



Leverhulme
Centre for Climate Change
Mitigation

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Engaging Citizens With Greenhouse Gas Removal

Cambridge Webinar 20th November 2020

Nick Pidgeon, Understanding Risk Group & Leverhulme Centre for
Climate Change Mitigation, Cardiff University UK

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UNDERSTANDING
RISK

Conventional Approaches for Dealing with Climate Change




- Mitigate – reduce our reliance on fossil fuels and make more efficient use of energy



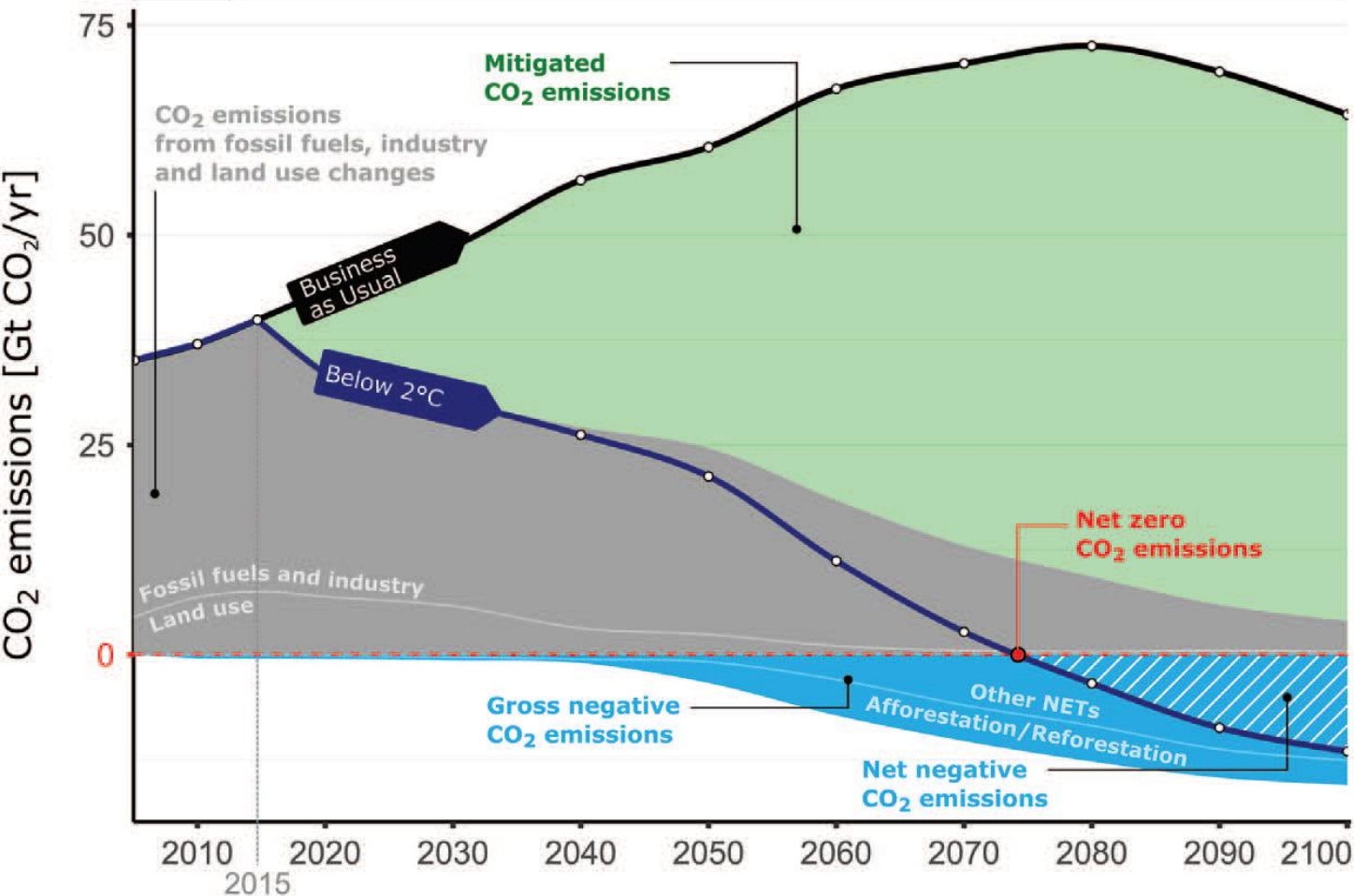
- Adapt – accept some climate change impacts and prepare to face them



