

UK Response to Climate Change

Final Report: Findings Public Dialogue

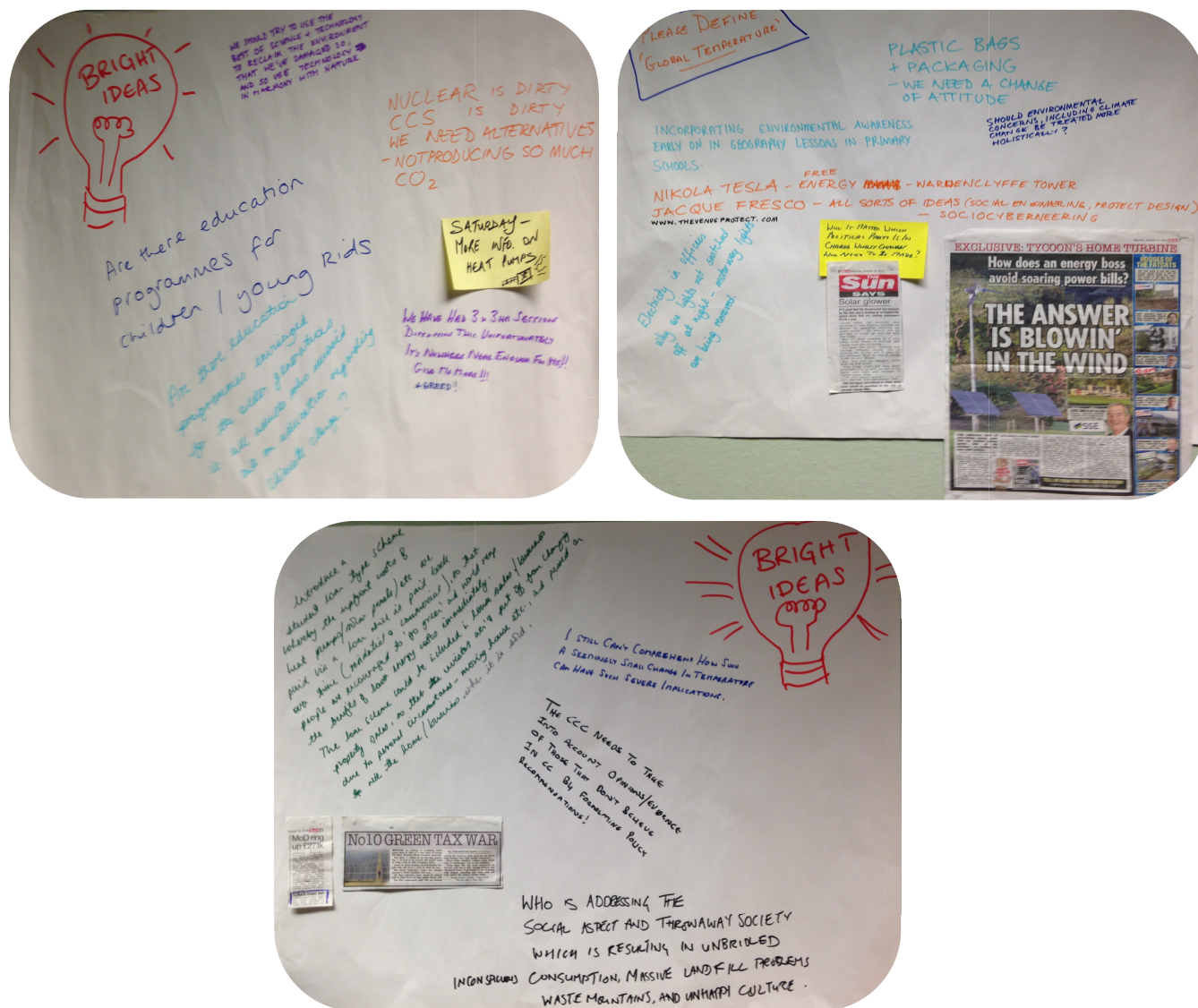


Figure 1: Snapshot of Ideas wall

8 November 2013

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1. Executive Summary

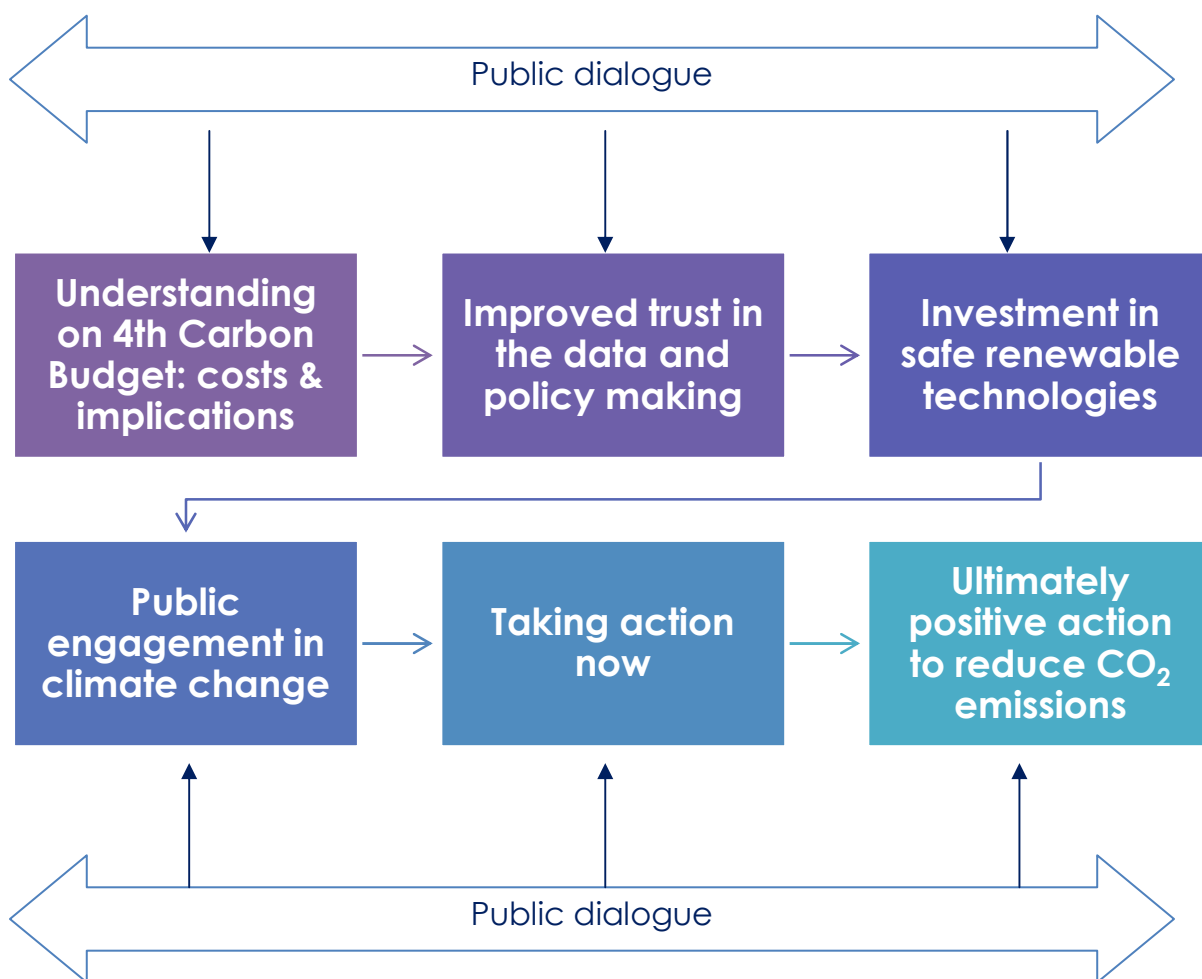
1.1 Introduction

The Committee on Climate Change with support from [Sciencewise](#)¹ commissioned Hopkins Van Mil: Creating Connections to recruit for, design, facilitate and report on a pilot public dialogue on UK action on climate change. The work took place in a six week timeframe from mid- September until the end of October 2013 and involved 25 independently recruited members of the public.

There was a need to share and deliberate on complex information in a short space of time and within a limited budget. HVM therefore designed a panel approach with a dialogue in three parts. The facilitation team worked with the same small groups of panel members over the course of four days. This report summarises the findings of the dialogue, which was conducted at the Institute of Education in London on 9, 10 and 12 October 2013. Programmes for each of the panel discussions are provided at Appendix 2.

1.2 Main findings

A review of all the material gathered in the dialogue process has led to a clustering of findings around the following headings informed by ongoing public dialogue:



¹ Sciencewise is the UK's national centre for public dialogue in policy making involving science and technology issues. See www.sciencewise-erc.org.uk

These are described in full in the report and led to the following main points:

- a. There is an appetite for public engagement in climate change.
- b. There is equally an appetite for action on carbon emission reduction now.
- c. Behaviour change is accepted as part of this process and there is surprise that current Carbon Budgets could be set without limiting, for example, the amount people fly or use their car.
- d. Panel members welcomed the opportunity of making individual household changes such as insulating homes or installing heat pumps, this is balanced with the view that costs should be managed and action incentivised so that steps are not impossible for low income households, or those who do not believe action is necessary.
- e. The cost of measures to combat climate change is a concern for panel members and they wish to see Government schemes in place to support incremental change.
- f. There is a strong belief in the value of safe renewable technologies with wind, solar, wave power being mentioned most frequently. Panel members demonstrated concern about technologies which they did not believe were well enough tested, such as carbon capture and storage or technologies they perceived as being unsafe for society, such as nuclear power.

1.3 Panel Member recommendations

As part of the dialogue process panel members formulated recommendations for consideration by the Committee on Climate Change as part of the review of the 4th Carbon Budget. The detail of their recommendations is included in section 5 of this report. In summary the panel recommended:

- a. Greater public debate and engagement on the sorts of measures the Committee is considering in the 4th Carbon Budget review.
- b. Education at all levels on climate change and carbon emission reductions.
- c. Acting now by investing in safe, renewable energy sources.
- d. Incentivising positive contributions by individuals and business in the form of grants and tax breaks.
- e. Keeping data up to date and using current data to inform policy advice.
- f. The issue of climate change is too important to be swayed by party politics and independent advice followed by legislation as necessary is essential.

1.4 Hopkins Van Mil observations

Having worked intensively in a six week period to manage, design, recruit for, facilitate and report on a public dialogue on UK action on climate change, Hopkins van Mil shares observations to inform potential next steps for the Committee as part of this report. As dialogue specialists HVM's focus is on meaningful engagement with the public and ensuring increased long-term understanding of the issues for all those who have a stake in ensuring the 4th Carbon Budget targets are being met, including members of the public who are a primary stakeholder.

- a. **Dialogue:** The Committee on Climate Change should consider continuing to hold dialogue with the public via a panel formed to sit alongside the policy advice that the Committee makes to Government. There was a high level of engagement with the process, suggesting it is an approach which may be of wider value to Government. The panel may be one standing panel, or, preferably a series of panels in different parts of the country reflecting regional differences in views on the climate change challenge.
- b. **The model:** Although the dialogue process is being evaluated independently, HVM's initial recommendation is to continue to use panel discussions as a dialogue method as it is both time-efficient and rich in results, giving panel members opportunity for reflection and effective dialogue with experts and each other.
- c. **Communication:** The Committee on Climate Change and Government should develop clear messages around climate change and how the public can contribute to carbon emission reductions making use of the expertise available to ensure public understanding of climate change and the legislation which frames carbon emission reductions.

2. Introduction

2.1 Aims of the public dialogue

Hopkins van Mil was commissioned by the Committee on Climate Change with support from Sciencewise² to design and deliver a pilot public dialogue to improve understanding of public opinions and attitudes towards greenhouse gas emissions reductions, and the costs and challenges in meeting the 4th Carbon Budget. The Committee is due to advise the Government on the 4th Carbon Budget in December 2013 and the outcomes of the dialogue process feed into the policy recommendations the Committee will make.

2.2 Actors in the dialogue

For the purpose of the pilot dialogue the Committee on Climate Change established an Oversight Group to ensure the project would be delivered on time and to standard.

- Professor Sam Fankhauser – Committee on Climate Change
- Adrian Gault – Committee on Climate Change Secretariat
- Mike Thompson – Committee on Climate Change Secretariat
- Sarah Leck – Committee on Climate Change Secretariat
- Steve Robinson – Sciencewise-ERC
- James Tweed – Sciencewise-ERC
- Laura Osborne- Which?
- Dr Louise Strong – Which?
- Phil Downing - Icaro Consulting (appointed evaluator)
- Henrietta Hopkins – Hopkins van Mil
- Anita van Mil – Hopkins van Mil

Figure 2: Members of the Oversight Group

The majority of Oversight Group members, representatives from the Department of Energy and Climate Change (DECC) and a number of Committee on Climate Change staff, including the Chief Executive, attended the panel discussions as observers.

- Professor Sam Fankhauser – Member of the Committee on Climate Change
- David Kennedy – Chief Executive, Committee on Climate Change Secretariat
- Sarah Leck – Carbon Budgets team, CCC Secretariat
- Nisha Pawar – Communications Officer, CCC Secretariat
- Steve Robinson – Dialogue and Engagement Specialist, Sciencewise-ERC
- Phil Downing – Evaluator, Icaro Consulting
- Two members of the Carbon Budgets team, DECC, Strategy Directorate

Figure 3: Observers during the dialogue

[Hopkins Van Mil](#) (HVM) is about engagement to gain insight. As expert facilitators we create safe, neutral and productive spaces in which to access people's views on the content which matters to them, to stakeholders and to communities. HVM and associates work flexibly and build trust using best practice guidance including [Sciencewise-ERC principles](#)³.

² Sciencewise is the UK's national centre for public dialogue in policy making involving science and technology issues. See www.sciencewise-erc.org.uk

³ <http://www.sciencewise-erc.org.uk/cms/assets/Uploads/Publications/Guiding-PrinciplesSciencewise-ERC-Guiding-Principles.pdf>

- Henrietta Hopkins, Lead Facilitator
- Anita van Mil, Facilitator and Project Manager
- Hally Ingram, Facilitator

Figure 4: Facilitation team

2.3 Timetable

The pilot public dialogue took the form of 3 panel discussions held on 9, 10 and 12 October 2013 with the same twenty five members of the public attending all three. The approach used for the public dialogue is described in section 3. In order for the Committee to make use of the dialogue findings in its advice to Government on the review of the 4th Carbon Budget the dialogue process took place within a six week timescale.

2.4 Acknowledgements

Hopkins Van Mil is very grateful to the members of the public who formed the panel for the way they embraced what for many was a new process. It was a big commitment and we appreciate that everyone attended all three sessions. The willingness of panel members to process complex information and deliberate on issues they had perhaps not considered before enabled the facilitation team to gain a clear understanding of the main issues and concerns regarding carbon emission reductions.

The Committee on Climate Change Team has demonstrated an equally great commitment. Special thanks go to Adrian Gault, Steve Smith and Mike Thompson for delivering clear and insightful presentations for the benefit of panel members during the panel discussions. It has been a pleasure working with Project Manager Sarah Leck, who has been invaluable in keeping the project on time and to a high standard while managing the complexities of the involvement of external observers and the Oversight Group, to whom we are also grateful. Steve Robinson, Dialogue and Engagement Specialist at Sciencewise, provided expert advice to the programme from process planning to managing venue challenges during the dialogue. Hopkins Van Mil is equally grateful to him.

3. Methodology

3.1 Recruitment

Hopkins Van Mil instructed [Acumen Fieldwork](#) to recruit a sample of 25 people residing in the Greater London area who were broadly representative of the population of the United Kingdom in terms of gender, life stage, social grade/household income, religion and ethnicity. The following table presents an overview of recruitment criteria and targets agreed by the Oversight Group, which were entirely met.

Criteria	Target
Professionally involved with an energy company or in a field related to climate change	Those with this experience should be excluded from the study
Gender	50% male / female
Age	Good age distribution including 20% of 18-35s
Ethnicity	13% black and / or minority ethnic
Current working status and type	A good spread of people in employment / stay at home parents / unemployed / students/ retired
Extent of knowledge of climate change debates	50% describing themselves as highly or fairly knowledgeable 50% who describe themselves as having little or no knowledge
Extent to which they have followed the debate in the media	50% would say they closely follow the debate in the media 50% who do not closely follow the debate in the media
Geographic location	Central and Greater London

In addition the fieldwork team also included their standard recruitment screener which restricts participation in the dialogue by people who work in journalism and / or have taken part in market research in the last six months. These criteria were partially met.

3.2 Preparation

HVM worked in close collaboration with the Oversight Group (see Figure 2 section 2.2) to make complex scientific information on the climate change challenge accessible for comment and review by members of the public with varying degrees of knowledge of the issue. HVM worked with the CCC team to produce four think pieces (see Appendix 1), which were sent to panel members in advance of the panel discussions to bring everyone up to speed with the challenges before they considered them in the sessions.

Delegate packs, including the first two Think Pieces, a programme for the dialogue day (see Appendix 2) and Discussion Help Points, including a glossary of terms (see Appendix 3) were emailed in advance of workshop 1 and provided in hard copy at the venue.

3.3 The process

As there was a need to share and deliberate on complex information in a short space of time and within a tight budget HVM designed a dialogue in three parts, adopting elements of the Citizen's Jury dialogue model. To enable deep engagement with the issues the dialogue participants formed a panel that was taken on a journey from exploring the context of carbon emission reductions to making recommendations to the Committee on Climate Change to inform their review of the Government's 4th Carbon Budget.

The facilitation team worked with the same small groups of panel members over the course of the three days. Panel members therefore had an opportunity to become familiar with each other's views; work together on solutions and proposals and feel they were in a trusted situation with both fellow panel members and their facilitators.

Presentations by Expert Witnesses provided the framework for small group deliberation and ensured that panel members gradually gained knowledge about the issues affecting the 4th Carbon Budget.

Wednesday 9 October 2013

- Dr Steve Smith – Climate scientist, Committee on Climate Change Secretariat:
The science of climate change
- Adrian Gault – Chief Economist, CCC Secretariat:
Global action on climate change

Thursday 10 October 2013

- Adrian Gault – Chief Economist, CCC Secretariat:
What is the UK doing to tackle climate change?
- Mike Thompson – Head of Carbon Budgets, CCC Secretariat:
Costs and impact of UK action on climate change

Figure 5: Overview of Expert Witness presentations

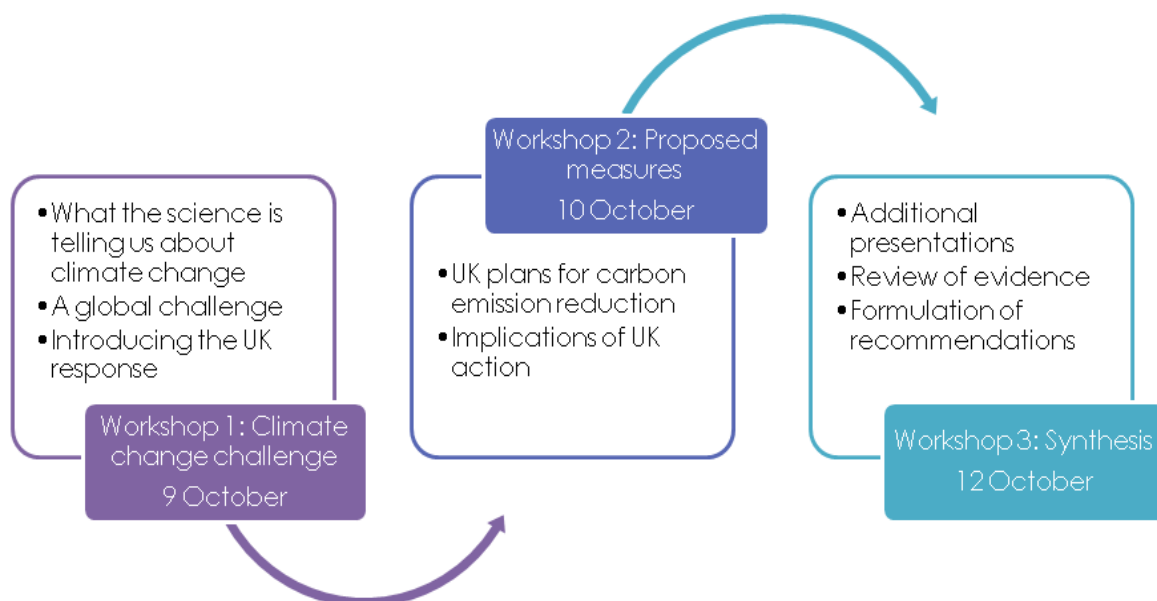
During the first two panel meetings panel members recorded what else they needed to know to make informed recommendations to the Committee on Climate Change at the end of the dialogue. Mike Thompson, Adrian Gault and Sarah Leck from the Committee on Climate Change Secretariat prepared answers to the main outstanding issues and questions and delivered a presentation on those at the start of the third meeting on Saturday 12 October 2013.

3.4 Pre- and post-dialogue questionnaire

HVM used a short questionnaire at the beginning and end of the dialogue process to track changes in panel members' knowledge of and concern about climate change. The results of these are presented in section 4.4. In addition, and in line with all Sciencewise⁴ programmes, this dialogue approach is being independently evaluated by Icaro Consulting.

3.5 The dialogue programme

Using the panel approach participants deliberated on the challenges, implications and opportunities in the following way.



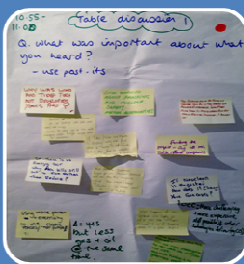
⁴ Sciencewise is the UK's national centre for public dialogue in policy making involving science and technology issues. See www.sciencewise-erc.org.uk

See Appendix 2 for the dialogue programmes and Appendix 4 for detailed process plans. The process plans for each workshop were approved by the Oversight Group before being finalised and employed by facilitators during each session.

3.6 Dialogue tools

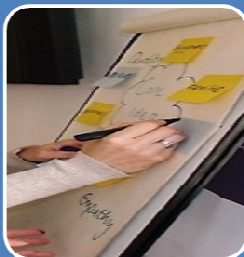
To ensure panel members were clear about their role and the process from the outset HVM used a short warm up and baseline session for each meeting. At the beginning of the first discussion panel members were moved into their three randomly selected small groups and invited to consider any questions they had on the process. Feedback included questions about the role of the Committee on Climate Change; the independence of the expert witnesses; the context of the discussions; and how the panel's views would affect the Government's decision making on the 4th Carbon Budget.

The panel discussion approach enabled panel members to deliberate on the issues at hand in a two main ways:



Individual reflection

- Post it exercises
- Ideas wall
- Paired discussion



Group reflection

- Brainstorming with flip chart recording
- Roving ideas storm – sub groups moving around the room
- Role playing (pessimistic / optimistic / fact-focused)

All of this was guided by the specialist facilitators who used these tools to ensure that everyone had their voice heard and recorded. The full process plans and explanation of each tool is included at Appendix 4.

Throughout the sessions the HVM team encouraged panel members to make use of Any Other Thoughts Cards on their tables and / or the Ideas Wall for comments and ideas that might have taken the panel discussion off-track but should nevertheless be captured. Any Other Thoughts Cards were handed over to the facilitator at the end of each session and have been transcribed for inclusion in the dialogue transcripts (see Appendix 5). Gradually over the three dialogue days panel members made good use of the Ideas Wall to share ideas with the stakeholders in the room and other group members. Comments included newspaper cuttings sourced by panel members, suggestions about the process, observations on what more information was required to inform the recommendations and proposals on areas for development such as education.

