DECC Science Advisory Group- 19th April 2013- Minutes

Agenda

1. Introduction and CSA's update
2. DECC role in responding to emergencies
   a) Overview
   b) Science and CSA's responsibilities in the event of an emergency
   c) Lessons learned from previous test exercises
   d) Civil nuclear, including international nuclear incidents
   e) Upstream emergencies (oil and gas)
   f) Downstream oil
   g) Electricity and gas distribution and supply
3. Evidence Strategy presentation
4. AOB

Present:	Apologies:
John Shepherd (Chair)	Paul Watkiss
David MacKay (DECC Chief Scientific Advisor)	Peter Cox
Nick Jenkins	
Jon Gibbins	
Stuart Haszeldine	
Sue Ion	
Tadj Oreszczyn	
Chris Mottershead	
Nick Pidgeon	
Harshal Mehta (DECC Evidence Team)	
James Davey (DECC Evidence Team)	
Katherine Hill (DECC CSA's Office) present for items 1-4	
David Warrilow (DECC Head of Science) present for items 3-4	
Alasdair Harper (DECC Emergency Preparedness and Response Manager) present for items 2-3	
Malcolm Campbell (DECC NDA team) present for item 2b	
Benjamin Green (DECC NDA team) present for item 2c	
Robert White (DECC Energy Development present for item 2d	
Hannah Wadcock (DECC Head of Downstream Oil Policy) present for item 2e	
Michael Cousins (DECC Energy Markets & Infrastructure team?)	

present for item 2f	
John Holmes (DECC Evidence Team) present for item 3	

1. Introduction and CSA's Update

John Shepherd welcomed everybody to the SAG meeting and asked David Mackay for his update.

Action: Secretariat to circulate internet link to last meeting's minutes.

The CSA had four matters to update the SAG on:

Electricity Market Reform (EMR) – This area of work is progressing well, but the possible unification of Electricity Demand Reduction (EDR) within EMR may create undesirable complications. There are other key areas of EMR that still need to be finalised (e.g. capacity markets) in addition to demand reduction. The SoS has requested expert advice on the issue.

Spending Review 2015/16- The CSA is making the case for more investment into Innovation in DECC and he is happy that the DECC board agrees with him. He is also seeking to increase funding to the Energy Technologies Institute (ETI) however he did point out they currently require an additional 20 million pounds of research funding which could not be found within the DECC budget. DECC works closely with ETI and this relationship will be key in the development of many technologies e.g. energy storage from wind.

Sue Ion highlighted the importance of the existing good relationship between the ETI and Research Councils. This is strengthened via the Low Carbon Innovation Coordination Group and should be maintained. The ETI mid-term review will be published shortly.

Stuart Haszeldine highlighted the difficulty of working with the ETI from the academic perspective.

Jon Gibbons added that a lack of UK manufacturing capacity acts as a barrier to taking ideas to market. Turning ideas into wealth requires the capacity to manufacture products. In his view the UK should aggressively pursue areas where wealth creation is possible – the difficulty is identifying these. Jon also highlighted that some quite 'fundamental' research is still needed at higher Technology Readiness Levels (e.g. basic chemistry research into CCS processes) but the Research Councils do not fund this, so there is a risk no one does. RC funding should not be rigorously restricted to TRLs 1 to 3 only.

SAG members considered that the R&D funding landscape for energy technologies had become undesirably complex and costly to navigate: better coordination and simpler mechanisms that enable academic-industry partnerships are needed.

Renewables Target- CSA expressed his concern that the 2020 renewable target was looking increasingly difficult to meet, particularly in the heat and transport sectors. He will be looking for help from the ETI in identifying additional renewables potential but would also welcome any ideas the SAG may have. The obvious way to do this is to increase heat demand and provide that increased demand renewably but this might result in perverse incentives.

[Action: SAG members to submit ideas for promoting uptake of renewables to the CSA]

The take up of the Renewable Heat Incentive had been slow although the RHI team state this is now picking up.[1]After a slightly slower initial period during December 2011 and January 2012, the number of applications received by month has remained fairly consistent from February to June 2012. There was a notable increase in applications in July to over 100 applications a month, since when the number of applications has grown steadily to reach 220 applications in January 2013, with a small fall to 193 in February. There has also been an increase in biomass boilers and biomass energy plants. The CSA has concerns about the implications of the projected scale of bioenergy imports into the UK. For example, by 2020 between 30 and 45 Mt(C) of dry biomass will need to be imported (probably from North America). Current total production in North America (for domestic consumption and export) is around 200 Mt(C).

