

# Evaluation of the Space Weather Public Dialogue

Report for Sciencewise and the  
Science & Technology Facilities  
Council

July 2015

# Executive Summary

This executive summary highlights the key findings from the evaluation of the public dialogue on space weather, commissioned by the Science & Technology Facilities Council in 2014 with the support of Sciencewise.

## Background

Space weather, now recognised as a significant natural hazard, has the potential to disrupt many technologies critical to the functioning of modern society. Extreme space weather events are characteristically low probability, but with the potential for a high level of impact. Understanding of the science of space weather is currently limited, and there are considerable uncertainties about how severe the impacts of such an event would be.

Space weather is now firmly on the political and commercial agenda, both in the UK and on a global scale. STFC felt that a better understanding of how members of the public understand space weather and perceive related risks and mitigation, as well as how to communicate the nature of these risks, is required. In late 2013, therefore, STFC, with support from Sciencewise, developed a space weather public dialogue process. Further resourcing was provided by STFC's RAL Space, Natural Environment Research Council (NERC), National Grid, and Lloyd's of London. The project was run from January 2014 to February 2015, led by a project Oversight Group.

The purpose of the space weather public dialogue was to inform the policy of government departments and agencies, and companies in respect of space weather and the consequences on people and infrastructure. Specific objectives were:

1. To engage members of the public and other stakeholders in developing this work, including enabling members of the public to ask questions and develop conversations with space weather stakeholders.
2. To develop and gauge public understanding of space weather, its impacts and the resilience of civil society.
3. To consider how to improve public and stakeholder awareness of space weather and its associated impacts.
4. To determine how far members of the public think the Government and companies should go to mitigate space weather impacts.
5. To inform policy, spending, responsibilities and the priorities for action to mitigate space weather impacts.

Three sets of public dialogue workshops were carried out with members of the public in Wrexham, Reading and Edinburgh. In each location there were two (Saturday) events with the same group of approximately 20 people in each area, with a shorter Friday evening session acting as a pre-cursor to the second event. The workshops were then followed by a third event – held at Jodrell Bank – involving the reconvening of 18 participants from across the locations.

Alongside this, three additional elements were carried out to learn about views from various members of the public in different ways: a project website ([www.talkspaceweather.com](http://www.talkspaceweather.com)); an opportunity for anyone to engage with the project through an online survey on the website; and a representative online survey of with a sample of 1,010 adults aged 18+ that matched the known profile of the GB population in terms of age, gender and work status.

Outputs from these dialogue elements fed into an interim dialogue report and stakeholder summit in October 2014. The summit involved 29 participants (19 specialists including Oversight Group members, five public participants from the dialogue workshops, the project team and an evaluator). The summit included a presentation of top-line findings, and its overall aim was to share initial findings and build upon the emerging outcomes.

Following the stakeholder summit, a final dialogue report was produced and published in February 2015 alongside all dialogue materials (including videos and graphics, all of which are suitable for use in other arenas), an executive summary, and further recommendations for communications materials. Public participants who expressed a desire to stay in touch were emailed a thank you note alongside a link to the final reporting pack. This was supported by a launch event On 11th February 2015, attended by around 75 people.

## Evaluation objectives and methodology

This evaluation had two aims:

1. To provide an independent assessment of the quality and impacts of the dialogue project to demonstrate the extent of the project's credibility, effectiveness, and success against its objectives, covering both the dialogue processes and their outcomes (including an assessment of impacts on policy and those involved);
2. To contribute to increasing the wider effectiveness and use of public dialogue.

The evaluation comprised four key elements:

- *Observing the dialogue events.*
- *Post-event feedback* - a two-stage approach: (i) a short paper-based questionnaire (asked of all participants); and (ii) an online discussion board with 12 of the participants. This latter approach allowed for in-depth responses.
- *Interviews with 15 key stakeholders.*
- *Analysis of evaluation data and reporting.*

## Key evaluation findings and lessons

### i) Design

- Policy need: Prior to the dialogue, little was known about how the public perceive space weather and its risks, or how best to communicate the risks, impacts and potential responses to an extreme space weather event. The dialogue was therefore designed to address a specific gap in the evidence base.
- Knowledge review: The first stage of the project was a knowledge review, which played an important role in summarising existing information and informing the scope and design of the dialogue. The fact that the project timings allowed for the inclusion of this element within the overall work programme was beneficial.
- Framing the dialogue: The discussions were framed around two core elements: a 'trigger' (i.e. space weather events) and a 'response' (i.e. how individuals and communities respond to the event). While both elements were integral to the approach, the balance between these two elements was a subject of debate among the stakeholder interviewees – with some feeling that more work is possible to consider the response element in a wider number of triggers (i.e. exploring the concept of community resilience in a variety of situations).
- Effectiveness of the dialogue structure: Participants were starting from a low knowledge base about space weather and needed time and space to process new information before giving an informed view. Furthermore, many of the stakeholders who attended the events noted the benefit of having extended interaction with participants (giving them more confidence in the validity of the findings). Turning to specific aspects of the overall dialogue structure:
  - Having a gap between sessions served a useful role in giving participants the space to consider the information from the first workshop. However, there were mixed views on the best amount of time between events, and several participants felt that the gap (around one month) was slightly too long.

- The value of the shorter session on the Friday evening was limited, although the premise itself (i.e. for a less formal, social space) has potential.
- Attitudes towards the reconvened event at Jodrell Bank were very positive – the majority of the 18 participants felt that the session covered new ground and that the session was a two-way discussion. The venue was also highly commended.
- Also positively received, this time by stakeholders, was the final stakeholder event. This served as a good opportunity for other stakeholders not directly involved in the public events to engage in the process, and also helped to encourage cross-agency working.
- Recruitment: While the overall target numbers were achieved and the sample was fit for purpose, this element of the project was nonetheless flagged as a concern by some stakeholders in terms of the fact that some participants were recruited in pairs (i.e. with family members or friends). The evaluators concur that this did, in some instances, have an impact, on the wider group dynamic.
- Dialogue methods: A range of high quality methods and approaches was utilised by the dialogue contractor. While some specific tasks were less effective, the overall mix in combination was highly effective.
- Dialogue materials: The dialogue involved the development of some very high quality resources, in terms of presentations, hand-outs and video. In particular, the use of video was frequently cited for being both engaging and conveying a wider range of perspectives from experts not in the room. Indeed, the fact that there was a high presence of experts in the room plus the video of additional expert perspectives was a highly effective combination.
- Engagement with specialists: one of the strongest aspects of the dialogue workshops was the level of interaction between participants and specialists. Feedback from participants highlights how the specialists were inclusive and approachable, and the fact that experts were deliberately interspersed on the table among participants and engaging in discussions (rather than sat on their own table/only engaging at certain points) was highly beneficial.
- Funding priorities exercise: The final exercise at the second event was a priorities exercise whereby participants, drawing on their accumulated knowledge, were asked first about the relative importance of possible space weather mitigation options and how funding should be allocated across these moving forward. In the evaluators' view this exercise generated some useful intelligence, although final decisions were highly influenced by particular individuals in the group and the input of the experts on the table.
- Other dialogue elements: The dialogue involved additional strands over and above the public dialogue events – including a project website, self-selecting online engagement and a quantitative online survey of the general public.
  - The website had several roles, including a place to direct media enquiries and also a forum for participants to use in between the sessions. Website analytics demonstrate that, up to the end of September 2014, the site has been visited 1,209 times by 738 different people (61% new visitors), averaging 3.81 page views per visit.
  - The website also helped to engage a self-selected sample of individuals not involved in the dialogue sessions themselves. A total of 71 people responded to the online survey on the website, although these were completely self-selecting and thus likely to have an existing level of interest or knowledge about space weather. It appears to have performed a useful role in generating wider engagement, rather than providing data that could be used for the formal analysis and reporting.
  - The representative online national survey with 1,010 adults aged 18+ was used as an data source for the overall analysis and synthesis, and performed an important role in addressing any concerns about the smaller numbers of individuals that are typically involved in the dialogue events.

## ii) Delivery

- **Organisation and delivery:** No concerns were raised about the event organisation which was exemplary. One reflection that specifically relates to Edinburgh is that the shape of the room made two large tables logistically challenging.
- **Facilitation:** This was strong throughout, although there were some imbalances between louder and quieter voices on the tables. Furthermore, there were some suggestions that the tables could have been 'purposely mixed up' at points in the session with the aim of re-grouping more and less confident participants together.
- **Presentations:** The presentations delivered by specialists were delivered to a very high standard. Most had previous experience of presenting to the public/doing outreach work, and this was evident in their personal style of delivery and ensuring that scientific facts and principles were explained in an accessible way. The schedule could potentially have benefitted from slightly more space for Q&A after each presentation or video.

## iii) Governance

- The governance of the dialogue through the Oversight Group (OG) was very strong. The OG was formed very early in the process (before any contractors were appointed) and gave the project a firm steer throughout. The composition of the OG was well designed and included a useful plurality of perspectives (e.g. the partnership with Lloyds was effective and allowed the outputs to be disseminated to a different audience). The OG also had a very effective chair (Mike Hapgood) who was very well networked and respected in the field.
- Only a few areas for improvement were identified, most notably the lack of involvement of National Grid (through staff illness) and the aviation industry, both of which could have brought a specific service provider perspective to the table.
- The STFC project manager reported feeling supported through the process by the Sciencewise DES and others. They did note one important learning point regarding the initial set up process of getting all the partners and funders to come together prior to submitting the final funding bid. They described this phase as the most stressful part in the project, and one suggestion they had for improving it in future dialogue processes would be to use a buddy system to put the project manager in contact with someone else who has gone through the same process recently.

## iv) Impacts

- The dialogue report was published on 11 February 2015, alongside a launch event attended by approximately 75 people (including two of the public participants).
- The dialogue has already led to a series of specific impacts, as follows:
  - Inclusion in the UK House of Lords Science and Technology Select Committee Inquiry into the resilience of electricity systems<sup>1</sup>, published in March 2015.
  - Cabinet Office has started the process of formulating a space weather communications plan – and the dialogue report was reported in the first meeting attended by the STFC project manager and OG chair.
  - Space weather week in Washington – The dialogue report was spoken about at length during the US-UK Space Weather Workshop on power grids and public communications in Washington in February 2015.
  - STFC has been contacted by a representative of an Australian university who said that the Australian Government were keen to do some similar work and therefore wanted to learn from the UK experience.

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<sup>1</sup> [www.publications.parliament.uk/pa/Id201415/Idselect/Idscitech/121/121.pdf](http://www.publications.parliament.uk/pa/Id201415/Idselect/Idscitech/121/121.pdf)

- Mike Hapgood has had an article published that talked about the project<sup>2</sup>.
- STFC has been invited to submit (and since submitted) an abstract for European Space weather week in November 2015 in Belgium – for the session on space weather communication and dialogue across Europe.
- One of the key overarching strengths of the dialogue was the level of collaboration and cross agency working it has stimulated. Primarily this has been across academic partners, although clearly extended to other groups, most notably Government departments such as Cabinet Office and also local community resilience officers. Indeed, the outcomes of the dialogue are anticipated to feed into the policies and strategies of these organisations.
- The project had a positive impact upon participants – with all (100%) agreeing that *‘I learned something new as a result of taking part’* and also that *‘I would recommend taking part in events like this to others’*. However, fewer (63%) were clear on how the results would be used.

#### **v) Overview and conclusions**

- We conclude that the dialogue was delivered very effectively – particularly in terms of Objectives 2 and 3 where there was a clear gap in the evidence base and a defined policy need to fill that gap. The design and delivery of the dialogue was very constructive in enabling public participants to engage with stakeholders on an equal footing (Objective 1) and there is already evidence – even at this early stage – of a range of impacts emerging from the project.
- The dialogue demonstrates detailed engagement with the public and – furthermore – clear evidence of wider stakeholder engagement and cross agency working. The latter is particularly important in terms of being able to deliver fully against objectives 4 and 5 where the discussions with public participants were highly informative and useful, but naturally did not reach a definitive position (nor is it fair to assume that they could or should have done within the confines of the project). Therefore, this is where further discussions will likely be required.
- Indeed, and as an overarching comment, one of the key successes of the dialogue (aside from the insights that have been generated in terms of public attitudes to space weather) has been the impact on cross-agency working and the linkages that have been established between academia and policy. The project team have been very successful in engaging a wider stakeholder audience.

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<sup>2</sup> <http://room.eu.com/articles?id=61>

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# 01

## Introduction

This report sets out key findings from the evaluation of the space weather public dialogue project, commissioned by the Science & Technology Facilities Council (STFC)<sup>3</sup> with the support of Sciencewise<sup>4</sup>. The findings from the dialogue project are published under separate cover<sup>5</sup>.

### Background

Space weather, now recognised as a significant natural hazard, has the potential to disrupt many technologies critical to the functioning of modern society. Extreme space weather events are characteristically low probability, but with the potential for a high level of impact. Understanding of the science of space weather is currently limited, and there are considerable uncertainties about how severe the impacts of such an event would be.

Space weather is now firmly on the political and commercial agenda, both in the UK and on a global scale. STFC felt that a better understanding of how members of the public understand space weather and perceive related risks and mitigation, as well as how to communicate the nature of these risks, is required. In late 2013, therefore, STFC, with support from Sciencewise, developed a space weather public dialogue process. Further resourcing was provided by STFC's RAL Space, Natural Environment Research Council (NERC), National Grid, and Lloyd's of London. The project was run from January 2014 to February 2015, at which point the dialogue report was published.

