



Government  
Office for  
**Science**

# **Annual Review 2011-12**

**Government Office for Science**

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# Foreword



Science and engineering are central to much of Government's business. As Government Chief Scientific Adviser (GCSA), I am responsible for ensuring that Government has access to the very best evidence and advice when developing and implementing policy, and for ensuring it builds the evidence base needed to address the major global challenges of the 21st century.

During 2011-12 the Government Office for Science (GO-Science) worked with colleagues from across Whitehall and from industry and academia in the UK and abroad to deliver reports on climate change, global migration, and low-probability high-impact risks. These have already informed decisions of policy-makers in the UK and internationally, and I hope will continue to be a valuable source of information over the years to come.

The last year also saw GO-Science continue to monitor the Government's science and engineering resources and capabilities, and to input to national strategy on topics such as cyber security, nuclear energy and the life sciences. The international challenges the world faces are significant; sustainably feeding a growing population, dealing with climate change whilst ensuring energy security, and preventing the spread and improving the treatment of disease. Last year has seen a consolidation of the UK's collaborations with international partners, including an agreement to work with the US on issues including ocean acidification and space weather.

This will be the last Annual Review published during my time as GCSA. Over the past four and a half years I have been privileged to work with what is now a truly multidisciplinary network of departmental Chief Scientific Advisers and to see the Government Science and Engineering community go from strength to strength. My thanks go to colleagues inside Government and out, and the staff of the Government Office for Science for their support.

A handwritten signature in black ink, appearing to read 'John Beddington'.

**Sir John Beddington**

# A year in Government science

Led by the Government Chief Scientific Adviser (GCSA) and supported by the Government Office for Science (GO-Science), the UK Government has well-developed mechanisms for obtaining scientific advice. 2011-12 was a year in which science and engineering continued to inform good decision making and saw the GCSA and GO-Science working to strengthen evidence in policy areas of energy, food, water, climate change, migration, security, risk and many more.

GO-Science's Foresight programme deals with global challenges that we face now and will continue to do so far into the future. Foresight has a separate annual review summarising its work this year and setting out forthcoming projects. The Foresight Annual Review 2011 can be downloaded from <http://bis.gov.uk/foresight/publications/annual-reviews/annual-review-2011>.

This report is the last under Sir John Beddington's tenure as GCSA who, having arrived in January 2008, will leave his post after a little over five years. His successor Sir Mark Walport will take up post in April 2013.

## Highlights from 2011-12

### Summer

- Engaging Academic Social Scientists in Government Policy Making and Delivery event staged with the joint Government Heads of Analysis Group, the ESRC and British Academy.
- [International Dimensions of Climate Change](#) Foresight report published as part of the Government's Climate Change Risk Assessment.
- GSE: Greater Skill & Efficiency event held at Civil Service Live for members of Government Science & Engineering.

## Autumn

- The GCSA attends the annual Science and Technology in Society Forum in Kyoto, Japan.
- The Council for Science and Technology issue their report; [the NHS as a driver for growth](#).
- Cabinet Office, with GO- Science input, publishes the [UK's cyber security strategy](#).
- The revised [Code of Practice for Science Advisory Committees](#) is published following a public consultation.
- Launch of the Foresight [Migration and Global Environmental Change report](#).
- The Royal Society, with the support of GO-Science, hosts the 2011 pairing scheme to help build bridges between parliamentarians, civil servants and scientific researchers.
- Publication of [UK Water Research and Innovation Framework \(UKWRIF\)](#).

## Winter

- Former Scotland Chief Scientific Adviser Professor Anne Glover is named as CSA for the EU.
- Publication of the Blackett Review on [High-Impact Low-Probability Risks](#); helping Government ensure that mechanisms for assessing and managing risk are robust.
- Launch of the Government's [Strategy for UK Life Sciences](#).
- Council for Science & Technology meet with their equivalent body in France, the Haut Conseil de la Science et de la Technologie.
- The 3<sup>rd</sup> Government Science & Engineering Annual Conference in London.
- Publication of the Government Science & Engineering [Continuing Professional Development \(CPD\) handbook](#).

