BBSRC
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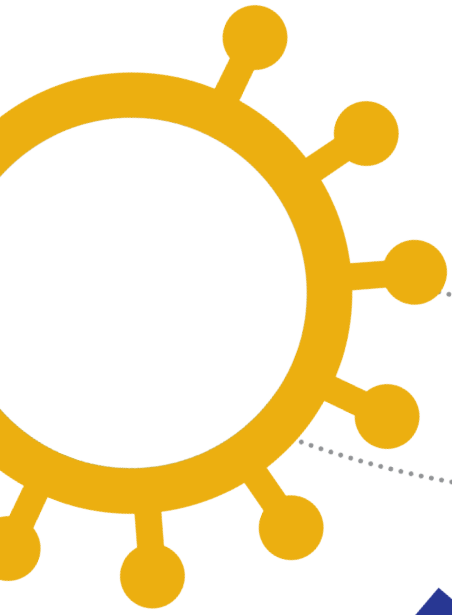
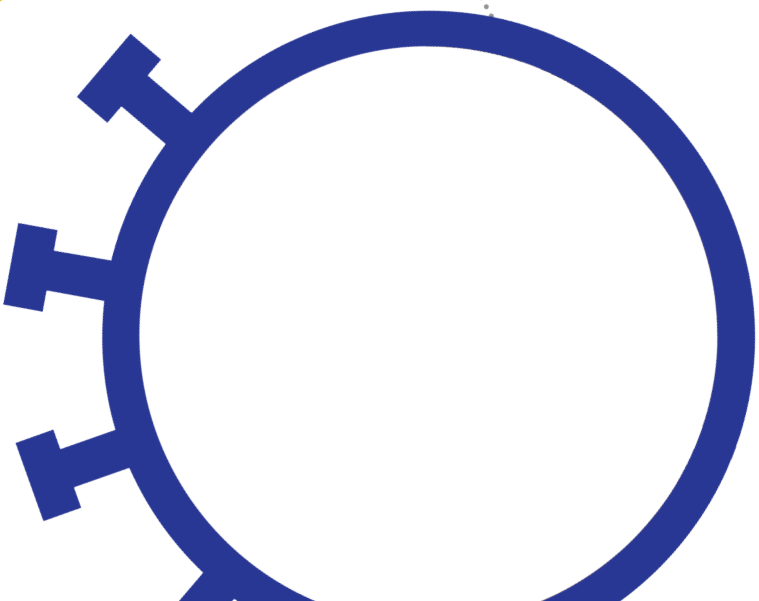
Bioenergy Dialogue

Final Report





BBSRC Bioenergy Dialogue - Report on a pilot public dialogue

December 2013

This report presents the findings of a public dialogue on bioenergy. The dialogue aimed to explore public views in regard to bioenergy, so that those views could be considered by BBSRC. It also aimed to pilot a novel, distributed approach to public dialogue.

The project took place between September 2012 and December 2013 and was carried out by the Biotechnology and Biological Sciences Research Council (BBSRC) with co-funding and support from Sciencewise. The data analysis was conducted by Ipsos MORI and the project was evaluated by Collingwood Environmental Planning (CEP).

Acknowledgments

The project team would like to thank both the BBSRC Sustainable Bioenergy Outreach Group and the Process Sounding Board in helping to develop the dialogue, as well as the participants in the public dialogue events (including all those who facilitated the events).

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BBSRC

BBSRC invests in world-class bioscience research and training on behalf of the UK public. Our aim is to further scientific knowledge, to promote economic growth, wealth and job creation and to improve quality of life in the UK and beyond.

Funded by Government, and with an annual budget of around £467M (2012-2013), we support research and training in universities and strategically funded institutes. BBSRC research and the people we fund are helping society to meet major challenges, including food security, green energy and healthier, longer lives. Our investments underpin important UK economic sectors, such as farming, food, industrial biotechnology and pharmaceuticals.

Sciencewise

Sciencewise is the UK's national centre for public dialogue in policy making involving science and technology issues. It provides co-funding and specialist advice to Government departments and agencies to develop and commission public dialogue activities in emerging areas of science and technology.

CEP

Collingwood Environmental Planning (CEP) is an independent multidisciplinary environmental and sustainability consultancy and is the evaluator of this project.

Ipsos MORI

Ipsos MORI is one of the largest and best known research companies in the UK and part of the global Ipsos Group. The Ipsos Social Research Institute is the leader in public sector research helping policy and decision makers understand what works.

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Executive Summary

Background

The Bioenergy Dialogue aimed to explore public views in regard to bioenergy, so that BBSRC strategy development in bioenergy can be responsive to public opinion. The dialogue also aimed to pilot a novel, distributed approach to public dialogue which develops an ongoing, embedded discussion around bioenergy research, that would engage a larger number of researchers and members of the public than previous dialogues.

The project took place between September 2012 and December 2013 and was carried out by the Biotechnology and Biological Sciences Research Council (BBSRC) with co-funding and support from Sciencewise. The data analysis was conducted by Ipsos MORI and the project was evaluated by Collingwood Environmental Planning (CEP).

The project was led by BBSRC's External Relations Unit. A Bioenergy Dialogue Coordinator was employed specifically to coordinate the project. Two groups provided oversight for the dialogue: the BBSRC Sustainable Bioenergy Outreach Group and the Process Sounding Board.

The process

In collaboration with academics, science communicators and the new economics foundation, BBSRC developed a toolkit of resources to be used by BBSRC-funded researchers and other interested groups in the dialogue events. The toolkit included:

- guidelines for running an engagement event
- a set of futures scenarios and associated discussion materials
- a Democs card game.

The main mechanism for the collection of feedback was through feedback forms which aimed to capture:

- Views and opinions of participants
- Demographic information about participants
- Information about the event itself
- Information about the process of the dialogue e.g. how the materials were received
- Perceptions about what the impacts of the dialogue might be.

The findings

11 public dialogue events were run by researchers and other groups between January and September 2013. 162 participant feedback forms and 35 organiser feedback forms were received.

Demographics

There were considerable differences across workshops in terms of who took part. Overall, attendees differed from the UK population in that they had very high educational qualifications and the age range skewed towards the old and the young over the middle aged. Also, three quarters said that they are in some way involved in science professionally. This, combined with the limitations found with using feedback forms to gather participants views, means that the findings from the qualitative analysis presented here should be treated

with caution. They are not statistically representative but are illustrative of the range of views and arguments made by participants and, where possible, the drivers behind these views. It is not possible to extend the findings to make generalised comments on the views of the UK population.

Hopes for bioenergy

Overall, many saw bioenergy as a key part of - but not the entire solution to - our energy needs in the future. Responses were positive about the range of potential uses of bioenergy, and saw a key place for bioenergy as part of a suite of renewable energy sources that will help us reduce our use of fossil fuels and thus reduce carbon emissions. Some noted its potential for use to power our transport needs, while others pointed to its use in recycling waste. The potential for bioenergy to allow for decentralised generation was also seen as a positive aspect of this source.

Concerns about bioenergy

However, there were concerns about whether the gains from bioenergy use will be spread fairly among all those involved in and affected by its production. The potential range of negative impacts was a worry for many, in particular the consequences for land use, food production, biodiversity and the environment more generally. Participants thought that there is potential for those who are already poorest to suffer the most from any such impacts.

Another strand of concern related to how bioenergy fits into the wider debate around cutting carbon emissions and diversification of the energy mix. Some worried that it could be used as “greenwash”, others thought it was distracting from the need for reducing the demand for energy. More practical concerns related to the ability of those taking decisions around energy to plan wisely in the long-term to ensure impacts are acceptable and to cooperate internationally to allow for efficient and speedy progress in the use of bioenergy.

What researchers should be thinking about

The participants who took part were keen to ensure that researchers are thinking about the ‘bigger picture’ issues of benefit and fairness, impact and sustainability, and not lose sight of the wider goal of reducing carbon emissions through both demand and supply side mechanisms.

They also suggested that researchers should be transparent in their work on bioenergy, and where possible make efforts to inform the public about their work, as well as providing high-quality evidence to politicians to enable good decision making in this area.

Conclusion

This dialogue set out to pilot a new approach to public dialogue. The project has revealed some useful insights into the hopes, concerns and aspirations of those who took part. It has also been a learning opportunity in terms of the dialogue process and we look forward to the final evaluation report to draw those learnings together.

This report, together with the evaluation reports when they are available, will be discussed by BBSRC’s advisory groups and used to inform the work of those groups. A BBSRC response to the findings will be produced.

1 Introduction

1.1 Bioenergy

The world has increasing pressures on its resources as a result of changes in populations and their consumption patterns combined with climate change and the fact that fossil fuels, which are non-renewable, will become more expensive to obtain in the future. BBSRC recognises that there is potential for huge scientific and technological advancement in bioenergy as an area of research that could help meet some of the challenges that society faces to secure future energy needs.

Bioenergy could contribute to an energy solution relying on renewables while offering the promise that it will take account of environmental, social and economic issues. To do that it is crucial that the field remains responsive to public needs and concerns, as the science develops.

BBSRC wants to ensure that contemporary public views, concerns and aspirations are taken into account as more sustainable bioenergy solutions are developed and ensure that BBSRC strategy development in bioenergy is responsive to public opinion. The project was co-funded by Sciencewise (supported by BIS as the UK's national centre for public dialogue involving science and technology issues) to run a dialogue project to this end.

1.2 Project aims and objectives

Aims:

- To explore with members of the public, their views in regard to bioenergy, and consider those views in our strategy and policy development in bioenergy.
- To pilot a novel approach to public dialogue, to develop an ongoing, informed discussion between ourselves, our research community, the public and other stakeholders, around bioenergy research.

Objectives:

- To facilitate discussions between the BBSRC scientific community involved in bioenergy research and members of the public.
- To identify public views, concerns and aspirations about the science, social implications, and ethics of bioenergy research.
- To raise awareness within BBSRC of the needs and views of the public in relation to bioenergy.
- To inform BBSRC's strategy and policy setting around bioenergy.
- To disseminate our findings to key stakeholders, for example, the government.
- To develop and test a novel, flexible model of dialogue for discussion of complex issues that enables engagement with a large group of people nationwide.

1.3 Distributed dialogue

BBSRC has a long history of engaging in public dialogue and in recent years BBSRC and other Research Councils have tended to use large-scale deliberative dialogues which happen as a one-off project, and often use market research-based techniques for public engagement. Examples include: Public attitudes to ageing research[1] (with MRC), the Stem Cell Dialogue[2] (with MRC) and the Synthetic Biology Dialogue[3] (with EPSRC).

BBSRC recognises the many advantages of these large deliberative dialogues, not least the robust and defensible evidence base that is generated. However, they tend to be limited on a number of levels including; lack of flexibility and innovation; audience confined to representative groups; limited number of researchers who can be involved; and their 'top-down' nature does not encourage spontaneous adoption by researchers or public engagement professionals (in contrast with, for instance, Democs). It was therefore decided that it would be valuable to explore the possibilities for a different model of dialogue that tackles these limitations without losing the advantages of the large-scale deliberative model.

