



Government
Office for

Science

GSE Annual Conference 2012

‘Science and Engineering Matter’

Queen Elizabeth II Conference Centre, London

Tuesday, 7 February 2012

GSE

Government
Science &
Engineering

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Opening plenary

At the annual conference on 7 February 2012, GSE members had an opportunity to celebrate achievements, learn from each other, find innovative solutions to common problems and work together on some of the challenges facing us as a professional community.

Sir John Beddington, the Government Chief Scientific Adviser, introduced the conference by reviewing some of the major achievements of government scientists and engineers, working alongside external experts and colleagues in other professions. Government scientists and engineers contributed to an international response to understand the potential impacts of Space Weather and design an effective response. Development of the Strategy for Life Sciences involved collaboration across departments, with colleagues in the NHS, industry and academia. Engineers in both public and private sector have played a critical role in delivering successful London Olympics.



Moira Wallace, Permanent Secretary at Department of Energy and Climate Change explained changes in her department to bolster the role of science and engineering. She issued four challenges to GSE members: 1) connect more with industry; 2) greater multidisciplinary working; 3) hone your communication skills so that you have greater impact with policy colleagues, and; 4) play your part in engaging the public in science and technology issues.

Colin Smith, Director of Engineering and Technology at Rolls Royce showed how they make long term investments in nurturing and applying engineering expertise to develop and bring technology to the market. He urged GSE members to connect with industry colleagues who have knowledge and expertise to help solve policy challenges. He also made a plea for consistency and coherence from Government across the wide range of policy areas impacting on industry: from industry and fiscal policies to university and education policies that affect the skills available in the UK.



The panel discussed questions from the audience including what it takes to be a great scientist or engineer in government, recruitment and retention, the role of GSE members in promoting new technology development, how to boost communications skills (top tip was to learn how to write a press release!).

*Above: Sir John Beddington addressing the conference
Left: Panel discussion with Sir John and keynote speakers*

Workshops and closing plenary

During the refreshment breaks, there was an opportunity to look round the marketplace which showcased the work of scientists and engineers in different government departments, agencies and key stakeholders.

Members of the GSE community led workshops on leadership, influential use of science and engineering, growth and innovation and pace and flexibility. The workshops gave delegates a chance to learn from each other and share their thoughts on improvements for the future.



Delegates visiting exhibition stalls

In the final plenary session, the Minister for Universities and Science, David Willetts, gave his perspective on the important role played by expert and experienced scientists and engineers in government.



Sir John Beddington closed the conference by reflecting on the strength of the community that has been built up over the last 4 years. Policy challenges increasingly cut across departmental, regional and national boundaries making collaboration across government and professions crucial. It is critical that scientists and engineers in government maintain their professional expertise and developing external networks with peers in industry and academia to ensure we continue to draw on the best available expertise and cutting edge thinking.

Minister of State for Science and Universities, David Willetts, addressing delegates at the end of the event

**** Visit [GSE Flickr](#) for more photos of the conference ****

Delegate feedback

Summary

On the whole, the conference was positively received as the figures below suggest. It was attended by 232 GSE members, Chief Scientific Advisers and exhibitors. This was a good turnout and a 13% increase over last year. As one of our delegates put, “it shows an eagerness for colleagues to learn about science and engineering” in government.

Following the conference, 117 attendees (50%) completed the evaluation questionnaire. They told us how important the conference is to them, that it was “enlightening and productive”, “a great initiative”, “a worthwhile event”, and encouraged us to “keep up the good work”. They particularly enjoyed networking with other members and Chief Scientific Advisers while visiting the various stalls in the lounge area. Some said the event boosted moral as they “felt more valued as scientists afterwards”.

The Queen Elizabeth II Conference Centre was a good choice, with its central location, decent facilities, hands-on staff and good catering. 88% of delegates who completed the survey said they liked the venue and 78% were pleased with the catering. The scores on the conference format were above average (69%) and slightly lower on the breakout sessions (52%). Views on the exhibition were positive (86%). Delegates particularly liked the fact “that it had people you could talk to” but would have liked to see more exhibitors from industry.