## Spring

- Roundtable event focussing on Government engagement with academia is held with departmental CSAs and university vice chancellors.
- The GCSA commissions the Royal Academy of Engineering and the Royal Society to produce a report on the risks associated with the extraction of shale gas.
- Publication of Foresight Global Food and Farming [one year on review](#).
- The UK-Japan nuclear industry panel, attended by the Prime Minister, is chaired by the GCSA.
- The GCSA initiates a review of the current nuclear research and development landscape in the UK, responding to recommendations from the House of Lords S&T Committee.

## Building capability and networks

The Government Office for Science plays a key role in building the networks and capabilities Government needs to effectively deploy science and engineering advice.

### The network of Chief Scientific Advisers

The GCSA leads the cross-Government network of departmental Chief Scientific Advisers (CSAs). A particular strength of the CSA group is its cross-disciplinary expertise and ability to contribute multiple perspectives, which can be collectively focused on current issues. The GCSA model is increasingly being explored by other countries, and 2012 saw the President of the European Commission appoint his first Chief Scientific Adviser Professor Anne Glover.

The departmental CSAs' effectiveness is enhanced by links to the wider research community outside of Government. Over the last year, GO-Science has ensured these links are sustained and built upon by hosting events at which CSAs have engaged with the wider scientific community, including the learned societies and national academies, senior academics, funding bodies and with university Vice Chancellors. In the latter case, the GCSA chaired a meeting at which around 40 universities were represented at Vice Chancellor or Pro-Vice Chancellor level to discuss how academia and Government could better engage. The GCSA and network of CSAs have also met regularly with Research Council Chief Executives to build strong links across the spectrum of Government funded science.

#### Science policy in practice: new appointments to the CSA network

This year saw new appointments to the CSA network. In June 2011 HM Treasury appointed James Richardson as its first ever CSA. In December 2011, Professor John Perkins joined the Department for Business, Innovation & Skills (BIS). His engineering background and interdisciplinary expertise help ensure that BIS' work is supported by technical insight. This is particularly important given the department's responsibility for the science and research base and its interest in the development of the cutting edge technologies of the future. Finally, Professor Rod Smith was appointed Chief Scientific Adviser to the Department for Transport (DfT), also in December. Professor Smith's appointment will be of huge value to DfT's work, given current priorities such as high speed rail. A list of CSAs can be found in Annex C.

## Supporting Science Advisory Councils and Committees

Covering issues as diverse as pesticide residue, gene therapy and radioactive waste, approximately 65 Science Advisory Councils and Committees provide expert independent advice to Government departments. Last year, GO-Science led a review of the [Code of Practice for Science Advisory Committees \(CoPSAC\)](#), a good practice manual for the work of these bodies, which was published in November 2011. GO-Science also facilitates regular meetings of the Chairs of the Science Advisory Councils and Committees, which are chaired by the GCSA.

### Council for Science & Technology

The Prime Minister's [Council for Science and Technology](#) (CST) operates at the very highest level in Government. Having appointed new members in early 2011, the Prime Minister announced the appointment of Dame Nancy Rothwell, Vice Chancellor of the University of Manchester, as co-chair alongside Sir John in February 2012. She replaces Dame Janet Finch, who stood down from the CST after 8 years.



The new CST members' first report, [The NHS as a driver for growth](#), was published in September 2011. It identifies ways of exploiting the huge potential that exists at the interfaces between the NHS and the UK's innovators. The report formed part of the evidence base for the Government's life sciences strategy published in December 2011. Good progress has been made since then with the launch of the £180 million TSB-MRC Biomedical Catalyst which supports the maturation of ideas from concept to commercialisation, and the creation of the Clinical Practice Research Datalink in March 2012, which provides researchers with access to patient data for recruitment to clinical trials and observational studies.

In early 2012, a delegation from the CST attended the [Big Bang Fair](#) in Birmingham, the largest celebration of science, technology, engineering and maths for young people in the UK.

