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CALOUSTE GULBENKIAN
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UK BRANCH

Public Engagement for Net-Zero:

A Literature review



About CPI Europe

The Centre for Public Impact (CPI) is a global not-for-profit, founded by Boston Consulting Group, with a mission to help government and public sector organisations achieve better outcomes for everyone. In the UK, we work with government and public sector organisations to tackle the complex challenges they face, equipping changemakers with the confidence, tools and mindsets to listen, learn and adapt in these fast-changing and unpredictable times.

This Review was co-authored by Martin King, Chandrima Padmanabhan, and Katie Rose at CPI Europe. Thank you to Graham Smith, Lorraine Whitmarsh, Lucy Stone, Clare Saunders, Brian Doherty and the rest of the CPI team for their formative contributions to this Review. Thank you to the Calouste Gulbenkian Foundation (UK Branch) for supporting the research and production of this Review.

This Review is published alongside A Case Study Compendium, which shines a light on eight examples of public engagement from across the world. Please visit the [CPI project page](#) to find out more.

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Foreword

In 2019, on the 150th anniversary of the birth of our founder Calouste Gulbenkian, the Foundation's trustees announced their commitment to prioritise climate change. This included launching the Gulbenkian Prize for Humanity, awarding €1 million annually to recognise contributions to the mitigation of and adaptation to climate change. At the UK Branch, we have begun a complementary programme supporting *Citizen Engagement on Climate*, seeking to demonstrate what effective public engagement looks like and create the conditions for its scaling.

We have a history of supporting environmental work at the UK Branch, including through our Valuing the Ocean programme which has illuminated the importance of effective communications in building ambition for environmental action. Yet, for some years we were concerned that we would not be able to make a difference in a problem so big and so complex as climate change. However, the growing visibility of climate impacts has reinforced the urgency of the issue. In 2019, the Foundation's trustees decided to divest from our oil and gas holdings which were the original source of Calouste's fortune. In the same year, I was shocked by the terrible flooding at Woolley Bridge, with the risk that an entire village and its residents would be subsumed under water, and the catastrophic fires in Australia. It seemed the impacts of our changing climate were everywhere: cyclones in Mozambique, the terrifying hurricanes in the Caribbean and grave water scarcity in parts of India. The effects are both near and far. The most vulnerable are those

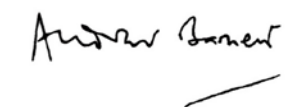
whose livelihoods are already insecure and whose interests we seek to prioritise at the Foundation.

This is why it matters and why we feel compelled to focus on climate change. But what to do about it? We know that scientific and regulatory solutions are a critical part of the answer. Yet whatever technologies we invent or policies we deploy, there is another critical ingredient: without deep public engagement, we will not be able to make real, sustainable change. Our research shows a big gap between what is necessary and the resources available for this work. Public understanding and engagement is the soil on which the seeds of government policy or scientific advancement lands. We must nurture that soil to ensure that when the opportunity comes to act, the seeds land on fertile ground.

This report – written by the Centre for Public Impact – offers a powerful foundation for that work of bringing the public with us in the fight to defend our climate. It provides a rich analysis of public engagement models on climate change, highlighting how *communication*, *collaboration* and public engagement around climate *interventions* can be made more effective. Each model has its own strengths and limitations, requiring conscious design and facilitation to build impactful, sustainable and inclusive people-led change. For those of us who are relatively new to this area of work, the report offers essential guidance about how to lay good parameters for new projects getting started. For those who are already

investing in this area, it serves as a helpful refresher on the vital principles on which we should base our approach.

This year, Glasgow will play host to the 26th Conference of the Parties of the United Nations Framework for the Convention on Climate Change. Those of us working on climate change in the UK have a special responsibility as a result. We must gather together to ensure that the negotiators are surrounded by the dual support and challenge that a vibrant civil society can offer. We must create a platform for people doing transformative work to tackle climate change all over the world. Most importantly, we must remind the UN negotiating teams that although they are the ones around the table, the real work of saving our planet from dangerous climate change will be done by billions of us, scattered in towns, cities and villages around the world, inland and on the coast. It is those voices – and the huge opportunity for change they carry with them – that must anchor the conversation in Glasgow. So as you read this report, we ask you to think about what the climate transition will mean for people and communities, and let us then ask ourselves how we can best support this.



Andrew Barnett OBE

Director, Calouste Gulbenkian Foundation (UK Branch)

April 2021

Executive Summary

The aim of this Literature Review is to understand effective ways to engage the public on meaningful behaviour change that can aid in achieving net-zero emissions goals. The Review is a first step to unpacking how public engagement strategies in practice can be built to be relevant, meaningful and inclusive to the public, while also conveying urgency and driving large-scale adoption.

Through in-depth desk research and practitioner interviews, the Review draws out three prominent ways of understanding public engagement around climate change:

I. Public Engagement as a challenge of Communication

This explores how the framing of the message, the legitimacy of the messenger, and the values and identities of the audience impact communication around climate change, and thereby meaningful engagement.

II. Public Engagement as a challenge of Intervention

This draws out how public engagement can effectively incentivise sustainable consumption and pro-environmental behaviour at an individual, social and systems level.

III. Public Engagement as a challenge of Collaboration

This focuses on understanding what makes effective public deliberation on climate policy (for example through mini-publics, citizen assemblies etc.), and impactful citizen-led grassroots movements around climate change.

Through the three lenses outlined above, this Review provides broad insight on the public engagement methods that can enable meaningful behaviour change around climate change. It also draws out the gaps in current research - particularly around a) how the complexity of decision-making around climate change can be communicated without reductionism, b) how public engagement can be made more adaptive to uncertainty and evolving local conditions and c) how engagement processes can be made more inclusive in order to produce legitimate and just outcomes. The importance of these themes are discussed in the final section of this Review, drawing out the need for further research. It highlights the importance of engaging with these tensions and value-laden decisions in order to ensure the transition to a net-zero world is socially just, sustainable, and impactful.

Introduction: aim and approach

Our aim

According to the IPCC SR 1.5°C (2018), global carbon emissions should reach net-zero by mid-century in order to limit warming to below 1.5°C and avoid catastrophic climate impacts. In response to a growing body of scientific evidence and mounting public pressure, a number of governments, including that of the UK, have translated these goals into national strategy, making tangible policy commitments to move to a net-zero carbon economy.

In 2019, the UK made a legally binding target to achieve net-zero by 2050. While the UK has reduced emissions by 40% since 1990, this has been predominantly achieved through the decarbonisation of energy supply, requiring very little effort on the part of the public. Reaching the net-zero target by 2050 will require significant behavioural shifts (as will meeting the legally binding carbon budgets). This would require significant investment in public engagement, to build mutual acceptability on a way forward.

This Review, commissioned by the Calouste Gulbenkian Foundation UK branch, is a first step in a quest to understand effective ways to engage the public on meaningful behaviour change that can aid in achieving net-zero emissions goals. The research aims to underpin further study on ways by which effective public engagement strategies can be built to be relevant, meaningful and inclusive to the public, while also conveying urgency and driving large-scale adoption.

