



# DNZ | DELIVERING NET ZERO

## FINAL SYNTHESIS REPORT

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PROJECT PARTNERS:



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# DELIVERING NET ZERO: SYNTHESIS REPORT



## EXECUTIVE SUMMARY



Eight workshops, three phases of data collection, involving participants from the research, private, public, and third sectors.



Key objectives: investigate narratives for change, clarify where consensus is lacking, and explore the underlying reasons for differences.



Net zero requires rapid deployment of existing solutions alongside continued learning, upskilling of the workforce and greater supply chain capacity.



The total sum of all the individual actions matter to ensure the delivery of net zero – a 'whole system' approach.



Sharing learning and best practice is essential. Successes and failures, should be communicated to increase understanding of necessary steps.



Effective collaboration between public, private and research sectors is vital.



Take action where vested interests seek to downplay the possibility for technological and social transformations or use 'discourses of delay'.



Prioritise research activities that drive change – reward effective engagement with a range of public, private and third sector actors.

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## EXECUTIVE SUMMARY

Over the course of a series of eight workshops, structured in three phases of data collection, participants from the research, private, public, and third sectors debated what will be required for the UK to deliver a net zero future. This report provides a synthesis of the findings of these workshops, alongside recommendations for the stakeholder groups and UKRI.

The key objectives of the project were to investigate whether a broad narrative for change exists, to clarify points where consensus might be lacking, and to explore the underlying reasons for difference. Building on this understanding, the project was also designed to identify future research requirements for UKRI. This synthesis report details areas of broad consensus and a series of processes and structures that will be key in enabling the delivery of a net zero future, alongside the areas of divergence and contention which were not resolved through the workshop deliberations.

Fundamentally, there was agreement that the elements of change will need to integrate social and technological system change, tailored to an understanding of the local requirements that will facilitate rapid deployment of solutions. However, working across the data as a whole it becomes clear that the existence of a range of alternative views means that at present a single pathway for change is yet to emerge.

While not fully capturing all the opinions shared, two broad narratives can be used to make sense of the discourse elicited in the workshops:

### NARRATIVE 1:

On the one hand there is a narrative which stresses that existing institutional and economic structures are difficult to change, that cultural and societal norms are slow-moving, and demonstrates a commitment to the idea of economic growth. To some extent this is aligned with traditional ideas of 'ecological modernisation', a school of thought which argues that economic growth is reconcilable with environmental protection through the reform of political and economic institutions. However, this narrative goes well beyond that idea. It emphasises a range of changes to technology, economy and society in ways which seek to manage transition risks, deliver substantial co-benefits and minimise unfair distributional aspects of change, while also building social legitimacy through societal engagement. Responding to climate change in this context would mean that fragmented and incremental change is a limitation of the system we are working within and may ultimately constrain the ability to achieve net zero targets. Put differently, this narrative did not provide a theory of change which demonstrated how net zero could be achieved within the limited timescale available. Overall, this narrative was prominent among participants from the private and public sector, funders, and some researchers.

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## NARRATIVE 2:

The alternative narrative places greater emphasis on the scale and urgency of the climate challenge, picking up on more radical themes within the workshops. Whilst the positions in this narrative were diverse, it emphasised the need to activate rapid processes of social and technological change, moving away from current growth assumptions and unsustainable consumption patterns, and for some participants, a commitment to social justice as a core objective of the UK's net-zero policy. Embedded within this narrative is a belief that this is the only way to deliver net zero in the timeframe available. The challenging nature of this narrative was recognised with gaps identified around how to deliver the changes it articulated, and divided opinion over the wider role and importance of societal engagement. This framing was most prominent among some participants from the research community and the third sector.

Importantly, these two narratives are not entirely mutually exclusive. Consensus sits where there is cross-over between them. Significant areas of overlap exist suggesting a range of short-term actions and policies. These include the rapid deployment of existing solutions alongside continued learning, upskilling the workforce and capacity building, developing appropriate funding and business models, and defining the roles and responsibilities of actors.

This leads to a series of recommendations that support areas of action where consensus existed. They also clarify where further understanding is needed to explore the underlying reasons for differences and address gaps in the prevailing narratives. The main report explores this in more detail, and considers the implications of the following recommendations for different stakeholder groups.

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## RECOMMENDATIONS

### 1. ACT NOW:

There are a range of solutions that are ready, effective and scalable; improving building efficiency, deploying heat pumps and district heating, electrifying transport, expanding public and active transport infrastructure, decarbonising and expanding the electricity system, and implementing nature-based greenhouse gas removal techniques. These need to be rapidly deployed, whilst considering the interconnectedness of different solutions to understand the impact of immediate delivery and the consequences in the short, medium and long term.

### 2. TRANSITION PATHWAYS:

There are a number of possible net-zero pathways, each of which create different co-benefits and unintended consequences. Solutions that deliver on the cross-sectoral desire for urgent action also need to clarify who pays and who benefits. This requires openness and transparency around the economic, social and environmental implications of different net zero pathways.

### 3. COMPETING NARRATIVES:

Key contentions are prominent on issues such as economic growth, just transitions, urgency and timescales, social legitimacy, and roles and actors. In response, UKRI research should be shaped to understand these differences and their motivations, bring evidence to the debate, and prevent them from becoming discourses of delay.

### 4. IMPORTANCE OF PLACE:

Solutions need to take account of the very different options and consequences of a net zero transition for diverse communities in different geographical locations, both nationally and internationally. Spatial dimensions are not outcomes but are intrinsically part of the process of decarbonisation.

### 5. MONITOR AND EVALUATE:

The impact of both individual change initiatives and the broader net zero transition must be understood. Research is needed to establish and mitigate any unintended consequences with respect to justice, equity and the social legitimacy of specific solutions.

### 6. COMMUNICATE OUTCOMES:

Sharing learning and best practice is essential. The outcomes of pilot and demonstration activities, both successes and failures, should be communicated to increase understanding of the necessary steps to net zero. This will show progress, create transparency and maintain motivation, enable replication, and avoid repetition of mistakes.

### 7. ACTIVE ENGAGEMENT:

There is potential for improving and widening public engagement and participation as part of generating political momentum for policy change. This requires actively engaging with local and diverse communities to understand and shape the changes that are likely to happen in the transition to net zero.

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## 8. CLARIFY EXPECTATIONS:

Clear governance structures are essential. Define roles and responsibilities for individuals, governments, companies and others involved in delivering net zero, matching these to available resources. This should improve accountability and increase diversity of opportunity ensuring more effective outcomes.

## 9. REALISING A FAIR AND JUST TRANSITION:

Achieving a 'just transition' requires 'fair and legitimate' decision-making processes. This involves empowering communities, particularly those who are marginalised or disproportionately impacted by the transition, to participate in shaping how the transition occurs.

## 10. POWER AND VESTED INTERESTS:

There are institutions and individuals who downplay the possibility for technological and social transformations in achieving net zero. This should be explicitly recognised, its impact identified and action taken where appropriate.

## 11. SKILLS, TRAINING AND EDUCATION:

The net zero transition requires upskilling and capacity building in the workforce and governments. This is a crucial component of a fair and just transition as well as providing the necessary supply chains to deploy, monitor and enforce low carbon solutions.

## 12. WHOLE SYSTEM APPROACH:

The total sum of all the individual actions matter to ensure the delivery of net zero. Cross sector dialogue is required to understand interactions and how systemic and strategic planning of net zero actions will happen. This is just as relevant to the research sector as it is to the government and the private sector.

## 13. REVIEW THE FUNDING LANDSCAPE:

Research funding needs to address the urgency of delivery, particularly from areas other than novel supply-side technologies. Take stock of the range, effectiveness, equality and diversity of existing net zero research investments and explore opportunities for investment from a wider range of sources.

## 14. INTERDISCIPLINARY RESEARCH:

No single discipline or theory can answer the net zero challenge in isolation. UKRI must provide strong support for interdisciplinary research and create greater clarity on the role of the research community in the delivery and implementation of net zero.

## 15. INCENTIVISE COLLABORATION:

Effective collaboration between public, private and research sectors is vital to the delivery of net zero. Specific schemes should be established that encourage secondments and other exchanges of personnel and capability between and within sectors relevant to net zero, with an emphasis on diversity.

## 16. REWARD IMPACT:

Academic institutions undervalue the importance of broader engagement needed to achieve net zero targets. The rewards for delivering effective academic impact should be greater, so that researchers can prioritise activities that drive change. This will involve engagement with a range of stakeholders including public, private and third sector actors.

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## 1. INTRODUCTION

Delivering Net Zero is a UKRI funded collaboration between the University of Leeds, Cardiff University and Cultivate Innovation Ltd, which aimed to explore the extent to which consensus exists around a credible narrative to deliver both urgent initial steps and a longer-term strategy for a net zero future. Ultimately, the project aimed to use this to inform how UKRI funded research can have the maximum opportunity to guide the response of decision makers to climate change.

The project involved three rounds of structured deliberative workshops with leading members of the UK research community and stakeholders from the public, private and third sectors. In the first round, 42 researchers were brought together over two workshops to deliberate on the decarbonisation of energy supply, reducing energy demand, and greenhouse gas removal (GGR). In the second round, 41 stakeholders from the public, private and third sectors were convened over four workshops to reflect on the outputs of the first round, identify gaps, and provide their perspectives on developing a narrative for net zero. The final round reconvened 30 of the original researchers, to further reflect on the outputs of previous workshops, provide input on any gaps identified and develop messages for UKRI. Further details of the project methodology are provided in the Appendix of this report.





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In synthesising the findings from these workshops, this report reveals that there are some broad areas of consensus which participants agreed should be priorities for delivering net zero. They agreed that elements of change will need to integrate social and technological system change, tailored to an understanding of the local requirements that will facilitate rapid deployment of solutions. However, no single narrative emerged and at the end of the workshop process there was still significant divergence of perspectives regarding how the UK should respond to climate change. While not encapsulating the full diversity of perspectives, two broad narratives can be used to make sense of viewpoints expressed.