4. Dialogue findings

The following is a summary of the main findings of the three panel discussions on the UK response to climate change. Full transcripts of flip chart recordings, Any Other Thoughts cards and the plenary sessions can be found in Appendix 5.

4.1 The 4th Carbon Budget

4.1.1 Targets

There were mixed opinions on the UK's emission targets with some panel members expressing the view that 80% was too little too late and others that it would be impossible for society to make enough change to meet the targets. Some said,

"The targets are too lax and the timescales too long. We need a contingency plan for when they aren't met."

And one panel member shared an early morning thought when he returned to the second session,

"I woke up at 2am thinking about this, 80% is ridiculous - why not 100% but take a slow but sure approach so that we know we'll meet the targets."

Others expressed a more optimistic view and pressed for a holistic approach to meeting targets,

"It's a big challenge but with the right equipment, knowledge and skills we can achieve this as long as we all work together."

"There is too much talk about business as usual and not enough talk about adaptation and living different sorts of life. We need a more holistic view to address consumption, waste and ownership."

Some panel members raised concerns about how realistic the targets are.

"The targets are for 2020 but we're in a recession, how possible is this?"

Others discussed the impact of the macro environment including the recession and current behaviour patterns,

"It is very optimistic to think that we can achieve all this. There is so much in the macro-environment that can potentially derail us, conflicts between countries, recession."

"How are the targets even possible? More people have a car and fly than ever before."

One group was particularly concerned about how realistic the targets are if a large contribution to carbon emission reduction is based on Carbon Capture and Storage,

"How realistic is it to include the rather large slice of CCS when it's not available yet?"

"What if we fail to use CCS to reduce emissions?"

Panel members asked the Committee on Climate Change to share more widely what its considerations about the Carbon Budget are:

"The advantages and the challenges [of setting high targets] need to be understood and balanced."

"The public aren't aware of the Carbon Budgets."

There was a call for making the targets more understandable for people in the context of their daily life. As someone said,

"A reduction to two tonnes [2tCO₂] per head. How much is this, e.g. translated to trips in a car?"

4.1.2 Enforcement

Some panel members expressed concern that it would be very hard to police countries that don't meet their targets even though they were encouraged that global action is being taken to reduce emissions. Questions included,

"If the situation gets worse will countries be forced to sign up?"

"How will targets be enforced If targets aren't met, is there a punishment?"

There was a majority view that targets should be legally binding and that rewarding positive behaviour through tax reductions and grants might be more effective than fines.

"Treaties – we need them to be legally binding for the whole world. What if, say China doesn't meet a target. What pressure would be put on them, you can't sanction. Where is the incentive?"

Some panel members preferred using the word 'encouragement' over 'enforcement', particularly regarding developing countries and small businesses. Someone said,

"We need to help countries that are developing rather than sanctioning them."

One group discussed the view that there is a 'choice editing' role for Government, which precedes enforcement,

"Remove consumer choices ensuring only products that don't harm the environment are available."

4.1.3 Global issue

Panel members accepted unanimously that climate change is a global problem requiring a global solution. Generally panel members were pleased to learn about what action has been taken so far. Positive statement included,

"We're all uniting globally to reduce carbon emissions, team effort."

"It makes you feel better if you know everyone is doing it."

"So when plans are in place we can achieve progress!"

Some felt that it is,

"Encouraging knowing that large powers are prepared to take action too."

However, there were concerns about the length of the decision making process, the contribution of big players such as China and Russia and the lack of an international agreement,

"Shocking that there isn't an agreed deal internationally. Why is it taking so long?"

"Why wasn't Russia mentioned?"

"Is China's data reliable?"

Some panel members expressed concerns about the feasibility of introducing targets in developing countries recognising that those nations will need to balance a need for economic growth with potentially old technologies and greater emissions. One group said,

"Where is the money going to come from? Another loan, struggling to pay back to the western world?"

4.1.4 UK role

The majority of panel members showed a high tolerance for the UK in a lead role and some demonstrated pride that the UK is being proactive,

"I am proud to see the UK takes a massive role!"

One panel member recorded the following as something that she felt was memorable about the presentations made in the first two workshops,

"How committed the UK is in its attitude towards climate change. I feel very positive about it."

Some said that the UK Government,

"Should be shepherds and not sheep. The UK should set the agenda and show thought leadership."

"The UK should be setting the standard to the rest of the world and commit to increasing the ambition immediately to tackle climate change."

Some expressed concern about the possibility that the current Government might introduce measures which will counteract the progress made. One panel member said,

"I'm worried that the process is so slow. The Government might be reducing the budget when the evidence is so strong –what message will it send to the world if the budget is reduced?"

And another,

"The reduction in CO2 emissions in the UK is positive but it should be more. We must encourage other countries to follow suit, we've shown that it is not that difficult."

Panel members felt that the Government should also lead by example with Government buildings turning off their lights at night, ensuring that new builds all had carbon emission reduction measures in place and funding and incentivising green technologies.

"[The Government] should lead by example. If the Government aren't seen to be making a change in the way they live their lives, then why should we?"

There was also a view, expressed in the final recommendations to the Committee on Climate Change by panel members (see section 5) that the issue should be set apart from party politics with,

"One programme for action on climate change agreed by all political parties."

One panel member summed this up further on cards left for panel members to add any further thoughts they had,

"Everything has to come from the very top, not expecting those at the bottom to respond without real evidence of leadership."

4.2 Research and evidence gathering

People need to know that they can trust the evidence / data and that it will be kept up to date. Following the presentations on the science of climate change and global action panel members demonstrated an appreciation of the range of data presented,

"Interesting that they presented a variety of results from different scientists. It made it seem more credible that various types of research are coming up with the same results."

Some were convinced by the evidence presented and others felt there was more to it than was being shared:

"Staggering, overwhelming evidence."

And,

"The problems and the danger are far greater than what is being reported."

Some doubted the accuracy of predictions:

"At one point they say we are confident but they also acknowledge that they don't fully understand certain processes. How can they know what is going to happen?"

"The evidence is questionable, it's not an exact science - to what extent is it accurate?"

A small minority of panel members expressed concern about the absent voice of climate change deniers,

"We haven't heard from the nay-sayers. We haven't discussed the arguments they have, that it is a foregone conclusion."

They said that,

"An open and transparent dialogue between the two parties would have been useful."

Panel members emphasised the lack of clear messages about climate change, in the media and even in the presentations made by the Committee on Climate Change:

"We need facts and logic and a transparent debate. At the moment we're getting mixed messages. A Government representative said in the Independent this week that energy bills are high because of green taxes which aren't spent on green issues!"

"We are all being told not to drive, to share cars by the media. Here, at this moment in time I understand that it is okay to continue driving. "

Accuracy and reliability of data is an important precondition for gaining public support. It was felt that if the public were given the tools to trust the data then there would be much more consensus around the need to take action and ultimately therefore a concerted effort to reduce carbon emissions. This was translated in a recommendation to the Committee on Climate Change in the last workshop (see section 6).

4.3 Investment in new technologies

4.3.1 Current and future measures

Following an Expert Witness presentation on what the UK is doing to tackle climate change panel members were eager to discuss the use of new low carbon measures by individuals, businesses and as part of carbon emission reduction policy. When considering what was important about what they had learned about existing and new technologies a feeling of excitement was expressed by some that action to reduce carbon emissions can be taken. For these people their first thoughts are positive,

"Things are going in the right direction as cars are becoming less polluting."

"40% of gas emissions are residential, using insulation and heat pumps could majorly reduce this."

There was also some surprise expressed by panel members that the Committee on Climate Change were not advocating greater changes in behaviour,

"It's not saying we can't fly, it's saying change the fuel and then we can fly."

This is picked up again in later discussions on action to be taken (see 4.5)

a. *Heat pumps*

A number of panel members were particularly impressed by the potential for using heat pumps. As such they were concerned that few people know about this method of heating.

"If people know that a heat pump is cheap and easy to install they would perhaps use it more."

"I think it is important to see how simple some of the cost-effective measures are such as heat pumps."

Panel members felt this was a particularly simple technology which should be used in new housing developments. For some this raised more questions than answers,

"New build homes and offices should have heat pumps, solar panels etc. Can this be implemented easily? How much would it cost? How efficient are they?"

b. *Electric cars*

A minority of panel members expressed the view that some measures, such as electric cars, are not cost-effective,

"I don't want an electric car because research and development means that the costs are high and maintenance costs are high and regular."

This same minority also expressed the thought that in fact it was not in the Government's interest to promote or invest in technology to improve the performance of electric cars. As one panel member said,

"The Government needs the fuel revenue. If the scientists say tomorrow that all cars can run on water, someone would get shot somewhere because the Government needs this revenue from fuel."

When the panel members were asked to take on a red (pessimistic view), green (optimistic view), or amber (neutral fact based view) hat, the views on current and future measures using new technologies presented interesting findings.

The fear that the public are not sufficiently aware of action they could take in their own homes by, for example, installing heat pumps was expressed.

"No one has heard of heat pumps, what incentive is there for these measures?"

As a central part of the third session the 3 panel member groups were asked to move around the room with their facilitator and discuss the extent to which they agreed with the measures being taken in the UK which would affect the economy, business and industry; the implications for society on taking action to reduce carbon emissions; and the use of renewables and new technologies. As a result of the discussion on renewables and new technologies one participant said,

"More investment is needed in renewables and new technologies."

This statement was strongly endorsed by panel members during the discussion with the panel member's own group all agreeing with it and a further 13 panel members expressing their approval by placing a green sticker next to the comment. As the recommendations were being formulated by the sub-groups the point came up frequently. As one panel member said,

"Investment, investment, investment in new areas of renewable sources of energy which could be cost effective and beneficial in the fight to reduce CO2."

And another summed up the views of many by saying,

"We need to invest in low carbon, particularly renewable technologies now so that we lose our dependency on high carbon fuels."

4.3.2 Safety concerns

Although not a core part of what was presented by the CCC to panel members, a strong line of interrogation for the majority of panel members was the safety of new technologies. A particular concern was expressed regarding technologies which some panel members perceive to pose a potential threat to society such as carbon capture and storage and nuclear power. It was understood by panel members that within the scope of the three workshops they were unable to explore all measures extensively and in-depth. However, what they were able to explore did give them an initial overview which led them to consider the importance of using safe new technologies.

Panel members wanted to ensure that the Committee considered carefully before providing any advice to Government about introducing what many perceive to be potentially unsafe new technologies in to Carbon Budget calculations. As one panel member put it,

"Think carefully before introducing unproven technologies such as CCS and (to a lesser degree) nuclear in policy recommendations."

The emerging majority view by the end of the panel discussions was that panel members would prefer the Government to make investment in what they perceive to be safe new technologies, rather than untried technologies such as carbon capture and storage. Panel members listed their perceived safe technologies as harnessing wind, wave and solar energy and in general a focus on renewable energy sources.

One panel member asked,

"Why was wind and tide technology not developed years ago?"

The general view is summed up in the comment of one panel member,

"If tide / solar and wave is existing why not fund that to make it effective rather than fund an unsafe technology such as CCS [which is] locking up a problem for a future generation."

This led to a discussion about the extent to which the Government was being clear to the public on which policies for reducing carbon emissions were being pursued and the potential risks to society in some new energy sources.

"Be more transparent about the risk of controversial technologies."

4.4 Cost considerations

The panel expressed concern about society's appetite to invest in new technologies,

"I know change is needed, but wonder whether individuals and Government will be prepared to spend or invest."

4.4.1 Price increase

When deliberating on a potential cost increase of £100 there was a mixed view. Some taking on a green (optimistic view) hat said that a £100 increase in costs is favourable as,

"£100 is manageable for most families."

One group expressed the view that spending money on taking action was a,

"Nominal price to pay."

The cost of inaction was seen as potentially worse by a number of panel members,

"You're insulating your home for example. Energy prices would go up more if you don't insulate it."

However, the majority of panel members mentioned an anxiety that even if householders are aware of the measures available to them, however interested they are they may not be able to afford to take action.

"Cost implications are the main stumbling block."

"How do we know it is affordable? What is a £100 increase like for people on the poverty line?"

There was a view that an increased bill now as an investment or insurance for the future may be more acceptable to the younger generations and families than to elderly people,

"Some people may not want to increase their energy bill now as it will not benefit them in 50 years time."

Two of the groups talked about the importance of balancing the cost of action with the cost of inaction,

"The £100 has to be explained very clearly and what will happen if no action is taken. Give the cost per household if no action is taken."

One group considered the issue holistically and expressed the view that higher costs might be offset against economic growth in terms of job creation and tax revenue. They called for greater creativity when assessing affordability of measures:

"You can sell energy back to companies and make money from our solar panels."

4.4.2 The role of big businesses

Two groups expressed a fear that some of the big companies involved in developing new technologies are motivated by greed and profiteering. They were concerned that this might increase rather than decrease the cost of innovative action on climate change.

"The companies that make money from burning fossil fuels were probably aware of all this damage 50 years ago but it wasn't in their interests to stop."

"We don't trust big companies. Will extra money collected be used wisely? We don't know how they will spend the money of increased bills."

"Big businesses will pass on the costs to consumers."

Another group of panel members were not particularly concerned about this though. They felt that companies should be incentivised but they did not mention profiteering as others had done. They said,

"Rewarding companies for investing in low carbon emissions would be a positive move."

In one of the groups panel members discussed large corporations as potential funders of the Carbon Budget:

"Why not ask multinational companies to pay more tax?"

4.4.3 Incentivizing positive contributions

Panel members asked the Committee on Climate Change to consider affordability of measures such as heat pumps and ensure that it is practical for the average and low income households in the current economic climate. One group said,

"Has the Government factored in public resistance to all these measure whilst the cost of living and taxes increase?"

Incentivizing positive contributions became a consistent theme for panel members. This included incentives for householders to take adaptation measures in their homes including insulation and the installation of heat pumps.

"[You need] upfront funding for heat pumps as the initial price is too expensive."

They also felt that using incentives could go further and include both big industry and companies and in fact countries who could be committing to do more to reduce their carbon emissions.

One panel member stressed the importance of energy companies making a commitment to supporting the drive for carbon emission reduction,

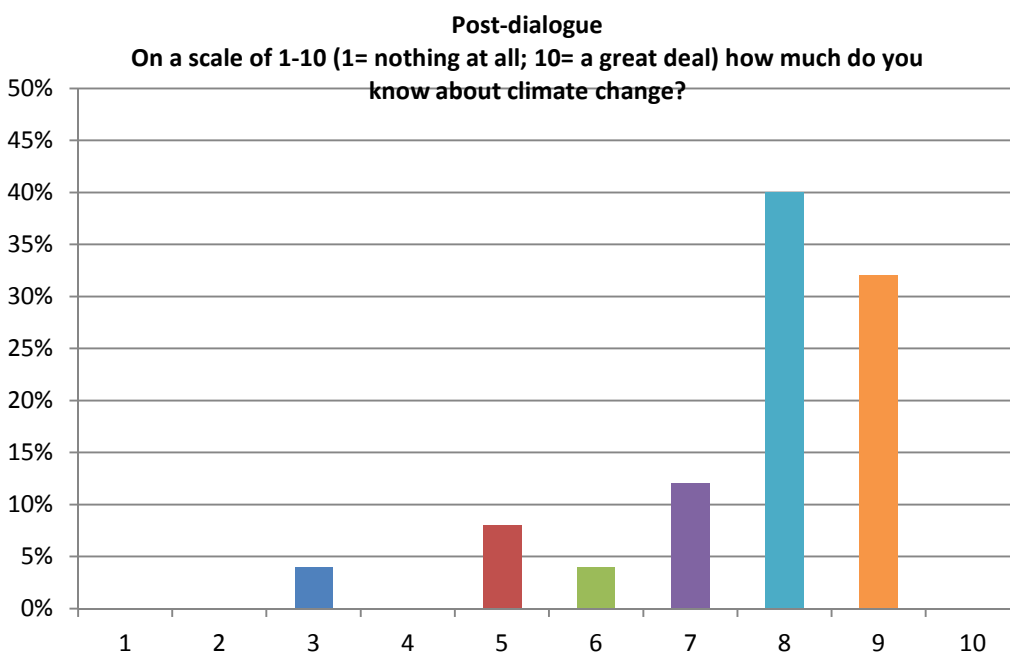
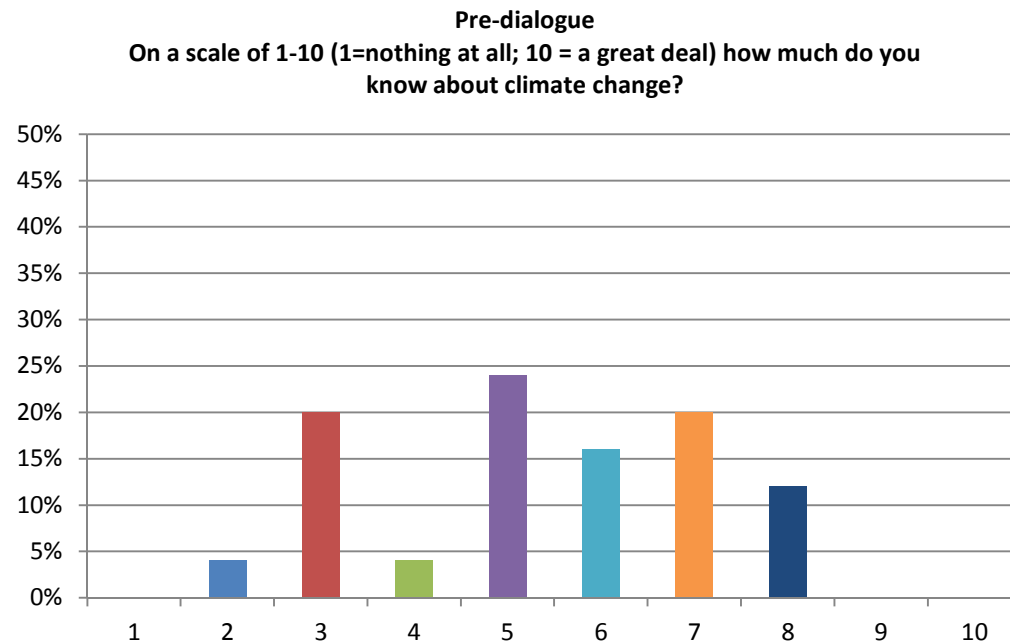
"I would like energy companies to commit to this by, for example, making energy saving boilers available to those who can't afford them. This morning I woke up to the news that energy prices are going to increase further. It seems to be about profit!"

4.5. Public engagement in climate change

In the very initial stages of the process facilitators asked panel members to complete a simple 1-10 scale (where 1 = nothing at all and 10 = a great deal) on their knowledge of climate change. They were also asked to answer a 1-10 scale on the extent of their concern about climate change (where 1 = not concerned and 10 = very concerned). The same questions were asked at the end of the third round table panel discussion.

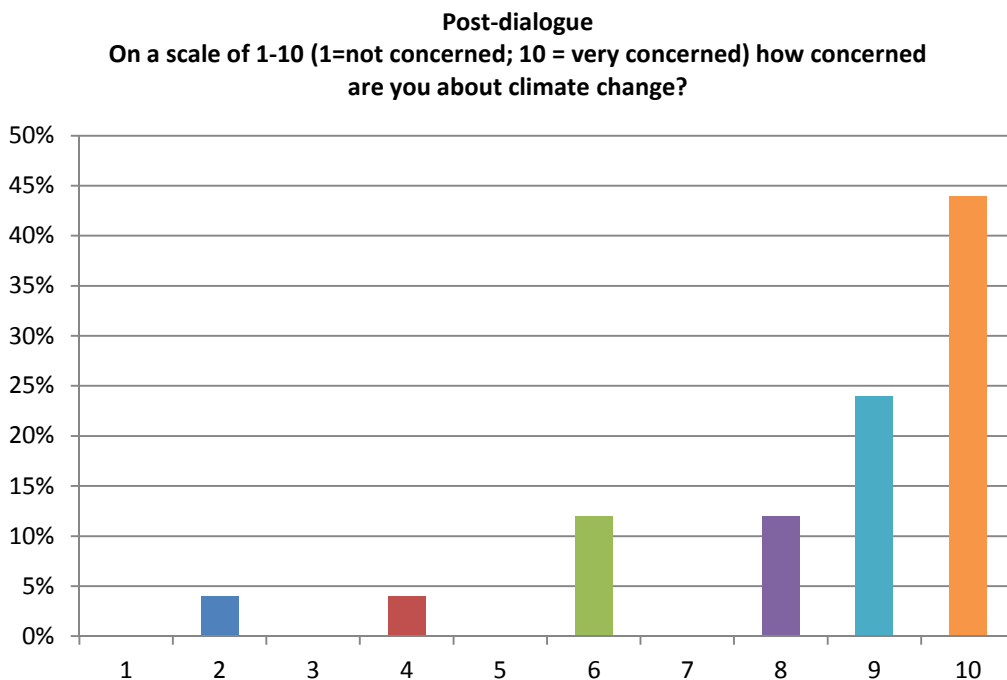
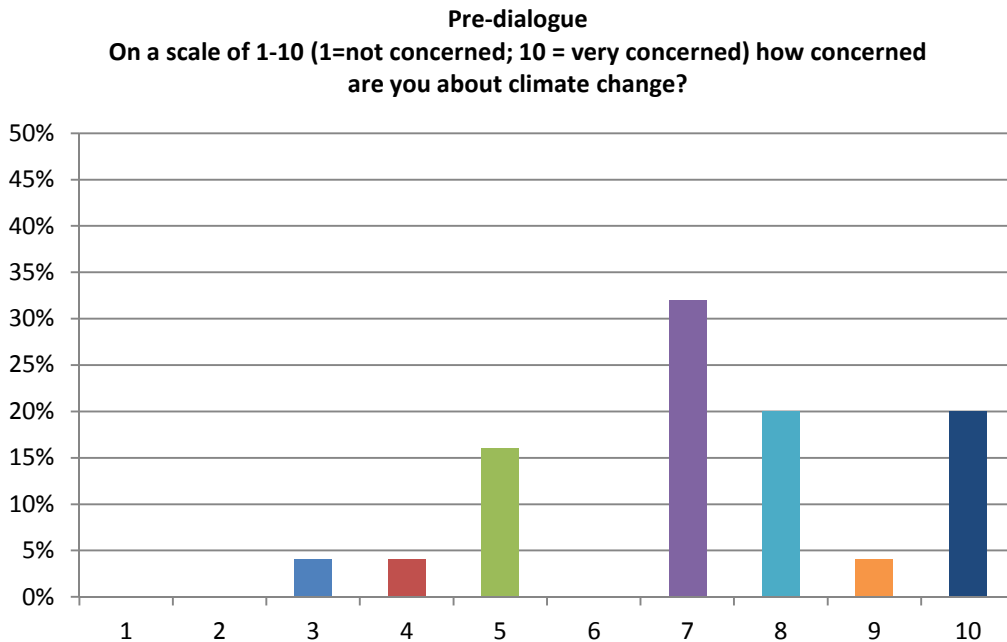
Before the panel discussions the responses were as follows:

a) Pre- and post-dialogue knowledge of climate change



We can therefore see that panel members believe their *knowledge* of climate change has increased with the largest group (24%) placing their knowledge at a level 5 before the panel discussions; and 40% placing their knowledge at a level 8 after the dialogue. 32% of the panel members placed their knowledge at level 9 by the end of the dialogue whereas no one had scored their knowledge as highly as that before the dialogue began.

b) Pre- and post-dialogue concern about dialogue



Pre-dialogue 32% of panel members rated their concern about climate change at level 7. By the end of the dialogue the 43% rated their concern at level 10. As panel members' knowledge increases so does their concern about climate change. This is perhaps reflected in the panel members call to action described in section 4.5.

