creates impact by developing research and technology that has long term benefits to the UK and global economies. A New Scientist poll voted STFC supported technologies as the two discoveries that have had the greatest impact on the world over the last fifty years:

- Top of the survey with 48% of the votes was the microprocessor, the technology that lies at the heart of all computers. Microprocessors are vital to the health and competitiveness of the UK aerospace, automotive, consumer technology and defence industries, which collectively account for £78 billion of UK GDP and employ around 700,000 people. STFC’s Microelectronics Support Centre has made a significant contribution to this field, by developing advanced design tool software in collaboration with twenty of the world’s leading microelectronics and microsystems companies and providing these materials at low cost to over 80 UK Universities and Research Institutes. Most of the microelectronics engineers graduating in Europe have been trained on STFC’s supplied and supported design tools.

- Second place with 31% of the votes was the revolutionary World Wide Web. The UK has been a member of CERN since its inception and STFC manages and funds the UK’s CERN subscription. This is where the web was invented to allow particle physicists to communicate more efficiently with each other.

Apart from funding CERN, STFC has underpinned the internet’s development in the UK by undertaking early computer networking, hosting the first UK website, developing the registry for the .co.uk domain, continuing to play a pivotal role in the development of web standards and protocols, and making an exceptional contribution to the development of the Grid, the next stage in Internet evolution.

The Internet is now a fundamental part of everyday life with 73% of UK households connected to broadband. STFC’s support and development of this general purpose technology, has contributed to the continuing transformation of commerce and society and helped the UK establish a leading global position in eCommerce with an industry that employed 250,000 people and was worth £100 billion in 2009. This is equivalent to 7.2% of the UK GDP, and makes a larger contribution than the construction, transportation or utilities industries and only a slightly smaller contribution than the financial sector. The sector is a net exporter of goods and services, exporting £2.80 for every £1 of imports, is estimated to be growing by 10% a year and is anticipated to grow to 10% of UK GDP by 2015. Indirect benefits include increased productivity, improved information flows particularly important for government services and an unleashing of creativity.
Saving lives with MRI

2011 marked the 100th anniversary of the first observation of superconductivity and since then, superconductivity has become the underpinning technology for many important applications like MRI scanners. There are more than 20,000 MRI scanners globally, performing 60 million examinations every year. Superconducting technology developed by STFC engineers to advance STFC-funded research in particle physics continue to be a key component in the establishment and on-going development of MRI scanners. These scanners form an industry that helps to save lives, improves diagnosis and allows more targeted treatment. This has provided direct economic impact for the UK firms operating in the MRI industry through employment and economic activity. In 2007, the UK MRI industry supported around 4,000 jobs, with an estimated value added contribution to UK GDP of £195 million.

The final way in which STFC supports this industry is by working with UK companies such as Oxford Instruments on technically demanding projects which develop their capabilities to manufacture and market these components around the world.

Addressing global challenges

Traditionally, STFC’s partner Research Councils have programmes better suited to addressing the global challenges. However, we have developed a Futures Programme which is ensuring that the skills and technology originally developed to address the fundamental research questions in STFC’s remit are harnessed effectively to provide solutions to the global challenges.

One area in which we already have a strong track record is environmental research. This is delivered through our RAL Space Department and Chilbolton Observatory and we work closely with NERC and other partners to deliver this programme. Current examples include:

- Distributing online climate data around the world on subjects such as carbon offsetting through the STFC/NERC British Atmospheric Data Centre.
• Investigating the heavy rain and storms that lead to flooding and studying the properties of clouds and airborne pollutants.

• Providing data so that Google Earth users can view images of greenhouse gas emissions by region and the expected consequences of climate change.

In addition we have developed programmes in energy, healthcare and security as part of the cross council programmes in these areas. Our energy programme consists of 50 different collaborative projects including:

• The development of new, highly efficient solar materials that offer ten times better price performance than those currently in use.

• A new computer modelling project with the City of Liverpool on a tidal wave energy system, helping Liverpool become a low carbon city.

• A nuclear fusion project through the UK-led international project HiPER (High Power Energy laser Research) to produce nuclear power using hydrogen atoms instead of uranium.

STFC’s healthcare programme is also having considerable impact, examples include:

• The development of novel approaches to spinal repair and the adaptation of innovative materials for treating wounds by STFC and the University College London.

• Addressing the common cause of blindness in the UK by helping to repair retinas – allowing people to see again and improving their quality of life. STFC is working with Moorfields Eye Hospital in London to address this issue.

• Helping pharmaceutical companies to improve drug design. A team of UK scientists has used STFC-funded ESRF to examine the structure of receptors in the body which regulate heart rate and blood pressure, enabling the design of new drugs to treat a variety of conditions.

Finally, STFC has already improved the UK’s security by demonstrating the use of lasers to detect explosives and developing more effective airport security systems. STFC’s main security activity is the Security Futures Laboratory, designed to develop technology for future security challenges e.g. novel technologies applicable to next generation defence systems.
Introduction

STFC has several different roles in the UK's innovation landscape. As a funder and direct producer of leading research, STFC has an important role in mobilising the UK's huge inventive capacity. STFC and its funded researchers have a distinguished tradition of developing innovative facilities, techniques and technologies that transform scientific research. For example, we pioneered novel protein crystallography techniques which are now used across the globe to develop new drugs for HIV, cancer and Alzheimer's disease.