### NARRATIVE 1:

On the one hand there is a narrative which stresses that existing institutional and economic structures are difficult to change, that cultural and societal norms are slow-moving, and demonstrates a commitment to the idea of economic growth. To some extent this is aligned with traditional ideas of 'ecological modernisation', a school of thought which argues that economic growth is reconcilable with environmental protection through the reform of political and economic institutions. However, this narrative goes well beyond that idea. It emphasises a range of changes to technology, economy and society in ways which seek to manage transition risks, deliver substantial co-benefits and minimise unfair distributional aspects of change, while also building social legitimacy through societal engagement. Responding to climate change in this context would mean that fragmented and incremental change is a limitation of the system we are working within and may ultimately constrain the ability to achieve net zero targets. Put differently, this narrative did not provide a theory of change which demonstrated how net zero could be achieved within the limited timescale available. Overall, this narrative was prominent among participants from the private and public sectors, and some researchers.

### NARRATIVE 2:

The alternative narrative places greater emphasis on the scale and urgency of the climate challenge, picking up on more radical themes within the workshops. Whilst the positions in this narrative were diverse, it emphasised the need to activate rapid processes of social and technological change, moving away from current growth assumptions and unsustainable consumption patterns, and for some participants, a commitment to social justice as a core objective of the UK's net-zero policy.

Embedded within this narrative is a belief that this is the only way to deliver net zero in the timeframe available. The challenging nature of this narrative was recognised with gaps identified around how to deliver the changes it articulated, and divided opinion over the wider role and importance of societal engagement. This framing was most prominent among the research community and some participants from the third sector.

Importantly, these two narratives are not entirely mutually exclusive. Consensus sits where there is cross-over between them. Significant areas of overlap exist suggesting a range of short-term actions and policies. These include the rapid deployment of existing solutions alongside continued learning, upskilling the workforce and capacity building, developing appropriate funding and business models, and defining the roles and responsibilities of actors.

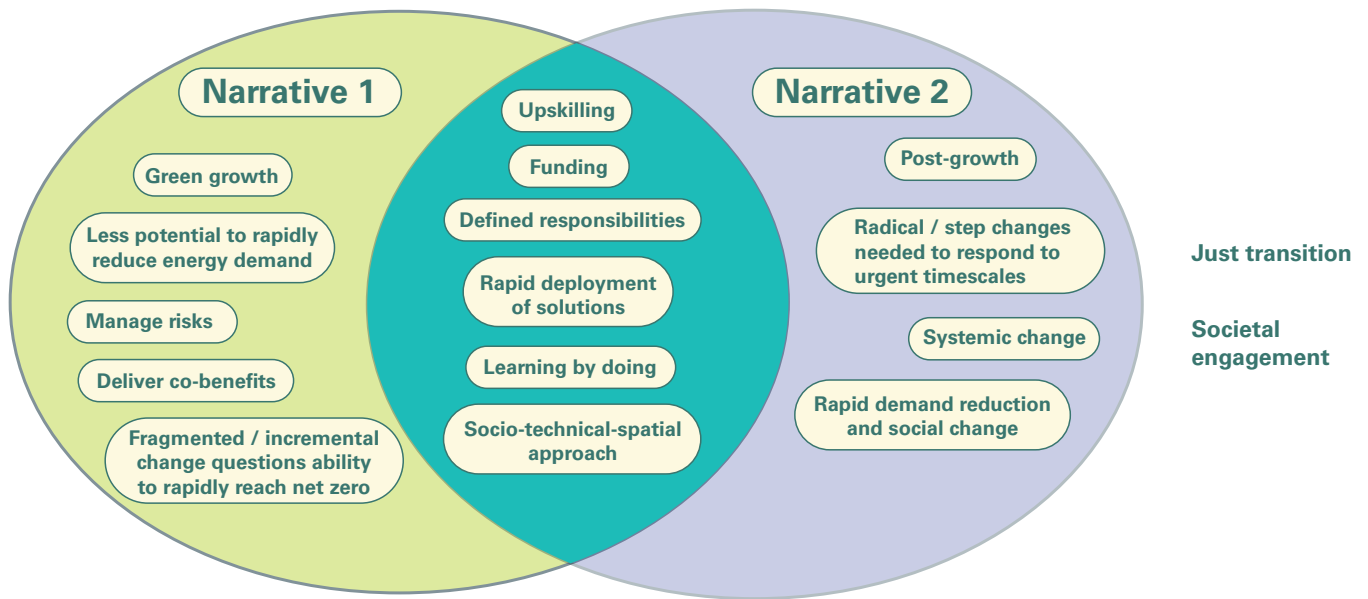


FIG.1 Emerging narratives on delivering net zero

**Fig.1** visualises the alternative framings of Narrative 1 and Narrative 2 and illustrates areas of consensus where the two distinct narratives overlap. Notably, there were also issues that elicited a diverse response from the participants and demonstrated a lack of consensus within each framing. These issues included the role of societal engagement and a just transition: some participants saw these as important and central to their narratives, others less so, and some emphasised different elements of the issues. Therefore, these issues sit outside of both narratives.

The following sections of this report delve into these areas in greater detail. In the first section, areas of consensus are outlined, with a focus on action required, or on processes and structures which would enable the delivery of net zero. In the second section, the distinction between the two dominant narratives is explored and interrogated, with a focus on drawing out an understanding of where these issues are contested. In the third section, the report expands on identified gaps in these dominant narratives. And finally, the report concludes with detailed recommendations tailored towards UKRI, the research community and the private, public, and third sectors.



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## 2. CONSENSUS AND ENABLERS

This section provides details of the areas of consensus which sat across the two dominant narratives, where participants agreed on actions required, or the processes and structures which would enable delivery.

### 2.1: THE RAPID DEPLOYMENT OF EXISTING SOLUTIONS AND ‘LEARNING BY DOING’

Across the workshops, participants felt it was essential to focus on the rapid deployment of existing solutions, which could provide immediate reductions to cumulative emissions. Such solutions were deemed to be both technologically ‘ready to go’ and able to reliably deliver emissions reductions. Solutions do not solely refer to technologies but also to societal changes. They identified a range of priorities around which there was broad agreement, including improving building efficiency, deploying heat pumps and district heating, electrifying transport, expanding public and active transport infrastructure, decarbonising and expanding the electricity system, and implementing nature-based greenhouse gas removal techniques.

Participants emphasised that it is now essential to deploy these solutions at speed and scale, with an emphasis on ‘learning by doing.’ In the workshops with the public, private and third sectors particularly, participants felt that deployment should be an iterative process, with a greater acceptance of the risks of deploying solutions at speed and the potential for some projects to fail. Whilst recognising this approach brings the risk of ‘unintended consequences,’ participants were keen to emphasise that failure to rapidly reduce emissions represents a larger risk.

*‘If we want to move forward at pace, you need to try lots of different things at different times and work out which ones work and acknowledge that probably in your first iteration, you’re not going to get anything quite right; you’re going to learn a lot of different things and you’re going to iterate and move forward.’ (Private sector participant)*

To counter the risk of locking in undesirable path dependencies, participants emphasised the importance of taking a whole systems perspective, to better understand the dynamics of how policy decisions interact and can create knock-on consequences. For example, a whole systems approach to urban design and transport infrastructure is needed to ensure that deploying electric vehicles as a rapid solution does not further lock society into car dependency. Participants also stressed the importance of building an evidence base that understands where and why projects succeed and fail, learns from historical mistakes, and more effectively supports deployment of innovative solutions.

*'I think recognising that this is a collective endeavour in which we need to try out stuff, test stuff and learn about what works and what doesn't work, in others words, be more tolerant of failure in that sense. Ultimately with a view to build an evidence base that demonstrates how we do it.'*  
(Researcher)

Participants also noted an evidence gap regarding the evaluation of the various impacts of social change initiatives and suggested that new methods and research would be required to fully understand this issue. They also identified systemic issues around the failure to learn from implementation experiences, particularly where projects are receiving public funding. This can result in multiple entities repeating the same mistakes, which is wasteful of public money and resources. Ultimately, participants called for an iterative approach to deployment that builds in assessment and improvement, and rapidly implements a range of existing solutions with the explicit goal of urgently reducing emissions.

**Suggested solutions included:** Updating electricity networks and improving system flexibility and storage; scaling up offshore wind infrastructure; expanding active transport infrastructure; rapid building retrofit; heat pump roll outs; a suite of 'ready to go' nature-based approaches to carbon removal, including peatland and soil carbon restoration; deploying CO2 transport and storage for carbon capture, utilisation, and storage (CCUS); developing robust monitoring, reporting and verification (MRV) protocols for GGR; creating a publicly accessible knowledge transfer mechanism; and investing in technological innovation in areas like energy storage, marine renewables, offshore hydrogen, and small modular reactors to maximise reductions in the longer term.



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## 2.2: A PROGRAMME THAT ACKNOWLEDGES SPATIAL CONTEXTS

Solutions should consider the social, cultural, economic, and technological contexts of local areas. Spatial dimensions are an intrinsic part of the process of decarbonisation and a tailored approach is necessary to understand local requirements and optimise the rapid deployment of solutions. Participants felt that decarbonisation pathways tended to focus on national and international scales and often overlook these local complexities:

*'I think geography isn't just important for devolved authorities; it's actually important everywhere because we can have these ... national level systems and national level accounting ... but the reality is that has to happen somewhere in the country ... what I would really love to see is a strategy that actually recognised geography and recognised that there are different solutions in different places and I've never seen anything that even goes close.'* (Researcher)

To realise a strategy that fully engages with spatial contexts and geographical realities, participants felt it was important to improve government collaboration across scales. This is predicated on building a far better understanding of the roles that each level of government would need to fulfil in order to successfully deploy solutions. Many participants also linked the importance of spatial analysis to achieving a just transition, as this understanding is essential to identify who the 'winners and losers' could be, and to ensure that any negative impacts can be mitigated for communities who are already vulnerable.

*'I'd argue the cutting-edge bit is no one's figured out how to deliver net zero at anything sub-national scale that involves talking to the people who live in those communities and places ... and understanding who the winners, who the losers, will be, what those kind of challenges might be, how it fits within other national or other scales of policy, how the differences within that region play out in terms of an urban transition compared to a rural transition, and what that means for inequality.'* (Researcher)

Some participants noted that developing spatially and sector specific measures, with situated demonstration projects, would build an evidence base around how and why projects succeed, and would help to overcome any initial resistance to change. Others also suggested that locally situated demonstration projects are an important and likely more effective way of engaging communities in net zero than public engagement around climate change in the abstract. Ultimately, an iterative programme of roll out, assessment, and demonstration of solutions will need to consider context, both in terms of the geographical realities of local areas, and the larger societal and economic contexts of people's lives.