4.5.1 Public dialogue and education

From fairly early on in the dialogue process people were surprised about how much they were learning from the presentations from the Committee on Climate Change on climate change and its implications. Even those who considered themselves fairly well informed on the subject felt that they had learnt a lot and that there was even more to learn. As one panel member said,

"We need to get this message across; last night's workshop has really opened my eyes."

The response at the beginning of the second panel discussion, before panel members had seen any further presentations, was very focused on communication and education. Facilitators asked panel members to reflect on what they had heard the previous evening and give their initial thoughts on the climate change challenge. Panel members immediately began to discuss ways of communicating the importance of taking action to reduce carbon emissions and making people more aware the impact of their actions on global warming. Solutions given included involving a range of stakeholders in future discussions, from artists and those working in a youth culture to celebrities who could act as ambassadors on the issue. As one panel member reflected,

"Use popular culture to communicate the message. Youth culture, [involve] artists of our society in getting this message across, engage the young as they are already quite knowledgeable."

In balance to this there was a concern expressed that there shouldn't be just another public information campaign,

"There is a problem if it's a public information campaign. People might just switch off."

What they wanted to see was much more education on the issue, education which would involve people of all ages in learning about climate change and its impacts. This was a consistent thread which was woven in to the second and third panel discussions. People expressed the view that even those that felt knowledgeable actually had significant gaps in their education and more should be done from early years to adult education. Concern was expressed by a number of panel members that people were completely unaware of:

- the climate change challenge;
- the action being taken in the UK and globally;
- and indeed the Carbon Budgets.

"Education about the impacts of climate change is so important otherwise people will not make changes [to their lives]."

There was a call to have simple measures in place to educate with straightforward and clear messages about the action required to reduce carbon emissions,

"A simple education [programme] to explain to us how climate change will actually affect our lives in England and then worldwide."

For some panel members education for young people is particularly important,

"Education from junior school upwards so by the time children become adults there isn't ignorance to the facts...make it part of the school curriculum."

An equally powerful related message came from panel members which is that once the public understand the issues to some extent they should be involved in an effective and meaningful dialogue with the Government and its advisers on action to meet Carbon Budgets and reduce carbon emissions. They welcomed this series of three panel discussions as a good initial first step, but would like there to be a greater involvement of the public over time.

"[This has been] good, really interesting. I'd like to do more. Three sessions isn't enough."

"I feel enlightened, interested, the [presentations] have been put across well - in layman's terms. But this should have been done much earlier and hold more sessions like these for young people".

For some participants hearing more about the climate challenge has helped them feel better that action is being taken,

"Thinking about last night I feel quite confident, because there was a lot about how we could change what's happening in the world, there is hope."

And,

"I was more depressed before, now I feel more positive and can think about solutions. I think education and communication is the way to go. Attacking globalisation and consumption is very good. I do feel more positive though even though there are lots of steps to be taken."

Panel members linked positive feelings they had to being provided with opportunities to contribute to decision making and reflect on the appropriate steps to take. For some this meant having a,

"National referendum and public vote on these budgets."

Setting this in the context of debate held in the media one panel member added,

"We have seen the controversy that fracking has caused, piloting without a referendum. There should therefore be a referendum about nuclear and carbon storage before presenting them as [advice to Government]."

For others it was about local action from ensuring that every borough gives their community access to recycling facilities,

"[The CCC] should advise the Government for the councils to work in unison, why don't people have recycling bins?"

The role of the media was also discussed in this context as it was felt that the media had an important role to play in informing the public, as one panel member said,

"The media is a channel for all, bring [the issue] in to the home, but they need to be responsible and get the facts right. The bias should be towards the real situation and pro-change."

4.6 Action timescale

As the dialogue sessions came to a close a near consensus was emerging amongst panel members to move swiftly on carbon emission reductions before more damage was done to the environment. A welter of comments was made which reflected the sense of urgency felt by panel members, they said for example,

"Start addressing the problem now."

"Time is already starting to run out."

And in the context of global action,

"Time is of the essence to get more countries signed up."

"Climate change is a global problem which needs to be tackled now and [progress on this] cannot be slowed by money, funding."

The majority of panel members also felt that there was a responsibility on individuals, businesses and society in general to play their part in the reduction of carbon emissions. For the most part they were quite willing to consider new ways of living in order to take action. For example,

"Why are we so committed to car ownership? What about car sharing and using public transport, we don't need to own cars."

"Why do you say it isn't required e.g. not using cars or flying? This doesn't make sense; we should be doing more across the board."

Linked again to the discussion on cost and incentives, action now was a significant call to the CCC and so to Government. However, this was balanced by the need to be mindful of what lower income households could afford and for education and dialogue to be in place so that society is aware of the issues and involved in decision making.

When panel members were asked by the facilitators what they felt the risks of inaction were they gave a very strong and emotive reaction from destruction of the planet to despair. One group summarised the risks of inaction as,

"Doom, expense, death, destruction, famine, flood and poverty."

This was echoed by a second group who said,

"Human conflict, the destruction of the planet and increased flooding, drought and disease."

For others the results of inaction were less catastrophic but equally important such as,

"Higher costs later"

"Population explosion and mass migration to safe parts of the world."

In summarising how they felt about action to reduce carbon emissions people used words such as "hope" and "safety".

Panel members related action to happiness and living more cost-effectively and healthily. One group summed up the feelings of many by saying,

"There will be a massive decrease in carbon emissions which will slow down the greenhouse effect."

5. Panel member recommendations

During the final small group discussion panel members were invited to develop recommendations for the Committee on Climate Change regarding the latter's advice to Government on the 4th Carbon Budget.

Each sub-group of panel members spent one facilitated session formulating recommendations to the Committee on Climate Change. Each group came up with a long list of initial recommendations. These included:

- Investment in measures to combat climate change balanced by the need to be concerned about the cost to individuals;
- Education for all linked to high profile action in the media which includes:
 - A sense of urgency
 - Is enacted across all Government departments
 - Across all areas of the curriculum
 - Compulsory elements for the young
- Using existing, proven renewable technologies as the primary focus for reducing carbon emissions;
- Incentivising people to take steps as long as this doesn't create a vicious cycle where companies only produce products that people will buy rather than what would be better for the environment; making sure the incentives cover business as well as individuals;
- Re-thinking how we all live our lives and encourage people to change their behaviour through Government policy on the climate change challenge;
- All political parties should develop a programme together so that it becomes independent of power shifts;
- Keep data up-to-date, revise targets regularly and link that to education for society;
- Take action now to shift from carbon intensive to low carbon / renewable energy.

This was followed by a plenary discussion where each group presented their top three recommendations. By discussing the similarities and differences between each group's findings the panel members were able to agree on six recommendations to the Committee on Climate Change.

5.1 More debate for a real democracy

In an age of transparency there needs to be a greater public debate on the sorts of measures the Committee is planning to include in the 4th Carbon Budget review. As we've seen already in the UK and in America there is a lot of controversy around new energy measures such as fracking. The recommendation therefore asks for more stakeholder engagement, more involvement of the public and more transparency about the money spent on carbon emission reductions against other public budgets.

5.2 Education

This recommendation asks for a starting point from grass roots involving children from about seven years old, right the way through. The programme should be devised in consultation with the Department for Education and various umbrella bodies like Age UK to focus on getting information out to local communities. It should be part of the agenda of all Government departments. The media should be used as part of the education of the public through television, radio, newspaper including broadcasting public debates such as those on Newsnight for example.

5.3 Acting now by investing in safe, renewable energy

The panel recommended that it is important to make a difference now. They suggest that one of the ways this can be done is by investing more heavily immediately in renewable energy because we know that will reduce emissions. Some of this work could be rolled out more quickly so that the UK becomes less dependent on high carbon technologies. This would also address the concerns that some people have about fracking and nuclear power. So if people want to continue to debate those they can, but the focus for this recommendation and immediate action is on using safe renewable energy as soon as possible.

5.4 Incentivise positive contributions

There should be incentives for doing the right thing. If people aren't really inclined to do things like reducing their carbon footprint and recycling but if there is money such as a tax break or grant in it for them then they may be more likely to do it. Incentivizing positive contributions could spread the cause more quickly.

5.5 Keep data up-to-date

The Committee on Climate Change and Government need to keep facts and figures up-to-date so that policies can be revised accordingly. The facts and figures could be worse in future so that targets have to be raised, or it could be that the facts were slightly wrong and that the targets could be lower.

5.6 No party politics on climate change

Panel members recommended having one climate change programme linked to all political parties that is independent of power changes. An obvious stakeholder to take this role is the CCC but at the moment Government doesn't have to take the advice given by the committee. Something more is needed that Government cannot ignore. This would include taking steps in legislation to combat carbon emissions.

5.7 The Committee on Climate Change's response

Following the presentation of the six recommendations made by self-selected panel members, Professor Samuel Fankhauser, Co-Director at the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science and Member of the Committee on Climate Change, responded on behalf of the Committee. The detail of the response is available in the transcripts of the discussion provided at Appendix 5. In summary Professor Fankhauser welcomed the panel members' findings and said that they were important. He acknowledged the process that the panel members had been through over three days and said that,

"[You] came to conclusions through informed debate. The things you would like us to do, I would find it very hard to disagree with."

It was clear from panel member immediate reactions to the response that they felt their work had been worthwhile and their contribution to the 4th Carbon Budget review recognised.

6. Next steps

Having worked intensively in a six week period to manage, design, recruit for, facilitate and report on a public dialogue on UK action on climate change, Hopkins van Mil would like to share the following observations on next steps. As dialogue specialists our focus is on meaningful engagement of the public and ensuring increased long-term understanding of the issues for all those who have a stake in ensuring we meet the 4th Carbon Budget targets including members of the public who are in fact the primary stakeholder.

6.1 Public dialogue

The emphasis the panel members placed on public dialogue, education and awareness of the issues, together with their enthusiasm for the dialogue and the fact that they remained committed to it during an intensive four day programme, supports the HVM team's view that this dialogue should not be a stand-alone event for the Committee on Climate Change and suggests that wider use of this approach in Government might be appropriate. HVM recommends that a panel is formed to sit alongside the policy advice that the Committee makes to Government and reflects on the societal concerns that impact on the reduction of carbon emissions. The panel may be one standing panel, or, preferably a series of panels in different parts of the country reflecting regional differences in views on the climate change challenge.

Panel members demonstrated a high tolerance for receiving very clear and practical messages. They shared the view that they would rather know exactly what they should and should not do to help the UK meet its carbon reduction targets rather than being presented with mixed messages. This supports HVM's proposal for further public dialogue and communication (see 6.3), so that the case being made by the Committee on Climate Change is one that is supported by the public, particularly on issues such as fundamental behaviour change.

6.2 The dialogue approach

The dialogue process devised for this particular issue was a response to the available budget and the intensive timescale and was seen from the inception meeting as a pilot for other dialogue programmes. HVM's approach grew from the Citizen's Jury concept whereby the jury listens to expert witnesses and formulates questions to ask them in order to understand the issues clearly before formulating their recommendations. It evolved in to a panel discussion in three parts to allow time for panel members to hear and understand expert witnesses, reflect on what more they needed to know and discuss it amongst themselves before formulating recommendations. Enabling three sessions was important as it allowed for one session to be broadly contextual with two further sessions to be more interrogative. The dialogue process is being evaluated independently, but HVM's initial recommendation is to continue to use this dialogue method as it is both time-efficient and rich in results, allowing time for reflection and effective dialogue.

6.3 Communication

Panel members expressed surprise during the dialogue that they were completely unaware of the work of the Committee on Climate Change, the advisory role they have with Government and the research they review which informs the advice they give. This would suggest, whilst recognising that the Government is their primary audience that the Committee on Climate Change would do well to make the public more aware of their work. This would include raising the profile of the valuable resources available on their website and developing clear messages about what behaviours are appropriate to adopt in line with combating carbon emissions. It would also ensure that the knowledgeable Committee members and secretariat could play a more overt role in the very current and public debate running in the media on energy costs and the impact of carbon emission reduction measures on those costs. Panel members were equally unaware of the cross-party commitment to the 2008 Climate Change Act. This suggests that a communications strategy related to public awareness of carbon reduction policies and measures would be a useful step forwards for the Committee and Government.

7. Final remarks

The panel members have provided the Committee on Climate Change with clear insights into their views on the targets for the review of the 4th Carbon Budget, the predicted cost increase, the UK's role in combating climate change and the acceptability of new technologies. Their call for ongoing public dialogue is a very positive outcome of the process and we look forward to learning more about how the Committee will incorporate the dialogue findings in its recommendations to Government on the 4th Carbon Budget.

Hopkins Van Mil: Creating Connections, 8 November 2013



Appendix 1: Think Pieces

Think Piece 1: What the science is telling us about climate change

1. Introduction

This Think Piece has been written to give you a brief introduction to the first of two subject areas being discussed at the round table panel meeting on 9 October. You should read this sheet before coming to the session. As you do so:

- Note any questions you have;
- Think about what you would like to talk about in relation to the science of climate change.

2. The causes of climate change

Several factors play a role in Earth's climate. Among these, carbon dioxide (CO₂) and other gases in the atmosphere help to warm the Earth. This is called the greenhouse effect.

Human activity is enhancing this greenhouse gas effect. We have been burning increasing amounts of fossil fuels since the industrial revolution, emitting CO₂ and other greenhouse gases in the process. As a result the level of CO₂ in the atmosphere has broken out of the range seen over the last million years, and the Earth is warming in response.

3. Evidence of warming

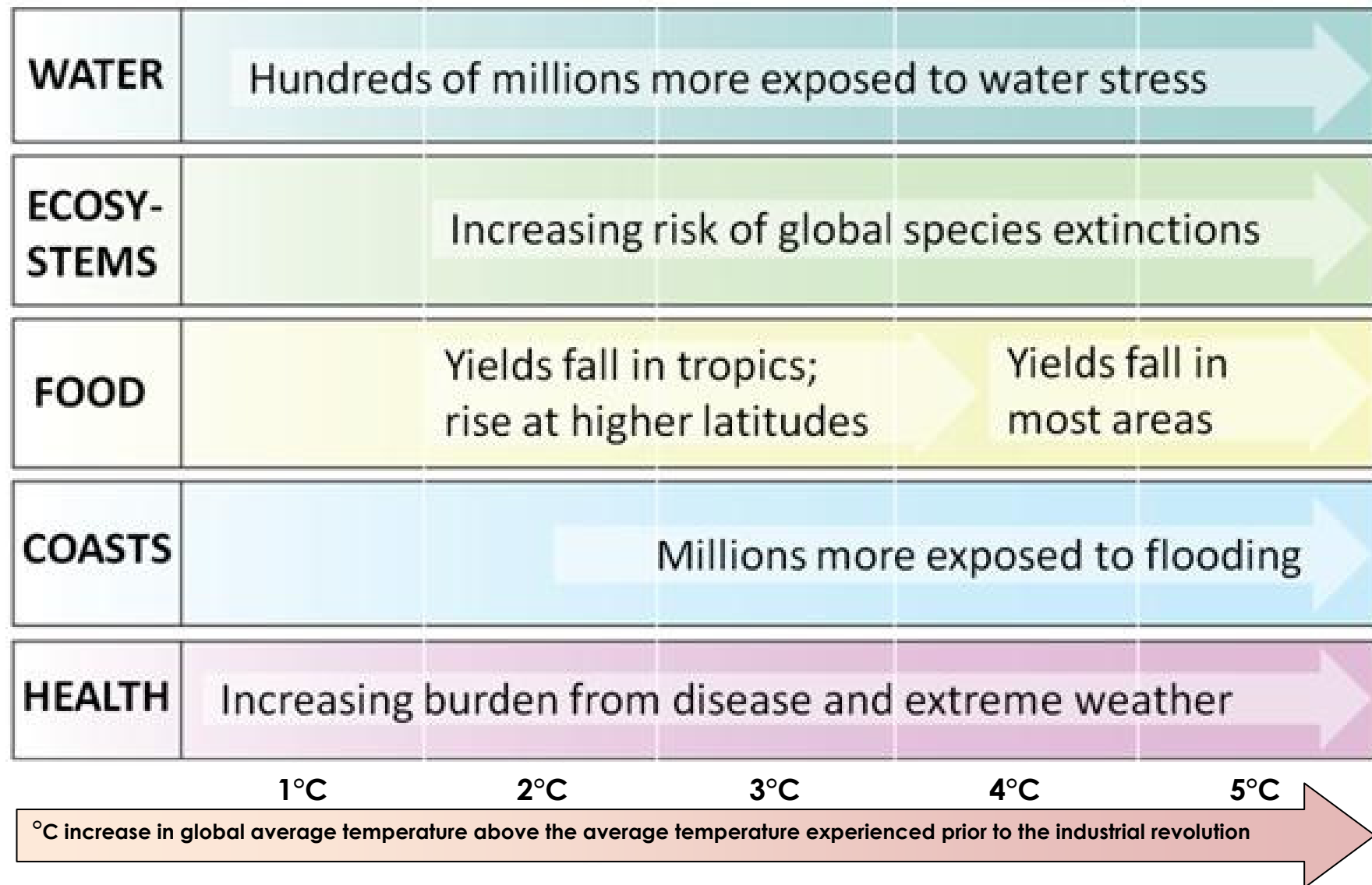
The Committee on Climate Change (CCC) has looked at a great deal of information on climate change since it was set up in 2008. The science shows that:

- Each of the last three decades has been warmer than the last, and together they are the hottest decades since measurements began in the 1800s;
- Extreme cold temperatures are becoming less frequent, while extreme heat waves and rainfall are becoming more frequent.
- Sea level around the world has risen by around 20 cm;
- Sea ice cover in the Arctic and snow cover over land are also decreasing.

4. The impact

If no effort is made to cut global use of fossil fuels, global warming is likely to reach between 2-7°C this century with further warming beyond. This will have significant consequences for human welfare and the environment. It is not possible to predict these long-term impacts precisely, but it is sensible to take action now as insurance against risks of dangerous climate change. Governments around the world, including the UK, agree that in order to avoid the worst impacts of climate change, global temperature rise needs to be kept within 2°C (see chart overleaf).

The impact of increasing degrees of global warming on various key areas of concern



Think Piece 2: A Global Challenge

1. Introduction

This Think Piece has been written to give you a brief introduction to the second of two subject areas being discussed at the round table panel meeting on 9 October. You should read this sheet before coming to the session. As you do so:

- Note any questions you have;
- Think about what you would like to talk about in relation to global action on climate change.

2. A global challenge

Governments around the world, including the UK, agree that in order to avoid the worst impacts of climate change, global temperature rise needs to be kept within 2°C. In order to achieve this, the world will need to make rapid and sustained cuts to emissions of all greenhouse gases. The chart over the page suggests what global emissions might look like to 2050 if we are to stay below that 2 degree target. In order to meet these targets countries will have to agree a global deal to reduce emissions.

3. International action to tackle climate change

The key international forum for climate legislation is the United Nations Framework Convention on Climate Change (UNFCCC) which sets out the framework for global cooperation to tackle climate change and which 194 countries (plus the EU) are signed up to. Within the UNFCCC many countries have legally binding commitments to reduce greenhouse gas emissions out to 2020 and still more have voluntary commitments to 2020.

There is more to be done at the international level to get a meaningful global deal but there have been two key areas of progress in recent years;

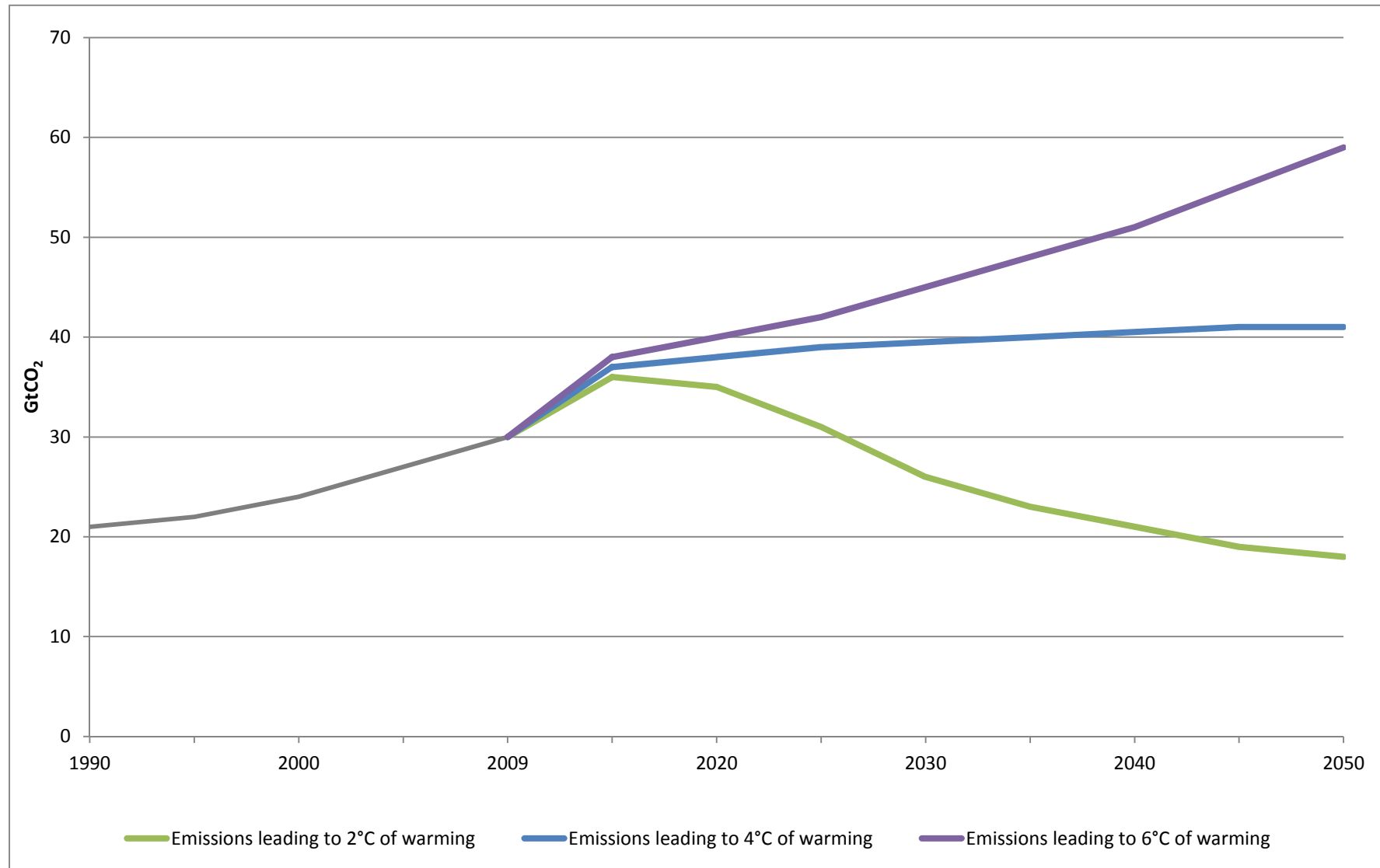
- The recognition by all countries in the UNFCCC that reductions in greenhouse gas emissions must be rapid and stringent enough to keep the global average temperature within 2°C of pre-industrial levels;
- General agreement that in 2015 legally binding targets to reduce greenhouse gas emissions should be set for all countries which are signed up to the UNFCCC.