This section describes the six different roles that we have in increasing innovation in the UK. This includes assisting our university partners to commercialise their research, exploiting the IP that arises from our own facilities and laboratories, developing the UK's Science and Innovation Campuses, working with UK industry by providing them with access to our world class scientific facilities, creating opportunities for UK companies to win contracts, and by supporting several industries and areas of the economy.

Supporting academic commercialisation

STFC supports innovation in UK universities by providing further funding to our university programmes to exploit technology and expertise that arises from the research. Our innovation programme provided researchers with £5m funding in 2010/11, plus the support and skills to develop their inventions into marketable products and services.

This year we launched e-Val, our new on-line data collection system which allows us to gather information on the outcomes of our university

Blackford Analysis

Blackford Analysis\(^1\), a spin-out from Edinburgh University, was formed in 2010 and is already employing more than 5 people. The company offers services directed at rapid registration of massive imaging datasets, with applications in the medical, defence and energy sectors. It develops commercial solutions based on an algorithm originally developed for astrophysics but now generalised to any problem where large sets of data must be analysed quickly. For example, it has been used to stabilise MRI images of moving patients, allowing young children to be scanned without anaesthetic.

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grants in our core areas of astronomy, space science exploitation, particle physics and nuclear physics. Although too early to report the full results, initial analysis reveals that 9 spin-out companies were formed between 2006 and 2010, and today these companies employ approximately 45 people.

Duvas Technologies

Duvas Technologies\textsuperscript{xi} was formed in 2008 and is a spin-out from Imperial College that employs more than 10 people. The company exploits particle physics technology in their systems which carry out air quality measurements designed to reduce the impact of air pollution to human health. They have sold solutions to UK Local Authorities and City Councils and have a large development contract with a major defence company. They distribute across the UK and Europe and have strong commercial interest from across the world. Applications for their products include sensors to detect Chemical Weapon Agents, oil and gas monitoring and transport-related health monitoring applications.

Cobalt Light Systems

2006 STFC spin-out Cobalt Light Systems Ltd\textsuperscript{xii} started tests with NHS hospital patients to help in the early diagnosis of conditions such brittle bone disease in 2011. The first instrument of its kind to be commercially available was delivered to the Institute of Orthopaedics and Musculoskeletal Science, University College London.

Cobalt Light Systems develops products and technology for non-invasive surface analysis and have unique and proprietary analysis systems with applications in many areas. At the heart of the technology is the ability to rapidly and accurately measure chemical composition without touching or changing the sample. Markets include pharmaceutical quantitative analysis, security screening of bottles and containers, and biological characterisation. Cobalt Light Systems was established to develop its novel technologies into a range of applications for laboratory and industrial analysis. The underlying technology is exclusive to the company and was invented at the STFC’s Rutherford Appleton Laboratory.

We also support our university research programmes by brokering partnerships through our Innovations Club. STFC runs the Innovations Club to forge stronger relationships between STFC’s researchers in the UK and at STFC supported international facilities, industry and other academic disciplines. This provides opportunities to network, identify new partnerships and share best practice. The Innovations Club runs an active programme of workshops and events for the benefit of academics, industrialists and other interested research and technology organisations. The topics covered include specific technology themes, core science projects and business advice.

Commercialisation of STFC IP

STFC Innovations Ltd (SIL), our wholly owned technology transfer company, was set up in 2002 to formally manage STFC’s intellectual property. SIL’s role is to support STFC in identifying and brokering deals to exploit and manage our IP rights, including generating revenue through spinouts and license agreements. We do not own the IP arising from grants we issue to university groups, experiments carried out on our facilities such as ISIS or the work undertaken by our international partners such as CERN. We only own the IP arising from our own

\textsuperscript{xii} Duvas Technologies – http://www.duvastech.com/index.php
\textsuperscript{xii} Cobalt Light Systems Ltd – http://www.cobaltlight.com/
\textsuperscript{xiii} Nominet – http://www.nominet.org.uk/
facility development and laboratory activities which is less than 10% of our total investment, and similar in scale to a university physics department.

SIL currently has a portfolio of 56 patent families of which half of these are already licensed either for royalties or as the base technology for our spin-out companies. Since 2002 we have launched 15 spin-out companies, which last year employed 88 people in high technology jobs in the UK. One of our earlier spin-outs, Nominetxiv, operates at the heart of eCommerce in the UK, running one of the world’s largest internet registries and managing over nine million domain names. The company works to provide a safe and secure .co.uk domain and shapes the development of the internet. Nominet was established as a private, not-for-profit company limited by guarantee in 1996; it currently has a £20m annual turnover and employs 115 people.

In 2010/11 STFC:

- Raised £90k licensing intellectual property, created three new licenses, (bringing the total to 20 since 2002), secured 4 new patents (total number of 56 patent families, filed in 161 countries) and recorded 40 new IP disclosures.
- Funded 15 new Proof of Concept projects, raising the total number of projects to 98 over 6 years.
- Created 2 new spin outs; bringing our total number to 15 since 2002 and employing a total of 88 staff.

New STFC spin-outs in 2010/11

Teratech Components Ltdxv, a new spinout from STFC, is employing novel electronic components for applications in security imaging, telecommunications and cancer detection. The company won a £10k prize in the RCUK Business Plan Competition 2010 and will use the prize money in the exploitation of alternative commercial applications for their devices.

Cella Energy Ltdxvi, a new STFC spin-out, has won the prestigious Shell Springboard Award 2011 for products that help tackle climate change. This novel technology allows hydrogen to be stored in a cheap and practical way, making it suitable for widespread use as a carbon-free alternative to petrol.