### Dialogue objectives

The overall purpose of the space weather public dialogue was to inform the policy of government departments and agencies, and companies in respect of space weather and the consequences on people and infrastructure. Specific objectives were:

1. To engage members of the public and other stakeholders in developing this work, including enabling members of the public to ask questions and develop conversations with space weather stakeholders.
2. To develop and gauge public understanding of space weather, its impacts and the resilience of civil society.
3. To consider how to improve public and stakeholder awareness of space weather and its associated impacts.
4. To determine how far members of the public think the Government and companies should go to mitigate space weather impacts.
5. To inform policy, spending, responsibilities and the priorities for action to mitigate space weather impacts.

3KQ and Collingwood Environmental Planning were commissioned to design and deliver the public dialogue. The total budget for the project was £218,000, with Sciencewise contributing £120,000 of funding.

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<sup>3</sup> The STFC is helping to build a globally competitive, knowledge-based UK economy. It is a world-leading multi-disciplinary science organisation, and its goal is to deliver economic, societal, scientific and international benefits. It supports an academic community of around 1,700 in particle physics, nuclear physics and astronomy. See <https://www.stfc.ac.uk>

<sup>4</sup> Sciencewise is funded by the Science and Society team of the Department for Business, Innovation and Skills (BIS). Sciencewise is the UK's national centre for public dialogue in policy making involving science and technology issues. See [www.sciencewise-erc.org.uk](http://www.sciencewise-erc.org.uk)

<sup>5</sup> <http://www.stfc.ac.uk/RALSpace/resources/PDF/SWPDFinalReportWEB.pdf>



## Dialogue project activities

This section provides the reader with an overview of the dialogue process and, in doing so, sets the context for the evaluation findings that follow.

### Oversight Group

An Oversight Group (OG) was formed to act as a sounding board for the project. They provided input on design and materials, attended workshops as specialists and fed back their views and reflections as a result. The members were as follows:

- Mike Hapgood – STFC – RAL Space (Chair of Oversight Group and Project Lead on content)
- Sarah Smart – STFC – RAL Space (Project Manager)
- Alison Crowther – Sciencewise (Dialogue and Engagement Specialist for the project)
- Andrew Richards – National Grid
- Andrew Ryan – GO Science
- Chris McFee – Department for Business, Innovation and Skills (BIS)
- Chris Scott – University of Reading
- David Kerridge – British Geological Survey
- David Wade – Atrium Space Consortium
- Jim Wild – Lancaster University
- Mark Gibbs – Met Office
- Mike Willis – UK Space Agency
- Poppy Leeder – NERC
- Robert Massey – Royal Astronomical Society
- Stuart Clark – freelance science writer

Two OG meetings were held early in the process: one at the beginning to clarify scope, roles and responsibilities; and one to discuss draft materials and the knowledge review. Following this, all communication with the OG was undertaken electronically (for example commenting on draft materials), or by phone and in person at dialogue workshops.

### Knowledge review

The purpose of the review was to gather, analyse and synthesise information about how people obtain, interrogate and make sense of information about space weather and similar risks, i.e. risks about which scientific knowledge is limited and which could potentially have far-reaching impacts on people's lives. The review provided a robust context and a starting point for designing the dialogue and developing dialogue materials.

To ensure a clear and useful focus, the scope of the review was discussed and agreed with the OG. The review included the following inputs:

- *Expert interviews*: given the range of expertise across the OG, 30-minute telephone interviews were conducted with six members to explore the main issues relating to space weather, the risks associated with extreme space weather events, the management of risks and public and stakeholder perceptions. Interviewees were also asked if there were any key perspectives missing from the list of interviewees or anyone else who should be contacted.
- *Document review*: both the interviewees and the wider OG were asked to provide relevant documents and materials for the knowledge review and for the preparation of materials for the dialogue events. A large number of reports, academic papers, media reports and grey literature were suggested. This source was further supplemented by Internet searches to fill in any gaps identified. Given the limited time available for the review, the team was guided in prioritising the review by the interviewees.
- *Analysis and synthesis of the evidence*: an analysis was made of interviewees' responses to each of the questions and key issues were drawn out. Key themes were also identified from the documents reviewed. The two strands of information were brought together and have been synthesised in the final dialogue report.

### Events with the public participants

Three sets of public dialogue workshops were carried out with members of the public. These workshops were held in different locations to reflect the different perspectives that would need to be considered in the event of an extreme space weather event: rural (Wrexham workshops), urban (Edinburgh workshops) and a “national” perspective (Reading workshops).

There were two (Saturday) events (from approximately 10:00-15:30) with the same group of approximately 20 people in each area (a total of 54 participants overall), with a shorter Friday evening session (for approximately 1.5-2 hours) acting as a pre-cursor to the second event. The workshops were then followed by a third event – held at Jodrell Bank - comprising a selection of participants from each location (18 in total). The dates of the groups were as follows:

- National workshops 1 & 2 – Reading. June 7th 2014 & July 11th and 12th 2014
- Urban workshops 1 & 2 – Edinburgh. June 14th and July 18 & 19th 2014
- Rural workshops 1 & 2 – Wrexham. June 28th 2014 & July 25th and 26th 2014
- Reconvened workshop (Jodrell Bank): 13th September 2014

Alongside this, three additional elements were carried out to learn about views from various members of the public in different ways:

- *Project website* – the space weather public dialogue website – [www.talkspaceweather.com](http://www.talkspaceweather.com) – was launched on Friday 6th June 2014, to coincide with the first public workshop. The purpose of the website was to provide a forum for participants to engage with the project in between events. It was also a focal point for materials and also a point to direct media enquiries to. The website consisted of five public pages and three password-accessible pages for participants.
- *Self-selecting online engagement*: As part of the project website, there was an opportunity for anyone to input views. A total of 71 people responded to the online survey. The group of people responding via this mechanism were completely self-selecting and thus likely to have an existing level of interest or knowledge about space weather.
- *Representative online survey*: This was undertaken using the Ipsos MORI i-omnibus, with a sample of 1,010 adults aged 18+ that matched the known profile of the GB population in terms of age, gender and work status. The aim was to gauge baseline levels of understanding and perceptions of space weather and related aspects of communication and resilience.
- *Stakeholder summit*: Outputs from the three dialogue elements – the workshops, self-selecting online engagement, and i-omnibus – were fully analysed and fed into an interim dialogue report that was presented at a stakeholder summit in October 2014. This summit involved 29 participants (19 specialists including Oversight Group members, five public participants from the dialogue workshops, the project team and an evaluator). The summit included a presentation of top-line findings, and its overall aim was to share initial findings and build upon the emerging outcomes. This event drew together learning from all strands of engagement and encouraged stakeholders to discuss how, and by who, specific recommendations and messages would be taken forward.

### Development of materials

Building on the knowledge review and with further input from the OG and other specialists, the project team developed a suite of materials for use in the workshops and on the website. The project team worked with a communications agency to develop a clear branding for the project, including a simple logo and style elements to apply across all dialogue materials to engender familiarity and consistency. This was also reflected in the project website and animation video used to introduce space weather to participants in the first dialogue session.

### Stakeholder representation at the events

Most OG members attended at least one dialogue workshop to provide input in the form of presentations or responding to questions, and to engage in discussions with members of the public.

They were joined by a wider group of specialists with specific interests or roles relating to space weather or the wider field of resilience. Some representatives of specific organisations attended as observers, playing a listening role rather than taking part in conversations – these were limited to no more than three per workshop. These specialists were as follows:

- Alan Thomson – British Geological Survey
- Alexi Glover – European Space Agency
- Alison Fleming – Leicestershire Community Resilience Partnership
- Chloe Onoufriou – NERC
- Chris Frost – STFC – ISIS
- Clare Watt – University of Reading
- Ellen Clarke – British Geological Survey
- Gemma Kelly – British Geological Survey
- Helen Chivers – Met Office
- Ian McRea – STFC
- Marsha Quallo-Wright – GO Science
- Sophie Daud and Kirstie Rouillard – Cabinet Office
- Steve Berry – Staffordshire Civil Contingencies Unit

### Reporting and dissemination

- *Final report and reporting pack:* Following the stakeholder summit, a final dialogue report was produced and published in February 2015 alongside all dialogue materials (including videos and graphics, all of which are suitable for use in other arenas), an executive summary, and further recommendations for communications materials. Public participants who expressed a desire to stay in touch were emailed a thank you note alongside a link to the final reporting pack.
- *Launch event / activity:* On 11<sup>th</sup> February 2015 there was a launch event attended by around 75 people, at which the dialogue report was presented to all key stakeholders.

### **Evaluation objectives**

This evaluation had two aims:

1. To provide an independent assessment of the quality and impacts of the dialogue project to demonstrate the extent of the project's credibility, effectiveness, and success against its objectives, covering both the dialogue processes and their outcomes (including an assessment of impacts on policy and those involved);
2. To contribute to increasing the wider effectiveness and use of public dialogue.

While there are some audit elements to the evaluation, the primary focus was on the impact of the dialogue and the key learning it generates. It was conducted in accordance with the Sciencewise requirements for evaluation<sup>6</sup>.

The evaluation was also formative, i.e. instigated from the outset so that it could feed back in real time to the project team and – by doing so - improve the project or processes that were being evaluated.

### **Evaluation methodology**

The evaluation comprised four key elements that generated a mix of quantitative and qualitative data:

- *Observing the dialogue events* – Icaro attended all of the events in Reading and Edinburgh as well as the stakeholder summit. Due to constraints in the evaluation budget, we were not present for the Wrexham events, nor the reconvened event at Jodrell Bank. However, there was an evaluation presence through the post-event questionnaires.
- *Post-event feedback* - a two-stage approach:

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<sup>6</sup> <http://www.sciencewise-erc.org.uk/cms/project-guidance/>

- (i) a short paper-based questionnaire at the end of the two main Saturday events in all three locations (asked of all participants) and also the reconvened event at Jodrell bank – all of which achieved a 100% response rate (see Appendices 1-4); and
  - (ii) an online discussion board (with 12 participants from across all three locations), which was held over the course of the weeks immediately after the second events. This latter approach allowed for in-depth responses and provided a detailed understanding of participants' perspectives. The discussion prompts are set out in Appendix 5.
- *Interviews with key stakeholders* - 15 interviews with key stakeholders, drawn from key policy audiences and funders. This included members of the OG, those involved in the events (as presenters or observers) as well as wider stakeholders who were involved only in the reporting of the outputs (e.g. the stakeholder summit). Interviews were conducted according to a stakeholder discussion guide (Appendix 6).
  - *Analysis of evaluation data and reporting* – the evaluation involved both quantitative and qualitative data, and drew upon different sources (i.e. participants, stakeholders, delivery team, the evaluation team's observations). Quantitative data was analysed in Excel; qualitative data was analysed through interview write ups and notes taken at the events. The evaluation team then synthesised the findings together through a series of brainstorm meetings. A draft report was submitted to STFC and Sciencewise, followed by a wash up meeting. Based upon feedback on the report and new insights gained through the wash up meeting, this report has been prepared.

## Report structure

This report is structured to provide evaluation findings and lessons on the following:

- i) Design
- ii) Delivery
- iii) Governance
- iv) Impact.

The final section outlines our conclusions and overall lessons for future dialogue activities.

Graphs are used throughout to represent the findings from the post-event questionnaires, while quotes are used to illustrate particular points made on the basis of the qualitative interviews with participants as part of the online board (undertaken following on from the events) and with stakeholders.

# 02

## Design

This section outlines key evaluation findings in respect of the design of the dialogue.

### 1. Context and scope

#### Policy need

Space weather is now firmly on the political and commercial agenda. For example, the European Commission's Joint Research Centre held a two-day Space Weather Awareness Dialogue in 2011, while in the UK the Department for Business, Innovation and Skills announced in December 2013 a £4.6M investment in space weather forecasting "to help protect the technologies our day-to-day lives rely on".

However, little was known about how the public perceive space weather and its risks, or how best to communicate the risks, impacts and potential responses to an extreme space weather event. The dialogue was therefore designed to address a specific gap in the evidence base. This was reflected in the comments of several stakeholders that were spoken to in the course of the evaluation, and many acknowledged that the focus on the public was novel in the sector.

Other stakeholders noted that the dialogue was also performing an important role in not only generating insights into public attitudes, but also raising the political profile of the subject, encouraging cross-agency working and providing STFC with political leverage to engage key audiences across the sector. This was a recurring theme throughout our discussions with stakeholders and has influenced the project's likely impacts (see Section 5).

***We could see that this is an area of science that needs to have political decisions made about it.***

OG member

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***Almost all of the other [research] councils have in some way been involved in public dialogue, so I think to a certain degree STFC felt there was pressure to be doing a public dialogue. But space weather was clearly the one to do it on...because of how it is moving up the political register of interest.***

Specialist

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#### Knowledge review

The first stage of the dialogue project was a knowledge review, designed to summarise existing information and inform the scope and design of the public dialogue. It involved both a review of current literature alongside interviews with space weather specialists working in different fields.

The knowledge review played an important role in highlighting a number of aspects which needed to be considered when engaging members of the public about space weather risks (e.g. the language used) as well as developing a number of key question topics for the dialogue. The fact that the project timings allowed for the inclusion of this element within the overall work programme was highly beneficial. It is an element that, under timetable pressures, can often be sacrificed.