## Departmental capability for a 21<sup>st</sup> century civil service

GO-Science works with departments to help them use science and engineering evidence and advice as effectively as possible. A programme of science reviews of capacity and capability of evidence processes in Whitehall departments was started in 2003. These reviews assess how scientific advice and expertise are used by departments, and how they engage with key stakeholders to get the evidence required to make effective policy decisions. The reviews produce an assessment of the 'fitness' of departmental information systems, and make strategically focused recommendations to help support and improve departments' capacity to access, manage, quality assure and use science in policy and strategy.

The current Science and Engineering Assurance programme (SEA), developed in 2008 from the original Science Reviews, is due to be completed in summer 2012. The final review will address the analytical capability of HM Treasury. This year saw the completion of reviews for the Ministry of Defence (MoD), Department for International Development (DFID), and Department for Work and Pensions (DWP), with reviews of the Department for Energy and Climate Change (DECC) and Foreign and Commonwealth Office (FCO) starting. Completed reports can be found on the [GO-Science website](#).

GO-Science is developing proposals for the next phase of the Science and Engineering Capability Review Programme. It is anticipated that the new approach will be piloted early in 2013.

## People & professionalism

The broad array of science and engineering done across Government relies on thousands of civil servant scientists and engineers. The range of different science and engineering occupations in the civil service covers many fields such as radiation health and safety, brain electrophysiology, cloud physics and agricultural processing. GO-Science and the GCSA, in his role as Head of Science and Engineering

Profession, have built a professional community for these invaluable members of the civil service workforce called the Government Science and Engineering (GSE) network, which will enable members to deploy and to develop their skills and knowledge.



### Science policy in practice: engaging with the community

By March 2012, the Government Science & Engineering (GSE) community had attracted around 3500 members from more than 30 different Government organisations. Two major GSE events were held during the year. In July 2011, as part of Civil Service Live, 'GSE: Greater Skill & Efficiency' gave members the chance to hear from Alex Burns, the Chief Executive Officer of Williams F1 Racing, and the Chair of the Academy of Social Sciences Prof. Cary Cooper. The GSE annual conference in February 2012 allowed members to discuss some of the challenges facing them as a professional community and featured talks from the Minister for Universities & Science, David Willetts, Permanent Secretary at Department of Energy and Climate Change, Moira Wallace, and Director of Engineering and Technology at Rolls Royce, Colin Smith.

For GSE members to be effective they need to be professionally credible with both the science community and policy makers, and to have strong communication and networking skills, enabling them to act as intelligent customers and a communication bridge between the policy and specialist communities. To this end, GO-Science worked with departmental heads of profession to publish a [GSE continuing professional development handbook](#) in February 2012. This offers guidance on how GSE members can manage their professional development, both as professional scientists or engineers and as professionals working in Government.

In October 2011, GO-Science introduced a mentoring scheme for GSE members as part of its focus on professional development, and to assist members with their continuous

professional development plans. The scheme allows members to access free peer mentoring for up to twelve months with the option to renew for a further six or twelve months. GSE also sponsored the science, engineering and technology category of the Civil Service Awards. Shortlisted finalists were; the Atmospheric Dispersion Group, the Met Office, Historic Scotland Conservation Team, the Plant Pathology Team and the Knowledge and Information Management Team from the Food Environment Research Agency. The Met Office took the honours this year.

Finally, in November 2011 GSE once again partnered with the Royal Society to run the scientist-civil servant arm of the now well-established pairing scheme, which this year



included a seminar by Sir John and a workshop on futures techniques.

## **Working across the analytical community**

Making good policy requires evidence of all kinds, which is why a multi-disciplinary approach is important. The GCSA has continued his engagement with the other analytical professions in Government, the economists, statisticians, social researchers, and operational researchers, through the Heads of Analysis Group.

In June 2011, the joint Government Heads of Analysis Group worked with the Economic and Social Research Council (ESRC) and British Academy to hold an event, Engaging Academic Social Scientists in Government Policy Making and Delivery. The event encouraged better engagement between academic social scientists and Government, aiming to increase the influence of evidence and expertise from the academic social science community on policy making and delivery in Government.

A year later, in June 2012, the GCSA, the Cabinet Office's Behavioural Insights Team and Government Economic and Social Research Professions brought leading academics from the behavioural sciences, analytical professions from across Government and the Science Minister David Willetts together to explore how evidence from the neurosciences and behavioural sciences could be used for Government initiatives on behaviour change interventions.