Our approach

For the purposes of this Review we have adopted a broad definition of “public engagement”. Our definition includes any intervention aimed at communicating with or mobilising the public, or changing their behaviours, choices or attitudes to positively contribute to reducing emissions. The synthesis report on the Action for Climate Empowerment by the UNFCCC similarly adopts broad definitions of public engagement (FCCC 2020).

Our methodology followed a 3-step process:

First, we conducted an initial abstract review. We utilised the Web of Science database and applied the following criteria:

- Abstract must include the terms: (“public engagement” OR “behaviour change”) AND (“climate change” OR “zero carbon”)
- Time-span: 2000-2020

The search produced 246 results. The papers were published in peer-reviewed journals providing some assurance of sufficient quality, relevance and significance. We reviewed the abstracts and categorised the papers by descriptive criteria; how the public are being engaged, who is leading the engagement and who is being engaged, and on what issues the public are being engaged. From this we were able to identify thematic clusters of research that shared an understanding of what the core aim of public engagement around climate action was, and explore these in greater depth. This exploration was guided in an emergent sense, by the number of

results, rather than pre-existing criteria or priorities around public engagement. We also conducted additional searches using terms specific to the area to identify the most cited, relevant and recent works for further exploration.

Second, we reviewed the grey literature and reports from established organisations and research institutions in relevant fields. The organisations and research institutions targeted for analysis were Climate Outreach, the Centre for Climate and Social Transformation (CAST), the Climate and Urban Systems Partnership (CUSP), Futerra, Centre for Sustainable Energy, the Institute for Public Policy Research (IPPR), New Economics Foundation (NEF), Involve, Grassroots Innovations the Global Action Plan, the work of Rebecca Willis, the Sustainable Consumption Institute at Manchester University, and the Research Group on Sustainable Lifestyles and Values (RESOLVE) at Surrey University. These organisations were selected on the basis of various criteria, primarily through a form of snowball sampling which noted that they were frequently referenced by research and practitioners. Further, these organisations represented diverse perspectives and viewpoints on the subject, and met considerations of access and relevance in the context of the Review.

Third, we interviewed practitioners and academics with established experience in the area of public engagement and climate change. The purpose of these steps was to ensure our account of the literature was informed by a diverse range of sources, perspectives and viewpoints. Our interviewees included individuals working at Involve, CAST and IPPR.

Illustrating our methodology



Scope and Limitations

By nature, literature reviews are prone to degrees of imprecision, particularly where the area is as wide as public engagement in the context of climate change. Different approaches to reviews will always be prone to exaggerating aspects of a phenomenon and occluding others. Given these inevitable constraints, we have sought to provide a review drawing on credible sources, providing a balanced account of the available information and ensuring they are relevant to the central issue.

The papers used in the abstract review were published in peer reviewed journals and therefore provide some assurance that independent professionals in the relevant field regarded the research as sufficient in quality, relevance and significance. This work was supplemented by deep dives into key texts and reviews (frequently cited papers pertinent to the review), an exploration of grey literature and the work of prominent organisations (as outlined above), and interviews

with experts in the field. This was necessary in order to develop a deeper understanding of the theory and practice of public engagement on climate change given the limited information available in abstracts. However this practice introduces a trade-off between depth and balance as we are relying on a smaller number of sources to gather richer information. Although these sources were well-established and credible, we must recognise that they only represent a sample of the potential research and perspectives. In order to ensure transparency, we have indicated sources, identified theoretical perspectives underpinning the approaches, and sought to offer descriptions of research in their own terms as well as recording criticisms featured in the wider literature.

We have limited our scope to research from high-income developed countries (and more specifically countries referred to as Annex II countries by the UNFCCC). It is enshrined in the UN Climate

Convention (1992) and re-established through the Paris Agreement that these countries need to lead the charge on emissions-reduction. In addition, or perhaps due to this, the understanding of and responses to climate change mitigation objectives such as Net-Zero are better researched and documented in highly industrialised economies of Annex II countries. Given the geographic scope, the sectors that were researched are those seen as contributing highly to consumption emissions in those economies including transport, food and diet, and domestic energy (Carmichael 2019). This review acknowledges this focus as a limitation, as the ensuing discussion misses out on considerations and perspectives relevant to the context of developing economies, and the systemic impacts of climate-related decision-making on those geographies. As these considerations form an integral part of meeting a global net-zero goal, further research on public engagement practices in developing country contexts is imperative.

Structure of Review

Section A

Section A illustrates the prominent ways of understanding public engagement in the climate space from the main themes that emerge from the literature. These themes have been organised into three categories:

- public engagement as a challenge of communication
- public engagement as a challenge of intervention
- public engagement as a challenge of collaboration

This section explores each of these three categories, highlighting the prominent insights and debates on how each method and/or process seeks to achieve behaviour change around climate change. It also aims to provide some insight into the benefits and limitations of each of these ways of framing and understanding public engagement.

Section B

Section B attempts to draw together conclusions from the literature – as far as this is possible. This section also highlights further considerations key to understanding the climate challenge as one that engages with complexity, uncertainty and deep-seated issues of justice and inclusion, drawing out what that might mean for public engagement, and new avenues of research.

Section A:

Ways of Understanding Public Engagement Around Climate Change: A Challenge of Communication, of Intervention, or of Democratic Collaboration



I. Public engagement as a challenge of communication

One understanding of public engagement from the literature is as a **challenge of communication**. Specifically, it explores how factors relating to the source of information, the message and the audience impact the effectiveness of communication. The link here between public engagement and behaviour change is through the development of effective communication strategies that speak to peoples' values and identities, encouraging the public to care about climate change and generating a mandate for action (Moser 2010, Whitmarsh 2013, Carvalho 2017, Schafer 2012, Corner et al 2014).

Insights and debates around communication as a way to understand public engagement

This research emerges from studies in communication and persuasion around climate change. It draws on psychological models, notably the elaboration likelihood model (Lazard 2015, Myrick and Comfort 2020) and the appraisal theory of emotions (Lazard 2015, Myrick and Comfort 2020) to explore the role of values, emotions, and context in communication on

climate change. There are a number of areas of consensus in literature. There is acceptance that the **deficit model is not sufficient**. This means that simply providing people with information about climate change is not sufficient to encourage people to care about the climate or support action on climate change (Maibach et al., 2008; Myers, 2003; Pitrelli, Manzoli, & Montolli, 2006 in Lazard 2015). There is agreement that in order to communicate effectively you need to reframe the debate and provide narratives that resonate with the identities and values of your audience. These need

to encourage the audience to see climate change as an important, tangible threat that they should take ownership of and seek to address.

There are debates within the literature about how best to do this, with different strands of research focusing on different avenues and possibilities for better engagement on climate change. We can consider these in relation to three interrelated elements of the communication process:

1. **the messenger**
2. **the message**
3. **the audience.**

et al 2014, Corner n.d). Research has focused on the impact of polarisation and the domination of particular segments of society in taking ownership of the issue which has resulted in scepticism and disengagement for others. Specifically, climate change is commonly perceived as an issue owned by left wing, progressive, middle-class liberals and activists. This perception is exacerbated by various trends in politics and marketing (e.g. 'green marketing' is targeted at this audience). As such a conversation has emerged around climate change conducted by and for a small section of the population. Research suggests the need for messengers to come from groups currently marginalised by this messaging and marginalised more generally by the political process. For

example, Corner (n.d) has called for "heroes" and champions on the centre right to lift climate change out of its left wing niche. Research also highlighted the need for greater attention to be paid to the marginalisation of certain groups and communities in conversations on climate change. Pearson et al (2017) draw attention to the need for greater diversity with respect to class, race and gender in climate communications. The research has also focused on the way "elite" messengers are perceived (e.g celebrities (Leas et al 2016), religious authorities (Myrick and Comfort 2020)) with evidence suggesting it can be a double edged sword (Whitmarsh 2013). While it may positively impact the profile of an issue (Whitmarsh 2013), it often risks negative reactions and resistance (see Myrick and Comfort 2020).

