# DECC SCIENCE ADVISORY GROUP 11TH SEPTEMBER 2012

# DRAFT MINUTES

**Agenda**

1. **Introduction**
2. **Update on Geological Disposal Facility (GDF)**
3. **Energy Efficiency Strategy and Smart Thermostats**
4. **Potentials for Smart Controls of home heating**
5. **Technical aspects of Smart Meters and Smart Grids**
6. **CSA's update to the SAG**
7. **Introduction of Ravi Gurumurthy to the SAG**
8. **SAG Forward Look**
9. **AOB**

| Present: | Apologies: |
|---|---|
| John Shepherd (Chair) | Paul Watkiss |
| David MacKay (DECC Chief Scientific Advisor) | Peter Cox |
| Nick Jenkins | Nick Jenkins |
| Jon Gibbins | |
| Stuart Haszeldine | |
| Sue Ion | |
| Tadj Oreszczyn | |
| Chris Mottershead | |
| Harshal Mehta (DECC Evidence Team) | |
| Jane- Dennett- Thorpe(DECC Head of Evidence Team) | |
| James Davey( DECC Evidence Team) | |
| Katie Black(DECC Evidence Team) | |
| Katherine Hill (DECC CSA's Office) | |
| Damitha Adikaari (DECC Engineering Team) Present for item 5-9 | |
| Ian Llewellyn (DECC Engineering Team) Present for item 5-9 | |
| Robert Edwards(DECC Engineering Team) Present for item 5-9 | |
| Mark Higson( DECC CEO Office New Nuclear) Present for item 2 | |
| Peter McDonald (DECC Head of GDF, EU and International)Present for item 2 | |
| Bruce Cairns (DECC Deputy Head GDF)Present for item 2 | |
| Peter Morgan( DECC Technical Advisor Smart Meters) | |
| Teresa Camey( DECC Head Smart Meter Policy) Present for items 5-9 | |
| John Sartin(DECC Lead on Energy Efficiency Strategy) Present for items 1-4 | |
| Sophie Boldon ( DECC Energy Innovation)Present for items 1-3 | |
| David Warrilow (DECC Head of Climate Science)Present for items 1-4 | |

## 1. Introduction, Minutes & Matters Arising

John Shepherd noted that the minutes of the previous meeting were not yet finalised.

**Action: SAG members to provide any further comments on the minutes to Harshal Mehta by Friday 14th September.**

## 2. Geological Disposal Facility (GDF).

Mark Higson (DECC) summarised the current status of the GDF programme. He stressed that the programme team is working hard to ensure that the best possible location for a GDF is found and is following the principles set out in the White Paper that Government would proceed on the basis of voluntarism first. The programme is still in its early stages, and while council and local community approval is an essential criterion, few candidate locations have volunteered as yet.

There are three major challenges that the programme faces:

- Public acceptability
- Technical issues i.e. ensuring suitability of combined geology and engineering solutions.
- Financial implications of the programme not meeting its deadlines.

### SAG Comments

The CSA sought the views of the SAG on what his future level of involvement should be. The SAG emphasised that as well as the public acceptability, and the geology of an area, the programme should consider engineering aspects and transport of waste with a similar level of scrutiny. The choice of a site is a complex multi-criteria problem, and unduly prioritising one aspect could make finding an overall acceptable solution more difficult. The programme should also look to lessons learned from other countries in their pursuit of similar facilities. The SAG did not have a unanimous view as to whether a further geological review of possible locations in order to minimise the risk to the overall programme would be helpful at this stage, but would be happy to assist with such a review as and when necessary.

**Action: Secretariat to request Bruce Cairns to give a presentation to the SAG about the roles and responsibilities of the Nuclear Decommissioning Authority**

## 3. Energy Efficiency Strategy

John Sartin (DECC) began by explaining the Energy Efficiency Deployment Office's (EEDO) high level objectives:

- To develop a national energy efficiency strategy (by the end of 2012).
- To be the centre of government expertise on energy efficiency.
- To support and challenge the development and delivery of major energy efficiency programmes across Government, ensuring a joined up "offer" to the consumer.