Delivering impact through the Science and Innovation Campuses

We are developing clusters of public and private sector science and technology enterprise at our two Science and Innovation Campuses. By creating a critical mass of facilities, skills and businesses, in synergy with the universities and research base, the Campuses are becoming centres of collaboration and cross-disciplinary working. STFC also plays a significant role in attracting inward investment to the UK through our two Science and Innovation Campuses, international partnerships and programmes. During 2005/6 and 2009/10 we leveraged £310m international inward investment and £220m from UK sources over the same period.

Daresbury Science and Innovation Campus

Daresbury Science and Innovation Campusxvii (DSIC) is home to 100 companies that employ 337 people, this is an increase of 13% or 45 jobs in 2010. Of these roles, 77% are at Bachelor degree or above, this is significantly higher than the UK-average for similar companies where only 13% of employees are similarly qualifiedxviii. An impressive 66% of Campus companies are forecasting significant recruitment in 2011 with the focus on software development, engineering, scientific, technical, sales, marketing and business development roles;

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xv UK Company set to transform electronics for security scanners and cancer detection – http://www.stfc.ac.uk/RALSpace/Areas+of+expertise/Technology/Millimetre+and+terahertz+instrumentation/In+the+news/20347.aspx
xvi Cella Energy ltd – http://www.cellaenergy.com/
xvii Daresbury Science and Innovation Campus – http://www.daresburysic.co.uk/
xviii “UK Innovation Survey 2009”, Department for Business Innovation and Skills, December 2010
recent forecasts expect the appointment of a further 180 employees.

Other notable business results from our annual survey\textsuperscript{xx} of companies on the DSIC include:

- 49% of Daresbury companies actively collaborate with each other at a value of £845k.
- Daresbury companies delivered £24m in sales in 2010/11, securing £54m to date.
- There was a significant overall growth in sales (40%) and investment (£10.6m) during 2010. Over the past 4 years, average growth in sales has been 49% per year.
- Of the companies in the Innovation Centre, 71%, (or 41 companies in total) experienced a growth in sales over the previous financial year. This compares very favourably to companies surveyed in the Federation for Small Businesses Annual Survey\textsuperscript{xx} for 2009 in which only 30% of companies reported sales growth.
- 65% of the companies developed 153 new products and services in 2010.

Additionally, only 2 Daresbury companies went into administration during 2010 – both of these phoenixed (i.e. the business restarted with a new financial and legal structure), with one remaining on Campus. In nearly 6 years, only 8 Campus companies have gone into administration of which 5 companies have phoenixed, and 1 was acquired by another Campus company. Three year business survival rates are 89% and five year business survival rates are 87%. This is significantly better than typical UK averages (50% over 5 years) and comparable to the best case measurements from the UK business incubator sector (~90% survival over 3 years).

The results of the survey carried out with 85 companies on Campus show that significant progress has been made in realising the objective to minimise business failure and accelerate business growth. By leveraging public investment in the research base and using a multi partner approach to create the environment for innovative companies to flourish, the DSIC is producing real impact to the region and helping to drive dynamism in the economy. This performance is particularly impressive given the challenging environment in which these SME’s are operating.

The Innovation Technology Access Centre\textsuperscript{xxi} (I-TAC) at DSIC opened in 2010 and is a unique, fully equipped space for innovation, research and development providing flexible access to laboratory space, “hot-labs” and £3m worth of scientific equipment. The I-TAC was created to utilise laboratory equipment from the now de-commissioned SRS facility. Avoiding any write-off costs and re-using equipment that had been paid for by public funding, STFC opened the facility which is now providing laboratory facilities.

\textsuperscript{xx} “Voice of Small Business Annual Survey”, Federation of Small Businesses by Guided Insight & ICM Research, February 2010.
\textsuperscript{xxi} STFC I-TAC – http://www.itac.stfc.ac.uk/
for 20 SMEs across a range of sectors including biomedical and energy. 32 new high tech jobs have been created and £8.5m in investment has been won by the companies since locating onto the Campus. Technologies being developed at I-TAC include cleaning products to combat bugs including MRSA, a portable TB test, green technologies that make oil extraction cleaner and a low-carbon alternative to coal that could fuel existing coal-fired power stations. Due to its success, this incubator model will be rolled out at our Harwell Campus.

Harwell Oxford Campus

STFC’s Harwell Oxford Campus also made significant strides this year. 4500 people are employed on the Campus in 150 organisations, including Research Councils, start-ups and multinational organisations in the healthcare, medical devices, space, detector systems, computing and green enterprise sectors. Examples of progress in 2010/11 include the launch of the International Space Innovation Centre; the space sector is an increasingly significant area of high-value manufacturing where UK businesses excel and has grown 10% over the last 10 years. UK industry already competes globally in the space sector and the ISIC will be a catalyst to bring our space activities together, positioning the UK to win a larger share of a growing global market. ISIC attracted £12m investment from the Government’s Strategic Investment Fund and has brought in more than £30m of further investment.

2010/11 also saw the launch of the European Space Agency Business Incubation Centre on the Harwell site. The Centre is designed to create new business opportunities and jobs for non-space companies and broaden the market for the space industry by translating technologies, applications and services into viable business ideas in the non-space market place. The first tenant of the Centre is the Electrospinning Company, an STFC spin-out which is a pioneering developer of advanced materials for the biomedical industry.