## Framing – space weather (trigger) vs. community resilience (response)

The dialogue was framed around two core elements: a ‘trigger’ (i.e. space weather events) and a ‘response’ (i.e. how individuals and communities respond to the event). While both elements were integral to the approach, the balance between these two elements was a subject of debate among the stakeholder interviewees. Views varied between two perspectives - some noted that they had been concerned that there might be too much focus on the former at the expense of the latter. Others, by contrast, thought that there was too much focus on the consequences of a space weather event, rather than talking about space weather in its own right.

***Space weather is a topic of interest to me in my role, but it is one of a number of things that can cause a national emergency and we could have taken a wider view. I was always slightly concerned of putting all the emphasis on this one issue.***

OG member

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***The conversations went off on a tangent quite early, and became more about community resilience in general and what happens when we have local or national emergencies. They (participants) were allowed to focus on that from an early stage, rather than space weather.***

Specialist

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## 2. Effectiveness of the dialogue’s structure

The premise of a deliberative, in-depth process was successful and delivered benefits over and above more traditional forms of social research (such as focus groups). Participants were, in most cases, starting from a low knowledge base about space weather and acknowledged that they needed time and space to process new information before giving an informed view. In this context, the first event involved a relatively high degree of educative elements (e.g. introduction to space weather, introduction to risk), whereas subsequent events then built on this starting point.

***I believe the thought-process of having three events rather than a shorter amount of longer events or a larger amount of short events was well done. The events were just the right amount of time so that you could keep focus and take-in what was being said. The morning sessions would have become tedious if they had been longer.***

Participant, online discussion board

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Furthermore, many of the stakeholders who attended the events noted the benefit of having extended interaction with participants in a way that is not possible in many social research formats. In some instances this appeared to give stakeholders more confidence in the validity of the findings (countering any concerns about the smaller sample sizes of participants that are typically involved in dialogue-based exercises). Indeed, some stakeholders expressed a degree of surprise at how well the participants had engaged with the subject.

***One of the benefits is the opportunity to be immersed with scientists and the public together. You can’t have that f-2-f interaction in a survey.***

OG member

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***The thing I liked about it was the ability to talk to participants and take an issue and thrash it out in more detail. It made you feel that they had at least thought through the issue in detail, rather than carrying through any misconceptions without a way of testing their views.***

Specialist

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***My overall impression is just how well the public engaged, it was really enlightening.***

Specialist

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Turning to specific aspects of the overall dialogue structure, the gap between sessions (about one month) served a useful role in giving participants the space to consider the information from the first workshop. Looking at participants' comments from the online discussions, there is evidence that their responses to a space weather event would have been different had the session been solely based around the first day when they were initially learning about the topic.

***It was good to have the break between the first and following sessions. Just to have the time to absorb the information and Google random stuff. At the end of the first session it did feel a bit like information overload and perhaps we came away from that session thinking the effects of space weather would be more serious than they could be (or at least I did), and moving on quickly may have changed the outcomes from the following discussions.***

**Participant, online discussion board**

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However, there were mixed views on the best amount of time between events, and in several cases participants felt that the month-long gap was slightly too long.

***It was probably a bit long between the first and second meeting, I had to refresh myself on the information. I think the momentum from the first meeting is lost with such a long time in between. Maybe a week might be good to gather information from friends and family.***

**Participant, online discussion board**

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***The gap between the first and second was a bit long, but it did give us chance to go away and have a think about things. I think it was about a month, maybe a fortnight would have been better to keep things fresh.***

**Participant, online discussion board**

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There were also mixed views about the value of the shorter session on the Friday evening (that served as a prelude to the second event). While a few participants were positive towards this (commending the general premise of having a more social event in a less formal environment), a recurring theme in the feedback was the difficulties of attending an event on a Friday evening and the limited additional value it provided from their perspective.

***I think it gave us a chance to get more comfortable with the other participants. In fact I think it would have been better to have a shorter more relaxed session as the initial one.***

**Participant, online discussion board**

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***It didn't add much to the discussions and was a recap which could of been done on Saturday morning. It was at an awkward time on a Friday night too.***

**Participant, online discussion board**

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***The evening event just wasn't for me, I work long days and came straight from work, my concentration wasn't what it would have been if it had been after a good night's sleep.***

**Participant, online discussion board**

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By contrast, attitudes towards the reconvened event at Jodrell Bank were very positive – with average scores (out of 10) ranging from 8.8 for 'setting out the objectives of the workshop' to 9.6 for 'feeling comfortable giving your opinion among the policy makers and scientists in the room'. The venue was also highly commended (9.8/10).



The majority of participants also felt that the session covered new ground – four participants strongly agreed with the statement ‘There was a clear progression from the previous events – we discussed new topics and developed the discussion points from the previous events’, while a further 11 broadly agreed. Among these, some participants pointed to the more in-depth discussions around community resilience, while others felt the event helped summarise the findings from the previous sessions. A total of three participants did not agree, however, with one saying that the discussions tended to repeat the previous sessions.

The majority of participants felt that the session was a two-way discussion – 13 of the 18 either broadly or strongly agreed with the statement ‘the event today felt more like a two way dialogue and discussion between participants and policy makers; not just about them finding out our views’.

Finally, an element of the overall structure that was very positively received by several of the stakeholders we interviewed was the final stakeholder event. This served as a good opportunity for other stakeholders not directly involved in the public events to engage in the process. This did not generate any additional insight for the final dialogue report, but it did perform a very useful function in terms of bringing stakeholders together and building momentum behind the project.

***The [stakeholder] event was very useful - they'd done a neat job of including the key players so it was a useful day from that point of view [being able to engage/network]. People were fairly open and the wide audience didn't impede an open discussion.***

**Specialist**

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As a final reflection in this section, the evaluation team – through their observation of the events - wish to raise a wider point for Sciencewise and others around the merits of structuring a dialogue with such a strong initial focus on education. While we do not dispute that an element of education on a subject like space weather is essential for participants to give reasoned responses, we wonder whether *leading* with it in dialogue events is necessarily the best approach. The degree of education and grounding upfront means that the discussion very quickly becomes non-representative of the general public's views and what they would think and feel in a ‘real’ situation.

We note that the wider dialogue did, of course, involve other elements (e.g. the i-omnibus) that involved no education at all and is more reflective of the public's initial reactions. Furthermore, in the wash-up meeting the dialogue contractor did outline some approaches that they had considered in the course of preparing their bid which are interesting in that they provide an alternative to the concentration of learning that is necessarily involved in a two day workshop structure (e.g. a community-centred approach that builds up to a workshop). We recommend that Sciencewise follow up these ideas with the contractor to assess their potential value in future dialogue projects.

### **3. Recruitment**

Recruitment was sub-contracted by the dialogue contractor to a research company (Ipsos MORI). While the overall target numbers were achieved and the sample was fit for purpose, this element of the project was nonetheless flagged as a concern by some stakeholders in terms of the fact that some participants were recruited in pairs (i.e. with family members or friends). The evaluators concur that, in the sessions that we observed, the latter approach did have an impact in some instances on the extent to which pairs engaged with others and therefore the group dynamic.

***I got the sense that they struggled with recruitment – the number of participants from rural areas in particular.***

**OG member**

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***I noticed one mother and daughter who contributed nothing. The facilitator tried to address this but it didn't work.***

**Specialist**

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Feedback from one or two of the participants also suggests that at least some of the participants knew one another from previous focus group research and therefore are likely to have been recruited from local panels (rather than free find).

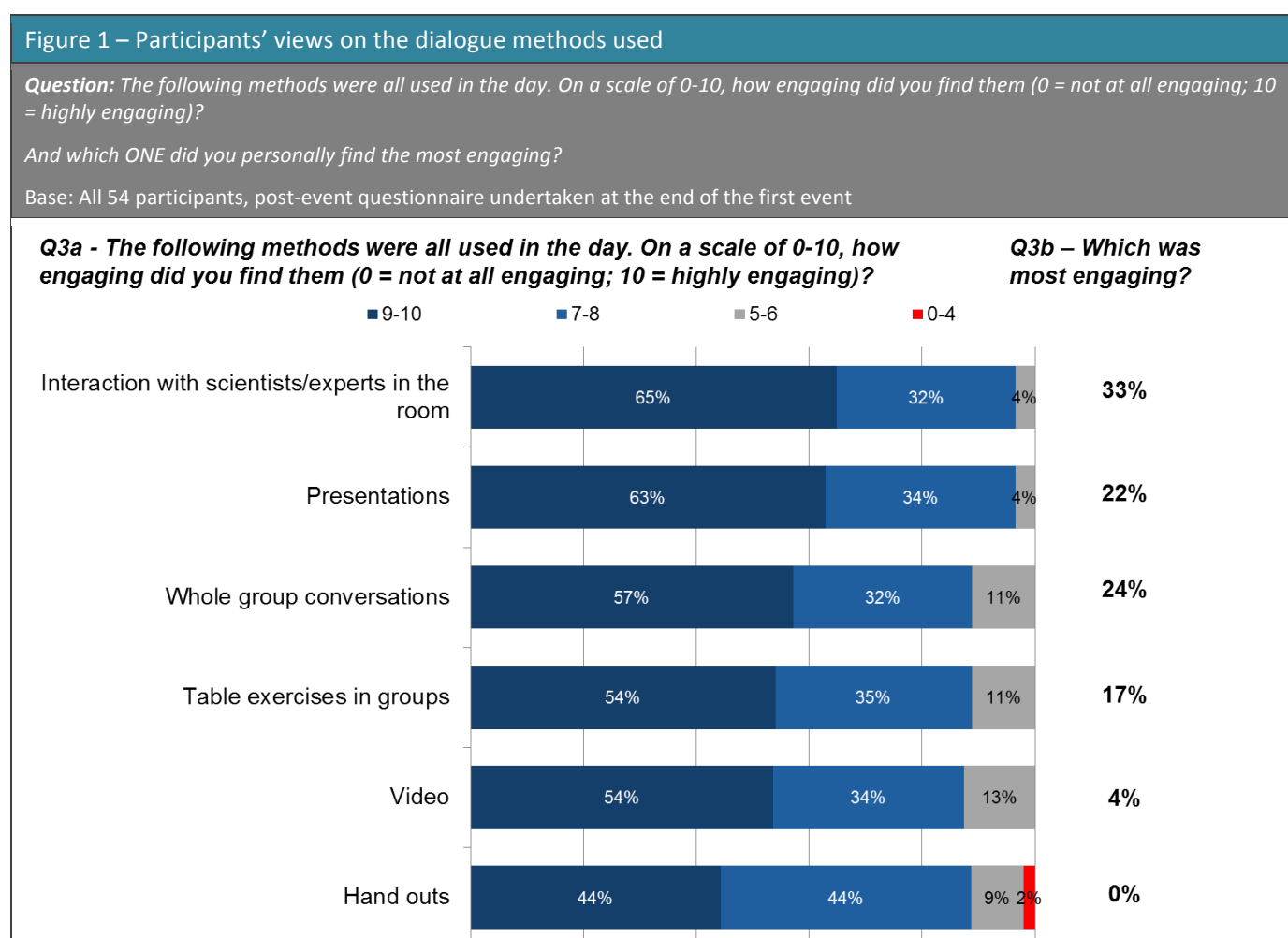
*They needed a bit more variety in terms of people and ages. Some of the people in attendance I'd seen before at several focus groups and didn't care and complained loads.*

Participant, online discussion board

#### 4. Public dialogue workshop methods

One of the defining characteristics of the public workshops, in the evaluation team's view, was the variety and high quality of different methods and approaches deployed by the dialogue team.

This is reflected in the post-event questionnaire feedback from participants (Figure 1). For example, when asked how engaging different elements of the first event were (on a scale of 0-10 where 10 is highly engaging), the majority of participants scored the methods 9-10, and almost all scored 7 or more. *'Interaction with scientists/experts in the room'* is one element that particularly stands out - 65% gave this a score of 9 or 10 and – when asked which was the most engaging method of the day - this ranked top (chosen by 33% of participants).



Without detracting from the wide range and high quality of approaches used, there were instances where there was some repetition in the tasks, and also instances where some exercises were not as effective as others. This included the cartoon conversations exercise and the role play exercise where participants were asked to put themselves in the mind-set of different local agencies (e.g. emergency services, council). These were noted by some participants and stakeholders alike as exercises that were less effective.