## Science in Parliament

Along with other analytical communities in Government, the GCSA and GO-Science continued to engage with the UK Parliamentary community. The Science and Technology Select Committees in both the House of Commons and the House of Lords play an important role in holding Government's policies on science and its use of science and engineering to account. Engaging with the committees on inquiries into topics such as [engineering](#), the [network of CSAs](#) and the [GO-Science Annual Review 2010-11](#) has remained an important mechanism for our interaction with Parliament. We have also worked with the Parliamentary Office of Science & Technology (POST) on the parliamentary launch of the Migration and Global Environmental Change Foresight [report](#).

# Global issues: evidence into policy

People across the planet continue to face the challenges of food shortages, scarce water and insufficient energy resources. During 2011-12, GO-Science has continued to help build the evidence base in order to understand some of these global challenges and inform the decisions of policy makers.

## Climate change

As part of the Government's Climate Change Risk Assessment (CCRA), Foresight was commissioned to deliver a [report](#) on the International Dimensions of Climate Change. This was published in July 2011. The report revealed how climate change impacts from abroad could affect the UK more than climate change at home, highlighting a wide range of risks to the UK in areas including foreign policy, security, resources and infrastructure, as well as potential opportunities for business, finance and global leadership. The report received strong support from its departmental sponsors, DECC and Defra, and again demonstrated Foresight's ability to translate issues of global significance into a UK context.

In September 2011, the GCSA convened a meeting which brought leading UK climate science experts together to consider the need for strengthening the scientific evidence on climatic thresholds or 'tipping points'. The meeting considered paleo-climatic events, climatic computer models, gaps in current understanding and predictive capability, along with policy implications and communications issues. It was agreed that a set of plausible scenarios considering the biophysical and socio-economic impacts of climatic tipping points should be developed and that the Research Councils' Living With Environmental Change (LWEC) partnership would take this work forward.

## Energy

### Shale gas

The extraction of shale gas in the UK has been the subject of recent debate. After discussion with the Chief Scientific Advisors from a number of Government departments, the GCSA asked the Royal Society and the Royal Academy of Engineering to produce an independent report to summarise the relevant scientific and engineering knowledge, including levels of uncertainty and potential risks associated with the extraction of shale gas. The report was published in June 2012.

## Nuclear energy

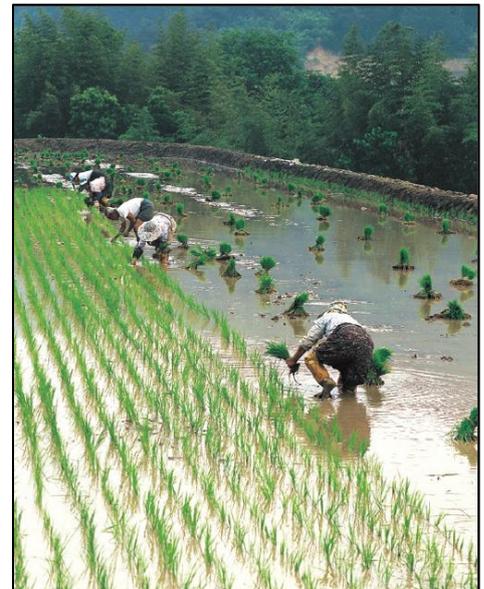
In November 2011, the House of Lords Science and Technology Select Committee published a report on nuclear research and development (R&D) capabilities in the UK. Responding to its recommendations, the Government asked the GCSA to lead a review of the current nuclear R&D landscape in the UK. The review will examine R&D capabilities across the nuclear fuel cycle (both fission and fusion) within academia and industry, as well as researching how funding makes its way through the nuclear R&D sector. Working closely with the national academies and other industry and academic stakeholders, it will also consider the ways in which different bodies cooperate and collaborate on specific project areas, both in the UK and in Europe. The review was launched in April and will report later in 2012.

## Food and water

### Food

The [UK Cross Government Strategy for Food Research and Innovation](#) was published in January 2010 and provided, for the first time, an overarching Government framework for food research and innovation across the UK. The one-year progress report published in 2011 highlighted progress in a number of areas including skills and translation of research.