Previously 'Small Talk[4], a collaboration between the British Science Association, the Royal Institution, Ecsite-UK and the Cheltenham Science Festival, and Sciencehorizons[5] have used a different model of dialogue. In Sciencehorizons, participants were engaged in one of three strands which included a range of types of engagement from full day facilitated workshops to self-organised community events. 'Small Talk' was comprehensively evaluated and provides a useful basis for future work.

Influenced by these dialogue projects, BBSRC adopted a model, new for the Research Councils, for a more distributed[6] and flexible approach to dialogue and engagement on bioenergy and the issues that surround it. This distributed dialogue model was aimed at developing an **ongoing, embedded** discussion between BBSRC, its research community, the public and other stakeholders, around bioenergy research, that would **engage a larger number** of researchers and members of the public than previous dialogues and which might be more cost effective.

The model, Figure 1, comprises a feedback loop that links engagement activities and policymaking. Rather than engage an external contractor to run the dialogue, BBSRC developed a 'toolkit' that could be used to run dialogue events; these could be run by BBSRC-funded researchers, colleagues at BBSRC strategically funded institutes or community and special interest groups as well as by BBSRC. It was planned that feedback from these events would be gathered and collated by BBSRC. The information captured at this stage can be used to inform future events, modifications of the toolkit and more importantly, it can be used to inform research policy within BBSRC.

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[1] http://www.bbsrc.ac.uk/society/dialogue/attitude/attitude-ageing.aspx
[2] http://www.bbsrc.ac.uk/society/dialogue/activities/stem-cell-dialogue.aspx
[3] http://www.bbsrc.ac.uk/syntheticbiologydialogue/
[4] [Reference/webpage no longer available – Feb 2016]
[5] [Reference/webpage no longer available – Mar 2016]
[6] Andersson, E., Burall, S. and Fennell, E. (2010) *Talking for a Change: a distributed dialogue approach to complex issues,* London, Involve http://www.involve.org.uk/blog/2010/04/06/talking-for-a-change/[1]
http://www.bbsrc.ac.uk/syntheticbiologydialogue/

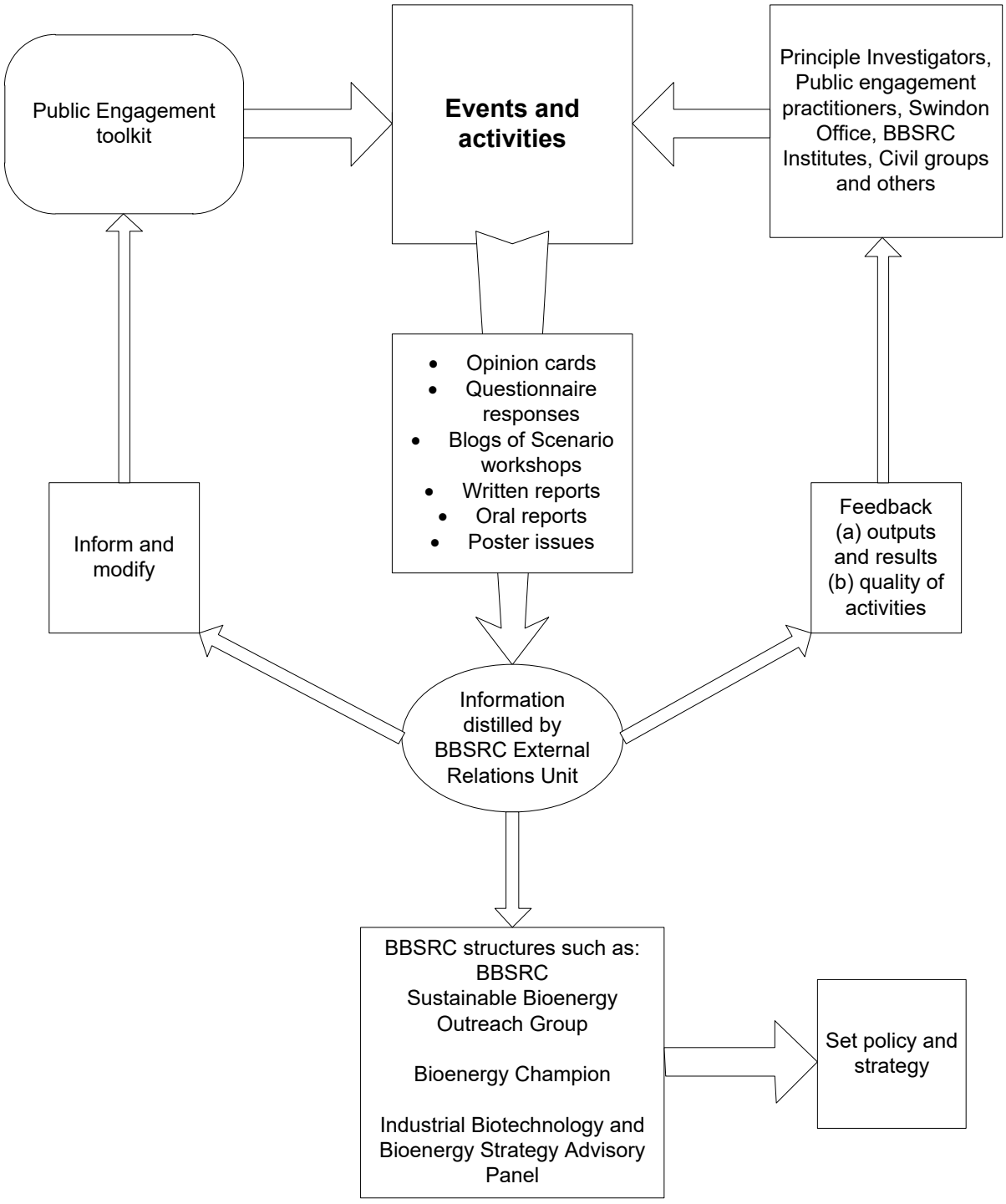


Figure 1: A distributed model for public engagement around bioenergy

1.4 Governance

The project was led by the Engagement Team within BBSRC's External Relations Unit, in collaboration with colleagues working in the relevant science funding areas. A Bioenergy Dialogue Coordinator was employed specifically to coordinate the project, including encouraging and supporting dialogue events, developing mechanisms of data collection at events and analysing feedback.

Dialogue projects usually have a single oversight group that is set up specifically for the duration of the project. However, BBSRC was keen to embed this dialogue within the structures that already exist in the organisation so that the dialogue exists as part of normal working. There were two groups which together provided oversight for the dialogue: the BBSRC Sustainable Bioenergy Outreach Group and the Process Sounding Board (Figure 2). The former, comprised of a variety of people from researchers to the RSPB and industry representatives, had ownership of the dialogue and the results, including leading on ensuring BBSRC responds to the dialogue, and advised on content of dialogue stimulus materials. The latter, comprised of social scientists and public engagement experts, was set up specifically for the project and advised BBSRC on the theory behind and process of the dialogue. The membership and terms of reference for these groups are in Annex I.

In addition, the BBSRC Bioenergy Champion, the Bioscience for Society Strategy Panel[7] and the Industrial Biotechnology and Bioenergy Strategy Advisory Panel[8] all had an interest in, and were kept informed about, the progress of the dialogue. These groups were represented on the BBSRC Sustainable Bioenergy Outreach Group and provided a mechanism for the flow of advice back in to BBSRC's decision-making structures.

[7] http://www.bbsrc.ac.uk/organisation/structures/panels/society/society-index.aspx
[8] http://www.bbsrc.ac.uk/organisation/structures/panels/ibb-panel.aspx

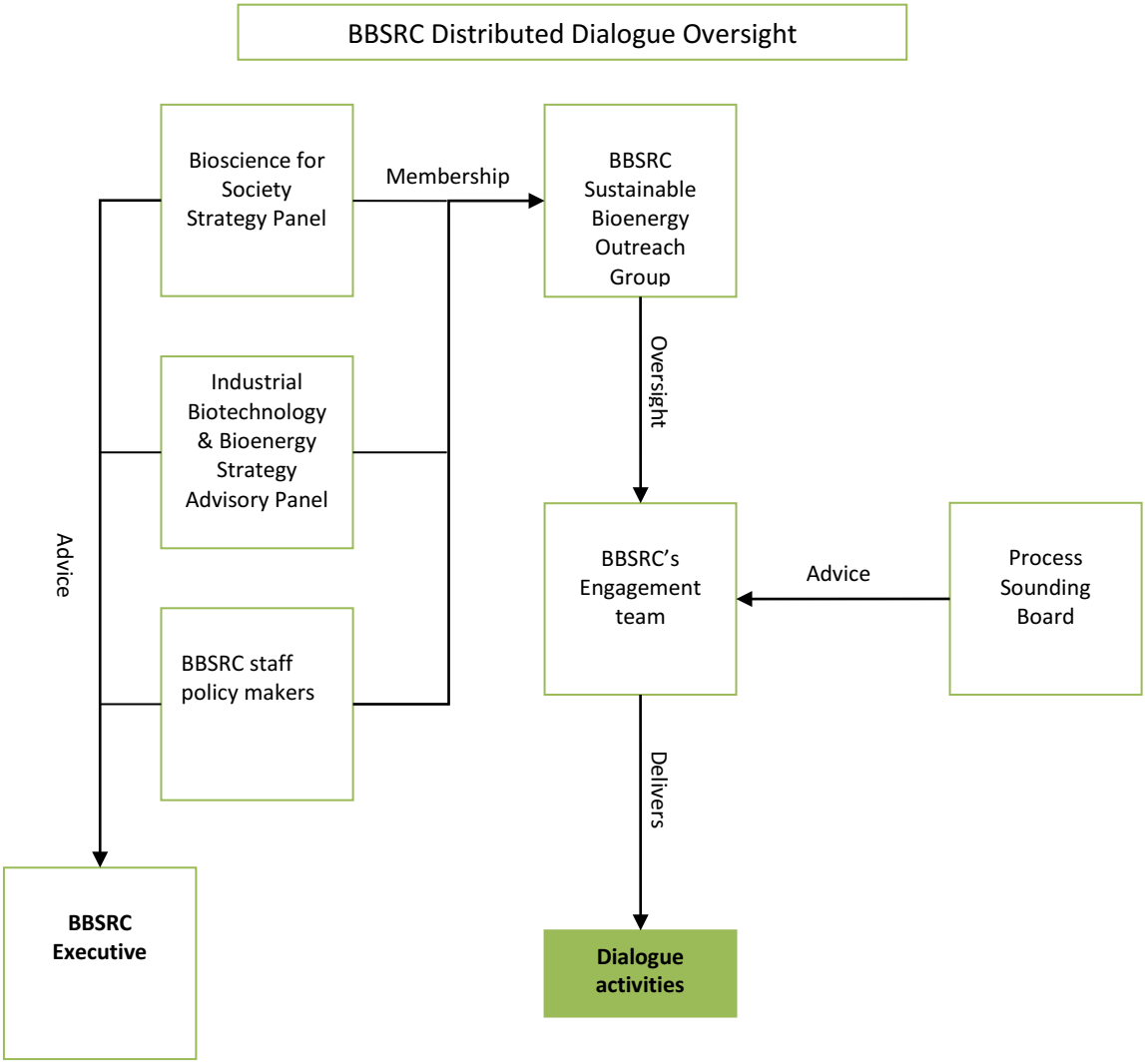


Figure 2: BBSRC Distributed Dialogue Oversight

2 Methodology

2.1 Introduction

Prior to the beginning of the Sciencewise funding and the appointment of the Bioenergy Dialogue Coordinator most of the groundwork for the project was laid, including initial development of the toolkit. Subsequently, the approach developed to implement the project took the form of a six phase process:

Phase 1 – After the appointment of the Bioenergy Dialogue Coordinator, this phase involved a detailed scoping of the project;

Phase 2 – This phase involved the finalisation and design of the toolkit of resources to use in the dialogue events, and developing questionnaires to collect feedback from the events, as well as the design of, and preparation for, the pilot event;

Phase 3 – This involved the delivery of the pilot event, the analysis of the feedback collected at the pilot, and subsequent adjustment of the toolkit. It also involved a preliminary analysis of participant views on bioenergy and the production of a briefing paper on the emerging findings;

Phase 4 – This phase involved the encouragement and support of BBSRC-funded researchers and other interested groups to run dialogue events, as well as the delivery of two BBSRC-led events;

Phase 5 – This phase involved the analysis of the data collected at the events run by researchers and others and the production of the final report;

Phase 6 – As this is an on-going conversation with the public, there is scope for the project to continue running throughout 2014 and beyond.

Figure 3: Implementation approach

2.2 The development of the toolkit

In collaboration with academics, science communicators and the new economics foundation (nef), BBSRC developed a toolkit of resources to be used in the dialogue events[9]. The toolkit included:

- guidelines for running an engagement event
- a set of futures scenarios and associated discussion materials
- a Democs card game.

The scenarios, set twenty years ahead, were designed to encourage discussion by being provocative projections of what the future might look like if particular decisions are taken concerning the use, or non-use, of bioenergy in the UK. The scenarios were originally developed as part of an academic report[10] and were adapted for use in the toolkit by a science communicator, Ray Mathius who also drafted the guidelines. The scenarios use stories, and scripts for short plays, involving fictitious characters to imagine what the future might look like if certain decisions are taken (or not taken) around bioenergy. 'Cue cards' and 'Character cards' provide additional prompts to engage participants in the discussion.

Democs is a type of resource produced by nef that uses a card game-like process to help small groups of people engage with complex topics. nef and Edinethics developed a bioenergy Democs game for use in this dialogue project that gives anyone all the information and structure they need to share ideas on bioenergy.

All the materials were reviewed internally at BBSRC, as well as being reviewed by the BBSRC Sustainable Bioenergy Outreach Group and the evaluators.

[9] http://www.bbsrc.ac.uk/society/dialogue/activities/bioenergy-dialogue/dialogue-materials.aspx
[10] 'BBSRC Sustainable Bioenergy Scenario Tool' authored by social scientists R Dingwall, A Balmer and M Goulden (2011).

2.3 Development of feedback mechanisms

The main mechanism for the collection of feedback was through feedback forms completed at the end of each dialogue session. Three forms were developed, one for participants to complete and two for organisers to complete (depending on whether they ran an event using the scenarios or the Democs game). Feedback forms were developed by BBSRC in collaboration with CEP and Sciencewise so that they were useful for the evaluation as well as the dialogue itself.

The feedback forms were an important mechanism to capture:

- Views and opinions of participants on bioenergy
- Demographic information about participants
- Information about the event itself
- Information about the process of the dialogue e.g. how the materials were received
- Participants' perceptions about what the impacts of the dialogue might be.

The distributed approach used in the bioenergy dialogue relied on researchers and other interested groups to run events. This meant that anyone could take part in the public events because participants were not recruited to a quota as might otherwise happen. With this approach, it was likely that participants would be self-selecting and not representative of the UK socio-economic profile. Therefore, gathering demographic information, and understanding who had been engaged, was particularly important.

In addition to the feedback forms, event organisers were also asked to return any other materials where discussions had been captured, on flipcharts or during the voting exercises described in the toolkit, for example. The intention had been to analyse that material alongside the feedback forms. However, only a few organisers returned this additional material and without having the detailed context for how information was captured, it was felt that it would be difficult to produce a reliable analysis. Therefore, the findings in this report come only from the feedback forms.

A number of recordings were made of discussions at two events (in Bath and Swindon), to see whether a greater depth of understanding of public views could be revealed than could be gleaned from the feedback forms. The findings from this data are presented separately in section 3.6.

2.4 Pilot event and training

BBSRC organised a pilot dialogue event at the Dana Centre in London in January 2013 to test both the toolkit and the feedback forms. A training session was held on the afternoon prior to the pilot event, to inspire and support training attendees to run dialogue events.

2.4.1 Training

The objectives of the training were to give participants an understanding of:

- what public engagement is and why it is important
- how to run a dialogue event
- how to use the bioenergy toolkit

- the skills required to carry out effective public engagement and dialogue events.

Researchers were encouraged to attend from the BBSRC Sustainable Bioenergy Centre and from institutes which receive strategic funding from BBSRC – 12 people attended including researchers (scientists and social scientists) and public engagement professionals.

The first part of the session covered an introduction to public dialogue, and the bioenergy dialogue in particular. There was then a section thinking about and discussing potential 'audiences' and their needs, and a section exploring the role of the facilitator and the importance of good facilitation.

The remainder of the training was spent preparing for the pilot event, which the trainees helped to deliver. The trainees were guided through each element of the toolkit and then given time in subgroups to prepare for their part of the event.

2.4.2 Pilot event

The pilot event served several purposes: it was an opportunity to test the toolkit, it was an opportunity for training attendees to be involved with a dialogue event (and hopefully gain confidence) and it was an opportunity for BBSRC to listen to public views about bioenergy.

As the event was a pilot, the Dana Centre was chosen as a venue with an established audience to ensure good attendance; it was recognised that there are also limitations with this approach, including the fact that the audience was self-selecting.

The event plan is in Annex II and was based on the plan included in the original toolkit with a short introductory talk, breakout groups discussing different future scenarios or using the Democs game, some plenary discussion and time allowed for completing feedback forms. The event ran for two hours, was attended by around 50 members of the public and the breakout groups received expert input from, and were facilitated by, attendees on the training.

2.4.3 Materials revision and policy briefing

The feedback received from those who helped to run, and who observed the pilot event was analysed by BBSRC and used to adjust the toolkit and the feedback forms that were then published for others to use. The main feedback on the toolkit was that it was too large and daunting to approach and over complicated to use. Feedback was also received from Dr Jeremy Woods, through CEP as part of the formal evaluation process.

No changes were made to the Democs game but the future scenarios and accompanying tools and guidelines were simplified significantly. This included separating out the resources themselves from the guidelines and producing two documents. The suggested discussion tools were reduced in number to make the guidelines easier to follow. The scenarios themselves were pared down too, as participants had found them to be too long with too much detail. One scenario was also altered to reduce the emphasis placed on algae. The glossary was extended.

In addition to the evaluative data, data on public views were collected, analysed by BBSRC and reported in a briefing document that was discussed with both the Process Sounding

Board and the Industrial Biotechnology and Bioenergy Strategy Advisory Panel (IBBE) before being published[11].

The demographic data including gender, age, qualifications, ethnicity and involvement in science were analysed in Excel. The 30 feedback forms that had been received from this event were manageable to treat manually so the qualitative data were not coded in any software program. Analysis of participants' views on bioenergy followed a general analytical procedure. The data were coded in themes for the different topics that emerged from what participants had written in the feedback forms.

2.5 Dialogue events

2.5.1 Setting up events

As part of the distributed model, BBSRC encouraged BBSRC-funded researchers and other interested groups to become involved in the dialogue by using the toolkit to run dialogue events in their local areas. A large amount of time was therefore spent on raising awareness of the dialogue and encouraging researchers, and others, to run events. This included attendance from the project team at key meetings such as that of the BSBEC Centre Management Board and the BSBEC conference for example, as well as use of the BBSRC website and social media and personal contacts by email or telephone.

Once individuals expressed an interest in running a dialogue event, BBSRC was able to offer support as required, both in the planning stages and at the event itself. In addition, BBSRC led two events (in Bath in collaboration with the University of Bath, and in Swindon).

2.5.2 Event Structure

Although there was not a prescriptive plan to follow in the events that used the scenarios, the toolkit produced by BBSRC included outline event plans, intended as a useful tool to help organisers plan their event. A typical two hour session included the following:

Introduction: a brief explanation of the aims of the dialogue project, expected outcomes, and structure of the event, followed by a brief talk by a bioenergy researcher about bioenergy (including the bioenergy research conducted within the research group organising the event) and the main issues around bioenergy.

Icebreaker: A short activity using 'picture cards' to allow participants to introduce themselves and promote quick identification of participants' initial reactions to bioenergy.

The scenarios: Participants were split into groups of 6-8 people, usually with one facilitator (responsible for guiding the discussion) and one bioenergy researcher (responsible for providing information on bioenergy if participants asked), and asked to read one of the scenarios either as a story or a short play. Facilitators used 'cue cards' and 'character cards' to help spur discussion. The scenarios could be used in different ways and it was up to the facilitator to decide which resources to use and how to use them. A voting-type activity was often used to help clarify the issues (by writing them down) and help participants think about

[11] http://www.bbsrc.ac.uk/web/FILES/Reviews/1309-bioenergy-dialogue-emerging-views.pdf

which were most important to them. This was often the focus of the plenary discussion which was encouraged.

Feedback: 10-15 minutes was recommended to allow participants to fill in the feedback forms, after which the event was drawn to a close.

The Democs game is a more structured discussion tool that prescribes an event format. It includes an introduction, dealing out and discussion of three types of card followed by sorting the cards and completing the feedback forms.

2.6 Ipsos MORI analysis methodology and Data limitations

The original intention was that the feedback forms would be analysed 'in house' by BBSRC. However, it became clear that this would not be possible because of the unexpected time that was required to encourage and support others to run dialogue events. Ipsos MORI were therefore engaged to analyse the feedback forms and provide the findings for inclusion in this report. The methodology for this analysis is as follows.

The feedback forms completed by participants at the end of each event included questions that gathered participants' views on four substantive bioenergy questions, namely:

- Thinking about bioenergy, my main concern is…
- I think that bioenergy could be useful because…
- I would like researchers to think carefully about…
- There are significant issues that were NOT discussed at this event, but should have been. These are…

Data from participants' questionnaires were transcribed, then managed in Excel. The use of Nvivo software was considered, but the limited size of the dataset meant that the functionality of Excel was sufficient for the task of data management and analysis. Each answer or theme within answer was assigned to a code (roughly corresponding to each highlighted theme in sections 3.1-3.5) in one spreadsheet column. The data in each code was then analysed and a summary written up. The themes are presented in order of best narrative flow.