The EU as a whole has signed up to the Kyoto Protocol with legally binding commitments out to 2020. It has a target to reduce emissions by 20% below 1990 levels by 2020 and is on track to more than achieve this. There are also a number of specific initiatives set up at the EU level including an emissions trading system. For those sectors covered by the scheme – which emit around half of EU emissions – this puts a cost on emissions so that reducing emissions has a monetary value; this allows emissions to be reduced in the most cost effective way. The UK has a key role in negotiating the climate change action at the both the UNFCCC and in the EU.

4. National action around the world

There have been a number of positive developments at a national level. Many countries and states now have or are developing a mechanism for either pricing or taxing emissions, including India, China, New Zealand, California, Quebec and Kazakhstan. The two biggest emitters of greenhouse gases, China and the USA are both implementing a range of measures and targets which will help reduce greenhouse gas emissions including limiting the amount of emissions coal power stations can emit, setting targets for renewable energy and improving the efficiency of cars and other vehicles.

Chart showing global emissions of carbon dioxide (CO₂) per year which would lead to three different levels of global warming



Think Piece 3: UK Plans for Carbon Emission Reduction

1. Introduction

This Think Piece has been written to give you a brief introduction to the first of two subject areas being discussed at the round table panel meeting on 10 October. You should read this sheet before coming to the session. As you do so:

- Note any questions you have;
- Think about what you would like to talk about in relation to global action on climate change.

2. Legislation

The Climate Change Act established a target for the UK to reduce its emissions by at least 80% from 1990 levels by 2050. This target represents an appropriate UK contribution to global emission reductions consistent with limiting global temperature rise to as little as possible above 2°C. To ensure that regular progress is made towards this long-term target, the Act also established a system of five-yearly carbon budgets (which act as caps on emissions) currently stretching out to 2023-2027.

2. UK emissions

Meeting the fourth carbon budget (which runs from 2023-27) will require that emissions be reduced by 50% on 1990 levels in 2025. In 2012 emissions were already 27% below 1990 levels. Of the greenhouse gas emissions in 2012, 27% came from burning fossil fuels to generate electricity, 16% came from heating buildings, 20% came from industry and manufacturing, a further 20% came from burning fuel for transport and finally 16% came from emissions of methane and nitrous oxide from agriculture and waste products.

3. Ways of reducing carbon emissions

There are two principal ways of reducing carbon emissions:

a) Using energy more efficiently

There will always be a demand for energy, but it is possible to use it much more efficiently and effectively than we do now. This is true for both consumers and businesses. In many cases, it is possible to save energy and money at the same time. This does not imply cold baths and no cars but does mean a more efficient boiler and driving cars with more efficient engines.

b) Low-carbon fuels

There are many opportunities to reduce our dependence on fossil fuels. For example increasing the amount of electricity generated through low-carbon technologies like nuclear and wind, and relying less on gas and coal. This low-carbon electricity can then be used in place of other fossil fuels such as petrol in cars or gas in heating.

Low carbon technologies that can be used to meet UK climate targets

Renewables	<ul style="list-style-type: none">• Energy sources from natural processes such as solar, wind and tidal• In the UK energy from renewables has increased from less than 4% of the total final energy consumption in 2004 to more than 10% in 2012 and should reach at least 15% by 2020.
Nuclear Power	<ul style="list-style-type: none">• A key source of electricity generation since the 1970s• The UK currently has 16 reactors contributing around 20% of generation in 2011
Carbon capture and storage	<ul style="list-style-type: none">• Captures CO₂ emitted by burning fossil fuels and stores it in secure places• Would allow the generation of electricity using fossil fuels with up to 90% less emissions, however has not yet been demonstrated at commercial scale
Bioenergy	<ul style="list-style-type: none">• A form of renewable energy made from a variety of crops, forestry, and organic waste• In 2011 energy from bioenergy accounted for 2.2% of heating; 6.3% of electricity generation and 2.9% of transport
Electrification	<ul style="list-style-type: none">• The process of moving from other energy sources to low-carbon electricity,• Increased use of electricity for heating and vehicles offers substantial potential to reduce overall emissions

Source: International Energy Agency (2012) Energy Technology Perspectives

Think Piece 4: Implications of UK Action

1. Introduction

This Think Piece has been written to give you a brief introduction to the second of two subject areas being discussed at the round table panel meeting on 10 October. You should read this sheet before coming to the session. As you do so:

- Note any questions you have;
- Think about what you would like to talk about in relation to the implications of UK action on climate change.

2. Impacts from UK action on climate change

Reducing UK emissions means switching from high-carbon energy sources (fossil fuels like oil, gas and coal) to low-carbon sources (like wind power and nuclear). Unfortunately these technologies tend to be more expensive. Although improving our efficiency of energy use can limit the effect overall, action on climate change will come at a cost. In advising government on the levels of carbon budgets for the UK, the CCC have estimated that cost with a particular focus on the impact of energy bills for households and businesses.

3. Recent increases in energy bills

Energy bills have increased significantly in recent years. For example, the average annual household energy bill (of a customer using gas for heating and electricity for lights and appliances) has risen from £610 in 2004 to £970 in 2011. However, most of this increase (80% in 2011) is a result of the international price of gas and investment in networks to deliver electricity and gas. The cost of green policies makes up around 10% of an average dual-fuel energy bill.

3.1 Household energy bills to 2020

The CCC estimate that measures to support low-carbon technologies will increase annual energy bills (for the average household using both gas and electricity) by around £100 by 2020. There is, however, scope to balance the bill increase through improvements in energy efficiency, for example:

- Replacing an old boiler can typically save over £100 per year;
- Further savings of £85 from more efficient lights and appliances;
- And an additional £25 from improved efficiency in heating systems (e.g. improved insulation).

3.2 Commercial and industrial energy bills to 2020

Energy costs will rise for commercial and industrial users due to low-carbon policies (by 20-25% from 2011 to 2020). However, given that energy costs make up only 0.4% of total costs for the commercial sector and 3% for the industrial sector, the CCC predicts the final impact on the consumer to be very small adding between 1-6p to every £10 spent on producing goods and services.

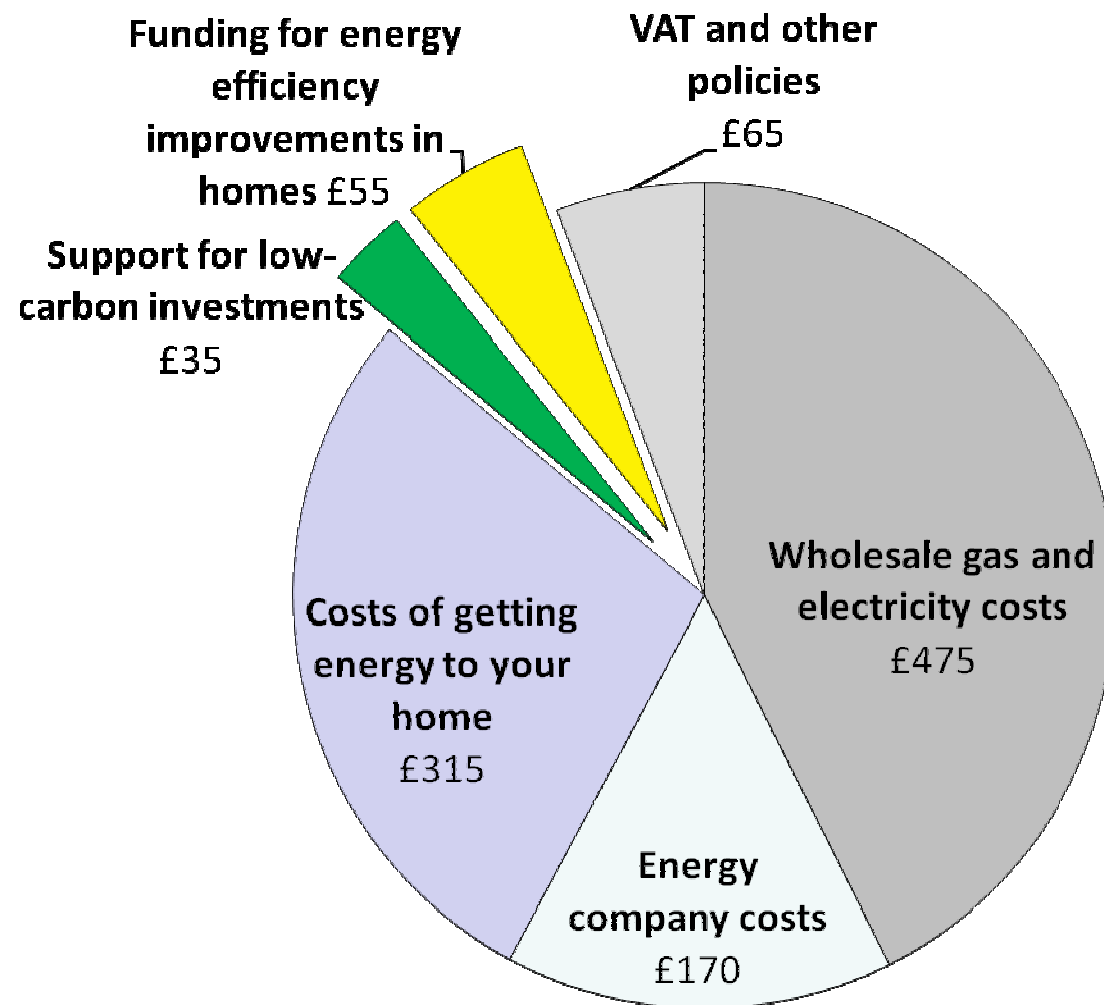
4. Competitiveness in Industry

Increases in energy prices will have a larger impact on heavy industry like steel production with very intensive energy use. There is therefore a potential concern about competitiveness impacts of low-carbon policies for a small number of energy-intensive industries. This can be and is being addressed through government policies to directly offset low-carbon costs for industries at risk.

5. Other impacts

Moving to a low-carbon economy will also have effects that many will see as beneficial – improved air quality, quieter vehicles, and more comfortable homes.

Typical household gas and electricity bill in 2012 was around £1,100. The chart shows a breakdown of that cost



- Recent increases in energy bills have been almost entirely driven by the wholesale price of gas and electricity, which has increased by 75% since the beginning of 2010.

- Low carbon policies currently make up around £35 (3%) of your yearly energy bill.

Source: CCC



Appendix 2: Dialogue programmes

Panel discussion 1: Wednesday 9 October 2013

Time	Activity
5:30-6:00	Arrivals and registration
6:00-6:25	Welcome & introductions
6:25-6:45	Small group warm-up & baseline session
6:45-6:55	Plenary Questions & Answers
6:55-7:15	Expert witness presentation: Why do we need carbon targets?
7:15-7:45	Discussion and questions
7:45-8:00	Coffee break
8:00-8:20	Expert witness presentation: Is the rest of the world acting on climate change?
8:20-8:50	Discussion and questions
8:50-9:00	Preparation for next workshop
9:00	Close



Appendix 2 continued

Panel discussion 2: Thursday 10 October 2013

Time	Activity
5:30-6:00	Arrivals and registration
6:00-6:20	Welcome & introductions
6:20-6:35	Small group warm-up & reflection session
6:35-6:55	Expert witness presentation: What is the UK doing to tackle climate change?
6:55-7:30	Discussion and questions
7:30-7:45	Coffee break
7:45-8:05	Expert witness presentation: What are the wider impacts of UK action on climate change?
8:00-8:20	Expert presentation: Is the rest of the world acting on climate change?
8:05-8:50	Discussion and questions
8:50-9:00	Preparation for next workshop
9:00	Close



Appendix 2 continued

Panel discussion 3: Saturday 12 October 2013

Time	Activity
09:30-10:00	Arrivals and registration
10:00-10:20	Welcome & introductions
10:20-10:35	Small group warm-up & reflection session
10:35-10:55	Witness presentation: The unanswered questions
10:55-11:05	Discussion and questions
11:05-11:20	Coffee break
11:20-11:50	Small group formulating recommendations - part one
11:50-12:35	Small group formulating recommendations - part two
12:35-12:55	Plenary cooperation on recommendations
12:55-13:05	Presentation of panel member recommendations to the Committee on Climate Change
13:05-13:15	Any other Thanks & Close
13:15	Distribution of incentives



Appendix 3: Discussion help points

1. Background

The purpose of the public dialogue round table discussions is to understand public views on the climate change challenge and proposed measures to reduce carbon emissions. The discussion we have at all three workshops will be facilitated by Hopkins Van Mil so that they are enjoyable, interesting and enhance participants' and the Committee on Climate Change's thinking about the UK's response to climate change.

2. Before you come to the Round table meetings

There is a lot to discuss at the meetings. You may want to think about some of the things we will be talking about beforehand. To help you do this we have written four Think Pieces. Before you come to the workshop on Wednesday please read Think Pieces 1 and 2 which have been emailed to you. At the end of Wednesday's workshop you will be given two more Think Pieces to read in preparation for Thursday's workshop. They are all short and are designed to introduce you to the key points that will be covered during the workshops. Please don't feel you need to spend a lot of time on this.

3. Points to remember during the Round table meetings

To make a good discussion possible at the round table panel meetings please read and remember the following:

a) Small group allocation

- You have been randomly allocated to one of three small discussion groups. Your group may change during the workshop process and we will decide this at the end of workshop 1.

b) Confidentiality

- Points made during the small group discussions will be recorded on flip charts and parts of the session will be recorded on a voice recorder. At the end of each session, we will have a record of all the views expressed but not who said what. The recorded views will form the basis of a summary findings report which will be shared with participants after the event. Voice recordings will be deleted after the analysis phase.

c) What we'll be talking about

- Over the three days expert witnesses will make presentations on the workshop themes. Some of the words used may need an explanation. We have provided

this in [section h](#) of this document - so do have a look if you would find it useful to think about these words before our first roundtable on Wednesday.

- If there are any words or phrases used during the presentations or discussions that you do not understand please let your facilitator know. They will work with you to make sure everything is as clear as possible for everyone.

d) Making the conversation easier

- It is helpful if people are positive in their comments (even if you disagree with someone) – constructive criticism is often very effective in an open discussion.
- Understand that everyone's input is equally valuable, and the facilitators will record everything that informs the discussion.
- Please allow everyone a fair and equal opportunity to speak and try not to interrupt. The facilitators will note that you are trying to make a comment and give you time as appropriate.
- Don't take part in side conversations as it makes it harder for everyone to hear and take part.
- Do remember that there are no 'stupid' questions, we're all here to learn, understand and move the debate forwards.
- Please come from breaks on time and help the facilitators to stick to time.
- Please do not use mobile phones during the discussions as it can be distracting for the group.

d) Expert witnesses

During the sessions we will be listening to short presentations from a range of experts on climate change issues. These are to help us gain an understanding so that we can formulate recommendations to the Committee on Climate Change by the end of workshop 3. They will take part in the discussion to answer questions and clarify the things they have said. They will not join in with the small group discussions, but they may drop-in to listen to what is being said.

f) Your facilitator

- The facilitator is the person who is helping your group with the discussion. Please remember that the facilitator is there to keep the roundtable discussion to time and to give everyone a chance to make the comments they wish to make. So do turn to anyone on the facilitation team for advice if you need more support to make a comment.

g) Observers

- Representatives from the Committee on Climate Change and Sciencewise UK will be present to observe the process. They are not in the room to take part in the discussion so please don't worry if they don't make any comments, they are listening to what takes place to understand the views of the public on the UK response to climate change.

- In addition, Phil Downing and Alex Plumb from Icaro-consulting will be present. Phil and Alex are researching how well the roundtable discussions meet the project objectives and evaluate the process.

h) Some words we may hear during the public dialogue round table discussions

Here are some words which may be used at the meetings with a brief explanation of their meaning.

Term	Definition
Biofuel	A fuel derived from biological material and used to power vehicles (can be liquid or gas). Biofuels are commonly derived from cereal crops but can also be derived from animals, trees and even algae. Blended with petrol and diesel biofuels it can be used in conventional vehicles.
Biomass	Biological material that can be used as fuel or for industrial production. Includes solid biomass such as wood and plant and animal products, gases and liquids derived from biomass, industrial waste and municipal waste.
Carbon Capture and Storage (CCS)	Technology which involves capturing the carbon dioxide emitted from burning fossil fuels, transporting it and storing it in secure spaces such as geological formations, including old oil and gas fields and aquifers under the seabed.
Carbon price	The price at which permission to emit 1 tCO ₂ e can be purchased. Carbon has a price where emissions trading schemes are operating (see emissions trading scheme below)
Climate	The climate can be described simply as the 'average weather', typically taken over a period of 30 years. More rigorously, it is the statistical description of variables such as temperature, rainfall, snow cover, or any other property of the climate system.
Climate sensitivity	The response of global mean temperatures to increased concentrations of carbon dioxide in the atmosphere. It is typically defined as the temperature increase that would occur at equilibrium after a doubling of carbon dioxide concentration above pre-industrial levels.
Eco-driving	Eco-driving involves driving in a more efficient way in order to improve fuel economy. Examples of eco-driving techniques include driving at an appropriate speed, not over-revving, ensuring tyres are correctly inflated, removing roof racks and reducing unnecessary weight.
Electric vehicle	Vehicle capable of full electric operation fuelled by battery power driven by an electric motor.
Emissions Trading Scheme (ETS)	Cap and trade system which establishes binding controls on the overall amount of emissions from participants. Within this cap, those entities which are covered by the scheme are then free to choose where best to deliver emission reductions by trading units at the prevailing carbon price (see above) which correspond to reductions in emissions.
Fuel Poverty	A household is said to be in fuel poverty if it needs to spend more than 10% of its income on fuel to maintain an adequate level of warmth.
Greenhouse Gas (GHG)	Any atmospheric gas (either natural or human in origin) which absorbs heat given off by the Earth's surface. This traps heat in the atmosphere and keeps the surface at a warmer temperature than would otherwise be possible.
Gross Domestic Product (GDP)	A measure of the total economic activity occurring in the UK.

GtCO₂	A gigatonne (1,000 million tonnes) of carbon dioxide.
Heat pumps	Can be an air source or ground source heat pump to provide heating for buildings. Working like a 'fridge in reverse', heat pumps use compression and expansion of gases or liquid to draw heat from the natural energy stored in the ground or air.
Intergovernmental Panel on Climate Change (IPCC)	The IPCC was formed in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). It is designed to assess the latest scientific, technical and socio-economic literature on climate change in an open and transparent way which is focussed on the science rather than the political implications. This is done through publishing a range of special reports and assessment reports, the most recent of which (the Fifth Assessment Report, or AR5) was produced in 2013.
Kyoto Protocol	Adopted in 1997 as a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol makes a legally binding commitment on participating countries to reduce their greenhouse gas emissions by 5% relative to 1990 levels, during the period 2008-2012. Gases covered by the Kyoto Protocol are carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), sulphur hexafluoride (SF ₆), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).
Methane (CH₄)	Greenhouse gas which arises in the agriculture sector from the digestive systems of ruminant animals (e.g. cattle and sheep) as well as in manures.
MtCO₂	Million tonnes of Carbon Dioxide (CO ₂).
Nitrous oxide (N₂O)	Greenhouse gas which arises naturally in agricultural soils through biological processes and is influenced by a variety of soil and nutrient management practices and activities (e.g. synthetic fertiliser application).
Pre-Industrial	The period before rapid industrial growth led to increasing use of fossil fuels around the world. For the purposes of measuring global mean temperature increases, 'pre-industrial' is often defined as before 1750.
Renewables	Energy resources, where energy is derived from natural processes that are replenished constantly. They include geothermal (heat from the earth), solar, wind, tide, wave, hydropower, biomass and biofuels.
Smart meters	Technology which can provide information on energy use directly to energy consumers (for example through display units or through the internet) with the potential to provide gas and electricity customers with accurate bills as well as real time information that could help them use less energy.
Smarter Choices	Measures that influence people's travel behaviour towards less carbon intensive alternatives to the car such as public transport, cycling and walking by providing targeted information and opportunities to consider alternative modes.
Solar photovoltaics (PV)	Panels that generate electricity from daylight.
Solar water heating	Solar technology which uses the warmth of the sun to heat water to supply hot water in buildings.
United Nations Framework Convention on Climate Change (UNFCCC)	Signed at the Earth Summit in Rio de Janeiro in 1992 by over 150 countries and the European Community (with further countries joining since then), the UNFCCC has an ultimate aim of 'stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.'



