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Introduction

I am very pleased to be here today to represent the UK Department for Energy and Climate Change.

DECC was founded just over a year ago, with the aim of tackling challenges we face to our environment, economy and the future security of energy supplies.

It has three aims:

- Ensuring our energy is secure, affordable, and efficient
- Bringing about the transition to a low-carbon Britain
- And achieving an international agreement on climate change at Copenhagen in December 2009

The close linkage between greenhouse gas emissions and energy use mean that it was essential to join up these two significant areas of national and international policy.

I will however, focus on the role climate science has played in the development of policy on climate change, its continuing importance and a little about what scientific information we will need in the future.

Science and Environmental Policy

I have been closely involved in both the scientific and policy aspects of three major environmental challenges over the last 20 years or so – acid rain, ozone depletion and climate change.

I can make a few observations from this experience: firstly most issues of this nature evolve through a common pattern, secondly science plays a key role in shaping the policy response

The development of the issues involves several common factors:

Phase 1 Initial reactions - shock and denial

- identification of a potential problem by scientists
- calls for action to deal with the problem from NGOs
- resistance from Governments/ Industry/ and other who might lose if the status quo is changed

Phase 2 Reflection or Procrastination

- Calls for more science to reduce uncertainty (legitimate but can be just to delay)
- Setting up international science assessments (eg IPCC)
- Debates on the robustness of the science – contrary voices from scientists – all set to delay action. Confusion in the public mind. Joy in the media at the prospects of more copy!

Phase 3 Acceptance and action

- Evidence tightens up – scientific consensus forms
- Pressure groups press for action
- International process initiated to handle the problem (eg UNFCCC, Vienna Convention)
- Governments recognise the need to act – maybe also that there are other benefits
- Sceptics redouble their efforts as a deal gets near.
- Agreement reached (but may well be less than science indicates)
- Repeat several times until problem effectively solved. (does this sound familiar?)

In this whole process science is essential in identify that there is a problem and in identifying possible solutions.

Because it is so fundamental to the policy response it is the first area to come under attack – from individuals and groups claiming scientific objections – the so called sceptics.

The techniques are similar – it may be claimed that an effect has been missed, the data are wrong, the models lacking, it has all happened before, it's perfectly natural, it's all too complicated and uncertain.

Of course there may well be real issues but the scientific community as a whole usually does not shrink from these.

Time for Action on Climate Change

- Climate change has been going through this process since the 1980s. Initial concerns came from the scientific community, who themselves recognised that there were uncertainties.
- 21 years ago the IPCC was formed – one of the most remarkable science assessment processes there is, involving thousands of scientists worldwide and engaging Governments directly in the assessment process. It has attracted eminent scientists who are prepared to put in their own time and effort to provide the best assessments. Its influence has grown and the award of the Nobel Peace Prize in 2007 was in recognition of the work of such efforts.
- As science has developed – enormously over the past 20 years as ENSEMBLES shows - so the IPCC has been able to make firmer statements about the risks of climate change and what we need to do to both limit and manage them. And it is worth observing in all this time the basic thesis has not changed.
- The clear implication from its assessments is that we need produce a shift in society unlike anything we or any other nation has seen before, if we are to avoid severe dislocation and damage from a changing climate.
- To do this we have needed to persuade the public, and the international community that action is vital, and, despite the huge body of scientific evidence, there are always those who take a contrary line – especially ahead of a major agreement. Some recent comments:
- ‘As a physicist I do not dispute the physics of global warming ...the cause for concern is the assumption in the models ... that positive feedbacks will amplify the effects.’ Peter Lilley (Hitchen and Harpenden) (Con) **18th June 2009**
- ‘equally mind-boggling now are the implications of the price we are being asked to pay by our politicians to meet that threat. More than

ever, it is a matter of the highest priority that we should know whether or not the assumptions on which the politicians base their proposals are founded on properly sound science.’ - Christopher Booker, Telegraph **25th October 2009**

- Little wonder that the public understanding of the problem and doubt that climate change is real has apparently increased as we saw reported in the UK press last weekend.
- What is clear is that persuasion is going to be a process strongly founded on visiting, and revisiting the scientific case for action. It also means that the assessment of the problem and the case for action needs to be clearly communicated by the scientific community.

No more science needed?

- It became common a few years ago in policy circles to say that the scientific case had been made and that it was time to act. In fact we didn't need science any more.
- Nothing could be further from the truth. We will need to adjust our ideas and projections in the light of new research and new evidence.
- The path to reduce emissions on the scale required will be questioned continuously and the arguments will need to be won by living and developing science, not just from the assessments made years before.
- In 2015/6 it is likely that there will be a further review of commitments made in Copenhagen.
- The 5th Assessment Report of the IPCC will be essential for that – and the research that is initiated now and completed in the next few years will feed into that.

Making the Case for Action

- Formally the agreement in Copenhagen will rest on the 4th Assessment Report. At Bali in 2007 it was recognised that the Fourth Assessment Report represented the most comprehensive and authoritative assessment of climate change to date.

- The Bali Action Plan which culminates in Copenhagen, recognised that “warming of the climate system is unequivocal, and that delay in reducing emissions significantly constrains opportunities to achieve lower stabilization levels and increases the risk of more severe climate change impacts,” and “ that deep cuts in global emissions will be required to achieve the ultimate objective of the Convention and emphasizing the urgency to address climate change as indicated in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.”
- But as noted we need to keep up to date. The publication of the ENSEMBLES work is timely. It covers key areas of interest to policy including impacts, emission pathways and treatment of uncertainty.
- The UK has also initiated a programme, entitled AVOID, to assess the risks of climate change for different stabilisation levels, understand what emission pathways are associated with long term temperature climate goals (such as the EU’s 2C limit), and assess the economic costs of damage and of mitigation action.
- We have used extensive modelling of different emissions trajectories through the AVOID project to understand when emissions need to peak, and by how much they need to fall by globally, in order to meet our objective.
- In doing this we have needed to take account of uncertainties in climate sensitivity and carbon cycle feedbacks amongst other processes.
- This has enabled us to have a clear quantitative picture of what we need to achieve to meet a 2C limit, and provide a benchmark against which we can assess the commitments that countries have already put on the table and will in Copenhagen.

So to recap

- **Science underpins policy on climate change**
- **It identifies the nature and scale of the risks**

- **It advises us on what we need to do to reduce and manage the risks**
- **It is the first point of contact for those opposed to action**
- **Science needs to continually develop and revise – it needs to be fresh**
- **And so ongoing research, analysis and assessment will continue to be essential in a post Copenhagen world.**