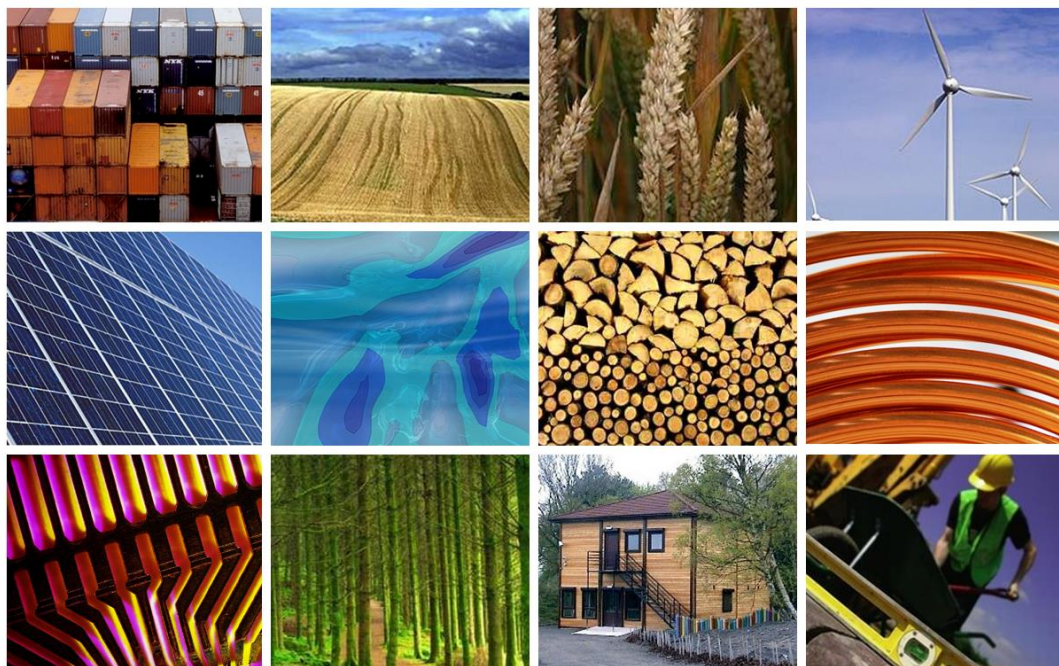


Department of Energy Security and Net Zero (DESNZ)
and UKRI Sciencewise

Evaluation of a Public Dialogue on Biomass and BECCS

Final report

October 2023



Quality Management

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Glossary and Acronyms

ADBA	Anaerobic Digestion & Bioresources Association
Biomass	A resource which originates from plants or animals which can be used for producing bioenergy or materials
BECCS	Bioenergy with Carbon Capture and Storage
BEIS	Department for Business, Energy and Industrial Strategy
Bioenergy	Energy extracted from biomass
Carbon negative	Removal of more CO ₂ from the atmosphere than a process produces
Carbon neutral	A process which adds no net CO ₂ to the atmosphere because the process removes the equivalent to what it produces
CCS	Carbon capture and storage is a technology that stops greenhouse gases entering the atmosphere typically involving capture of CO ₂ emissions and piping it to offshore underground storage sites for permanent storage
CCC	Committee on Climate Change
DACC	Direct air carbon capture
DESNZ	Department of Energy Security and Net Zero
EfW	energy from waste
ENGO	Environmental non-governmental organisation
GHG	Greenhouse gases
GGR	Greenhouse gas removal technologies
Net Zero	NZ - a balance between carbon emissions entering the atmosphere and carbon emissions being removed from the atmosphere
PAT	Public Attitudes Tracker
OG	Oversight Group
REA	Rapid Evidence Assessment

Executive summary of an independent evaluation of a public dialogue on the role of Biomass and BECCS in reaching Net Zero

This evaluation is of a public dialogue commissioned by the Department of Energy Security and Net Zero (DESNZ, previously the Department for Business, Energy and Industrial Strategy (BEIS)) and co-funded and supported by the UKRI Sciencewise programme. The dialogue was designed and delivered by NatCen in collaboration with Economica.

Context

The Government's [Net Zero Strategy for 2050](#)¹ (October 2021) demonstrated that biomass and bioenergy with carbon capture and storage (BECCS) has a role to play in achieving net zero (NZ). BEIS was tasked with developing a biomass strategy by late 2022 to set out how this could be achieved. A call for evidence on biomass in 2021 and BEIS's regular Public Attitudes Tracker (PAT) showed that many members of the public broadly support the Government's NZ goals but know little about biomass in general and BECCS in particular: and that once they learn more about BECCS they tend to have concerns over its effectiveness for addressing climate goals and its overall sustainability. BEIS therefore wished to commission a public dialogue that would deepen their understanding of the public's hopes and concerns and help to inform the drafting of the biomass strategy.

Dialogue aims and approach

- The dialogue was framed within the wider context of NZ and the challenges in decarbonising the power, transport and certain industrial sectors. In order to have maximum policy impact, the work was commissioned to deliver findings by Autumn 2022 in time to feed into cross-departmental priorities for the biomass strategy.
- The dialogue process brought together about 105 members of the public (of whom 95 attended all five online Zoom workshops held on weekday evenings over a five week period in June and July 2022). The participants were recruited from across the country to be broadly reflective of UK demographics: a third of individuals also brought lived experience as members of communities close to an area producing or using biomass.
- The dialogue report² was published alongside the Government's Biomass Strategy³ on 10th August 2023. Due to a number of events (the Ukraine war, the ensuing energy security and cost of living crisis, and political upheaval in 2022) both publications were delayed.

Dialogue impacts

- The dialogue findings were presented to policy makers at a cross-Whitehall webinar in February 2023. Some 38 policy makers with biomass related interests attended, ensuring that, although the report had not been published, key messages were heard in relevant DESNZ policy areas (energy security, NZ, innovation and industry) and elsewhere in Government (business, trade and agriculture). The involvement of a number of BEIS

¹ HM Government, Net Zero Strategy: Build Back Greener, October 2021.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

² <https://www.gov.uk/government/publications/role-of-biomass-in-achieving-net-zero-public-dialogue>

³ HM Government, Biomass Strategy, August 2023. <https://www.gov.uk/government/publications/biomass-strategy>

officials (at the time) as observers at the public workshops also helped ensure that they heard messages directly from the public while drafting.

- BEIS/DESNZ departments (energy security, NZ, innovation and industry) and elsewhere in Government (business, trade and agriculture). The involvement of a number of BEIS officers as observers at the public workshops also helped ensure that they heard messages directly from the public while drafting.
- The [gov.uk biomass strategy web page](#) includes a link to the dialogue report and references to the process and the key findings can be traced as a clear thread throughout the strategy. The dialogue report is cited within footnotes and the introductory chapter and in subsections within most of the following chapters. The process the participants went through, and the values, hopes and concerns they expressed about specific aspects of biomass are clearly described. The overall message that most participants felt biomass has a role to play in net zero, but that they had real concerns about how this could be delivered with strengthening sustainability considerations comes through strongly.
- Chapters in the Biomass Strategy on sources of biomass (3), end uses (5) and BECCS (6) describe participants' views on whether the application seems sensible, feasible or effective in tackling net zero. The real impact of the dialogue is felt in the commitments made to develop a stronger sustainability framework that is applied to all types of biomass including BECCS. There appears to be a strong link between participants' suggestions – alongside evidence from other sources – and the emphasis placed on ensuring that GHG emissions are fully accounted for, that environmental and social impacts are addressed, that verification and monitoring is robust and transparent and that more information is provided on the costs of biomass. The strategy commits to developing this framework, and to consult on the details in 2024.
- However, the long elapsed time between the end of the dialogue and final publication meant that few of the original OG members or wider stakeholders have gone on to share the final report or visibly use the dialogue insights to inform policy or research priorities. A blog and analysis of the biomass strategy shared by the OG chair (www.supergen-bioenergy.net) was picked up by the biomass industry and environment press, although few made mention of the public dialogue.