Appendix 4: Process plans

Workshop 1 9 October 2013 18:00 – 21:00 The Climate Change Challenge

Objectives (Why we are doing it)	Programme (Key areas that need to be covered)	Outcomes (What we want at the end that we have not got now?)
<p>Aim To engage 25 people recruited for the purpose in a round table panel process and provide background information to support their contribution.</p> <p>Objectives - to ensure understanding on:</p> <ul style="list-style-type: none"> ○ The background to the project ○ Why a round table panel process is appropriate ○ What will be achieved during the 3 workshops and this workshop ○ The threat and long-term impact of climate change ○ Global action and the UK's role ○ To lay the foundations for workshops 2&3 in which: <ul style="list-style-type: none"> • We discuss UK plans & implications; • The panel calls back or asks for additional witnesses; • and produce their recommendations 	<ul style="list-style-type: none"> ○ Welcome ○ Introduction to the workshop ○ Warm-up and baseline session ○ Witness presentation 1: The science of climate change ○ Discussion & questions ○ Witness presentation 2: Global action ○ Discussion & questions ○ Preparation for the next workshop ○ Close 	<ul style="list-style-type: none"> ○ An understanding of the round table panel process and everybody's role within it ○ A parity of understanding and knowledge of the science of climate change ○ A parity of understanding and knowledge of international action and the UK's role within it ○ Clarity on next steps and ongoing participation

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
5:00	Set up	<p>Room layout, facilitation stations (x3) displays, refreshments etc</p> <p>Note: facilitation team will have a briefing away from the venue as there is no time before get-in at the venue. This is so we all use the process plan consistently and effectively to get the best workshop outcomes. Key points:</p> <ul style="list-style-type: none"> • Importance of flexi-time -gains and losses in time even out through the process (HH to manage) • Reference to the help notes / ground rules • HH to brief speakers - keep to time and focused / short answers to questions - purpose to inform and then allow time for discussion. 	Henrietta (HH) Anita (AvM) & Hally (HI)	Set up and ready to go	<p>Facilitation Tool Kit (HVM)</p> <p>Prepared flip charts for each facilitation station (HVM)</p> <p>Additional flip chart paper (venue)</p> <p>Setting up facilitation stations (Henrietta / Anita / Hally)</p> <p>CCC Displays ? (CCC)</p> <p>Ideas wall set up</p> <p>Refreshments (venue)</p> <p>Powerpoint projector / Laptop (venue)</p> <p>Screen (venue)</p>
5:30-6:00	Arrivals – Sign in desk	People welcomed, signed in, given a hard copy of the participation pack, pointed to facilities / refreshments.	HVM team to staff the sign in desk	Everyone aware of the available space and how to move in to the discussion	<p>Badges (HVM)</p> <p>Printed participation packs (HVM)</p>
6:00 (10 mins to 6:15)	Welcome Introductions	<p>Initial welcome from the facilitation team plus venue health, safety and housekeeping announcement. Then introduce: Committee on Climate Change who explain:</p> <ul style="list-style-type: none"> • What the CCC is 	HH CCC	All clear on what we are doing here	Further reference to packs

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
(5 mins to 6:20)		<ul style="list-style-type: none"> Why this dialogue had been commissioned What the CCC's role is in policy advice to government Role as observers / expert witnesses during the panel process <p>Explain aims & objectives of the panel - to learn more about public:</p> <ul style="list-style-type: none"> Understanding of the global climate change challenge Acceptability of the risks of global climate change compared to the costs of global action Views of the UK's role and responsibility within global action Understanding of what the UK and others are doing about the challenge Views on tolerance for the risk of the UK moving first compared to the benefits Understanding of and attitudes to energy bill impacts of UK action including what: <ul style="list-style-type: none"> has driven price change may happen to prices / bills in the future are possible trade-offs <p>Specific purpose of this workshop:</p> <ul style="list-style-type: none"> To allow you to understand the aims and objectives of the citizen's panel style process and the intended outcomes To make sure you understand your role and those of the witnesses, observers and facilitators To lay the foundations for all of the work this week To provide you with sufficient knowledge of climate change and its impacts so that 	HH		

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
		<p>you can make specific recommendations on the 4th Carbon Budget to the Committee on Climate Change by the end of the third workshop.</p> <p>Introduce help points / ground rules - hard copy in your participation packs, remember to highlight:</p> <ul style="list-style-type: none"> • Interested in a range of views • Respect other people's even if not your own • Everyone is listened to and recorded • There are no stupid questions - we're here to learn, understand and move the debate forwards • Come back from breaks on time and help us stick to time • No mobile phones during the discussions • Don't interrupt when speaking • Use the facilitators <p>We'd like a couple of volunteers to make notes about what they have done during these sessions. What did you think about the experience of working on the panel; what if anything you have learned about climate change. Very brief but will help us understand what the experience of being on the panel was like for you. When you break in to small groups your facilitator will ask you about this again.</p> <p>We are joined by expert speakers who will be giving us a series of presentations on key subjects to inform our discussions. The experts will also be available during our discussions if a technical point requires immediate clarification. We will spend time in small</p>	HH		

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
		<p>groups formulating questions for the speakers so that we understand the issues fully before formulating recommendations in our third workshop on Saturday.</p> <p>Note on observers: we have a team here from the Committee on Climate Change, Steve Robinson from Sciencewise and xxx from DECC plus xxx the external evaluator. These observers will drop in to each group to observe what is happening, but they will not take part in the discussions.</p>			
6:20-6:25	Divide in to 3 groups	<p>You have been randomly allocated to a group for this workshop as follows: Anita van Mil - green group Hally Ingram - purple group Henrietta Hopkins - orange group</p> <p>Please go to your facilitation station now</p>	HH	Everyone in their small group setting	
6:25-6:45 (5 mins to 6:30)	Warm-up & baseline session	<p>Facilitators: Welcome to the group Go round the table - introduce yourselves and say where you live. Then tell the group one fact about yourself.</p> <p>Ask for permission to use the table recorders - explain this is only to capture their views and no other purpose. The recordings will be stored safely by HVM and destroyed once the reporting process is complete. If there is anything you would like to say which you would rather was not recorded please ask the facilitator to turn the recorder off until you have finished that comment.</p>	HH, AvM & HI in each facilitation station	Panel members feel at ease and comfortable working together	<p>Audio recorders for each table Flip chart recording</p>
(5 mins		Facilitator to distribute pre-session			Pre-session questionnaires (HVM)

6:55-7:15	Witness presentation 1	<p>Introduce the session and the speaker, stress that we'll work together on formulating questions in the small group session so Panel members should note any points they need clarified / or need to understand better and bring them to the next session.</p> <p>The Science of Climate Change CCC expert witness So that Panel members understand:</p> <ul style="list-style-type: none"> • Why the issue is important • Natural and human factors • How we know (monitoring / measuring) • What the long-term impacts are for individuals / communities / society <p>Participants go back to their original tables for the formulation of questions.</p>	HH CCC	Clear understanding on the starting point for a discussion on climate change leading to trajectories or carbon emission reductions.	Presentation in the participation packs
7:15-7:35 (10 mins to 7:25) (5 mins to 7:35)	Facilitated table discussion	<p>START RECORDING</p> <p>Draw attention to material in participation packs Q1: What was important about what you heard - ask participants to record one point on a post-it, gather and discuss <i>Prompts [to be used as necessary]:</i></p> <ul style="list-style-type: none"> • When thinking about what you heard is there anything you would want to share with a friend? <p>Q2: What was difficult to understand about the presentation? <i>Prompts [to be used as necessary]:</i></p> <ul style="list-style-type: none"> • To what extent did you find the words used to describe the science clear? • If you were telling someone else about the presentation what would be hardest to describe to them? • What were the challenges for you in 	HH, AvM, HI	Questions for the expert witnesses are drawn up by the group and calmly discussed before being asked of the speaker	Facilitators to record key points on flip chart Participants to record points on post-its

		<p>listening to the presentation?</p> <ul style="list-style-type: none"> To what extent did you find the science presented credible? <p>Q3: What else would you like to know about the science which explains climate change? <i>Prompts [to be used as necessary]</i></p> <ul style="list-style-type: none"> To what extent do you have questions that remain unanswered following the presentation? <p><i>Last five minutes:</i> Table agreement on which questions should be asked of expert witnesses and who should ask them.</p> <p>STOP RECORDING</p>			
7:35-7:45	Plenary session	<p>Each table asks witnesses for clarification on the above questions</p> <p>Opportunity for further panel member questions</p> <p>End session & introduce <i>ideas wall</i></p>	HH to facilitate		HI to record plenary discussion on flip chart
7:45-8:00	Coffee break	<p>During the break Panel members encouraged to write any ideas / thoughts they have on climate change on the <i>ideas wall</i></p>	Facilitators to help / encourage use of ideas wall		Ideas wall
8:00-8:20	Witness presentation 2	<p>Introduce the session and the speaker, remind the group that we'll follow the same process as before with the tables working together on formulating questions in the small group session so Panel members should note any points they need clarified / or need to understand better and bring them to the next session.</p> <p>Global action CCC expert witness</p>	<p>HH</p> <p>CCC</p>	Clear understanding of global action	Presentation in the participation packs

		<p>So that Panel members understand:</p> <ul style="list-style-type: none"> • Why this is a global problem requiring global action • What action is being taken internationally • Examples of action being taken by individual countries • Very brief signposting on how global action moves us to UK action <p>Participants go back to their original tables for the formulation of questions.</p>			
<p>8:20-8:40</p> <p>(5 mins to 8:25)</p> <p>(5 mins to 8:30)</p> <p>(5 mins to 8:35)</p>	Facilitated table discussion	<p>START RECORDING</p> <p>Draw attention to material in participation packs</p> <p>Q1: What was important about what you heard - ask participants to record one point on a post-it, gather and discuss</p> <p>Q2: What was difficult to understand in the presentation?</p> <p><i>Prompts [to be used as necessary]</i></p> <ul style="list-style-type: none"> • To what extent did you find the words used to describe the steps being taken globally difficult? • If you were telling someone else about the presentation what would be hardest to describe to them? • What were the challenges for you in listening to the presentation? <p>Q3: What else would you like to know about global action on climate change?</p> <p><i>Prompts [to be used as necessary]</i></p> <ul style="list-style-type: none"> • Tomorrow we'll be hearing presentations on proposed action in the UK. To what extent has the information you have heard today given you the background you need to understand the UK situation? 	HH, AvM, HI	Questions for the expert witnesses are drawn up by the group and calmly discussed before being asked of the speaker	Facilitators to record key points on flip chart Participants to record points on post-its

(5 mins to 8:40)		<p><i>Last five minutes:</i> Table agreement on which questions should be asked of expert witnesses and who should ask them.</p> <p>PLUS - volunteer - one panel member per table to be asked to complete a brief diary for the workshop process.</p> <p>STOP RECORDING</p>			
8:40-8:50	Plenary session	Each table asks witnesses for clarification on the above questions Opportunity for further panel member questions	HH to facilitate		HI to record plenary discussion on flip chart
8:50-9:00	Preparation for next workshop	<p>HH to thank everyone for the contribution, stress how helpful it has been and that the facilitators will write up the notes as swiftly as possible so that they can be used to inform Saturday's final workshop.</p> <p>Participants asked to read the 2 think pieces for the next workshop tomorrow evening. They are told that they are welcome to discuss what they've heard with family and friends.</p> <p>We'd like you to reflect actively on what you've heard and think about:</p> <ol style="list-style-type: none"> 1) Anything else you'd like to know? 2) Is there any more you need to hear from today's speakers on Saturday's workshop <p>If you think about that overnight and we'll ask you that when we start tomorrow's session. Stress the importance of coming to each of the next two workshops. If you miss tomorrow's presentations then we will all struggle to make sense of what we are doing on Saturday.</p>	HH		Confirmation that £200 will be given out on Saturday.

9:00-9:15	Wash-up	<p>Very brief facilitator wash-up</p> <ul style="list-style-type: none"> • How were the table groupings? • Should we keep the same table groupings tomorrow or swap people around? • What would you differently tomorrow given what we've achieved this evening 	HH, AvM, HI, Sciencewise and CCC	Better understanding of placements / process to make any adjustments for tomorrow.	HH to take notes to feed in to any process amendment for tomorrow.
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Appendix 4 continued

Process Plan Workshop 2: 10 October 2013

18:00 – 21:00

Proposed UK Measures

Objectives (Why we are doing it)	Programme (Key areas that need to be covered)	Outcomes (What we want at the end that we have not got now?)
<p>Aim To engage 25 people recruited for the purpose in a Citizen's Panel Process and provide background information to support their contribution.</p> <p>Objectives - to ensure understanding and encourage discussion on:</p> <ul style="list-style-type: none"> ○ The UK's role and responsibility within global action ○ Steps to reduce carbon emissions ○ Impacts of those steps on individuals, communities and society ○ Costs and benefits of the various options available ○ To lay the foundations for the workshops 3 in which: <ul style="list-style-type: none"> ● Panel calls back or asks for additional witnesses and it produces its recommendations to CCC. 	<ul style="list-style-type: none"> ○ Welcome ○ Introduction to the workshop ○ Warm-up and reflection session ○ Witness presentation 1: UK plans for carbon emission reduction ○ Discussion & questions ○ Witness presentation 2: The implications of UK plans ○ Discussion & questions ○ Preparation for the next workshop ○ Close 	<ul style="list-style-type: none"> ○ A parity of understanding and knowledge of UK action on carbon emission reduction ○ A parity of understanding and knowledge of the implications as they are understood by CCC ○ Initial understanding of the views of participants on the steps being taken and their implications ○ The views of participants when discussing the detailed impacts of climate change on individuals, communities and society ○ Clarity on next steps and ongoing participation

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
5:00	Set up	Room layout, facilitation stations (x3) displays, refreshments etc Facilitation reminder: flexi-time HH to remind speakers - keep to time and focused / brief answers to questions	Henrietta (HH) Anita (AvM) & Hally (HI)	Set up and ready to go	Facilitation Tool Kit (HVM) Prepared flip charts for each facilitation station (HVM) Additional flip chart paper (venue) Setting up facilitation stations (Henrietta / Anita / Hally) CCC Displays ? (CCC) Ideas wall set up Refreshments (venue) Powerpoint projector / Laptop (venue) Screen (venue)
5:30-6:00	Arrivals – Sign in desk	People welcomed, signed in, given a hard copy of today's Think Pieces, pointed to facilities / refreshments. Facilitators liaise informally with their group's diary keepers, how did they get on?	HVM team to staff the sign in desk HH, AvM, HI	Everyone aware of the available space and how to move in to the discussion	Badges (HVM) Printed material as necessary (HVM)
6:00	Welcome	Initial welcome from the facilitation team plus venue health, safety and housekeeping announcement. Acknowledge absences and thank everyone for coming back again - if people aren't here [agree process for Saturday].	HH	All clear on what we are doing here	Further reference to packs
6:05-10	Introduction	Reminder about observers present and dropping in to sub-groups. Specific purpose of this workshop - to learn about and discuss: <ul style="list-style-type: none"> • The UK's role and responsibility within global action • Steps to reduce carbon emissions • Impacts of those steps on individuals, communities and society 	HH		

6:10-6:15		<ul style="list-style-type: none"> • Costs and benefits of the various options available • The insurance dimension - action in the face of uncertainties <p>Reminder that we are doing this so that:</p> <ul style="list-style-type: none"> • You can make specific recommendations on the 4th Carbon Budget to the Committee on Climate Change by the end of the third workshop. <p>Very brief reminder of ground rules - hard copy in your participation packs. Pick up on anything in particular that may have happened the day before which should be addressed:</p> <ul style="list-style-type: none"> • Interested in a range of views • Respect other people's even if not your own • Everyone is listened to and recorded • There are no stupid questions - we're here to learn, understand and move the debate forwards • Come back from breaks on time and help us stick to time • No mobile phones during the discussions • Don't interrupt when speaking • Use the facilitators <p>Brief reminder from CCC about what you heard yesterday - highlight no more than 3 key messages.</p>	Adrian or Sarah		
6:15-6:20	Divide in to 3 groups	<p>We've had a think about yesterday's session and we'd now like to ask you to stay in the same group as yesterday:</p> <p>Anita van Mil - green group Hally Ingram - blue group Henrietta Hopkins - orange group</p>	HH	Everyone in their small group setting	

		Please go to your facilitation station now			
6:20-6:45 (5 mins to 6:25)	Warm-up & reflection session	<p>Facilitators: Welcome [back] to the group Remind the group about the recording and that they can ask to stop the recording if they wish to talk about something off the record. Go round the table - [re]introduce yourselves to the group and answer this: What were your thoughts as you left the building yesterday evening?</p> <p>START RECORDING</p> <p>Q: You've had time to reflect on what you heard last night, as a result, what, thoughts do you have on the climate change challenge?</p> <p>Facilitators to distribute post-its and ask participants to write at least one thought on the post-its.</p> <p>Talk to your neighbour about the thoughts you've had. After 5 minutes, facilitators to gather up post-its and group on flip chart. Discussion on the groupings.</p> <p>STOP RECORDING</p>	HH, AvM & HI in each facilitation station	Panel members feel at ease and comfortable working together	<p>Audio recorders for each table Flip chart recording of key points</p> <p>Recorded points on flip chart Post-it verbatim record</p> <p>Flip chart recording</p>
6:35-6:55	Witness presentation 1	<p>Introduce the session and the speaker, remind everyone that we'll work together on formulating questions in the small group session so Panel members should note any points they need clarified / or need to understand better and bring them to the next session. Stress that we are hearing from two speakers this evening, firstly on UK plans, secondly on the implications of those plans.</p>	<p>HH</p> <p>CCC</p>	Clear understanding on what action is being taken and what is possible for the UK in reducing carbon emissions.	Presentation in the participation packs

		<p>UK Plans for Carbon Emission Reductions CCC expert witness So that Panel members understand:</p> <ul style="list-style-type: none"> • CCC's rationale for the budget levels • What the UK plans to do in relation to the 4th Carbon Budget • The reasons for a Government review of the budget in early 2014 • The low-carbon technologies in existence, or likely to be developed • Ways of deploying those technologies moving steadily towards the large emissions reductions required in the long-term <p>Participants go back to their original tables for the formulation of questions.</p>			
6:55-7:25 (10 mins to 7:05) (10 mins to 7:15)	Facilitated table discussion	<p>START RECORDING</p> <p>Draw attention to material in participation packs including the copy of the presentation.</p> <p><i>Process: brainstorming with post-it grouping</i> Q1: What was important about what you heard - ask participants to record one point of importance on a post-it, discuss, facilitator to gather post-its on flip chart, group and discuss</p> <p>Q2: What was difficult to understand about the presentation? <i>Prompts [to be used as necessary]</i></p> <ul style="list-style-type: none"> • What do you think about the reasoning behind UK action? • Were there any areas where you thought the arguments didn't add up? • To what extent do you find the future scenarios presented difficult or challenging? 	HH, AvM, HI	<p>Questions for the expert witnesses are drawn up by the group and calmly discussed before being asked of the speaker</p>	<p>Facilitators to record key points on flip chart Participants to record points on post-its Copies of presentation for each participant.</p> <p>Facilitators to record questions to be asked at plenary session.</p>

(5 mins to 7:20)		<p>Q3: What else would you like to know about the steps being taken in the UK? <i>Prompts [to be used as necessary]</i></p> <ul style="list-style-type: none"> Given what you know what do you think of these steps? What do you need to know to give you the clearest understanding of the setting of carbon budgets? <p><i>Last five minutes:</i> Table agreement on which questions should be asked of expert witnesses and who should ask them.</p> <p>STOP RECORDING</p>			
7:20-7:30	Plenary session	<p>Each table asks witnesses for clarification on the above questions Opportunity for further juror questions End session & reminder about <i>ideas wall</i> which will have been brought back from yesterday's workshop.</p>	HH to facilitate		HI to record plenary discussion on flip chart
7:30-7:45	Coffee break	<p>During the break Panel members encouraged to write any ideas / thoughts they have on UK action on climate change / 4th carbon budget on the <i>ideas wall</i> which will have been brought back from yesterday's session. Group to use different colour pens from the previous day.</p>	Facilitators to help / encourage use of ideas wall		Ideas wall Different coloured pens from yesterday
7:45-8:05	Witness presentation 2	<p>Introduce the session and the speaker, remind the group that we'll follow the same process as before with the tables working together on formulating questions in the small group session so Panel members should note any points they need clarified / or need to understand better and bring them to the next session.</p>	HH	Clear understanding of implications of UK action as they understood by CCC	Presentation in the participation packs

		<p>Implications of UK Action CCC expert witness So that Panel members understand:</p> <ul style="list-style-type: none"> • The insurance issue • Implications of new technology use • Impacts for energy bills / energy security / energy stability including what has happened in the past and what may happen in the future. • Other benefits / risks that arise from tackling climate change through a reduction in carbon emissions <p>Participants go back to their original tables for the formulation of questions.</p>	CCC		
8:05-8:40 (15mins to 8:20)	Facilitated table discussion	<p>START RECORDING</p> <p>Draw attention to material in participation packs including the copy of the presentation</p> <p><i>Process: thinking hats</i> Q1: What are your immediate views on the actions as you have heard them presented?</p> <p>The facilitator gives 2-3 people (depending on how many in the group) a card <i>without</i> explaining it, with either a red (negative view), amber (focusing on the facts) or green (positive view) hat on it. The facilitator keeps the white (neutral) hat. They are then told what their hats represent and they are asked to discuss in their sub-groups as follows making notes of key points on post-its:</p> <p>Red hats - all the negative points they wish to make about what they have heard, flaws they can see in the action, items that were not clear, steps that didn't seem feasible to</p>	HH, AvM, HI	Questions for the expert witnesses are drawn up by the group and calmly discussed before being asked of the speaker. The issue has been looked at from a variety of standpoints so that the group knows it has considered everything.	<p>Facilitators to record key points on flip chart Participants to record points on post-its Copies of presentation for each participant. Coloured hat laminated cards x 9 of red, amber, green and x3 white.</p> <p>Three separate sheets prepared for notes from each coloured hat.</p>

<p>(10 mins to 8:30)</p> <p>(10 mins to 8:40)</p>		<p>them, test the negative implications in terms of costs / economics / impacts on industry etc.</p> <p>Amber hats - think about the facts they heard in the presentation: what was clear to them; what additional facts would they need to know to understand the issues really well; what facts emerge from the implications presented; which facts were challenging.</p> <p>Green hats - to think about all the positive points they have heard in the presentation on implications; what did they feel was positive; are there clear benefits to individuals, communities, society in what was presented, how do the implications affect insurance against the uncertainties of climate change?</p> <p>White hat - remains neutral, providing support to the group, collects and collates post-its as it goes along and reminding them of their focus as necessary.</p> <p><i>Process: Brainstorming and collating</i> Facilitator invites each set of hats in turn to report their discussions based on the post-its they have produced. The other hats are invited to comment adding additional points if they have them.</p> <p><i>Last ten minutes:</i> Given the discussion the table is asked to agree on which questions should be asked of expert witnesses and who should ask them. Note: Facilitators not required to bring about consensus on the issues, the agreement is on which questions to ask. Facilitator to use coloured dots to prioritise if more questions come out than there is likely to be time for. The additional questions will nevertheless be added to the</p>			<p>Coloured dots for prioritisation as necessary</p>
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		record of the evening. STOP RECORDING			
8:40-8:50	Plenary session	Each table asks witnesses for clarification on the above questions Opportunity for further juror questions	HH to facilitate		HI to record plenary discussion on flip chart
8:50-9:00	Preparation for next workshop	<p>HH to thank everyone for the contribution, stress how helpful it has been and that the facilitators will write up the notes as swiftly as possible so that they can be used to inform Saturday's final workshop.</p> <p>We'd like you to reflect actively on what you've heard and think about: 1) Anything else you'd like to know? 2) Is there any more you need to hear from today's speakers on Saturday's workshop</p> <p>HH to ask panelists to use the 'any other thoughts cards' to record the views on the above questions. We'll need to invite the experts back first thing tomorrow so that they can come along on Saturday which is why we're asking you to write this down.</p> <p>Reminder about timings for Saturday and that incentives will be given out then. Stress importance of coming back on Saturday - all their hard work will have been for nothing if they don't come and formulate recommendations. Reminder to those writing up their thoughts and feelings on the sessions that we'd love them to do that for this evening's session.</p>	HH	Everyone has made their contribution and is clear on next steps	Any other thoughts cards
9:00-9:15	Wash-up	<p>Very brief facilitator wash-up</p> <ul style="list-style-type: none"> How were the table groupings? 	HH, AvM, HI, Sciencewise	Better understanding of placements /	HH to take notes to feed in to any process amendment for tomorrow.