The CSA is concerned that the definition of sustainability, with regard to bioenergy, needs to be looked at carefully. It is important to account for the total emissions and removals of CO_2 resulting from exploitation of bioenergy, including the effects on carbon stocks of standing biomass. The intensity of cropping and timescales & discount rates used need to be considered. The CSA's team is doing some work in this area and is in conversations with DECC policy officials to ensure a sound analysis, in order not to incentivise activities that are not properly sustainable. SAG members would welcome further discussion of this topic.

[Action: CSA to circulate results of analysis to SAG for comment when available]

Finally, the CSA announced that he has been appointed the first Regius Professor of Engineering at the University of Cambridge. Regius Professorships are prestigious academic positions, created by the monarch. The Engineering chair is a new Regius Professorship, announced in 2011 to celebrate the Duke of Edinburgh's 34 years as Chancellor of the University. SAG members congratulated the CSA on his appointment.

2. Government role in responding to emergencies

a. Overview - Alasdair Harper

Alasdair Harper gave a comprehensive overview on the role of Government (and DECC in particular) during emergencies.

An "emergency" is defined in the Civil Contingencies Act, 2004, as

An event or situation which threatens serious damage to

- human welfare in the UK
- the environment in the UK
- the security of the UK.

The government framework divides response to emergencies into five levels

[1] Official statistic on RHI and RHPP can be found at : https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/renewable-heat-incentive-renewable-heat-premium-payment-statistics

I. Local response only
II. Local response with government officials providing two-way channel to central government or lead government department (LGD)
III. Serious – Level 1 – LGD led central response, with Cabinet Office Briefing Rooms (COBR) not involved
IV. Significant – Level 2 - Co-ordinated central response led by LGD from COBR
V. Catastrophic- Level 3 – Central direction from COBR

The UK is yet to have a Level 3 event. The London 7/7 bombings were seen as a level 2, and the possible fuel tanker strike as a level I (DECC were LGD for this emergency).

DECC will act as the LGD in the following areas; gas (upstream and downstream), oil (upstream and downstream), nuclear accidents (UK civil installations and overseas) and electricity. There are trained teams in DECC to deal with any given situation in all these areas.

Action SAG advises DECC to identify people (e.g. members of relevant Learned Societies) who would be able to review the DECC emergency risk registers with a view to providing challenge and comment, and could also assist in this task.

b. Science and CSA's responsibilities in the event of an emergency- Katherine Hill

Katherine Hill gave a brief summary of how science input would be passed into the COBR meetings during an emergency and the responsibilities of the DECC CSA in an emergency situation.

There are three ways in which scientific input in an emergency can be called upon. In a National emergency situation (Level 2 or higher) the COBR is convened which has powers to convene SAGE (Scientific Advisory Group in Emergencies). The SAGE will comprise scientific experts across a number of different sectors (chosen according to the nature of the emergency by the Government Office for Science). The meetings will be chaired by the Government Chief Scientific Adviser who will directly relay the advice back to the group meeting in COBR.

If felt to be necessary the lead government department, its CSA or the Government CSA can request independent advice or small working groups outside of the main SAGE. Some such groups (e.g. JAM – Joint Agency Modelling for Nuclear) have already been defined.

For an incident which DECC considers to be an emergency but for which it has not been necessary to form a meeting at COBR, the DECC CSA may choose to form his own group of advisors as necessary. This could include SAG members if required.

To ensure the DECC CSA is prepared for an emergency situation the CSA's office has written a manual setting out the procedures that should be followed. This manual is updated annually.

c. Lessons learned from previous test exercises- Malcolm Campbell

The presentation gave an overview of a government-wide run exercise known as Northern Chain developed to test the response of the government departments and local authorities in an emergency. The exercise took place over a continuous 36 hour period over 2 days (5 and 6 March

2013). The scenario included a Level 2 series of events which resulted in an explosive attack at the Sellafield re-processing plant creating an off-site radioactive plume. This required a test of the site specific, and off-site multi-agency response plans. DECC ran three 12 hour shifts.