Key elements which made this a successful dialogue

- **The online format made it feasible to recruit a diverse group of participants** from across the country including those with experience living near existing biomass growing or use sites who enriched discussions and brought issues about local economic, social and environmental impacts onto the agenda.
- **A small, engaged and well chaired Oversight Group** (OG) led by Dr Mirjam Röder of Aston University represented all key perspectives and helped frame the dialogue so it would meet the commissioners' ambitious perspectives.
- **An experienced contractor team, which incorporated general expertise across the NZ and biomass field, helped to deliver a quality process to tight deadline.** Working closely with the commissioner team, having topic expertise within the delivery team enabled a comprehensive set of neutral background materials to be developed within a challenging time frame. An online design workshop brought in the expertise of the wider BEIS team and captured scientific knowledge in key areas (BECCS and sustainability).

- **The structure of sessions ensured that all dialogue objectives were covered but with some compromise between breadth and depth.** In retrospect it may have been possible to consider some areas in greater depth by only asking the 15 small groups to look at a subset of the options (e.g. for sources or uses) within the workshops.
- **The convenient scheduling of workshops (evenings a week apart) and topicality of the NZ discussions kept participants engaged** – their growing interest over the course of small group deliberations helped ensure a very low drop out.
- **A dedicated share site (Engagement HQ) worked well for participants to review background materials after workshops.** Had timetables been a little less constrained, more could have been made of the space for answering questions raised in the sessions, sharing specialist presentations and providing opportunities for individual deliberation.
- **A group of nine specialists (including BEIS officials, academics and representatives of industry and NGOs) were able to fill most gaps and share very different perspectives.** Participants found the range of views really interesting and many would have liked more time to hear from specialists. However, many participants found the 'grey' areas of uncertainty or apparently confusing evidence about the cost and effectiveness of biomass relative to other options rather frustrating.
- **Some excellent facilitation in small groups created an atmosphere and space for all participants to feel comfortable and share their views.** The simultaneous notes that they took on an interactive whiteboard proved really helpful in structuring the final session so that participants could co-produce a set of principles for how biomass should be developed in the future.

Lessons learnt and recommendations

For commissioners

- Where a dialogue is designed to inform a specific policy process, ensure a realistic timescale – including contingency for slippage in the procurement process – so that findings can have maximum impact.
- Have early discussions on expectations of the final report (format, length, style, editorial voice, how different types of evidence will be used) to help streamline final reporting.
- If there are likely to be delays to the sign-off / publication of a dialogue report, consider other ways in which key messages can be shared with policy audiences. In this case involving the commissioner team as observers at the workshops and running a cross-departmental webinar helped embed key messages in the policy process.
- A carefully chosen smaller Oversight Group can have many advantages: smaller groups can be more easily convened at points in the process where their input will be most useful. In this case a well-briefed vice-chair was also able to step in for a busy chair.
- Consider making the first meeting slightly longer, or face-to-face, to allow space to clarify the role (informing the dialogue not the policy process) and to share insights on contested areas, information gaps and useful materials for sharing with the public.
- Develop an audit system (e.g. a spreadsheet) to collate and track OG comments and demonstrate how they have (or have not) been taken into account.

Design and delivery

- Where a topic is very broad it can be really helpful to include topic experts in the team as 'informants' to prepare and present neutral material: 'Scientists' and 'advocate' specialists can then be recruited to fill identified gaps and introduce a breadth of perspectives.
- If time or budget do not allow for piloting the design and materials with public participants then build in time to test the flow and materials with facilitators or colleagues not involved in the dialogue.
- Try not to rely too heavily on PowerPoints but consider more varied formats such as video or animations.
- Build in time to review specialist presentations to ensure that they are not too dense or technical and leave participants feeling overwhelmed.
- Build some space into the overall workshop timings for participants to follow their interests (in this case exploring how biomass and BECCS might fit alongside alternative approaches to meeting NZ).
- Consider creating a dedicated share site for participants to review information, continue their conversations and to carry out individual deliberation between workshops. Note that this will require staff time for design and moderation.
- Build in sufficient resources for the final reporting stages. Consider whether bringing in fresh eyes (e.g. a final report editor who has not been too closely involved in design or delivery) could help the team stand back from the evidence and add value to the final report structure, narrative and use of evidence.

1 Introduction and context for the dialogue

1.1 Background

This report has been prepared by URSUS Consulting for the Department for Energy Security and Net Zero (DESNZ)⁴– previously Department for Business, Energy and Industrial Strategy (BEIS) - and UKRI’s Sciencewise programme⁵. The report presents the final evaluation findings of the public dialogue on biomass and Bioenergy with Carbon Capture and Storage (BECCS).

The evaluation process has been formative (feeding into the scoping, design and delivery of the dialogue) and summative and involved observing all online stakeholder and public workshops, a policy dissemination event and collecting formal feedback from participants and Oversight Group (OG) members via online surveys.

This report focuses on the impacts of the dialogue on government policy since the dialogue report and UK Biomass Strategy were published in August 2023 (*Chapter 2*). Our evaluation of the inter-related factors which have helped the dialogue meet its objectives is described in *Chapter 3*, while *Chapter 4* summarises conclusions and recommendations for future dialogues based on lessons learnt. Supporting evidence is shown in *Annexes A-E*.

1.2 Policy Context

The Government’s [Net Zero Strategy for 2050](#)⁶ (October 2021) demonstrated that biomass and bioenergy with carbon capture and storage (BECCS), has a role to play in achieving net zero (NZ). This was followed by publication of the [Biomass policy statement](#)⁷ (November 2021) which described the Government’s view of the role that biomass should play in NZ, while noting that biomass is a vital but limited resource. The statement set out principles to prioritise biomass use (e.g. reflecting the waste hierarchy and current and emerging sustainability criteria) and stated that in future, large-scale power biomass will need to be equipped with carbon capture and storage in order to receive Government support. A biomass team within BEIS (now DESNZ) then started work on developing a UK Biomass Strategy – initially planned for late 2022 - to identify the scale of the contribution that biomass can make, including via the use of BECCS. During this time BEIS undertook a [consultation on a proposed business model for power BECCS](#) between April and October 2022, (which built on a previous BEIS [call for evidence on the sourcing and role of biomass](#) (April-June 2021)).

⁴ During February 2023, biomass responsibilities moved from BEIS to the newly established DESNZ

⁵ [UKRI Sciencewise](#) is an internationally recognised public engagement programme which enables policy makers to develop socially informed policy with a particular emphasis on science and technology. Sciencewise helps to ensure policy is informed by the views and aspirations of the public. The programme is led and funded by UK Research and Innovation (UKRI).

⁶ HM Government, Net Zero Strategy: Build Back Greener, October 2021.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

⁷ Department for Business, Energy & Industrial Strategy (2021). Policy paper, Biomass policy statement: a strategic view on the role of sustainable biomass for net zero, November 2021. [Biomass policy statement: a strategic view on the role of sustainable biomass for net zero - GOV.UK](#)

These processes had provided a partial picture of public attitudes to biomass and BECCS: stakeholders’ responses mainly came from industry, academic and environmental non-governmental organisations (ENGOS) rather than the general public and demonstrated the polarised nature of views across the topic and the need for a deeper understanding of the public’s views in contentious areas such as BECCS. Previous public engagement including by the [Climate \[Citizen\] Assembly UK⁸](#) (2020) and BEIS’s previous public dialogue on [Carbon Capture Utilisation and Storage \(CCUS\)⁹](#) (2021) touched on BECCS but not in great depth. However, these processes highlighted that, in general, the more participants learnt about biomass feedstocks and the use of CCUS, the more they were concerned about its sustainability. The [DESNZ Public Attitudes Tracker](#) (PAT) also highlighted that in the context of high levels of overall public support for biomass use (72% in Autumn 2021), there was both limited awareness of CCS and mixed support amongst those who knew of it.

BEIS worked closely with UKRI Sciencewise to develop a business case and commission a public dialogue to understand public attitudes in more depth. The aim was for dialogue findings to be able to inform the drafting of the UK Biomass Strategy (originally intended for publication in late 2022) on a footing with other sources of opinion¹⁰ including technical studies by biomass specialists.