		<ul style="list-style-type: none"> • Should we keep the same table groupings on Saturday or swap people around? • What would you differently on Saturday given what we've achieved this evening 	and CCC	process to make any adjustments for Saturday's workshop.	
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Appendix 4 continued

Process Plan Workshop 3: 12 October 2013

10:00am – 1:30pm

Synthesis

Objectives (Why we are doing it)	Programme (Key areas that need to be covered)	Outcomes (What we want at the end that we have not got now?)
<p>Aim To engage 25 people recruited for the purpose in a Round Table Panel Process and provide background information to support their contribution.</p> <p>Objectives:</p> <ul style="list-style-type: none"> To hear the views of witnesses called back by the panel for additional information / clarification To ensure all panel members have had the opportunity to reflect on and contribute to the discussion To give the panel the time and space to formulate clear and effective recommendations to the Committee on Climate Change To allow panel members to present those directly to the Committee and know that they will be taken in to account in policy advice to Government. 	<ul style="list-style-type: none"> Welcome Introduction to the workshop Warm-up and reflection session Witness presentation 1: The unanswered questions (flexible depending on what is asked for by panel members) Discussion & questions Formulation of panel recommendations Discussion & questions Presentation of the recommendations Thanks & Close 	<ul style="list-style-type: none"> A parity of understanding and knowledge on climate change challenge, the steps to mitigate the challenge and the implications of those steps Recommendations from the public to the Committee on Climate Change about the 4th Carbon Budget

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
9:00	Set up	Room layout, facilitation stations (x3) displays, refreshments etc	Henrietta (HH) Anita (AvM) & Hally (HI)	Set up and ready to go	Facilitation Tool Kit (HVM) Prepared flip charts for each facilitation station (HVM) Additional flip chart paper (venue) Setting up facilitation stations (Henrietta / Anita / Hally) CCC Displays ? (CCC) Ideas wall set up Refreshments (venue) Powerpoint projector / Laptop (venue) Screen (venue)
9:30-10:00	Arrivals – Sign in desk	People welcomed, signed in, given a hard copy of the programme pointed to facilities / refreshments.	HVM team to staff the sign in desk	Everyone aware of the available space and how to move in to the discussion	Badges (HVM) Printed participation packs (HVM)
10:00 (5 mins) (5 mins to 10:10)	Welcome Introduction	<p>Initial welcome from the facilitation team plus venue health, safety and housekeeping announcement. Then introduce:</p> <p>Specific purpose of this workshop - to:</p> <ul style="list-style-type: none"> • Reflect on what we've heard in previous two • Make specific recommendations on the 4th Carbon Budget to the Committee on Climate Change by the end of today <p>Very brief reminder of ground rules - hard copy in your participation packs, particularly if there is anything that happened the day before which should be addressed:</p> <ul style="list-style-type: none"> • Interested in a range of views • Respect other people's even if not your own • Everyone is listened to and recorded • There are no stupid questions - we're here 	HH HH	All clear on what we are doing here	Further reference to packs

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
(5 mins to 10:15)		<p>to learn, understand and move the debate forwards</p> <ul style="list-style-type: none"> • Come back from breaks on time and help us stick to time • No mobile phones during the discussions • Don't interrupt when speaking • Use the facilitators <p>CCC to remind those present of their role (refresher on 1st workshop which may feel fairly distant by now).</p>	CCC		
10:15-10:20	Divide in to 3 groups	<p>We've had a think about yesterday's session and we'd now like to ask you to stay in the same group as yesterday / move around a bit as follows [based on discussion the previous evening]:</p> <p>Anita van Mil - green group Hally Ingram - purple group Henrietta Hopkins - orange group</p> <p>Please go to your facilitation station now</p>	HH	Everyone in their small group setting	
10:20-10:35 (5 mins to 10:25)	Warm-up & reflection session	<p>Facilitators:</p> <p>Welcome [back] to the group</p> <p>Remind the group about the recording and that they can ask to stop the recording if they wish to talk about something off the record.</p> <p>Go round the table - [re]introduce yourselves to the group and answer this:</p> <p>How are you feeling as we come to the end of the three workshops?</p> <p>START RECORDING</p>	HH, AvM & HI in each facilitation station	Panel members feel at ease and comfortable working together	Audio recorders for each table Flip chart recording of key points
(10 mins to 10:35)		<p>Q: When you think about the presentations that you've had this week about climate change what particularly stands out in your</p>			Recorded points on flip chart Post-it verbatim record

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
(10 mins to 11:05)		<p><i>Process: brainstorming with post-it grouping</i></p> <p>Q1: What was important about what you heard - ask participants to record one point of importance on a post-it, discuss, facilitator to gather post-its on flip chart, group and discuss</p> <p>Facilitator to tell them that this session will feed in to the report to the Committee on Climate Change, not for further discussion now. STOP RECORDING</p>			
11:05-11:20	Coffee break	During the break Panel members encouraged to write any ideas / thoughts they have on UK action on climate change / 4th carbon budget on the <i>ideas wall</i> which will have been brought back from previous sessions. Group to use different colour pens from the previous day.	Facilitators to help / encourage use of ideas wall		Ideas wall Coloured pens
11:20-11:50 (aiming for 3 ideas areas with 10 mins on each sheet)	Formulating recommendations - 1	<p>Panel members return to their small groups. Facilitator to explain the Roving Ideas Storm. Each group will visit each sheet in turn and make comments on the subject areas based on the evidence they have heard in answer to the question:</p> <ul style="list-style-type: none"> To what extent do you agree with the measures being taken in the UK on these issues? <p>They won't repeat what others have written, but put a round green sticky dot next to it if they agree with it / or a red sticky square if they disagree with it.</p>	HH, AvM, HI	Consideration of action as a route towards recommendations Will also energise the group after the break	<p>Roving ideas storm pre-prepared on a flip chart based on the final evidence presentations and the results of the first 2 workshops. They will focus on the workshop 2 issues though to get to the core of the 4th carbon budget.</p> <p>Where possible CCC team standing by the sheets to provide information to panel members as required</p> <ol style="list-style-type: none"> UK Action Implications of the action - additional sheets on: <ul style="list-style-type: none"> Industry Energy consumption Fuel poverty Technologies etc.

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
11:50-12:35	Formulating recommendations - 2	<p>START RECORDING</p> <p>Facilitator - to create recommendations for the CCC I will ask you to talk to your neighbour for 5 minutes.</p> <p>Q: Given what you have heard what do you think is important for the CCC to include in its advice to Government?</p> <p>Please use post-its to record each point that you think should be included as you talk to your neighbour.</p> <p>Facilitator to gather up and group the post-its Group to discuss the themed groupings looking at the flip chart. [If time - prioritise the items to be included with coloured dots]</p> <p><i>Process: Brainstorming</i></p> <p>How would you summarise the risks of action?</p> <p>How would you summarise the risks of inaction?</p> <p>How would you summarise the benefits of the UK's proposed action?</p> <p>What are the three points you would like to make to the Committee on Climate Change around:</p> <ul style="list-style-type: none"> • What should be included in the advice to Government on the 4th Carbon Budget? • What are the risks of action? • What are the risks of inaction? • What are the benefits of the UK's proposed action? 		Recommendations are formulated	<p>Flip-chart</p> <p>Post-it recording</p> <p>Coloured dots for prioritisation if that helps the group</p> <p>Fast paced Yes <i>and</i> facilitation</p>
(15 mins to 12:05)					
(10 mins to 12:15)					
(15 mins to 12:30)					

Time	Agenda	Process	Who	Outputs / comes	Materials / notes
(5 mins to 12:35)		<p>As group ending hand out questionnaire used at the beginning and ask them to record their views now on:</p> <p>On a scale of 1-5 where 1=no knowledge and 5=very knowledgeable how would you rate your knowledge of climate change issues?</p> <p>On a scale of 1-5 where 1=not followed and 5=closely followed to what extent have you followed debates on climate change in the media?</p> <p>Facilitator to collect up the questionnaires</p>			Questionnaire
12:35-12:55	Plenary session	<p>Each group present their findings to the whole group</p> <p>Discussion: What is similar about the findings of each group?</p> <p>What is different about the findings of each group?</p> <p>What 6 points would you like as a group to make to the Committee on Climate Change?</p> <p>2 volunteers from each group to present two points each from the six to the Committee.</p>	HH to facilitate		<p>HI to record discussion on flip chart</p> <p>AvM to summarise 5 points on a flip chart</p> <p>Could use a spectrum line to indicate where people are on the issues as a final exercise.</p>
12:55-13:05		<p>Volunteers to present the recommendations to the Committee</p> <p>Committee on Climate Change to respond</p>	CCC		HI to record key response points
13:05-13:15		HH to thank everyone for the contribution, stress how helpful it has been and say that they will receive the summary findings from	HH	Everyone has made their contribution and contributed to the	Any other thoughts cards



Appendix 5: Dialogue transcripts

Panel discussion 1, 9 October 2013

Q: Do you have any questions about the panel process / the agenda?

Orange group notes:

- Is this funded by Government?
- 80% reduction. Is this an arbitrary amount?
- What is the figure based on - could it be 100%
- What's the penalty for not making the targets?
- Why are you allowed to buy credits? Individuals can own carbon credits. How can they do that? Shouldn't it be governmental?
- What is the impact on the ozone layer?
- Are the % based on globally recognised metrics? Is it standardised - EU / International / UK?
- Who is policing this?
- Fracking - why is government going down that route?
- Nuclear? After Japan we need to recognise the risks of that.
- Is 80% a worldwide figure or just the UK?
- Where do chemical trials fit in?
- How are electric car batteries disposed of?
- Does their disposal create health and other problems?
- Smart meters - are there health issues around having them in people's homes?
- I want to give some feedback: The science museum is not telling people enough about carbon emissions - I got no reply to my email when I asked why.
- Is there money for carbon emission reduction projects?
- How can government reconcile the carbon reduction agenda with a policy of growth and consumption?

Summary of questions raised by the orange group in the plenary

- How can the government reconcile the carbon emission agenda with a policy of growth and consumption?
- Globally recognised - who is policing it?
- How are the targets even possible? More people have cars / fly?

Green group notes

- Are all the people who are presenting independent?
- Is everything we discuss here pro climate change?
- Where do climate change deniers fit in?
- Do you have to give your own opinion only or can you give others' opinions to contribute?
- How does the CCC deal with controversies?
- How does the CCC achieve correct/ up-to-date media reporting?
- Are we only talking about impact on climate change by human beings?

Thought: Where is the proof? You don't see climate change, you don't feel it.

Blue group notes

- Nothing at the moment
- How will we affect Governments decision to do more or less about CC? How much of an impact/influence will we have?
- How will we use our views? What data is collected?
- How do you know we are really going to participate? People turning up for the money. Is (market research) the correct way to recruit?
- Another respondent responded... the advantage of this approach is that you do get a cross section
- Will the presenters have a broad range of views?
- Are we talking about the UK or an international level?
- What other research will be conducted by the Government?
- What is the relationships of this to fracking? Why do the Government want to do anything about global warming (if Cameron supports fracking)?
- What initiatives are in place to teach young people about CC?
- How much of an impact can the UK have globally as it is such a small country?
- What happens after the 3 sessions?
- Are other countries conducting similar research?

Plenary discussion – first session

Q: Do you have to give your own opinion or can you give others?

A: Your views are primary, but do talk to family and friends and bring those views too. But do tell us if it is not your views you are giving

Q: How will this affect the Government's decision to do less/more on climate change?

A: It is hard to say, because it [this process] will feed into the Committee's thinking re: what to recommend to Govt. So far the Committee has been very influential, each recommendation so far have been accepted. But the Government do not have to accept our recommendation. Your views will be fed into the Committee's, which will be fed into the Government.

Q: What initiatives are in place to educate young people on CC?

A: This is part of the responsibility of the Department for Education, it's covered in the curriculum – element of what is taught in schools. Department of Energy & Climate Change has also published information for schools to use.

Q: Will the presenters have a broad range of views? Where do you get the evidence?

A: We will present a balanced picture of the evidence. We are from the Committee on Climate Change, an independent body. We provide recommendations drawing on a wide view of the evidence.

A: We commission our own work (we have a research budget), review other evidence available, and from the government here and internationally. And we talk to business. [Participant then queried this]. You have to be aware of the interests of people you are talking to, and factor that into your considerations. We try to pull in evidence from a big range of sources.

Q: How can the government reconcile the carbon emissions agenda with a policy of growth and consumption?

A: We will present evidence to you. There are costs that have to be paid [to address CC]. The alternative is you let CC happen and don't try to tackle - then there will be costs to the

economy. Balancing cost of measures to avoid effects of CC, with what happens if you don't tackle CC. There is a cost, but if you don't do anything the costs will be substantially greater.

Q: How do you transfer from carbon based energy producing model to something where it is completely new....

A: It's an enormous questions, which will be covered in other presentations

A: It is unlikely something will become available that we know nothing about now. [Briefly made points about technologies]

Q: Are all the presenters independent?

A: They are employed by the CCC. Some of us are ex civil servants. The Committee is independent of Government, it prizes its independence. We do not share recommendations with Government prior to them being published. We don't give them the chance to change things it is not happy with.

Q: How much of an impact can the UK have globally when it is such a small country?

A: This will be covered later

Q: Define climate change – do we mean global warming, weather variations? If you are concerned about global warming, but Cameron says you can frack in someone's backyard?

A: To be discussed later

Table Discussions in response to *The Science of Climate Change*

Q1. What was important about what you heard?

Orange group

Panel members recording on post-its

- No brainer: overwhelming scientific evidence - what's the debate? Why have faith in the process?
- Consequences if we don't act
- Reference to ice age
- Sea rising
- The warming atmosphere
- How much of what is happening is natural?
- Why is it getting dryer in some parts of the world and wetter in others - how come it's not the other way round?
- What happened in the 1950s to create such an impact?
- Environmental change effect on bacteria and virus? i.e. extinction of the human species
- The effect of global warming on health.

Discussion recorded on flip chart

- Authenticity of commitment in 2013 when the UK's track record is dismal
- Why is the sea rising? Is it the earth's crust getting hotter / or is there an impact on cliff erosion and cliffs falling in to the sea

Green group

Panel members recording on post-its

- Sounds like they are 100% confident in what they are predicting. The actual effect of climate change
- The long term effects of climate change on the future of weather, food production, sea levels rising, etc. Discussion: We hear a lot about climate change but we don't actually know/ hear about specific impacts. It becomes a bit more of a reality.

- It is evident that the main cause of climate change is due to greenhouse gas emissions. Discussion: If humans are behind it then it's important that we take action.
- Prevention of worldwide disasters
- What is being done in all areas to combat climate change. Discussion: it would be nice to know what is being done.

Discussion recorded on flip chart

- That was bothering me because at one point they say we are confident but they also acknowledge that they don't fully understand certain processes. How can they know what is going to happen?
- What is the link between CCC and the Government, how does legislation come about?
- Flooding: important to me as I would have nowhere to live or to work if anything happens to the Thames Barrier.

Blue group

Panel members recording on post-its

- How bad the climate is and how it's going
- World warming up to dangerous levels
- We obviously are having a massive impact on the climate, and something needs to be done about it sooner rather than later
- Even if we don't produce any more emissions. It still won't be enough to completely halt CC
- Staggering overwhelming evidence
- Immediate changes need to be made to stop further Co2 etc. emissions due to global environmental impacts
- Who contributes to climate change, for example the greenhouse effect
- All about fossil fuels?

Discussion recorded on flip chart

- Evidence overwhelming, we're doomed unless something is done. Another person had a similar view, about how bad it is
- Learning about current contributions e.g. GHG
- Distressing it has got so far - why hasn't it been monitored
- Drastic measures have to be taken immediately
- Not sure measures are strong enough "smacks of a band aid put on a huge wound"
- It's about money, were companies aware of this in the past, did they choose to do nothing?
- How much control, influence do we have?

Q2. What was difficult to understand about the presentation?

Orange group

Flip chart recording

- I think we need to consider the extinction issue more
- The presentation was:
 - Very good
 - Easy to understand
 - It flowed really well

Green group

Panel members recording on post-its

- The science stuff!
- Is it all to do with Earth?
- The graphs?
- I didn't understand the grading of the graphs he was showing.

- The graphs are difficult to understand, - need image to illustrate change on ice, water levels etc
- Didn't know what p8 green graph represented
- Didn't realise p.10 top graph 1,2,3,4 represent degrees of temperature

Blue group

- It was clear, easy to read graphs
- It was clear, easy enough for the lay person
- Pace was good
- We got the overall message
- Showing different types of research, coming from different angles, made it more authentic

Q3. What else would you like to know about the science which explains climate change?

Orange group

Discussion recorded on flip chart

- Why the government is not focusing on more immediate issues such as the extinction of bees and the cost and shortages of food?
- What's the buffer time between cause and effect - when would positive change come about?
- I'd like to know more about why it is cooler at the upper levels and warmer lower down
- What about the ozone layer?
- Why do we get rid of greenhouse gases?

Summary of questions raised by the orange group in the plenary

- If the government track record on meeting global reduction targets hasn't been met over the last 30 years - what hope is there?
- Ozone layer wasn't mentioned - where are we with it now?
- How much of it is natural / and how much of what we are doing is because of the human effect compared to nature?

Green group

Panel members recording on post-its

- I would like to know more of the detail regarding long-term effects
- What is the accuracy of the predictions?
- the graphs on global average temperature record 3 different temperatures from 3 different sources: how / where were they obtained?
- If certain actions into lowering CO2 emitting gases have been in place for some time, why is the chart racing upwards as if it is a lost cause?
- Do we know if there will be another ice age?
- What about the damage already done? Discussion: Can it be reversed? Can we undo it?
- What action has been taken to combat global warming to date?
- What will the UNFCCC do to ensure that countries meet their targets?

Questions recorded on the flip chart

- The graphs on global average temperature record 3 different temperatures from 3 different sources: how / where were they obtained?
- If certain actions into lowering CO2 emitting gases have been in place for some time, why is the chart racing upwards as if it is a lost cause?
- Do we know if there will be another ice age? And if so, when?
- Can the damage already done be reversed?

Blue group

Questions recorded on flip chart

- Are other countries taking it as seriously as us (the UK)?
- Why is it 1990? Does it relate to Kyoto?

- Is the trend reversible? What steps need to be taken to make it happen?
- Will countries that have a greater impact on global warming be prepared to take proportionate steps?
- Why haven't we been investing more in renewable energy since 1990?

Plenary discussion 2

Q: Are other countries taking it as seriously as the UK? If indeed the UK is taking it seriously enough.

A: There is a spectrum, historically UK towards the front. Some take it seriously, because there is such an existential threat, such as the Maldives.

Q: Are biggest culprits taking it seriously?

A: Actions are occurring at different levels. Question probably is, is it enough? Countries in China and US are starting to do things.

A: Graph global average temperature, 3 different sources – what is the accuracy of these? Inter annual uncertainty, year on year, it would be much smaller than the signal.

Q: If action has been taken already, why is the graph still racing up?

A: Emissions are still climbing, which is driving warming.

Q: What is the UK's track record to date on global treaties ratified in last 30 years? Kyoto protocol set targets for developed nations including UK to reduce emissions by 2012.

A: We met, over achieved ours; interesting question about why, but we have achieved on this.

Q: Did we buy credits from other countries?

A: I don't think so, no.

Q: Did other countries achieve it?

A: Yes, other countries did

Q: Why haven't we been investing more in renewable energy since the 1990s?

A: Good question. This will be discussed tomorrow

Q: Do we know if there will be another ice age?

A: This is a fun question for scientists. There would be, the question is when. Given emissions we will probably skip the next ice age, it's very long timescales.

Q: Could there be a self-righting mechanism?

A: Not that I know of, would be scary and mean climate is less stable

Q: Ozone layer, CFCs banned – we don't hear much about this now, does it protect us.

A: This is a separate issue, though subtly linked. The ozone layer doesn't regulate earth temperature, but blocks out harmful UV rays. Fallen off news agenda partly because it's been a success story – globally CFS have been phased out. The ozone hole isn't getting bigger, but it will take decades to recover, but we are not making the problem worse. Ozone hole may have influenced wind patterns over the arctic.

Q: Why is it 1990?

A: It is used a lot in climate negotiations. First global summit, in Rio, was in 1988 and in 1992 the UN convention on climate change was formed. 1990 was the first time all data was pulled together to work out each country's emissions, the first year governments came together and took responsibility.

Q: Can we reverse damage that has already been done? Or is this preventing future issues?

A: If we omitted no more Co2, global temperatures would stay at that level for several millennia. It is irreversible on timescales we are interested in, unless we come up with technologies to suck it out of the atmosphere. Sea levels will keep going up for several centuries.

Q: Why is the sea rising?

A: Atmosphere is warming, as water warms up water expands

Q: Lots of factors contributing to global warming. How much is natural and how much is human?

A: According to research, human activity caused more than natural factors. Natural variability played a small role. IPCC agreed that it is 95% certain that at least half of warming is due to human factors, but that is a conservative estimate.

Table Discussion in response to the presentation on *Global action on Climate Change*

Q1. What was important about what you heard?

Orange group

Panel members recording on post-its

- We're all uniting globally to reduce carbon emissions - team effort
- Things look far better after this presentations
- UK's contribution is encouraging
- UK is being unfair to EU partners

Note: additional questions were added to Q3.

Green group

Panel members recording on post-its

- The previous success from between 2008-2012 (unsure about dates). Discussion: So when there are plans in place we can achieve progress!
- How much China was contributing
- That no binding agreement has been met or may be met.
- What measures are in place to police that countries will meet their targets? Discussion: We need legally binding targets everyone agrees to. How do we enforce it?
- How many countries signed up?
- Is the UK capable of meeting its targets? Discussion: And if it is realistic, can we do it and how?
- That we need to take more action compared to the rest of the EU by 2020.
- The UK taking the lead. Setting an example. Good

Blue group

Panel members recording on post-its

- A disgrace that the UK has to lead the way whilst other EU Nations dragging their heels
- Positive news that the UK is reducing emissions and other countries have pledges. Shocking that there isn't an agreed deal internationally. Why is it taking so long?
- That targets seem very high. Not sure we can manage that
- Encouraging to know that 'large powers' are prepared to take action too

- The statistics are not supported by facts: i.e. 40% reduced by 2020
- How much we need to reduce in the next few decades
- Setting targets to 2050 is too long needs to be more proactive and act earlier
- Reduction of emissions seems positive – greater reduction required?

Discussion recorded on flip chart

- Disgrace the UK is leading the way. I'm also concerned about China
- 2050 is too long, we need to act sooner
- Disgraceful no agreement, we shouldn't be waiting
- The reduction in emissions (in the UK) is positive, but it should be more – encourage other countries to follow suit, we've shown it's not that difficult
- Why wasn't Russia mentioned?
- Are the aims supported with the facts? Where does the data come from?
- How did the UK make this reduction (18%)?
- If we are doing it so easily should the targets be greater or are other not doing enough?

Q2. What was difficult to understand in the presentation?

Orange group

Discussion recorded on flip chart

- It was clear
- The graph made very good sense to me [the one showing the countries with the largest emissions]

Green group

Panel members recording on post-its

- Why is Russia missed out?
- The % amounts in reduction, will they make any difference? Discussion: How much difference does 15% make, or 40%?
- Is China's data reliable?
- What is 2tCO₂ per person of global emission? Discussion: what does it mean? What do we need to do/ reduce?

Blue group

- It was clear, like the last one
- Some of the figures could be confusing e.g. Obama figures
- What about China power plants
- Emission trading scheme – exactly what is this?
- 2 tonnes per head? How much is this e.g. trips in car

Q3. What else would you like to know about global action on climate change?

Orange group

- I am impressed about developed countries commitment, but question why developing countries are not involved
- How does the recent announcement by the new Australian prime minister [affect global action?] - to stimulate the economy he will increase coal production?
- How is it being reduced? What mechanisms are being used to leverage for carbon emission reduction?
- What are the fines for not meeting the targets?
- What are acceptable forms of renewable energy
- In terms of reducing CO₂ emissions per person by 80% 2tCO₂
- Why do we continue to put off acting now?

Summary of questions to ask at the plenary

- Do targets take in to account that global population will rise = more consumption of everything
- Government have to bring in a degree of legislation to change individual habits

- Lives will be transformed - are people ready?
- It's going to be expensive

Green group

- What are other countries doing? Africa seems a big gap. It would be good to know more about different continents, a worldwide range of countries. Are they doing anything? E.g. North Korea. It should be about collaboration, it makes you feel better if you know everyone is doing it.
 - If the situation gets worse will countries be forced to sign up?
 - If targets aren't met is there a punishment? How will targets be enforced?
 - What can we do to counteract population growth from 6.9 to 9 billion by 2050?
- Summary of questions to ask at the plenary

- What are other countries doing?
- How will targets be enforced?

Blue group

Summary of questions to ask at the plenary

- 2 tonnes per head. How much is this?
- Emissions trading scheme – please explain
- Why 2050? Feels too long away, could the date be brought forward e.g. 2040, 2025? (For all countries, not just the UK)
- What about the process for achieving the targets/ the UN body?

Plenary discussion 2

Q: Question about global worldwide contribution, Europe is small compared to other countries

A: There are different targets for developing countries – emission intensity targets, which reduce emissions relative to GDP, so they can still grow economy. They are concerned about increasing their incomes because starting from low level. UK ends with 80% because we have had economic growth, and quite high % of emissions per head, therefore we have to do more than a less developed country.