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### 2.3: UPSKILLING AND CAPACITY BUILDING IN THE GOVERNMENT AND WORKFORCE

The need to upskill and capacity build was emphasised across the workshops, both in the workforce, to deploy and monitor infrastructure, and in government, to oversee and implement change. This was identified as a key enabler of change. Participants also identified a role for research in developing an understanding of how capacity can be built in government and supporting this process. Building the capacity, particularly in local authorities, to more effectively respond to climate change was a prominent theme. Several participants cited ‘a lack of funding at a local level’ and a ‘lack of expertise and knowledge’ within local authorities as barriers to decarbonisation. Capacity building in local authorities was also linked to improved communication and public engagement as participants recognised that local authorities could be highly effective at engaging their local community, but the capacity to do this was not equally shared across different locations:

*[Larger local authorities such as Greater Manchester have] ‘put resource in... [to] deliver on that engagement piece and that collaborative discussion to bring the citizen with you. But that doesn’t exist, I would argue, in the smaller local authorities, the capacity to be able to do that, or even the level of ambition to do that.’ (Public sector participant)*

Participants also identified a ‘massive skills gap’ in the workforce acting as a key barrier to the acceleration of change. Upskilling was a common short-term priority, where across the workshops it was recognised that ‘there’s a huge requirement for labour and skills,’ and participants viewed this as a key enabler of other priorities. The need for an ambitious programme of upskilling and capacity building was linked to the importance of acknowledging geographical diversity, as industries will shift according to the social, cultural, economic and technological contexts of local areas. Workforces will need to adapt to changing industries and acquire new skills to ensure the transition to a net zero economy. This is dependent on a joined up and context specific series of interventions which must operate on a multitude of levels:

*‘If net zero is to be successful, we need a governance strategy that is multi-level, but for the different levels such as regional and local to work, they need to be sufficiently resourced, not only with funding but with the various skills needed to help implement and support different projects at these levels.’ (Researcher)*

**Suggestions for upskilling and capacity building included:** Upskilling workers for large scale programmes deploying heat pumps, retrofit, and EV charging infrastructure; combining local skills and jobs programmes with the decommissioning of fossil fuel infrastructure and the roll out of low carbon infrastructure to help assist a just transition in regions with local economies dependent on fossil fuel infrastructure; decentralisation of fiscal and decision making powers to allow local authorities to become an important agent for delivering localised solutions; educating policy makers around the public values and preferences for decarbonisation options; and academic research to understand areas of government that require capacity building.

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## 2.4: APPROPRIATE FUNDING STRUCTURES AND BUSINESS MODELS

Participants agreed on the need for appropriate funding structures to raise large amounts of capital, and the importance of demonstrable and viable business cases for net zero innovation. Whilst funding was identified as a key enabler of the net zero transition, there was considerable variation in views on how funding should be managed and distributed. Participants involved in innovation funding recognised a range of barriers relating to the financing of net zero; investment cycles are rigid, meaning that there is often a small window for projects to receive funding, and funding incentives are structured towards low risk, short term gains, meaning there is a failure to invest in more long term, systemic solutions:

*'There's this constant challenge of the longevity of our funding, we end up... funding a three-year programme - well that's a really piecemeal approach to a much bigger, longer-term problem which does need investment in longer term demonstrator projects... three years is not going to cut the mustard.'* (Public sector participant)

This challenge is compounded by political short termism, where funding priorities often change with a change in government. Some participants noted that the weight of financial incentives is still geared towards fossil fuel industries, preventing low carbon technologies from becoming financially viable. There is also a notable lack of access to finance for low-income individuals to reduce emissions in their homes, such as installing heat pumps and buildings insulation. Participants felt that both in the private sector and for the public, there is a need for the government to provide access to low-cost finance:

*'Across the board, there's a need to provide access to low-cost finance... if the government viewed this challenge as a national infrastructure issue and used the Green Bank to help drive the availability of access to capital, that would really help to solve the [problem].'* (Third sector participant)

Whilst there was broad agreement on the urgent need to raise a large amount of capital to fund net zero, there was some divergence across the two narratives in how participants felt this should be distributed. Some participants, more aligned with Narrative 1, saw a strong role for the private sector, and suggested that if a more stable political environment can be created, then industry will be able to develop appropriate business models that attract investors. Private sector participants felt that a focus on innovation is key, and highlighted the potential for economic benefits and the opportunities for the private sector to lead on innovating new business models. However, others, more aligned with Narrative 2 noted the challenge of aligning the private sector with net zero:

*'The big urgent priority that hasn't come up just yet... how do we rapidly re-direct flows of capital and the economy? So, it's already beginning to happen with divestment of investors from fossil fuels, but is it happening fast enough set against a backdrop of relentless pressure on short-term profit maximisation which then stops the private sector from investing in longer term plans which are aligned with net zero?'* (Third sector participant)

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Many participants were enthusiastic about increased collaborations and partnerships between researchers and authorities but emphasised that there was still a need for more resources from central government. Some participants framed this around the idea of a 'local green deal' providing greater access to longer-term funding, to enable authorities to develop stable local supply chains and deliver programmes of decarbonisation themselves, such as buildings retrofit. Ultimately, participants articulated the need for financial structures that embolden the transition. There were calls for significant increases in government investment, and for this to be targeted more strategically, for example investing in solutions which we know can deliver in the short term, whilst still investing in solutions we know we will need in the long term but require more innovation. However, whilst participants were agreed on the need to fund a net zero transition, this topic brought conflicting perspectives into the foreground. Where some participants believed that existing economic structures could be altered to focus more distinctly on the net zero transition, others questioned whether the level of change needed was possible within our existing economic structures, with their implicit growth assumptions and unsustainable consumption patterns.

## 2.5: DEFINED ROLES AND RESPONSIBILITIES

In both the researcher and stakeholder workshops participants observed that there is a tendency for actors to shift responsibility onto other entities. For example, in the public and private sector workshops a strong onus was placed on central government and ministers to lead in taking action. However, in the third sector workshops participants argued that there is currently no 'systems architect,' meaning that there is a need to take collective responsibility for the shift towards a net zero society. Broadly, participants called for a greater sense of shared responsibility and collaborative endeavour. This was expressed at a range of scales, from the local to the national and international levels. Coupled with this desire for a collective endeavour, participants identified a need to form a better understanding of how we transition to a net zero future, who owns the responsibility to act, how do we hold them to account, and how do we ensure transparency and accountability:

*'Who is responsible for which parts of this? And how do we hold those offices, officials, business persons, etc, to account? How do we, in other words, get ownership of the problems and get clarity about who has to do what, who has to make what sorts of changes?'* (Researcher)

Participants also called for an improvement in transparency and honesty in the public discourse around temperature targets, urgency of change, and the way these changes will impact the way people live their lives. Participants articulated the need for improved coordination and multi-level governance, which requires effective knowledge production and communication, with resource and funding to be spread across different levels of governance. In terms of leadership, participants saw an opportunity for local authorities to play a stronger role in the transition. They thought that it was important not to take an overly centralised approach, and felt that if granted more powers and resources, local governments have the 'momentum and ambition' to drive forward decarbonisation at a faster speed. Overall, there was a call for greater collaboration across scales of government and for policy to be developed at a whole systems level. There was also a call for more collaboration between public and private sectors, and academia:

*'Tackling the net zero challenges is one of the few issues that requires a sort of whole place type approach where you need all the different institutions and organisations and entities of a place working with a shared purpose in common.'* (Third sector participant)




Participants also emphasised that this responsibility is differentiated, with institutions and entities having vastly different capabilities to act, change and influence. Largely, it was felt that too much onus is shifted onto individuals, which deflects attention away from the need for systemic change and this can be used as a tactic of delay. Nevertheless, participants also felt that smaller actors and individuals can create the political pressure to enact changes to slower moving institutions, as long as their actions are situated among the need for broader systemic change. For example, they highlighted the importance of researchers and academic institutions 'walking the walk' in terms of taking responsibility for reducing their emissions and doing this publicly. Some participants also re-emphasised the historical and colonial legacy of the UK, and called for the UK to assume a leadership role, and act on its responsibility to support poorer nations to decarbonise:

*I wonder if there's somewhere that we can also reflect on the international role of the UK and the role of UK policy and research community in taking responsibility as a major emitter, as an industrialised country, as an ex-colonial power... and the responsibility that the UK has to support particularly global south decarbonisation. (Third sector participant)*


**Suggested responsibilities included:** A whole system plan for decarbonisation to be implemented across government departments and scales, linked to regulation; a body that sits above changes in government to provide long-term strategy for decarbonisation; a regulatory framework to link decisions across sectors; and the creation of a regulator for heat that coordinates decision making and investment across the gas and electricity networks.

# DNZ | DELIVERING NET ZERO




## 2030 | 2040 | 2050

### CONSENSUS AND ENABLERS




Different solutions are interconnected. The system-level impacts of immediate delivery need to be understood in the short, medium and long term.




Skills, training and education are important to build capacity for the net zero transition in the workforce and governments.

Funding needs to address the urgency of delivery. Research and innovation are needed across multiple sectors, not just in novel supply-side technologies.




Net zero creates very different options and consequences for diverse communities in different geographical locations both nationally and internationally.




No single discipline or theory can answer the net zero challenge in isolation. Interdisciplinary research is important.

Delivering a fair and just transition will require improved supply chains and new skills to deploy, monitor and enforce low carbon solutions.



Industry, commerce and government must develop appropriate governance, funding and business models, and define the roles and responsibilities of different actors.



Cross sector dialogue, to understand interactions and plan strategically, is just as relevant to the research sector as it is to public and private sectors.