1.3 Public dialogue objectives

The aim was to understand participants’ views on the potential benefits, risks and trade-offs of biomass in achieving NZ. Six objectives were endorsed by the project Oversight Group:

- 1 To engage a diverse group of participants, broadly reflective of the UK public, in topic areas relating to the development of the Biomass Strategy.
- 2 To explore and understand participants' aspirations and concerns in relation to biomass sourcing (both domestic and imports), production and use across the economy.
- 3 To understand what values and perspectives inform participants’ views in order to inform and help refine any future communications and engagement.
- 4 To define conditions of use in relation to sustainability frameworks (including areas such as land, biodiversity, environmental impacts, ecosystem services, emissions and social criteria) to help shape policy development in this space.
- 5 To determine participants’ views of using biomass, particularly through BECCS, as a negative emissions technology in achieving net zero, to inform policy development in this area.
- 6 To help shape other aspects of Government policy and guidance as part of the forthcoming Biomass Strategy and inform future engagement.

⁸ Climate Assembly UK, The Path to Net Zero, September 2020, Report - [Climate Assembly UK](#)

⁹ BEIS, Carbon Capture and Storage CCUS public dialogue, July 2021 [Carbon Capture Usage and Storage](#)

¹⁰ [Analysis of responses to the call for evidence for biomass strategy on the role of biomass in achieving net zero. Department for Energy Security and Net Zero Chief Scientific Advisor’s Task and Finish Group report on BECCS](#)

1.4 Framing and key challenges for the dialogue

Broad scope in the context of net zero

The commissioners were keen that the dialogue should cover biomass in its broadest sense, not just bioenergy (as some OG members had expected) and recognised that this meant participants would need to have access to information about the Government's NZ policy aims and the different approaches - including greenhouse gas removal (GGR) or negative emissions technologies – that would be needed to achieve it. This ambitiously broad scope needed to expose participants to many disparate, but interlinked, issues over the equivalent of just two days of dialogue without overwhelming them. This left very limited space to compare biomass to other better-known renewable energies or alternative CCS approaches (such as forestry and soils).

Reflecting a full range of perspectives on BECCS and sustainability

Previous stakeholder engagement had identified polarised views on biomass and BECCS and the full range of perspectives needed to be heard in the dialogue. The design ensured that the full spectrum of perspectives was involved via a broadly representative OG and pool of specialists (see *Annex B*) and in the information shared with participants. Experts within the contractor delivery team developed and delivered broad based 'neutral' introductions to biomass sources and uses: this was complemented by contributions from academic, government, industry and environmental non-governmental organisations (ENGOS) who could explain the complexity and areas of hot debate (for instance in relation to sustainability criteria for biomass, and BECCS's role as GGR contributor to NZ).

Involving affected people living close to existing biomass sites

Published literature and the PAT survey suggested that those living near existing biomass or CCS projects might hold different views to the wider public about key issues such as the environmental and social impacts of bioenergy and BECCS. The design therefore included a third of all participants who, by dint of their postcodes, were likely to have different views about living near biomass sources or uses.

External factors shaped underlying values

The dialogue took place shortly after the start of the Ukraine war, within the context of a growing cost of living crisis, anxiety about energy security and political uncertainty which culminated in the resignation of the prime minister, Boris Johnson. These factors contributed to the interpretative frames that participants brought to the deliberations.

1.5 Dialogue approach

- The dialogue was designed and delivered by the National Centre for Social Research (NatCen) in collaboration with partners Enomia, specialists in the energy sector, and ran from April 2022 – three weeks later than initially planned – and finished in January 2023. The process was overseen by a 10-person Oversight Group chaired by Dr Mirjam Röder of Aston University (see *Annex B*).

- Participants (about 100) attended online workshops over the course of 12.5 hours split over five weekday evening workshops, a week apart during June and July. They met in two groups of 50 on consecutive evenings.
- Participants were given a broad background in biomass and net zero before considering specific biomass sources, production and uses (including BECCS) and how sustainability is assessed. The final workshop enabled participants to co-produce a set of principles for how biomass should be developed in the future. The methodology is described in detail at *Annex A*.
- The final dialogue report was approved internally by BEIS (DESNZ by that time) officials in February 2023 and the findings were shared at a cross-government workshop in February. The final report was published on 10th August 2023 and is available at [DESNZ](#), [UKRI Sciencewise](#) and [NatCen](#) websites.

2 Potential for Impact

The sixth objective of the dialogue was to have an impact in helping to shape Government policy and guidance as part of the forthcoming Biomass Strategy and inform future engagement. *Section 2.1* summarises the extent to which the dialogue process has been reflected in the Biomass Strategy and future policy, *section 2.2.* summarises potential wider impacts including via other stakeholders, *section 2.3* how far the process has helped build support for public dialogue as a methodology, while *section 2.4* compares the financial costs of the dialogue with potential economic benefits.

2.1 Impacts on Government biomass policy

Dissemination of dialogue findings

- The initial intention was to publish the dialogue report before the Government’s Biomass Strategy (originally due in late 2022) so that the findings could feed into relevant sections of the report. However, due to the impacts of unforeseen events (including the energy crisis resulting from the invasion of Ukraine and political events) both the public dialogue report and the Biomass Strategy were delayed beyond 2022.
- Despite the delay in publication, from autumn 2022 onwards the emerging findings were shared with the OG members at their final meeting, and with biomass related teams within BEIS. Many of the latter had already heard useful messages directly from the public as observers at the public workshops (see *Section 3.2*).
- Key messages were also shared more widely with other interested government departments via a one-hour online webinar hosted by the Cross-Whitehall Biomass Strategy Working Group on the 7th of February 2023 (see *Box 2.1*). The webinar was chaired DESNZ officials with the process described, and key findings shared, by NatCen and Eunomia. The presentation deck was shared with attendees afterwards.

Box 2.1: Dissemination of Findings to policy makers

- The webinar was well attended (38 of 90 invited policy makers) with representation from relevant teams within DESNZ (including those working on Net Zero, Energy and Security, the Net Zero Innovation Programme, Science and Innovation) and experts on bioenergy, industry, CCS and hydrogen.
 - Other key departments with biomass-related interests were also represented including Defra (food waste, land use, bioenergy crops), Business and Trade, Transport and Levelling Up, Housing and Communities.
 - While welcoming the high level findings, questions mainly related to how far public participants had been able to delve into the complexities, risks and trade-offs around specific applications (such as waste incineration with energy recovery or BECCS). Attendees recognised that there had necessarily been a trade-off between depth and breadth of coverage in the time available. They also appreciated that despite the political and economic context in which the dialogue took place, participants had been able to develop nuanced views on the role of biomass in NZ.
- The session allowed enough time for attendees to ask questions and all those who commented praised the findings as “*interesting*” and “*reassuring*.” Many seemed to find the participant journey described - from initial high hopes for biomass as a silver bullet for NZ to growing concerns as they grasped the complexities and trade-offs for each source and use – resonated with what they had heard elsewhere. Many found the breadth of findings added nuance to previous consultations and the BEIS PAT Survey,

even if the discussions had not been able to go into the depth they were interested in for specific sources or applications.

Key findings are threaded through the UK biomass strategy

- The DESNZ biomass team have made great efforts to ensure the dialogue findings are visible throughout the strategy document as illustrated in *Figure 2.1*. The dialogue report is listed alongside other types of evidence with a direct link to the report on [gov.uk website](https://www.gov.uk).
- There are prominent references in the foreword and introduction – which describe the process, confirm the importance of the dialogue, and highlight overall support for biomass to achieve NZ, but with widespread scepticism about sustainability and the need for further work to demonstrate the benefits.
- Chapters 2-7 which deal with different aspects of biomass each describe how the dialogue participants discussed the issues and their hopes and concerns for different sources and uses. Dialogue findings have been considered alongside stakeholder opinions and more technical analysis published at the same time.¹¹ The exception is the chapter on air quality which does not explicitly mention the dialogue but does focus on issues highlighted by those with lived experience of living near biomass facilities.
- There are clear links between dialogue messages and commitments and key messages contained within each chapter. This is most evident in chapters on sustainability (2) and on BECCS (6). For instance, there is a strong link between participants’ suggestions about aspects of sustainability that they did not feel were fully covered and the proposed principles for taking forward biomass in general. Chapter 2 notes that "*these [sustainability] concerns are understood by policy makers and are one of the reasons we have focused on the robustness of our sustainability criteria.*" The proposed areas for improvement in a new and improved sustainability framework include coverage of social and land use impacts, GHG accounting and monitoring and verification – all areas that participants felt the existing sustainability criteria are lacking.