Foresight has worked with national and international partners to catalyse action on its [Global Food and Farming Futures](#) report since publication in January 2011. In the UK, the report helped shape the Defra Green Food Project, an initiative which aims to integrate activities to reduce waste, link the production of food and energy, and influence consumer behaviour. By doing so, its goal is to improve production, growth and competitiveness in the farming and food industry, whilst promoting global food security and protecting our natural environment. DFID has also acted on the report's findings on the global food system in a range of ways for example, through funding studies which link agriculture and climate change and taking steps to strengthen modelling in agriculture and other relevant research programmes.



Engaging with major international institutions, such as the UN, to meet food and farming challenges on the global stage is essential if progress is to be sustainable and far reaching. To this end, Foresight continues to work with agencies like the Food and Agriculture Organization, the International Fund for Agricultural Development, and the World Food Programme to inform and support their programmes in sustainable agriculture and hunger alleviation. A [One-year Review](#) of Global Food and Farming Futures looks at the impact the report has had over the first year of its release.

During this year, in an independent capacity, the GCSA chaired the International Commission on Sustainable Agriculture and Climate Change. This Commission comprised experts in agriculture, climate, food and nutrition, economics, and natural resources from across the world. The Commission's report [Achieving Food Security in the Face of Climate Change](#) was launched in March 2012 at the international conference 'Planet Under Pressure'.

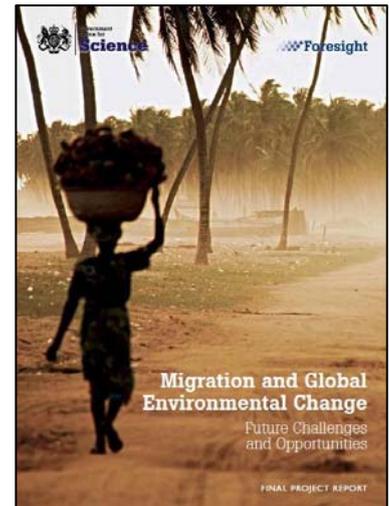
## Water

GO-Science has worked closely with the LWEC programme and the UK Collaborative for Development Science (UKCDS) to establish the UK Water Research and Innovation Partnership (UKWRIP). Chaired by the GCSA, the group published the UK Water Research and Innovation Framework (UKWRIF) in November 2011. This has enabled partner organisations from the public, private and third sector to prioritise the national and global water security challenges that could best be addressed through the evidence generated and impact achieved by UK research and innovation. This will help to ensure better co-ordination of the various public funding schemes for water research and innovation.



## Migration

In October 2011, Foresight launched its report on Migration and Global Environmental Change, challenging current views about migration associated with environmental change by highlighting two as yet underestimated groups of people who are particularly vulnerable; those moving into areas of environmental risk, and those trapped in hazardous areas. In the few months since the launch, the report has been presented and discussed with stakeholders at the World Bank, the UN, the European Commission and within DfID here in the UK. Foresight will build on this firm foundation with a programme of follow-up activity throughout 2012.



## Humanitarian disasters

In June 2011, Andrew Mitchell, the Secretary of State for International Development, asked the GCSA to determine how best to improve the Government's use of science in predicting and preparing for humanitarian disasters. To meet this request, Sir John commissioned two pieces of work. The first, [\*the Use of Science in Humanitarian Emergencies and Disasters\*](#) report, was published in June 2012. This report focuses primarily on the way Government plans and prepares for international humanitarian emergencies. The recommendations have provided stimulus and support to collaborations between Government and the humanitarian disasters community.

The second piece of work was a Foresight Policy Futures Report on *Improving Future Disaster Anticipation and Resilience*. Already underway, the project will identify actions that could be taken within the next 10 years to reduce the impacts of disasters arising from natural hazards up to 2040. It will call on industry and academic expertise from around the world and explore how emerging science and technology might improve our ability to prepare for and respond to these impacts. It will publish in late 2012.