1

The messenger

It is important for the source of information to be trusted and credible. The extent to which an audience trusts the source of information will depend in part on perceptions of authority and the messenger's expertise. However, the research suggests these judgements are highly contingent upon wider social and political conditions and the extent to which the audience match their own values and identity onto the messenger (Donner 2017). In this sense, the question audiences might ask of the source relates more to whether this person is like them and shares their values and outlook, rather than their qualifications, in determining whether they are to be trusted (Corner

2

The message

In relation to **engaging the public in general on climate change**, points of consideration on 'messaging' include:

- **Framing and narrative:** A primary focus of the research involves understanding the most effective framing and narratives for climate change messaging. This refers to the broad frames of thought through which the issue is understood and the values appealed to (Corner et al 2014). For example we could frame climate change as a war, as a race, or a problem. We could appeal to values of avoiding waste, preservation (e.g biodiversity), or preparedness. The most effective framing and narrative will depend greatly on the values and identities of the audience, and much of the research is focused on testing how different language, framing and narratives resonates with different audiences (Corner et al 2014, Moser 2010, Saltmarsh n.d).
- **Drawing on Emotion:** There is a large body of literature on the emotional reactions to messaging on climate change, including emotional reactions to climate change risks and positive messaging around hope, efficacy and potential co-benefits. Bohm (2003) provides an influential account of different emotional responses to environmental risks, distinguishing consequence-based emotion (for example, prospective emotions such as fear, despair, worry, and retrospective emotions such as sadness, sympathy), and ethical-based emotions (for example, other-related emotions

such as anger, and self-related such as guilt or shame). Research explores the emotional impact of different messaging on climate change and the relationship between affective reaction and risk appraisal (see Bohm 2003). Messaging on climate change can also be linked to positive emotional responses including hope, and efficacy. There is general consensus around the need to couple negative and positive messages. For example, fear might grab people's attention but can lead to despair, therefore it can be helpfully paired with messages of constructive action (efficacy) and more positive messaging around co-benefits. Crucial to these messages is ensuring the audience finds the messaging around both risk and hope credible and relatable. This will be different for different audiences, and depends on factors such as the source of information and how successfully framing and narrative matches the values and identity of the audience.

- **Connecting climate change to human-centred co-benefits:** Research in this area has explored the potential of linking climate change to more tangible issues and highlighting co-benefits. For example, linking action on climate change to better jobs, wellbeing, biodiversity and health. There has been significant interest in drawing out the links between climate change and better health outcomes (e.g. in relation to diet, air pollution). As highlighted above, crucial to the efficacy of this message is that the source is trusted (e.g. in this case parental groups and

health professionals were found to be more trusted sources for this messaging). Furthermore the public must find the link credible and relatable (e.g. they feel vulnerable to the health risk). For example the link between a low carbon diet and a healthier diet varies in acceptance amongst different audiences (the young find it more credible than older generations). Similarly research around air pollution found that appealing to the claim that air pollution causes cancer was met with scepticism (evoking associations with the thought that "everything causes cancer"), while messages that emphasised links with asthma were more effective.

- **Visual imagery:** The research has explored the significance of imagery associated with messaging around climate change. It has long been recognised that images overpower words in persuasive messages (Griffin 2008, Messaris 1994 in Lazard 2015). This area of research explores variables of different types of imagery in encouraging the audience to care about climate change and overcome distancing. For example it finds that it is important to show real people not staged photo ops, local but serious examples of impact, and to be very careful with imagery of protestors (which can cause resistance amongst people who don't identify with these groups) (Corner et al 2015). We should note there are ethical considerations in relation to telling stories or sharing images of particular groups, and practitioners need to ensure that the images they show of people do not negatively impact or result in any harm to them.





3

The audience

We have observed, throughout the research, the significance of the audience in understanding how climate change messaging is processed. The research considers a range of variables in exploring effective communication, including general considerations of literacy and numeracy as well as the timing of communication (Bostrom et al 2013). A significant strand of the research involves segmenting the audience by demographic and attitudinal criteria to understand different responses and to develop better strategies for communicating with these groups (Bostrom et al 2013, Hine et al 2014). There has been a particular focus on political values, ideological world-views and cultural mindsets, but also increasing interest in non-partisan social factors including racial and ethnic identities, social class and gender. The research suggests that these factors interact, and that beliefs and risk perceptions around climate change are more polarised amongst advantaged groups than disadvantaged groups (Pearson et al 2017). There has been particular research interest in addressing the scepticism prominent amongst centre-right audiences (Corner n.d), and the identification of conservative white men (Ballew et al 2020) and centre

right evangelical groups as notably resistant (this is arguably a reflection of the dominance of US research in the cultural setting of this research). Pearson et al (2017) describes how there has been relatively less attention to those groups for whom the issue of climate change is less politically charged such as racial and ethnic minorities and members of socioeconomically disadvantaged groups. Pearson et al (2017) argues there is a research gap around these audiences, as these groups are currently poorly served by climate change messaging. Additional research has considered engaging faith groups (Marshal et al 2016), different national identities (Marshal 2014), young people (Dodson and Papoutsaki 2017), and low income groups (Pearson et al 2018). Research develops evidence around how to frame information and what narrative or stories to tell to resonate with the values and identity of different groups. There is also a focus on developing profiles of different languages, framings and narrative techniques for engaging specific groups. For example, talking about “creation” when engaging faith groups on climate change was found to resonate well with Muslim, Jewish and Christian faith groups, but less well with Hindu and Buddhist faith groups (Marshal et al 2016). The centre right are easier to engage on climate change by framing the conversation around

values such as responsibility, avoiding waste, protecting the land, rather than on issues of justice (e.g. supporting the vulnerable, addressing inequalities).

Finally, there is also the issue of targeting. The research warns against exacerbating polarisation with messaging that might engage some audiences while alienating others (Pearson and Schuldt 2015, Whitmarsh and Corner 2017). Therefore the research in this area considers not only what messaging is most effective with an audience, but also what messaging is least polarising. For example, a study by Whitmarsh and Corner (2017) found framing around “avoiding waste” resonated well across all groups in contrast to climate justice (e.g the view that climate impacts the most vulnerable first, therefore it is the responsibility of those in greater positions of wealth and power to address it), which works well with left audiences, or patriotism (e.g preserving the nations’ heritage/countryside) which works better with the right. We should also note that while the research focusing on different audiences aims to overcome the problem of polarisation, it encounters an ethical and epistemological challenge in ensuring it does not inadvertently contribute to reductive understandings of different groups leading to blame attributions.