Potential influence on how biomass is developed over the next few years

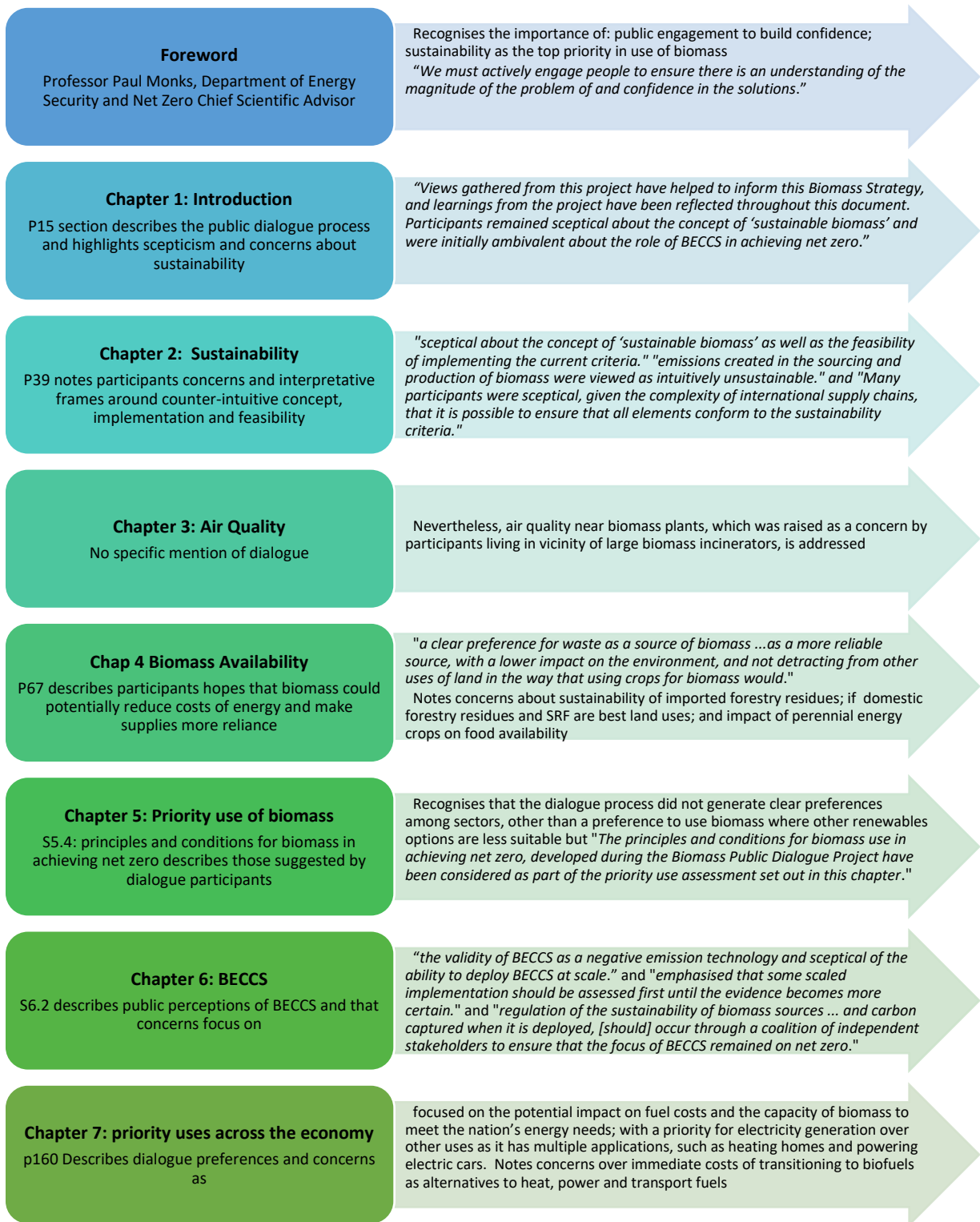
"We are committed to maintaining a strict approach to biomass sustainability and are planning to consult on a sustainability framework to support this approach." Foreword, Minister of State for Energy Security and Net Zero, Graham Stuart

"It is imperative that biomass is sourced and used sustainably. This requires clear criteria for what constitutes sustainable biomass and implementing robust monitoring, verification, and reporting processes..... There is a need, as laid out in this strategy, to review and further strengthen the criteria." Foreword, Professor Paul Monks, DESNZ Chief Scientific Advisor

Table 2.1 summarises how the key messages from the public dialogue, as set out in the executive summary, have been addressed in policy statements in the Biomass Strategy. A key theme running through the strategy is the commitment to develop and implement a cross-sectoral common sustainability framework, subject to consultation in 2024.

¹¹ Modelling of biomass availability, Carbon Budget 6 analysis (CB6) and UK TIMES modelling of the UK energy system

Figure 2.1: How the dialogue findings are reflected in the UK biomass strategy
(direct quotes shown in *italics*)



The text in Chapter 2 makes it clear that participants' views have helped inform this - alongside other stakeholders. Commentary in the environmental press and Private Eye (see *Table 2.1*) stress that participants' concerns about how BECCS can be developed as a cost effective option for GGR, given their concerns about sustainability is "*a particular reason why much of the biomass strategy focuses on sustainability.*" | Carbon Brief.

Table 2.1: How the key messages from the dialogue are reflected in emerging policy

Key messages in dialogue executive summary	How messages are reflected in policy commitments
<p>The majority felt that biomass and BECCS should play some role in achieving NZ driven by a desire to do everything possible, but with fewer participants feeling this should be a big role by the end than at the beginning</p>	<ul style="list-style-type: none"> Recommendations and commitments throughout recognise the need for further work to refine the sustainability criteria, demonstrate benefits and address areas of uncertainty. A key message is that uses that provide the greatest GHG emissions savings, compared to alternatives, should be prioritised.
<p>Interpretative frames underly views:</p> <ul style="list-style-type: none"> The concept (and whether it is counter-intuitive) Implementation (concerns about feasibility and profit motives vs NZ needs) Impact (uncertainty about GGR performance and whether BECCS is yet feasible at scale). 	<ul style="list-style-type: none"> Participant's scepticism about the concept of sustainable biomass is recognised in key chapters: "<i>emissions created in the sourcing and production of biomass were viewed as intuitively unsustainable</i>" and that "<i>participants wanted a mix of organisations regulating private companies to ensure the focus remains on net zero.</i>"
<p>Clear preferences for waste over other sources (perennial energy crops, forestry residues, and marine sources) because it is seen as more reliable, a simpler process, with lower environmental impact and less trade-offs with food and other land uses</p>	<ul style="list-style-type: none"> A key message (chap 4) recognises concerns and future uncertainties about both domestic and imported biomass and that "<i>In developing policy that directly or indirectly touches on biomass availability and use, government will also take into account matters that are of concern to the public including impact on the environment and need for robust evidence base to support decision making.</i>" Highlights the role of the Biomass Feedstocks Innovation Programme in funding ideas to address UK production barriers but that "<i>we are determined that this will not compromise government's Food Strategy goal of maintaining food production or our ability to meet our Environment Act targets.</i>"
<p>Concerns over current sustainability criteria, including whether woody biomass can be sustainable (across long supply chains for imported wood chips, whether CO2 emissions include the whole lifecycle, and concerns about self-monitoring by private companies and potential social impacts)</p>	<ul style="list-style-type: none"> Sustainability (Chap 2) notes: "<i>These concerns are understood by policy makers and are one of the reasons we have focused on the robustness of our sustainability criteria.</i>" Foreword notes: "<i>No easy solutions to the decarbonisation challenge. As we progress towards net zero, we must prioritise low regrets options that allow us to move forward effectively and quickly. Placing sustainability as our top priority when utilising biomass will support this approach.</i>" A key commitment is "<i>to develop and implement a cross-sectoral sustainability framework, subject to consultation...which we intend to publish in 2024.</i>" Which will include building on existing sustainability criteria, and touch on GHG accounting (e.g. to cover CO2 from the whole supply chain from growing, through processing and transport), land use, social impacts and developing appropriate governance mechanisms to deliver needs for increased data transparency and accessibility.
<p>Preferences for different uses incl. BECCS Ambivalence about the role of BECCS in NZ. While there seemed to be few other alternatives for large scale removal of carbon, participants were not clear that BECCS is ready for implementation at scale, that GHG emissions</p>	<ul style="list-style-type: none"> Only supporting capture and storage of biogenic CO2 emissions generated from sustainable biomass meets clear, enforceable, and transparent sustainability criteria Net GGR based on full life cycle assessment, irrespective of where in the supply chain emissions occur BECCS should provide valuable, low carbon co-products or services alongside GGR to maximise the materials' use