*There was definitely some repetition and places where it felt we were asking them the same thing in a slightly different way. This seemed to annoy a few participants - but in terms of overall learning there was probably no harm.*

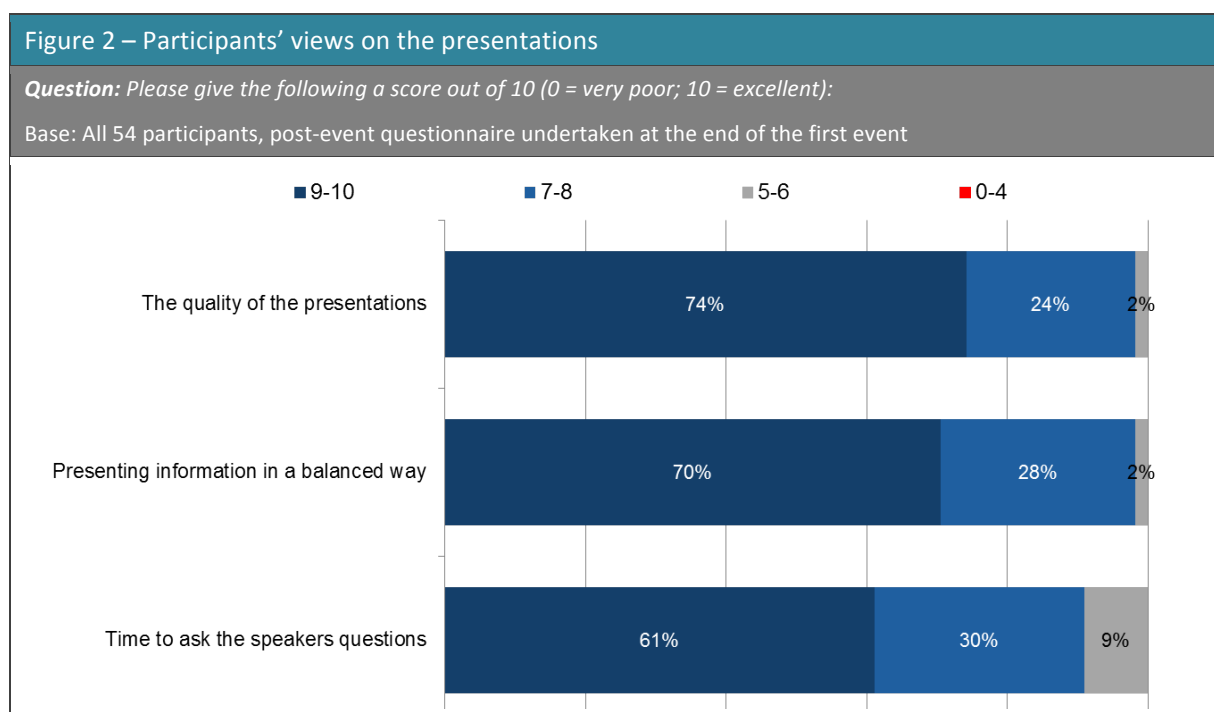
OG member

*The one that was not so good was the exercise where they put us into teams as the council or emergency services – it's impossible for us to know how they'd react.*

Participant, online discussion board

## 5. Materials/resource development

The dialogue involved the development of some very high quality resources, and this is reflected in the feedback from participants. For example, the presentations scored very highly in the post-event questionnaire in a range of respects (Figure 2) – on *quality* (74% rated 9 or 10 out of 10), *presenting information in a balanced way* (70%) and the *time to ask speakers questions* (61%).



The use of video (both the 'introduction to space weather' and 'Professor Risk' videos) was frequently cited in the online discussion boards for being both engaging and interesting, with a high production value and the ability to convey a wider range of perspectives and opinions from experts not in the room.

*I think the first video clip we saw using animation was very engaging. I really enjoyed the Risk Professor's film as well, this has got good humour in it but makes serious points about the way in which risk is assessed and how we have to make judgements.*

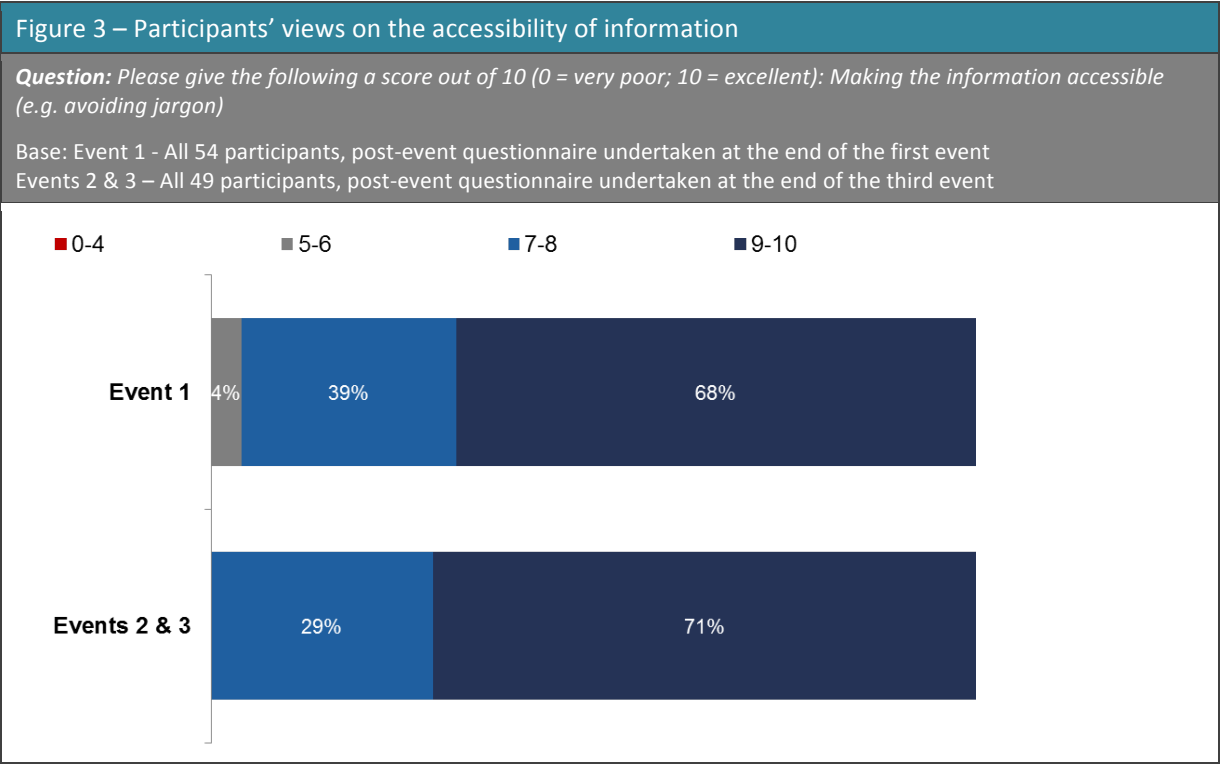
Participant, online discussion board

*I believe video clips to be a lot more useful than PowerPoint presentations as they are far more engaging. Consequently, I can remember the videos very clearly; however, the PowerPoints become somewhat of a blur that merges in to one. It was very interesting to find out what specialists, who were not attending, also thought about space weather.*

Participant, online discussion board

This contrasts with some previous Sciencewise evaluations that we have undertaken where sound and/or visual quality was lower quality and/or criticised by participants (i.e. because it was deemed to be a poor substitute for having actual experts in the room). In the context of this project, the fact that there was a high presence of experts in the room plus the video of additional expert perspectives was a highly effective combination.

Turning to the hand-outs, these scored highly in the post-event questionnaires (Figure 3) with almost all participants giving the *accessibility of information/avoiding jargon* a score of 7 or more out of 10. Likewise, the hand-outs were praised among participants in the online discussion boards.



*The Q&A document was brilliant, it was great to have detailed responses, and no one made us feel like we were asking silly questions.*

Participant, online discussion board

*The documents were very useful, and in fact, I still have the space weather sheet on my desk. I use this to teach others about space weather. It was also useful to keep your mind attuned to what had happened at the previous session.*

Participant, online discussion board

This reflects the work of the dialogue contractor and the project Steering Group to help ‘translate’ the scientific and technical language into accessible terms and concepts:

*Science language needs to be translated into plain language. They (scientists) are committed to their own scientific language and want it to be right. But it might not be right for public participants.*

OG member

Nonetheless, the development of the materials was not without its challenges, particularly in terms of the resource demands on the dialogue contractor to manage comments that came from individuals in separate emails (rather than collated into a set). The suggested amendments did continue close to the actual events themselves and sometimes were not clear what action should be taken, with a level of disagreement between the reviewers on certain points. This was acknowledged by some stakeholders.

***Working with scientists you realise that we're trained to be pedantic. I chose not to engage at the level of specific feedback in the materials because at some level it becomes personal preferences, not tweaks that lead to a different outcome.***

**Specialist**

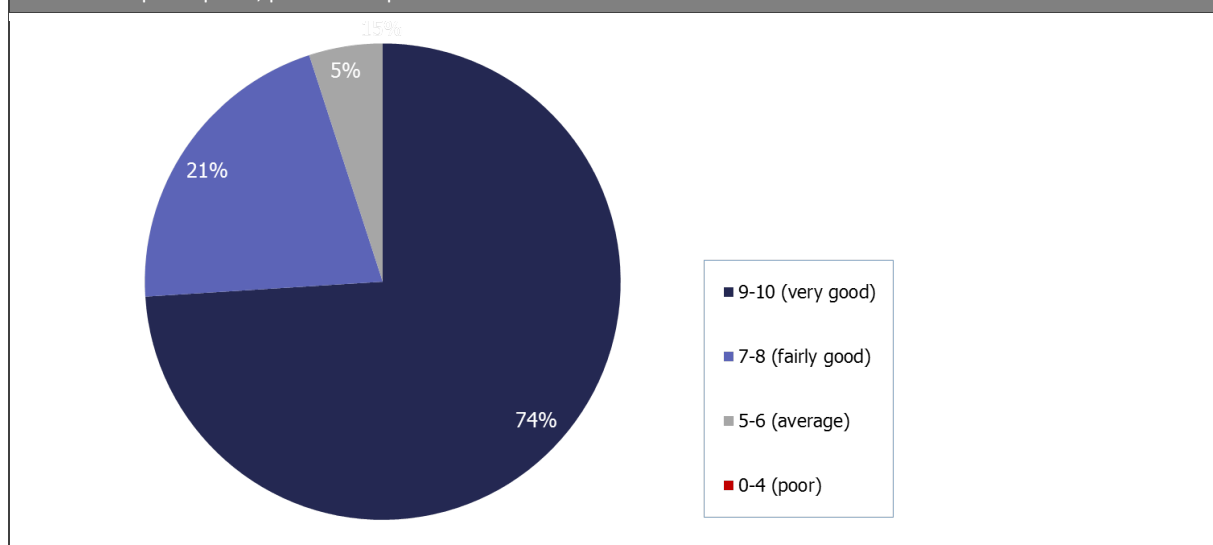
## 6. Engagement with specialists

As already noted in Figure 1, one of the strongest aspects of the dialogue workshops – from the participants' perspective – was the level of interaction between participants and specialists. This is reinforced through Figure 4, which demonstrates that 74% gave the level of input from technical/scientific perspectives a score of 9 or 10 out of 10.

**Figure 4 – Participants' views on the input from technical/scientific perspectives**

**Question:** Please give the following a score out of 10 (0 = very poor; 10 = excellent): Having enough input from technical / scientific perspectives

Base: All 54 participants, post-event questionnaire undertaken at the end of the first event



The discussions in the online bulletin board, in particular, highlight how the scientists were successful in being inclusive and approachable, which guarded against the development of any 'them' and 'us' dynamic. This in part reflects how personable the scientists were, partly the guidance of the Sciencewise DES (e.g. 'watch out for acronyms') and partly through the fact that experts were deliberately interspersed on the table among participants and engaging in discussions (rather than sat on their own table/only allowed to engage at certain points). The latter, in our view, was particularly significant and a key piece of learning for future dialogues.

***I went in to the first event thinking I would be bored, that it would be uninteresting and actually there would be no way I would be able to have a discussion on the same level as the specialists, I came away looking forward to the next event and wanting to tell friends and family all about what had been discussed.***

**Participant, online discussion board**

*Having specialists attend was a really key part of the dialogue. They did a great job at making sure they weren't leading us in one direction or another, while being there to answer questions, as people quickly honed in on the nitty gritty, practical detail parts of the whole space weather subject.*

Participant, online discussion board

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*Having specialists in the room was one of the most exciting things for me. As I mentioned earlier, I am a keen documentary fan; so to have scientists with me in the room was a huge excitement. The bonus of having these specialists in the room was also that you could ask any question you wanted without the thought that nobody in the room may know the answer. If anything, I believe there should be more specialists!*

Participant, online discussion board

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In contrast, and only in one or two instances across the dialogue, the potential for experts to inadvertently have a negative impact on participants' confidence and the group dynamic was also made clear.

*There was one point when [expert A] was a bit too steadfast in dismissing my question about the role of the armed forces in emergency situations and might have been more relaxed about his responses, I felt a bit self-conscious as a result of [expert A and expert B's] response to the suggestion I made that in a crisis it is possible for governments to impose martial law.*

Participant, online discussion board

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*I believe the wide range of specialists from different organisations was very beneficial. The majority of specialists also allowed for a brilliant conversation; but there was one in particular who did not interact as much as was very one-way in their conversational skills.*

Participant, online discussion board

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## 7. The final exercises: funding priorities

The final exercise at the second event was a priorities exercise whereby participants, drawing on their accumulated knowledge across the process, were asked first about the relative importance of possible space weather mitigation options and, following on from this, how funding should be allocated across these moving forward. For the latter they were given counters and asked to allocate these across the different funding possibilities.

In the evaluators' view this exercise generated some useful intelligence, although final decisions appeared to be highly influenced by particular individuals in the group and the input of the experts on the table. This was reflected in some of the feedback in the online discussion board.