Evaluation and limitations

This approach draws on an evidence base derived primarily from focus groups and surveys which test responsiveness to different types of messages. Although the Review did not find major schisms in the literature on how to understand communication, there was variation in how studies operationalise different variables and measure impact. Researchers highlight that the majority of evidence is drawn from studies in the US and therefore grounded in a particular cultural context limiting generalisability of findings. In addition, there are challenges with measuring long-

term and short-term effects of different messaging i.e. a message that draws an initially negative response during testing in focus groups may, if applied over the long-term, usefully shift perceptions and become more acceptable. For example, declaring a climate emergency may be received poorly initially, but through repeated use over a sustained period of time may usefully shift the tone of debate.

The limitation of this approach to public engagement is arguably less to do with the quality of evidence, but with the limitations

in its scope. This literature, and the evidence it builds, focuses on changing people’s behaviour primarily by encouraging them to care about and relate to calls for more action on climate change. It has less to say about the challenges of changing people’s day-to-day behaviours, or understanding what change is needed at the level of government policy or business practices to enable us to respond to climate change. The researchers in the field acknowledge this, recognising that good communication can only be part of the response to climate change.



II. Public engagement as a challenge of intervention

A second cluster of literature is centered around an understanding of public engagement as a **challenge of intervention**. The thought is that the transition to net-zero requires urgent and fundamental behaviour change. This research explores measures that can be taken by different actors to support more sustainable consumption and pro-environmental behaviour at an individual, social and systems level (Suessbauer and Schaefer 2018). The link between public engagement and behaviour change within this approach concerns the efficacy of various interventions in encouraging sustainable consumption and pro-environmental behaviour.

Insights and debates around interventions as a way to understand public engagement

This approach to public engagement as interventions is characterised by a fundamental theoretical divide on how to understand individuals and the actions they engage in. On one side of this debate are social psychology and behavioural economics models that focus on **individual behaviour and choices** as the unit of analysis. An alternative perspective, increasingly offered as a counterpoint to this, is the sociological approach that focuses on **social practices** (Corsni et al 2019). The first sees pro or anti-environmental behaviours (or more or less sustainable consumption) as the result of individuals making choices based on their knowledge, attitudes, values or beliefs. The second sees our actions as explained by social practices that are constructed, reproduced and sustained by meanings (symbols, identity, norms, discourse), skills (competencies) and materials (technology, artefacts, infrastructure, the environment) (Buchs et al 2011). On the first understanding encouraging more sustainable behaviour such as riding a bike

to work might involve interventions that provide information about its benefits, or make other forms of transport more expensive than they currently are. On the second understanding this would be insufficient and further interventions would have to be made to ensure the person knew how to ride a bike (skills), viewed themselves as the kind of person who would ride a bike (identity), that they had access to a bike, bike storage, cycle lanes or safe roads, a sufficiently local job (artefacts, infrastructure) etc.

These two understandings have implications for the **methods of intervention**. The levers available to elicit more sustainable behaviour are wide and diverse. Our understanding of human behaviour will draw us to particular types of interventions, for example measures that seek to address individual choice, or measures that seek to address wider factors impacting people's lives and behaviours (competencies, social change, infrastructure or policy). The interventions can take radically different forms in terms of how they are trying to bring about more sustainable behaviour (restricting, guiding, providing) and different actors will also have different capacities to intervene (e.g. state, third sector, private sector (Beaston et al 2020), schools, citizens/peers).

For example, interventions designed around individual choice include:

- Laws and regulations to eliminate and restrict choice (e.g. banning plastic bags)
- Fiscal and non-fiscal incentives (e.g. environmental taxes, emissions trading)
- Provision of information (e.g. 10:10; a global campaign that seeks to persuade and support individuals and organisations to cut their emissions by 10% each year)
- Simplification and framing of information (e.g. feedback on energy consumption, metering)
- Changes to the physical environment to guide choice (e.g. appliances designed for sustainable behaviour)
- Changes to the default policy (e.g. opt-out green electricity offers or smart grid trial)
- Use of social norms (e.g. social comparison billing feedback, smartphone apps to encourage physical activity (Lehner et al 2016))

Whilst, interventions designed around social practice include:

- Provision of training or education programmes (e.g. sustainable audits of homes which provide training to residents on conserving energy)
- Provision of practical activities (e.g. British Trust for Conservation Volunteers (BTCV) who support activities around sustainability and connect this with addressing other challenges in the community, e.g. Global Action Plan's Pollinator Paths to encourage community growers)
- Provision of physical artefacts/ infrastructure (community financed renewable projects, ecovillages, cycle lanes, workplaces installing showers and parking spaces for bikers (Heisserer 2013 in Suessbauer and Schaefer 2018), farm to fork initiatives, smart grids, (for further examples see Ellen MacArthur Foundation (2016))
- Provision of access to resources (e.g. local trading schemes, GardenShare projects (Buchs et al 2011))

We can observe how social practice theory directs us to consider interventions that target action at the level of group activities and systems of provision. This directs us to developments in the literature that focus on pro-environmental social behaviours beyond the traditional domain of the household environment and the citizen as a consumer. This includes research into collective activism (Saunders et al 2012), community activities, and also the potential of interventions in the workplace environment (the latter is perceived to offer great potential for direct intervention, and has attracted considerable attention; see Ciorciran 2017, Loverock 2010, Norton et al 2015, Smith and O'Sullivan 2012, Tudor et al 2008 and Young et al 2015 in Suessbauer and Schaefer 2018, Frezza et al 2019, Suessbauer and Schaefer 2018). The research also emphasises the importance of systems of provision in supporting widespread transformations in behaviour. Interventions at this level have sometimes been niche (e.g. farmers markets, health food shops) and research has considered

what needs to change at a system level and the role of governments and business in creating appropriate conditions for behaviour change. Literature in this area connects sustainable consumption with sustainable production (Tukker et al 2010, Tseng et al 2013, Lorek and Spangenberg 2014, Stanikis 2012, Fedrigo and Hontelez 2010, Luo et al (2017) discusses this in the context of individual behaviour change, Alayon et al 2017 in the context of social practice) and reflects on the responsibilities of different actors (beyond individual consumers), and economic implications (see debates on "green growth", "degrowth", or "steady state" economies (Lorek and Spangenberg 2014, Fedrigo and Hontelez 2010).

Another important consideration throughout this research is the issue of spillover. Spillover is a psychological concept used to describe impact of change in one behavioural area leading to the probability of change in another area (Frezza et al 2019, Suessbauer and Schaefer 2018).