The analysis is not quantitative, as the data collected are not suited to this form of analysis. It is neither consistent nor is it representative. Taking consistency first, some participants wrote very long or multipart answers, while others only wrote single words, so a quantitative analysis would give too much weight to the answers of the former. As outlined in 3.1.1, the participants in the dialogues were not representative of the general public, and thus understanding proportions is not useful, as the proportions are not generalisable.

Instead the analysis is qualitative – it aims to present the range of views and arguments made by participants, and, where possible, the drivers behind these views. Here again though, there are limitations:

- Some answers were illegible, and thus impossible to transcribe, so some views were lost entirely.

- Many answers were very short, which meant that they could only be assigned to a code, and no further analysis was possible.
- Other answers were unclear, and there was no opportunity to probe those answers to get to the underlying ‘why’ of the opinion.

These data limitations have constrained the level of insight that could be generated.

3 Dialogue findings – views on bioenergy

This chapter describes the range of views among participants in the distributed dialogues in relation to four key questions about bioenergy. It outlines the type of people that attended the dialogues, and the scenarios and other stimulus materials that each group discussed. It then presents a thematic analysis of participants' responses in feedback questionnaires, drawing out the key principles that underlie views. The final section contains a short analysis of conversations in Swindon and Bath, where audio recordings of the dialogue were made.

Summary of Key Findings

Hopes for bioenergy

Overall, many saw bioenergy as a key part of - but not the entire solution to - our energy needs in the future. Responses were positive about the range of potential uses of bioenergy, and many saw a key place for bioenergy as part of a suite of renewable energy sources that will help us reduce our use of fossil fuels and thus reduce carbon emissions. Some noted its potential for use to power our transport needs, while others pointed to its use in recycling waste. The potential for bioenergy to allow for decentralised generation was also seen as a positive aspect of this source.

Concerns about bioenergy

However, there were concerns about whether the gains from bioenergy use will be spread fairly among all those involved in and affected by its production. The potential range of negative impacts was a worry for many, in particular the consequences for land use, food production, biodiversity and the environment more generally. Participants thought that there is potential for those who are already poorest to suffer the most from any such impacts.

Another strand of concern related to how bioenergy fits into the wider debate around cutting carbon emissions and diversification of the energy mix. Some worried that it could be used as "greenwash", others thought it was distracting from the need for reducing the demand for energy. More practical concerns related to the ability of those taking decisions around energy to plan wisely in the long-term to ensure impacts are acceptable and to cooperate internationally to allow for efficient and speedy progress in the use of bioenergy.

What researchers should be thinking about

The participants who took part were keen to ensure that researchers are thinking about the 'bigger picture' issues of benefit and fairness, impact and sustainability, and not lose sight of the wider goal of reducing carbon emissions through both demand and supply side mechanisms.

They also suggested that researchers should be transparent in their work on bioenergy, and where possible make efforts to inform the public about their work, as well as providing high-quality evidence to politicians to enable good decision making in this area.

3.1 What happened at the events?

A total of 11 public dialogue events were run by researchers and other groups between January and September 2013.

The table below shows the areas, dates and number of feedback forms received from the dialogue events (note that the number of attendees at events was sometimes more).

Location	Date	Lead organiser	Number of participant forms received	Number of organiser forms received
Dana Centre, London	24 January	BBSRC	30	11
University of Nottingham	25 April	Public engagement professional (with BBSRC-funded researchers)	12	2
Rothamsted Research	6 June	Public engagement professional (with BBSRC-funded researchers)	13	3
Cambridge Union Society	8 June	BBSRC-funded researcher	20	4
Arts Centre Bar, University of Aberystwyth	13 June	BBSRC-funded researcher	8	2
Newcastle University of the Third Age	25 June	Sciencewise Citizen Panel member	5	1
University of Exeter, Falmouth Campus	18 July	BBSRC-funded researcher	11	1
University of Exeter, Exeter campus, University of the Third Age	30 August	Public engagement professional (with BBSRC-funded researchers)	18	1
Showroom Café Scientifique, Sheffield	9 September	Public engagement professional (with BBSRC-funded researchers)	21	0
Bath Royal Literary and Scientific Institution	24 September	BBSRC	15	8
STEAM, Swindon	30 September	BBSRC	9	2
			Total: 162	**Total: 35**

Table 1: Dialogue events run around the country

3.1.1 Profile of participants

The chart below shows the breakdown of characteristics across the 11 dialogue workshops. In all, 162 people attended the dialogues and filled in feedback forms. As the chart shows, attendees had very high educational qualifications. Half held a postgraduate degree, compared with 8% in the UK working population[12]. Three quarters said that they are in some way involved in science professionally. The age range skewed towards the old and the young over the middle aged. The attendees were relatively ethnically mixed, with a higher proportion of participants identifying as 'White Other' (15%) than the overall population in England (6%).[13]

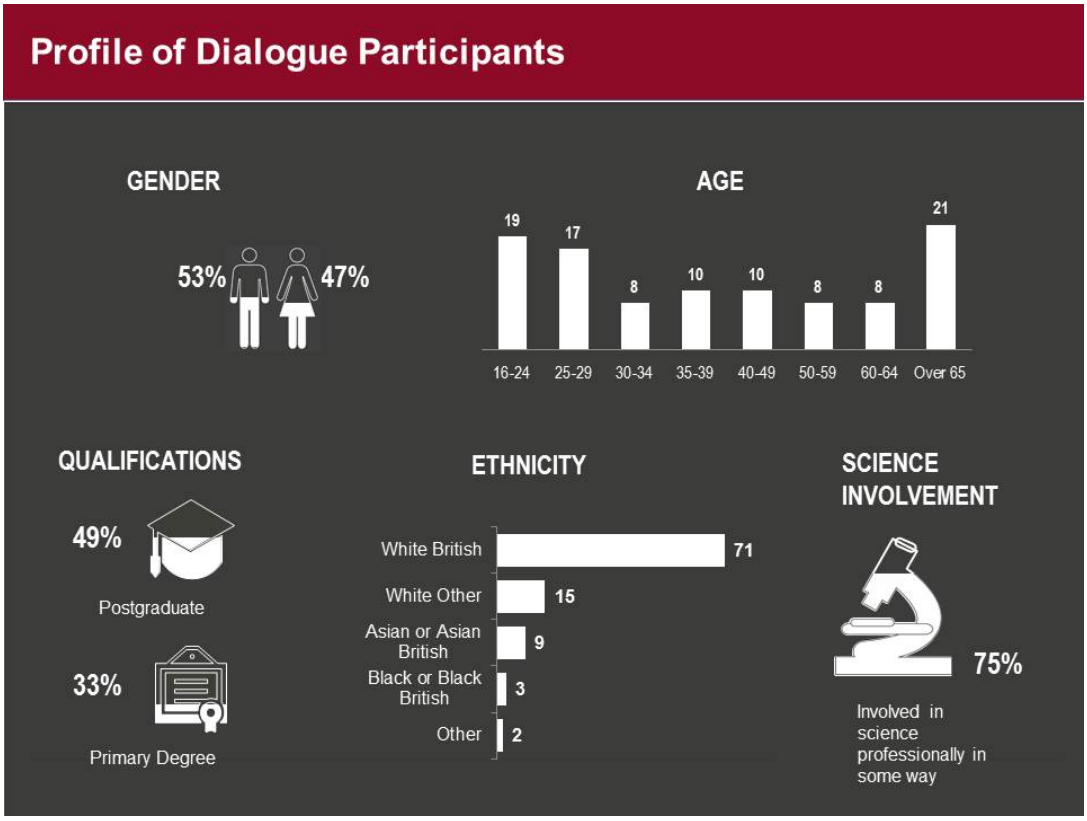


Figure 4: Profile of dialogue participants

There were considerable differences across workshops, which are outlined below:

Gender: This ranged from most participants in Aberystwyth being female (7 female, 1 male) to most participants in Falmouth being male (9 men, 2 women).

Age: In Nottingham all participants where aged under 29, and in London and Sheffield at least half of participants were in this age range. By contrast, over half of Bath attendees, two thirds of those in Swindon and all participants at Newcastle were aged over 60. The events in Rothamsted and Cambridge had the widest spread of participants across all age groups. There were minimal differences in views by age. The charts below – which map word frequency across answers to the four bioenergy questions by age - show significant overlap. However, young attendees were more likely to talk about sustainability, and older

[12] [Reference/webpage no longer available – February 2019]

[13] Please see appendices for a table comparing the profile of dialogue attendees with the general population.

participants to discuss carbon emissions. These minor differences suggest that those workshops with mixed age groups allowed for greater range of conversation.

Figure 5: Words used by those aged over 55 (n=57)

Figure 6: Words used by 16-29 years olds (n=55)

Ethnicity: All dialogues except for the one in Aberystwyth – where a large proportion identified as White Other - had a majority of White British attendees. In Exeter and Newcastle all participants were White British. Cambridge and London had the highest proportions of Black and Minority Ethnic attendees (32% and 24% respectively).

Qualifications: Six out of 11 dialogues had fewer than half of participants with postgraduate degrees. In Aberystwyth, London and Nottingham this seemed to be a function of the younger age range of participants. However, in Bath, Rothamsted and Swindon, this was a sign of a slightly wider educational range than in the other areas. Overall however, only six people with low or no qualifications attended the dialogues.

Science Involvement: In Rothamsted and Sheffield, over 60% of participants were scientists, while in Nottingham, all participants were science students. The areas that had attracted participants who don't consider science part of their professional life were London and Exeter (each 47%), Swindon (33%) and Bath (31%).

3.1.2 What did they talk about and what pattern did they follow

In Swindon, Rothamsted and Newcastle, the participants used the Democs cards to explore the issues. In London, five out of six groups used the Scenarios, and one group used the Democs cards.

In all other areas they used one of the Scenarios. In Exeter all participants discussed Scenario 1: 'Bumping along the Bottom' but in all other areas at least two were discussed (Table 2).

Scenario	Dialogues where scenario was discussed	Number of participants	Proportion of participants[10]
Bumping along the bottom	Bath, Cambridge, Exeter, Falmouth, London, Nottingham, Sheffield	52	32%
No change of course	Aberystwyth, Bath, Cambridge, London Sheffield	33	20%
How green is my valley	Bath, Falmouth, Nottingham, London, Sheffield	28	17%
Riding along on the crest of a wave	Aberystwyth, London	16	10%
Democs	London, Newcastle, Rothamsted, Swindon	31	19%

Table 2: Breakdown of which materials were used at each dialogue event

3.2 Public hopes and expectations for bioenergy

When asked why they thought bioenergy could be useful, participants in the dialogue event could see the potential of bioenergy to:

- Increase the amount of renewable sources in our energy supply
- Offer an alternative to fossil fuels and/or nuclear power
- Power our transport needs
- Provide cost effective fuel that uses current resources well
- Increase energy security through domestic and decentralised generation
- Reduce carbon emissions and help tackle climate change and environmental destruction
- Generate energy from currently unused resources (land and waste).