Improving UK business

STFC operates several world class research facilities in the UK and provides access to others abroad. UK industry makes use of these facilities to develop their products and processes working collaboratively with university researchers where they are happy to publish the results of their work and by buying proprietary access where they require research confidentiality. Our synchrotron and neutron facilities form a critical part of R&D in industry for companies ranging in size from FTSE 100 multinational organisations to SMEs. This is a

Battling bird flu

Researchers from BBSRC and STFC are employing a new form of microscopy to develop more effective vaccines which prevent the devastation caused by bird flu. Genetically modified fowl pox viruses have been used in other countries to vaccinate against bird flu and the researchers have been observing how poxviruses interact with live cells to make them more efficient. This research was carried out at the Research Complex, a collaborative venture between 5 Research Councils and the Diamond Light Source, opened in 2010 on the Harwell Oxford Campus. The Research Complex provides facilities for researchers to undertake research in life and physical sciences and gives researchers access to 6 world leading facilities on Campus.

Understanding the bird flu virus can help scientists design an effective vaccine. Credit: Shutterstock

xix International Space Innovation Centre – http://www.stfc.ac.uk/ISIC/default.aspx
xxv ESA Business Incubation Centre – http://www.stfc.ac.uk/ISIC/Business+Incubation+Centre/19536.aspx
xxix The Electrospinning Company – http://www.electrospinning.co.uk/
xxvii The Research Complex at Harwell – http://www.rc-harwell.ac.uk/home.html
xxviii The Diamond Light Source – http://www.diamond.ac.uk/
unique offering to the UK’s industrial community as these world class facilities are beyond the financial reach of any one company or university.

We have an increasing industrial customer base and in 2010/11 our UK large scale facilities had 40 proprietary commercial users from the health sector, the car manufacturing, nuclear, chemical, oil, electronics, defence, pharmaceutical and energy industries.

A significant proportion of the 1500 or so experiments that are carried out on our facilities are carried out by academics that have industrial partners. Some of the most outstanding, highly cited work carried out on our facilities has involved this type of industrial collaboration. For example, the University of Oxford’s determination of the 3-D structure of the Foot and Mouth Disease virus on the Synchrotron Radiation Source was carried out in conjunction with the Wellcome company (before their merger with Glaxo Smith Kline) in this manner. We are currently working on a methodology to capture this data more fully and will report this in next year’s report.

STFC also deploys capabilities and expertise from other parts of our laboratories to assist industry. This year we have enabled global giant Unilever to develop innovative new products, using our world-class capabilities in modelling and simulation to develop new software tools that will speed up the development of new products across Unilever’s personal care range.

Helping to build the UK’s space industry

We have also assisted Clyde Space, a leading provider of miniature spacecraft, in securing a funding package worth £1m to support the company’s growth in a burgeoning global space market. Clyde Space is widely regarded as one of the most innovative young companies in the UK and in just 5 years has become the largest indigenous space company in Scotland.
Creating new business opportunities

STFC works with UK industry to help ensure they are well placed to win contracts which arise from our own laboratories and international subscriptions, in some cases bringing foreign direct investment into the UK economy. In 2010/11, STFC increased contracts for UK industry from our international partners.

Our other role in this area is collaboration with UK companies on technically demanding projects. This allows them to build their expertise and go on to win more business from other companies and become more competitive. For example, in 2010/11 STFC continued to collaborate with e2v on space projects, helping them to build their own skills and expertise which allowed them to win £300m of contracts.

Contracts to UK industry

- £2m contracts were awarded to UK firms from the European Southern Observatory (ESO) in 2010, bringing the total to £16m between 2008 and 2010.

- £9.5m contracts from CERN were secured by UK companies. This is an increase of 20% in 2010 and has more than doubled from 2008, bringing the total to £19.5m between 2008 and 2010. An example of this is Viglen, a leading British manufacturer and provider of IT solutions, who recently won a tender at CERN in a three-year deal worth £1.8 million.

- STFC also places contracts from its large facilities with UK industry through competitive tender and awarded £90m in contracts to UK SMEs and some of the UK’s major corporations.

Viglen’s first delivery of equipment to CERN forms part of the LHC Computing Grid. The Grid is needed to provide the Large Hadron Collider with the high performance computing and storage equipment to handle roughly 15 petabytes (15 million gigabytes) of data annually.
Supporting new and existing markets

STFC has a good track record of developing technology from which new markets emerge. We have played a key role in the development of the World Wide Web, medical imaging and computer animation technology. Together, these technologies underpin the digital economy in the UK which contributes £125 billion to UK GDP per annum, estimated to contribute up to 13% of annual GDP by 2015. The two former examples are explained elsewhere in this report and our role in the development of computer animation technology is described below.

STFC also supports and underpins several industries and other areas which contribute to the UK economy. Although we cannot take full credit for the establishment or success of these industries, our support role is a distinctive one - we provide unique facilities, technology and training which underpin and are key to certain industries. Without this support, these industries may not have progressed as well or as far as they have. For example:

- STFC supports the £23bn UK microelectronics sector, which is growing at 15% per year, by providing underpinning training and support to the sector through our Microelectronics Support Centre. The microelectronics sector itself is vital to the health and competitiveness of the UK aerospace, automotive, consumer technology and defence industries which collectively account for £78 billion of UK GDP and employ around 700,000 people.