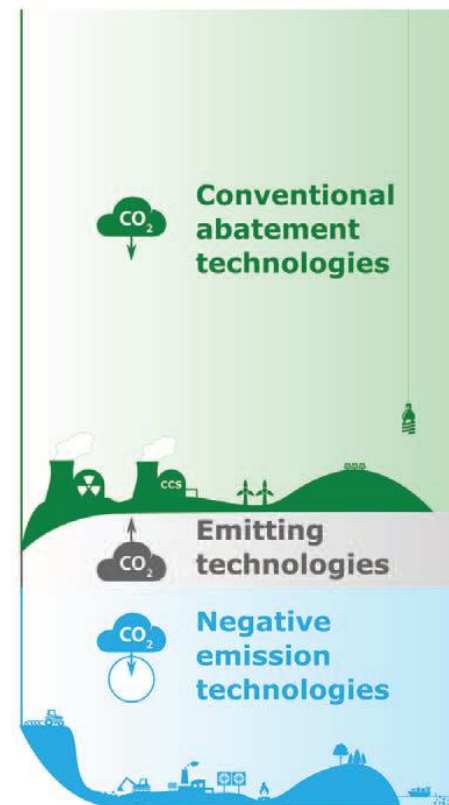
Paris Climate Agreement 2015

- **Keep global temperatures below 2deg C**
- **Aim for 1.5deg C**
- **Net-zero emissions sometime before 2100**
 - **Socio-technical system transformation (mitigation)**
 - **Address climate risk and resilience (adaptation)**
- 
 - **Greenhouse gas removal (ggr)**

CO₂ emissions pathways from the scenario literature

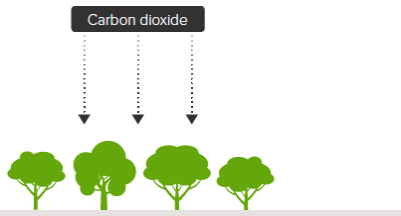


Examples of technologies

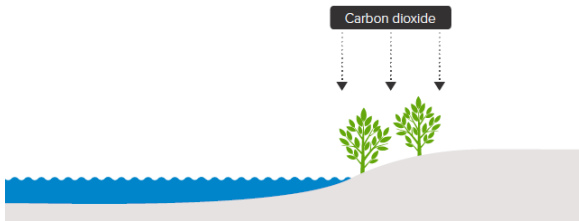


(Fuss et al 2018):

2.1 Afforestation, reforestation and forest management

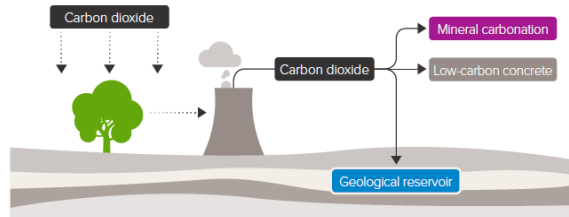


2.2 Wetland, peatland and coastal habitat restoration

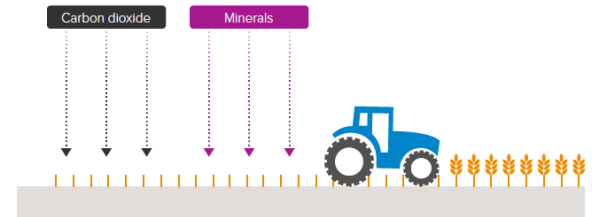


Source – Royal Society 2018

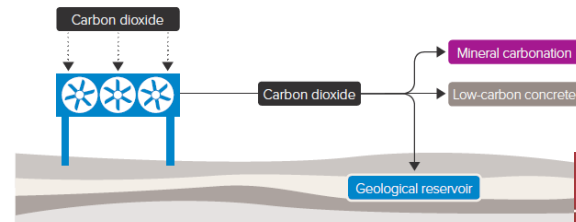
2.5 Bioenergy with carbon capture and storage



2.5 Enhanced terrestrial weathering



2.11 Direct air capture and carbon storage (DACCS)



Some Ethical Considerations

Corner and Pidgeon, (2010) *Environment*, 52(1), 24-37

Cox et al, (2018) *Front. Env. Sci.* doi.org/10.3389/fenvs.2018.00038

Should we intentionally manipulate the climate?

Unintended consequences when scaling up interventions?

Consent - who should decide?

Global security, legality and trans-boundary issues?

Mitigation deterrence?