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## 2.6: A SOCIOTECHNICAL APPROACH

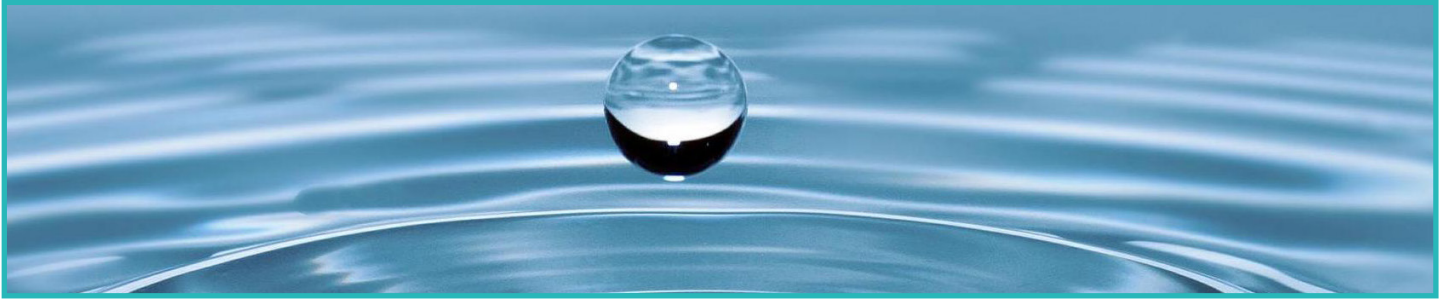
Across the workshops, participants described the net zero transition as a series of sociotechnical transitions linked to one another, implemented concurrently across the country at a range of scales. As the participants in the workshops articulated, it is essential to understand these transformations as interconnected:

*We do need to have optimism in technology, but at the same time system change is equally important ... it's understanding which technologies we can deploy sooner rather than later because they are ready to go, but in the context of where they would work best as they're not going to work everywhere. And these strands lead back to things like the need to upskill and capacity build in the workforce. (Researcher)*

The ambitious nature of the transition will require a linked-up series of changes; ready to go solutions must be deployed in areas where they will have the most impact. The workforces and authorities in these areas need the opportunity to reskill and capacity build. The requisite funding and business incentives need to be in place to embolden the transition. And the ultimate successes will in turn increase our knowledge base and build public confidence in a net zero transition.

Participants cautioned against an overreliance on technological solutions alone to deliver emissions reductions. Instead, they emphasised that the transition will be sociotechnical, taking into account the social, cultural, economic and technological contexts of local areas, which makes it complex and challenging. This means that while some solutions may be technologically 'ready to go,' they may not be ready for deployment. The difficulty is compounded by a lack of evidence demonstrating the impacts of sociotechnical and social interventions. Ultimately, participants highlighted the fundamental importance of an interdisciplinary approach that makes use of a mosaic of solutions to deliver a comprehensive transition to a net zero society.





### 3: DIVERGING NARRATIVES

As the previous section looked at where consensus sits in the overlap between the two overarching net zero narratives previously described, this section now details the key areas in which the narratives diverged.

Narrative 1	Narrative 2
<ul style="list-style-type: none"><li>- Structures and norms are slow moving</li><li>- Green growth</li><li>- Change fragmented</li><li>- Aim to manage transition risks</li><li>- Deliver co-benefits and mitigate unfair distributional outcomes</li><li>- Develop societal engagement</li></ul>	<ul style="list-style-type: none"><li>- Rapid step changes necessary to transform current social, economic and political structures</li><li>- Post-growth</li><li>- More emphasis on need for rapid demand reduction</li><li>- For some, social justice is a core objective</li><li>- Diverging perspectives around the role of societal engagement</li></ul>

While we have broadly grouped the areas of contention into two overarching narratives, dissensus also exists within these narratives regarding certain topics. This section describes four of the key areas of disagreement which imply fundamentally different visions of delivering net zero.

#### 3.1 URGENCY AND TIMESCALES

Whilst unsurprisingly, all participants agreed with the need to act with 'urgency', there were significant differences in what participants felt this meant, and whether they felt it was being achieved. As one participant articulated, when urgency is prioritised, this implies not just that the UK needs to reach net zero by 2050, but that cumulative emissions, defined as the total amount of emissions released over a specified period of time, must be kept as low as possible through rapid short-term reductions. However, it was not clear that all participants were fully on board with the implications of this interpretation of urgency in their discussions.

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Under Narrative 2, participants felt that this urgency meant that radical and 'step change' measures were the only credible response. In early workshops, they called for transformative measures to change social practices and infrastructures, and a re-focusing of research funding towards areas primarily in energy demand reduction which they felt could have the largest impact in the shortest time. In later workshops, they critiqued the agreed outputs from earlier workshops as not radical enough to reflect the urgency of the situation. On the other hand, others aligned with Narrative 1 had a much more cautious interpretation of the actions required to act with 'urgency' and raised concerns that pushing for more radical measures may cause researchers to lose credibility. They commented that this disagreement reflects a difference in how urgency and timescales are perceived:

*'[The main difference] between me and [participant] is that I get the impression that [participant] is more accepting and less worried about what he's saying, whereas I am a lot more worried about whether we're going to get to net zero.'* (Researcher)

Some participants were pessimistic about the ability of current systems to react to urgency and focused on the barriers to moving forward. Some even expressed scepticism throughout the workshops and in particular that the timescales of government targets are unrealistic. For example, one Researcher commented in respect to the Scottish Government's target to reduce emissions by 75% by 2030:

*'I think that 75% target, the timeframe is nonsense! It comes back to the point about don't over promise.'* (Researcher)

The two narratives also diverged around their interpretation of risk. In several workshops a debate was had regarding the urgency of rapidly deploying solutions and 'learning by doing', against concerns that rapid roll out may lead to poor decision making and failed deployment, which risks losing trust and more time overall. While some participants felt that 'the time for saying urgency is way, way in the past', others commented that 'there's a risk of doing something too rapidly that might have unintended consequences' and 'we don't have time to screw up, we don't have time for a car crash'.

To resolve this tension, they felt that it was important to focus on financing 'quick fail' demonstration projects, to learn quickly what does and doesn't work, and develop a stronger 'feedback loop', to document and learn from failures. However, they also commented that this debate reflects a divergence in concern for acting urgently:

*'I think we're answering this with it depending on how big of a challenge we think this is. Because it's not 80% from energy by 2050, and some people are saying it's complete decarbonisation by 2040... that shifts how you think about this in terms of deployment and what might be necessary.'* (Researcher)

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This also fed through to debates that participants had regarding the extent to which the government suffers from 'political inertia'. While this was a clear theme in the stakeholder workshops, the research community expressed a range of perspectives around the extent to which government engagement with net zero is adequate:

*'I just don't think we have political inertia at the moment. I have never seen governmental departments so engaged on this. I think at the moment I'm sitting on three or four different advisory committees, we're talking to people on at least a once a week basis. The number of announcements we had last month was unbelievable. Never in all the years I've been working in this sector have I seen so much activity. There is definitely not political inertia.'* (Researcher)

Some participants seemed to be conflating government targets and indications of intent to act as sufficient evidence that government are responding effectively to the urgency of reducing emissions. Others suggested that while net zero may be being taken seriously at cabinet and committee level in national and local government, this has not translated yet into good policy and investments and there is still significant inertia around the need for changes to lifestyles. All of these debates indicate a spectrum of perspectives regarding both the immediacy and scale of response which is required to reduce emissions and respond to the urgency of climate change. The scepticism of some participants toward the appropriateness of government targets suggests that despite the fact that there was agreement around the need to act 'urgently', the participants did not discuss the full implications of not achieving these targets. There was clear variation in the level of interest to engage in a discussion about the speed of change needed to deliver net zero.

### 3.2 ECONOMIC GROWTH

Alongside disagreements around the pace of change possible, participants were divided around the extent to which the need to rapidly reduce emissions to net zero implies a need to move away from conventional assumptions about the nature and necessity of economic growth. The term economic growth was not clearly defined meaning only a high-level discussion took place that did not address the details of a future economic system that is compatible with net zero objectives. Narrative 1 took on a green growth framing, where participants either argued that it was unfeasible to move away from a growth economy, or simply did not feature changes to economic structures as part of their understanding of a net zero transition. Under Narrative 2, participants described economic growth as the 'elephant in the room' in net zero, expressed growth as incompatible with the need to rapidly decarbonise, and placed a move away from growth as a core feature of their narrative. The vast majority of participants who raised concerns about economic growth were members of the research community, and on the whole this debate did not seem to be prominent among stakeholders from other sectors.

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Within the early workshops, this debate largely took place in a group focussed on energy demand reduction, where participants were divided around the extent to which net zero can be achieved within our current economic system, or whether there is a need to move away from economic growth to alternative economic systems of distribution. While some participants were concerned that de-growth or post-growth measures were not more prominent in the set of priorities from the research community, other participants expressed scepticism around the feasibility of moving away from a growth economy. This contention was raised again in the final set of researcher workshops, and one participant identified it as the crux of the disagreement in the energy demand group:

*'It was much more than just, is it social change, is it technical change, or is it socio-technical change. It was actually, does capitalism need overthrowing? Can we do this while growing the economy? And is social justice absolutely integral to decarbonisation, or can you decarbonise without necessarily really pushing hard on progressive policies that constrain growth in upper income brackets?' (Researcher)*

Other participants expressed concern that the themes which emerged from the initial researcher workshops largely represent a 'continued green growth agenda,' which they felt did not match up with the need to make 'really large changes very quickly' to the economy and energy system. In particular, they suggested that a continued pathway of economic growth may be incompatible with the need to reduce energy demand, and that 'alternative economic distribution systems' were instead needed. However, while this issue was raised by several participants, in the main they did not go into greater detail on the subject, with comments such as 'we've not got time to go there' being common. This unwillingness to confront the problem suggests that the complexity of the debate around the relationship between climate change and economic systems is not a prominent feature of how most participants from the research community are considering the issue of net zero more broadly.

In the stakeholder workshops, this was not an area of contention and their discussions of net zero largely took on a green growth framing aligned with Narrative 1. Amongst the public sector participants, arguments around de-growth and systemic economic transformations were not prominent. While most participants did not take issue with this, some researchers felt strongly that this has led to a lack of funding for research which challenges the dominant economic paradigm:

*'It relates in a way to the mainstream, the current paradigm of us as researchers. We get funded by research councils who are trying to fund stuff which is then going to be acceptable by the policymakers... they want the green growth agenda type research, so we go away and that's the stuff we're on' (Researcher)*

As a consequence of this implicit framing some participants felt that the themes from the initial workshops, whilst reflective of the mainstream discourse in the research community, are not significantly critical of the current economic paradigm, and therefore do not reflect the true challenge of transforming the energy economy system to reach net zero.