Those who went to the Abbey pub after the conference appreciated the additional networking opportunity with Sir John and colleagues in a relaxed environment. Some said they would have liked to meet more senior people. Those who couldn’t attend said they would have preferred to stay in the exhibition area.

- 96% were satisfied with the registration process and pre-event information
- 86% found the event enjoyable
- 83% were satisfied with the general organisation
- 81% found the event useful
- 78% thought the event website was useful

What delegates liked most about the event:

The plenary was what GSE members liked the most about the conference. 95% of those who replied to our survey said they enjoyed the first three presentations by Sir John Beddington, Moira Wallace and Colin Smith. They appreciated the opportunity to hear from senior civil servants in other departments and the private sector about the challenges faced by scientists and engineers. They said that having a speaker from outside the civil service was particularly inspiring and provided “a refreshing and honest view of leadership”. Colin Smith’s presentation gave an insight into engineering in the private sector and some food for thought as to what we, in the civil service could learn from it. The panel questions and answers with Sir John Beddington and keynote speakers were also received well by 92%.

Delegates appreciated the networking side of the conference. They highlighted the importance of feeling like they are part of a community of “fairly rational thinkers in government”. Meeting other scientists and engineers facing similar issues allowed them “to better understand the wider government issues”. They reconnected with old colleagues and met new people who they “wouldn’t normally meet” at the exhibition area which provided the

ideal space for networking. All in all, networking continues to be an important feature of the GSE annual conference.

A few delegates mentioned the ‘critical thinking’ presentation by Dr Graham Smith (Fera) at the ‘Influential use of science and engineering’ workshop, which they said was the sort of “cutting edge topic” they expected. Others were interested in “a good mix of examples” presented and in the senior scientists’ perspectives.

What delegates would like to see improved:

With an average of 52% positive rating, the breakout sessions were the least satisfactory part of the event. Delegates said that their workshops needed clearer aims and outputs and to be more focussed on impact than process. An hour for breakout sessions was clearly not enough time for some groups to complete presentations and have sufficient discussion time. Others felt they were not pitched at the right level both in terms of grade and area of work. Coupled with this, was the issue of noise overflow from adjacent workshops. Some said they were not satisfied with the feedback session as it “did not highlight a number of important points that were generated” in the workshops and with having to stand up during this session.

What delegates suggest for next year:

Several suggestions to help improve next year’s conference were received. These were mainly about changes to the conference format but also about content.

Format: Delegates asked for a better structure for the workshops including clearer instructions. They would like to engage with workshop panellists and a shorter feedback session. They would also like to interact with invited speakers, Chief Scientific Advisers and industry representatives both in the plenary and exhibition areas.

Views about timing were varied. Some said the current format suited people travelling from the regions and that a half-day event saves travel and subsistence costs. Others would like to start early to allow sufficient time for workshops, networking, market place and feedback session. There needs to be “a significant benefit for it to have net value”, and to achieve this, they prefer a whole day event with lunch.

Content: This is an area that attendees felt most passionately about judging by the tone of comments. Firstly, they would like a conference theme on a subject not previously explored such as health, technology and engineering (and not a popular subject like climate change, social research and policy). They asked that ‘delivery’ engineers are catered for just like ‘research’ engineers and scientists; and as they would like to maximise their learning and “make the best use of (their) skill sets”, they would like to engage in challenging tasks, recent case studies and hear about the latest developments instead of how valued they are.

Secondly, they would like workshops with SMART goals which are communicated to them in advance, so they can have useful input. These could be based on CPD or ‘chartership’ which are likely to appeal to all members. Also they suggested that “information is gathered in a useful way” at the workshops, action points clearly communicated and taken forward. Some had shown a willingness to take issues forward and would appreciate support to enable cross-departmental collaboration.

New ideas: Delegates sent us some new ideas for future events including smaller events organised by members and regional conferences.