## Life sciences

GO-Science facilitated a seminar for the Prime Minister on genomics in June of last year. During the seminar, key academics and business people told the Prime Minister directly about the huge potential of the emerging science, issues for UK research and current and future economic opportunities. This was followed in September 2011 by the publication of the CST's report *The NHS as a Driver for Growth*. Building on this platform, GO-Science worked with the Department of Health, BIS, and major external stakeholders to support the development of the [Strategy for UK Life Sciences](#), launched by the Prime Minister in December 2011. This set out an ambitious programme for the next 10-15 years to build on the UK's huge strengths at the cutting edge of biomedical research and business.

## Space weather

In London in May 2011, and again at the White House in March this year, the PM and the President of the United States of America highlighted the importance of space weather to national infrastructure.

Coronal mass ejections from the sun, solar flares and the solar wind, affect technology and systems such as satellites, GPS and radio communications. Thus, space weather forecasts are of crucial importance to the armed forces, and the aviation, energy, and communications industries. The management of space weather threats requires strong collaboration between scientists, forecasters, emergency planners, industry and others. The importance of space weather is reflected by its inclusion in the UK's National Risk Register.

In June 2012, GO-Science and the US National Oceanic and Atmospheric Administration (NOAA) agreed to strengthen the countries' collaborative efforts to protect critical infrastructure from the impacts of space weather. Sir John Beddington gave the opening address at a Space Weather Policy Roundtable held at the International Space Innovation Centre in Harwell, Oxfordshire and was joined via video conference from Washington by Dr Kathryn Sullivan of National Oceanic and Atmospheric Administration (NOAA). As part of the collaborative effort, the UK Met Office will be given access to NOAA's state of the art 'ENLIL' computer model, which is used to predict the arrival time of coronal mass ejections. This is part of a wider collaboration with other partners including the Science and Technology Facilities Council (STFC) and the British Geological Survey (BGS).

# Understanding risk, ensuring the nation's security

Science and engineering are critical aspects of planning for and reacting to sudden or unexpected events.

## Risk and uncertainty

Over 2011, the GCSA convened a Blackett review group to address the question “How can we ensure that we minimise strategic surprises from high-impact, low-probability risks”. The group’s report considered how Government could best identify, assess, communicate and quantify the inherent uncertainty in these types of risk. It recommended that Government consistently consult external experts, and highlighted the importance of considering social and behavioural factors and the need to consider unlikely risks. Its recommendations are already being used to strengthen how Government identifies and plans for emergencies.

The Löfstedt Report on Health and Safety, published in November 2011 identified, amongst other things, the need for a greater understanding of risk in today’s society and recommended that the Government ask the GCSA to convene an expert group to address this challenge. To take this forward, Sir John will be hosting an event to consider issues such as the impact on regulation of policy maker’s approaches to risk and public perceptions of risk in autumn 2012.

## Resilience

The internet is revolutionising our society by driving economic growth and giving people new ways to connect and co-operate with one another, but along with the social and economic benefits it is unlocking, it also brings new threats. GO-Science assisted the Cabinet Office’s production of the UK’s Cyber security strategy in November 2011 and commissioned a short review of current cyber capabilities and gaps in UK industry and academia. The report fed in to the National Security Council and its recommendations are now being followed up.

Early last year, Foresight started a project to examine the resilience of financial markets in the face of technological change. Advances in technology continue to transform how these markets operate. The volume of financial products traded through computer automated trading taking place at high speed and with little human involvement has increased dramatically in the past few years. This Foresight project involves leading experts in this field and will explore how computer generated trading in financial markets might evolve in the next ten years or more, and how this will affect financial stability and the integrity of financial markets. It will publish in late 2012.



## **National security**

The GCSA chairs the National Security Council (Officials) Science and Technology Committee. The Committee was established following the 2010 Strategic Defence and Security Review to advise the National Security Council on how it can best provide focus and overall strategic direction on the science and technology capability contributing to national security. The GCSA has also led work in the run up to the London 2012 Olympics ensuring that emergency response processes are clear and effective.

Finally, the Foresight Horizon Scanning Centre provides support for the security and intelligence community. The Future Security and Intelligence Outlook Network (FUSION) promotes collaboration on issues that span many different departments and encourages the use of futures techniques.