<p>are fully accounted for or that it is effective or safe.</p>	
<p>Principles and conditions that participants saw as foundational to future biomass policy included:</p> <ul style="list-style-type: none"> • cost and financing • feasibility and evidence base • accountability, transparency, and trust • minimising local, national and negative global impact on the environment • prioritising natural resources • impact on society 	<p>States that: <i>"the principles and conditions for biomass use in achieving net zero, developed during the Biomass Public Dialogue Project have been considered as part of the priority use assessment."</i></p> <ul style="list-style-type: none"> • Includes a key message that: <i>"In developing policy that directly or indirectly touches on biomass availability and use, government will also take into account matters that are of concern to the public including impact on the environment and need for robust evidence base to support decision-making."</i> • The cross-sectoral sustainability framework will cover environmental & social impacts, accountability, transparency.
<p>Providing more information to raise public awareness of biomass and BECCS including:</p> <ul style="list-style-type: none"> • How it might be implemented as a sustainable energy source • How biomass use may influence everyday lives • Potential costs of using biomass and impacts on UK consumers • Monitoring and reporting on biomass contribution to NZ against transparent performance indicators (incl against other renewables) • Use of trusted information providers outside the Government 	<p>Commitments to further develop the evidence base to address some of these gaps include:</p> <ul style="list-style-type: none"> • Ongoing work to support BECCS, including the development of new business models underpinned by clear guidance and principles for GGRs and BECCS. • publishing the updated Global Bioenergy Resource Model used to develop the strategy. • Continuing to build a robust evidence base for biomass uses across different sectors and technologies in order to support optimal policy choices to achieve NZ and energy security targets.
<p>Continue the dialogue started here, between policy makers and the public, in different forms and to influence ongoing decision making.</p>	<p>Commitment to public consultation on the new sustainability framework (2024) and to <i>"set out next steps, based on the consultation, for implementing a common sustainability framework in the Government response."</i></p> <p>Detailed processes, such as review of electricity market arrangements (REMA, Autumn 2023), will explore public support for market reforms to encourage BECCS</p>

Other important policy commitments which reflect on the participants’ concerns are to prioritise uses that will provide the greatest GHG emissions, to develop the evidence base and business models for BECCS and other biomass applications, and to only provide public support to biomass power that employs long term, safe CCS and meets key principles on sustainability including counting GHG emissions from across the supply chain, regardless of the sources. These principles largely reflect the dialogue participants’ principles for future biomass development. The biomass strategy foreword underlines that such principles will be an important element in increasing transparency and building the trust which is vital for public acceptance.

The dialogue findings underlined that participants considered waste as the priority source of domestic biomass. Government regulations on the waste hierarchy are likely to increase the volume of food waste being used for biomaterials and bioenergy. The participants’ preferences for using waste as a biomass source are echoed in Defra’s Food Waste hierarchy¹² which includes using food waste as biomaterials, for anaerobic digestion and for energy from waste (EfW).

¹² Defra, Statutory guidance, Food and drink waste hierarchy: deal with surplus and waste

2.2 Potential for wider impacts

Many organisations welcomed the publication of the biomass strategy publication. Those that are largely positive (the biomass industry)¹³ and more critical (environmental organisations) described it as '*long awaited*.' A blog and analysis of the biomass strategy, which highlighted the role of the public dialogue, was shared by the OG chair at [Supergen bioenergy net](#) and this was picked up in the specialist press, although only a few sources (Carbon Brief, Biomass Connect) made mention of the public dialogue (see *Table 2.2*). Probably largely due to its publication during summer recess in the middle of August, neither the biomass strategy nor the public dialogue have attracted much broader press coverage. The exception has been Private Eye which picked up on the participants' concerns about BECCS.

The long elapsed time between the final OG meeting (where findings were shared) and final publication of the dialogue report has also meant that few OG members responded to requests for evaluation interviews: there is also little evidence that they have actively disseminated the report or its findings since publication. There is therefore limited evidence of the dialogue findings impacting on wider research priorities in academic or industry circles, although OG members suggest potential future impacts:

- The OG chair considered that the findings about principles for biomass development, the implied hierarchy of preferences for uses, and about the sources of information considered trustworthy by participants will help to inform Aston University and the Supergen Bioenergy Hubs research priorities.
- The six principles are also likely to prove useful to developers in talking to local communities as they develop biomass sources and production facilities in the future.

2.3 Building support for public dialogue methodologies

Within DESNZ and other stakeholders

The DESNZ public dialogue managers reported that the biomass team has gained useful insights into the potential benefits of using public dialogue as a research method. The online delivery approach created many opportunities for relevant departmental staff to take part as silent observers in one of the 10 workshops and this is likely to be a contributing factor in increasing support for public dialogue and the rich insights it can generate in a complex and contentious area. However, it is not yet clear whether the further consultation on the sustainability framework referenced in the biomass strategy will involve public dialogue or more quantitative approaches.

The biomass team intend to share the lessons learnt from running this public dialogue more widely.

Updated April 2023 <https://www.gov.uk/government/publications/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste>

¹³ [Drax given biomass boost but support comes with strings attached – City AM](#); [UK Govt releases Biomass Strategy 2023; outlines key role for Net Zero – Gas World](#); [Government's biomass strategy 'must lead to deliverable policies' on net zero – Facilitate Magazine](#); [UK Biomass Strategy looks to reduce wood pellet reliance – Environment Journal](#)

Table 2.2: Dissemination of the dialogue report and findings by other stakeholders

Organisation	References to the public dialogue process or findings
Twitter press announcement of publication	<ul style="list-style-type: none"> • Sciencewise 18.8.2023 -bit.ly/45agxqp reposted by NatCen, Involve and Dr Mirjam Röder (OG Chair) 22.8.2023 bit.ly/3YxXjJ4 • @mattadamw, Senior Advocate @NRDC 11/8.2023 " <i>Public Dialogue document contains some very telling comments from the public about their concerns on biomass.</i>"
Supergen-bioenergy net blog, Aston University Blog on context and comment on the UK Biomass Strategy cited the dialogue and included a link to report	<ul style="list-style-type: none"> • Dr Mirjam Röder (OG Chair) " <i>We need rigorous approaches to sustainability governance that go beyond emissions. Considering wider environmental, social and economic trade-offs is essential for true sustainability and building trust in bioenergy projects.</i>" • Supergen blog picked up and referred to by Carbon Brief (see below) and by other outlets, although most did not mention the public dialogue.
Biomass Connect, blog 10.8.2023	<ul style="list-style-type: none"> • Professor Iain Donnison (IBERS and Biomass Connect project management team) made indirect reference to public views: • " <i>given the public concern about the sustainable sourcing of biomass, it is important that the strategy has covered the need for robust criteria for monitoring, verification and reporting of biomass supplies whether they are produced domestically or imported.</i>"
Carbon Brief, What does the strategy mean for net zero? blog 18.8.2023	<ul style="list-style-type: none"> • " <i>within the public dialogue on biomass – commissioned by the government in collaboration with the UK Research and Innovation's Sciencewise – participants said they were sceptical about the concept of "sustainable biomass", as well as the feasibility of implementing the current criteria.</i> • " <i>Participants within the biomass public dialogue expressed a clear preference for waste as a source of biomass as they saw it as a more reliable source, with a lower impact on the environment, which does not conflict with other uses of land.</i>" • " <i>The strategy highlights that public perceptions of BECCS focus on its validity as a negative emissions technology, as well as scepticism over the ability to deploy BECCS at scale. This is a particular reason why much of the biomass strategy focuses on sustainability.</i>"
Private Eye No 1605 25 August – 7 September 2023 p13	<ul style="list-style-type: none"> • Notes the contrast between Government support for BECCS as a CO2 removal technology and public participant scepticism: • " <i>Refreshingly ...Joe Public does. Unusually for such a strategy exercise, ministers didn't go out to consultation with expert stakeholders, instead organising a 'public dialogue' plus questionnaire. Records from those exercises show that the truth is widely known. And tellingly, it turned out that 'to consider biomass to be sustainable, participants repeatedly stated that it should generate an overall reduction in emissions.'</i>