Q: Developing countries are using very old industrial machinery, level of emissions will be high from those machines - therefore they have more emissions than the developed world?

A: Some equipment/technology may be old. There is an allowance for technology transfer in agreements with developing countries, so they can move to more efficient technologies and move to less emissions per unit of GDP.

Q: Where is the money going to come from, another loan, struggling to pay back to the western world?

A: Point made about emissions trading (countries in UK wanting to reduce emissions can invest in other countries and help them to reduce their emissions, because it is more cost effective).

Facilitator: example of something to discuss on Saturday

Q: UN framework, deal not reached for other countries on targets, why isn't it not in place? And no progress agreed on how to achieve the target? How long will it take?

A: Being negotiated now. More meetings this year and next year. 2015 meeting is the target for making an agreement, earlier meetings will look at draft plans and how reductions will be shared by countries/blocks. Not just one meeting per year, there are many discussions.

Q: Treaties – we need them to be legally binding for the whole world. What if, say China doesn't meet a target. What pressure would be put on them, you can't sanction. Where is the incentive?

A: Good Q, difficult Q to answer. Agreement would include reporting arrangements. Not sure sanctions are agreed if targets are not met or how they could be enforced. Legal binding agreement is the strongest way a country can say it is serious about meeting a target. There hasn't been a country who has signed up to Kyoto who hasn't met it. It would be difficult for us, or anyone else, to sanction another country. There is an incentive not to act and let others do it. Therefore you need monitoring and verification. Sign up to target, what are you doing to achieve it? Monitor what measures are taken e.g. electric vehicles? Difficult to say what the sanction is at the end.

Q: We are using more resources than the planet has. Do figures take into account growth in population – what does it mean for quality of life, and 80% reduction (e.g. restrictions?)

A: The numbers do take into account growth in population. There is uncertainty about how population will grow, but 2050 figure does reflect a growing world population. If population grows more than expected the figures would have to change.

Q: What does it mean for people?

A: We'll come back on this tomorrow. There is a lot we can do to reduce emissions that don't require big behaviour change as individuals. We're not saying that you can't fly (Committee estimates there could be more flights by UK in 2050 than now), were not saying that you can't drive anymore. If we can move towards electric vehicles and produce electricity through low carbon fuels, like renewables, then at the point of use you won't have emissions of CO₂. Some behaviour change would be desirable; before we get to 100% electric cars e.g. reduce use of cars, use video conferencing rather than business travel, etc.

Q: 2 tonnes per head - how much is this?

A: What we're doing now as a country means that the fossil fuels burning for electricity, petrol and diesel in vehicles, fossil fuels used by industry to produce goods, come to 10 tonnes per head of population - need to reduce by 80%. How do we reduce? You could stop doing things or change fuels you use e.g. from fossil fuels to electricity produced by renewables or nuclear generation. These are Qs we need to look at.

Appendix 5 continued

Dialogue transcripts: Panel discussion 2, 10 October 2013

Q: Having had time to reflect on what you heard last night, what thoughts do you have on the climate change challenge?

Orange group

Recorded by Panel members on post-its and subsequent small related points recorded on flip chart

Communication

- We need to get this message across, last night's workshop has really opened my eyes
- Find the right way to communicate this issue
- Celebrities travel a lot they should be more aware of what they are doing and use their celebrity status to be ambassadors for reducing carbon emissions (example Claude van Damme's twitter followers / FB friends)
- Use popular culture to communicate
- Youth culture - artists of our society getting this message across, engage the young as they are already quite knowledgeable
- Problem: if it's a public information campaign people might switch off

Education

- There needs to be more information out there, education needs to be a higher priority
- There are gaps in people's education
- Actually young people are learning a lot in school, I talked to my friend's daughter last night, she knew all about it
- Well how about starting with younger children, and older people
- What is global temperature?

Targets

- I woke up at 2am thinking about this, 80% is ridiculous - why not 100% but take a slow but sure approach so that we know we'll meet the targets
- I think 80% is a very high amount to achieve
- What is big industry doing about this? It takes finance and investment
- There are high (affordable?) up-front costs for ordinary person to improve basic equipment

Policy / politics

- Don't see government taking action now with a range of areas from packaging through to plastic bags and public transport (more expensive, no incentive).
- In terms of transport, for example, the costs are going up every year
- We can save the environment from being destroyed by CO₂
- Why can't we have politicians / artists working together e.g. Live Aid
- The Green Party is getting nowhere
- Who is funding the change?

Technology / transport / fuel

- It's a big challenge but with the right equipment, knowledge and skills we can achieve this as long as we all work together
- Technology has come a long way in 10 years we may create a device to fix problems in the next 10 years to come?
- In 2023 technology will have grown so much
- It's not saying we can't fly, it's saying change the fuel and then we can fly
- LPG is so cheap, but it's not a success - not quite clear why as its 0 emissions

Summary of questions raised by the orange group in the plenary

- How can the government reconcile the carbon emission agenda with a policy of growth and consumption?
- Globally recognised - who is policing it?
- How are the targets even possible? More people have cars / fly?

Green group

Panel member recording on post-its

- It needs to be taken seriously
- Time is already starting to run out
- Time is of essence to get more countries signed up
- That it has to be a worldwide effort and laws must be implemented
- It will be impossible without a collective binding agreement by all nations. What will happen to the countries not involved?
- The climate change challenge is going to be solved by industry rather than individuals.
- Have we done enough? Discussion: Shouldn't we have learned from Chernobyl or Japan?
- I now have thought about climate change where yesterday morning I didn't...

Discussion recorded on flip chart

- They need to be incentivized to use emission friendly technology, i.e. grants paying less tax
- Can fines be introduced if manufacturers don't collaborate on producing clean emissions
- I would like energy companies to commit to this, i.e. make energy saving boilers available to those who can't afford them. This morning I woke up to the news that energy prices are going to increase further, it seems to be about profit!
- Therefore education is paramount
- Maybe not enough ordinary people think about it [climate change].
- Make it part of the science curriculum for children

Blue group

Initial thoughts recorded on flip chart

- Still don't understand 2 tonnes per head
- UK response so slow
- Learnt more in session than any newspaper?
- Unsure how going to turn around situation, damage already done
- More education is needed!
- Concern about press bias, which is confusing the public
- Why response so slow, why not years ago...
- Media is covering the extent of the problem

Panel member recording on post-its

- Need more to be done to educate people what is happening
- CC is a global problem which needs to be tackled now, and cannot be slowed by money/funding
- I don't think there is a contingency plan in place. As it seems the goals to make cuts are unrealistic
- I think it's going to be a bit of a battle getting all the countries to agree on various figures
- Against big business It's still an uphill challenge
- Bigger awareness. And the subject to be taken more seriously among everyone
- Education required by professionals not press bias

Discussion recorded on the flip chart

- We spoke to friends [2 Panel members] after the workshop and they don't care. It's another thing in life, another cost...
- This sounds quite typical, people are set in their ways
- Need to educate the middle age group, children are better. However, another participant said the young are just interested in cars

- Need to raise more awareness
- But people don't respond well to being told what to do. Therefore need education
- We need to help countries that are developing rather than sanctioning them
- Until it affects you, they aren't going to change
- Targets are too lax, timescales are too long. Need contingency plans for when they are not met
- There isn't enough sense of urgency
- The public aren't aware of the carbon budgets

Table Discussion in response to *What is the UK doing to tackle climate change?*

Q1. What was important about what you heard?

Orange group

Panel members recording on post-its

- There are bold statements here, but is it [the 80% target] realistic?
- Depressing
- It will cost the end-user a fortune through profiteering with big companies taking advantage, prices going up, and industrial greed
- I do not want an electric car
 - costs are high because of the research and development aspect
 - maintenance costs are high and regular
- Where are the pods of CO₂ going if caught? Will not this affect the environment?
 - sea storage is ridiculous, the risks are too high
 - we're locking in problems for future generations
- Things are going in the right direction i.e. cars are becoming less polluting
- 40% of gas emissions are residential - using the insulation and heat pumps could majorly reduce this
- I worry that the risk of an increase in nuclear plants from terrorism and accidents as we are such a small island - just like Japan
- Disappointed that so many nuclear reactors are even being considered
- We need an explanation of what is generating CO₂ and plan actions to reduce / remove CO₂

Green group

Panel members recording on post-its

- That you need to spend more now but that it means savings in the future
- How SIMPLE some of the cost effective measures are, i.e. heat pump
- It's going to cost £100 billion to meet targets by 2020. How much will this cost to the average household?
- We already pay a lot of tax on long haul flights; does that go into the pot?
- What are the dangers of nuclear power stations – pros and cons?
- What about harnessing our wave power around our shores?

Discussion recorded on the flip chart

- If people know that a heat pump is cheap and easy to install they would perhaps use it more.
- Are heat pumps being built into new housing? Also, are solar panels?
- The targets: are they realistic?
- CCS is technology which currently does not exist. What if we fail to use CCS to reduce emissions?
- If we don't spend more now the costs in the future will be much higher

Blue group

Panel member recording on post-its

- The cost of electric cars and the grant from government

- How electric cars will be common place, petrol cars will become obsolete
- That there is a grant available for buying electronic vehicle
- It's important to start being aware and making changes today
- It's doable
- Steps to take to reduce emissions are relatively easy and not costly and can be implemented now
- Not needing to use gas to heat homes (the potential of)
- Didn't like the idea of storing all the carbon dioxide underground or in the sea – doesn't sound like an answer

Discussion recorded on the flip chart

- Concern about carbon capture and storage – uncertainty putting underground
- Why do you say "it isn't required" e.g. not using car or flying? This doesn't make sense, we should be doing more across the board
- Can't we do more in other areas, why have these priorities been set?
- Concerned about carbon capture and storage, do they know what impact it will have?
- They will think of anything to keep using fossil fuels.
- How do the experts here live their lives? At home and in the office?
- Grants for electric cars aren't publicised.
 - Need more information.
 - What about people who can't afford it, you will alienate people.
 - Hybrid cars another option

Q2. What was difficult to understand about the presentation?

Orange group

- Carbon storage - why is this included in the advice to government when it is an unproven technology?
- There will be a loss in tax revenues
- As a result of us travelling less and being at home more shops will close and there will be a loss to community and society
- The advantages and the challenges need to be understood and balanced
- Cars - why are we so committed to ownership? What about car sharing / using public transport - we don't need to own cars

Green group

Panel members recording on post-its

- How realistic is it to include the rather large slice of CCS when it's not available yet?
- Why is nuclear power cleaner than gas or coal? What about problems or accidents at nuclear plants?
- What proposals do CCC have for big businesses?
- How can we reduce emissions from buildings and power? Will there be grants to encourage people/ businesses, e.g. when old cars are traded in?
- Is there enough evidence to show that we can cut down to 160MtCo2e by 2050? Are we being realistic?
- What is unabated gas?
- How much electricity would be needed if everyone drove an electric car (i.e. charge points) and would the state pay for this?
- We are all told not to drive, to share cars by the media. Here, at this moment in time I understand that it is okay to continue driving. Hybrid buses, switch off in traffic etc..
- That flying doesn't need to be reduced and may even increase!
- The 1st and 2nd chart. 594 mt -> 2011 versus 160 mt -> 2050. If IAS + non CO2 cannot change (+ would possibly increase) then that means we have to reduce the other contributors = 457mt to 35mt (=160mt – (IAS+N-CO2)) = >90%, is that possible??

Discussion recorded on the flip chart

- Seems weird that we are taking something [CCS] into account that doesn't exist yet.

- Unabated gas - we don't know what that is
- Nobody is promoting the use of electric/ hybrid vehicles at the moment

Blue group

No further comments

Q3. What else would you like to know about UK action?

Orange group

- We need a public debate / national referendum on nuclear / carbon storage - on the use of unproven technologies before these are incorporated in to plans
- The use of nuclear seems massively risky - there are too many power stations / there is a cost involved and it is HIGH RISK
- There are alternatives
- But solar hasn't been mentioned
- How will the old carbon run machines be disposed of when replaced by renewable technologies?
- There is a bigger ethics question. Do we need to generate this much waste? Can we re-educate people? (like the anti-smoking campaigns)

Questions for the plenary

- We need a public debate / national referendum on nuclear / carbon storage - on the use of unproven technologies before these are incorporated in to plans
- How will the old carbon run machines be disposed of when replaced by renewable technologies?
- There is a bigger ethics question. Do we need to generate this much waste? Can we re-educate people? (like the anti-smoking campaigns)

Green group

Questions for the plenary

- CCS: targets realistic?
- Nuclear: why cleaner than gas or coal?
- Costs for average household?

Blue group

Questions for the plenary

- Concern about carbon capture and storage [answered in plenary]
- New build homes and offices should have heat pumps, solar panels etc. Can this be implemented easily, how much would it cost? How efficient are they? [Not time to answer in plenary. Briefly discussed efficiency but do not answer putting measures into all new builds]
- Why are we not investing more in offshore wind, tidal and wave energy?
- Will we be able to cope with the increased demand for electricity e.g. electric cars, underground heating – could there be power cuts?
- How do you live your lives?

Plenary discussion – first session

Q: You mentioned carbon capture, storage – just how sensible is doing that?

A: Each element in process has been done. For example, the Norwegians are storing CO₂ in the North Sea in depleted oil wells. There are other processes where it is being captured. Individual elements have been done, but they haven't yet been combined. Demonstration projects will test how well it works and what the costs are like when implemented. If promising, it can be rolled out further. We wouldn't say it 100% right now, but it is right to look at it and invest in it at this stage.

Q: We have seen controversy that fracking has caused, piloting without referendum. Should there be more referendum about nuclear and carbon storage before presenting them together? Unproven technology is in the recommendation when we have solar, wind, biogas which are proven.

A: Public debate would be very useful. To some extent, we need to demonstrate CCS works and produce evidence to help make more informed decisions about it. Nuclear is very important to have debate and public views. In our scenarios, we have nuclear on existing sites and not beyond. As plants come to end of life we'd replace with new reactors. They create jobs and there is relatively high acceptance in local areas. But these are important issues. And with nuclear there are diverse views, it is likely we will never have complete acceptance

Q: Why is nuclear power cleaner than coal or gas, what about accidents?

A: Nuclear is cleaner re: CO2 emissions, but other risks of accidents and nuclear waste which needs to be stored for hundreds of years. Other issues need to be part of the public debate. New nuclear plants produce much less waste than previous plants, but they will still add to storage requirements. Risk of accidents – you have to think about risk and have tight regulatory controls on plants. The kind of controls for UK plants are very safe. It is a very small risk, but there is a risk and there needs to be debate about whether to accept it.

Q: How efficient are heat pumps and solar panels, how easily can they be installed, what is the cost – why aren't new build homes and offices being fitted with them as a matter of course?

A: Heat pumps are relatively efficient compared to a gas boiler. They are more expensive than replacing with a gas boiler. But there may be pay off over time with regards to electricity to run heat pump compared to gas for gas boiler. There is an upfront cost, but you get a carbon saving.

Facilitator – can we address this later, perhaps ideas wall and discuss on Saturday?

Q: 100billion to implement changes, how much is that per household?

A: We'll look at that in the next presentation

Q: Old plants and equipment, how are we going to dispose of them?

A: I guess a lot will be recycled. As existing plants come to end of life, they will be replaced with more wind. Steel etc. will be recycled into other uses.

Table Discussion in response to *The costs and implications of UK action*

Q1. What are your immediate thoughts on the actions / implications as you have heard them presented?

Orange group

- The incremental increases in the shopping basket are hard to believe when food costs are on the increase and neither is £100 per household
- The cost of carbon fuels - does it become a non-cost when the energy comes from renewables?
- How will companies operate when they are charged more?

No immediate thoughts recorded from blue or green groups.

Panel members were then introduced to the 'Thinking hat' exercise and invited to reflect on the implications of UK action as presented from a negative point of view (red hat), positive point of view (green hat) or the facts (amber hat).

Orange group

Red hats: report back

Recorded by Panel members on post-its

- Has the government factored in public resistance to all these measures whilst the cost of living / taxes increase?
- No one has heard of heat pumps - what incentive is there for these measures?
- Question the validity of metrics due to unknown variables - as measurement of cases is slightly intangible

Discussion

- The evidence is questionable, it's not an exact science - to what extent is it accurate?
- It's not believable - the small incremental increases
- There isn't much thought leadership - what about things where immediate action is possible such as excess packaging or recycling bags
- How will all this be afforded when benefits are being cut but more people are reliant on benefits
- The targets are for 2020 but we're in a recession how possible is this?
- Why are we going for expensive solutions when we should be taking the most cost-effective routes
- It's the first I've heard of heat pumps too, it's not common knowledge "are you brave enough" is the advert
- Why aren't we looking to Europe? They are doing better

Yellow hats report back

- Mobile technology firms they should be investing and taking action - they'd get the job done
- Is there a risk? The ratio to CO₂ emissions
- The new light bulbs are a model they are 21 watts but burn as if at 100 watts - this is a cheap solution and is more sustainable, other models like this would mean we could meet the target - adapt the model to everything else and it solves the problem
- Responsibility has to fall on scientists to take the right action

Green hats report back

- It's a no brainer: healthier, happier people who are proud of the world they live in
- Preserves the planet, mammals and life
- Better quality of life: individual actions benefit society as a whole
- It will be cheaper, investing to save money and the planet
- It is a long-term gain

Summary of questions to ask at the plenary

- Not enough evidence based action now to make an immediate impact
- There is a public mistrust of the data - we are in an age of transparency and the government has to demonstrate this by involving the public more in understanding how the data is arrived at and working together on solutions
- Mobile technology companies should be used to work on some of this stuff.

Green group

Red hats report back

- Increased bills + shopping/ taxes. Comment others:
 - Off-set by future savings
 - It's a nominal price to pay
- We don't trust big companies. Will extra money collected be used wisely? We don't know how they will spend the money of increased bills. Comments from others:
 - We'd assume the government would take that part of the money.
- How can we guarantee the costs will be lower in the future? Are the savings guaranteed? If the calculations aren't accurate, savings will be skewed. Comments from others:
 - You're insulating your home for example. Energy prices would go up more if you don't insulate it. Comment back from red hat: What if insulation fails?

Green hats report back

Post its:

- Improving lives of future generations
- Some ideas already taking place; recycling is becoming the norm
- Cost is favourable, £100 manageable for most families
- Health benefits important
- Comfortable lifestyle
- One off expense/ long term saving
- Energy security, UK can be self sufficient, e.g. no longer dependent on Russia
- Economic growth: job creation, tax revenue
- Set example for the rest of the world
- Transport improvements
- Everybody shares the costs
- Grants from government
- You can sell energy back to companies and make money from our solar panels

Comments from others:

- It's very optimistic to think that we can achieve all that this. There is so much depending on the macro-environment that can potentially derail it: conflicts, disagreements between countries, recession.
- How do we know it is affordable? What is £100 increase like for people on the poverty line?

Amber hats

Post its:

- Prices are not listed on the side
- Slide 7: Costs involved in delayed action may reduce to the same extent as the costs involved predicted by green graph. Some people may not want to increase their household bills now as it will not benefit them in 50 years. No costs mentioned of not taking action.
- NOISE? Most noise comes from lorries, vans, trucks and not just cars.
- How realistic would cycling be for everyone in London? We don't have the infrastructure

Comments from others:

- It is not clear how noise is defined
- Delay action now: what is the difference in costs between delay/ act now and no action??

Summary of questions to ask at the plenary

- What financial aid will be available for people below the poverty line?
- How can the government get large companies to invest in low carbon technologies?
- What is the difference in cost between acting now and delaying action?

Blue group

The blue group used dots to signify a priority point:

Green hats report back

- All good!
- Acting now will make a big difference for the future
- The benefits outweigh any negative impacts
- No major cost implications
- Health benefits for all! (in a few years time)
- Idea... Home and beyond e.g. offices – introduce student loan style scheme to implement measures. Which could be passed on from one household to the next

Amber hats report back

- £100 is a lot less than expected annually. Then why wouldn't the economy go for it
- What does 49% richer mean? Personal or collective? [Lack of belief that they would be that well off]

- In real terms, we will be £155 better off by 2020 ONE DOT

Red hats report back

- Practicality of change i.e. heat pump, electric car, solar panels – concern about costs, bills going up ONE DOT
- Cost involved (£100 per household) is confusing TWO dots
- Younger people more attracted to change. Older wouldn't reap benefits. Why bother? THREE DOTS
- Big businesses will pass on extra costs to consumer and business will suffer
- We won't be better off e.g. taxes will be raised
- Don't like nuclear or CCS

Summary of points to ask at the plenary

- Great clarification is required on the figures and how reached e.g. 49%. Cost implications is the main stumbling block 4 DOTS therefore £100 has to be explained very clearly and what will happen if not action is taken (give the cost per household if no action is taken e.g. £500) 4 DOTS (plus 2 from above)

Any other thoughts card that relates to above... "For the public to be on board, they need to be clear what the £100 will be spent on, why we need to implement climate change now, and the implications to the Earth if we don't act. Also the cost implications in the future if we don't act – in multiples of £100"

Plenary discussion – second session

Q: Will the government provide financial aid to those who live below the poverty line who can't afford £100, the elderly live in draughty accommodation etc?.

A: The current intention and partly current policy – energy efficiency funding – is spread over everybody but some kept in a pot to help households on lower income/pensioners to help make changes for free.

A: Part of the obligation of energy companies is directed at households that are relatively poor, they should have greater probability of having energy efficiency measures fitted at no cost?

Q: Greater clarification is need on the figures, how reached, a long way into future, how costs to people are arrived at. £100 is a nice round number, how do you get to it?

A: We spend about 2% of GDP on energy. Measures talking about will put up price of energy by a half. Spend 2% today, put up by half – that is where 1% comes from. That translates over energy bills and it is £100. £100 is the electricity part of it, which is the largest part.

Q: Question relating to having faith in telecommunication companies like Samsung and Sony, perhaps they can cure the problem?

A: Samsung make offshore wind turbines as well. A lot of big technology companies also involved

Q: How does the Government get large companies to invest in a low carbon future?

A: Big important question. Regulations including EU (e.g. efficiency of fridges, cars, light bulbs have been regulated), tax policies and subsidy (wind farm driven by subsidy) and providing a clear direction – we are serious about climate change, we will stick the course, policy/tax etc. are going to follow, if you invest there will be a market now and in the future.

Statement: Younger people more attracted to change. Older generation aren't going to reap the benefits if happening in 30 years time, their attitude could be why bother

A: That is a comment for us to take away

Q: Not seeing much evidence based track record, UK lags behind e.g. plastic bags, packaging – these could be acted upon now. Belief, mistrust and faith in what saying, but not seeing it translated into day to day life now, yet happening in other countries. We need a holistic package that fits together.

A: Reality from climate change perspective is that plastic bags is pretty small fry, meeting targets will not relate to plastic bags tax. But responding in other ways will matter.

Appendix 5 continued

Dialogue transcripts: Panel discussion 3, 12 October 2013

Q: When you think about the presentations this week about climate change what particularly stands out in your mind?