The CSA participated in this exercise and informed the SAG about the experience and what he felt were the lessons to be learned. These included

- ensuring clear mechanisms for the transmission of scientific advice
- avoiding over-simplification of scientific advice
- ensuring adequate consideration & communication of uncertainty (in both measurements and inference)
- ensuring adequate communications (both facilities & procedures)

The SAG considered that a possible emergency related to nuclear installations already has a very strong level of contingency planning. DECC should focus their efforts on less obvious forms of emergencies e.g. a terrorist attack at a LNG terminal. **Providing adequate communications and access to information if the internet should become inoperable could also become a crucial issue for the future.**

d. Civil nuclear emergencies, including international nuclear incidents- Benjamin Green

This presentation looked the government aims to ensure all organisations have clear and effective risk assessment processes in place. The risks the UK faces are continually changing and the government monitors the most significant emergencies that the UK and its citizens could face over the next 5 years through the National Risk Assessment (NRA). The NRA is a confidential assessment, conducted every year, which draws on expertise from a wide range of departments and agencies of government. The NRA is intended to capture the range of emergencies that might have a major impact on all, or significant parts of, the UK. These are events which could result in significant harm to human welfare: casualties, damage to property, essential services and disruption to everyday life. The risks cover 3 broad categories: natural events, major accidents and malicious attacks.

e. Upstream emergencies in oil and gas – Robert White

In the oil and gas industry the upstream sector includes;

- The searching for potential underground or underwater crude oil and natural gas fields.
- Drilling of exploratory wells/subsequent wells.
- Operation of the wells that recover and bring the crude oil or natural gas to the surface.
- Pipelines between fields and to the shore.

UK upstream infrastructure is normally created as part of a field development. This consists of offshore wells and platforms – around 350 fields and 300 platforms offshore within the UK EEZ. There are pipelines between fields, and to the shore – around 9,000 miles in total for UK – plus a number of onshore terminals.

In this area much of the emergency planning is done in conjunction with operators of the platforms and the terminals e.g. Shell and BP. Oil spills and gas leaks are the most common events considered, with well-established emergency plans and procedures in place.

f. Downstream oil- Hannah Wadcock

The downstream sector commonly refers to;

- The refining of petroleum crude oil and the processing and purifying of raw natural gas
- The marketing and distribution of products derived from crude oil and natural gas.

In 2011 petroleum products were the main fuel (by energy) used by final consumers in the UK (48%) compared to natural gas 29% and electricity 19%.

The UK's total annual demand for petroleum products is 62Mt. Of this 42Mt is met through domestic refineries and 23Mt through imports. The total output of our refineries (80.6Mt) is greater than our overall product demand, but not matched on a product basis – the UK is the biggest importer of aviation fuel in the OECD and third largest exporter of gasoline.

In an emergency (e.g. the threatened fuel tanker strike) the DECC Downstream Oil team would follow an existing National Emergency Plan for Fuel (NEP-F). This sets out a suite of tools that can be implemented as required – independently or in combination – ranging from voluntary options, to changes in regulation, to measures that require the use of Emergency Powers. The tools would be used in a way that is proportionate to the risk and what was happening on the ground. Emergency Powers are seen by Government as a tool of last resort.

The expectation within the NEP-F is that local responders have adequate Business Continuity Plans in place and should look to these in the first instance to respond in the event of fuel shortages. A number of the tools outlined in the NEP-F were implemented during the threatened tanker strike e.g. a temporary increase in the number of hours tanker drivers could operate for.

g. Electricity and gas distribution and supply – Michael Cousins

In the event of a major gas or electricity supply emergency, both industry and government would have significant roles to play. DECC is the Lead Government Department for responding to major energy emergencies. The National Emergency Plan for Gas & Electricity sets out a framework for industry and government to work together to manage a major supply emergency.

For gas, in the event that supply and demand fails to balance, there are contingency plans in place under the Gas Safety (Management) Regulations. The Network Emergency Co-ordinator (NEC), currently Director of Network Operations at National Grid, has statutory duties during an emergency, and is responsible for taking steps to rebalance gas supply and demand.

DECC has a number of ways to help minimise the impact of an electricity or gas supply emergency. As a primary measure, DECC can instruct power stations to use alternative fuel sources to generate electricity, as part of the Fuel Security Code. If a prolonged electricity shortage affects a specific region, or the whole country, electricity rationing might be necessary. The Electricity Supply Emergency Code (ESEC) sets out the process for ensuring fair distribution nationally while protecting

electricity supplies to essential users from the health, transport, energy, communications , water and sewage sectors, using a process known as 'Rota disconnections'.