- We also play a key role in supporting the development of technology for and providing skilled staff for the physics based manufacturing industry which is worth £90 billion or 6.4% contribution to UK GDP and supports one million jobs, equivalent to financial services.

- STFC techniques also underpin the pharmaceutical industry; 15 of the world’s current 75 best-selling drugs were discovered and developed in Britain using techniques pioneered by STFC. This industry contributes £8 billion to UK GDP and supports 67,000 jobs.

Finally, our grant funding which contributes to the UK research base is part of the £33.4 billion GDP generated by UK universities, which in turn generates a further £60bn of further economic activity and employment of 670,000. We also contribute to the £1 billion annual UK tax contribution by the high-tech graduates and postgraduates attracted and funded by STFC research.

“Through knowledge exchange programmes, we encouraged adoption and played key role in the proliferation of the technology throughout the world.”

Computer animation industry

Our role in the development of the computer animation industry was key. In the 1960’s and 1970’s, STFC’s Rutherford Appleton Laboratory developed computer graphics and animation technologies to help researchers visualise scientific data as images or animated films. We realised that these ground breaking computer graphics and animation technologies had far wider application than the scientific purposes that they were originally designed for. Through knowledge exchange programmes, we encouraged adoption and played key role in the proliferation of the technology throughout the world. The Financial Times pronounced the Laboratory as the home of computer animation in Britain and we continued to lead UK CGI development, most notably creating the computer images for the movie Alien, winning British director Ridley Scott an Oscar in 1980 for best special effects.

The movie, computer game and World Wide Web graphics industry today is underpinned by international computer graphic standards developed under STFC’s stewardship. The UK computer animation industry is currently worth £20 billion including £2bn generated by the UK video and computer games market. As the champion of computer graphics and animation in the UK for many years, the STFC made significant contributions to this key UK industry.
World-class Skills

“Applications for physics courses at university in 2010/11 were up by more than 17% on the previous year and in astronomy by 40%”

Introduction

The UK has aspirations to be one of the foremost knowledge economies in the world, attracting inward investment, international companies, and jobs at the top of the global value chain by supporting a thriving high technology culture. World class skills are one of the most important ways that we deliver this impact. World-class research and innovation depend on the outstanding performance and contribution of UK researchers, technologists and engineers to create knowledge, exploit ideas, and build and operate large scale facilities. It requires a distinct combination of skills to deliver world-class science and technology on this scale; building this skills base is one of STFC’s unique contributions to the UK.

As with our other strategic goals, STFC has several roles in delivering skills impact including the provision of skills at the highest level through grant support to universities, subscriptions to international facilities and training at its own facilities. We encourage collaboration by: promoting cross institutional projects at our own laboratories, encouraging joint appointments, and establishing hubs of national expertise, such as the Cockcroft Institute at Daresbury Laboratory. We also develop and support our own highly technical workforce and have a vibrant science in society programme; encouraging young people into science and helping the broader public to engage in science more.

Post Graduate Training

STFC funds the training of the next generation of researchers and skilled workers, supporting PhDs in particle physics, astronomy, space science and nuclear physics, with our rolling cohort currently standing at 830. In 2010/11 we sustained our PhD award level in astronomy, particle physics and nuclear physics, with 235 new PhD studentships awarded. In addition to directly-funded activities, we also exploit our laboratories and facilities as unique training centres with more than 700 students, funded by other Research Councils, receiving more than 7,000 PhD training days every year – an annual increase of 28%.

Our PhD students enjoy almost full employment when they complete their courses, with half continuing in research. The remainder who leave research are much valued for their numerical, problem solving and project management skills and choose equally important commercial or government careers.

It is important for us to understand the impact of our investment in terms of the career paths of our students and the skills they developed during their PhDs. In 2009 we commissioned DTZ to find out about the career paths of students whose funding ended 6 to 9 years earlier and how useful their PhD training had been. Case study material was also collected from former students who were then 12 to 14 years into their post-PhD careersxxvi

xxvi The careers of STFC funded PhDs – http://www.stfc.ac.uk/Funding+and+Grants/18313.aspx
PhD Career Paths

Our postgraduate training programmes provide opportunities for students to develop the skills they require to become effective researchers, to enhance their employability and assist their career progress after completion of their degree. The findings of the study were:

- 97% of the respondents were in employment and only 1% were unemployed.

- Just under half were working in higher education. Of these, a third held an academic appointment as lecturer or senior lecturer, training the next generation of scientists and engineers.

- A further 23% were employed in the public or voluntary sector and were almost evenly split between roles in research establishments (both in the UK and abroad) and public or non-for profit organisations including central and local government and charities.

- Just over a quarter of the sample were working in the private sector, of which 75% were in highly salaried financial and business services roles at companies such as Barclays, IBM, BP and Goldman Sachs. These are high-value, knowledge-intensive sectors that are critical to the future competitiveness of the UK economy.

- Approximately 62% of the sample were earning a salary similar to or greater than the average for workers in professional occupations in the UK.

- Just under three quarters believed that their PhD training had been very useful in developing their career and 58% considered their PhD to have been essential. Unsurprisingly, almost all those employed in higher education considered their PhD to have been very useful and essential to their career. However, nearly 90% of those in the private sector considered their PhD to have been very or quite useful and 80% felt it was essential or of some importance.

- Respondents reported having gained several high-level skills that are important in driving a high-value, innovative economy and are transferable to many occupations. A common feature of many of the roles was that they require high-level mathematical, computer modelling and information technology skills which are key components of most STFC PhDs.