ALSO -

MANY PUBLICS (global North and South?);

DIFFERENTIATED GGR APPROACHES;



LC3M - Public(s) Perceptions - Cardiff Work Programme (2016-2021)

WP 1: Science Scoping

- Review work
- Technical expertise in project team
- Interviews and Background Knowledge

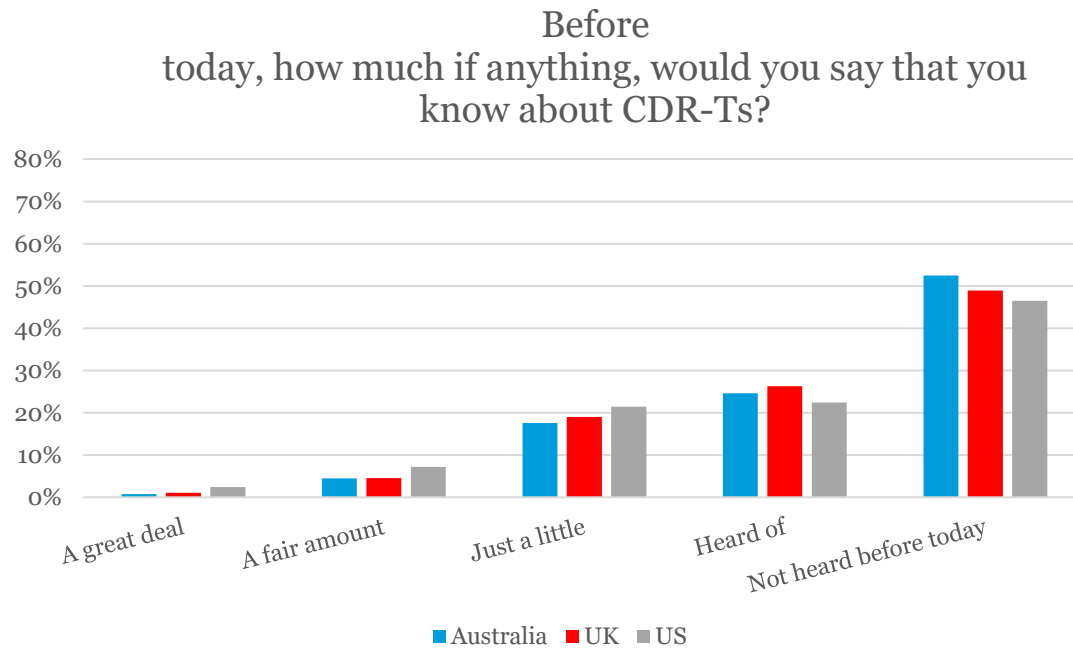
WP 2: Deliberative Workshops

- **Deliberating BECCS, DAC and Weathering**
- **6 locations in UK and US**

WP 3: Comparative Survey

- **GGR and Weathering (US, UK, Aus n=3026)**

Prior knowledge



The Challenge of National-Level Public Engagement

Pidgeon, Demski, Butler, Parkhill, Spence, *Proc Nat Acad Sci USA*, 2014

- Opening and Maintaining Deliberative Spaces with Diverse Publics
- Systems Thinking and Problem Scale
- Providing (Balanced) Information and Frames
- Accessing Broader Values

PNAS

Creating a national citizen engagement process for energy policy

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This paper examines some of the science communication challenges involved when designing and conducting public deliberation processes on issues of national importance. We take as our illustrative case study a recent research project investigating public values and attitudes toward future energy system change for the United Kingdom. National-level issues such as this are often particularly difficult to engage the public with because of their inherent complexity, derived from multiple interconnected elements and policy frames, extended scales of analysis, and different manifestations of uncertainty. With reference to the energy system project, we discuss ways of meeting a series of science communication challenges arising when engaging the public with national topics, including the need to articulate systems thinking and problem scale, to provide balanced information and policy framings in ways that open up spaces for reflection and deliberation, and the need for varied methods of facilitation and data synthesis that permit access to participants' broader values. Although resource intensive, national-level deliberation is possible and can produce useful insights both for participants and for science policy.

public engagement | national dialogue | energy system transitions

Delivering public engagement about science and technology topics is a goal in many areas of current science policy in both Europe and North America. Much of the literature on this topic stresses the importance of early and extensive engagement between the science and policy communities on the one hand, and stakeholder groups and the wider public on the other, particularly when decisions involve contested societal values, complex tradeoffs between risks and benefits, and uncertain science and technology (1, 2). For science communication practitioners, these developments have signaled a methodological as well as a conceptual shift, with more traditional forms of one-way communication making way for dialogic or discursive fora that aim to empower people regarding the issues which might affect them or their communities (3). Increasingly, an additional aim of such dialogue is to reflect useful social intelligence back to scientists, engineers, and policy makers regarding public values and interpretive frames, such that decisions might be achieved that genuinely reflect diverse societal concerns (4, 5).

A clear conclusion to be drawn from experience with deliberative science communication to date is that members of a varied cross-section of publics are perfectly capable of debating quite complex issues of environmental science, technology, and policy with which they have little day-to-day familiarity given the right tools and sufficient opportunity to do so (6–8). Although people will typically come to a research exercise (e.g., an interview, focus group, deliberative event, or informed preference survey) with very limited technical knowledge of the topic, many will engage enthusiastically with the subject by drawing on a range of shared cultural narratives and resources regarding the way in which science and technology is located in (and shapes) society, often expounding insightful views on the institutions

involved and on the promise and perils of scientific progress. In this respect people often focus less on the technology or science *per se*, than on the social context within which it is to be deployed, including complex arguments about the regulatory or governance conditions surrounding the application of science. However, designing successful deliberative fora is not a simple matter, and in this paper we outline a series of interlinked science communication challenges associated with conducting public deliberation on national-level topics. We use as our illustration a recent citizen dialogue about energy system change for the United Kingdom.

Moving Citizen Engagement to the National Level: The Case of Energy System Change

At the first Sackler Science of Science Communication Colloquium, Thomas Dietz observed (9) that, although the existing base of empirical evidence on public deliberation in many countries is rich and diverse, much of that experience derives from cases involving local or regional issues (10). Particularly in the United States, national-level public deliberation is relatively rare, and where it does occur is often restricted to policy-focused questions with professional stakeholder representatives and groups as participants. Outside of North America there is more experience with national-level issues, with examples evident in a number of European countries; e.g., Danish consensus conferences, Swiss referenda, and the UK Sciencewise-Expert Resource Centre (ERC) program.

Dietz (9) makes the related methodological point that scale also matters for national-level issues. At the local level, deliberation often emerges around a specified problem for which relatively bounded sets of options, attributes, risks, and benefits can be defined—the local siting of a waste incineration facility for example, or proposals to alter water abstraction and flow in managed wetlands. National-level issues by contrast typically bring with them significant additional layers of complexity and uncertainty, alongside a need to frame issues in terms of wider policy goals and system linkages. A local public engagement process for siting a single wind farm might consider such things as impacts on wildlife, visual intrusion into the local landscape, and community compensation or coownership. Debating the question of an appropriate future share of renewable energy for a nation or region as a whole, by contrast, would need to

This paper results from the Arthur M. Sackler Colloquium of the National Academy of Sciences, "The Science of Science Communication 8," held September 23–25, 2013, at the National Academy of Sciences in Washington, DC. The complete program and video recordings of most presentations are available on the NAS website at www.nasonline.org/science-communication/.

Author contributions: N.P., C.D., C.B., K.P., and A.S. designed research; N.P., C.D., C.B., K.P., and A.S. performed research; C.D., C.B., K.P., and A.S. analyzed data; and N.P., C.D., C.B., K.P., and A.S. wrote the paper.

The authors declare no conflict of interest.

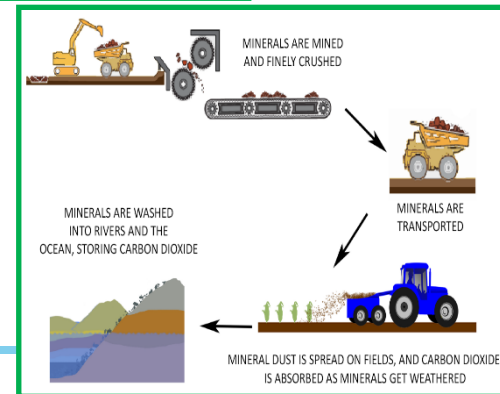
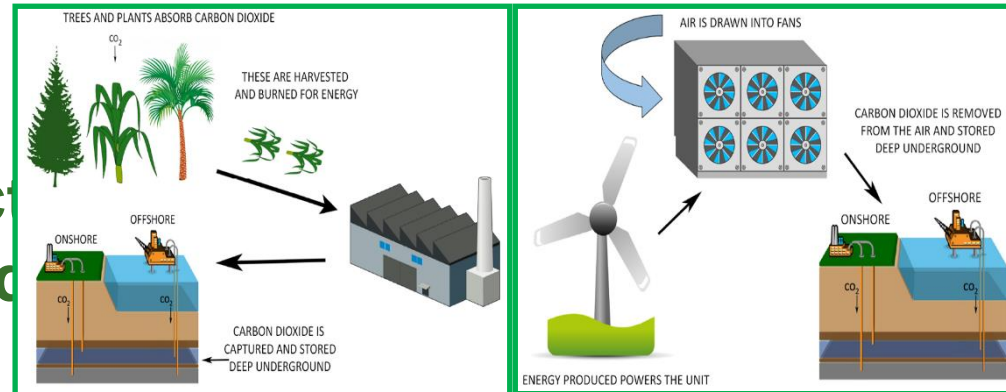
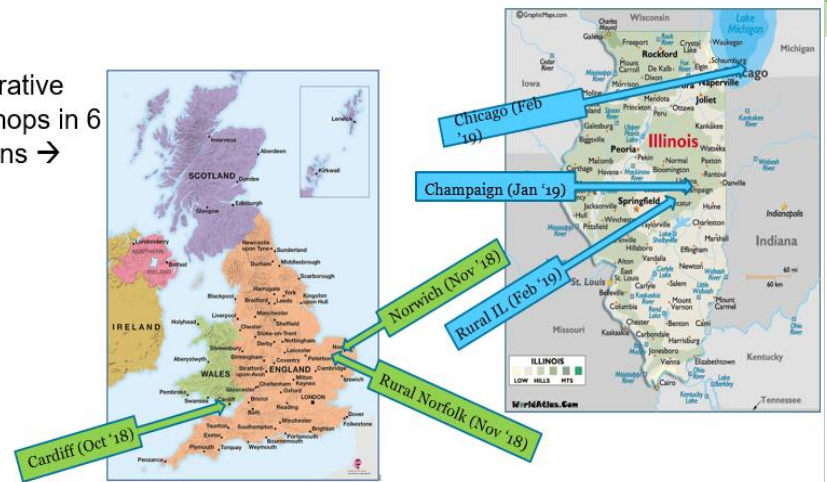
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Workshops

- Workshops in 6 locations in UK and US; same facilitation
- Introduced CDR via posters on three novel techniques: BECCS, Direct Air Capture, and Enhanced Weathering
- Groups reconvened a week apart to discuss EW in more detail

Deliberative workshops in 6 locations →



Workshops: Attitudes to CO₂ removal in general

- Non-transition? GGR doesn't necessarily reflect people's vision for a sustainable society
- Analogies of landfill and 'pushing it under the carpet'
- GGR doesn't deal with the root cause of climate change (survey confirms this)
- People differentiate between 'engineered' & biological GGR

And that's the thing, they say they dump it in the middle of the ocean and it goes down – I don't know where – but it comes back.

I spoke to my daughter.... She was like, "For one problem to be solved, you're creating more problems by doing the stuff that you're doing. To solve one problem, you're creating nine."

Are we burying the problem for later generations? It's like we're not actually getting rid of the carbon, we're just hiding it.

It seems a bit like shutting the gate after the horse has bolted. We should be trying to control the horse.

Workshops: Cross-national comparison: US/UK

Illinois	England & Wales
Lots of similarities (as expected); different analogies used to describe the same underlying issues	
Analogies: Cigarettes, asbestos, land contamination, nuclear waste	Analogies: Fracking, landfill, plastic in the ocean, nuclear waste
Concerned about human health	Fewer mentions of human health
Focus on economics	Focus on politics & ethics
Young people = despair	Young people = hope
What's the point of buying time?	CDR might buy time to reduce emissions

Preliminary Conclusions

- BECCS = would it create other environmental problems?
 - DAC = might need work on local engagement (air quality misunderstandings)?
 - ERW = need better understanding of ocean impacts + concerns about mining impacts
 - Little outright opposition to GGR, but preference for 'joined-up' climate policy (extensive mitigation + GGR deployment). Survey shows affect and 'messing with nature' matters to evaluation of individual technologies.
- Wicked temporal dilemmas exist around 'climate urgency' and 'non-transition'

See: Cox, E., Spence, E. and Pidgeon, N.F. (2020) Public perceptions of Carbon Dioxide Removal in the US and UK. *Nature Climate Change*, July 2020.

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