*I think this was an activity that the stronger speakers tended to be more vocal in and so maybe not such a communal activity. The actual activity was interesting especially when the two groups came together and we saw the difference in opinion as to where both groups allocated the resources. Each group could justify their choices but I did find it difficult to prioritise the resources as they all seemed worthwhile or important.*

Participant, online discussion board

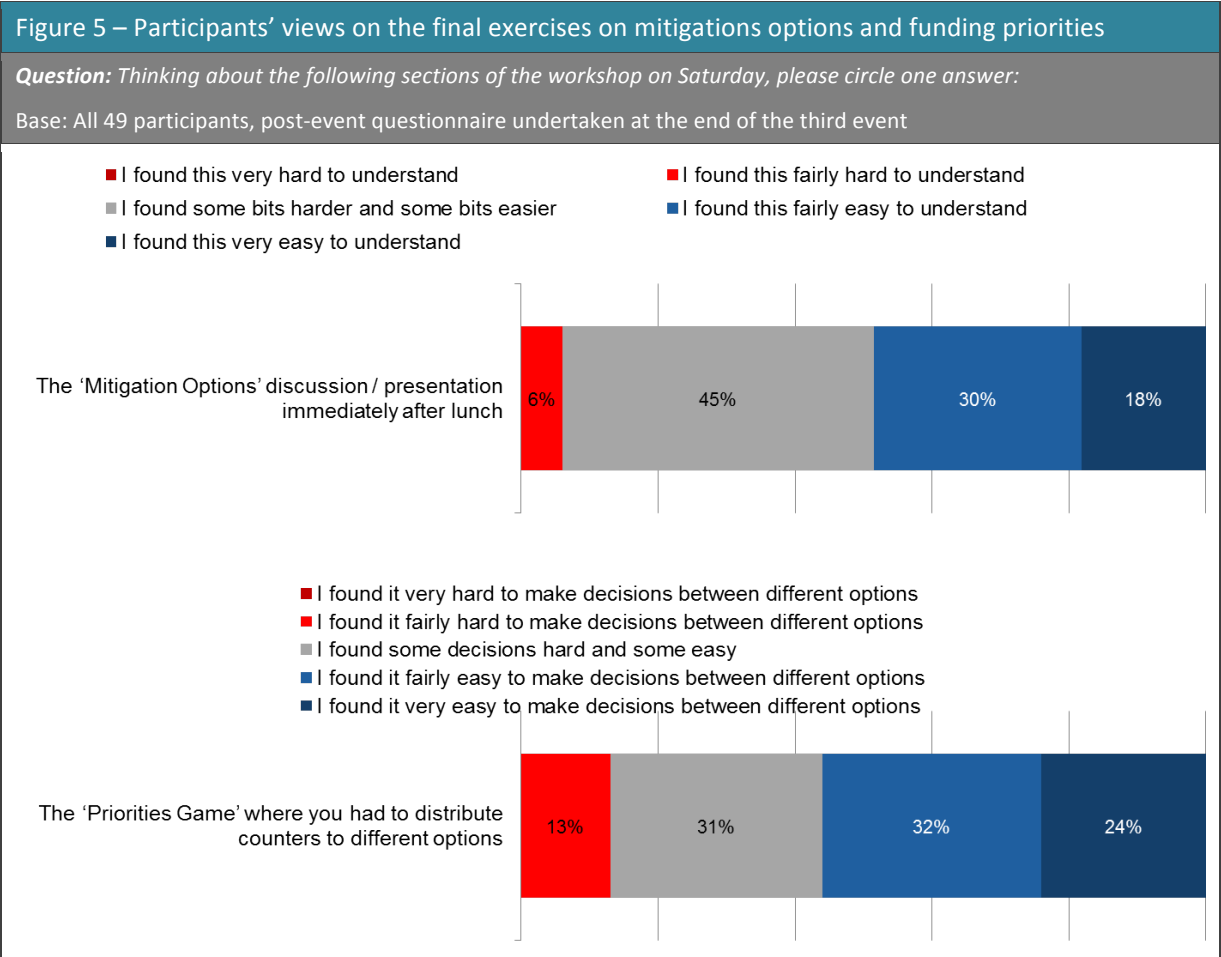
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*This event was engaging and allowed for the group to put their knowledge in to play. The group had to argue as to why they think some should be invested in to, and other shouldn't. This exercise also somewhat excluded the quieter members of the group as they were in the shadows of the more outgoing ones.*

Participant, online discussion board

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Feedback through the post-event questionnaire highlights a divide among participants in terms of how easy these particular exercises were to understand (Figure 5). For example, while only a minority of 6% found the mitigations exercise ‘very hard’ to understand, almost half (45%) said they found ‘some bits’ of the exercise harder to understand (compared to 48% who found it ‘very’ or ‘fairly’ easy). Turning to the priorities exercise, a larger minority of 13% found this ‘very difficult’ and close to one in three (31%) found ‘some bits’ harder to understand (compared to 56% who found it ‘very’ or ‘fairly easy’).



Some stakeholders also ‘thought out loud’ in our discussions with them about the relative merits of having external (non-space weather) funding options in the exercise to set the exercise in a broader context.

*I did discuss with a few colleagues before this whether if you did the same exercise [fund allocation] with cancer treatment whether you’d get the same result, or whether it would depend on which subject you spoke to them about first...there is potential to do more of a reality check against other areas.*

OG member

8. Wider dialogue activities

As noted in the introduction, the dialogue involved additional strands over and above the public dialogue events – including a project website, self-selecting online engagement and a quantitative online survey of the general public.



The website had several roles, including a place to direct media enquiries and also a forum for participants to use in between the sessions. Website analytics demonstrate that, up to the end of September 2014, the site had been visited 1,209 times by 738 different people (61% new visitors), averaging 3.81 page views per visit. The highest number of visits occurred just after the launch of the website, probably because the site was publicised on twitter via the public dialogue twitter feed as well as via a number of Oversight Group members.

The website also helped to engage a self-selected sample of individuals not involved in the dialogue sessions themselves. A total of 71 people responded to the online survey. The group of people responding via this mechanism were completely self-selecting and thus likely to have an existing level of interest or knowledge about space weather – and this is reflected in the responses received. It was considered, by both STFC and the dialogue contractor, to be a useful engagement tool to engage a wider audience. Nonetheless, it has not materially added to the analysis of the overall findings because of how different this group of individuals are to those participating in the sessions – and therefore it's value is one of engagement rather than analytical enquiry.

By contrast, the representative online survey undertaken through the Ipsos MORI i-omnibus was used as a means of adding a quantitative element to the analytical enquiry of the project, and was reported formally in the dialogue report. Undertaken with a sample of 1,010 adults aged 18+, the aim was to gauge baseline levels of understanding and perceptions of space weather and related aspects of communication and resilience. STFC and OG stakeholders both noted that it had an important role in addressing any concerns about the smaller numbers of individuals involved in the dialogue sessions, helping to give a sense of attitudes across the public as a whole.

# 03

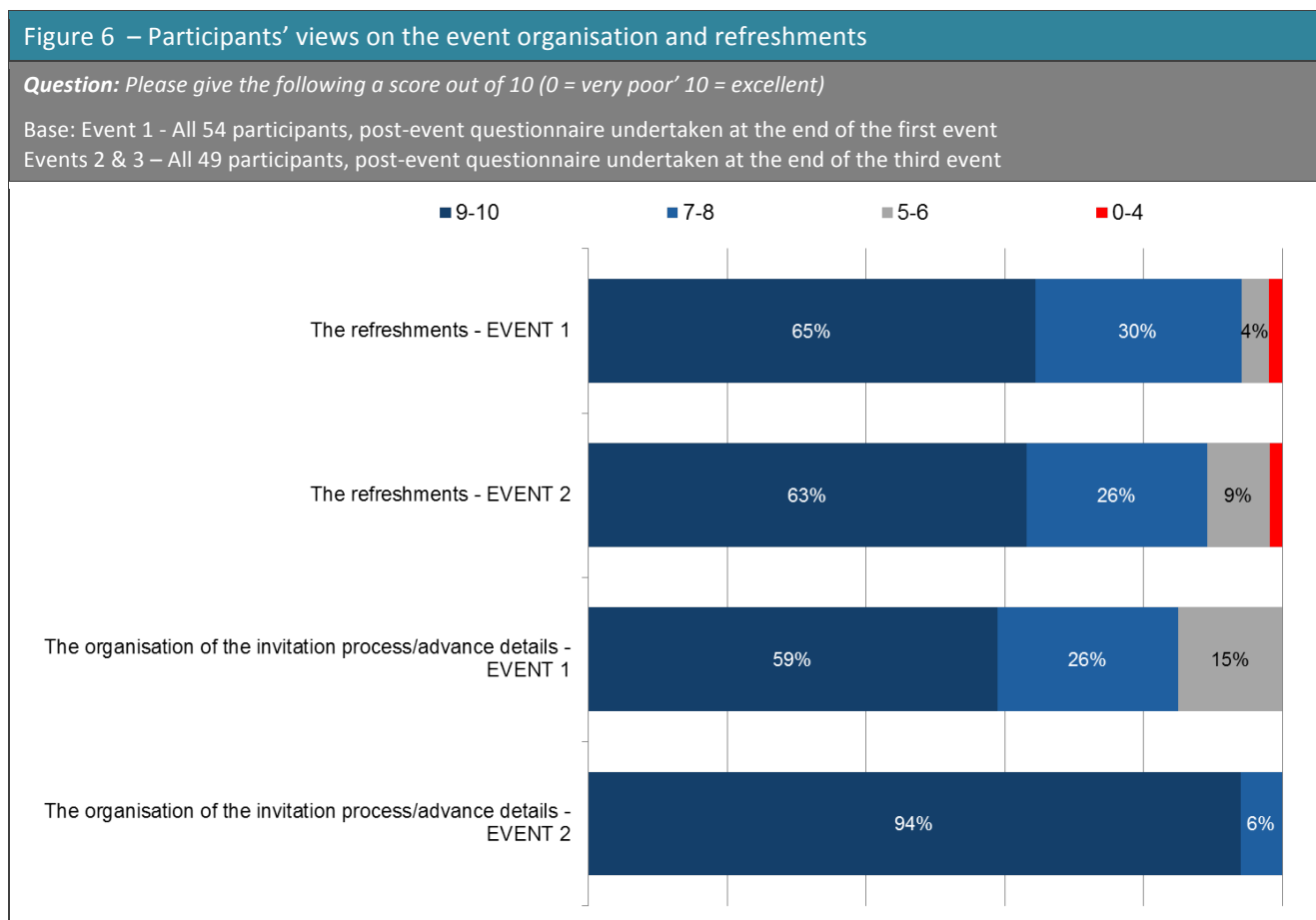
## Delivery

This section outlines the key findings from the evaluation in respect of the delivery of the dialogue project.

### 1. Organisation and venue

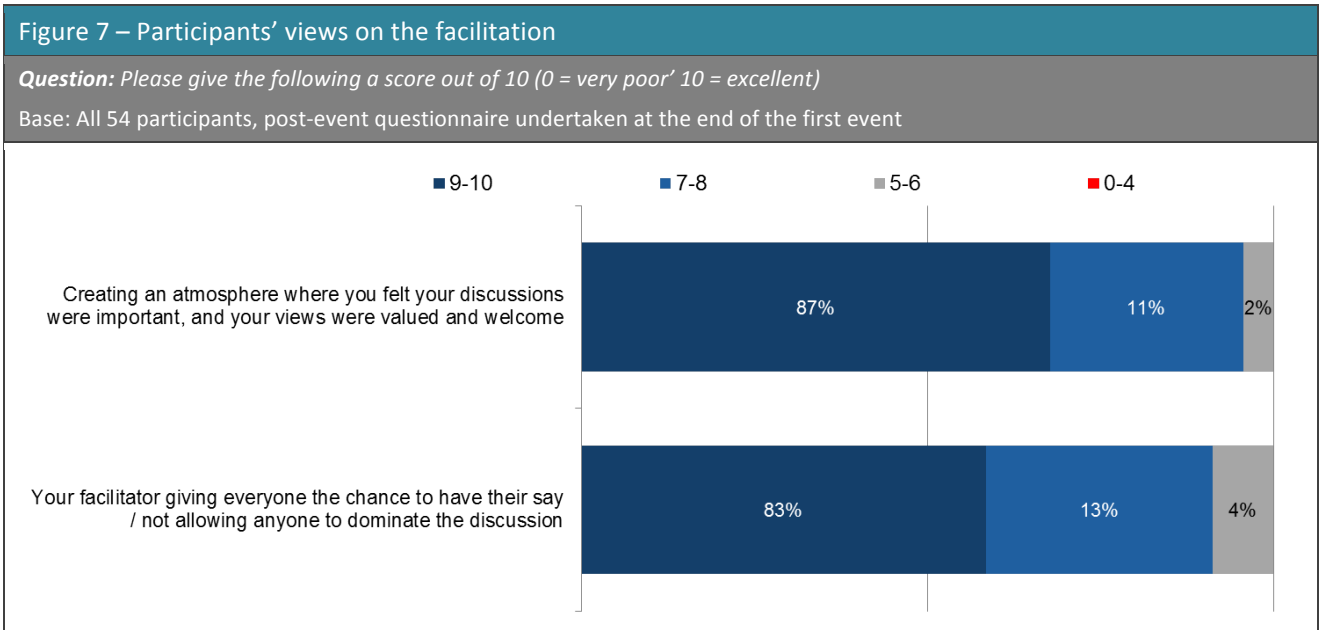
No concerns were raised about the event organisation which was exemplary. A majority (85%) gave *'the organisation of the invitation process/advance details'* a score of 7 or more out of 10 for event 1, although this notably increased to 100% for event 2 (Figure 6). In addition, *'refreshments'* also scored highly - 95% scored it 7 or more out of 10 at event 1 and 89% at event 2.

One reflection that specifically relates to Edinburgh is that the shape of the room made two large tables logistically challenging.