We have carried out an update to this survey in 2011 and will report the results in next year’s RPEIR.
Collaboration Activities

Scientific and technological creativity thrives on openness and collaboration. Addressing our future scientific and technical challenge is best achieved by open-handed sharing of knowledge, data and skills. STFC has an excellent track record of disseminating technical knowledge. Our scientists and engineers work closely with their international peers, designing the next generation of research facilities and publishing research papers.

We also have considerable success reaching out to HEIs and commercial researchers. Our technology showcases, workshops and conferences, such as the Appleton Space Conference, bring together thousands of public and commercial researchers to stimulate innovation enterprise. Our collaborative activity with HEIs and industry currently stands at £30m.

We are using these strengths to promote an open innovation approach in developing our Campuses and are setting up formal structures to assist this process. For example, our Knowledge Centre for Materials Chemistry provides a focus for UK chemical companies to access public research skills and facilities. Our plans for the Campuses will be strengthened by our technology themed Centres of Expertise. These will be explicitly outward focused and will enable multidisciplinary interactions with HEIs, public, private and third sector organisations that would benefit from access to our skills, expertise and resources. Our first, the International Space Innovation Centre (ISIC), opened in 2010 and is already detailed in a previous section.

We are currently designing methodology to fully capture the extent of our collaboration activities and will report on there in next year’s report.

Addressing the skills gap in advanced engineering

DSTFC is setting up initiatives for skills training activities which will support individual and business growth and development in the regions surrounding the campuses. The activity at Harwell will be delivered through STFC’s participation in the OXETA partnership, which aims to address the skills gap in the advanced engineering sectors across the UK by the integration of current and future talent into a dedicated space at the Harwell Science & Innovation Campus.

Opening up markets for UK

Collaboration between STFC and Shakespeare Engineering has given the UK the technical capability to supply specialist components for the construction of next generation light sources, which will lead to improvements in cancer treatment and sources of cleaner energy. This allowed the UK to enter a market potentially worth £1 billion over the next ten years.

Highly-skilled People

STFC has approximately 1700 staff members, the majority of whom are scientists and engineers. We train and educate this technically skilled workforce at all levels from apprentice to PhD. Our staff also transfer their expertise externally when they leave us, taking their skills to other research establishments, joining industry or creating their
own spin-out companies. Highly-skilled workers are seen by the Government as a source of competitive advantage and a key way to stimulate private sector growth\textsuperscript{xxx}. Whilst it is difficult to track and measure the impact of staff who leave us, data from past evaluation projects has shown that this can create significant impact.

For example, the 2010 SRS impact report\textsuperscript{xxx} found that around a third of staff from the facility transferred their expertise and knowledge to industry, universities, schools and other synchrotrons facilities around the world. On the industrial side, staff moved to a diverse range of industries including Schlumberger, VG Scientia and BNFL and several of the STFC’s own spin-out companies.

Addressing fertility issues

A fertility treatment invented at the Daresbury Laboratory is offering hope to couples who long for a baby. The idea for DuoFertility\textsuperscript{xxxi}, developed to help people suffering from unexplained infertility, was initiated in 2005 by a Cambridge University PhD who studied at the Laboratory from 2003 to 2006.

DuoFertility is a fertility monitor with expert support to assist couples in getting pregnant naturally and is designed to avoid invasive medical procedures such as IVF. The product is a convenient, totally natural, non-invasive and drug free fertility product which can be used at home and is now on the market and available at high street pharmacies.

Additionally, some of our own staff and staff which we fund in universities are considered to be world leaders in their fields. As a reflection of this they are regularly rewarded scientifically and are invited to join scientific advisory bodies around the world. For example, this year, a member of STFC’s ISIS neutron source was awarded the prestigious BTM Willis Prize for neutron scattering by the Institute of Physics and the Royal Society of Chemistry. This was in recognition of the development of novel neutron techniques that are opening up new areas of fundamental and applied research in nanoscience.

Finally, in a poll by TARGET jobs in 2010\textsuperscript{xxxii}, STFC was voted the 1st public sector and 5th overall in the top 10 top ten most popular graduate recruiters in scientific research and development. STFC joined GlaxoSmithKline, L’Oréal, Johnson & Johnson and Dyson in the top 5. We have commissioned the Sunday Times “Best Companies Survey”\textsuperscript{xxxii} to survey our staff in 2011 which will help us to assess eight different aspects of our organisation including leadership and management; we will report these results next year.

Public Engagement with Science

STFC plays a key role in attracting young people into science through the inspirational nature of its research. Applications for physics courses at university in 2010/11 were up by more than 17\% on the previous year and in astronomy by 40\%. The high profile and very visible research funded by STFC has been shown to attract 90\% of these students to their studies and we have worked closely with the Institute of Physics to further encourage students to study STEM subjects, directly engaging with teachers, school pupils and the general public.