SAG discussed the role of the CSA in an emergency and ways to ensure that he has adequate support and access to relevant expertise. Several SAG members indicated that they would be willing to participate in reviews of the DECC risk registers.

SAG members observed that

- the hard problem was to provide a plan for dealing with unforeseen events, and felt that this should be considered as a specific issue (e.g. as an additional item on lists of foreseeable events)
- the use of social media tools in future emergencies should be considered explicitly, both as a potential resource for and as a threat (through rapid propagation of unreliable information) to effective communication
- loss or degradation of internet communications could constitute an emergency in its own right, and seriously exacerbate other emergency situations and the response to them
- excessive reliance on resources, facilities & mechanisms provided by industry sectors could create unnecessary risks and should be avoided

Action: CSA Secretariat to compile lists of SAG members willing to be consulted if necessary.

3. Evidence Strategy presentation- John Holmes

John Holmes requested SAG help in reviewing drafts of DECC's Evidence Strategy, being prepared on joint behalf of the CSA and Chief Economist (Steven Fries). The Strategy will consider evidence needs & gaps, opportunities (including synergisms) and priorities, to support open and evidence-based policy-making. The intention was that the Strategy will be published in July, and the review process would involve the formation of a working group made up of members of both the DECC SAG and the joint DEFRA/DECC Social Science Expert Panel (SSEP).

- It was agreed that the early bulleted draft will be sent to all the SSEP and SAG members for comment and sent directly back to the Evidence team.
- A working group to support drafting of the Evidence Strategy will be formed. The first full draft will then be sent to this group who feed their comments to a convener. The convener will provide the Evidence Team a collated response.
- A teleconference may be involved at some stage

A number of the SAG members offered to help but had concerns with the short deadlines between the drafts.

Action: Secretariat to assemble list of SAG members to participate: [Done}

4. AOB

SAG Subgroup: Feasibility of changes implied by 2050 scenarios for the Carbon Plan

John Shepherd proposed the establishment of a SAG working group in response to SAG Action – "A subgroup of SAG members to consider and evaluate the relevant 2050 pathways and highlight any elements, or pathways, that they think stretch credibility" Starting with The Carbon Plan, which envisages major changes in energy generation and infrastructure (e.g. 100 GW(e) installed of low carbon electricity) by 2050, the subgroup would oversee a reality check of the pathways set out in the Plan. This work would be led and executed by DECC staff, overseen by the SAG working group.. The work would involve assessment of the pathways, focusing on whether the combined volume of technology deployment under each pathway is feasible given UK capacity. An assessment of the social acceptability of the pathways would also be useful.

Sue Ion, Nick Pidgeon, Nick Jenkins, Stuart Hazseldine, Tadj Oreszczyn, Jon Gibbons and John Shepherd have all volunteered to participate in line with the agreed terms of reference.

Action – CSA to speak to Tom Council about provision of manpower resources to undertake and lead this work.

Horizon Scanning

John Shepherd proposed a new structure to the Horizon Scanning paper which was agreed on by the SAG. The main body of paper will consist of the key messages and conclusions in a tabular format with footnotes to give further details in certain areas.

Action – John Shepherd and SAG secretariat to meet and finalise the paper, SAG members will be asked to comment on areas as required.

SAG Membership

John Shepherd is happy to step down as the SAG chairman at the start of 2014. He asked the SAG to consider whether they would be interested in the role and how long they would like to remain as part of the group. His suggestion is that one third of the SAG membership changes annually from 2014 onwards.

Action –- SAG secretariat to poll the members to establish whether they would like to leave at the end of 2013, remain one year or remain for two years.

Forward Look

The agenda for the next meeting will focus on

- Low-carbon Heat, with the aim of understanding this as an energy system.
- Alternative pathways to an International Climate Negotiations (Proposed as a Joint SSEP and SAG discussion). Potentially interested SAG members include: Peter Cox, Paul Watkiss, Chris Mottershead, Jon Gibbons and John Shepherd.
- DECC outlook on Electricity Generation post-2015

Action – SAG secretariat to poll members on preferred dates for the next two meetings (with SSEP participation at next meeting as appropriate).