### 2. Facilitation

Facilitation was generally strong and this is reflected in the post-event questionnaire feedback with very high scores (Figure 7). For example, 87% of participants gave a score of nine or 10 out of 10 for *'creating an atmosphere where you felt your discussions were important, and your views were valued and welcome'*. In addition, 83% gave the same scores to *'your facilitator giving everyone the chance to have their say/not allowing anyone to dominate the discussion'*.



However, from the evaluators’ perspective there were some noticeable differences in facilitation style and competence between the lead facilitators on the day (who were excellent facilitators) and some of the supporting table facilitators (who, on occasion, struggled with the group dynamic and engaging everyone). Partly as a consequence of this, some imbalances between louder and quieter voices on the table were noted, both by participants and by observing stakeholders. Furthermore, there were some suggestions that the tables could have been ‘purposively mixed up’ at points in the session with the aim of re-grouping more and less confident participants together (and actively splitting those who had been recruited together):

*I believe that everybody had a fair opportunity to put forward their input. However, some members of the group had a greater knowledge and therefore would put forward their thoughts and opinions regularly. I believe this may have knocked the confidence of other attendees. By moving the louder attendees to different tables during "group time" you may get the other quieter ones to feel more relaxed and therefore contribute a little more.*

Participant, online discussion board

*I feel the facilitators of the discussion could have regrouped us more and kept us on topic a bit better in certain discussions. I felt people were getting very repetitive and narrow minded about certain things and fixated on points that were not relevant in those discussions.*

Participant, online discussion board

*Some people didn’t say a lot but presumably that’s pretty much the way in most scenarios like this.*

Specialist

We think that there may have been scope to include an exercise early in the sessions to talk about attitudes to risks in general (e.g. risks of driving a car, nuclear power, etc.). We note that this was a feature of the recent Sciencewise dialogue on shale gas and oil which, quite aside from its role in generating insights, proved to be a very useful methodological device to encourage engagement and prevent particular individuals dictating the table discussions. In this previous dialogue it was held early, as group dynamics were being formed, and in pairs to ensure everyone engaged (as opposed to a table-wide discussion where it can sometimes be difficult for all participants to find space to voice their opinion).

### 3. Presentation - delivery

The presentations delivered by specialists were delivered to a very high standard. The STFC project manager noted that most of the presenters had previous experience of presenting to the public/doing outreach work, and this was evident in their personal style of delivery and ensuring that scientific facts and principles were explained in an accessible way. The one exception was on Friday night in Edinburgh when someone from the building was allowed to speak about their projects [This highlights the need to have prior sight of the content of a speaker's slide deck]

We also note again the high production quality of the videos used on the day and the means of presenting these to participants. Unlike in some other Sciencewise projects we have evaluated, there were no major issues with playback of the video and it was easy to both see and hear (although the room in Edinburgh had poor acoustics and the audio speaker system was not quite up to the task). The dialogue team always arrived in good time to test the systems and avoid any 'nasty surprises' on the day.

One final element to note was that in places, the schedule would have benefitted from slightly more space after a presentation or video to discuss what had been seen / said. In a few places this felt like a missed opportunity with a video or presentation being slightly standalone where participants could have opened up some interesting discussions if given more time.

### 4. Analysis

From each workshop, the contractor compiled all notes and worksheets into a single document, grouped by theme and then pulled out messages from there, as well as compiling a spread sheet of all comments. Draft reports then went around the team to check the content chimed with their reflections of the workshops in terms of key messages.

# 04

## Governance and oversight

The governance of the space weather dialogue was very strong, which can be attributed to the following factors:

- The OG was formed very early in the process (before the contractors were appointed) and gave the project a firm steer throughout.
- The composition of the OG was well designed and included a useful plurality of perspectives. For example, the partnership with Lloyds has been effective and allows the disseminated outputs to reach a different audience and network of contacts.
- The OG had a very effective chair (Mike Hapgood) who, in the view of many of the stakeholders, was “*universally respected and very well networked*”. Others commented that he gave the project legitimacy.
- Participation levels in the OG were high. One participant commented that “*everyone came to the OG - I think a lot of the success was the community the project was based around*”.

Only a few areas for improvement were identified:

- The lack of engagement from National Grid (through illness), with one stakeholder commenting ‘*we have missed their contribution. Because they’re not Government or academic, but a service provider so have a very specific perspective to bring to the table*’.
- Some stakeholders noted the lack of any representation from the aviation industry on the OG.
- There was strong engagement from the Cabinet Office, but there was occasionally a lack of continuity with different staff members attending meetings across the project.

The STFC project manager reports feeling highly supported through the process by the Sciencewise DES and others. They did note one important learning point regarding the initial set up process of getting all the partners and funders to come together prior to submitting the bid. They described this phase as the most stressful part in the project, and one suggestion they had for improving it in future dialogue processes would be to use a buddy system to put the project manager in contact with someone else who has gone through the same process recently.

# 05

## Impacts

This section assesses the impact of the dialogue: both in terms of the impacts on STFC and wider stakeholders involved in the project, as well as on participants. The dialogue report was published on 11 February 2015, alongside a launch event attended by approximately 75 people (including two of the public participants).

### 1. Impact on STFC and wider stakeholders and policy decisions

One of the key strengths of the project was the fact that it was designed to address a particular knowledge gap in the evidence base. This was reflected throughout the discussions with stakeholders:

***It was interesting and innovative in that it [the dialogue] was so public facing. Everything else I work with is from a technocratic process.***

Specialist

***There's nothing else out there on public attitudes. So for a practitioner like me it's worth its weight in gold.***

Specialist

The dialogue has already led to a series of specific impacts, as follows:

- Inclusion in the UK House of Lords Science and Technology Select Committee Inquiry into the resilience of electricity systems<sup>7</sup>, published in March 2015.
- Cabinet Office has started the process of formulating a space weather communications plan – and the dialogue report was reported in the first meeting attended by the STFC project manager and OG chair.
- Space weather week in Washington – The dialogue report was spoken about at length during the US-UK Space Weather Workshop on power grids and public communications in Washington in February 2015.
- STFC has been contacted by a representative of an Australian university who said that the Australian Government were keen to do some similar work and therefore wanted to learn from the UK experience.
- Mike Hapgood has had an article published that talked about the project<sup>8</sup>.
- STFC has been invited to submit (and since submitted) an abstract for European Space weather week in November 2015 in Belgium – for the session on space weather communication and dialogue across Europe.

Beyond specific events and impacts, one of the key overarching strengths of the dialogue is the level of collaboration and cross agency working it has stimulated. Primarily this has been across academic partners, although clearly extended to other groups, most notably Government departments such as Cabinet Office and also local community resilience officers. Indeed, the outcomes of the dialogue are anticipated to feed into the policies and strategies of numerous organisations.

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<sup>7</sup> <http://www.publications.parliament.uk/pa/Id201415/Idselect/Idsctech/121/121.pdf>

<sup>8</sup> <http://room.eu.com/articles?id=61>

***As a community we've realised we have to work closely together and have a central point to put all the material. Somewhere the media and the public can easily go to access the information.***

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OG member

***It's good to have more collaboration in the sector, and the public forums gave stakeholders a good reason to come together.***

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Specialist

Another key benefit of the dialogue from the stakeholders' perspective is the degree of political leverage associated with undertaking a high profile public dialogue:

***From an academic point of view I'd like to think that this helps sharpen Government's interest in policy development around this area. It provides some political leverage to have the findings from this exercise.***

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OG member

Many of the stakeholders feel that the dialogue has provided value for money, by providing them with important detail and direction and generally adding value over and above what could be achieved through some of the more traditional social research methods (e.g. quantitative surveys or focus groups).

STFC report that they have found the dialogue process highly beneficial and will consider it for future work. However, at present they have no specific project in mind. Several stakeholders also commented that it would be valuable to use dialogue methods to widen out the debate about responses to a wider suite of risks (e.g. to assess if public and community responses are likely to be similar or different according to whether the trigger is novel or familiar).

## **2. For participants**

The evaluation finds that the dialogue had a positive impact upon participants (Figure 8). All (100%) agreed that *'I learned something new as a result of taking part'* and also that *'I would recommend taking part in events like this to others'*.

At the end of the dialogue process, a minority (31%) agreed that they were actively worried about a space weather event. A slightly larger minority (37%) disagreed, while the remaining 31% were neutral.

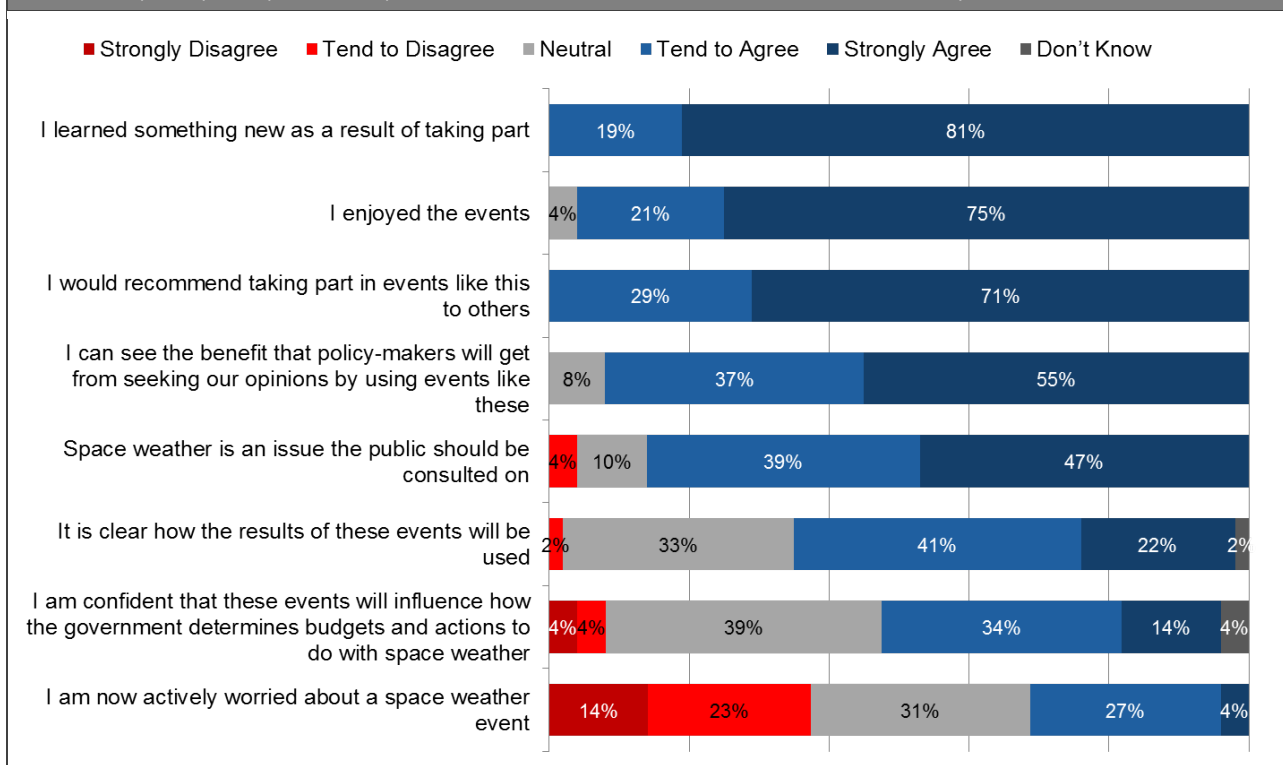
A large proportion of participants (92%) agreed that they could *'see the benefit that policy makers will get from seeking our opinions and using events like these'*, although fewer (63%) were clear on how the results would be used.



Figure 8 – Participants' views on the impact of the event upon them

**Question:** To what extent do you agree or disagree that...?

Base: All 49 participants, post-event questionnaire undertaken at the end of the second Saturday event



The comments from the online discussion boards also demonstrate a range of views on what might (or should) happen in response to the dialogue.

*I'm sure the dialogue team will have some influence in developing emergency planning procedures, which may be useful. However I have no hope at all that the government has any real interest in the structural issues which underlie the potential impact of space weather events: Neo-liberal economics and sustainability cannot co-exist.*

Participant, online discussion board

*I hope that they will also take away that people really don't know where to go to get help in a crisis if they don't have working phones, TV, radio or computers. I think we also established that a space weather education campaign wasn't really necessary and that really people just needed to know what the procedure was if any problems occur due to a space weather event (or anything else that disrupts communications).*

Participant, online discussion board

*I'm hoping that they realise we are not as stupid as they seem to think, that we want what they want which is a better understanding of what happens during a space weather event. That they can trust us to make decisions if need be during a space weather event.*

Participant, online discussion board

# 06

## Overview and conclusions

The table below assesses how the dialogue performed against the original objectives and research questions. In summary, we conclude that the dialogue delivered very effectively – particularly in terms of Objectives 2 and 3 where there is clear gap in the evidence base and a defined policy need. The design and delivery of the dialogue was very constructive in enabling public participants to engage with stakeholders on an equal footing (Objective 1) and there is already evidence – even at this early stage – of a range of impacts emerging from the project.

The dialogue demonstrates detailed engagement with the public and – furthermore – clear evidence of wider stakeholder engagement and cross agency working. The latter is particularly important in terms of being able to deliver fully against objectives 4 and 5 where the discussions with public participants were highly informative and useful, but naturally did not reach a definitive position (nor is it fair to assume that they could or should have done within the confines of the project). Therefore, this is where further discussions will likely be required.