His presentation also included an overview of the effectiveness of current energy efficiency policies and projected impact of energy efficiency policy from 2010-2030. [1]

SAG Comments

John Shepherd pointed out that whilst energy efficiency policies are required, they risk being ineffective while energy prices are low. Other SAG members observed that incentives such as a substantial price on carbon were needed to promote innovation and reducing carbon intensity, and it was vital to avoid carbon lock-in. A cost/potential curve (like the McKinsey curve for the abatement of GHG emissions) would be a useful guide.

The potential of innovative controls (e.g. the NEST thermostat) was discussed. EEDO is considering how to study the potential of such heating controls, so that they might be included in policy (see also next item). The crucial role of solid-wall insulation and the continuing need for better technology and products was noted. Once again, stronger incentives (especially for deployment by landlords and facility managers) are needed.

## 4. The potential for Smart Controls of home heating (Tadj Oreszczyn and David Shipworth)

The presentation started by defining "Smart Heat", as the term has very different meanings to different audiences (and may include cooling where required). In addition, different stakeholders expect smart heat to provide different services. Although government and industry often focus on smart heat from the perspective of energy saving, emissions reduction, demand smoothing and thermal comfort, there are many other aspects that occupants may require which smart heat may deliver (including health, cleanliness, aesthetics, air quality and damp avoidance).

Although there are many claims about the potential energy savings that smart heat may deliver (e.g. 30% of the heat component of final energy use) at present these are either based on small field trials or theoretical modelling. Historically the model predictions for the performance of heat controls have not materialised in practice. In fact smart heat may result in increased energy use if used to improve comfort levels. There is a need to better understand, both what people want from smart heat and its potential, and to undertake more substantial smart heat field trials. Organisations such as the Energy Technology Institute, EPSRC and DECC have various plans to undertake research in this area however there is a challenge to undertaking this research in a time scale and manner which can support highly innovative and rapidly developing smart energy companies. Good measurements are not easy and are (as always) crucial.

[1] http://www.decc.gov.uk/assets/decc/11/about-us/Science/6992-eedo-strategy-presentation-sartin.pdf

### SAG Comments

It was agreed that there is a need for much more work to be done to better understand consumer behaviour both now and with improved controls, as there is high potential for unintended consequences. Even simple devices such as easily and remotely programmable room thermostats (see above) could be very effective. An important innovation would be improving and reducing the costs of heat meters. Experience elsewhere where heat is sold directly (e.g. with district heating schemes) could be helpful. David MacKay expressed his desire to set up a research programme to trial innovations in the area of smart thermostats and heat meters, with the aim of reducing costs.

## 5. Presentation on technical aspects of Smart Meters and Smart Grids

Peter Morgan (DECC) began by giving a high level overview of the Smart Meters programme. The foundations of the programme are due to be in place by December 2014. This will be followed by a five year roll out period and a completion target of December 2019. It is expected that there will be benefits both to consumers and to suppliers.

The minimum requirements of smart meters are encompassed within the Smart Metering Equipment Technical Specifications (SMETS). The first iteration of SMETS has been passed by the EU and is now available as a white paper. Crucial requirement include interoperability and network (WAN) protocols.

SMETS2 is currently going through a consultation process. The most significant proposals in this consultation relate to the Home Area Networking solution (HAN), the communications hub requirements and responsibilities, and equipment assurance. The presentation then covered more technical issues of Home Area Networks (including Wi-Fi reliability). Further information will be available in a report with the team's findings, to be published later this year.

### SAG Comments

The SAG were particularly interested in the data access aspects of Smart Metering: concerning both personal privacy aspects with regards to individuals, and the availability of data for research and policy development purposes (i.e. not only for the energy suppliers). Peter Morgan explained that only very basic information will available to energy suppliers with regards to consumer usage and permission of the customer would be required if any anything more specific was required. With regards to data sharing with government and academics, there is currently no policy in place to access this information; all data will be kept confidentially with the Data and Communications Company. SAG members suggested that an opt-in (with incentives) to collecting finer resolution and more detailed data could be useful, and that aggregation of anonymised data could allow data protection problems to be overcome, to allow the potential utility of the data to be fully realised.

The SAG also questioned why real-time data would not be available to National Grid, since the information could prove invaluable for load balancing and in emergency situations when load shedding is needed to avoid power cuts. The CSA added that a "use case" paper covering National Grid access will be made available shortly. The SAG observed that there was need for consumers to be involved in an engagement process, that a mechanism would be needed to deal with unforeseen applications, and that faster sampling speeds (better than 10 sec) were needed for consumer applications. The CSA considered that a specification for electric vehicles and high-power swirchable supplies would be needed very soon.

