Patrick Devine-Wright

Renewable Energy and the Public

From NIMBY to Participation

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Gordon Walker is Professor at the Lancaster Environment Centre, Lancaster University. He has a distinctive profile of research on the social and spatial dimensions of environment and sustainability issues, including work on environmental justice, socio-technical transitions, renewable energy and forms of 'natural' and technological risk.

Maarten Wolsink has an MA in methodology and political science and a PhD in social psychology. Associate Professor in Environmental Geography at the University of Amsterdam, he is a leading author on the topic of social acceptance of renewable energy innovations, and other environmental concerns.

Acronyms

ACC	Arizona Corporation Commission
ADEQ	Arizona Department of Environmental Quality
ADOC	Arizona Department of Commerce
APS	Arizona Public Service
ASERS	Arizona Solar Electric Roadmap Study
BBC	British Broadcasting Corporation
BERR	Department for Business, Enterprise and Regulatory Reform
BS	biomass stove
BWEA	British Wind Energy Association
CCAG	Climate Change Advisory Group
CCAP	Climate Change Action Plan
CCHP	combined cooling heat and power
CCS	carbon capture and storage
CEDC	Commerce and Economic Development Commission
CEPEL	Centro de Pesquisa em Energia Elétrica
CERT	Carbon Emissions Reduction Target
CHP	combined heat and power
CMRP	Clyde Muirshiel Regional Park
CSIRO	Commonwealth Scientific and Industrial Research Organization
CSP	concentrating solar power
DCC	Devon County Council
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DFT	Domestic Field Trial
DIS/BCN	Social Impact Detection/Barcelona
DNO	distribution network operator
DRET	Department of Resources, Energy and Tourism
DSM	demand-side management
EFF	Energy Futures Forum
EIA	Environmental Impact Assessment
EMEC	European Marine Energy Centre
EOW	European Offhore Wind
EPSRC	Engineering and Physical Sciences Research Council
ES	Environmental Statement

ESCO	energy services company
EST	Energy Saving Trust
ETF	Energy Transformed Flagship
GDP	gross domestic product
GHG	greenhouse gas
GLA	Greater London Authority
GM	genetically modified
GSHP	ground source heat pump
HEP	hydroelectric project
IAPS	International Association of People–Environment Surroundings
IEA	International Energy Agency
IPC	Infrastructure Planning Commission
IPCC	Intergovernmental Panel on Climate Change
IPPR	Institute of Public Policy Research
LCBP	Low Carbon Buildings Programme
LCCA	London Climate Change Agency
LDA	London Development Agency
NaREC	New and Renewable Energy Centre
NERC	Natural Environment Research Council
NFFO	Non-Fossil Fuel Obligation
NGC	National Grid Company
NGO	non-governmental organization
NIMBY	'Not in my back yard'
NPS	National Policy Statement
NRW	North Rhine–Westphalia
OFGEM	Office of the Gas and Electricity Markets
OU	Open University
PCED	people-centred ecodesign
PERF	Parque Eólico de Rio do Fogo
PIDD	Paloma Irrigation and Drainage District
PPA	power purchase agreement
PPS22	Planning Policy Statement 22
PSE	public and stakeholder engagement
PURE	Promoting Unst's Renewable Energy
PUS	public understanding of science
PV	photovoltaic
PV	public value
RDA	Regional Development Agency
RES	Renewable Energy Standard
RES	Renewable Energy Strategy
RET	renewable energy technology
RFP	
RN	Rio Grande do Norte
ROC	Renewables Obligation Certificate
SINS	Shetland in Statistics

SPA	special protection area
SRT	social representations theory
SSSI	site of special scientific interest
STHW	solar thermal hot water
STS	science and technology studies
SWRDA	South West Regional Development Agency
TNO	transmission network operator
UK	United Kingdom
UKSHEC	UK Sustainable Hydrogen Energy Consortium
UPE	upstream public engagement
US	United States (of America)
WFB	wood-fuelled boiler
WGA	Western Governors Association
WINBEG	Winkleigh biomass gasifier
YIMBY	'Yes in my back yard'

Public Engagement with Renewable Energy: Introduction

Patrick Devine-Wright

Changes to the earth's climate are the foundation for this book. According to an international panel of the world's leading climate scientists, the concentration of carbon dioxide (CO_2) and other greenhouse gases in the atmosphere has reached 435 parts per million (ppm) of carbon dioxide equivalent (CO_2e) (IPCC, 2007). This compares with about 280ppm before industrialization in the 19th century. The IPCC has predicted that, as a result of continuing increases in greenhouse gas emissions, the average global temperature will rise by 5° or more over the next 100 years in comparison with pre-industrial times. It has been more than 30 million years since temperature was that high (Stern, 2009), raising the spectre of a more hostile physical environment than the human species, which has been around for no more than 200,000 years, has experienced before.