Indeed, and as an overarching comment, one of the key successes of the dialogue (aside from the insights that have been generated in terms of public attitudes to space weather) has been the impact on cross-agency working and the linkages that have been established between academia and policy. The project team have been very successful in engaging a wider stakeholder audience.

Objective	Evaluation findings
1. To engage members of the public and other stakeholders in developing this work, including enabling members of the public to ask questions and develop conversations with space weather stakeholders.	Clear evidence that this objective was met
2. To develop and gauge public understanding of space weather, its impacts and the resilience of civil society.	Clear evidence that this objective was met
3. To consider how to improve public and stakeholder awareness of space weather and its associated impacts.	Clear evidence that this objective was met
4. To determine how far members of the public think the Government and companies should go to mitigate space weather impacts.	This objective was largely met – it was discussed in the initial groups and also was a theme in the reconvened event at Jodrell Bank. While providing very useful perspectives and informing the debate, no conclusive position was determined.
5. To inform policy, spending, responsibilities and the priorities for action to mitigate space weather impacts.	This objective was largely met – participants were engaged on the subjects of policy and funding priorities and gave a series of useful perspectives. However, the funding exercise worked at exploring the issue of priorities rather than arriving at a definitive set, since the final decisions were subject to influence by individuals in the group and the input of the experts. Nonetheless, the degree of stakeholder engagement generated through the dialogue will undoubtedly help to hone thinking on these key issues.

Turning to the lessons that can be taken from the design and delivery of the process itself, the project demonstrated a number of strengths:

- The structure of the dialogue, with reconvened events, was important. Participants were starting from a low knowledge base and therefore needed the time and space to process new information before giving an informed view. The final stakeholder event performed a very useful function in engaging a wider stakeholder audience and building momentum behind the project.
- The events benefited hugely from the set up process and the time dedicated to this, both in terms of the knowledge review and the professional/high quality design of the materials.
- The dialogue contractor deployed a wide range of high quality dialogue methods and exercises. Some individual exercises did not always work as well as others but – as a collective – the methods worked effectively and ensured that participants were highly engaged with the topic.
- The level of interaction with scientists and experts in the room (supported by additional perspectives in the videos) was one of the most effective aspects of the dialogue. In particular, the experts were deliberately interspersed on the table engaging in discussion (as opposed to being silent and passive observers), which helped guard against any ‘them’ and ‘us’ dynamic.
- The OG was very strong and played a key role in the development of the project and its subsequent dissemination. It represents, in our view, best practice for a dialogue project.

The project also highlighted a number of important lessons for future dialogues in terms of where aspects did not perform as well:

- Notwithstanding the necessity of the educational elements on a subject like space weather, we judge that the process could have potentially benefitted from an initial session to consider reactions to risks without a prior grounding in the subject (e.g. to discuss a mock event). This could have been useful to understand initial reactions before then moving on to topics in more detail/with more information provided.
- The use of the Friday night sessions was less successful than hoped, although the premise of having a less formal/socially focused event is interesting and worthy of further testing in future public dialogue projects.
- Recruitment was weak in some instances, particularly around the recruitment of pairs of individuals (e.g. friends, family) which did impact on the group dynamic. On occasions some table facilitators could have done more to engage quieter members on the table.
- The funding priorities exercise suffered to a degree from being undertaken in a whole table environment which led the group view to be influenced by louder voices on the table or the views of experts.

# APPENDICES

## 1. Post event questionnaire – event 1

We are the independent evaluators for the events and would appreciate your feedback on how they have been for you. Your individual response will be treated anonymously and will only be seen by the evaluators.

Q1. Please give the following a score out of 10 (0 = very poor; 10 = excellent)	SCORE 0 - 10
• The organisation of the invitation process/advance details	
• The refreshments	
• Setting out the objectives for the workshop (i.e. why you were there; what the workshop was intended to achieve)	
• Presenting information in a balanced, impartial way	
• Making the information accessible (e.g. avoiding the use of jargon)	
• The quality of the presentations	
• Time to ask the speakers questions	
• Having enough input from technical / scientific experts	
• Creating an atmosphere where you felt your discussions were important, and your views were valued and welcome	
• The facilitator on your table giving everyone the chance to have their say / not allowing anyone to dominate the discussion	

Q2. How easy or difficult were each of the following sessions in the day to understand (0 = very difficult to understand and 10 = very easy to understand)?	SCORE 0 - 10
• What space weather is	
• The impact of space weather	
• Risk	
• Resilience	

Q3a. The following methods were all used in the day. On a scale of 0-10, how engaging did you find them (0 = not at all engaging; 10 = highly engaging)?	Q3a (give 0-10 FOR EACH ONE)	Q3b (tick only ONE)
Q3b. And which <u>ONE</u> did you personally find the most engaging?		
• Video		
• Hand-outs		
• Table exercises in small groups		
• Whole group conversations		
• Presentations		
• Interaction with scientists/experts in the room		

Q4. Is there anything else that you would like to say about this event (and – in particular - what could be changed to improve it)?

## 2. Post event questionnaire – events 2 & 3

We are independently evaluating the events and would appreciate your feedback on how they have been for you. The evaluation report will be published but your individual response here will be treated anonymously and will only be seen by the evaluators. We will also be inviting some participants to take part in a short online discussion over the next few weeks to follow up on some of these questions – if you are interested see the final page.

Please give scores for Friday and Saturday separately:

Q. Please give the following a score out of 10 (0 = very poor; 10 = excellent)		SCORE 0 - 10	
		Friday	Saturday
1	The organisation of where and when I was required to be		
2	The organisation of the workshop on the day		
3	The food / refreshments		
4	Setting out the objectives for the evening / day (i.e. why you were there; what the sessions were intended to achieve)		
5	How clear and accessible the information was (e.g. avoiding the use of jargon)		
6	The structure of the sessions, i.e. the balance between working in small break out groups and plenary sessions when everyone was together		
7	The quality of the input from the scientists / experts in attendance		
8	The facilitator on your table giving everyone the chance to have their say / not allowing anyone to dominate the discussion		
9	An overall score for the evening / day as a whole		

Now please give an overall score for the following aspects:

10	How useful the homework was in developing your thoughts and opinions on space weather	
11	The accompanying website / forum ( <b>if you did not use it then please write in 'DK'</b> )	
12	Having sufficient information to enable you to make an informed contribution on how much money / resource should be dedicated to Space Weather resilience	
13	Creating an atmosphere where you felt your discussions were important, and your views were valued and welcome	
14	How well the structure worked i.e. a shorter evening session followed by a full day	

Q. Thinking about the following sections of the workshop on Saturday, please circle one answer:

1	The 'Mitigation Options' discussion / presentation immediately after lunch	I found this very hard to understand	I found this fairly hard to understand	I found some bits harder and some bits easier	I found this fairly easy to understand	I found this very easy to understand
2	The 'Priorities Game' where you had to distribute counters to different options	I found it very hard to make decisions between different options	I found it fairly hard to make decisions between different options	I found some decisions hard and some easy	I found it fairly easy to make decisions between different options	I found it very easy to make decisions between different options

Q. Please circle one answer for each of the following statements.

1	I learned something new as a result of taking part	Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know
2	I enjoyed the events	Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know
3	I am now actively worried about a space weather event	Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know
4	Space weather is an issue the public should be consulted on	Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know
5	I can see the benefit that policy-makers will get from seeking our opinions by using events like these	Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know
6	It is clear how the results of these events will be used	Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know
7	I am confident that these events will influence how the government determines budgets and actions to do with space weather	Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know
8	I would recommend taking part in events like this to others	Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know

Please consider ALL EVENTS overall when you answer the following questions.

Q. Overall, how satisfied you were with the experience of the event as a whole (all three sessions combined)	SCORE 0 - 10
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What was the single best thing about taking part in these events?

And what one thing would you have changed?

To continue our evaluation we would like to hold an **online discussion forum** over the course of the next few weeks with around 12-15 of the participants across the 3 locations. This will involve logging on 2-3 times to answer some questions along with other attendees. **It should take around 60 mins in total and you will receive a £20 cash 'thank you' for your time.** Your answers will be anonymous. Are you interested in taking part? If so, we may be in touch with you next week and will provide you with further details about how to log in, etc.

Yes

☐

No

☐

Sciencewise co-funded the dialogue project you are taking part in. It is a national programme that promotes public dialogue on policy issues involving science and technology. Would you like to receive other information from Sciencewise, including opportunities to be involved in other debates in future?

Yes

☐

No

☐

If you answered 'yes' to either of the two questions please provide the following details - these will only be used for the purposes described above and they will not be given to anyone else.

Name: .....

Home phone number (including area code): .....

Email address: .....




### 3. Post event questionnaire – Jordell bank

We are the independent evaluators for the events and would appreciate your feedback on this third event. Your individual response will be treated anonymously and will only be seen by the evaluators. Many thanks! Phil & Alex.


Q1. Please give the following a score out of 10 (0 = very poor; 10 = excellent)	SCORE 0 - 10
• The venue	
• Setting out the objectives for this third workshop (i.e. its purpose in addition to the 2 events that you attended previously)	
• Time to engage with the policy makers and scientific experts in the room	
• Feeling comfortable giving your opinion among the policy makers and scientists in the room and feeling listened to	
• The facilitator giving everyone the chance to have their say / not allowing anyone to dominate the discussion	
• Please give an overall score for the day	

Q2. Thinking about how the event today added to the discussions that you had in the two previous events, which of the following positions do you think is more accurate? Please circle one of the numbers along the scale (1-5) that is closest to your view, and tell us why in the box below.

I'm not clear what this event added over and above the previous events – we covered similar ground and topics without developing them further				There was a clear progression from the previous events – we discussed new topics and developed the discussion points from the previous events	
1	2	3	4	5	

Please tell us in a little more detail why you think that?

Q3. Thinking again about the event today, which of the following positions do you think is more accurate? Please circle one of the numbers along the scale (1-5) that is closest to your view, and tell us why in the box below.

The event today felt more like it was more about the researchers and policy makers finding out our views; and less about having a two way discussion				The event today felt more like a two way dialogue and discussion between participants and policy makers; not just about them finding out our views	
1	2	3	4	5	

#### 4. Post event questionnaire - Topline results

##### EVENT 1:

Q1.	Please give the following a score out of 10 (0 = very poor; 10 = excellent)				
		Reading (19)	Edinburgh (17)	Wrexham (18)	Overall average (54)
	The organisation of the invitation process/advance details	8.5	7.8	9.2	8.5
	The refreshments	8.7	8.9	8.7	8.8
	Setting out the objectives for the workshop (i.e. why you were there; what the workshops were intended to achieve)	8.1	8.8	9.1	8.7
	Presenting information in a balanced way	8.5	8.8	9.9	9
	Making the information accessible (e.g. avoiding jargon)	8.6	8.6	9.8	9
	The quality of the presentations	8.8	8.8	9.8	9.2
	Time to ask the speakers questions	8.4	8.4	9.6	8.8
	Having enough input from technical / scientific perspectives	8.7	8.5	9.7	9
	Creating an atmosphere where you felt your discussions were important, and your views were valued and welcome	9.0	9.2	9.8	9.3
	Your facilitator giving everyone the chance to have their say / not allowing anyone to dominate the discussion	8.9	9.1	9.9	9.3

Q2.	How easy or difficult were each of the following sessions in the day to understand (0 = very difficult to understand; 10 = very easy to understand)?				
		Reading (19)	Edinburgh (17)	Wrexham (18)	Overall average (54)
	What space weather is	8.3	7.3	9.4	8.3
	The impact of space weather	8.3	7.7	9.6	8.5
	Risk	8.2	7.4	9.6	8.4
	Resilience	7.9	7.4	9.6	8.3

Q3a.	The following methods were all used in the day. On a scale of 0-10, how engaging did you find them (0 = not at all engaging; 10 = highly engaging)?				
		Reading (19)	Edinburgh (17)	Wrexham (18)	Overall average (54)
	Video	7.7	8.4	9.5	8.5
	Hand outs	7.7	7.5	9.2	8.2
	Table exercises in groups	8.1	8.4	9.6	8.7
	Whole group conversations	8.3	8.1	9.6	8.6
	Presentations	8.3	8.7	9.7	8.9
	Interaction with scientists/experts in the room	8.4	8.8	9.8	9

Q3b.	And which ONE did you personally find the most engaging?				
		Reading (19)	Edinburgh (17)	Wrexham (18)	Overall average (54)
	Video	5%	0%	6%	4%
	Hand outs	0%	0%	0%	0%
	Table exercises in groups	16%	29%	6%	17%
	Whole group conversations	21%	24%	28%	24%
	Presentations	32%	18%	17%	22%
	Interaction with scientists/experts in the room	26%	29%	44%	33%

**Event 2:**

Q1a.	Please give the following a score out of 10 (0 = very poor; 10 = excellent)								
		Reading (16)		Edinburgh (16)		Wrexham (17)		Overall average (49)	
		Fri	Sat	Fri	Sat	Fri	Sat	Fri	Sat
	The organisation of where and when I was required to be	9.0	9.6	9.8	9.7	9.9	9.9	9.6	9.7
	The organisation of the workshop on the day	8.8	9.3	9.6	9.4	10	10	9.5	9.6
	The food / refreshments	7.4	8.4	9.1	9.2	8.6	8.5	8.4	8.7
	Setting out the objectives for the evening / day (i.e. why you were there; what the sessions set out to achieve)	8.3	9.1	9.1	9.1	9.9	9.9	9.1	9.4
	How clear and accessible the information was (e.g. avoiding the use of jargon)	8.3	8.4	8.7	8.7	9.8	9.8	8.9	9.0
	The structure of the sessions, i.e. the balance between working in small break out groups and plenary sessions when everyone was together	8.3	8.8	8.7	8.6	10	10	9.0	9.1
	The quality of the input from the scientists / experts in attendance	8.9	9.3	9.5	9.4	10	10	9.4	9.6
	The facilitator giving everyone the chance to have their say / not allowing anyone to dominate the discussion	9.6	9.4	9.8	9.7	9.7	9.7	9.7	9.6
	An overall score for the evening / day as a whole	8.4	9.1	9.3	9.3	9.9	9.9	9.2	9.4