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### 3.3 JUST TRANSITION

Another key area of divergence in the narratives was the extent that social justice should play a central role in the transition to net zero, and what the implications of a 'just transition' are. Participants recognised that the concept of a just transition is broad, and can be poorly defined, meaning it is often reduced to a 'buzzword'. While this did not lead to a detailed discussion of its definition, in general, the concept of a just transition recognises that the responsibilities for climate change are highly unequally distributed, and that the impacts of a net zero transition have the potential to disproportionately impact vulnerable and marginalised communities if social justice is not embedded in the process of decarbonisation. Across the two narratives, participants had differing interpretations of the implications of this for a net zero transition. Among those who viewed it as a priority, there were four different dimensions of a 'just transition' that participants referred to: procedural justice, spatial distributions, economic distributions and co-benefits. Some of these dimensions are more closely aligned with Narrative 1, whilst others are more closely aligned with Narrative 2. Across both narratives there were also some participants who did not believe that a just transition should be a core focus of a net zero transition.

#### 3.3.1 PROCEDURAL JUSTICE:

Many participants across both net zero narratives acknowledged the importance of procedural justice. Participants discussed the idea that a key part of a just transition involves having fair decision-making processes. Rather than aiming to achieve a social consensus around net zero, which they felt was futile, participants commented the goal should be to ensure that processes are 'perceived as legitimate approaches to address the problem'. Part of this involves empowering communities, particularly those who are marginalised or disproportionately impacted by the transition, to participate in shaping how the transition occurs. Some felt that having strong levels of public participation would make it more likely for the transition to net zero to be just. They also discussed procedural justice in relation to the importance of 'leading from the top', meaning that decision makers embody the changes they are calling for.

#### 3.3.2 SPATIAL DISTRIBUTION:

The impacts of a net zero transition, and the measures required to achieve it, are highly spatially differentiated. 'Winners and losers' are an inevitable consequence of the economic restructuring required to reach net zero, and a better analysis of spatial distributions is essential to help mitigate the potential impacts of a transition on vulnerable communities. Some participants felt that this was not recognised enough: for example, there is a lack of spatial analysis in most net zero pathways. Such spatial variations make delivery of net zero significantly more complicated, requiring 'more finely grained' solutions for vulnerable or isolated populations, and more 'bottom-up' planning of energy system transformations.

*'We know from what's happened in the past is jobs get lost in some areas, they don't get recreated in the same areas and they don't employ the people who've lost their jobs... we need to understand the spatial dimensions of this and how we compensate for the process of job destruction'*  
(Researcher)

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As in the past, the geographical differentiation of industrial restructuring means that some communities will lose jobs, and this will create social costs with long lasting intergenerational consequences. Some participants questioned whether arguments for a 'just transition' to net zero have fully considered these implications, and whether it is even possible to compensate for the destruction of jobs and industry in a just way.

*'When you read all this stuff about redeploying people from the North Sea to work on this, that and the other, I think well yeah, there may be other jobs created but there sure as hell aren't going to be where these people are currently living.'* (Researcher)

The spatial dimensions of a just transition both within the UK and internationally were identified as a key research gap. For example, participants noted a lack of research around how to address the spatial injustices relating to which countries have ability to develop GGR:

*'Some of the physical geography, as well as the social, cultural, historical geography of existing networks, infrastructures, relationships to do with colonialism that you have will shape the GGR trade'* (Researcher)

Several participants noted the need to address international injustices; they felt that the prominence of net zero targets meant that 'some of the differentiated responsibilities seem to have gone out the window', meaning that to transition justly there is a need to re-emphasise the differentiated roles of rich and poor countries.

### 3.3.3 CO-BENEFITS:

Some participants frequently discussed the concept of co-benefits alongside the concept of a just transition, particularly co-benefits relating to reducing fuel poverty, improving public health, improving access to energy services, job creation and ecological sustainability. In the workshops with the public, private and third sectors, delivering these co-benefits was largely seen as a core part of achieving a just transition, and this understanding was conceptually aligned with Narrative 1. In the researcher workshops, some participants felt that co-benefits were an important way of communicating the benefits of a transition, and an important consideration in decision making. However, they also raised concerns that focusing on co-benefits gave a potentially very narrow framing of a just transition, focusing exclusively on alleviating poverty and overlooking the need for policy which transforms energy use in the wealthy. Some participants also cautioned that a co-benefits narrative can be 'misused' by some actors as a form of climate delay:

*'There's been an interesting phenomenon that's been going on where some of the interests that were trying to resist the whole notion of climate change and deny it have shifted tack to now arguing about inequality and suddenly being on the side of the poor, as a very deliberate tactic to try and delay and slow down and make more complicated processes of decarbonisation'* (Researcher)



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These concerns are more aligned with Narrative 2, where participants placed a greater emphasis on the importance of economic distribution (and re-distribution) to create a just transition.

### 3.3.4 ECONOMIC DISTRIBUTION:

Some participants framed a just transition through the lens of economic distributions. They argued that economic inequality plays a huge role in the distribution of responsibility for emissions, and the vulnerability of different communities both to climate change impacts and the potential impacts of a net zero transition. While climate justice often focuses on the impacts of energy transitions on those in poverty, participants emphasised the need to understand economic distributions as relational, and therefore to also focus on the role of wealth in driving emissions, which is often overlooked. They therefore felt that there is a need to develop solutions which address high consumption lifestyles, with a greater emphasis on the need to transform social practices rather than just technology switches. This approach aligns with Narrative 2 and follows on from the assumptions made in this narrative regarding the role of the economic system in causing climate change:

*'It's recognising that we have huge inequality. That we are dealing with a system that is increasingly polarised in terms of wealth and poverty... I can't really see much happening to address major inequality... with the policies set out at the moment for net zero transitions, and that's both in the UK and in a global sense. What's happening at the moment is those things are being exacerbated with transition... it's a huge, big, systemic issue that underpins all of this.'*  
(Researcher)

These participants felt that more emphasis on economic inequality and the relationship between poverty, wealth, and emissions, is essential due to the connection between an economic system which drives economic inequality, wealth concentration and high consumption, and the growth of greenhouse gas emissions:

*'Most emissions are from a very small percentage of the population... if we were to focus more on the just transition and the consumption side of this, where those emissions are originally generated from, you might get more bang for your buck, and that also addresses some of the social injustices in this.'* (Researcher)

Addressing this injustice of the inequality of emissions and climate change was a core priority for a group of researchers, who implied that emissions could not be rapidly reduced without confronting this relationship. In policy terms, it was suggested that this means there is a need to differentiate policy for different socio-economic groups, for example, while government finance is needed to insulate low-income households, other policy mechanisms should be used for those with high incomes. They also felt that there is a need to develop policy which is aimed at restricting high consumption lifestyles. Both areas were noted as in need of more research and policy attention.

Finally, some participants did not agree that issues of justice should play a central role in net zero. They raised concerns that focusing on a just transition ‘might be a bit distracting to the wider transformation’. Others felt that the narrative of a just transition unnecessarily politicises the issue:

*‘We have this remarkable political consensus across the party political spectrum on the need for an importance of net zero... what I worry about with the just transition framing is that it introduces a social equality dimension to net zero which risks politicising more than [consensus] and potentially challenging it or undermining it... ultimately you can ensure a just transition in terms of its key aspects... without turning this all into inherently a story about social justice which is more political than a story about greenhouse gas emissions equalling zero’ (Researcher)*

This perspective does not sit neatly in either of the overarching narratives, and demonstrates the lack of consensus in this area, which participants noted was ‘a very charged topic’.



### 3.4 SOCIAL LEGITIMACY AND PUBLIC ENGAGEMENT

In the stakeholder workshops, the need to improve public engagement with net zero and widen public participation was a core theme. However, in the researcher workshops this became a contested topic, particularly regarding the extent to which there is a need to develop ‘social legitimacy’ for decarbonisation. The divergence in perspectives around this topic did not fit neatly into the two overarching narratives. Most participants who aligned with Narrative 1 felt that public engagement and participation were important for developing social legitimacy for net zero, although some disagreed around the extent to which the public are already engaged. Some participants, more aligned with Narrative 2, felt that calls for more public engagement can be a form of climate delay and a distraction to achieving rapid change, whilst others saw a more radically participatory approach to decision making as a key part of their narrative for net zero.

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A significant group of participants, both researchers and other stakeholders, saw improving public engagement and participation as a core priority, particularly as net zero increasingly requires transformative change to society and the way people live their lives. They felt that this does not necessarily mean that we should aim to achieve broad social approval or consensus for measures before implementing them, and that this usually follows rather than precedes implementation. They pointed out that 'social legitimacy' should be considered a dynamic process and hence is challenging to measure or quantify.

*'You'll never get everybody to come on board with you, and that shouldn't be a barrier to proceeding. And it's also not a static process either, you don't have a single acceptance or 'you got acceptance, everybody's happy, move on'. But people can change their views, and people do change their views. I think this is something you've seen with offshore wind, there was a lot of opposition before it was implemented, and then once it was actually seen how it worked and what the impact was, the support gradually grew.'* (Researcher)

Some therefore felt that social legitimacy was important, but better conceptualised as having fair and just decision-making processes:

*'Another way of presenting a social legitimacy argument is around procedural justice... it's about how you proceed with measures, about setting examples from the top, about how things are implemented. It's about approaches being perceived to be legitimate approaches to address the problem'* (Researcher)

For these participants, improving and widening engagement and participation was also seen as a necessary part of generating political momentum for policy change:

*'We seem to have gone through the first stage of transition where all of the emission reductions have happened centrally, then we're going into a next phase where actions will infringe on people, or at least people will be more involved in terms of the transition going forward, and therefore they will see change more readily. I think without a stronger push in public engagement, explaining some of the issues, the urgency of the situation, then we're still going to have this political inertia where we're going to be moving very incrementally along. And I suspect the political class won't feel like they have the political capital to push things as quickly as needed.'* (Researcher)

However, there was some disagreement on the extent to which the UK public is already engaged around net zero. Some felt that they were highly engaged, and that a 'social contract to decarbonise' is evidenced by involvement with citizen's assemblies, climate activism, and widespread declarations of a climate emergency across localities in the UK. Others felt that while engagement was strong among some social groups, particularly younger populations, this was not widespread across the whole UK population and not for all issues, particularly for the need for transformative changes to social practices.