Overall, many saw bioenergy as a key part of - but not the entire solution to - our energy needs in the future.

[10] This data was missing for 2 participants, so numbers sum to 160 rather than 162, and percentages sum to 98 rather than 100.

"It provides an environmentally sustainable alternative to fossil fuels, and is renewable"

The key positive aspect of bioenergy outlined was the fact that it is renewable, though some added caveats around the issue of carbon debt. Often twinned with this was its sustainability, or relative sustainability in comparison to other fossil fuels.

Many saw its main use as an **alternative to fossil fuels and/or nuclear power**. A strong theme in the feedback from the questionnaires was the urgent need to "wean ourselves off" our dependence on diminishing reserves of fossil fuels, and perhaps remove the need to extract them at all. In any case, many of the comments pointed to the fact that this is urgently necessary as fossil fuels will run out very soon (several mentioned 2050). Others thought that using bioenergy would allow the current reserve of fossil fuels to last longer, potentially for more important uses than fuel and energy production. Some pointed to the future cost of increasingly scarce fossil fuels as a key driver of increased bioenergy use. A handful saw it as a short-term replacement for fossil fuels, while we invest in creating more sustainable solutions.

"Fossil fuels won't last forever"

"Keep these precious resources available for future essential use like development of medication or for medical surgery plastic"

"It would be nice to have energy sources that are harmonious with the preservation of life on earth"

"It is less damaging to the environment"

Related to this, many of the answers pointed to the potential of bioenergy to **reduce carbon emissions, help to tackle climate change and environmental destruction**. Some referred to it as a 'carbon neutral' source, or 'closer to carbon neutral' than other sources. A small number of participants highlighted the potential for its use in carbon sequestration and controlling pollution (as well as not creating further carbon emissions). However, some of these comments were balanced with a cautionary note, with the environmental benefits seen as potential and not guaranteed. For some, bioenergy is only seen as an environmentally constructive technology if it is "managed well" or "produced locally".

On the other hand, bioenergy was seen by some as having some key advantages over other renewable sources, such as its portability and ease of storage, both of which allow its use in **transport as a liquid fuel**. Many comments pointed to the fact that transport of people and goods is essential to ensure that people's standards of living do not fall. Others again highlighted the fact that biofuels are potentially cleaner and require less transport as they can be generated closer to where they are used.

"We need it for clean transport"

"Could provide low carbon transport fuel"

"It could give other countries energy independence"

"It is a big part of energy security"

Another key hope is that bioenergy could **increase energy security through domestic and decentralised generation**, which would make the UK and other countries less dependent on imported energy. Others pointed to the fact that the energy can be grown exactly where needed, avoiding transport costs (economic and environmental). They thought that more investment should be put into generation of bioenergy at a local level, close to where it is used.

Some thought that bioenergy may provide **affordable energy**, or at least prove more **cost effective** than other energy sources. Again however, this was couched in speculative language, with participants referring to the *potential* for it to be cheaper in the long term.

"We desperately need to secure fuel in the future that is affordable"

Links were made between affordability and how well current resources are used. Bioenergy is thought to **match well with our current energy infrastructure and technologies** and require minimal alteration of existing fuel burning and consumption systems. In addition, another expectation was that it could allow us to make use of resources that are currently unused, in particular land that is not suitable for arable farming, and waste.

"Cost effective/good use of current resources"

"It is a good way of dealing with rubbish"

Other potential uses of bioenergy mentioned included:

- The creation of plastics and pharmaceuticals
- Job creation
- Wealth distribution/growth and job creation in the developing world
- Increase in global cooperation.

"It is an important part of our energy mix and especially to meet our 10% energy from renewably [renewables] by 2020 in line with the emissions targets"

"It supplements other sources"

"It could be a small part of the whole solution"

However, the strongest theme to emerge from the responses to this question was that bioenergy is a **key part of, but not the entire solution to the problem** of fulfilling our energy needs in the future. While it was noted that "every little helps", many of the comments referred to the scale of our energy needs and the inability of bioenergy to do more than make a small contribution towards filling them. As such, bioenergy was seen as one small part of the wider diversification of the energy mix with only a very few thinking it could ever be more than this.

3.3 Concerns about bioenergy

Participants were asked to outline their key concern about bioenergy in their feedback forms. The key themes across these forms were:

- Transparency of motivations of bioenergy enthusiasts
- Fairness of impact of bioenergy
- Impact on land use and food production
- Environmental impact
- Obscuring wider demand and supply side debates
- Quality of long-term planning
- Efficiency and sustainability
- International cooperation
- Speed of progress.

An important theme in the feedback was the **need for transparency** and clear **information about the motives** of those who seek to increase investment in and use of bioenergy. The participants wanted to know who will make the decisions in this area, and whether their agenda will be made clear to the public.

The phrase "greenwash" was used several times, suggesting that participants were not convinced that bioenergy advocates are truly driven by environmental concerns. As well as questioning the motivations of politicians, there was also a suspicion of private companies gaining monopolies and too much power over energy supply, and calls for strong legislation of bioenergy use and production. While this was not elaborated on in the feedback forms these suspicions may be rooted in the broader lack of trust in energy companies, which is a constant theme in public perception research on the energy sector.[14]

[14] Cf. http://www.telegraph.co.uk/finance/personalfinance/consumertips/household-bills/9887504/Half-of-consumers-do-not-trust-energy-suppliers.html

More broadly, participants were concerned about **fairness**: who will benefit from bioenergy, and, conversely, who will lose out. They questioned whether enough thought has gone into ensuring that any impact (positive or negative) is spread in an equitable manner, and suspected that many of the benefits would accrue to "vested interests", "the rich", energy companies and multinational organisations. Some were concerned that the broader interests of society would be lost in the rush to profit, and that the underlying demand for energy was part of increasing global inequality.

"Given the profits included, I'm concerned that their development involves a shift of land and power towards already powerful corporations"

"Not enough research on social equity concerns; impact on developing countries"

In particular, there were numerous comments around the potentially negative impacts on developing countries, and the global poor. Concerns here include "land grabs", dispossession and displacement of local populations to allow for land use for the production of bioenergy, impact on agriculture and rural people's lives, and availability of food in developing countries.

"That market forces will lead to the production of biofuel crops for rich people in preference to food crops for poor people, leading to increased difference between rich and poor and more poverty."

"Will be used to help the rich drive their cars and contribute to global warming"

Participants called for a greater focus on ethics and ensuring that local populations benefit from bioenergy production in their area, though they did not specify who should be responsible for ensuring that this should happen.

The potential impact on **land use, food production and food security** also concerned participants, who were worried about this giving rise to food shortages and food price spikes, when too much arable land is used for fuel production. Some also mentioned the potential increase in competition for water due to bioenergy production. Many of the comments suggested that where there is conflict between food and fuel, food should always be prioritised. Others noted the lack of available land to produce sufficient bioenergy production for our energy needs.

"That all bioenergy should be 2nd or 3rd generation, i.e. not use arable land"

"That its production does not compromise food production globally"

Some suggested that the food/fuel conflict meant that we should stop using first generation bioenergy altogether, with the focus on bioenergy from waste or water-based products.

"We don't know what its future impact on the environment could be. I doubt it would be all that positive"

"Is it really 'green'?"

"Development of monocultures that have destructive impact on biodiversity"

Another strong theme across the questionnaires was concern around the lack of clarity around **environmental impact of bioenergy**. Some questioned whether bioenergy is indeed carbon negative or neutral when transport and infrastructure is taken into account, and did not think there was sufficient evidence of this available. The environmental effects of land clearances to make way for bioenergy crops worried some, who raised the example of deforestation and removal of rare and established ecosystems. Other comments indicated a more general scepticism about the environmental sustainability of bioenergy.

The impact on biodiversity was also mentioned, with concerns about monocultures and unforeseen effects along the ecochain, as well as an increased reliance on genetically modified crops.

Some of the questionnaires pointed to the wider underlying issues behind the need for more renewable energy, and thought that the bioenergy debate could **obscure the wider demand-side debate about how to reduce our energy usage**, especially the growth in global population. Others thought that the bioenergy debate could **obscure the wider supply-side debate**, and pointed out that bioenergy should be considered within the wider quest to diversify the energy mix, in particular the need to invest in other renewable energy sources. Overall some participants were suspicious of bioenergy as a "truly sustainable solution", seeing it instead as one that "makes the stats look good".

"Distraction from key issue of overconsumption"

"We're looking at a technofix not behavioural change"

"This is seen as the 'holy grail' of energy solutions - it is a part"

"That decisions [about how and where to produce bioenergy] will made that are irreversible and could change the environment that would later be regretted"

"Is it economically sound?"

This concern around sustainability was common to many participants, with some questioning whether we really know enough about the costs and benefits to be sure that bioenergy is a long-term solution, from a social, environmental or an economic perspective. The **economic concerns** tended to be related to efficiency, scalability, overall cost/benefit and the wisdom of investing heavily in what remains a "nascent technology". Others mentioned the price of bioenergy, with comments suggesting that bioenergy should be affordable to the UK public.

A few participants pointed to the need for life-cycle analysis of bioenergy sources to help to allay these **sustainability concerns**, and that this thinking should be done now, before we commit to potentially irreversible impacts. More broadly, comments pointed to a wider cynicism around the ability of those taking decisions to think in a joined up and long term way about the energy crisis, and to really take into account all of the potential outcomes and impacts of new energy sources, including bioenergy.

"The application of a systems-thinking approach [and] joined up thinking i.e. are we budgeting for water consumption, what are the impacts on carbon sequestration and what are the unintended policy outcomes"

"Ensuring the research and production of bioenergy remains a global solution"

One of the reasons for this was scepticism that the international effort and co-operation required to do this thinking would be possible; several questionnaires pointed to **international issues** (trade, cooperation, global supply chain) as their biggest concern about bioenergy. One participant was concerned about bioenergy production funding criminals in countries lacking strong legal systems.

For a small number, the biggest concern was the **lack of progress in the production of bioenergy**. Some pointed to the wider issue that much of what was being discussed in the dialogue referred to potential technologies that are as yet untested, while others highlighted what they see as the lack of government direction and subsidy in this area. The worry is that the UK was being "left behind", which could lead to negative consequences for the UK economy.

"Will the amount produced be enough to meet the demands of the population?"

"We are not supporting our scientists with sufficient funds to allow the best sources of bioenergy to be identified, developed and put into practice"

Other concerns raised in regard to the development of bioenergy were:

- Lack of information for policy makers to make decisions on this issue
- Public understanding and the need to educate people in order to have an informed debate
- Negative media coverage of the topic
- Lack of advertising of the bioenergy that is already in use in the UK.