## 6. CSA's Update

1. The CSA recently visited France to attend a meeting at the Jules Horowitz Reactor (JHR). JHR[2] will provide a modern experimental capability for studying materials and fuels behaviours under irradiation for applications such as:
    - Support to nuclear power plants of generations II and III
    - Development for future generations of reactors
    - Radioisotope production for medical applications.

    The CSA is keen to find any DECC interest in getting involved in the project and to make a business case for this. He is also interested in gauging if there is any British industry interest in the project.
2. On 30th October DECC is holding a workshop on smart products. The CSA will present the conclusions of this at the next SAG.
3. The CSA will begin work to engage with MP's on the 2050 calculator, starting with the Energy and Climate Change Select Committee next week.
4. A report on Electricity Demand Reduction (prepared by McKinsey for DECC) is being published as an early draft document after extensive revision as part of the peer review process.
5. Work is being done to clarify the overall whole-system green-house gas consequences of a range of bioenergy growth, supply and use options . The CSA feels DECC requires more expert opinions and he plans to establish a specialist working group review the work done so far.
6. A review of figures in the Green Deal had found that some assumptions (in particular the assumed U-value of solid brick walls) used when running SAP modelling program may be incorrect for the average solid wall property in the UK, so the benefits of solid wall insulation may have been overestimated. Since SAP underpins almost all domestic energy efficiency policy it is important that there is a review of the assumptions and uncertainties associated with SAP. The assumptions underpinning policy development were changed to reflect our understanding of the evidence base

[2] http://www.ncnr.nist.gov/trtr2005/Proceedings/Gaillot%20-%20JHR%20Experimental%20Capabilities%20text.pdf

(see the Final Impact Assessment, June 2012). However, further work is required to improve the evidence base on solid wall insulation and we will be going out to tender shortly.

7. Work for the Renewable Heat Incentive had shown that the realised performance of heat pumps is extremely variable, and incentives or standards for good system design and installation may be needed (especially as all of the output of heat pumps is treated as renewable…).
8. Moira Wallace is leaving her post as Permanent Secretary. A successor will be appointed in the coming months.
9. **CSA to share a paper on "How to Fix the Inefficiency of Global Cap and Trade" with the SAG.**

## 7. Introduction of Ravi Gurumurthy to the SAG

Ravi is the new Director of DECC Strategy. He outlined to the SAG his three main objectives:

1. Setting goals and working out carbon budgets
2. Making sure DECC has a portfolio of policies that will meet its objectives
3. Flexible problem-solving within DECC

The SAG offered their expertise if he required any assistance. Members suggested that big challenges ahead included backlash against higher energy prices, availability of skilled people to ensure that electricity market reform delivers carbon emissions reductions, and electricity and heat system balancing and demand management. Some further possible but uncertain potential eventualities were discussed: these included availability of unconventional fossil fuels (leading to low carbon prices), unexpected climate change (especially in & around the Arctic), public refusal of new nuclear capacity, continued failure to achieve any meaningful international agreement on carbon emissions reductions, political polarisation of opinion on scientific issues (including climate change), and pressure to repeal the Climate Change Act. The SAG agreed to expand, assess and prioritise these and other eventualities as part of a Horizon Scanning exercise (see below)

## 8. Forward Look

In order to ensure SAG can be most effective, providing timely advice, especially in advance of major decisions, as well as allowing members time to prepare, it was agreed that the majority (around 2/3) of the agenda would be set for a number of meetings in advance. James Davey (DECC) presented a number of ideas for a "Forward Look" for future SAG meetings, which were discussed. These included climate engineering, imperfections of the Climate Change Act, the possibility of a new basis for an international agreement (c.f. the Cramton & Stoft 2012 paper), enhancing adaptative capacity, and alternative systems for managing electricity.

**Action: SAG Chair, CSA and Evidence Team to consider the agenda for next meeting and longer term forward look.**

## 9. AOB

The SAG discussed the current requirement for DECC to receive Hadley Centre papers at the point of their submission for publication.

**Action: The CSA to discuss the matter with the new Head of Science.**

Meeting concluded at 16:30