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Some participants from the workshops with researchers suggested a need for a more radically participatory approach to decision-making: a reform of democratic processes to 'ensure collective decision-making reflects human and ecosystem wellbeing'. Others expressed concerns that public engagement should not be limited to a form of consultation process. They felt that there is a risk that calls for more public engagement - as a type of consultation before implementing measures - can become a form of climate delay, particularly when used to slow or prevent mitigation measures to 'get a more diverse mix of people to say 'yes, we support doing absolutely nothing''. They argued that in seeking legitimacy or social approval for decarbonisation, this implies there is legitimacy in a status quo which is in fact fundamentally unjust:

*'The need to develop social legitimacy for ambitious decarbonisation implicitly assumes that there is social legitimacy for what we have right now, and a lot of people would entirely disagree with that. A lot of people in the global north would disagree, but when you're talking about global south issues and marginalised communities, there is no social legitimacy for what we have now. So this idea that we actually have to develop social legitimacy before we can act is horrendous.'*  
(Researcher)

In summary, most participants agreed that social consensus or approval should not be a requirement for action, and that public engagement and participation should go beyond just public consultation. However, among researchers, participants remained divided around the fundamental role of the public in the net zero transition, which shaped the importance they attached to public engagement, participation and 'social legitimacy'.

Some felt that the urgency of decarbonisation means that measures need to be implemented immediately, regardless of whether they have strong public support. They felt that public support for the broad need to decarbonise is strong enough, and that the dynamic nature of public opinion means that support for individual measures will likely not develop until they have begun to be implemented. They expressed scepticism about the ability to develop public support for a suite of individual decarbonisation measures before they are implemented, and some felt that calls to do this would slow down the process of decarbonisation and amount to climate delay. Therefore, they felt that attempting to improve public engagement and widen participation were low priorities, or not priorities at all.


On the other hand, another group of participants prioritised the need to improve engagement, participation with and legitimacy for net zero. Particularly for measures which strongly impact people's lives, they saw this as a key part of implementing them successfully and fairly, and several participants linked this to achieving a just transition in terms of meeting broader social objectives alongside net zero. There was a range of perspectives expressed around what this engagement should look like and how transformative public participation should be. They also felt this was instrumental to creating the 'political capital' to motivate policy makers to fund and legislate around net zero. They linked public engagement with upskilling and 'learning by doing', feeling that the most effective way to develop engagement was by actually 'doing stuff', to 'build some real constituencies of political and business and social support', the implications of this being the need for more situated demonstration projects.


*'You can do some engagement in abstract, in things like citizens assemblies, but you're much more likely to do it around renovating council estates or improving cycling and walking facilities locally... those are real political issues that probably get more engagement than anything else.'* (Researcher)

For these participants, widening and improving public participation was therefore both an objective in its own right, to ensure the fairness of decisions made around net zero, and a facilitator of political momentum to increase the speed at which decisions are made to reduce greenhouse gas emissions.

# DNZ

DELIVERING  
NET ZERO







### DIVERGING NARRATIVES

Urgent social and technological system change is needed, alongside an understanding of how this plays out at a local level.

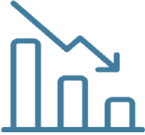
Research is needed to establish and mitigate any unintended consequences with respect to justice, equity and the social legitimacy of specific solutions.




A 'just transition' requires 'fair and legitimate' decision making processes.




Actively engaging with local and diverse communities will widen and improve public engagement as part of generating political momentum for change.




Openness and transparency around the economic, social and environmental implications of different net zero pathways are key to societal engagement.



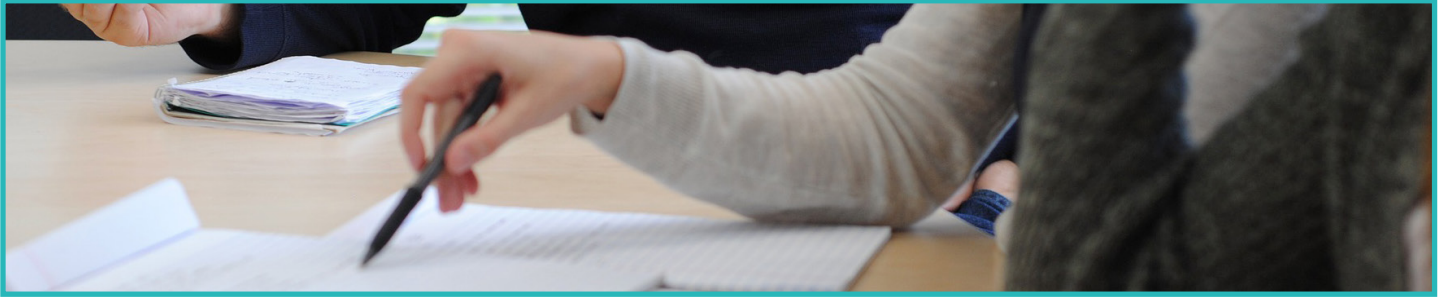
Societal change creates benefits and unintended consequences. Both need to be managed in a way that is seen to be fair.



Empower communities to shape the transition, particularly those who are marginalised or disproportionately impacted.



Research should be shaped to understand key contentions, bring evidence to the debate, and prevent them from becoming 'discourses of delay'.



#### 4. KEY GAPS IN THE NARRATIVES: ACTORS AND THEORIES OF CHANGE

Both narratives have areas of consensus at which they intersect, and areas of divergence as previously described. However, there was also a notable gap across both of the narratives around which actors they felt should drive change. Overall, neither narrative provided a clear view of which actors had the responsibility and capability to initiate and drive change. Similarly, only one participant in the researcher workshops articulated a broad 'theory of change', and few participants demonstrated a consistent approach to how change should occur, and how this might impact their field of research or the way they engage with stakeholders.

Some participants had a highly state centric view of how change is achieved. For example, the recommendations of one group, in response to the question 'how to deliver transformative change?', involved the creation of a 'systems architect' governing body to oversee changes to the energy system and government finance, create better alignment across government departments and political parties, and provide more ambitious targets and obligations. Several participants emphasised that net zero is unachievable unless the government 'accepts being "big" government'.

*'There are so many difficult barriers that we need to get moving forward, and I think part of that is the political class can't make a convincing argument that brings everyone on board so that it is taken as not acceptable not to move... how do we do that? We won't move until we do that'* (Researcher)

While certain participants therefore had a strong focus on the government as the key driver of change, it was not clear how they felt governments should be shifted onto the more transformative path necessary to achieve net zero. Others felt that focusing on government as the key initiator of change was the wrong approach, as governments are often very slow moving and can be the most inert part of the system. They suggested more focus on smaller actors was important both to represent the 'true complexity of fossil fuel society', and because these actors can be more agile and able to speed up change.

*'We have a tendency to get caught up on - when we're talking about actors, we talk about government, big business and citizens and very few in between... really, we're not very good at getting or representing the true complexity of a fossil fuel society.'* (Researcher)

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Some suggested it was important to focus on enabling climate activism as a key driver of change. While some were cautious about academia having an active advocacy role and supporting activism, others felt this was integral to facilitating a process of change:

*'If we're serious about the processes of change that have started to shift the agenda, we could point to things like the IPCC and so on, but we'd also absolutely have to point to the work of a whole range of activist organisations, including Greta Thunberg and the Friday stuff and Extinction Rebellion and so on. So, there is a question about how academia actually supports climate activism, and I don't mean we study it and say interesting things about what it's doing, but actually actively supporting it in a way that we would actively support business, and we would actively support policy communities.'* (Researcher)

One participant in the researcher workshops articulated a theory of change through the idea of stimulating a 'virtuous cycle':

*'I think there is a potentially kind of virtuous cycle to activate that leads from activism, through advocacy, through public engagement and support, to create legitimacy for more stringent policy action, to create the conditions for business to do its thing, and so on, in a reinforcing loop... The question is, where is the intervention point? How can we stimulate that virtuous cycle to deliver transformative change? And I think that the emphasis in that discussion tends to be that the intervention point is on the policy bit... [but] I think that's the most inert bit of the cycle, not the most responsive bit of a cycle, and I think that this building sense of social momentum behind climate change, that was really in evidence at COP, is the way to sort of initiate that that virtuous cycle.'* (Researcher)

To initiate this cycle, they felt it was important for all actors, but particularly those in leadership positions, to recognise and celebrate social momentum behind change, rather than perceiving it as a threat. This includes communicating the changes which are happening, such as the decommissioning of coal power stations. This theory implies both that more focus should be targeted towards how to support social movements and activism, and that in conceiving change as a cycle, there could be multiple intervention points at which to try and push change forward, making it important for researchers to engage and support actors throughout the cycle.

Other participants similarly iterated that 'doing stuff and learning by doing', public engagement and upskilling could be areas of intervention which then drive change more broadly. This being said, most participants did not articulate a theory of change, and a broad narrative for this did not emerge in any of the workshops. This implies that more attention may need to be paid both towards overarching questions of how transformative change can be initiated, and also how more specific research agendas can slot in and contribute to this broader process of delivering change and the role of the research community within it.



## 5. RECOMMENDATIONS

Based on the two overarching narratives that emerged during the workshops, a series of targeted and actionable recommendations have been developed. These are listed again here, along with an elaboration, where appropriate, of their implications for five specific groups of stakeholders: UKRI; the research community; the public sector (including all levels of central, devolved and local government, and regulators); the private sector (including industry, large businesses and SMEs); and the third sector (including NGOs, campaigning organisations, think tanks, advisory bodies).

**1. ACT NOW:** there are a range of solutions that are ready, effective and scalable; improving building efficiency, deploying heat pumps and district heating, electrifying transport, expanding public and active transport infrastructure, decarbonising and expanding the electricity system, and implementing nature-based greenhouse gas removal techniques. These need to be rapidly deployed, whilst considering the interconnectedness of different solutions to understand the impact of immediate delivery and the consequences in the short, medium and long term.