Research on the impact of spillover has considered the capacity to foster consistent positive spillover to encourage more sustainable lifestyles (Nash et al 2017, Muster et al 2011, Thogeresen and Crompton 2009 in Frezza et al 2019). Further research has focused on evidence of inconsistent spillover in which pro-environmental behaviours in one area result in a deterioration of environmental behaviours in other areas. This has been found to happen in a subconscious way, but has also been linked to a more conscious process sometimes described as moral licensing; a cognitive bias, which enables individuals to behave immorally without threatening their self-image of being a moral person (Tiefenbeck et al 2013, Blanken et al 2015, Mullen and Monin 2016 in Frezza et al 2019). For example people have described their take up of recycling by way of justifying doing enough for the cause of sustainability, disregarding its other tenets related to diet or flying. Summarising on the state of research on spillover, Frezza et al (2018) observe that while the evidence of spillover existing

as a commonplace phenomenon is clear, the evidence is limited in explaining how spillover might take place or understanding how to intervene in a way that encourages consistent spillover (although there is some evidence linking consistent spillover with self esteem and efficacy (Frezza et al 2018, Geiger et al 2017))

The understanding of individuals and actions they engage with also influences decisions around **when to intervene**. The research suggests that when you intervene is as important as how you intervene. The evidence suggests that certain interventions will be most effective when paired with life changes that disrupt existing habits (Verplancken and Wood 2006). These moments of change may be biographical life course events (e.g. having a child, retirement, relationship transitions, moving home (Foulds et al 2016), retiring or serious illness) experienced by an individual (both planned and unplanned) or exogenous to the individual (e.g. sudden cultural or political change, the Review found recent explorations of the potential impact of Covid-19, see Lidskog et al (2020)

and Gawel and Lehmann (n.d)) (Nash et al 2020). For example, a person is unlikely to invest in a more sustainable fridge apropos of nothing, but linking policy interventions to moments of change such as moving house might be more effective. In the research these moments have sometimes been described as a “window of opportunity” (Bamberg 2006), “moments of change” (Thompson et al 2011) and “critical moments” (Waitit et al 2012 and Burningham et al 2014 in Shirani et al 2017). In a Review of the evidence on the relationship between moments of change and food-related behaviours, Nash et al (2020) highlights evidence that transitions carry different implications based on factors such as culture, gender, income and age and therefore interventions targeting specific moments of change should be tailored to specific groups. Nash et al (2020) acknowledges limitations in the evidence base, and argues this is an area in which further research is needed, specifically in order to better understand its implications for policy implementations and interventions.

Evaluation and limitations

Tukker et al (2010) observe that while the relationship between consumer behaviours and their associated environmental impacts has reached a mature stage, the state of knowledge around the role of policy measures to stimulate sustainable lifestyles and forge sustainable systems of consumption and production is far less certain. The interventions to encourage more sustainable consumption and behaviour vary radically, and the evidence on which these interventions are based also varies in nature and quality. It is generally accepted that a combination of diverse interventions aimed at different barriers (individual, social, economic, political) are necessary to address climate change.

On the theoretical underpinnings of this approach, the methods based on social psychology and behavioural choice models, which focus on individual behaviour and choices, have been subject to particular criticism for their limitations and assumptions. It is argued these interventions have limited impact, and the impact they are found to have in one context cannot be easily generalised due to their failure to consider the wider complexity of human nature and the range of barriers and pressures acting upon it. Furthermore it is suggested this approach places too much emphasis on individual consumer responsibility, neglecting the responsibilities of governments and other actors. Developments in the literature such

as the use of social practice are advocated as a remedy to these limitations. The strength of the social practice approach is its ability to serve as a diagnostic tool in explaining why it is difficult to change behaviour. However more work needs to be done to enable the framework to guide interventions (Corsini et al 2019, Frezza et al 2019, Buchs et al 2011).

It is also important to note that the literature focuses on the efficacy of interventions. It is a separate question to ask what we should do and to consider the power dynamics that exist. Given the changes demanded in response to climate change are significant, far-reaching and disruptive of current lifestyles, it is reasonable to ask questions of the legitimacy and rightness of the intervention. This entails thinking about who and how we should decide what interventions should be used, what desirable behaviour really is, who should be the target of behaviour change, and whether the interventions go far enough. This literature tends to assume these questions are known prior to the intervention, and the evidence has less to say about how you answer them. These are crucial questions as the evidence suggests that failure to collaboratively engage those impacted by decisions can produce resistance, it can result in poorly designed or damaging interventions with unintended consequences, only delaying efforts to address climate change.



III. Public engagement as a challenge of collaboration

The third prominent cluster of research is centred on an understanding of public engagement as a **challenge of collaboration**. This development can be understood within the context of a wider participatory turn across different sectors and disciplines which emphasises the importance of greater collaboration with the public. In this understanding, public engagement on climate change involves the creation of spaces in which the public are involved in decision making on climate policy, or involved in a process of co-governance in the delivery of public goods and implementation of interventions to address climate change. Implicit within these approaches is the assumption that public collaboration is necessary to ensure action is optimal (the right thing to do, just) and legitimate (supported by those impacted, inclusive). Research explores the potential mechanisms of collaboration and the conditions required to support these processes.

Insights and debates around collaboration as a way to understand public engagement

Public engagement on climate change as collaboration is a nascent area of research and the evidence base is not as extensive. However we highlight two prominent contexts in which current research has developed. The first concerns collaboration as a deliberative space in which the public inform climate policy, while the second concerns forms of co-governance to deliver public goods. In addition we highlight prominent literature which situates the second discussion in the context of procedural justice and as integral to

discussions around 'just transitions' to a greener economy.

Collaborating through the creation of deliberative spaces:

There is a growing interest, in both research and practice, in the creation of deliberative spaces to inform decision making and climate policy. A significant strand of this literature is characterised by a shared understanding and broad approach to collaboration rooted in political science and deliberative democratic theory (see Dryzek 2010, Gutman and Thompson 1996, Habermas 1962, Habermas 1981). This approach seeks to create carefully structured deliberative fora in which citizens engage

in informed deliberative decision making. Of particular interest, has been the use of deliberative mini-publics which involve a representative microcosm of the population (determined by varying demographic and attitudinal criteria). Deliberative mini-publics include citizen juries, deliberative polls and citizen assemblies. There has been a strong trend in recent years of applying these practices in the context of the climate emergency and the transition to net-zero. Examples include, the Irish Citizen Assembly (Devaney et al 2020), Climate Assembly UK, the Citizens' Convention on Climate in France, and at a local level Camden (Cain and Moore 2019), Oxford, Newham (Mutual Gain 2020), Brent, Leeds, Kendal.



The precise design of deliberative mini-publics vary. Indeed if we consider recent cases described as "citizen assemblies" we can observe significant variation in recruitment methods, design, decision-making mechanisms and links to policy. There is rich debate around the issues encountered by these deliberative mini publics; however it is helpful to highlight some key considerations:

- The purpose and authority of the deliberative spaces:** The legitimacy and authority of mini-publics is ambiguous. They are representative, but they are not representing (citizens did not vote them in). They exist in tension with the democratic authority of representative democracy. This can be a productive tension that enhances legitimacy, public engagement and decision making, or a negative tension that sets up competing legitimacies which undermine each other (Vandamme et al 2018). In practice this tension plays out in various ways, for example in determining whether there is sufficient buy-in from decision makers to commission a climate assembly, through to its reception by the public, opinion leaders and decision makers (Boswell 2013).
- Internal quality:** this refers to the internal quality of deliberative mini publics, such as whether the design and delivery of the mini-public is legitimate, inclusive, transparent and accountable, whether the conversations meet the standards of good deliberation (e.g. respectful, not dominated by powerful groups) etc. There is increasing evidence that many mini publics successfully address concerns around internal quality through standards of design (e.g. stratified random sampling helps ensure inclusion and diversity, independent oversight helps ensure balance). Furthermore, researchers have also found that mini publics overcome problems of polarisation, various types of bias and domination by powerful groups through careful design and facilitation (Himmelroos and Christensen 2014, Gronlund et al 2015, Gerber 2014, Farrar et al 2009). There are also emerging standards that seek to ensure high quality deliberation can be replicated in different cases (see the work of Involve).
- Relationship to decision making:** A key issue concerns the willingness and capacity of decision making organisations to respond to deliberative mini publics. In practice, mini publics may be entirely ignored by decision makers or the results may be cherry picked to give an illusion of meaningful participation. Where this happens, or is perceived to happen, the process can damage trust and undermine legitimacy. For example, there is a danger that those who participate feel their voice has had no impact and thus the process erodes public trust rather than building on it. There has been far less attention in the research to the question of capacity, and what is required of organisations and bureaucracies to act on the recommendations of mini publics in response to complex challenges such as climate change (See Boswell 2018 discussion of deliberative bureaucracy).
- Relationship to wider public and existing movements:** There is an issue of wider engagement and awareness of mini publics. Increasingly, mini publics are preceded by wider engagement activities that lead subsequently on to the deliberative process (see Camden, Brent, Leeds, Newham), which can strengthen its legitimacy. There is also the broader question of legitimacy in relation to overall public awareness i.e. the extent of awareness of the wider population to what a mini public constitutes, what its recommendations have been, and if/how they will inform policy making. Typically there is a negligible level of awareness around all of these areas, which has been found to have implications for perceptions of legitimacy and wider support (Boulianne 2018). Echoing the findings on communication, the often polarising nature of the climate change debate would suggest the need for careful and systematic communication around the processes of a mini public to ensure legitimacy (Boulianne 2018, Raphael and Karpowitz 2013).
- Conditions of success and evaluation:** Evaluating the evidence on deliberative spaces is complex, but some are clearly closer to the theoretical ideals of high quality deliberation than others. Experience suggests conditions for success include entrepreneurial actors initiating the process, willingness and organisational capacity to act on the recommendations from the deliberations, and strong engagement beyond the participants to the wider public.

Collaboration as co-governance in the delivery of public goods

There is a second strand of literature on public engagement which concerns the study of collaboration as co-governance in the delivery of public goods. For example, we may contrast a supermarket delivering a range of organic products with a community-supported organic vegetable box; or an offshore wind farm operated by a multinational utility company vs one locally financed by a renewable energy scheme. A wide range of grassroots initiatives and community engagement projects are studied in this literature, addressing areas of housing, renewable energy, food and alternative money. Examples include Transition Towns, local organic food schemes, time banks, and Local Agenda 21 (Smith et al 2016, Seyfang and Longhurst 2016 see also Kheerajit and Flor 2013, Cumming and Norwood 2012, Grassroots Innovations n.d). These developments can be understood as a collaborative or participatory approach to systems of provision. It is argued that these bottom-up solutions can be more responsive to the interests and values of the communities involved. The research tends to discuss these processes in terms of strategic niche management and grassroots innovation, and it is thought that sustainable development can be facilitated by creating niches (protected spaces that allow experimentation in the co-evolution of technology, users practices and regulatory structures (Smith 2007, Dana et al 2019)). The argument is that if these niches are constructed appropriately they can act as building blocks for broader societal change through innovation

diffusion (Schot and Geels 2008).

It is helpful to highlight two further related considerations emerging from the research. The first concerns our understanding of how inclusive these forms of collaboration are; where these innovations take place, who takes part in them, and who is best served by them. For example, Middlemiss (2018 in Howard 2019) offers a critique of Transition Towns, observing that they are seen to be run largely by white, middle class volunteers who manage it to their own advantage. Howard (2019) warns us against “universalising the social realm” and failing to consider internal and external power dynamics acting on these innovations. If these innovations tend to take place only in certain well-resourced, affluent areas, run by limited sections of the population with the outcomes favouring those groups, there is likelihood that these bottom-up processes only serve to further exacerbate inequalities and disadvantage. A related question concerns not just the conditions under which these take place, but the role of government and other organisations in supporting these conditions, or even acting as stewards or facilitators of these practices (specifically in areas where these innovations are rare, where the conditions of success are lacking, and where action is badly needed).

In consideration of these issues we may benefit from developments in the final area of literature considered in this Review, which frames collaboration within the context of procedural justice and as part of a wider movement towards a *Just Transition*. This framing explicitly focuses our attention on ensuring the groups most vulnerable to climate change

and adaptation processes are able to participate in the process of decision-making and delivery.

Just Transition is an area informed by international labour movements (Galgoczi 2020), and the disciplines of law and geography (Heffron and McCauley 2018), and involves different scholarly traditions of climate justice, energy justice and environmental justice (Heffron and McCauley 2018). It also addresses the three main pillars of justice: distributional, procedural and restorative. The discussion of procedural justice offers a potentially useful lens through which to view collaboration. It concerns setting a new infrastructure of community engagement and involvement within environmental justice. This includes long-term engagement processes with the affected community. In contrast to the more formally theorised understanding of participation as deliberation presented in deliberative democratic literature, the just transition literature includes a more expansive concept of participation and co-governance including protest movements, negotiations and deliberations, and most notably community-led schemes (Simcock 2016 in McCauley and Heffron 2018). The Review found increasing interest and case studies illustrating efforts to achieve just transition including Lusatia in Germany (transitioning away from coal) (Emden 2020a), Pittsburgh (Ahmad 2020, Gothenburg (Ahmad 2020), Alberta (Cameron 2020), as well as agricultural transitions in the UK and Denmark (Emden 2020b) and waste management in the US (Gowda and Easterling (2000 in McCauley and Heffron 2018).

This is a wide, diverse and nascent literature with ongoing debates concerning the meaning and implications of procedural justice, including how radical the mechanisms need to be (affirmative or transformative, Galgoczi 2020), the conditions required to enable communities to have meaningful involvement in the process, and what role government and other authorities have in creating those conditions (for example acting as stewards and facilitators). Evaluating the evidence on just transition is complex, but the research has drawn out a number of lessons about conditions of success including: the presence of entrepreneurial actors in companies and civil society to act as a catalyst, antecedent conditions such as the strength of resources, networks and administrative capacity of the region, the degree and quality of stakeholder and public involvement, actions that strengthen and diversify the local economy and avoid incentivising unsustainable development.

Evaluation and limitations

The collaborative approaches describe deeply complex processes, whether manifested as deliberative spaces informing decision making or spaces for empowering collaboration and co-governance to achieve more just and equitable transitions. In addition to the variety of design choices, and the different conditions and contexts of application, there are different approaches to testing and evaluation. Different studies have used different criteria and methods of operationalisation in evaluation. For example, some focus on the legitimacy of the internal process, some on the evidence of impact and outcomes, others on their relationship to the wider system. This is not to say that we cannot learn lessons from this research, but rather to highlight some of the challenges encountered as we consider more complex forms of engagement.