3.4 What researchers should be thinking about…

When asked about what they thought bioenergy researchers should be thinking about participants responses generally fell under one of the following key themes, which are very similar to the concerns described in the previous section.

- Ensuring the viability/practicality/scalability/accessibility of bioenergy technology
- Who is going to benefit and what are their motivations
- Implications for people
- Implications for the planet and what's most sustainable long-term
- Consider the bigger picture and other options
- Cost/economics/funding
- Talking to and informing the public/transparency
- Listening to the public and taking their opinions into account
- Population growth/population control.

Overall, they thought it important that researchers should be thinking about benefits, impacts and risks of bioenergy, while keeping one eye on the bigger picture of how it fits in with wider attempts to diversify the energy mix and reduce carbon emissions. The responses to this question were the most heterogeneous of the four, and what follows is necessarily a high-level summary.

"Is this really the best solution to be plugging money into, or the cheapest/easiest?"

"Bioenergy integration with other sources"

"Issues as complex system, not in isolation"

Many comments referred to the need for researchers to keep one eye on the bigger picture, and asked the following questions:

- What are the world's energy needs and how does bioenergy fit with them?
- What other research is being done?
- Are there other, better or more efficient energy solutions available, or is bioenergy just the one that is currently favoured due to its fit with current infrastructure and business agenda?

In particular, researchers should be thinking about other renewable resources and solutions and how to integrate bioenergy with them – for example considering the potential of electric powered vehicles when researching biofuels for transport. Many comments suggested that participants were not entirely convinced that bioenergy use is more desirable than most other renewable sources.

Often this was related to suspicions about who benefits, as outlined in detail, in the section above. Many responses to this question urged researchers to bear in mind who has vested interests in bioenergy, what their motivations are, and who will have control and thus benefit most from any technology that researchers work on. A few thought that researchers need to mindful of the possibility that power to profit from bioenergy will "fall into the wrong hands," with the example of the power of big companies in the area of GM used as a cautionary example. More generally, comments indicated that participants are suspicious of profit motive in this area.

"Ethical means of upscaling operations, not allowing it to fall into the wrong hands, big business or corporations abusing their power"

"The short term political drives which dictate directions of research"

"Food climate energy security nexus trade-off"

"Justice"

Participants thought that researchers should be considering other factors outside of the energy production sphere, in particular what the full social, economic, environmental and other impacts will be, both in the UK and worldwide. Several suggested that researchers need to study or learn more about the unintended consequences of bioenergy use so far.

The impacts of people and society were pointed to as key considerations for researchers. Participants thought that they should consider humanity generally, taking into account social equity, and the health, cultural and social effects. They wanted them to think about quality of life now and in the future. Numerous comments focussed on the impact on residents of developing countries, the world's poor, those who work in bioenergy production (sugar cane farms). Taking into account the impact of bioenergy production on food production was a strong subtheme.

"Established cultures and local economies"

"Less exploitation of the poor"

"Fair trade and rights of individuals and countries involved in producing fuels"

"Unforeseen toxic damage"

"The wider consequences of bioenergy sources on biodiversity, carbon emissions"

"Treading gently on the world. What will cause the least damage and possible harm"

"Fully funding research into biodiversity-conscious means of creating bioenergy. Energy from waste products e.g. grass, excreta etc."

Participants were also keen that researchers take into account the potential impacts on the environment. Impact on biodiversity was common in these comments, as was concern about deforestation, loss of wilderness, loss of agricultural land, effect on soil, water use. Again, participants pointed to the potentially disproportionate effect on the environment of the world's poor; researchers should be thinking about their ecosystems in particular. Some of the comments urged a strongly precautionary principle, and were driven by concern about the unintended negative impacts and a strong sense of environmental value. Taking long-term sustainability into account was also mentioned, and some suggested carrying out life-cycle analyses. Participants wanted researchers to take into account the full range and length of the impact of bioenergy production into account.

Other comments for researchers were more pragmatic, suggesting that researchers take into account the viability, practicality, scalability and accessibility of the technology they are working on. Some of these comments were based on a perception that current bioenergy production is not particularly efficient, although the remedies differed. For some, this meant that researchers should focus on more local production and use, whereas for others it meant that researchers should focus on industrial scale and high yield production. Other comments were more focussed on the practicality of biofuel use and the message for researchers was to think about making biofuel accessible to households, rural communities and consumers in developing countries.

"Cost in fossil fuels and money of transporting ethanol and wood pellets, etc. around the world. I would like more work on local use"

"Making the whole process more efficient"

"How to fuel can actually be used - is it practical?"

"Making it a viable, low input, high yield alternative to fossil fuel"

"Energy return on investment. Long term sustainability"

"Cost benefit and not just 'does the project break even?"

The wider economics of bioenergy were mentioned by some participants. Some suggested that researchers should focus on attracting investment into bioenergy research. Others wanted researchers to focus on efficiency of different sources and developing energy that is the best value in terms of cost per unit and carrying out full cost-benefit analyses. This seemed to be driven by a concern that the full costs are not always taken into account currently. A few comments related this directly to sustainability and ecological cost.

Numerous participants said that researchers should be thinking about transparency, public information and public engagement. Ideas to help the public understanding of bioenergy included:

- Being careful about language/explaining in layman's terms
- Advertising biofuel products and presenting about the opportunities associated with bioenergy (though others advocated presenting a balance of positives and negatives)
- Ensuring that the environmental concerns about bioenergy are not portrayed as niche or unimportant by the media
- Ensuring that companies who sponsor their research do not stop it from being published.

"Educating the public (and politicians) people need evidence to want to do the right thing"

"Presenting balanced information about biofuels/GM"

"How they are going to explain their research?"

This theme should be balanced with the sentiment expressed in the answers to the questions about whether pubic views expressed in the dialogue should be taken into account. A few explicitly mentioned the need to take into account the voices of marginalised groups, for example those who stand to lose from bioenergy. Some also mentioned the need for researchers to listen to the public and take their opinions into account.

Finally, while few elaborated further on this issue, a number of answers indicated that researchers should seek to be thinking about population growth or the need for population control.

Other issues for scientists to consider, mentioned by at least one participant were:

- How to implement behaviour change
- The benefits of co-products of bioenergy e.g. high protein animal feed
- Concentrating on using bioenergy for mobile devices e.g. cars, aircraft
- Water use
- Urgency of the need for CO_2 reductions

- 2nd generation biofuels and using waste products
- Micro level generation and decentralisation of energy supply.

3.5 Topics that should have been covered in the dialogue

The last question that participants were asked was what they would have liked to discuss during the dialogue, but didn't. The main themes that participants thought should have been discussed, or discussed in more detail were:

- Climate change and the energy crisis
- Social impact of bioenergy
- Environmental impact of bioenergy
- Political and global issues around bioenergy use
- Demand management
- Sustainability of bioenergy.

Some participants simply would have liked more contextual information to allow for better discussion. Answers to this question are described in less detail than the other questions, as they contained many similar themes that have been drawn out in previous sections.

"How likely is it we will see if being used in our life time in a big scale?"

A few participants would have liked more discussion and information about climate change and the energy crisis i.e. the background to the wider development of bioenergy.

Some wanted more information about what is actually happening currently in the world of bioenergy research, implementation and policy development. Their comments suggested introducing more factual or technical information, perhaps using case studies. For some this meant more information about the negative impacts of bioenergy production up to now. Participants also wanted to know more about timescales for development of different types of bioenergy, and the scalability of different types of bioenergy production.

However, despite these comments and criticism in the wider evaluation feedback that there was insufficient scientific information at the dialogues, feedback for this question almost unanimously referred to environmental, social, political and global issues, and the impact of bioenergy (now and in the future).

Many of the comments suggested that participants would have appreciated more time to focus on the 'bigger issues'. For some, this meant discussing demand management in more detail, for example how population growth is affecting demand and whether it needs to be controlled, or how energy per person use can be reduced. Others were more interested in how bioenergy fits with other supply side solutions to the energy crisis and would have preferred to talk about what the alternatives are, for example nuclear and hydrogen fuel cells. Finally others were more focussed on the bigger picture of implementation and would have liked to discuss the political and global issues in more depth for example how food security can be guaranteed, or how much investment the UK government should be putting into research and development of bioenergy.

Others would have liked more discussion about the global, environmental and visual impact, and the impact on biodiversity. It was suggested that this could be done with more visual stimulus material such as pictures of bioenergy production in action. Similarly, some would have welcomed a wider discussion on sustainability and the potential resource shortages that bioenergy could cause.

"Experts doing more financial/ethical/social/climate damage than dictators/criminals with unintended consequences"

Other subjects participants thought should have been discussed in more detail were:

- Land use
- Costs/Economics – commonly mentioned by those who used the Democs cards to facilitate the dialogue
- Water usage and conservation – mentioned particularly by those who discussed the 'Bumping along the Bottom Scenario'
- Algae
- Education/Public knowledge.

3.6 Dialogue discussions

Originally it was hoped that feedback could be collected solely through written feedback forms. However, following an initial review of the feedback forms, a decision was taken to make recordings of the conversations in Swindon and Bath, to allow for more detailed analysis of conversations.
As with the feedback forms, there were significant data limitations.[15] Nevertheless, analysis of the discussion allows us to understand some of the themes outlined in the feedback forms in greater depth.

3.6.1 Spontaneous views of bioenergy

In Bath, participants were asked to pick one image from a large selection that resonates with them, when they think about bioenergy. The discussion about these images allows a snapshot of spontaneous views of bioenergy.

Participants didn't talk about bioenergy in isolation, but chose images that were **linked with the wider energy debate**. For example, they debated the potential visual impact of biodiversity and other renewables. Some argued that these can enhance natural beauty, and others were concerned about the potential for destroying diversity and creating ecological and visual monocultures.

> *"I'm really interested in what can be done [with bioenergy] that doesn't carpet the UK"*

[15] Recordings were partial and missing introductions, which made it impossible to note who is talking in transcriptions. This also meant that there was limited data outlining spontaneous reactions to bioenergy. In addition, recordings in Bath were of poor quality, therefore many sentences in the transcripts are incomplete. Finally, facilitation was generally limited to introducing topics and starter questions, rather than probing answers, thus discussion remained high-level within many groups, which means it is not possible to analyse the drivers of opinion.

The wider energy debate prompted discussion of the need for **greater reuse of waste** in society, and bioenergy was seen as one way of avoiding this.

Climate change and **population growth** were both seen as driving the need for bioenergy. Discussion thus expanded from bioenergy into reflections on what life would be like in the future, and the **difficulty of working out what our energy needs will be**. Participants thought that there were many things that could be done to alter demand for energy, but that this involves human decisions and planning, and could involve restrictions that would be potentially unpalatable in democracies.

> *"Well I think maybe the way to save the world with so many people – let's put them in little bubbles and stop them doing things"*

Participants came to the conclusion that educating women in the developing countries would help to slow global population growth.