- **Research Community:** provide decision makers with evidence of the value delivered by different solutions in the short-term, support the delivery of these solutions with research that overcomes barriers to deployment, and identify the preparatory work required to enable solutions that will be delivered in the longer-term.
- **Public Sector:** implement strategies and policies to accelerate the transition and remove barriers that prevent the rapid roll-out of key solutions. Put in place cross-departmental structures to identify barriers and unintended consequences. Evaluate all major investments to consider whether they are consistent with net zero ambitions.
- **Private Sector:** ensure that the supply chains required to deliver new technologies are secure and identify business models to operate under the different modes of delivery associated with net zero, supporting the rapid roll-out of commercially available solutions.



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**2. TRANSITION PATHWAYS:** there are a number of possible net-zero pathways, each of which create different co-benefits and unintended consequences. Solutions that deliver on the cross-sector desire for urgent action also need to clarify who pays and who benefits. This requires openness and transparency around the economic, social and environmental implications of different net zero pathways.

- **Research Community:** undertake an interdisciplinary effort to identify, develop and clarify the implications of pathways which deliver net zero.
- **Public Sector:** provide transparency around government's intended net zero pathway - openly publish the distributional effects of key policy initiatives along with a clear identification of the co-benefits to public health, investment, economy, levelling up etc, and any unintended consequences.
- **Private Sector:** engage in the policy debate and develop and invest in low carbon technologies and business models that deliver net zero.
- **Third Sector:** communicate the benefits and address the unintended consequences of specific pathways.

**3. COMPETING NARRATIVES:** key contentions are prominent on issues such as economic growth, just transitions, urgency and timescale, social legitimacy, and roles and actors. In response, UKRI research should be shaped to understand these differences and their motivations, bring evidence to the debate, and prevent them from becoming discourses of delay.

- **UKRI:** enable research that acts as a 'convener' to address the conflicts that currently exist, seeking to understand differences and their motivations and to prevent them from becoming discourses of delay.
- **Research Community:** through an inter-disciplinary approach, explore contested areas and engage with public, private and the third sector in meaningful debate.
- **Public Sector:** avoid narratives that place the burden of action on individuals without addressing economic, political and structural barriers to the delivery of net zero. Be open to the perspectives of narratives which sit outside of the current government paradigm (where Narrative 1 is the dominant framing).



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**4. IMPORTANCE OF PLACE:** solutions need to take account of the very different options and consequences of a net zero transition for diverse communities in different geographical locations both nationally and internationally. Spatial dimensions are not outcomes but are intrinsically part of the process of decarbonisation.

- **UKRI:** fund targeted projects that demonstrate the impacts of specific investments in specific locations.
- **Research Community:** engage nationally and internationally to learn lessons from deployment in diverse locations, but also to understand the distributional impacts of deployment on different communities.
- **Public Sector:** draw on on-going work to understand the spatial effects of different solutions at both local and national levels to ensure adoption of optimum solutions for specific locations whilst minimising adverse impacts. Recognise the wider economic impacts of investment decisions in specific locations and work with other stakeholders to mitigate these.
- **Third Sector:** gather evidence of the impact of localised specific investment decisions and play an advocacy role, ensuring that wider economic and societal impacts are taken into account.

**5. MONITOR AND EVALUATE:** the impact of both individual change initiatives and the broader net zero transition must be understood. Research is needed to establish and mitigate any unintended consequences with respect to justice, equity and the social legitimacy of specific solutions.

- **UKRI:** fund programmes that develop the capability within the research community to deliver an active role in analysing, communicating and, where appropriate, challenging the impacts of specific decarbonisation solutions.
- **Research Community:** develop new methodologies to monitor, evaluate and share learning with respect to the impact of deploying specific decarbonisation solutions. Economic and other societal impacts are at least as important in these evaluations as technical effectiveness and are often less well studied and understood. Develop stakeholder relationships that maximise the impact of this research.
- **Public Sector:** use available evidence and collaborative engagements with a range of stakeholders to establish best practice with regard to the delivery of specific solutions, their wider system interactions and overall net zero objectives.
- **Private Sector:** work with other stakeholders to understand the wider implications of specific investment decisions, establish best practices, support the development of appropriate regulation, and share experiences to prevent repeated delivery failures.
- **Third Sector:** gather evidence of the impact of deploying specific decarbonisation solutions and play an advocacy role, ensuring that wider economic and societal impacts are taken into account as well as their efficacy in delivering net zero targets.

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**6. COMMUNICATE OUTCOMES:** sharing learning and best practice is essential. The outcomes of pilot and demonstration activities, both successes and failures, should be communicated to increase understanding of the necessary steps to net zero. This will show progress, create transparency and maintain motivation, enable replication, and avoid repetition of mistakes.

- **UKRI:** emphasise the importance of effective communication in delivering research impact and ensure that funded projects have mechanisms in place to share knowledge on shorter timescales than are typical for academic projects.
- **Research Community:** put effort into the communication of research outputs and creating strong stakeholder relationships that enable rapid knowledge sharing. Where net zero transitions are contested, universities are well placed to communicate with stakeholders both nationally and locally as independent and trusted bodies.
- **Public Sector:** work to present a clear vision and maintain enthusiasm for the transition to a net zero society by communicating the transformative changes that are being made and how communities are benefitting. Emphasising benefits should not be at the expense of maintaining transparency regarding any dis-benefits or unintended consequences.
- **Private Sector:** the urgency of the net zero transition requires collaborative working and a sharing of knowledge. Lessons from failed projects, to prevent the repetition of mistakes, are as important as communicating where and why specific solutions have been successful. A collaborative approach that supports the need for change, requires transparency and encourages the sharing of lessons from investments is likely to accelerate delivery of net zero and safeguard future investments by reducing risks.
- **Third Sector:** communicate the benefits of change, which can be supported by a wellbeing-based socio-economic framing when envisioning the transition. This shouldn't simply be about individual behaviour change but also the benefits of systemic changes to infrastructures and social practices.

**7. ACTIVE ENGAGEMENT:** there is potential for improving and widening public engagement and participation as part of generating political momentum for policy change. This requires actively engaging with local and diverse communities to understand and shape the changes that are likely to happen in the transition to net zero.

- **Research Community:** engage more proactively in communicating findings to a wide range of audiences and seek to develop active relationships with key representatives of the communities to which specific research applies. Highlight where social engagement is genuinely effective, and where public consultation is disingenuously used as an excuse for inaction.
- **Public Sector:** actively increase public engagement by widening opportunities for the public to participate in understanding and shaping how the transition impacts their communities and society as a whole. Develop new approaches which go beyond consultation exercises. In some cases, public sector bodies are trusted agencies and can use this position to positively influence appetite for change and shape a more just transition. There are many opportunities for engagement with broad groups of stakeholders who can help to deliver co-benefits, maintaining and increasing the motivation for change.
- **Third Sector:** support efforts to create the broadest possible engagement with net zero solutions, and amplify the voices of communities and groups pushing for stronger climate action and developing the political momentum for policy change.

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**8. CLARIFY EXPECTATIONS:** clear governance structures are essential. Define roles and responsibilities for individuals, governments, companies and others involved in delivering net zero, matching these to available resources. This should improve accountability and increase diversity of opportunity ensuring more effective outcomes.

- **UKRI:** ensure diversity across funding programmes, making governance of net zero as much a focus of publicly funded research as technological innovation.
- **Research Community:** clarify the demographic disparities of emissions, research who is best placed to take on what role, design potential governance structures, and hold people to account.
- **Public Sector:** provide oversight in delivering clearly defined roles and responsibilities, increase diversity among decision makers, and implement the governance structures needed to ensure accountability. Whilst individual responsibility has a role to play, individuals cannot take responsibility without having the options available to them that will be delivered by effective public sector leadership.

**9. REALISING A FAIR AND JUST TRANSITION:** achieving a 'just transition' requires 'fair and legitimate' decision making processes. This involves empowering communities, particularly those who are marginalised or disproportionately impacted by the transition, to participate in shaping how the transition occurs.

- **UKRI:** continue to fund research that builds the capability to address issues of justice and equity in the delivery of net zero.
- **Research Community:** provide evidence of marginalisation and distributional inequalities – identify communities that have been or are likely to be losing out and research how this could be mitigated. Explore the definition, role and even the plausibility of a 'just transition'.
- **Public Sector:** give more consideration to the distributional impacts of policy pathways over simple cost/benefits. Empower a wide range of communities, particularly those who may be marginalised, to participate in decision making processes around these policies.
- **Private Sector:** consider a broad range of interests, benefits and potential adverse impacts when implementing new business models aimed at delivering net zero.
- **Third Sector:** identify and highlight best practice and where greater equity is required. Identify communities that are being marginalised and advocate for improvements. Deliver positive engagement in a net zero transition.

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**10. POWER AND VESTED INTERESTS:** there are institutions and individuals who downplay the possibility for technological and social transformations in achieving net zero. This should be explicitly recognised, its impact identified and action taken where appropriate.

- **UKRI:** recognise the range of strategic motivations among potential funding partners and avoid the misalignment of values, aims and objectives which might delay net zero. Fund research that explores motivations of key actors at all levels in the system, including those of powerful actors and incumbents, and the impact this has on progress towards net zero targets.
- **Research Community:** develop research capability and an evidence base around the nature, development and impact of organisational motivations for strategic engagement in a net zero narrative. Provide this evidence to decision makers and support organisations seeking to align their cultures with the delivery of a genuine transition to net zero. Deliver research which reveals the impacts of power and vested interests. In communicating research, avoid discourses of climate delay that replicate current power structures and vested interests.
- **Public Sector:** acknowledge and be transparent about the influence that vested interests have on public sector decision making. Improve procedures to reduce the impact that counter-productive lobbying has on decision making processes, policy and regulation. Avoid replicating discourses of climate delay in decision making. Make alignment with net zero objectives a key criterion in strategic engagement, policy and regulatory decisions, and procurement. Ensure that delivery partners meet commitments they have made to net zero targets.
- **Private Sector:** seek alignment with global net zero ambitions in procurement and strategic partnership decisions. Avoid investment in expansion of fossil fuel assets. Support the creation of transparency, including through the development of appropriate standards and regulation. Seek to understand broader decarbonisation impacts and unintended consequences when lobbying for particular sectoral benefits. Be cognisant of any delaying impacts of your own campaigns and actions.
- **Third Sector:** champion the urgency of net zero, and the potential of specific decarbonisation solutions. Challenge the behaviour of reactionary movements and other actors who may be seeking to delay the transition, including other third sector pressure groups. Be cognisant of any delaying impacts of your own campaigns and actions.