In many countries, the energy required for transport, heat and power is derived predominantly from fossil fuels (e.g. natural gas, coal and oil). In response to the threat of climate change, governments around the world are making commitments to reduce their reliance upon these sources of energy and to increase the use of low carbon energy sources, specifically nuclear and renewable energy. Moves to reduce the use of fossil fuels are also motivated by concerns over energy security and, in particular, reliance upon what may in future be increasingly scarce and expensive supplies of natural gas and oil.

Renewable energy is an umbrella term describing a wide variety of energy sources that are non-depleting with use, including solar, wind, tidal, wave or bioenergy. Globally, the use of these sources of energy is rapidly increasing (see Figures I.1 and I.2). During 2008, at least 73 countries set policy targets for renewable energy, up from 66 in 2007, and many countries have opted for a path of low carbon growth in response to the international financial crisis, notably the US, where US$150 billion has been pledged over the next ten years (REN21, 2009). China, India and other developing countries are increasingly playing major

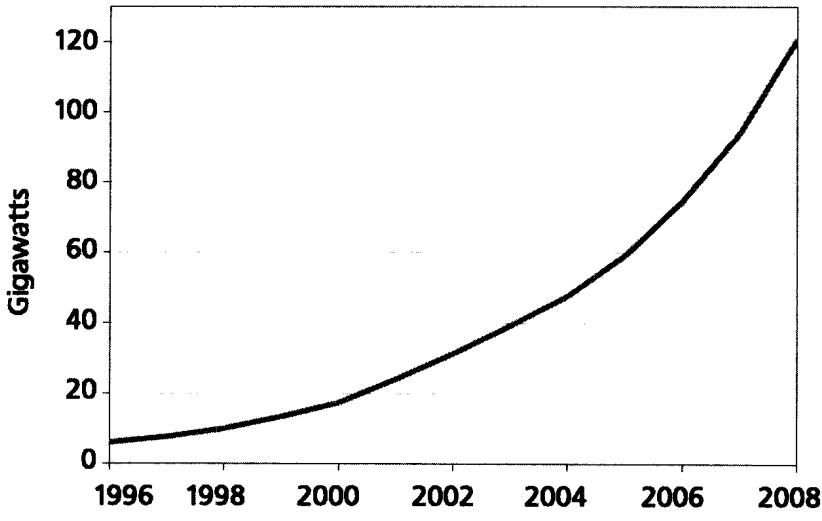
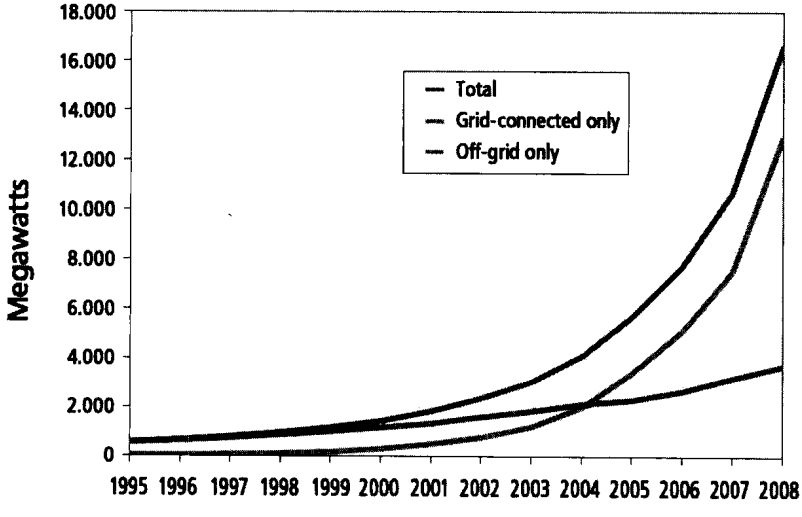


Figure I.1 *Wind power, existing world capacity, 1996–2008*

Source: REN21, 2009

roles in both the manufacture and installation of renewable energy: for example, China's total wind power capacity doubled in 2008 for the fourth year running.

However, the transition to low carbon energy systems has not proved straightforward. The growth in the use of renewable energy over the past 20 years has been extremely variable across different social, political and economic contexts, from a



Source: REN21, Renewables Global Status Report: 2009 Update

Figure I.2 *Solar PV, existing world capacity, 1995–2008*

Source: REN21, 2009

rapid implementation in countries such as Germany and Denmark, to a more stagnant level of growth in the UK. Commentary in the media and advocacy by interest groups has often pitted different sources of low carbon energy against each other as mutually exclusive alternatives (e.g. nuclear vs. renewables; large scale vs. microgeneration). Social movements have arisen to challenge proposals to develop increasing numbers of onshore wind farms in rural areas (e.g. the Country Guardian organization in the UK), while concepts such as 'NIMBYism' ('Not in my back yard') have had a strong influence in shaping how industry, policy-makers and media commentators think about and respond to the sometimes sceptical responses of local residents to proposals for renewable energy in their locality.