3.6.2 Reaction to No Change of Course Scenario

This same group acted out the story for 'No change of course'. This scenario immediately raised wider questions about energy sources. Participants debated how other solutions could be used in tandem with bioenergy or would affect the uptake of bioenergy.

> *"As soon as carbon capture and storage comes into things a bit more and you start integrating this with power station, we'll probably move to burning biomass"*

The focus of the scenario on the contrast between Germany and the UK resonated with participants. They seemed resigned to the idea that the UK would lag behind in terms of innovation in the energy sector. There was some suggestion that this is because Germans are more willing to create - and comply with - legislation and rules in this area.

> *"Germany are years ahead, even for recycling, because it's illegal not to, and people just do it automatically. Whereas here if the Government ever suggested any kind of enforcement about anything there's a great problem"*

There was some discussion of other countries' use of nuclear and how their politicians take decisions about the energy mix. Participants found this hard to discuss as they lacked information on what the mix currently is in similar countries at the moment.

In this context, they weren't sure how plausible the scenario is, and moved on to discussing bioenergy in more depth with the expert who was present, asking questions about other types of bioenergy, including biofuel from the sea, the use of electrolysis of hydrogen and discussed the need for better means of energy storage.

3.6.3 Reaction to Democs cards

In Swindon, the Democs cards helped participants to talk through some of the more detailed considerations that need to be taken into account when thinking about bioenergy funding and policy.

For example, the cards that talked about the efficiency of bioenergy, and the amount of land needed to create enough bioenergy for our needs surprised participants, and led them to question the economic wisdom of committing to high levels of production of this kind of bioenergy. Participants concluded that it would be fine to use non-agricultural land for this purpose. Their key consideration when discussing this issue was the availability and security of food.

> *"One important factor to keep in mind is how much do we forsake in lost production from agriculture"*

They also discussed the possibility that mass production of biofuels would lead to a need for intensification of land use, and heavy use of chemicals, and thought that this warranted further investigation.

Other discussions centred on unintended consequences of using incentives to encourage the production of bioenergy. The prime example that participants had heard about was bioenergy initiatives driving up global food prices, but they worried that there were other potential consequences of similar scale, especially if governments try to encourage rapid growth in bioenergy production.

However, the cards also helped participants to better understand the potential benefits of biofuels and bioenergy. For example, they were surprised about what a big effect it has had on greenhouse gas emissions in the UK alone:

> *"Biofuels supplied in the UK during 2009/2010 generated greenhouse gas emissions savings equivalent to taking half a million vehicles off the road…that's quite a large effect, for not a lot of biofuel"*

So while, on the whole the group were very much in favour of increased production of bioenergy, the cards made them realise the complexities of the trade-offs at play, and how little they currently know about the topic.

3.6.4 Main issues discussed

Across the two workshops, participants were asked to reflect on what they thought the main themes were that they had covered.

Many at this stage came back to a discussion of **demand side issues**, principally **overpopulation**, energy efficiency and lifestyle changes.

> *"We're here to talk about bioenergy, but if we became more efficient in our use of energy, a lot of these problems would be more manageable"*

There was no consensus on the issue of population, though some thought that we need to start a discussion about whether having more than two children is socially acceptable. On lifestyle, some made moral arguments about considering others and the planet, while others were more pragmatic, pointing out that it is in people's self-interest to preserve the planet for

their children and grandchildren. Selfishness, complacency and ignorance were all blamed for people not reducing their energy use.

Ultimately however, participants thought that the **lack of political consensus** about the best way to deal with tackling climate change (e.g. whether to focus more on demand or supply side) means that there is a **lack of political will**, which effects individuals' behaviour. In addition, there was an unwillingness to countenance any kind of strong government action in terms of curbing demand from individuals. In Bath, a discussion of carbon credits ended with participants agreeing that personal carbon credits would be unacceptable to them, though carbon credits might be important in controlling demand from industry.

A key feature of all discussions was a focus on **decision-making around bioenergy**. This included:

- Suspicion that those who supply funding for research in this area "dictate" what they want scientists to find. This chimes with findings from other public perception and dialogue projects about scientific issues, which shows low public understanding and awareness of how scientists work, how science is funded and the function of peer review and publication
- Concern that big companies will come to dominate the bioenergy industry, and that 'vested interests' will have too much of an influence on Government policy around bioenergy

  > *The issue is the problem of the influence of big companies, like Monsanto and GM food…going down the route of biofuels leads to the same vested interests potentially*

  However, some suggested that focussing on this issue and trying to stop big businesses would lead to paralysis and lack of progress in this field
- Related, a concern that there is too much "dawdling" about the issue with nothing getting done
- Conviction that politicians lack the scientific literacy and knowledge to make good decisions about bioenergy
- Sense that the public are disinterested and thus difficult to engage on this issue. Participants thought that this is not helped by the lack of media coverage of this issue

  > *"I would have thought if you checked the column inches devoted to nuclear or wind versus bioenergy it would be rather skewed in favour of the first two in terms of column inches"*

- It was suggested that bioenergy is a fundamentally dull topic, and one that people don't want to discuss, except in the context of a broader discussion of the diversification of the energy mix.

Finally in Bath, a key issue for one group was **sustainability**.

> *"How important it is to consider the environmental, social and economic impacts of biofuels"*

Importantly, this was influenced by the particular expert who had spoken to that group about how his work had to take into account lots of different criteria for sustainability.

3.7 Organisers' views of dialogue themes

Organisers noted that participants were keen to learn more about bioenergy, but also that their discussions tended to be focussed on overall future energy use or "moral issues" rather than the science or technology debates within bioenergy. This view is in keeping with the findings presented above.

> *"The set up was 'bioenergy' but the discussion was all on 'energy' - how we provide energy from all possible sources"*

One noted that participants *"lack of understanding of issue"* and "focussed on developed versus developing countries", which this organiser noted is *"not an issue solely relevant to biofuels"*. This type of comment suggests that it was not always clear to the organisers what the objective of the dialogue was.

The main issues organisers thought were of interest to participants were:

- Environmental impact particularly biodiversity
- Social impact, particularly in developing countries and on future generations;
- The food vs. fuel debate and food security
- Ownership/who benefits/economics
- Politics and how decisions are made about bioenergy and renewable energy
- Sustainability of bioenergy
- Complexities of scale
- Level of public information and engagement
- Technical and scientific literacy of policy makers.

Organisers noted high levels of agreement within their groups on these issues, in particular agreement on the following ideas:

- That the issues are much broader than just biofuels
- The need for a balance between technology efficiency and environmental impact
- The need to be more aware of the social impacts of biofuel
- The need for political action and leadership.

There were a few exceptions to these general viewpoints, for example in London. The organiser who facilitated one mini-group of four students who knew each other commented:

> *"There seemed strong consensus that the development of biofuels should not depend on whether global ethics were resolved. If advancement in global fuel and energy was possible it should be pursued and the social scientists or whoever else should sort out the inequality issues"*

Finally, most organisers said that participants didn't disagree on any of the topics discussed. The only major disagreements reported are listed below.

- GM crops and whether government is regulating this properly
- Economics/assumptions in the scenarios
- Collegiate-sharing-knowledge and innovation versus capitalism
- Impact of growing biofuels in less developed countries (less developed)
- Personal carbon credits.

4 Reflections

In this chapter we have sought to briefly draw together a series of reflections on elements of the dialogue process that have been highlighted by BBSRC and Ipsos MORI whilst compiling this report. This is not intended to be an exhaustive evaluation, indeed a full evaluation of the project is currently underway. As such, we do not draw conclusions about the success, or otherwise, of the process.

BBSRC has been conscious throughout this project that we have been trying something new. The many decisions that were made about the project involved weighing up different options; often it was difficult to identify the 'ideal' solution and trade-offs had to be made. There is therefore lots to be learnt both from all the things that went well and the things that went less well during this project.

4.1 Format and materials

4.1.1 Information provision

Two types of stimulus materials were developed – the future scenarios and a Democs game. The transcripts analysed in 3.6 suggest that participants using the future scenarios found it hard to focus on bioenergy, and lacked the information to properly discuss it in detail. The discussion could have been aided by less complicated scenarios which allowed the different political, ethical and social issues to be separated out more easily and discussed in detail.

> *"What's interesting is, going around the table, how we're here to talk about bioenergy but still, even where we're tasked with talking about it, we still couldn't"*

> *"Maybe it was our scenario – we got stuck into all the other bits and didn't really talk about it"*

In this respect, the Democs cards seemed to facilitate a better informed discussion, or at least one in which participants were learning new things and taking them into account.

Simpler but more informative materials may also have made it easier to develop iterations of the toolkit. The revision that took place after the pilot took longer than would have been ideal because the materials were complex to change.

4.1.2 Event format

To enable a diverse range of groups to become involved in organising dialogue events, the distributed model did not ask organisers to recruit to specific demographic criteria or pay attendees for their time as this would have been quite burdensome. This recruitment model meant that it was unreasonable to ask participants to attend day-long events and the suggestion in the toolkit was to run events for two hours. The analysis of the transcripts from two dialogue events indicated that the short length of each of the workshops, and the complexity of the stimulus material (which took time to work through), hampered participant's opportunity to really discuss bioenergy in detail.

The recruitment model also had an impact on the demographics of those who were engaged in the dialogue; participants tended to be more highly educated than the general population, for example. It is difficult to say what impact this had on the dialogue findings and it remains to be seen how this affects the way that dialogue findings are received.

Analysis of the transcripts also revealed that bioenergy was discussed in the context of overall views on energy and responding to climate change. This sometimes prevented participants from thoroughly discussing bioenergy. If time could have been devoted at the start of the discussion to these topics, they could then have been 'parked' and allowed a more detailed discussion of bioenergy to be had.

4.2 Training, participation and facilitation

One training event was run early in the project – it was intended as a 'taster' of the skills needed to organise an event for the project and was an opportunity for trainees to try out the materials. Further support was then offered, and provided, by BBSRC. It was also hoped that the training would encourage attendees to run dialogue events themselves.

However, only five of the twelve people who attended the training went on to run or take part in dialogue events and it was far more time consuming than had been expected to encourage and support people (including those who had not come to the training event) to run events. This certainly limited the overall number of events that were run and had knock-on effects on other aspects of the dialogue as less time was available (e.g. Ipsos MORI were engaged to analyse the feedback forms rather than analysing them 'in house').

It is possible that earlier engagement with a wider cohort of people might have built a greater understanding of, and enthusiasm for, the project which might have made it easier to encourage people to run events. This would also have helped ensure that the toolkit was as approachable as possible for those expected to use it and may also have helped BBSRC to better identify skills gaps, which would have allowed more time for addressing concerns in this area. The toolkit encourages those planning an event to ensure they have sufficient facilitators involved but clearer guidance or training on facilitation may have been beneficial, both for those doing the facilitating and for the depth of understanding that could be drawn from the discussions.