Amongst the public participants

Feedback from public participants summarised in *Box 2.1* (and shown in detail at *Annex E*) indicates that they found being part of the process a satisfying experience. As their journey through the dialogue progressed initial hopes for biomass as a silver bullet for NZ were pared back as they were able to negotiate with each other and the information they heard from specialists. Participants gradually became confident that they were making a meaningful contribution and being listened to by policy makers who would be willing to act on their advice. This was a considerable achievement against the backdrop of the energy

crisis and upheaval in government, and an endorsement of the quality of the process, the visible role played by commissioners, and their openness to seeking public input to decision-making. A typical view was that: *"I really enjoyed it, it felt good to be involved in something this important and I really loved being informed on the pros and cons of biomass, it was a really interesting discussion."*

Box 2.1: Public support for public engagement in biomass policy making

- Most participants were aware of and interested in net zero but very few started off knowing about biomass. Many welcomed the chance to learn more about what felt like an important topic.
- Many relished the opportunity to exchange views with people from different places and backgrounds and particularly enjoyed hearing from those with 'lived experience' of biomass.
- The vast majority of participants reported found it important for the public to be involved in this type of policy decision and valued the chance to be part of a deliberative democratic process:
"I enjoyed the process. It felt like an important discussion to be part of."
- Despite the uncertain political context in which the dialogue was taking place, by the end of the process two thirds of participants felt confident that BEIS would take their opinions into account in drafting the Biomass Strategy.
"[valued] feeling heard and that my opinions mattered and would be taken into account."
- Others are keen for this to be part of an ongoing public engagement process:
"A more continuous dialogue beyond the 5 sessions which should serve as an introduction to everyone, but the hard work should start now and must involve the public, not government."
"Moving forwards I would advocate that this is a requisite course of action."
- A few participants also expressed an interest in continuing to be actively involved in this policy process through signing up to relevant bulletins, newsletters or in next stages of public engagement:
"It was great to have been selected to enable me to air my views and find out about biomass. I would be willing to help with any follow up project."
- A number of participants also valued the opportunity to continue these discussions in their daily lives:
"I got really into it and [became] so interested that I was researching in my own time." "I feel I can now continue the discussion surrounding net zero with my circle of friends. This will impact us all!"
"Made me think about the issue and look up information on the internet, etc."
"I look forward to seeing more public debate on the subject of achieving net zero in general."

2.4 Comparing the dialogue costs and potential benefits

Costs

The overall financial budget for this dialogue was £171.1K including design and delivery (including desk research, recruitment, thankyou incentives for participants, design of materials, facilitation of small groups, data analysis and reporting) and the independent evaluation. The costs of the dialogue were shared between UKRI Sciencewise (£103.6K) and BEIS (£67.6K). BEIS also made an in-kind contribution of £36K in officials time. The time contributions made by members of the OG (about 15 days), stakeholders and specialists (about 5 days) in reviewing or preparing materials and attending online meetings contributed an estimated additional £10K of in-kind contributions.

Potential economic benefits

The benefits of taking the dialogue messages into account are likely to far outweigh the financial costs of this process, but it is too early to estimate the scale of benefits. This will depend on how far commitments made in the biomass strategy to strengthen the sustainability framework across all types of biomass and fill current gaps in background information on BECCS are delivered over the next few years. If the next stage of DESNZ's

work is able to develop a robust sustainability framework and governance arrangements, and make public more information about the costs and performances of biomass in general and BECCS in particular, this could go a long way to addressing the wider public's concerns about the feasibility and sustainability of BECCS, so improving trustworthiness and belief in the role that BECCS could play in achieving net zero.

This will be important since the Climate Change Committee's scenarios for NZ all envisage a growing role for biomass (from its current 11%¹⁴ share of electricity generation) as a means of providing a base load and levelling out variable renewables supply to meet the goal of decarbonising the power system by 2035.

A stronger sustainability framework could underpin the development of domestic biomass sources - such as perennial energy crops. In addition to their potential for carbon removal, they could deliver economic benefits, such as creating income opportunities on marginal land not suited to food production and wider ecosystem services such as flood protection. In order to achieve such benefits it will be important that principles developed during the dialogue – such as avoiding land use conflicts with food production and biodiversity – are fully addressed in the cross-sectoral sustainability framework.

¹⁴<https://www.gov.uk/government/statistics/renewable-sources-of-energy-chapter-6-digest-of-unitedkingdom-energy-statistics-dukes>

3 Lessons on factors which allowed objectives to be met

3.1 Overview

As summarised in *Table 3.1* (and described in more detail in *Annex C*), despite delays in the procurement process which compressed the timetable for process design, the dialogue successfully delivered on all its objectives.

Table 3.1: Factors which have contributed to meeting specific objectives

Objective	How far it was met	
1.To engage a diverse group of participants, broadly reflective of the UK public, in topic areas relating to the development of the Biomass Strategy		<p>The recruitment brief and methods brought together 105 participants who met expectations for diversity and inclusivity: the design, incentive structure and warm facilitation kept them engaged: 95 attended all 5 sessions. The third of participants ‘affected’ by living in postcodes close to biomass sources or facilities enriched small group discussions (workshops 2, 3, 4) raising both pros (jobs) and cons (air, smell and noise pollution, economic blight) which informed wider views and were reflected in the dialogue report.</p>
2. Explore and understand participants’ aspirations & concerns in relation to biomass sourcing (both domestic and imports), production, and use across the economy		<p>The ambitious scope meant sharing a lot of new information with participants but PowerPoints (incorporating OG, BEIS & stakeholder input) allowed most to feel sufficiently well informed to explore their hopes and concerns across different biomass sources and uses (although in some cases e.g. hydrogen not in great depth). However, this left limited space for participants to explore the wider context of NZ and non-biomass alternatives as many would have liked.</p>
3. To understand what values and perspectives inform participants’ views in order to inform and help refine any future communications and engagement.		<p>Three ‘framings’ – conceptual, implementation & impact – emerged strongly as the dialogue shaped by both the external context (energy security and trust in government concerns), perspectives shared by specialists and areas where what seemed like basic information (costs, GHG performance) were lacking. High level suggestions on comms. & engagement and gaps in knowledge where the wider public would want to know more were identified and are addressed in the biomass strategy.</p>
4. Define conditions of use around sustainability frameworks (including land, biodiversity, environmental impacts, ecosystem services, emissions and social criteria) to help shape policy development.		<p>Specialists shared very detailed information in this complex and contested area: some participants felt they could not contribute much on the detail (e.g. carbon accounting) but their insights on the issues were captured via interactive whiteboard and played back as ‘principles’¹⁵ which participants were able to refine during the final session. These resonated with commissioners and the OG and appear to have contributed to the emphasis on strengthening sustainability criteria across all sources that is a central theme of the biomass strategy.</p>
5. Determine participants’ views of using biomass, particularly BECCS, as a negative emissions technology in achieving NZ, to inform policy development		<p>Session 4 was dedicated to BECCS and participants heard a range of perspectives, including sceptical voices but would have liked more time to discuss the wide NZ context, including GGR alternatives. Nevertheless, findings on hopes and concerns chimed with those found in the DESNZ PAT survey¹⁶ and concerns and scepticisms are cited in the biomass strategy and its commitments to only supporting biomass power with CCS.</p>

¹⁵ Cost/financing; feasibility & evidence base; trust, transparency & accountability; prioritising natural resources; impact on society

¹⁶shows that by Spring 2023 many respondents were supportive of biomass but only half knew enough about CCS to give an opinion on whether they supported or opposed it: of those nearly half (46%) supported CCS mostly on the basis of its potential contribution to tackling climate change, with others citing its potential to create jobs, re-use existing infrastructure, benefit the UK economy, or position the UK as a world leader in the area. Among those who directly opposed CCS (9%) this was mainly because they did not see it as a long-term solution, preferred more natural strategies such as tree planting, or did not feel it would tackle the causes of climate change or stop emissions. They also cited concerns about safety and disruption to the local area.

A combination of an energetic delivery team incorporating biomass topic expertise, effective project management via a small core project management team, and a highly engaged Oversight Group resulted in a high quality design which ensured that the ambitious scope of objectives would be covered. Information shared by different types of specialists including ‘informants’ who shared neutral background information, ‘scientists’ who shared detail in key areas such as sustainability and BECCS, and ‘advocates’ who brought in a range of different perspectives gave participants most of the information they needed to come to nuanced opinions.