Q1b.	Now please give an overall score for the following aspects:				
		Reading (16)	Edinburgh (16)	Wrexham (17)	Overall average (49)
	How useful the homework was in developing your thoughts and opinions on space weather	7.6	7.4	8.9	8
	The accompanying website / forum ( <i>Reading: 9 had used it, 7 had not; Edin: 7/9; Wrex: 14/3; Overall: 30/19</i> )	7.6	6.4	8.9	7.6
	Having sufficient information to enable you to make an informed contribution on how much money / resource	7.8	8.1	9.4	8.4
	Creating an atmosphere where you felt your discussions were important, and your views were valued and welcome	8.9	9.0	9.8	9.2
	How well the structure worked i.e. a shorter evening session followed by a full day	8.9	8.3	9.8	9

Q2.	Thinking about the following sections of the workshop on Saturday, please circle one answer:					
	The 'Mitigation Options' discussion / presentation immediately after lunch	I found this very hard to understand	I found this fairly hard to understand	I found some bits harder/easier	I found this fairly easy to understand	I found this very easy to understand
	Reading (16)	-	13%	56%	25%	6%
	Edinburgh (16)	-	6%	50%	25%	19%
	Wrexham (17)	-	-	29%	41%	29%
	Overall average (49)	-	6%	45%	30%	18%
	The 'Priorities Game' where you had to distribute counters to different options	Very hard to make decisions between options	Fairly hard to make decisions between options	I found some decisions hard and some easy	Fairly easy to make decisions between options	Very easy to make decisions between options
	Reading (16)	-	25%	31%	31%	13%
	Edinburgh (16)	-	13%	50%	25%	13%
	Wrexham (17)	-	-	12%	41%	47%
	Overall average (49)	-	13%	31%	32%	24%

Q3.	Please circle one answer for each of the following statements.							
		Strongly Disagree	Tend to Disagree	Neutral	Tend to Agree	Strongly Agree	Don't Know	
	I learned something new as a result of taking part	Reading (16)	-	-	-	38%	63%	-
		Edinburgh (16)	-	-	-	13%	88%	-
		Wrexham (17)	-	-	-	6%	94%	-
		Overall average (49)	-	-	-	19%	81%	-
	I enjoyed the events	Reading (16)	-	-	13%	31%	56%	-
		Edinburgh (16)	-	-	-	25%	75%	-
		Wrexham (17)	-	-	-	6%	94%	-
		Overall average (49)	-	-	4%	21%	75%	-
	I am now actively worried about a space weather event	Reading (16)	13%	6%	56%	19%	6%	-
		Edinburgh (16)	13%	27%	20%	33%	7%	-
		Wrexham (17)	18%	35%	18%	29%	-	-
		Overall average (49)	14%	23%	31%	27%	4%	-
	Space weather is an issue the public should be consulted on	Reading (16)	-	13%	25%	44%	19%	-
		Edinburgh (16)	-	-	-	31%	69%	-
		Wrexham (17)	-	-	6%	41%	53%	-
		Overall average (49)	-	4%	10%	39%	47%	-
	I can see the benefit that policy-makers will get from seeking our opinions by using events like these	Reading (16)	-	-	19%	50%	31%	-
		Edinburgh (16)	-	-	-	44%	56%	-
		Wrexham (17)	-	-	6%	18%	77%	-
		Overall average (49)	-	-	8%	37%	55%	-
	It is clear how the results of these events will be used	Reading (16)	-	-	38%	63%	-	-
		Edinburgh (16)	-	6%	44%	31%	13%	6%
		Wrexham (17)	-	-	18%	29%	53%	-
		Overall average (49)	-	2%	33%	41%	22%	2%
	I am confident that these events will influence how the government determines budgets and actions to do with space weather	Reading (16)	6%	6%	38%	31%	13%	6%
		Edinburgh (16)	-	6%	50%	25%	13%	6%
		Wrexham (17)	6%	-	29%	47%	17%	-
		Overall average (49)	4%	4%	39%	34%	14%	4%
	I would recommend taking part in events like this to others	Reading (16)	-	-	-	31%	69%	-
		Edinburgh (16)	-	-	-	38%	63%	-
		Wrexham (17)	-	-	-	18%	82%	-
		Overall average (49)	-	-	-	29%	71%	-

Q4.	Please give the following a score out of 10 (0 = extremely disappointed; 10 = very satisfied)				
		Reading (16)	Edinburgh (16)	Wrexham (17)	Overall average (49)
	Overall, how satisfied you were with the experience of the event as a whole (all three sessions combined)	8.9	9.1	9.9	9.3

**Event 3:**

Q1.	Please give the following a score out of 10 (0 = very poor; 10 = excellent) – Base: all (18)	
		Overall average
	The venue	9.8
	Setting out the objectives for this third workshop (i.e. its purpose in addition to the 2 events that you attended previously)	8.8
	Time to engage with the policy makers and scientific experts in the room	8.9
	Feeling comfortable giving your opinion among the policy makers and scientists in the room and feeling listened to	9.6
	The facilitator giving everyone the chance to have their say / not allowing anyone to dominate the discussion	9.5
	Please give an overall score for the day	9.7

Q2. Thinking about how the event today added to the discussions that you had in the two previous events, which of the following positions do you think is more accurate? Please circle one of the numbers along the scale (1-5) that is closest to your view, and tell us why in the box below. Base: all (18)				
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 45%;"> <p>I'm not clear what this event added over and above the previous events – we covered similar ground and topics without developing them further</p> </div> <div style="width: 10%; text-align: center;"> </div> <div style="width: 45%;"> <p>There was a clear progression from the previous events – we discussed new topics and developed the discussion points from the previous events</p> </div> </div>				
-	N = 1	N = 2	N = 11	N = 4

Q3. Thinking again about the event today, which of the following positions do you think is more accurate? Please circle one of the numbers along the scale (1-5) that is closest to your view, and tell us why in the box below. Base: all (18)				
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 45%;"> <p>The event today felt more like it was more about the researchers and policy makers finding out our views; and less about having a two way discussion</p> </div> <div style="width: 10%; text-align: center;"> </div> <div style="width: 45%;"> <p>The event today felt more like a two way dialogue and discussion between participants and policy makers; not just about them finding out our views</p> </div> </div>				
-	-	N = 5	N = 7	N = 6

## **5. Online board - initial questions**

### **First batch of questions – general reflections**

1. You've now had a few days since you attended the events. What are your main reflections looking back at the process? This can be anything at all, but please try to be as detailed in your answers as possible.
2. What do you think of the approach of having two events with a gap in between?
3. Overall, do you think that the events were too long, too short or about right?
4. What did you think of the break-out sessions when you were discussing the issues in smaller groups?

[4b. Specific prompt on whether everyone talked equally or some people dominated – and, if so, how the facilitator handled it?]

### **Second batch of questions – speakers, hand outs and information**

5. What did you think of the presentations?
6. Did you feel you were able to get answers to key questions that you had about shale gas and oil?
7. What did you think of the hand-outs?

[7b. specific follow up prompt about whether they were pitched at the right level in terms of the language and facts/figures they used]

8. Do you think there was enough input from different perspectives e.g. scientific/technical?

[8b. Specific follow-up prompts about how useful they found the talking heads/audio clips in the presentations]

9. One or two participants told us that the events felt like DECC were trying to 'sell the benefits' of shale gas and oil; others disagreed and said that the quotes from different organisations/perspectives showed that all sides of the argument were being put forward. What did you think about the balance of information?

### **Final batch of questions - how the findings will be used**

10. At the final event the main exercise involved each group coming up with their own process for how local communities should be engaged about shale gas and oil; and this was then fed back to the other teams and to DECC attendees. How did you find this approach?
11. How confident are you that what people said in the events will make a difference to how communities are engaged about shale gas and oil?
12. What are your views on the value of public participation in these sorts of topics?
13. Is there anything else that you would like to add that we didn't cover in these evaluation questions?

## 6. Interview guide for discussions with stakeholders

### Introduction

- Interviewer to introduce themselves and Icaro.
- Aims of evaluation: independently evaluating STFC's public dialogue on space weather – learning what went well, what could be improved, and contributing to increasing the wider effectiveness and use of public dialogue. Also keen to identify any immediate impacts on policy or people that have already appeared or that can be flagged up as potential impacts in the near future.
- Confidential: their name won't appear anywhere; any quotations will be anonymised.
- Interview will last around 30-60 mins.
- Permission to record; explain you'll be making notes throughout – for our memories only!
- Any questions before we start?

### Module 1: Background to them and their involvement

- Describe Role
- How and when they got involved in the dialogue
- What their involvement is/has been

### Module 2: STFC's decision to undertake public dialogue

- [STFC only] Where did the idea for public dialogue come from?
- [STFC only] How much support did the idea receive internally? What about the engagement approach prompted enthusiasm or concern?
- [STFC only] What made you take the idea forward? What were you hoping it would achieve?
- [Other stakeholders] Why do you think STFC decided to undertake a public dialogue on this issue?

### Module 3: The Oversight Group (OG members only)

- What has your role on the OG been?
- How did you first get involved? Were you involved at the right time – both initially and throughout the project?
- [STFC only] How was the OG selected? Why this membership? What did you hope the OG would achieve?
- [Other stakeholders]: Why did you/your organisation decide to become involved in the OG and this project?
- How well has the OG functioned? PROBE ON: right membership? Opportunity to add value? Effectiveness of the communication to the group? Extent to which the OG influenced the project?
- What about it has worked well and not as well as hoped? How could it have been improved?
- Did you have an opportunity to comment on/contribute to:
  - o The research objectives
  - o The recruitment for the dialogue
  - o The presentations and stimulus materials
  - o The design of the multi-stage process
  - o The structure/topic guide for individual dialogue sessions
- [STFC only] How important was the funding from Sciencewise? Would you have done the project anyway, without that funding? How did you find the support from Sciencewise? How did the support they give you make it a better project (or not)? Was there anything else you would have liked Sciencewise to provide?
- [Sciencewise only] How have you found working with STFC on the project?



## Module 4: The dialogue process

- Do you have any prior experience of public dialogue?
- What are your overall impressions of the dialogue process?
- What worked well?
- What didn't work as well?
- And thinking now about specific elements, what did you think of...? [NB. depending on whether they attended or not] [PROBE on specific aspects. For each ask: (i) What worked well and why? (ii) What worked less well and why? (iii) If it worked less well, how could this aspect have been improved?]
  - Recruitment
  - The multi-stage dialogue process and time in between the sessions
  - Venues
  - The structure of the sessions overall i.e. education followed by discussion
  - The stimulus material (Probe: accessibility and quantity of information, and how it was presented and used in the events)
  - Expert speakers (e.g. scientists and video clips). Probe: accessibility and quantity of information; how were they decided? Range of speakers; time for participants to ask questions)?
  - The two break out groups
  - Establishing / setting out the objectives for participants
  - The amount of interaction between public participants and stakeholders
  - If the sessions were sufficiently creative/included enough variety to maintain participants' attention.
  - Would they have suggested anything different in terms of how the events were designed?
  - Clarity about how, where and by whom the dialogue results would be used
- ASK IF ATTENDED: What, if anything, surprised you about how the dialogue went? What did you think of the quality of the questions, debate etc. among public participants and the quality of their contribution throughout?
- ASK IF DID NOT ATTEND: What, if anything, surprised you about the findings you've heard about so far?
- How was the approach different from other options that could have been used, e.g. focus group research? What additional benefits were gained from this approach? And any additional challenges?
- What are your thoughts on running future dialogues? When would they be most appropriate? When do you think they would not be appropriate?
- [STFC only]: Would you recommend a dialogue process to others? What advice would you give to other organisations considering public dialogue?
- Did you feel the dialogue process overall was sufficiently credible for you to be able to use the results with confidence in making future decisions? What added to or reduced that credibility?
- The project had financial costs. At this stage, do you think that it was money well spent, or not, and why?

## Module 5: Impact

- What are your reflections on the dialogue report?
- [NON STFC only] What impact do you think the project has had on STFC so far, and may have in future? And your own organisation?
- How easy is it/will it be to convert the findings/views from participants into your work? What have the findings shown that is different to what you thought before or completely new? Are there any particular insights from the project that you will remember as particularly valuable?
- What tangible things can you see coming as a direct result of the dialogue that hadn't / couldn't happen before?
- [STFC only] - How will the findings be circulated? And to who?
- [STFC only] - What are the plans for feeding back to the participants about the influence of their input?

- [STFC only] - What are STFC going to do next based on the results of the project - both in terms of work on space weather and on public dialogue / engagement?
- What have you personally learnt about using dialogue processes?
- What do you think has been most special and interesting about this dialogue project overall?

## Wrap Up

Thank you for your time today and your contribution to this evaluation: we really appreciate your input. Before we close, is there anything we haven't covered so far that you think it is important for STFC and its partners to understand about the dialogue?