# Working internationally

## GCSA international visits 2011-2012

Over the year, the GCSA also undertook a range of visits to international events including strategic discussions in Brussels with a number of Commissioners and Director Generals to profile Foresight reports, and visits to the Far East and Americas to discuss opportunities for scientific collaboration.

### Asia

Following his role advising the UK and Japanese Governments on the repercussions of the Fukushima nuclear power plant meltdown, the GCSA has been active in Asia. He attended the annual Science and Technology in Society (STS) Forum dubbed the 'Davos of science' in Kyoto, Japan. He took part in a high level panel session on energy and nuclear safety and discussed the communication of risks during emergencies. He was subsequently involved in a nuclear industry workshop during a visit by the Prime Minister in spring 2012. These helped foster enhanced links between the UK and Japanese nuclear sectors.

After attending the STS Forum, the GCSA visited South Korea and Malaysia. In Korea the GCSA met with various research bodies to discuss strengthening the relationship between the UK and Korea, raised awareness of the impacts of climate change in a major workshop and initiated discussions on nuclear issues with Government stakeholders in advance of the Nuclear Security Summit in Seoul. The highlight of his visit to Malaysia was the signing of a UK-Malaysia agreement which provides the basis for future collaboration in priority areas in nuclear energy, research commercialisation and innovation, biotechnology and nanotechnology, and maritime engineering. These visits provided an opportunity to highlight the benefits of scientific advice within Government, secured high level engagement with Government and industry on a number of important issues and raised the international profile of UK science and education.

### The Americas

In May 2011, the GCSA visited Brazil with a small delegation of researchers and university representatives. During the visit, he discussed current and future collaborations between UK and Brazilian research funders, and witnessed agreements between the BBSRC and Embrapa Joint Action Plan on Food Security and between FAPESP and the Universities of

Nottingham and Southampton.

During his visit to Washington DC in February 2012, the GCSA met US Energy Secretary Steven Chu, President Obama's Senior Science and Technology Adviser John Holdren and colleagues from, amongst others, the World Bank and USAID. The visit cemented key relationships, explored opportunities for collaboration across a number of areas including shale gas and elevated the profile of UK science within the Administration, key science agencies and the broader science policy community.

## Europe

In summer 2011, the GCSA gave a lecture on climate change, growing world population and food and energy security to the German Academy of Science and Engineering – ACATECH whose members include CEOs of German multinationals. ACATECH was keen to learn how it could best develop and influence the German advisory process. Other notable meetings were with Munich Re - the world's largest reinsurance company to exchange views on climate change and open the door for collaboration with the Met Office.

The last year has seen the GCSA work closely with the Director General of the EU Commission's Joint Research Centre (JRC) to disseminate Foresight reports; The Future of Food and Farming and Migration and Global Environmental Change. Specifically, the JRC and GO-Science hosted two major multi-stakeholder events in Brussels to showcase Foresight's findings and to explore their potential resonance and impact with Europe's senior stakeholders from the policy, research and business communities.

## South Africa – Carnegie Group

The 2011, annual congregation of Science ministers and advisers from the G8+5 took place in South Africa. The GCSA used the forum to raise awareness of how science technology and innovation efforts should be organised to meet today's global challenges. He also held various bilateral meetings with counterparts from the G8+5 countries to drive forward the UK's science and innovation objectives.

# ANNEX A

## About the Government Office for Science

The Government Office for Science (GO-Science) supports the Government Chief Scientific Adviser (GCSA) in ensuring that the UK Government uses the best science and engineering research and advice for policy development and delivery.

The GCSA Professor Sir John Beddington reports to the Prime Minister and, within the Civil Service, to the Cabinet Secretary. The GCSA advises Cabinet and works closely with the Minister for Universities and Science.

GO-Science supports the GCSA and is located in the Department for Business, Innovation and Skills (BIS) but is semi-autonomous from it.

## Global Issues Science Team

The GO-Science Global Issues teams help the GCSA to ensure that policy decisions are well-handled by the Government and that science and engineering evidence is properly considered. Particular areas of focus are issues that cut across several departments' responsibilities. These include: climate change, energy, food, health and the effective use of science in emergencies and to safeguard against threats.