3.2 An efficient and collegiate core project management team

- **The core team quickly established clear roles, strong working relationships and efficient mechanisms to aid timely decision-making** (such as weekly Teams meetings, Excel spreadsheets to audit OG inputs and actions). The two person BEIS team had appropriate delegated responsibility to make most decisions: they also kept senior managers and the wider biomass strategy team closely involved so that they felt ownership of the dialogue findings.
- **Including biomass topic expertise in the contractor delivery team and via BEIS topic specialists made it possible to develop background neutral stimulus materials within a challenging design timeframe.** An online design workshop involving many BEIS specialists proved an effective way of capturing background information on very technical areas (such as BECCS and sustainability criteria) within a tight deadline, but with sufficient time for NatCen and Eunomia to present this in a user friendly way for public participants.
- **The commissioners were able to take advantage of the online delivery format (with a choice of 10 sessions and no travel time or costs) to observe workshops, hear directly from the public.** The number of observers involved helped increase BEIS’s visibility and helped ensure that by the end two thirds of participants felt confident that the BEIS team would take their views into account, despite the challenging political context at the time.
- Opportunities to hear directly from the public also increased the BEIS team’s confidence in the robustness of the findings. Given the long delay in publishing the dialogue report, this has also proved important in ensuring that the dialogue insights have fed into the Biomass Strategy drafting process. It also makes it more likely that the team will be stronger advocates for public dialogue and how it might be used further in policy making (see *Section 2*).
- **Turnover within the core team for the final stage of the project was managed well so that there was no disruption to the process.** Both the BEIS and NatCen project managers moved on once the field work and initial data analysis was completed: far from disrupting the final drafting process interviewees agreed that it had been well-managed: *“handing over the baton for the final reporting worked really well.”* The introduction of a NatCen new chief editor actually added value by: bringing in fresh eyes to how evidence was used; tightening the structure and drafting; and polishing the final report. The resulting report and executive summary are analytical, with a clear narrative and nicely presented.

3.3 A small, animated and engaged OG group

- **A carefully chosen group of 10 individuals was able to bring a broad range of specialisms and a breadth of perspectives across the biomass area.** The group drawn from four universities, two environmental non-governmental organisations (ENGOS) and three business associations brought a good mix of scientific and policy expertise, and a range of attitudes from strongly pro to scepticism about biomass' role in NZ. The mix of scientific, campaigning and industry viewpoints gave confidence to BEIS policy makers and stakeholders that the process has been robust and the findings are credible.
- **Some members (half a dozen across a mix of academic, industry and NGO backgrounds) were more actively engaged than others.** There was often lively debate, but effective chairing meant all members were able to share their views with no specific viewpoints given preference over others. A few members confused the role of overseeing the dialogue with trying to influence the biomass strategy: in order to address this it would have been helpful to have the initial meeting face-to-face with time to explore positions and clarify exactly what members were being asked to contribute.
- **Over the course of its three online meetings the OG was able to inform the framing, recruitment sampling, and identify gaps where specialists would be needed.** Their advice also prompted a more dialogic design and helped improve the format, tone and language of information shared with participants and the report. The contingency measure of appointing a sub-chair proved important in enabling the group to meet at the most useful points in the process (for instance to provide feedback on the draft dialogue report and how the evaluation findings should be shared with participants). However, at some points the delivery contractors would have welcomed a stronger steer from BEIS and Sciencewise on how to navigate disagreements and which points needed to be acted on.
- **Experience in communicating biomass and CCS issues to the public was captured by contributions by four members as specialists in the public workshops.** More of their knowledge about engaging communications materials (e.g. comics and animations) could have usefully been captured after the first meeting to enrich the information shared with participants.

3.4 A structure designed to address all objectives

- **The OG's advice was invaluable in creating space for unprompted discussions and avoiding a knowledge deficit approach.** Their inputs ensured that the initial design – which focused on giving and testing information – was modified to create more space in small groups for open discussion and negotiating between those with different perspectives and experiences, including those living near biomass growing areas or facilities. The change in emphasis also ensured information was shared in smaller portions: as a result the majority of participants reported that they felt sufficiently well informed to feel they had made a useful contribution on how biomass and BECCS might be developed in the future.
- **The design covered all objectives by striking a compromise between breadth and depth.** As noted in *Table 3.1* the ambitious scope meant that each of the five 2.5-hour

workshops had a lot to cover. But each session built from self-discovery in small group discussions (often stimulated by a short homework task), through information shared in plenary (by delivery contractors or specialists), to discussions structured around elicitation exercises. Most participants found the sessions pacy but engaging. While a few found sessions too long or dense (see *Annex E*) most would have welcomed more time to discuss the wider context (e.g. around net zero and other renewables).

- **Elicitation exercises (e.g. for biomass sources or uses) worked well to surface hopes and concerns which were then developed as principles for future biomass development.** In terms of prioritising between options this approach proved more challenging: participants found repeating the exercise across all options somewhat repetitive; and they did not feel they had all the information they needed (e.g. on costs and environmental/carbon performance) to make choices. In retrospect the number of small groups (14-15 across the two cohorts) could have allowed each group to spend more time reviewing a subset of the options in depth (and perhaps review the rest in their own time on the Engagement HQ microsite) while still giving the full breadth of coverage.
- **Building in time and methods to allow rapid analysis after the first four sessions worked well to provide a framework for co-producing principles and criteria for taking biomass and BECCS forwards.** Simultaneous notes taken by small group facilitators (using a shared interactive blackboard) instantly captured key findings and helped the facilitation team gauge the areas of consensus and disagreement between the many small groups. The emerging values relating to participants beliefs which could be used as building blocks for exercises during the final workshop where participants discussed the values, refined, or honed their meanings and developed a strong consensus around six broad principles.¹⁷ These principles, represented by icons, were used to structure the dialogue report. The principles have also been cited and informed the biomass strategy.
- **Quantitative surveys - repeated after the first and final workshops – provided additional contextual evidence for the qualitative description of individual participants’ journeys.**

3.5 The benefits of hearing a range of, sometimes conflicting, perspectives

- **The breadth of the topic lent itself to introductory information being shared by ‘informant’ specialists from the delivery team who were well equipped to present neutral information which had been rigorously reviewed by BEIS and OG members.** However, the compressed timetable limited opportunities for exploring more creative formats, or for sharing information with participants in advance (either in hard copy or on Engagement HQ).
- **The design relied on PowerPoints shared in plenary and then made available on the Engagement HQ public microsite which the majority of participants found useful for this purpose.** The site could have been made more valuable still if the design team had had time and resources to create space for individual deliberation, discussion threads, or to share additional background information such as responses to unanswered

¹⁷ cost/financing, feasibility, transparency, natural resources, environmental and social impacts

questions from the workshops. More creative approaches to sharing information – e.g. via pre-recorded videos, animations, cartoons or case studies – could also have made more of the online format. As noted above, examples of existing materials could have been collected from the OG at the outset.

- Carefully chosen specialists including ‘advocates’ (representing positions of their organisations), and scientists were able to fill gaps where the core project team and OG had identified the need for more specialist inputs of different perspectives. Invitations sent by the BEIS team were helpful in securing their participation.** Participants strongly appreciated *“the ability to listen to and scrutinise experts in the field,”* and the variety *“of opinions and data from both the proposing and opposing sides”* brought by the mix of nine BEIS, academic, industry and NGO specialists. Many participants particularly welcomed hearing more sceptical voices in the sustainability and BECCS workshops. For instance the points raised by ENGO representatives about woody biomass supply chains and GHG accounting made a real impression: for many these perspectives validated doubts they had already raised themselves in earlier sessions.
- Time pressures between weekly meetings did not allow for the delivery team to review specialist presentations in advance.** Despite briefing by the delivery team, some specialists fell into the trap of trying to get too much detail across in their allotted slots: in a number of cases PowerPoints were dense and jargon laden. We noted some participants struggling with the level of detail or contradictory evidence: in some cases participants homed in on a graphic, statistic or statement which strongly shaped the following small group discussions. A few participants suggested that, if one thing could have been done differently, it would be to give specialists more time to share their views: *“and not rush through SO MUCH information in a short space of time.”*
- The approach taken to mixing small groups between sessions allowed all participants to hear from those with lived experience near local biomass growing or use facilities as well as those from other backgrounds which worked well to enrich the findings.** Participants really appreciated hearing what it was like living near incinerators and biomass plants: they did not defer to ‘affected’ people but respected their views which enriched discussions. Reflections on the environmental and social impacts and benefits were clearly reflected in the six ‘principles’ which emerged from workshop 5. Participants welcomed both discussions where small groups came to a consensus view, while feeling confident to disagree in other areas: many described this as the most valuable part of the process: *“Hearing others’ opinions helped me shape my own.”* And *“Being able to respectfully disagree and sometimes finding a middle ground within the breakout rooms.”*

3.6 Excellent facilitation involved all participants in small group deliberation

- Facilitators, many with prior Sciencewise experience, were professional and independent and able to bring their experience to the design in lieu of a pilot with public participants.** They created a warm atmosphere and were able to probe for the values underlying what participants said. All participants told us that they felt heard and able to contribute. By the final sessions most conversations seemed natural, rather than extractive.