Annexes

Annex A – Event programme

12:30 - Arrival and registration, plus opportunity to network and visit market place

13:30 - Opening Plenary: Science & Engineering Matters by Sir John Beddington, GCSA

13:45 - Keynote address, Moira Wallace, Permanent Secretary, DECC

14:05 - Keynote address, Colin Smith, Director of Engineering & Technology, Rolls-Royce

14:30 - Panel questions and answers with Sir John and keynote speakers

15:00 - Coffee break, and another opportunity to network and visit market place

15:30 - Breakout sessions

- 1: Leadership
- 2: Growth
- 3: Influential use of science and engineering
- 4: Pace and flexibility

16:40 - Feedback on workshops

17:00 - Keynote address, David Willetts, Minister of State for Universities & Science

17:15 - Closing remarks by Sir John Beddington, Mountbatten Lounge

17:30 - Event ends, Networking with Government Chief Scientific Adviser at

The Abbey (1 Abbey Orchard Street, London SW1P 2LU)

Annex B – Exhibitors at the Market Place

Defence Science and Technology Laboratory (Dstl)

Dstl exhibited an introduction slide show including case study examples of work on [simulation-based training systems](#), [improving imagery on operations](#) and others.

Leaflets on how Dstl not only works in defence but also across Government in the area of security, including a case study on providing crime-science advice to wider Government.

Copies of Dstl’s [Annual Report](#).

Representative from Dstl’s [Athena project](#) – which collects and stores MOD-sponsored scientific and technical research reports in a central repository to make these more widely available where possible.

Department for Energy & Climate Change

DECC ran two stalls, which was a great opportunity for us to showcase the important work we do to help the Department achieve its key objective of “Powering the Country, while protecting the Planet”.

To communicate our key messages we used:

- the 4 degree map an [interactive map](#) that highlights some of the possible impacts of runaway global temperature rise;
- the 2050 calculator, an online tool that has been used to engage the public on how we might achieve the transition to a low carbon economy whilst securing low carbon, affordable energy supplies and the difficult choices we face;
- and the climate machine an interactive piece that invites users to input energy behaviours with a set of slider switches. It instantaneously evaluates and displays energy footprint and resulting carbon footprint (<http://www.agencyofdesign.co.uk/projects/the-climate-machine/>).

Department for Food & Rural Affairs

Key projects were highlighted from across the Defra Network. Posters and brochures demonstrating the [Climate Change Risk Assessment \(CCRA\)](#); the [UK National Ecosystem Assessment \(NEA\)](#) and the [marine research programme](#) had particular appeal. For any questions, please contact Gemma Mulholland: gemma.mulholland@defra.qsi.gov.uk

Food and Environment Research Agency (Fera): Plant Pathology and Knowledge Information & Management teams

Exhibited two slide shows on the [CropMonitor](#) wheat disease [Smartphone app](#) and field based diagnostic [capabilities](#) which Fera provides. Small range of dedicated literature to take away.

Good interest in the spatial aspects of data we collect while out on the field and in the requirements for robust equipment for efficient working.

The event was particularly useful as we met representatives from sectors, such as the NHS, with whom we don’t normally have direct contact.

Food Standards Agency

Slide show on the Food Standards Agency's protection of food safety that is based on science and evidence, being informed by research and surveys and independent advice from experts, and also covering the Chief Scientist's Blog: 'Hungry for Science'.

There was interest in the Food Standards Agency's Continuing Professional Development Scheme for scientists that helps staff demonstrate that they are developing and maintaining their skills and knowledge.

Government Office for Science

Slide show on how GO-Science helps ensure policy and decision-making is informed by robust science and engineering evidence and by long-term thinking.

Reports and leaflets illustrated the wide range of information, guidance, training, networks of expertise and support on science and engineering issues offered by GO Science.

There was particular interest in [Foresight](#) reports on Tackling Obesities and the Future of Computer Trading as well as [GSE Continuous Profession Development](#) handbook and [Mentoring Scheme](#). For further information, please email us at GSE@bis.gov.uk

Historic Scotland

Historic Scotland's Conservation Directorate ran a stall showcasing the Scottish Ten project (www.scottishten.org), which was shortlisted for the Science, Technology and Engineering prize at the 2011 Civil Service Awards. This is a groundbreaking five year project using cutting edge technology to create exceptionally accurate digital models of Scotland's five UNESCO designated World Heritage Sites and five international ones in order to better conserve and manage them.