## Foresight

Foresight uses the latest scientific and other evidence, combined with futures analysis, to tackle complex issues and help policy makers take decisions affecting our future. Foresight's work makes a critical contribution to meeting important challenges of the 21st century – including food security, flooding and obesity. Foresight teams undertake in-depth studies examining major issues up to 100 years in the future and the Foresight Horizon Scanning Centre carries out short projects looking at discrete issues across the entire public policy spectrum.

## Science Capability & Networks

The Science Capability & Networks teams support the GCSA in a number of ways. They provide underpinning support for the network of CSAs, maintain the GCSA's guidance to colleagues across Government, keep abreast of science and technology activities in

departments, and support the GCSA in his role as Head of the Science and Engineering Profession. SCAN also host the Secretariat to the Council for Science & Technology

### **International Knowledge & Innovation Unit**

GO-Science is supported on international science, research and innovation issues by the BIS International Knowledge and Innovation Unit (IKIU). Amongst other things, IKIU is responsible for the Global Science & Innovation Forum, which engages across Government and with key stakeholders on overseas science and innovation strategies, co-ordinating the GCSA's overseas travel and the Global Science and Innovation Network (SIN) comprising 92 staff working out of British overseas missions in 46 different locations in 29 countries and territories.

# ANNEX B

## Government Office for Science financial information

The Government Office for Science is financed via the Department for Business, Innovation and Skills.

### GO-Science spend

GO-Science total spend in 2011-12 was £6.3 million. Of this, £4.0 million was admin spend and £2.3 million programme spend.

Table shows outturn for 2009/10, 2010/11, and 2011/12. Figures quoted are in £m.

	<b>2009/10</b>	<b>2010/11</b>	<b>2011/12</b>
<b>Programme</b>			
Foresight	2.9	2.3	2.3
<b>Admin</b>			
<i>GCSA/Private Office/Deputy Head</i>	<i>0.9</i>	<i>0.9</i>	<i>0.7</i>
<i>Foresight</i>	<i>1.7</i>	<i>1.4</i>	<i>1.3</i>
<i>Science in Government</i>	<i>3.0</i>	<i>2.1</i>	<i>2.0</i>
Total Admin	5.6	4.4	4.0
<b>Overall total</b>	<b>8.5</b>	<b>6.7</b>	<b>6.3</b>

# ANNEX C

## List of departmental Chief Scientific Advisers

Department	CSA	Expertise
Government Office for Science	Sir John Beddington	Population biology and bioeconomics
Department for Business, Innovation & Skills	Prof John Perkins	Chemical Engineering
Department for Communities & Local Government	Prof Jeremy Watson	Engineering
Department for Education	Carole Willis	Economics
Department of Energy & Climate Change	Prof David MacKay	Physics
Department for Environment, Food & Rural Affairs	Prof Sir Robert Watson Prof Ian Boyd (from Sept '12)	Environmental science Marine and environmental science
Department of Health	Prof Dame Sally Davies	Health, including Biomedicine
Department for International Development	Prof Chris Whitty	Epidemiology
Department for Transport	Prof Rod Smith	Engineering
Department for Work and Pensions	Dr Bill Gunnyeon	Occupational medicine
Foreign & Commonwealth Office	Prof David Clary	Chemistry

Department	CSA	Expertise
HM Treasury	Dr James Richardson	Economics
Home Office	Prof Bernard Silverman	Statistics, Mathematics and Operational Research
Ministry of Defence	Prof Vernon Gibson	Chemistry
Ministry of Justice	Rebecca Endean	Economics, Modelling, Statistics and Social Research
Food Standards Agency	Dr Andrew Wadge	Environmental Science and Toxicology
Forestry Commission	Prof Peter Freer-Smith	Forestry and environmental sciences
Health & Safety Executive	Dave Bench	Environmental biology & chemicals regulation
Scottish Government	Prof Muffy Calder	Computing Science, Computational Modelling
Welsh Assembly Government	Prof John Harries	Environmental science (climate change, Earth observation)

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