\textsuperscript{xxx} Skills for Sustainable Growth, Department of Business Innovation and Skills, November 2010
\textsuperscript{xxx} New Light on Science, the economic impact of the SRS – http://www.stfc.ac.uk/resources/PDF/SRSImpact.pdf
\textsuperscript{xxxi} Duo Fertility website – http://www.duofertility.com/
\textsuperscript{xxxii} Which are the most popular graduate recruiters in scientific research and development? – http://targetjobs.co.uk/news/155922-which-are-the-most-popular-graduate-recruiters-in-scientific-research-and-development
\textsuperscript{xxxiii} The Sunday Times “Best Companies Survey” – http://www.bestcompanies.co.uk/Index.aspx

Sixth form students using STFC IT packages to learn more about particle physics.
In 2010/11 STFC:

• Attracted 2,500 undergraduates to study physics, inspired by STFC research areas.
• Attracted over 12,000 pupils and 15,000 members of the public to events at STFC sites, a 40% increase over 2 years.
• Invested in 95 national school outreach projects in partnership with the Institute of Physics to encourage students to study STEM subjects, directly engaging with over 900 teachers.
• Provided particle physics master classes at STFC sites for 570 secondary school students.
• Invested in 51 Public Engagement Awards including 4 Science in Society Fellowships. These fellows have reached an audience of 1.4 million members of the public.

In addition, Particle Physicist Professor Brian Cox continues to have a huge impact on public understanding of science and the promotion of STFC science:

• Wonders of the Solar System had 6 million viewers per episode with a very broad demographic spread
• BBC Wonders books account for 20% of UK popular science market in 2011

Training Physics Teachers

STFC has been helping physics teachers across the UK to stay at the forefront of physics research and helping to bring new ideas to tomorrow’s young scientists. In 2010, almost 300 secondary school physics teachers visited CERN to view the Large Hadron Collider for a range of residential courses, lectures and tours.

Moon Rock Projects

STFC loans out rare samples of priceless moon rock and meteorites across the country to enable pupils to learn about and engage with physics. Hundreds of schools, colleges, universities, museums and astronomical societies throughout the UK have enjoyed the samples since the scheme began.
The search for dark skies

The STFC’s Dark Sky programmes have turned the search for dark skies into an environmental asset for tourism, education and communities in the UK. Dark skies are found in rural areas that are free of urban light pollution, making them ideal places to view our night sky with the naked eye. A major development in 2009 was the establishment of Galloway Forest Dark Sky Park as the first Dark Sky Park in Europe. 2010/11 was the first full year of operation and it is expected that the Dark Sky Park will increase the regional economic impact of the Galloway Forest Park which currently attracts 0.8 million visitors each year and contributes 10% of the tourism GDP for Galloway. The Dark Sky Park is actively helping and encouraging local businesses to take advantage of this new initiative. It is hoped that the new Dark Sky Park will help to strengthen the delicate rural economy in Galloway.

An example of a project in our impact evaluation programme is the development of an innovation index to measure the progress of our innovation activities. We are approaching this by starting with an evaluation of innovation activities in STFC’s own laboratories and will extend this to our other delivery vehicles in subsequent stages of the project. Whilst at the early stages of this work, we are making good progress and are taking advice from NESTA and BIS in its development. Innovation indices are a relatively new way of measuring innovation and we are adapting NESTA’s public sector innovation index to develop our own index.

Methodological developments and future challenges

As demonstrated in this report, STFC delivers differing types of impact for the UK – our impact occurs at many levels and on differing timescales. Because of this, there are several evaluation methodologies which we are employing to demonstrate the impact that our programmes make. We are also developing new methodologies for this purpose and continue to work with BIS and other stakeholders to implement these.

Our challenges in this area are to demonstrate both the value of STFC’s research, innovation and skills to the UK and how we are increasing our impact over the spending review period. Using our key strategic themes of delivering world class research, innovation and skills, we have developed an impact framework which outlines the different impact roles we have in each of our delivery vehicles. This has enabled us to identify gaps in our evaluation knowledge and we are developing a series of different approaches to address these gaps, which will allow us to assess our progress in achieving them. For example, the development of the e-Val data collection system is allowing us to gather information on the impact of our university funded programmes. We carried out the first round of data collection this year and are currently analysing the data. This will allow us both to track and feedback progress to our university partners.

An example of a project in our impact evaluation programme is the development of an innovation index to measure the progress of our innovation activities. We are approaching this by starting with an evaluation of innovation activities in STFC’s own laboratories and will extend this to our other delivery vehicles in subsequent stages of the project. Whilst at the early stages of this work, we are making good progress and are taking advice from NESTA and BIS in its development. Innovation indices are a relatively new way of measuring innovation and we are adapting NESTA’s public sector innovation index to develop our own index.

We are also refining our evaluation strategy which will outline our programme of studies to demonstrate impact over the medium to long term. We have identified our current projects in the table below and will add to this plan when our impact framework and evaluation strategy are complete.
## STFC impact evaluation programme