This approach is also helpful in highlighting a more fundamental challenge that arguably connects all of the approaches reviewed which is the role of power as a catalyst for change. Much of the research on public engagement is written

in anticipation of an entrepreneurial actor who will act on the recommendations provided by these approaches. This is most evident in this last approach which relies on those in positions of power and responsibility to open up decision making power to a wider circle. In addition to having the will and capacity to open up decision making, and successfully creating meaningful collaboration, the organisation/government must have the capacity to respond to this new source of decision making and act effectively. There is an open question concerning why this catalyst for change occurs when it does, and how it can be recreated at the scale needed to respond to the problem. It is possible that this is answered by the literature, that if we just learn enough about good engagement practice and refine our methods (whether as communication, intervention, collaboration or another approach) then we will be creating the change needed. Alternatively, it may involve another explanation beyond the quality of public engagement, in which case we need another theory of change to explain this crucial element to understanding what is needed.



Conclusions from the Literature Review

This Review sought to provide broad insight into the public engagement methods that are enabling meaningful behaviour change around climate change issues. By explaining prominent ways of understanding public engagement in this context, it also serves to provide a common language to talk about public engagement methods in this complex space.

It is beyond the scope of the Review to offer a solution to the challenge of public engagement on climate change. However some key messages did emerge from the research that should be considered when devising public engagement strategies. One of these key messages suggest that public engagement should be linked to formal decision-making processes. Also key to the acceptance and success of our response to climate change is that measures are accepted by the public as fair (including procedurally by involving people in decisions that affect them in a two-way participatory process). We cannot have a net-zero transition without the public being involved as hugely disruptive social and behavioural change is required for the majority of measures to reach net-zero. This requires a public mandate built on effective participation and collaboration, as well as inclusive and effective communication.

There is also a need for multiple layers of interventions and messaging. There

are not only heterogeneous audiences that respond in different ways, but there are wide-ranging behavioural and structural barriers to achieving change. Change is required in relation to people's consumption patterns and lifestyle, but beyond this change needs to happen across groups and in a range of contexts (e.g. parents, employees, employers, political actors). Interventions across multiple levels and involving various levers need to be introduced to address values, beliefs, competencies, access to resources and infrastructure. While these changes need to be timely, the evidence from the literature also suggests they need to be carefully communicated and framed, demonstrating fairness and realising co-benefits.

The findings from the Review also suggested gaps in current research on public engagement. In particular, researchers are grappling with how to manage the urgency of the situation and the time required to get public

engagement right. There is more evidence needed in the communication literature on how you convey the urgency of the situation without evoking identity threats. There is an on-going debate over whether we have time to deliberate rather than just intervene. There is some research that suggests that you can still act without a public mandate and the public will come on board and accept policies later. This is a risky strategy and other evidence suggests public buy-in is necessary for measures to be effective and fair. There is also significant concern that the time-scales involved require a difficult balance between systematic deliberations vs. quick interventions. Finally, there is still a lot to learn about how best to engage the public in decision-making, specifically how to design genuinely inclusive spaces that produce legitimate and just outcomes, and how to overcome the power structures and barriers to more open decision-making that create more meaningful and impactful engagement.

Section B: Further considerations affecting impact of public engagement methods

In concluding this Review, it is important to highlight other critical factors that would need to be considered when designing public engagement methods around behaviour change for net-zero that exist outside the literature. These omissions determine important conditions for the design and implementation of any public engagement method on this subject. The limited discussion of these in the literature reviewed also indicates the need for further research.

Considerations illustrated in this section are:

- The need to embrace complexity
- Navigating uncertainty in science communication
- Designing for inclusivity and justice

The need to embrace complexity

Climate Change is a complex challenge, involving interlinked political, social and economic systems and combining technical, behavioural and institutional issues. In addition, the issue spans multiple regional (nations, territories, cities), social (family, community, society) and temporal scales. This makes public engagement on the subject inherently challenging. For instance in the case of food systems, what people produce and consume in a country is a factor of climatic considerations, agricultural subsidies, land zoning ordinances, choices made by school and care-home canteens and kitchens, trade policies and income-support schemes. Many decisions are contested and involve significant trade-offs that touch on public values, the allocation of scarce resources, and have direct impacts on people's lives.

In order to effectively engage the public and enable meaningful behaviour change to help meet net-zero, it is important that public engagement methods take into account the complexity surrounding such decision-making. If the holistic nature of the climate challenge is not embraced and there is a skew in the framing of the climate issue by governments or other organisations, to be sector-specific and expertise-focussed, this can lead to public engagement processes facilitated or commissioned by them to be siloed, piece-meal and unable to connect with people and their true needs and concerns. Many frameworks have been designed to help decision makers look at complex challenges through such a system lens that can also be extended to facilitating public engagement processes; for instance the Cynefin Framework categorises problems into 5 domains: simple, complicated, complex, chaotic and disordered (Conor 2018). Used as a sense-making tool it can enable practitioners and communities to make sense of complex issues, while avoiding the pitfalls of applying reductionist approaches to 'manage' complexity. For complex problems such as climate change, it highlights the need for emergent solutions which require experimentation

and prioritisation of learnings; to account for the complex, ever changing, interrelated nature of the problem.

This is however just one element of the challenge. Another significant area of work involves identifying how insights and learnings from public engagement processes can be actioned by governments when current models of governance involve siloed departmental remits, tightly-held data and evidence sharing processes, as well as dense hierarchical vertical accountability structures. These governance structures are ill-suited to tackling the complexity of climate change. What is needed, instead, is a model of governance that promotes a more iterative, flexible approach to decision-making across the system; focusing on sharing information horizontally across organisational levels and sectors, and trusting actors closer to the ground to experiment, learn, and make decisions suited to the context, prioritising the needs of the communities and places they are engaging with. A more localised, place-based approach to presenting and discussing climate impacts and policy considerations for net-zero also enables the conversation to be more relatable and relevant to the communities involved. The challenge with this approach is that it runs counter to the traditional way by which politicians and policymakers operate, i.e. by looking for blueprints on big ideas that offer to provide long-term one-stop solutions. However, by establishing systems that are primed for learning instead of control, we can centre communities and long-term public engagement processes as key elements of a governance culture focussed on embracing complexity, experimenting in small flexible ways, seeking consistent public feedback with the aim of growing our collective understanding of complex climate change impacts and evolving societal needs. The Human Systems Learning approach (Lowe 2020), outlined by a range of public service bodies, governments, foundations and non-profits (see Human Learning Systems n.d) frames a clear pathway for exploration of such an approach in the climate public engagement space.