Orange group

- Confusion - this chart we have the potential damage between 1 and 5 degrees, I still can't come to grips with the fact that such a seemingly small change in temperature can create so much damage. Perhaps the graphic needs to be simplified in some way so I can understand it better.
- Are we completely clear that the risk has been identified can be linked to CO2.
- The notes are quite poor - when I went back to look at what we were given in terms of definitions I couldn't find 'hydro-carbon'. Q: *Is that the only reason the notes were poor?* Yes.
- Thinking about last night I feel quite confident - because there was a lot about how we could change what's happening in the world - there is hope
- I was more depressed before, but now I feel more positive and can think about solutions, I think education and communication is the way to go. Attacking globalisation and consumption is very good. I do feel more positive though even though there are lots of steps to be taken.
- BBC News this morning, Osborne is about to reduce subsidies or something which doesn't inspire you with confidence
- It's our money at the end of the day.
- What responsibility is big business going to take - how are they stacking up? We haven't really discussed that.
- Electric cars - the Government needs the fuel revenue. If the scientists say tomorrow that all cars can run on water, someone would get shot somewhere because the Government needs this revenue from fuel.

Participants write down what has stuck in their minds on post-its

- Prices of a lot of things will go up in order to save the planet
- Electric cars reduce government tax earnings
- At the end of the day the person in the street will have to fund these changes - how?!?!?
- Huge discrepancy between carbon goals and global financial goals
- Too much talk about business as usual and not enough talk about adaptation and living different sorts of life. We need a more holistic view to address consumption, waste and ownership.
- Selling us a false story - surely we do have to do things to reduce carbon emissions
- International involvement - working with other countries
- Transport issues - how to deal with car emissions and public transport

Green group

Panel members recording on post-its

- It has broadened my vision
- That education about the impacts of climate change is so important; otherwise people will not make changes.
- We hear about energy prices rising but not about reasons for these from the media.
- That there is real scientific evidence and not just unwarranted fear. I've heard it from real scientists now!
- How committed the UK is in its attitude towards climate change. I feel very positive about it.
- We need a binding global agreement that makes a real change
- All countries must pull together if we want to succeed in the fight against climate change
- The accuracy of the data?

- £100 per household a realistic figure
- I'm unclear about how much of an affect the economy will have and how much is has affected climate change.

Discussion recorded on the flip chart

- Because there isn't enough education a lot of people are swayed by what the media say. This morning R4 broadcast for example: 'global warming is helping the world'. If you don't know what is going on you might believe it.
- We need facts and logic and a transparent debate. At the moment we're getting mixed messages. A government representative said in the Independent this week that energy bills are high because of green taxes which aren't spent on green issues!
- Data accuracy: Discussion:
 - We might be increasing the bills for no reason
 - We haven't heard from the nay-sayers. We haven't discussed the arguments they have, that it is a foregone conclusion. An open and transparent dialogue between the two parties would have been useful.
- Coming out of the recession, will emissions go up?

Blue group

Discussion recorded on flip chart

- Good, really interesting, I'd like to do more. Three sessions isn't enough
- *"Good, I'd like to do more. I think it's a really good cause... three sessions is not enough"*
- We should be doing more rather than less – is it tokenism? Will it make any difference?
- Felt enlightened, interested, it has been put across well – in layman's terms
- Interesting, more aware now of subject when watching the media
- Educational, learnt a lot – but should have been done earlier. Also hold lot more sessions like these for young people
- Eye opener – watching Question Time for the first time! Need to educate people, raising awareness is key
- Enlightened, feel educated – will take more of an interest
- Similar, but how much impact will this have

Panel members recording on post its

- Educate people on climate change
- What a ridiculous situation using fossil fuels has got us into!
- Understanding the severity
- The evidence that climate change is happening is very real and the affects will be devastating and costly if we don't act soon
- Lack of action since 1990 is disappointing and worrying
- Government needs to take this more seriously
- Proud to see UK taking massive role!
- To make a change in lifestyle means making an investment in money

Discussion recorded on the flip chart

- We now understand the severity, but will Government act accordingly?
- Concern about money/cost – know change is needed, but wonder whether individual and government will be prepared to spend or invest
- Worried so slow, Government might be reducing budget when the evidence is so strong – what message will it send to the world if the budget is reduced?
- Unless the public is educated change won't happen e.g. using electric cars
- Concern about bias in the media and sensational approach with regard to energy bills and how much money energy companies make

Table Discussion in response to *the unanswered questions?*

Q: *What was important about what you heard?*

Orange group

Participants recording on post-its

- Why was wind and tide tech not developed years ago?
- Satisfied with the reasons for not looking into solar and wave / tidal energy
- If tide / solar and wave is existing why not fund that to make it effective rather than fund an unsafe technology (CCS) locking up a problem for a future generation
- What does the Government budget for our nuclear deterrent? How does this compare against the amount / budget allocated to low carbon power of 7.6 billion?
- If there is no energy cost why are bills set to rise rather than reduce?
- Using more power and electricity to use electric vehicles and heat pumps - A=yes, but less gas & oil at the same time.
- However the same can be done with charging people through energy bills for insulation
- Still worried about fracking and nuclear safety - prefer alternatives
- The responsibility of funding changes will be in the hands of private enterprise. Will they fund what is necessary out of their rental incomes? I doubt it.
- Funding the project - why not ask multi-national companies to pay more tax
- If nuclear is rejected how does it change your forecasts? CCS: more challenging and more expensive, still possible if other technologies deliver (e.g. CCS)
- What happens if the countries who supply us oil or gas like Russia decide to cut off supplies due to a future conflict?
- Some questions now have answers - with a lot more investigation the new ideas like wind / solar will work. How much funding is the government prepared to pay in order for these to be used wider as this is a good way to produce energy.

Green group

Panel members recording on post-its

- Very surprised about how very expensive a heat pump is.
- The cost of technology, solar and wave is twice as expensive as coal etc.
- How many years needed for wave/ tidal research? And why has solar not been driven forward?
- It is necessary to pay more now to save costs later
- How long has fracking been used in the USA and how safely? [Group asked CCC observer for input: The technology has been around for about 20 years and the USA has been experimenting with the technology for about 5-10 years.
- Fracking should be implemented at a large scale in the UK
- Low carbon technologies meet a TINY percent of our electricity demand. It should be a lot more.
- There are huge risks for the long-term storage of radioactive waste that we don't know about (i.e. in future). So nuclear is potentially more damaging.
- Present building of nuclear power stations – How many years planning ahead for predicted electricity surges versus no power cuts?

Discussion recorded on the flip chart

- My parents had a heat pump installed in Ireland and it didn't cost them more than about €3000
- Would the cost come down for a block of flats?
- These seem to be untapped. We're not investing enough into research perhaps, whereas we might gain more from it in the long term as we are surrounded by water.

Blue group

- The £100 explained
- I like the idea of the climate levy
- The Green Deal was important as it could eventually reduce costs for everyone
- Upfront funding for heat pumps as the initial price is too expensive
- The issue of cost to the public
- Costs involved in initial change. No mention of 'smart meter'

- It will cost a fair bit more in the short term, but is necessary and if not done now will cost even more...
- There are initiatives in place to reduce carbon emissions which is great – but is it enough?

Discussion recorded on flip chart

- You need to help upfront with heat pumps, solar etc
- No mention of smart meter
- Like the idea of rewards – rather than punitive measures. Help people, like concept of reward rather than taking from people
- Question about Green deal – answered by Adrian

Roving Ideas Storm

Each group invited to tour the room visiting one of three stations:

- Societal issues
- Renewables / new technology
- Economy / business / industry

Each group used a different colour pen to record their comments:

Blue pen - green group

Red pen - blue group

Black pen - black group

As the groups moved around they were asked to mark with a ● to note agreement with a previous participant's statement or a ■ to note disagreement with a previous participant's statement.

Q1: Societal issues

To what extent do you agree with the measures being (amended by group to proposed / considered) in the UK?

- Serious societal questions to be asked before we go down the road of certain technologies ■ ■ ●
- Throwaway society and too much additional waste ● ●
- Address how we live our lives which is driving us to a high carbon society ● ●
- Waste disposal is a viscous cycle of consumerism leading to more waste ■ ■
- If we continue to emit (sun) what do we do ■ ■ ■ ■ ■ ■
- Education at all levels = ethics of understanding for society ● ● ● ● ● ●
- Personal responsibility / leadership, the Government should be responsible - but this shouldn't be limited to the party in charge
- Provisions should last beyond one Government
- Education is essential to be informed individuals ● ● ● ● ● ●
- Local government are not putting out recycling bins [in all areas]
- Be more of an activist, get involved ● ●
- Measures aren't being taken, they are all theoretical ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
- Aren't people only interested in their own environment? They are generally quite selfish. ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
- Recycling your furniture - we use websites to do that
- Media, getting information out there using the platform positively - ● ● ● ● ● ● ● ●
- **It's hard to present facts and debate appropriately** ● ●
- All measures should be enforced / encouraged more ● ●
- We need to educate the media to be positive [and give both sides of the argument] ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
- Public needs to understand the role of government and that their hands are tied once legislation has passed
- Could all political parties collectively make decisions for long-term planning so that it becomes independent of who is in power? ● ●
- Could scientists of both sides of the equation have a discussion and come to an agreement (pro-climate change people and those who disagree with climate change?)
- To what extent do you take population increase into consideration in your measures?

Q2. Economy / Business / Industry

To what extent do you agree with the measures being taken in the UK?

- Agree with industry being rewarded for being agree. Award fine
- Tax incentives rather than fines
- Introduce harsher fines for industry
- Introduce a badge to acknowledge are taking responsible action against climate change
- Power companies need to spend a lot more on research to make their companies more green.
- Agree with the triple A star rating people who buy those appliances feel they are contributing
- All appliances should be triple A!!!
- Moving away from petrol towards hybrid / electric cars: incentivize this. i.e. 3 years ago - old car scrapped money awarded to a new car.
- Apply this to scrap a boiler, a washing machine if you scrap it buy a more efficient one
- Could we have recycling targets included in the Climate Change Bill?
- Government buildings & large companies should install heat pumps / solar panels and switch off lighting over night.
- It should be all new build including residential
- Measures being taken must be successful as emissions going down but no room for complacency
- Lighting of buildings and spaces is a concern. This relates to efficiency measures in short term and energy sources
- Use incentives e.g. tax reductions if you implement measures (business & individuals)
- Choice editing - remove consumer choices so only have what's available [things that do not harm the environment]
- Food packaging - sometimes you can't leave it to the consumer to make the right choice. Business should give people green choices as a starting point
- Higher level action
- Do more to recycle carrier bags [e.g. M&S scheme]
- Profit is an issue - the energy companies are all profiteering
- Energy should be put back into the remit of the state. Nationalised. It's a human right.

Q2. Renewables / new technologies

To what extent do you agree with the measures being taken in the UK?

- More investment is needed in renewables / new technologies
- More £ but it's the consumers who have to pay
- Other countries need to be doing more
- Scandinavia is doing more but UK should set the agenda and show thought leadership.
- Think about safety / long-term consequences of CCS and nuclear
- WE must shift from high carbon technologies to low carbon / renewable technologies ASAP
- Idea: why not harness the inherent electrical power of the earth? Keep open to new and old technologies.
- Carry on investing in renewables that are safe in the long-term rather than CCS, that would be safer.
- CCS will end in disaster
- Biogas / heat recovery - not covered
- Heat pumps -6-10k run by electricity - how can that be cheaper?
- Insulation
- New builds ok - but not right to leave certain elements to house builders.
- Double & triple glazing
- Why aren't new homes fitted with solar panels?

- We need to find cheaper ways of harnessing tidal / wave power: this is urgent
- We need to look in to other alternative energy sources as suggested by scientist, e.g. Nicholas Tesla: wireless transmission of electricity●
- We need to invest more in onshore farms.

Recommendations

Q: Given what you have heard what do you think is important for the CCC to include in its advice to Government?

Orange group

Participants recording their comments on post-its

- The public should be rewarded for using less energy
- Incentives to small and big companies and individuals
- Involve more international companies
- More research on solar energy
- The government needs to spearhead an ethical stance toward holistic health and integrity of our environment
- Simple education to explain to us how climate change will actually affect our lives in England then worldwide
- Education - we don't need to educate YOUTH, they learn all of this. It's the older people that use up energy. Educate the older.
- Recommend: more investment in renewable energy (wind / sea) educate the public (knowledge = power) and encourage insulation of homes and the use of heat pumps
- Get companies to make basic, less expensive appliances to give a starting point including cars
- Investment, investment, investment in new areas of renewable sources of energy which could be cost effective and beneficial in the fight to reduce CO₂
- Government should be addressing society's intrinsic values around consumption and waste
- Be more transparent about risk of controversial technologies
- Be transparent about the proposed spending in reaction to other budgets
- National referendum and public vote on these budgets
- Simple education through the media and other formats
- Ethics
- Integrity
- Acting locally to affect change - a campaign like Jamie Oliver's 'healthy eating' using celebrity as influence

Q: How would you summarise the risks of inaction?

- DESPAIR
 - extinction
 - people may not all feel that now but they will with increases in food costs etc
 - there are so many issues that need addressing from burning forests in Indonesia to plastic bags.

Q: How would you summarise the risks of action?

- HOPE
- Change - people like things how they are, people need t accept change will happen and to be reassured through education that action is a good thing
- When people see action they will be inspired to carry on
- Profiteering from new technologies is a risk - companies will make money out of developing new technologies
- Re-thinking ideology

Q: How would you summarise the benefits of action?

- Survival of humankind [is at stake]
- Wealth and health

- Happier
- Security - it will be better if there is no resource to war over
- "I don't believe it's this rosy!"

Summary of Orange Group's long-list of recommendations

- Investment - is currently tolerable but more is needed balanced by a concern about the cost to individuals
- Education - understandable for everyone and linked to a high-profile campaign
- Renewable - using existing / proven technologies which are safe
- Incentivise people - the down-side of this is that it could be creating a vicious cycle with companies only producing products they know people will buy
- Re-think ethics / beliefs / values. It's about how we live our lives, but this is a society that's used to £ so we need to re-think to create government policy

Orange group - final list of three recommendations

- A targeted education campaign around ethics and knowledge around how climate change is affecting / will affect us. Government should be modelling best practice.
- National / local public and stakeholder debate about the risks and opportunities around unproven and unsafe technologies compared to existing safe renewables which need more testing.
- Investment in safe / renewable energy should be balanced against costs to the consumer with transparency about public budget allocation.

Green group

Panel members recording on post-its unless otherwise marked

Education and awareness raising (7 dots)

- Curriculum – students; Adult education: media coverage, TV documentaries; Should also have focus at local communities/ Boroughs
- Climate change should become part of all government bodies, mandates, agendas, transportation used
- Need to introduce education from primary school level but also educate people in general to consider how lifestyle affects environment

Introduce a sense of urgency (2 dots)

- Time is of essence. A sense of urgency should be introduced. Discussion:
 - Through education
 - Using the media

Updating data (1 dot)

- These targets and aims are best guesses so far on the evidence available and can and should be revised when the latest evidence becomes available

Incentives for both companies and the public (1 dot)

- Rewarding companies for investing in low carbon emissions
- These recommendations should include incentives as far as possible

Get rid of capitalism! (1 dot)

- Discussion: Impossible to do but the way we live and the way we are bombarded by media and advertising campaigns that we need more and more and more is very much affecting this issue

Investing in green technology (0 dots)

- Investing now to save later

Make green technology more affordable to the public (0 dots)

Invest in making cycling safer (0 dots)

Legislation/ policing(0 dots)

- Discussion: Set up something like the Financial Services Authority for environmental issues

Work with other countries (0 dots)

- Share technologies and ideas

Q: How would you summarise the risks of action?

- Costs
- Over reaction, scaremongering
- Safety considerations: new technology needs to be tested out
- Reliability of information
- Penalising developing countries
- Setting the bar too high:
 - might take other countries come to a stand still as they may feel they won't be able to meet the targets
 - job losses
- Competitiveness on the global stage
 - If we start making a lot of electric cars and other countries don't use them/ import them from us: too far too soon scenario

Q: How would you summarise the risks of inaction?

- Human conflict
- Destruction of the planet
- Increased flooding, draught, disease
- Loss of agricultural produce
- Fossil fuels will run out
- Increased global warming
- Higher costs later
- Extinction of maritime species
- Population explosion/ mass migration to safe parts of the world
- Inaction may lead to apathy

Q: How would you summarise the benefits of the UK's proposed measures?

- Safer world
- The way we'll live will be more cost effective
- We'll all have healthier lives
- Well-educated, green society
- Seen as ambassadors for climate change
- More green jobs and other economic opportunities
- Massive decrease in carbon emissions, which will slow down green house effect
- Healthier nation: better health = less spent on NHS
- A population that is more caring towards the environment
- Business community setting an example to society and individuals

3 recommendations

- Education and awareness
 - Sense of urgency
 - Across all government departments
 - Across all areas of the curriculum
 - Use media
- All political parties should develop a programme together so that it becomes independent of power shifts
- Keep data up to date, revise targets regularly and educate us about it

Blue group

Q: Given what you have heard what do you think is important for the CCC to include in its advice to Government?

Panel members recording on post-its

Education including young people

- To invest in educating the public. Awareness of climate change and what is the issues
- Education – from junior school upwards so by the time children become adults, there isn't ignorance to the facts
- To educate from primary school age upwards. Make it part of the school curriculum
- Young people should invested in a lot more about their contribution to climate change
- Create a "social atmosphere" for young children to gain more interest

Media (links to education)

- The Government should force the media to fully inform the public of the severity of the situation
- Creating awareness of climate change to the media. With just the facts, with no need to be bias.

Action now!

- Start addressing the problem now!
- There's no debate – we shod do what needs to be done now
- The time for action is NOW

Renewables (links to action now)

- Investment in and introduction of renewable energy must be compulsory. If we wait for a further debate, we are wasting time.
- We need to invest in low carbon, particularly renewable technologies now so that we lose our dependency on high carbon fuels

Cost effective/incentives for everyday person

- Concern about cost for everyday person
- Government support/funding is needed for everyday person
- Incentives for people to "go green" i.e. reward scheme however small
- Give the public incentives to make these changes i.e. reduced tax.
- Advise them to cut taxes for those who commit to make their environment greener
- To look at changing the interest rate for the green deal. This would make it more appealing

Government leading

- The UK should be setting the standard to the rest of the world and commit to increasing its ambition immediately to tackle climate change
- Lead by example. If the government aren't seen to be making a change in the way they live their lives, then why should we
- Any changes made initially, shouldn't be allowed to change if there is a change in government

Government working with...

- Government should work with businesses as they can be high contributors to climate change
- They should advise the Government for the Councils to work in unison. "Why don't people have recycling bins"

Other

- If we become less dependent on oil supplying countries, the whole political agenda globally will change and morally, this would change the lives of millions of people for the better. This is our moral obligation as a civilised society.
- If the world went vegetarian it would reduce green-house gas emissions massively!

How would you summarise the risks of action?

- There aren't any! Only short term costs.
- Government is taking a risk, but it is the right thing and could be a vote winner

How would you summarise the risks of inaction?

- Doom! Expense, death, destruction, famine, flood, poverty...

How would you summarise the benefits of the UK's proposed action?

- Slow progress, not enough – but UK could be an example.
- But they are real and will make a difference
- More needs to be done

3 recommendations:

- Education - everyone should be made aware, but it might be easy / should be compulsory for the young - media is a channel for all, bring in to the home, need to be responsible and get the facts right. Bias should be towards the real situation and pro-change
- Government to Incentivise people / make people better off
 - Industry / business
 - Members of the public
- Action now / urgency! - to shift from carbon intensive to low carbon / renewable energy.

Plenary discussion

1. Education and awareness raising for all
 - a. Across all government departments/ public bodies
 - b. Sense of urgency
 - c. Use the media for all ages
2. More debate for a real democracy
 - a. Risks/ opportunities regarding new technologies, i.e. fracking, nuclear
 - b. Is related to education as it is about raising awareness of the public
3. One programme agreed by all political parties
 - a. Independent of power shifts
 - b. Create a longer term vision

[Feedback from CC: the Climate Change Act is set up for this]

4. More encouragement by governments
 - a. Tax breaks, incentives, grants
5. Investment in safe renewable energy
 - a. More transparency
6. Keep all data up to date and revise targets and policies as new data become available
7. Acting now as a matter of urgency
 - a. Particular focus on safe renewables

Six recommendations presented:

1. Education
2. Democracy
3. Incentivise
4. Investment
5. Data up to date / revised targets
6. Act now

Final session – feedback to plenary

Response from the CCC member

- It's easy to respond. Because there is nothing I would disagree with. All important messages. I enjoyed listening. Nice not having to talk. You had a good debate, came to conclusions through informed debate. The things you would like us to do, I would find it very hard to disagree with.
- You want debate, absolutely. This is a small contribution. And you mentioned you need education to go with it, which we agree. We do have debate in the media, but it gets emotional, and departs from the facts. What you are calling for us to do is exactly the right thing, let's hope we can project that message.
- Education. Absolutely right. There was a debate recently about whether climate change should be removed from the curriculum, but it is still in the curriculum. Those are messages it is worth reinforcing to Government, this is something you all want.

- Renewables – Interesting to hear risk awareness you have and healthy suspicion on new, untested technologies e.g. carbon capture and storage, fracking, and nuclear where still sense there are risks. Good to hear that sense let's not get into it without checking the risks, which we agree. Renewables we do strongly agree with, also need to find balance with costs, we have to keep that balance in mind.
- Incentives – you are right, there is a lot we can do that will save money e.g. insulate homes, drive more slowly. Incentives in right way, such tax breaks that you mentioned, they are incentives that would change our behaviour in a meaningful way.
- Data – this point is well received. It is what we are doing. When we go through our budgets, there are updates each time we recommend a new the budget. We look at the evidence again, what we have learnt about the science, what we now know about new technologies e.g. CCS. We go through that process, respond and adjust targets accordingly.
- Climate change Act 2008 was passed with cross party consensus. We have to renew our attempt for consensus and remind the current generation of politicians that this something that people want to see happen
- Should we just wait until everybody else does the same thing? I heard a person in one group say “We want to be shepherds we don't want to be sheep”. A wonderful way of putting, we want to provide that leadership.
- What is the risk of inaction? I noted what you said in groups about despair, gloom, doom. I really feel it is important people understand, when we advocate education, incentives etc. there is a reason why we are doing it. It is nice this group understands why.
- A lot will be reflected in the report and we hope the government will listen to us. By listening to us they listen to you.
- Steve briefly talked about Sciencewise and Phil talked about his role as evaluator and how participants could contribute to the evaluation of the process.

Any other thoughts cards

Why aren't the EU countries broken down so there is a better estimate on each country's Cos emissions? Some EU countries are more developed than others

Affordability on all the cost effective long run things, e.g. lagging off street parking cost effective boiler fridge the list seems endless

How do you work out what target each country should meet?

Can we hear more about buying credits?

Everything has to come from the very top - not expecting those at the bottom to respond without real evidence of leadership.

The Government needs to take an ethical stance that honours the integrity of our environment.

Global ethical change needed.

Isn't there an ethics question about using carbon capture and storage and nuclear because of future risks as opposed to wave / solar / wind.

Hydro carbon is not in the definition of terms in the glossary [Help Points].

Switch off! We do it at home (at least try) - do not leave equipment on standby it costs more. Get people to do it at work too.

We cannot save the planet. We can try but maybe this was meant to happen. 666- end of the world.

Not save the planet - save ourselves.

The presentations didn't cover mitigation and adaptation.

Could we not switch funding from nuclear disarmament which is not an insubstantial amount to education [on the issues]? Is there any point in having a deterrent when we have more pressing needs.

Most capital intensive projects exceed budgets like the Millennium Dome / Channel Tunnel / Olympic stadium. Is the government being realistic about its budgeting?

The explanation of global temperature [in the unanswered questions sheet] has done nothing to ease my concern. People are generally only interested in their own environment and won't be able to relate small temperature change there to change elsewhere.

Why isn't anyone talking about population control?