- **Simultaneous notes taken by small group facilitators on a shared interactive whiteboard (Mural) allowed the process designers to pull out shared principles which could be tested and refined in the final workshops.** These notes could have also been a useful update for the NatCen chair – roving between groups – to spot frustrations that developed in some small groups as they grappled with perceived gaps in basic information, or grey areas where different specialists presented conflicting facts.¹⁸ Such issues could have been dealt with head on in plenary sessions with chances for the BEIS team to make it clear where some questions could be answered before the next session, but where in other cases information is not yet available. Instead, the lack of answers appears to have fed into a growing scepticism about the concept, implementation and net zero impact of BECCS. As one participant put it: "*more real-world, in-depth information would have been helpful to prove exactly how burning crops is actually helpful. [I'd] also like to know the financial and business structure of this model.*"

¹⁸ For instance, when elicitation exercises asked them to prioritise between different sources and uses participants quickly identified comparative information (on costs and GHG performance) that they would need to compare biomass with other renewable and carbon capture solutions. The number of variables involved made it hard to respond with meaningful data.

4 Conclusions and recommendations

4.1 Conclusions

- This large public dialogue brought together about 100 participants with a range of specialists during June and July to discuss an ambitiously broad and contentious topic covering a full range of biomass sources and end uses - including BECCS - and the complexity of how sustainability is measured and monitored. The dialogue successfully deepened understanding of the participants' views on biomass and BECCS in the context of NZ.
- The online design – equivalent to about two full days of dialogue – brought groups of 50 participants from diverse backgrounds - including those living near to existing biomass sites - together for one evening a week over a five week period. The elapsed time meant that participants were able to absorb what they had heard and did not become too overwhelmed with the complexities of the topic. Despite the amount of ground covered, a careful design enabled participants to co-produce a set of six principles for how biomass should be developed in the future.
- Despite a delay in internal sign-off, due to events beyond the control of core team, the findings from the dialogue are threaded through the DESNZ's Biomass Strategy which recognises the need for a strengthened sustainability framework across all types of biomass as a key factor in gaining public support and securing an effective role for biomass in meeting NZ ambitions. However, due to the publication of the dialogue report alongside the biomass strategy in mid-August, there is limited evidence that the dialogue has had much impact beyond the strategy.

4.2 Recommendations for future dialogues

Commissioners

Procurement, timetabling and sign-off

- **Where a dialogue is designed to inform a specific policy process, ensure a realistic timescale** – including contingency for slippage in the procurement process – so that findings can have maximum impact.
- **Ensure timelines with milestones and responsibilities – including for sign-off processes within the department - are clearly laid out and kept updated**, while maintaining some flexibility to respond to external events which may affect the dialogue's overall impact.
- **Have early discussions on expectations of the final report** (format, length, style, editorial voice, how different types of evidence will be used) to help streamline the final reporting process.
- **If there are likely to be delays to the sign-off / publication of the dialogue report then consider other ways to share key messages with internal audiences** (e.g. those drafting related policies). In this case a cross-government webinar helped ensure key opportunities to inform policy development were not lost.
- **Take advantage of opportunities offered by an online format to involve as many commissioner staff as possible**. In this case DESNZ specialists and policy advisers were

able to help shape materials (via an online workshop) and to hear directly from the public as silent observers at the online workshops.

Getting the most value from an Oversight Group

- **A carefully chosen smaller group can have advantages over a fully representative large group – not least in being easily convened and in creating an expectation that participants are fully engaged in all key tasks.** As long as the group is balanced between policy, academic, NGO interests and other key interests additional stakeholder viewpoints can be brought in via stakeholder interviews/workshops or via specialist participation in public workshops.
- **Ensure that OG members understand that their role is to oversee and inform the dialogue, not to influence the policy process and outcomes.** If practical, consider holding the first OG meeting face-to-face so that individuals have a chance to air their aspirations, differences in perspective and agree constructive ways of working together.
- **Build in contingencies so that the group can be convened at the most useful points for the process.** In this case appointing a sub-chair, briefed to step in at a period when the chair was busy, worked really well to ensure that meetings could be scheduled at the point where they would be most useful to the delivery team.
- **Develop an audit system (e.g. a spreadsheet) to collate and track OG comments and demonstrate how they have (or have not) been taken into account.** Where OG members provide conflicting comments or advice then it is useful to have an audit trail and a mechanism for the commissioners and Sciencewise to advise on how key points should be taken into account.

Delivery contractors

Building in expertise and final editing capacity

- **Where a topic is very broad but encompasses many specialist areas it can be useful to have topic expertise within the core team.** In this case the timeframes for developing materials had been condensed due to delays in commissioning, making it really important to be able to put together broad-based background information quickly, with gaps in specialist knowledge or perspectives filled by specialists.
- **Build in sufficient resources for the final reporting stages.** Consider whether bringing in fresh eyes (e.g. a final report editor who has not been too closely involved in design or delivery) could help the team stand back from the evidence and add value to the structure, narrative and use of evidence.

Ensuring there is enough time to both address objectives and for participants to follow their interests

- **If time or budget do not allow for piloting the design and materials with the public** then build in time to make best use of the accumulated experience of the facilitator pool or core team members to test and amend designs during briefing sessions.

- **Ensure that the participants have time and space to consider the technology in its broadest context**, even if this means being more selective about the amount of detail shared on each option/technology/elicitation exercise in every small group.
- **Wherever possible ensure that most stimulus materials are ready before the start of the workshops with sufficient time for the core team to review** all stimulus materials for accuracy, balance, style and variety (including video, photos, cartoons, animations etc.) before sharing them. This will allow more time between workshops to respond to specific gaps/interests identified by participants.
- **Make the most of an information sharing microsite to also create space for individual deliberation.** In this case a microsite worked well for sharing background information after workshops but with a little more time and budget could have also been used to share specialist presentations/videos, answers to questions which could not be answered in the workshops, providing links to other sources of information and for individual deliberation exercises (e.g. reviewing materials not covered in small groups). However, note this will require resources for design and moderation time and possibly building homework tasks into the incentive structure.
- **Try and anticipate where participants might identify information gaps and highlight where they may hear evidence that is contradictory or presented in different ways.** Allow some space early in the process to explain contested areas and where information is not yet available. Ask commissioners to respond to participants' unanswered questions after each workshop and share answers (e.g. in plenary sessions or posted to a microsite).

Making the most of specialists and observers

- **Emphasise that specialists may present opposing views and different types of evidence.** Make it clear that participants will be able to interrogate specialists to reach their own conclusions but are not expected to make scientific judgements about what they hear. Consider whether it would be helpful for participants to question specialists as a group (e.g. as a panel in plenary) or hear them debating with each other.
- **Suggest that specialists base their presentations around a few simple slides and images and build in enough time for the delivery team to review them in advance.** Advice on the length, tone and language of presentations can help improve their accessibility and ensure participants do not feel overwhelmed.
- **Encourage commissioner teams to take full advantage of opportunities offered by online dialogues to observe public workshops.** This is likely to build ownership within the commissioning body for both the findings and future public dialogues.

Reporting and analysis

- **Make use of simultaneous notes taken by small group facilitators** to help lead designers/lead facilitators sum up and recap during plenary opening and closing sessions and ensure that participants feel acknowledged, valued and encouraged.