Navigating uncertainty in science communication

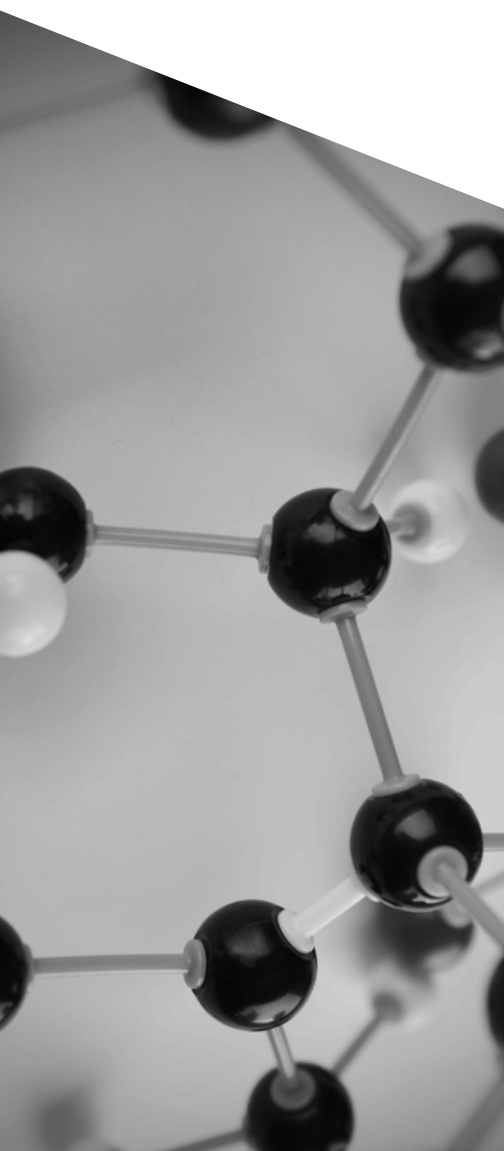
Communicating the effects of climate change inevitably involves engaging with uncertainty, as future projections of the timing, pace and severity of climate change impacts, and the options for managing them are variable and uncertain. There exist various challenges with driving action or engagement on climate change, due to framings of uncertainty as 'errors' and 'inaccuracies' in climate data, instead of as probabilities. This comes from an understanding of any area of complex science (as is also the case with COVID-19) as providing stable, fixed and immutable facts and answers, when in fact it is an area that is constantly evolving, with findings being constantly refined and updated. This understanding speaks to our innate need

for simple answers, which is unlikely when dealing with complex systems.

In response, climate change engagement is increasingly beginning to frame the conversation around a language of risk, as a more understandable and nuanced framing to drive engagement and action. This shifts the public debate away from the idea that decisions should be delayed till the science is settled, towards discussions around what timely action might mean, as well as an analysis of the comparative costs and risks of different choices and options (including doing nothing). Risk is also a more accepted and commonly understood concept in conversations around health, well-being, jobs, and the public have to regularly contend with managing it in different ways (e.g. weighing the risks and benefits of different health treatments, or taking out home insurance against the low probability-high impact case of a fire). While perceptions of risk can be affected by several factors, including lived experience, belief-systems, cultural and social framings, it is important to note that these perceptions continually evolve to fit present circumstances. This

necessitates sustained, iterative public engagement on the climate, and a need to envision climate policy as being flexible and adaptive given its value-laden nature and associated costs and trade-offs.

There is also a significant case to be made for a bottom-up contextualisation of climate risks to be place and people-centric. This would mean tailoring engagement processes to context-specific risks and climate events that the public are likely to relate with locally, and are likely to have to contend with again in near-term scenarios (this could include extreme weather events, flooding, hurricanes and fires, water shortages etc.). Presenting risks in this manner requires actors facilitating public engagement processes to build a close understanding of the communities they are engaging, in order to build out relevant scenarios of their life-worlds, for which a range of factors may be significant drivers of risk requiring associated decision-making. Such engagement holds great potential for generating more urgent commitment to action even in the context of inherent uncertainty, and is a significant avenue for additional research.



Designing for inclusivity and justice

Another critical consideration for the impact of public engagement methods around climate change and the growing interest around building net-zero strategies across high-income developed countries, is the importance of designing for true inclusivity and prioritising justice.

Across the world, climate change has impacted the poorest and most vulnerable the hardest. It is also the same communities who are most unduly affected by the unintended consequences of climate policy interventions (such as wind farm construction, shale gas drilling, coastal erosion schemes, increase in household energy tariffs), while being excluded from the economic benefits of carbon-intensive

resource extraction. Climate interventions can have substantial direct and indirect impacts on communities' air quality, access to housing, jobs, food, and a secure quality of life, and health, often disproportionately and systematically affecting black and minority ethnic communities. Therefore, foregrounding inclusion and justice considerations, while confronting racial and social injustices should be fundamental to public engagement around climate change, as it is critical to delivering meaningful impact.

Issues of race and social injustice have often served as a systematic, divisive wedge between communities, facilitating the exploitation of certain groups, and fundamentally inhibiting their ability to take action for social change. The pervasive presence of an extractive, exploitative and inequitable system is incompatible with a societal model where every individual can make a positive change towards mitigating climate change. Thus public engagement methods on climate issues need to first acknowledge the exclusivity inherent in historical efforts to combat climate change, including confronting and reckoning with the historic whiteness of the movement, in order to identify meaningful ways for inclusion and justice to become more inherent to conversations and engagement processes around the climate, and society more broadly.

In addition, public engagement methods must aim to directly and closely engage disproportionately affected or vulnerable groups and communities that are traditionally labelled "hard-to-reach" by policymakers and other actors. Research shows that often these groups are critical to climate-related public engagement processes but traditional methods often exclude them from being so, by not accounting for their needs and preferences on engagement [Centre for Public Impact, 2020]. Thus these groups are not so much "hard-to-reach" as they are "seldom-heard"; an important shift in framing that refocuses attention on the exclusionary nature of traditional public engagement methods rather than reinforcing a (false) characterisation of the group. Our research shows that there are various factors that must be considered in order to design

truly just and inclusive public engagement processes with seldom-heard communities. Prior to formally engaging them in a communication-focussed or deliberative process, it would be necessary to engage in deep listening exercises to understand the language, lifestyle, concerns, aspirations of the communities being engaged with, in order to then design engagement processes suited to them. Whilst technology is expected to present huge opportunities to democratise this process and reach seldom-heard groups, it can also be exclusionary to certain communities (further stratified across race, gender, age, and other demographic indicators) who aren't familiar with technology and its usage, or who aren't confident about their ability to understand and engage in its use, or who live in towns and places with limited broadband or mobile infrastructure, or who aren't comfortable with the implications of technology use on their privacy or security. These considerations need to be at the heart of any public engagement method to ensure true inclusivity.

Lastly, our research has shown it is not just the public engagement method used that determines impact but the underlying relationship between the public and the actor facilitating engagement. Of particular relevance is the legitimacy of the actor-facilitator, and their ability to build trusted relationships with the communities involved, and actively facilitate an engagement process in the communities' best interest. Overall, these are important considerations for building a sense of collective humanity to challenge systemic injustices. The climate challenge in its exemplification of those systemic injustices provides us an opportunity to redefine systems of engagement to adopt a more human and equitable approach from the outset. It does this by allowing for a foregrounding of justice and inclusion, ascribing value to trust-building at all levels, enabling the centring of human relationships in understanding needs and challenges of seldom-heard communities, and offering ways to close the loop between public engagement and policy interventions for net-zero through sustained collaboration and deliberation.

Final remarks

In addition to conclusions drawn from the literature, there is a strong case to be made for thinking more deeply and critically about public engagement in the climate change space, in a way that recognises inherent complexity, uncertainty and interconnected issues of inclusion and justice. A question that remains to be answered is whether the pace at which the mechanisms and processes of public

engagement might be instituted and expected to drive positive change may be too slow to match the pace at which urgent climate action is required. Engaging with this tension is an important tenet to forming a public engagement strategy that responds both to the call for urgency, while also placing adequate emphasis on the process being human-centred, adaptive, and inclusive in achieving a net-zero world.



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