<table>
<thead>
<tr>
<th>Subject/focus</th>
<th>Action</th>
<th>Complete by</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy/strategy work</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| STFC Impact Evaluation Strategy & Framework | • Development of a framework which describes and helps us assess the outcomes and impacts across the STFC’s key strategic themes of research, innovation and skills  
 • Outline why we evaluate and what we are going to evaluate                                                                                             | SR year 1 (October 2011)    | 1st and 2nd drafts complete  
 Needs updated after advice from BIS and signed off by STFC Council                                           |
| **Metric development**            |                                                                                                                                                                                                     |                             |                                                       |
| Science and Innovation Campus metrics | • Development of improved metrics to illustrate the broad spectrum of impacts that arise from DSIC and HSIC  
 • Work with BIS to modify company survey at DSIC and improve reporting  
 • Develop a company survey at the HSIC                                                                                                         | Implement by SR year 2      | Phase 1 complete  
 Phase 1 – May 2011  
 Phase 2 – March 2012                                           |
| STFC impact metrics               | • Comprehensive set of metrics to demonstrate STFC’s progress over a range of indicators  
 • Will report over SR period                                                                                                                      | SR year 2 (Summer 2012)     | Options being explored                                |
| STFC corporate strategy success measures | • Long term, high level metrics to measure direction of travel across key strategic themes in STFC corporate strategy  
 • E.g. development of an Innovation Index, a PhD cohort study and development of metrics to capture the excellence of our university and large scale facility research  
 • Measures reported annually where appropriate                                                                                                 | Approach to each measure to be agreed in SR Year 1 | Approach on track for delivery in March 2012 |
| STFC e-Val                        | • Commission the STFC e-Val on-line system to collect outcomes and impact data from our university research  
 • Evaluate the outputs from phase 1 of the project  
 • Explore how e-Val can be adapted to UK facilities and international subscriptions                                                              | Phase 1 SR year 1  
 Phase 2 Summer 2012    | Pilot run in 2010 & Phase 1 data collection completed. Data analysis underway                                                                     |
| **Medium to long term impact studies** |                                                                                                                                                                                                     |                             |                                                       |
| Neutrons impact report            | • A study which will highlight the range of impacts from the ISIS and ILL neutron facilities                                                                 | SR year 2                   | Scope been extended from previous version           |
| Case studies                      | • 20 – 30 case studies to be written on an annual basis over the SR period which highlight different aspects of STFC’s impact                                                                         | 10 to be submitted by December 2011 | 20 submitted in 2010                                 |
| Plan of studies over spending review period | • Plan for impact studies being refined                                                                                                           | December 2011               |                                                       |
## Appendix 1 STFC publication statistics

### Astronomy

<table>
<thead>
<tr>
<th>Year</th>
<th>No of publications &amp; world ranking</th>
<th>Citation impact &amp; world ranking</th>
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<tr>
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<td>2009</td>
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<td>11.37, 1st</td>
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<td>2010</td>
<td>2411, 2nd</td>
<td>11.79, 1st</td>
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### Particle physics

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</thead>
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<td>8.35, 1st</td>
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<tr>
<td>2009</td>
<td>1047, 3rd</td>
<td>8.99, 1st</td>
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<tr>
<td>2010</td>
<td>1030, 4th</td>
<td>9.23, 1st</td>
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### Nuclear physics

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<th>Citation impact &amp; world ranking</th>
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<td>2009</td>
<td>347, 7th</td>
<td>6.99, 2nd</td>
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<td>2010</td>
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### STFC impact evaluation programme

#### Appendix 2  STFC statistics

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<th></th>
<th>UNITS</th>
<th>2008/09</th>
<th>2009/10</th>
<th>2010/11</th>
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<td><strong>Total Funds Available</strong></td>
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<td>657</td>
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<td>601</td>
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<td>56</td>
<td>X</td>
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<td>of which Private</td>
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<td>35</td>
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</tr>
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<td>of which from other Research Councils</td>
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<td>19</td>
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<td>of which from other source</td>
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<td>of which Private</td>
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<td>of which Other Research Councils</td>
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<td>3%</td>
<td>X</td>
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<tr>
<td>of which Other</td>
<td>%</td>
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<td>7%</td>
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<td><strong>Total Expenditure</strong></td>
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<td>of which Responsive Mode Grant</td>
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<td>116</td>
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<td>of which Postgraduate Awards</td>
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<td>of which Other components</td>
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<td>of which Postgraduate Awards</td>
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<td>of which Other components</td>
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<td>Principal Investigators</td>
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<td>459</td>
<td>439</td>
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<td>Research Leaders in Sponsored Institutes</td>
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<tr>
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<td>2010/11</td>
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<td>--------------------------------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
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<tr>
<td><strong>Human Capital</strong></td>
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<tr>
<td>Number of PhD Students Supported</td>
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<td>235</td>
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<tr>
<td>Number of Masters Students Supported</td>
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<td>Number of Other Students Supported</td>
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<tr>
<td>Finishing Rates</td>
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<td>Student funding/training schemes</td>
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<td><strong>Knowledge Transfer and Exchange</strong></td>
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<td>Patents applications</td>
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<tr>
<td>Income from IP activity</td>
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<td><strong>Human Capital</strong></td>
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<td>Destinations of leavers</td>
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<tr>
<td>Of which University</td>
<td>%</td>
<td>50%</td>
<td>52%</td>
<td>42%</td>
</tr>
<tr>
<td>Of which Wider Public Sector</td>
<td>%</td>
<td>15%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Of which Third Sector</td>
<td>%</td>
<td>9%</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>Of which Private Sector</td>
<td>%</td>
<td>26%</td>
<td>35%</td>
<td>23%</td>
</tr>
<tr>
<td>Of which Unknown or Other</td>
<td>%</td>
<td>0</td>
<td>0</td>
<td>17%</td>
</tr>
<tr>
<td>Of which Unemployed</td>
<td>%</td>
<td>0</td>
<td>0</td>
<td>9%</td>
</tr>
<tr>
<td>Placements in user organisations</td>
<td>#</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Facility usage</strong></td>
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<tr>
<td>Station Days</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>9297</td>
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<tr>
<td>Unique Users</td>
<td>#</td>
<td>*</td>
<td>*</td>
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<td>Experiments</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>1584</td>
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</table>

X – Data to follow from annual accounts

* - Historical data unavailable due to changes in method of data collection