The stall attracted considerable positive attention and gave the team the opportunity to meet and interact with a range of governmental representatives, promoting the project and the ongoing mission of Historic Scotland to preserve and promote the historic environment.

Home Office

The Home Office stand presented introductory information on the work that the Centre for Applied Science and Technology (CAST) undertakes. A small range on literature was available to take away.

There was a good interest in the broad range of work completed CAST and the event proved especially useful in meeting other representatives from different sectors across Government.

Met Office Atmospheric Dispersion Group

The role of the [Met Office Atmospheric Dispersion Group](#) in informing decision-making across Government was highlighted using a slide-show and leaflets demonstrating recent examples of the application of science and expert knowledge. There was considerable interest in the responses to the Fukushima nuclear power plant incident and the Icelandic volcanic eruptions.

Work for the Government on animal health and greenhouse gas emission inventories was also showcased and the science behind the CHEMET service for the Emergency services explained.

The attendees enjoyed the marketplace and got to have some interesting conversations and make new connections. It has also helped us think about how we explain/promote the work we do to a wider audience, which will have positive impacts in the longer term. For more information please contact the group at enquiries@metoffice.gov.uk.

Ministry of Defence, Trials, Evaluation Services and Targets (TEST) Team

Good opportunity to promulgate recent work in building a Catalogue of Test and Evaluation capabilities across the UK and International supply base.

There was wider cross-departmental interest in the MOD/DE&S provided service which offers evaluation advice in the planning, conduct and exploitation of Test and Trials.

The team issued leaflets and marketing material which demonstrated the broad range of services and capabilities available from the Trials, Evaluation Services and Targets team at MOD Abbey Wood.

Prospect

The GSE Conference provided an opportunity to explain the benefits of Prospect membership to a wide range of existing and potential members from across Government departments and to explain the role of the union's science, engineering and sustainability advisory committee in campaigning for better science funding and careers and better recognition of the contribution of specialist skills to the key challenges facing government.

Research Councils UK

The GSE Annual Conference was an excellent opportunity to engage with scientists and engineers working across government and we look forward to being involved again in future.

Research Councils UK (RCUK) is the strategic partnership of the UK's seven Research Councils who annually invest around £3 billion in research. We support excellent research, as judged by peer review, that has an impact on the growth, prosperity and wellbeing of the UK. To maintain the UK's global research position we offer a diverse range of funding opportunities, foster international collaborations and provide access to the best facilities and infrastructure around the world. We also support the training and career development of researchers and work with them to inspire young people and engage the wider public with research. To maximise the impact of research on economic growth and societal wellbeing we work in partnership with other research funders including the Technology Strategy Board, the UK Higher Education funding bodies, business, government, and charitable organisations. To learn more about us, please visit www.rcuk.ac.uk.

Sciencewise

Introductory information to dialogue and the services that Sciencewise offers was made available on the stand. The interest was very high across a broad range of government departments. Approximately 20 contacts have been followed up since the Conference and have been provided with initial information. The contacts made will be re-contacted in April with a view to arranging a meeting and presenting the services on offer and the benefits of public dialogue in more relevant detail.

[Links to case studies of interest](#) were sent to all contact made. For more information on Sciencewise, please contact: Nanasha-Aishetu Oyofe, Project Communicator, Sciencewise-ERC. Telephone: 0870 190 6170, Email: Nanasha.A.Oyofe@aeat.co.uk

Annex C - Workshops

Workshop I - Leadership and skills

Chair: Andrew Wadge, Food Standards Agency

The civil service is changing with potential impacts on scientists and engineers. What skills and experience do scientists or engineers in the civil service need to rise to these challenges and forge a successful and fulfilling career?

The skills framework and a [handbook for continuing professional development](#) offer guidance to scientists and engineers working in government. Heads of profession are now developing a curriculum of training and professional development resources available across departments and agencies to support scientists and engineers in government, to sit alongside the other material available on the civil service learning online portal.