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**11. SKILLS:** training and education: the net zero transition requires upskilling and capacity building in the workforce and governments. This is a crucial component of a fair and just transition as well as providing the necessary supply chains to deploy, monitor and enforce low carbon solutions.

- **UKRI:** fund research that identifies areas of the economy that will be affected by a net zero transition, where re-skilling will be required. Support the amelioration of these issues through the development of capacity and capabilities in specific areas.
- **Research Community:** apply knowledge and deliver evidence of where re-skilling will be effective in delivering a vibrant net zero economy. Champion the role of academic institutions as educators and providers of relevant, high-quality training.
- **Public Sector:** the reality of a transition to net zero is that jobs will be lost in many industries. Early intervention through ambitious programs of re-skilling will prevent this leading to the unemployment seen in past energy and economic transitions. Work to build decarbonisation capability at all levels of government that supports the development of appropriate supply chain capacity and net zero investments.
- **Private Sector:** champion the development of a workforce and supply chains that can implement proven decarbonisation solutions in a way that makes them 'commercially available'. Invest in skills and training programmes that support this objective.

**12. WHOLE SYSTEM APPROACH:** the total sum of all the individual actions matter to ensure the delivery of net zero. Cross sector dialogue is required to understand interactions and how systemic and strategic planning of net zero actions will happen. This is just as relevant to the research sector as it is to the government and the private sector.

- **UKRI:** continue to deliver a strategically co-ordinated and interdisciplinary approach to the funding of research that supports the delivery of net zero.
- **Research Community:** expertise needs to be valued on the basis of qualified evidence from across disciplines. Drawing on the whole systems research capability that has been developed in the UK, evidence should be scrutinised by a diverse community, recognising the importance of questioning norms, for example the pervasive growth narrative or current calls for the creation of a 'system architect'. All of this should be supported by the development and application of appropriate theories of change, evidence of the impact of net zero delivery decisions, and research that seeks to ameliorate unintended consequences.
- **Public and Private Sectors:** delivery of net zero requires broad collaboration both internally, across departments, and externally, with partners from academia, the public sector, the private sector and the third sector.

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**13. REVIEW THE FUNDING LANDSCAPE:** research funding needs to address the urgency of delivery, particularly from areas other than novel supply-side technologies. Take stock of the range, effectiveness, equality and diversity of existing net zero research investments and explore opportunities for investment from a wider range of sources.

- **UKRI:** take stock of the range, effectiveness and diversity of existing net zero research investments. Address the imbalance identified by participants regarding the types of research which receive larger amounts of funding, in particular the focus on supply side technologies, at the expense of demand side options and social change initiatives. Identify gaps to be filled, explore opportunities for leveraging investment from a wider range of sources, and establish where investments have been ineffective and should be stopped. This should all be done in the context of the urgency of delivering net zero and minimising cumulative greenhouse gas emissions between now and 2050.
- **Research Community:** the urgency of the net zero challenge requires research that is not just exciting or interesting but also delivers impact. Establish a clear vision for how research will help deliver net zero.
- **Public Sector:** align funding with net zero delivery, seeking to overcome upfront capital costs and unlock innovation, encouraging the development of new low carbon business models.
- **Private Sector:** the challenge of net zero requires a collaborative response that draws on all available resources. The private sector has an important role to play here in leveraging public sector funding and working with the research community to create new solutions that can be deployed on a commercial basis to meet the needs of society at large.

**14. INTERDISCIPLINARY RESEARCH:** no single discipline or theory can answer the net zero challenge in isolation. UKRI must provide strong support for interdisciplinary research and create greater clarity on the role of the research community in the delivery and implementation of net zero.

- **UKRI:** continue to encourage an interdisciplinary approach that better captures and reflects the reality for various groups, recognising the importance of the range of capabilities alongside support for technological solutions in accelerating progress towards net zero.
- **Research Community:** no single discipline or theory can answer the net zero challenge in isolation. Interdisciplinary approaches to research can often feel tokenistic. This needs to be addressed at an institutional level as well as in the co-design of responses to specific research challenges.

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**15. INCENTIVISE COLLABORATION:** effective collaboration between public, private and research sectors is vital to the delivery of net zero. Specific schemes should be established that encourage secondments and other exchanges of personnel and capability between and within sectors relevant to net zero, with an emphasis on diversity.

- **UKRI and the Research Community:** engagement with a range of stakeholders including public, private and third sector actors should be more highly valued. The rewards and recognition for exchanges that support the development of these relationships could be greater. There may also be opportunities for secondments from universities into UKRI, and vice versa, to increase mutual respect and understanding particularly for individuals at an early stage in their careers.
- **Public Sector:** exchanges of personnel intra-governmentally and across sectors have long been valued and have the potential to make a significant difference to the delivery of net zero. There would be added benefits from specific funding for exchanges between the research community and public sector bodies, particularly those working in policy development or local government.
- **Private Sector:** exchanges between the private sector and the research community should be supported and encouraged. These have been shown to deliver significant benefits, not least more effective co-design of solutions to specific net zero challenges.

**16. REWARD IMPACT:** academic institutions undervalue the importance of broader engagement needed to achieve net zero targets. The rewards for delivering effective academic impact should be greater, so that researchers can prioritise activities that drive change. This will involve engagement with a range of stakeholders including public, private and third sector actors.

- **UKRI:** delivery of effective impact should continue to be a clearly stated requirement for net zero related funding. The research community should be encouraged to deliver a wide range of outputs and supported in communicating and delivering benefit to diverse groups of stakeholders.
- **Research Community:** in support of delivering net zero targets, researchers should be trained to deliver a broad range of impacts in addition to academic publications, and institutional reward structures should recognise the importance of such work. The academic community should be encouraged to act with a sense of urgency without exacerbating inequalities, or creating reactionary factions.





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## APPENDIX - METHODOLOGY SUMMARY

### OBJECTIVES

The project was created to ensure UKRI research funding would have the maximum opportunity to inform and guide the response of UK decision makers on climate change. We used a deliberative process, running a series of 8 workshops with over 80 leading UK academics, stakeholders from the public, private and third sectors, and funders of innovation.

### STRUCTURE

Workshops were conducted online on Zoom, using Mural software to share notes, facilitate communication between breakout groups, and trace the process of each workshop. The workshops were designed and developed iteratively by all members of the research team working in committee over numerous meetings; thus the methodology is inherently interdisciplinary in nature, reflecting the team's expertise in engineering, psychology, social sciences, communications, and management science. All workshops underwent extensive piloting, using contacts of the team and research students for the pilots. Each workshop lasted around 5-7 hours, therefore we made sure to include a mix of interactive activities, lone reflection periods, and plentiful breaks to minimise fatigue. All workshops were facilitated by members of the research team, with an additional member of staff providing technical support. In advance of each workshop participants were asked to review various technical reports that had been produced by the DNZ team, alongside other material they themselves had access to, and to submit initial written comments on key issues arising.

### STAKEHOLDER RECRUITMENT

Recruitment was an important part of the project's methodology, with participants being sought from a diverse range of stakeholder groups involved in energy and climate policy research and implementation. Recruitment was split into two sections: for Round 1, we recruited researchers from the academic community, whereas for Round 2 we targeted four non-academic sectors from the public sector, private sector, third sector, and the funding community. A full stakeholder mapping process was used to identify participants for purposive sampling, with snowball sampling being used in some limited instances where the originally-identified participant was unavailable. Participants were initially identified on the basis of their expertise, and we aimed to represent the full range of topic areas and skillsets present in today's energy sector. In addition, diversity criteria were used to ensure a balance of career stage, gender, and demographic characteristics.

### ROUND 1

Round 1 comprised two workshops of 42 academics in February and March 2021. Each workshop consisted of three subgroups of Supply, Demand and Greenhouse Gas Removal, who worked in breakout groups for the majority of the workshop. In addition, we had a 'Spokes Council', with participants who we identified as having particularly broad expertise, which focused on cross-cutting themes and facilitated the sharing of ideas between groups. During the workshop, participants worked through a series of activities designed by the research team to iteratively construct consensus around urgent initial steps and longer-term actions and solutions for delivering net zero in the UK, while considering the wider social and economic implications.

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## ROUND 2

Round 2 comprised four workshops in June 2021, one for each of the four non-academic sectors, with 41 stakeholders in total. The key aims of Round 2 were to understand non-academic stakeholders' key priorities for net zero, both in terms of themselves as individuals and their organisations; and to elicit responses to the academic priorities identified in the analysis of the Round 1 data. Reflecting on Round 1, we decided to simplify the methodology to reduce fatigue and allow time for more free-flowing discussion. We also decided not to allocate participants into expertise groups, focusing instead on encouraging 'whole-systems' thinking.

## ROUND 3

Round 3 comprised two further academic workshops, reconvening 30 participants from the Round 1 workshops in November 2021. Twelve of the Round 1 participants were unable to attend at the time. As far as possible, we aimed to keep the same two workshop groups as in Round 1, but some participants' other commitments meant they had to move groups. During the morning session of the Round 3 workshops, the academics reflected on their portrayal in the Round 1 outputs, and evaluated the stakeholder priorities from Round 2. In the afternoon session, the aim was for the academics to discuss the delivering of net zero by focusing on specific solutions, and then to identify key research areas and messages for UKRI.

## DATA ANALYSIS

Workshops were audio-visually recorded and transcribed by members of the research team, then validated for accuracy by other team members and anonymised to remove identifiers. Analysis work was performed directly after each workshop so as to be able to present findings for the subsequent workshops, and involved repeatedly listening through the workshop recordings to develop matrices to answer project aim related questions, identify key messages, develop overarching themes, and clarify this final synthesis report's recommendations.

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PROJECT PARTNERS:



PROJECT FUNDERS:

