Public Values and Energy System Futures

Nick Pidgeon

Understanding Risk Research Group, Cardiff University

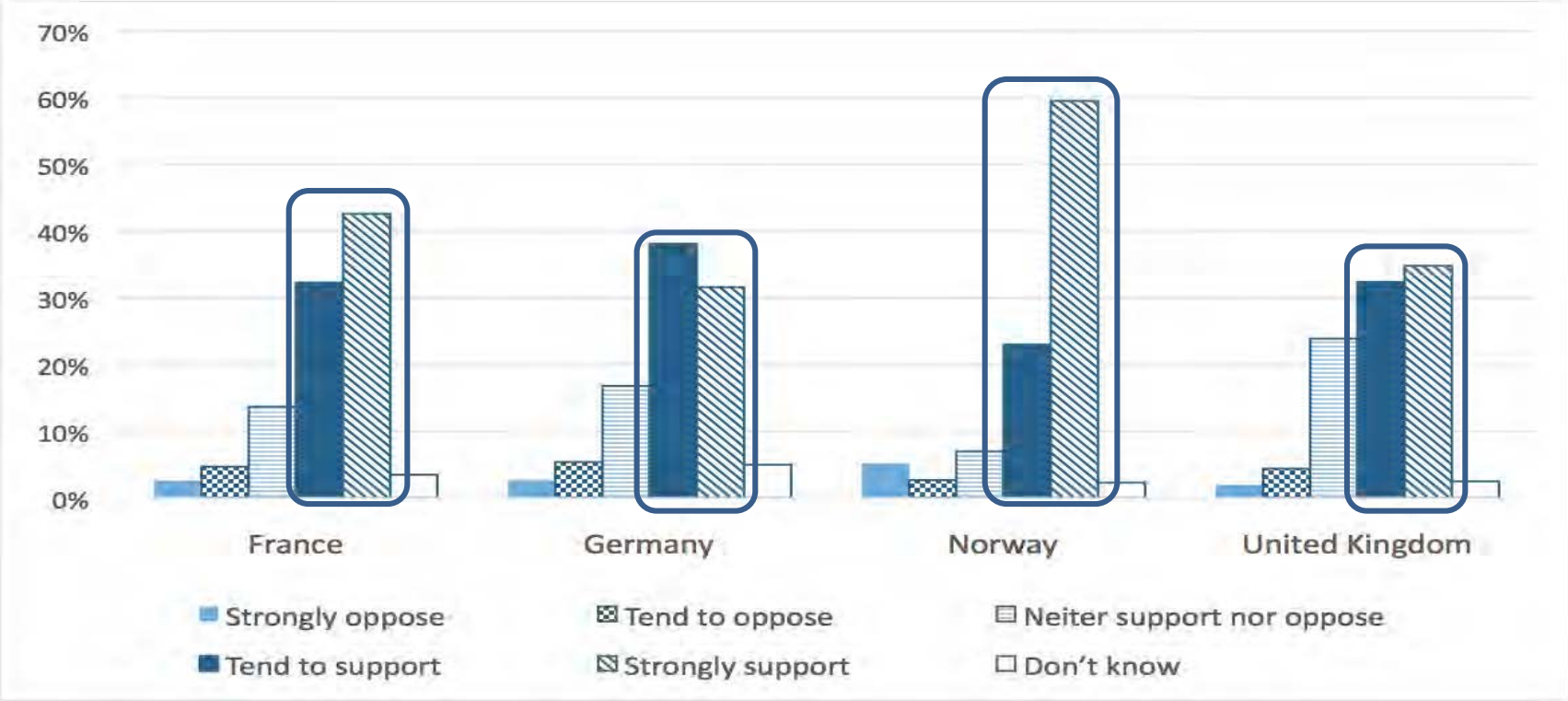
PEP1.5 Potsdam September 2019

LEVERHULME TRUST

Support for Paris agreement

In Paris in December 2015, most countries agreed to an international agreement that aims to keep global temperature rises below 2 degrees.
Do you support or oppose [France/ Germany/ Norway/ the UK] being part of this agreement?

COP21 · CMP11
PARIS 2015
UN CLIMATE CHANGE CONFERENCE



Attitudes to Energy System Change Project: Background – People at ALL levels of change

Key project frames:

Whole-system, Trade-offs, and Social contracts

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

Creating a National Citizen Engagement Process for Energy Policy

Nick Pidgeon[1], Christina C. Demski[1], Catherine Butler[2], Karen A. Parkhill[3] and Alexa Spence[4]

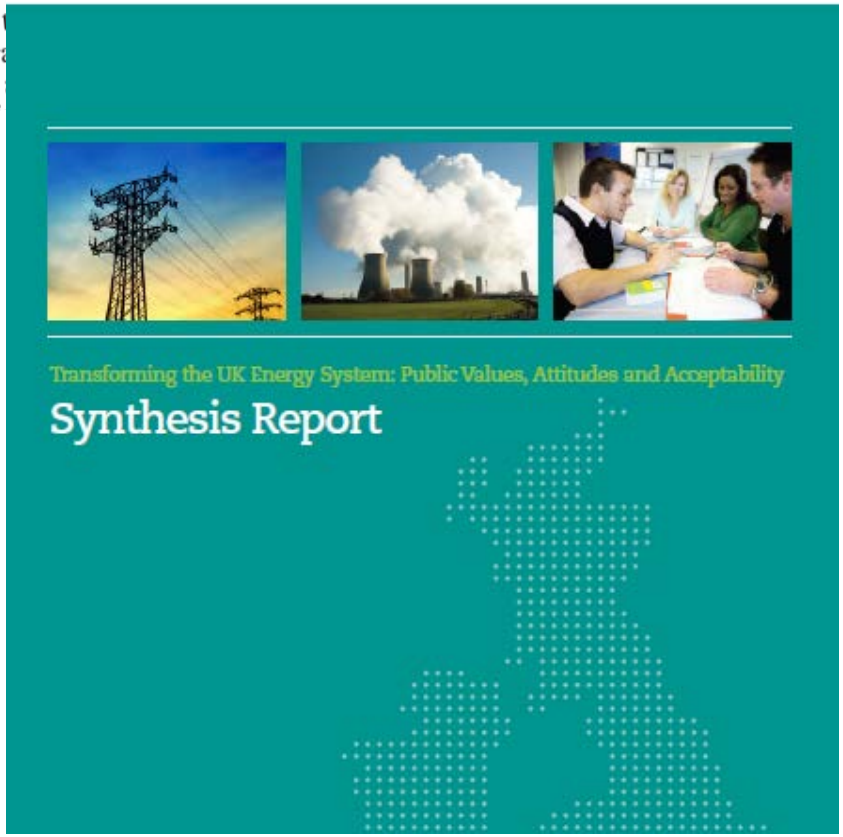
1 Understanding Risk Research Group, Tyndall Centre and Climate Change Consortium of Wales, School of Psychology, Cardiff University, Wales UK 2 Geography Department, The University of Exeter, England, UK 3 School of Environment, Natural Resources and Geography, Bangor University, Wales UK 4 Horizon Digital Economy Research and School of Psychology, The University of Nottingham, England UK

Submitted to Proceedings of the National Academy of Sciences of the United States of America

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 towards future energy system change for the UK. National-level issues such as this are often particularly difficult

people often focus
on the social conte
complex argument
tions surrounding
successful delibera
paper we outline

UKERC
UK Energy Research Centre



Pidgeon et al, PNAS, 2014

Spence et al, Nature Clim. Chg, 2015

Butler et al, Energy Policy, 2015

Demski et al, Global Env. Chg, 2015

Demski et al, Nature Energy, 2017

Project Overview (Jan 2011–July 2013)

WP 1: Scenarios

- **Scenario Adaptation, Expert Consultation & Material Development**
- Review work
- 18 Interviews
- Advisory Panel
- Technical expertise in project team

WP 2: Qualitative

- **Deliberating Energy System Scenarios & Trade-offs**
- 6 full day deliberative workshops (N = 68) in Edinburgh, London, Cardiff, Cumbria, Glasgow, Merthyr
- Conducted by research team June – Oct 2011

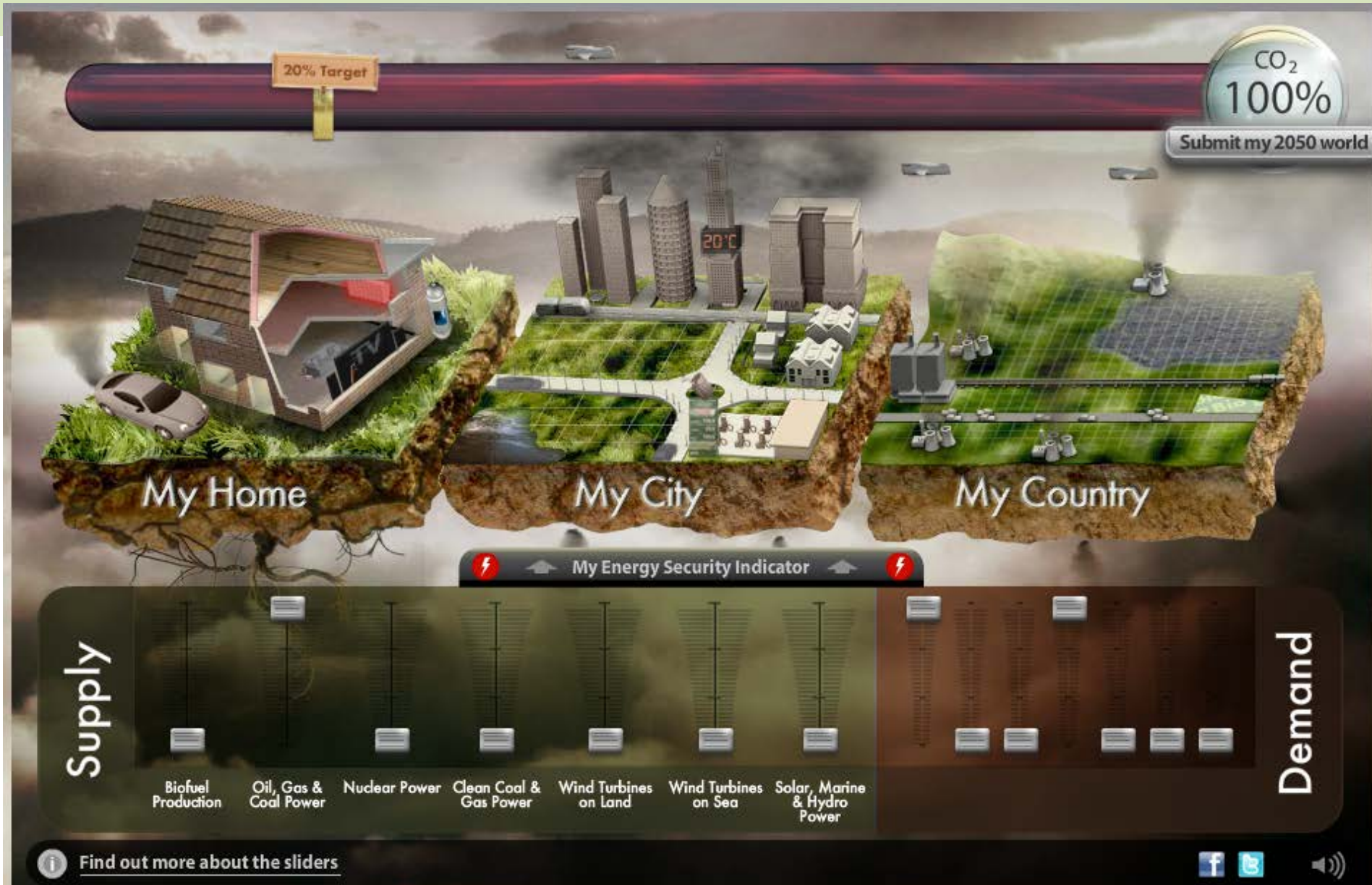
WP 3: Quantitative

- **National (UK) Survey: Attitudes toward Whole Energy System Transformations**
- GB nationally representative (N = 2,441)
- Conducted online 2-12th 2012 August by Ipsos MORI

UKERC

The my2050 tool

The My2050 tool




20% Target
CO_2
100%
Submit my 2050 world
20°C
My Home
My City
My Country
My Energy Security Indicator
Supply
Demand
Manufacturing Growth
Business Greenness
Home Efficiency
Home Temperature
Heating Fuel
How We Travel
Transport Fuel
Find out more about the sliders

Key Findings

The British public wants and expects change with regard to how energy is supplied, used and governed.

They **do not prioritise the demand over the supply side**, or vice versa, in terms of being a greater priority for change.

Above all **renewable supply**, **reduction in (finite) fossil fuel use and 'waste'**

More **conditional support** for deployment of **nuclear, and carbon capture**, and **electrification** in home and transport

Importance of taking a **LONG TERM** view and, respecting underlying **VALUES FOR CHANGE**

Research Councils UK Energy For a Low Carbon Future

UKERC

Public VALUES for Energy System Change

Demski et al (2015) *Global Environmental Change*, September 2015.

Reducing the use of finite resources

Reducing overall levels of energy use

Avoiding waste

Efficient

Capturing opportunities

Environmental protection

Naturalness and Nature

Availability and Affordability

Reliability

Safety

Social Justice

Fairness, Honesty & Transparency

Long-term trajectories

Interconnected

Improvement and quality

Autonomy and Freedom

Choice and Control

UKERC

Solar Energy – example

"CLEAN"

"RENEWABLE"

"JUST"

"FAIR"

It's not about the technology or demand side intervention - it's about the values they embody

UKERC

Values of Solar Energy

Reducing the use of finite resources

Reducing overall levels of energy use

Avoiding waste

Efficient

Capturing opportunities

Environmental protection

Naturalness and Nature

Availability and Affordability

Reliability

Safety

Social Justice

Fairness, Honesty & Transparency

Long-term trajectories

Interconnected

Improvement and quality

Autonomy and Freedom

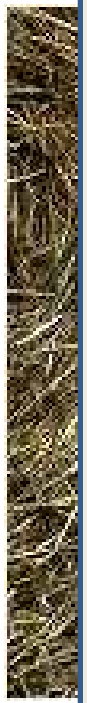
Choice and Control

UKERC

NOTE – Imagining Change – Non-Transition (and 'Negative' Emissions)

Butler, C. (2015) et al *Energy Policy*,87, 665-672.

- A
  s
  t



Non-transition - Biomass…

Fiona - **It's another oil** and you would exploit countries who will allow you to have land and everyone else wants that land so I think you would end up with more wars and water issues.

Cheryl:- Yeah it feels like a **step backwards**… it feels like come on guys, **we can do something better than that**. I don't know what it is about it, maybe it is because it's just burning stuff, **it doesn't seem very sophisticated or sustainable** and it seems like they have just panicked and said we'll just burn stuff. (Cumbria)

CCS Ambivalence as 'Non-Transition'

Reducing the use of finite resources

Reducing overall levels of energy use

Avoiding waste

Efficient

Capturing opportunities

Environmental protection

Natural Resources and Nature

Availability and Affordability

Reliability

Safety

Long-term trajectories

Interconnected

Improvement and quality

Social Justice

Fairness, Honesty & Transparency

Autonomy and Freedom

Choice and Control

UKERC

European Perceptions of Climate Change and Energy (EPCC) - 2016

	France		Germany		Norway		UK	
	Oppose	Support	Oppose	Support	Oppose	Support	Oppose	Support
Increasing taxes on any use of fossil fuels	54%	29%	53%	22%	35%	53%	37%	38%
Nuclear power as part of the energy mix	38%	28%	55%	17%	58%	25%	23%	46%
Subsidising renewables	14%	76%	11%	69%	8%	88%	12%	70%
Increasing the price of electricity	74%	13%	67%	15%	56%	32%	58%	19%
Subsidising insulation of homes	13%	74%	19%	60%	21%	63%	15%	66%
Banning non-efficient household appliances	19%	65%	18%	62%	34%	49%	24%	53%
Spending public money on national adaptation	16%	70%	12%	71%	10%	79%	7%	77%
Financially support adaptation in developing countries	26%	56%	22%	51%	12%	79%	26%	53%

European Perceptions of Climate Change and Energy (EPCC) - 2016

	France		Germany		Norway		UK	
	Oppose	Support	Oppose	Support	Oppose	Support	Oppose	Support
Increasing taxes on any use of fossil fuels	54%	29%	53%	22%	35%	53%	37%	38%
Nuclear power as part of the energy mix	38%	28%	55%	17%	58%	25%	23%	46%
Subsidising renewables	14%	76%	11%	69%	8%	88%	12%	70%
Increasing the price of electricity	74%	13%	67%	15%	56%	32%	58%	19%
Subsidising insulation of homes	13%	74%	19%	60%	21%	63%	15%	66%
Banning non-efficient household appliances	19%	65%	18%	62%	34%	49%	24%	53%
Spending public money on national adaptation	16%	70%	12%	71%	10%	79%	7%	77%
Financially support adaptation in developing countries	26%	56%	22%	51%	12%	79%	26%	53%

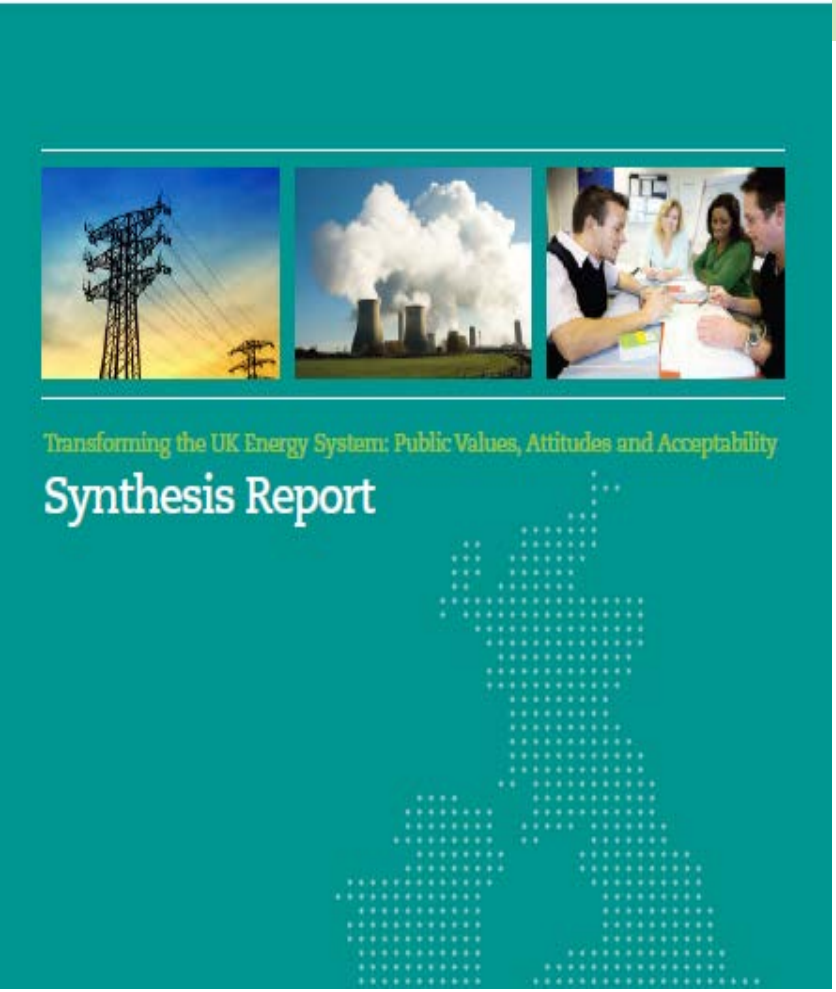
European Perceptions of Climate Change and Energy (EPCC) - 2016

	France		Germany		Norway		UK	
	Oppose	Support	Oppose	Support	Oppose	Support	Oppose	Support
Increasing taxes on any use of fossil fuels	54%	29%	53%	22%	35%	53%	37%	38%
Nuclear power as part of the energy mix	38%	28%	55%	17%	58%	25%	23%	46%
Subsidising renewables	14%	76%	11%	69%	8%	88%	12%	70%
Increasing the price of electricity	74%	13%	67%	15%	56%	32%	58%	19%
Subsidising insulation of homes	13%	74%	19%	60%	21%	63%	15%	66%
Banning non-efficient household appliances	19%	65%	18%	62%	34%	49%	24%	53%
Spending public money on national adaptation	16%	70%	12%	71%	10%	79%	7%	77%
Financially support adaptation in developing countries	26%	56%	22%	51%	12%	79%	26%	53%

Conclusions

- Views about whole energy system change can be studied (although methodologically complex!)
- Public values matter, and help explain perceptions of risks and benefits of specific changes (technology, behavioural, resource etc.)
- While energy uncertainty modelling typically stresses economic and technical uncertainties – we argue for the need to add public values
- Concept of non-transition in the context of negative emissions under Paris2015 requires more study

UKERC



UNDERSTANDING RISK

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

ENERGY Systems Project

Butler, C. Demski, C.C, Parkhill, K.A., Pidgeon, N.F. and Spence, A. (2015) Public values for energy futures: Framing, indeterminacy and policy making. *Energy Policy*, *Energy Policy*,87, 665–672.

Pidgeon, N.F., Demski, C.C, Butler, C., Parkhill, K.A. and Spence, A. (2014). Creating a national citizen engagement process for energy policy. *Proceedings of the National Academy of Sciences of the USA*, 111 (Sup 4), 13606-13613.

Demski, C.C., Spence, A. and Pidgeon, N.F. (2017) Effects of exemplar scenarios on public preferences for energy futures using the my2050 scenario-building tool. *Nature Energy*, 2, article 17027. DOI: 10.1038/nenergy.2017.27

Greenhouse Gas Removal Research

Corner, A.J., Parkhill, K.A., Pidgeon, N.F. and Vaughan, N.E. (2013) Messing with nature? Exploring public perceptions of geoengineering in the UK. *Global Environmental Change*, 23,938-947.

Cox, E., Pidgeon, N.F., Spence, E.M. and Thomas, G. (2018) Blurred lines: The ethics and policy of greenhouse gas removal at scale. *Front. Env. Sci* https://doi.org/10.3389/fenvs.2018.00038

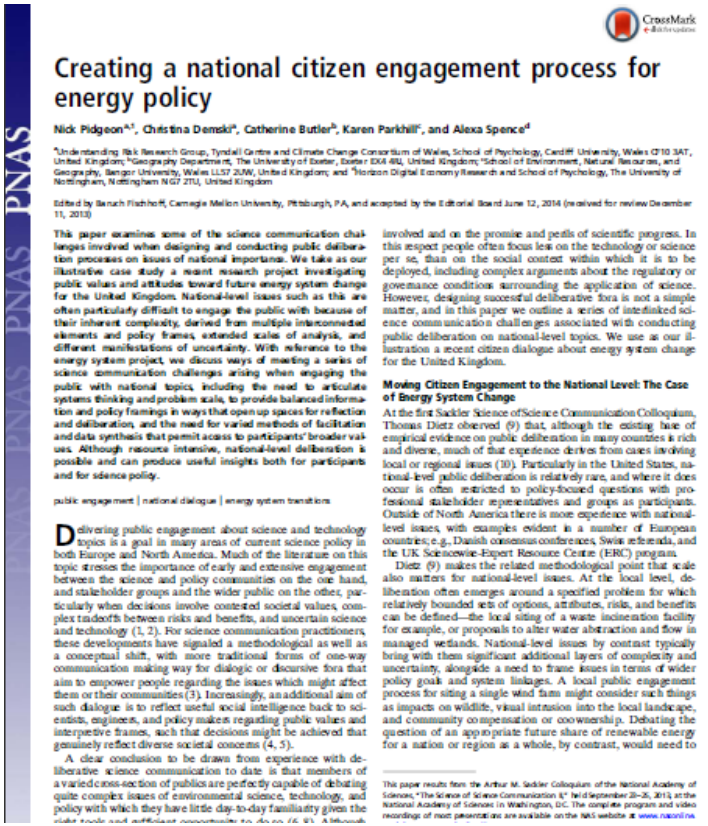
Thank You for Listening

Acknowledgements – collaborators Christina Demski, Catherine Butler, Karen Parkhill, Alexa Spence, Adam Corner, Emily Cox, Elspeth Spence

Challenges 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

Nick Pidgeon[a,1], Christina Demski[a], Catherine Butler[b], Karen Parkhill[c], and Alexa Spence[d]

[a]Understanding Risk Research Group, Tyndall Centre and Climate Change Consortium of Wales, School of Psychology, Cardiff University, Wales CF10 3AT, United Kingdom; [b]Geography Department, The University of Exeter, Exeter EX4 4RJ, United Kingdom; [c]School of Environment, Natural Resources, and Geography, Bangor University, Wales LL57 2UW, United Kingdom; and [d]Horizon Digital Economy Research and School of Psychology, The University of Nottingham, Nottingham NG7 2TU, United Kingdom

Edited by Baruch Fischhoff, Carnegie Mellon University, Pittsburgh, PA, and accepted by the Editorial Board June 12, 2014 (received for review December 11, 2013)

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, 7). Although 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 II," held September 20–21, 2013, at the National Academy of Sciences in Washington, D.C. The complete program and video recordings of most presentations are available on the NAS website at www.nasonline.

UKERC

Energy preferences

	France Mainly/ Very positive	Germany Mainly/ Very positive	Norway Mainly/ Very positive	UK Mainly/ Very positive
Biomass	72%	58%	72%	62%
Coal	13%	22%	5%	22%
Natural gas	56%	50%	51%	52%
Hydroelectric power	78%	85%	92%	74%
Nuclear power	23%	14%	18%	40%
Oil	20%	28%	30%	30%
Sun/solar power	93%	87%	92%	82%
Onshore wind power	80%	74%	79%	70%
Offshore wind power	79%	80%	87%	74%
Hydraulic fracturing*	8%	16%	7%	19%

Energy preferences

	France Mainly/ Very positive	Germany Mainly/ Very positive	Norway Mainly/ Very positive	UK Mainly/ Very positive
Biomass	72%	58%	72%	62%
Coal	13%	22%	5%	22%
Natural gas	56%	50%	51%	52%
Hydroelectric power	78%	85%	92%	74%
Nuclear power	23%	14%	18%	40%
Oil	20%	28%	30%	30%
Sun/solar power	93%	87%	92%	82%
Onshore wind power	80%	74%	79%	70%
Offshore wind power	79%	80%	87%	74%
Hydraulic fracturing*	8%	16%	7%	19%

Objectives

1) To identify key trade-offs in system change & stakeholder & public responses to these

2) To build knowledge and understanding of public attitudes, values and acceptability of energy system change

3) To create qualitative and quantitative data sets for examination of the perspectives of varied publics across the UK on whole energy system

4) To develop and utilise innovative methodological approaches for examining public values, attitudes and acceptability

5) To develop a range of generic materials that can be utilised as a basis for working with varied publics

UKERC