Different people will need different types of training and support at each stage of their career. Delegates looked at the diversity of roles open to GSE members across the civil service and considered the skills and experience necessary.

Senior members of the community shared their advice:

Plan your career

There are interesting and challenging jobs in science and engineering in government but don't forget to think about what your long term career goals and what will help get you there. Have medium term goals for your career as well as long term – identify your next move and talk to people in the role. Tell people what your aspirations are and seek their advice. Identify and tackle your personal weaknesses that might stop you getting the job you want. Keep a portfolio of examples that provide evidence to illustrate your experience and skills. Take jobs you don't enjoy if it helps to stretch you. Roles that help you see the bigger picture can also be valuable, understanding the role of Chief Scientific Advisers and how science in government works. Keep up your professional development if you move out of a specialist function and make the most of your spare time to read or attend events relevant to your discipline.

Focus on developing your skills

Communications skills, including listening skills are important. Understanding your customers is critical. Get policy experience early as nothing beats walking in someone's shoes to understand their role. The Defra analysts ambitions could apply to all GSE members working with policy teams 'visibility, pace and relevance'

Gain breadth of experience

Spread your wings early but remember that different organisations work in different ways, so take time to understand the local context to make sure you apply your expertise effectively.

Workshop 2: Growth and Innovation

Chair: Susan Chalmers, Intellectual Property Office

In December 2011, the government published an [Innovation and Research Strategy for Growth](#). Paul Mason from the [Technology Strategy Board](#) (TSB) explained their role in working with business to stimulate innovation and how they prioritise investments to turn emerging technologies into new industries.

Delegates explored how departments could work together more effectively.

There should be a more coherent approach between departments. Partnerships are important to build critical mass, to pool resources and share knowledge more effectively and more broadly – including the Research Councils, the TSB and academia. A single point of entry into the knowledge base was desirable – perhaps the GSE could act as a conduit.

There should be more horizon scanning to establish where we were going – what were the likely opportunities and problems. One example is HSE risk assessments on new technologies. Government should be monitoring technology development and be ready to support new industries as they emerge. One way we could do this is to use technologies better in the public sector, eg using technology in mobile phones to identify and record data.

Government funding is important, for research and the next stages such as seed funding of technology development.

It is challenging for Government to foresee what the next emerging technology might be. However, Government has to make some decisions about where it thinks the best opportunities lie. DECC’s use of the TINA method was cited as one way of approaching.

There should be a greater willingness to publish data and other information on the internet for the use of industry. For example, the “Ploughshare” scheme enables Defence Science and Technology Laboratory’s technology to be accessed by industry (particularly SMEs) to develop into civilian applications.

How can government better focus on what can be done in partnership with industry, particularly small and medium sized enterprises (SMEs)? Competitions around challenges (rather than pushing solutions) can be effective.

Government has a role in encouraging large companies who work with them to collaborate with SMEs. For example, MoD invests £400m on defence and security through SMEs and universities and also provide follow-up funding for to bring technologies to market. Large players are experienced in dealing with government and are well plugged into the system. SMEs can be sources of innovative products and services, and MoD (CDE) have processes to engage them. Could other Departments emulate this? Can we help SMEs through the bureaucracy of dealing with government? How can we address SME concerns on threats to their intellectual property from large companies?

We should use the existing framework of support as much as possible (IPO, standards, NMS etc) and raise awareness of IPR (beyond patents alone i.e. copyright, designs).

Workshop 3: Influential use of science and engineering

Chair: Jeremy Watson, Communities and Local Government

Case study 1: Rob Solly, Defence Science and Technology Laboratory, MoD

Scientists and engineers have worked with leadership at the MOD to change perceptions of how they can add value, not just by developing technology and maintaining critical facilities, but also by helping to reduce cost; developing human sociological aspects of capability; supporting current defence and security operations; and supporting decision making. In this last area, MOD is using “science gateways” to close the gap with decision makers, providing advice directly, reaching back into the wider knowledge base, and helping clients to develop their own analytical skills.

Case study 2: Chris North, International Knowledge and Innovation Unit, EU team, BIS

[Horizon 2020 programme](#) (€80 billion budget proposed) is the main European research and innovation programme for the period 2014-20. It will be split into 3 parts: excellent science, industrial leadership and societal change. UK officials have been working with European partners to outline funding priorities. Scientific evidence and stakeholder consultations inform the complex political decision making process involving the Council of Ministers and the European Parliament. Formal agreement on Horizon 2020 is expected during 2013.

Case study 3: Graham Smith, FERA

Biases in thinking exist and people sometimes make conclusions based on fundamental errors. We need to be careful when reporting results as mistakes can be made from the misunderstanding of statistical assumptions. People need to be aware of reporting bias from the media as well as conformation bias (people like evidence that supports their view).

Discussion:

In order to resolve uncertainty and debate on scientific topics, scientists need to evaluate the evidence for and against a topic (e.g. by making a list). Present the best idea against a topic they are defending in order to see the other side of the argument.

In order for science to have an influential part in decision making, scientists and engineers need to develop a simple language to communicate ideas to the public.

In government departments data tends to get filtered as it goes to the top. It is important that scientists and engineers are able to raise issues with senior management and CSAs on topics they see as important. If there is a gap in the evidence, it is important to publish the necessary information.

Workshop 4: Pace and Flexibility

Chair: Peter Tallantire, Civil Contingencies Secretariat, Cabinet Office

Chris McFee, Civil Contingencies, GO Science provided an introduction to the way the Government uses science and engineering advice to respond to civil emergencies. In an emergency where a national strategic response is required, a COBR (Cabinet Office Briefing Room) committee meeting may be called. Where science and technology advice is needed, a Scientific Advice Group for Emergencies (SAGE) will be set up to integrate the evidence and provide a ‘single source of science advice’ to COBR. SAGE aim to reach a consensus but major differences of opinion must be presented to COBR if they exist. It is important that the policy advisers and scientists avoid jargon when briefing Ministers, but avoid “dumbing down” the issues as it is vital that the uncertainty in the science is captured.

Responses have to be provided in a timely manner, often with incomplete information, especially in the early stages of an emergency response. Ministers will mainly be concerned with impacts of the emergency (e.g. will there be casualties, will energy supplies still be available?) whereas scientists may focus more on the scientific explanation for what is happening.

Finding the appropriate experts quickly can be an issue in the early stages of a response, particularly when advice to COBR is requested with only a couple of hours notice. This can also present challenges to scientists who are asked to give their ‘best judgment’ without necessarily having as complete a picture as they would wish. It is important to state the uncertainties and assumptions made in coming to the advice. Suitable experts are often found using the Chief Scientific Advisors network, and through institutions such as the Royal Society. However, departments are in the process of preparing lists of suitable experts for key risks, who can be consulted if an incident occurs.

Alex Salvoni, Horizon Scanning Centre, Foresight, GO Science gave an introduction to horizon scanning techniques that can help identify emerging issues and develop contingency plans. Delegates participated in an exercise to illustrate some of the approaches (environmental scanning and silent brainstorming).

What are the key changes that are likely to affect Government scientists or engineers over the next 10 years?

Political structures and governance	Policy challenges
Government policies and the spending review, delivery of more with less, Devolution and the EU’s future, charity versus Government funding, short-term contracts will make it difficult to build up an experienced staff base, retention of expertise.	food security, long-term investment in science, declining funding of R&D, risk assessment of new technologies, climate change, resource and water security, population growth and demographic change,

Societal values

state surveillance versus liberty, the public perception of Government science (eg "climate-gate"), changes in science education, less graduate knowledge of the nuclear industry, acceptance of robotics, how green issues will drive obsolescence, increasing litigation against scientists and engineers, new legislation on scientific issues, ethical questions.

New technologies

battery technology, rare earth metal availability for supporting technologies, will carbon capture deliver and what else can be done, cloud computing, genetic engineering.

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