However, there has been success in terms of participation, as many members of the public contributed their feedback to this project as took part in the BBSRC/EPSRC Synthetic Biology Dialogue for example, and more people will have taken part in discussions at events but not completed feedback forms. Further, 35 people completed organiser feedback forms, which is many more than previous dialogue projects where only a handful of researchers usually take part. Again more researchers and public engagement practitioners than this were involved in running events.

4.3 Recording discussions

The feedback forms were developed as the mechanism by which key points from the dialogue discussions would be captured. As has been noted however, participants' comments were often short and difficult to draw deeper meaning from. In future distributed dialogues, data collection and analysis could be improved by recording and transcribing all conversations, although this comes with costs both in terms of money and effort for organisers. A less costly option would be to ask some participants to act as note-takers (with clear instructions on how to capture data) in order to record more of the discussion and allow for more detailed analysis. This would have an advantage over a transcription of enabling the flow of action to be recorded (e.g. what cards people are holding up, whether people are nodding in assent etc.). However, this approach would still be limited without the presence of practised facilitators familiar with probing and laddering techniques to allow them to explore the values driving the surface level attitudes and opinions.

5 Next Steps

5.1 The dialogue findings

This report, together with the evaluation reports when they are available, will be discussed by the BBSRC Sustainable Bioenergy Outreach Group, the Bioscience for Society Strategy Panel and the Industrial Biotechnology and Bioenergy Strategy Advisory Panel and used to inform the work of those groups. A BBSRC response to the findings will be published.

BBSRC will also seek to disseminate the reports more widely, bearing in mind the dual outputs of this dialogue in terms of learning about participants' views on bioenergy and learning about the process of public dialogue.

5.2 Continuing the discussion

The resources produced as part of the dialogue will continue to be available on the BBSRC website for anyone wishing to use them, either to garner feedback or simply as a public engagement or training tool.

Depending on the findings from the evaluation, and on the feedback from BBSRC's Strategy Advisory Panels, the resources could potentially be used in a modified form to facilitate further dialogue.

Annex I

Membership and Terms of Reference for the oversight groups for the Bioenergy Dialogue

BBSRC Sustainable Bioenergy Outreach Group

Membership:

Duncan Eggar, BBSRC Bioenergy Champion (Chair)
Benedict Gove, RSPB
Claire Halpin, University of Dundee
Brian Ilbery, Countryside and Community Research Institute and Bioscience for Society Strategy Panel
Anglea Karp, Rothamsted Research
Simon McQueen-Mason, University of York
James Mills, NFU
Beatrix Schlarb-Ridley, University of Cambridge
Gregory Tucker, University of Nottingham
Klaus Winzer, University of Nottingham

This group was asked to:

- Hold BBSRC to account to deliver the Bioenergy Dialogue
- Provide comment and advice on the elements of the distributed dialogue
- Comment on the outcomes and outputs of the dialogue
- Provide strategic level advice on the focus of the dialogue.

Process Sounding Board

Membership:

Simon Burall, Director of Involve
Perry Walker, New Economics Foundation
Dr Robert Doubleday, Executive Director, Centre for Science and Policy
Alison Crowther, Sciencewise Dialogue and Engagement Specialist

Terms of Reference

The Process Sounding Board is asked to draw on their expert knowledge of dialogue and policymaking to advise BBSRC on the theory behind and process of the dialogue.

This may include advising on:

- How BBSRC engages participants and event organisers in the dialogue (including consideration of who those people are and whether they are appropriate)
- The format and balance of the discussion tools used
- The feedback mechanisms used
- How BBSRC analyses and reports the findings of the dialogue.

Annex II

Timings	**Arrival** Participants arrive and take their seats (5 groups of 8 around tables; the rest sit on chairs lined up in front of the stage -- these participants will make their way to the mezzanine after the introduction)						
15 mins	**Introduction** BBSRC briefly introduces the project and main aims; explains to participants what it is and why BBSRC is organising this event; introduces the organisers, evaluators and the plan for the evening **(5 mins)**; **2.** This will be followed by a short explanation of biofuels given by one of the researchers **(8 mins); 3.** BBSRC introduces the task and asks some participants to move to the mezzanine **(2 mins).**						
Groups and location	Group 1 6-8 people Cafe	Group 2 6-8 people Cafe	Group 3 6-8 people Cafe	Group 4 6-8 people Cafe	Group 5 6-8 people Mezzanine	Group 6 8-10 people Mezzanine	**Comments**
Stimulus	**Scenarios**					**Democs**	
10 mins	Card sorting exercise (3-4 images)	Picturing the future' and 'I have one thing to say'	'I have one thing to say'	'Picturing the future' and 'I have one thing to say'	Card sorting (3-4 images)	'Dealer' explains the rules of the game	**Scenarios -** 3 researchers per group (designated expert, facilitator etc). The facilitator asks the group to write down their first thoughts using icebreaker activities. This will allow groups to initiate debate and identify issues. **Democs** - facilitator explains the rules of the game
8-10 mins	Read Scenario 1 Text	Read Scenario 2 Script	Read Scenario 3 Text	Read Scenario 4 Text	Read Scenario 4 Script	Information cards; Issues cards; clusters	**Scenarios -** participants asked to read the text or script; **Democs** - cards are explained and distributed to participants.
30 mins (10-15 mins/card)	Cue cards	Debate cards	Cue cards	Cue cards	Debate cards		**Scenarios -** the cue OR debate cards are explained and distributed to the group for discussion; Group 1 should move to the next activity after 10 mins
10-15 mins	Ethical matrix' (25-30 mins)	'Targeting our future world'	'Voting: Hitting your target'	'Voting: Making your mark'	'Where I stand'	Voting: 'Making choices in the real world'	**Scenarios -** participants asked to use the 'generic activities' to encourage reflection and prioritisation after issues have been identified; Participants' choices can then be discussed among the group.
15 mins	**Plenary session**						BBSRC invites each spokesperson to present the main points of the discussion to the audience and the audience to comment.
15 mins	**Feedback forms**						BBSRC asks participants to fill in and return the questionnaires emphasising that in order to respond to people's views about bioenergy, it is very important that they return the feedback forms.
10 mins	**Concluding remarks and thanks**						BBSRC - concluding remarks and thanks

Pilot event plan – January 2013

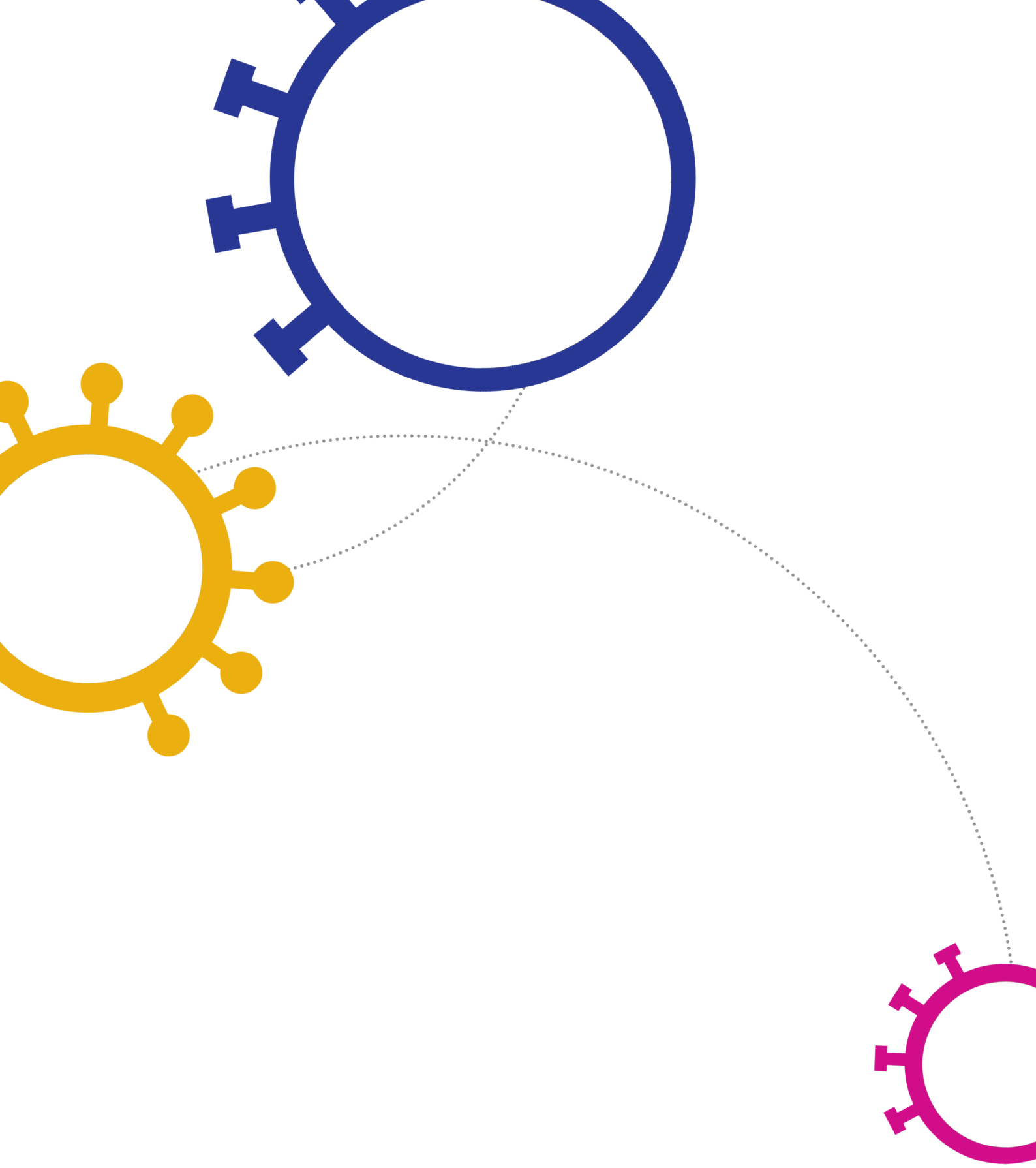
Annex III

Attendee Profile

		Attendees	England Population[16]
Gender	Male	53	49
	Female	47	51
Age	16-24	19	16
	25-29	17	8
	30-34	8	8
	35-39	10	8
	40-49	10	18
	50-59	8	15
	60-64	8	7
	65 and over	21	21
Ethnicity	White British	71	81
	White Other	15	6
	Asian or Asian British	9	7
	Black or Black British	3	3
	Other	2	3
		Attendees	Estimate GB Population[17]
Highest qualifications	Postgraduate degree	49	8*
	Primary degree	33	26
	A levels	13	21
	Vocational	1	N/A
	GCSE	2	29
	Other	1	6
	None	2	10

[16] Source: ONS Mid-year population statistics, 2013

[17] Sources: For postgraduate degree estimate
This is a UK-wide figure. Other figures were sourced using ONS 2013 data on highest NVQ levels, equivalised to the categories used to sort the attendees.



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