The NIMBY concept is often used to address what at first seems to be a confusing 'social gap' (Bell et al, 2005) between high levels of public support for renewable energy and frequent local hostility towards specific project proposals. As Haggett documents in Chapter 2 of this volume, local hostility to renewable energy is a global issue, having been documented in the US, Australia and Asia, as well as in many European countries. But many social scientists have argued that the NIMBY concept is a misleading, inaccurate and pejorative way of understanding local objections (Burningham et al, 2006; Wolsink, 2006; Devine-Wright, 2009). Instead, academics have revealed the complexity of public responses, and stressed the importance of public participation, arguing that a lack of meaningful and timely opportunity to have a say in decision-making can contribute to public scepticism, mistrust and opposition (Bell et al, 2005).

When done well, increased public input into diverse forms of environmental assessment and decision-making can improve both the quality and the legitimacy of such activities, enhancing trust and understanding (National Research Council, 2008). Such a call for increased citizen involvement is based upon criticism of the view that lay people are inadequately informed or irrational about science and therefore need to be 'educated' by experts (see Flynn et al, Chapter 17, this volume). The use of analytic-deliberative methods of public engagement, including mechanisms such as citizens' panels, at an early or 'upstream' stage of policy or technology development, can enable the integration of public values into policy formation and decision-making, leading to enhanced legitimacy and trust (Renn, 2008). This implies the abandonment of technocratic planning perspectives, since 'decide–announce–defend' approaches have been denounced as contributing to social conflict, and leading to delays or even cancelled project proposals (Wolsink, 2010).

Given the ambitious targets that many governments have now adopted for increasing the deployment of renewable energy, systematic and robust social science research into public engagement with renewable energy is urgently required. Research and development into renewable energy has been rather dominated by technological and economic approaches to date, to the detriment of social science input. This book, which brings together the latest international research findings in a single volume, reveals the capacity that social scientists have to inform industry practices and policy-making, and to serve as a more useful and reliable evidence base than commonsense beliefs such as NIMBYism. But the

book can do more than this. It can demonstrate a broader scope to social science research beyond the issue of social acceptance. As Walker and Cass make clear in Chapter 4, there are multiple roles that publics can play when engaging with renewable energy technologies – NIMBY-type objection to large-scale energy projects is merely one of these. The book's contributors reveal a vibrant and burgeoning literature characterized by a diversity of conceptual and empirical approaches, encompassing a range of energy technologies at different scales of deployment and levels of maturity, and a range of contexts of engagement, from upstream deliberation on national energy futures to local responses to siting proposals. This range of social science input suggests a more expansive and varied future research agenda on public engagement, with the consequent ability to think more creatively about policy and practice implications.

The Structure of This Book

The book is divided into two sections. The first section comprises five chapters addressing theoretical aspects of public engagement with renewable energy.

Conceptual approaches to public engagement with renewable energy

Chapter 1 by Walker and colleagues proposes a comprehensive conceptual framework for understanding public engagement, which arose from a multidisciplinary research project conducted in the UK between 2005 and 2009. At the heart of the framework is the notion of symmetry – that public engagement encompasses not only public reactions to technology proposals, but also the actions of those actors who are involved in promoting technology development and engaging with publics in various ways. The framework also seeks to capture the *expectations* involved in shaping how people and organizations seek to engage or not engage with others, the *dynamic* nature of such expectations and responses over time, and the *contextuality* of engagement, shaped by both broad policy and economic landscapes and the characteristics of local places and communities.

Haggett, in Chapter 2, addresses the rationale and methods used for engaging the public in decision-making about the development of renewable energy, placing this discussion within the specific context of recent UK legislation on spatial planning and the transition to a low carbon economy. She advocates that developers build long-term relationships in communities, seem concerned and involved in them, and accountable for the strategies developed that will effect them, while remaining sceptical that recent UK policies, which suggest early, abstract agenda setting and limited consultation later, will provide a suitable context for addressing local scepticism and objection.

In Chapter 3, Barry and Ellis also build on recent changes to UK planning legislation to explore alternative ways of thinking about conflict around renewable energy. They argue that in order to make sense of the struggles over project

proposals, we must step back and understand both protagonist and antagonist viewpoints, and by doing so may be able to use the conflictual engagement of such disputes to the broader advantage of delivering low carbon societies. Arising from this perspective upon conflict, they suggest that the hegemonic idea that planning practice should seek 'consensus' is not only counterproductive but also damaging to democratic ideals.

Walker and Cass adopt a socio-technical approach in Chapter 4 in seeking to broaden perspectives on how the public and renewable energy are related beyond the dominant focus on questions of acceptability, local responses to development projects, and how engagement operates between developers and local communities. They argue that there are many other important points of encounter and connection and many other roles into which publics can be cast, yet these have typically been overlooked to date. They identify ten discrete roles and argue that these roles and their interrelation is a necessary first step towards pursuing a more expansive and varied future research agenda and thinking more creatively about policy and practice implications.

In Chapter 5, Patrick Devine-Wright critically reflects on the ways that the locations of renewable energy projects are commonly thought of. Two predominant ways of thinking about locations by policy-makers, industry and academics are identified – as 'sites' for development and as 'backyards' defended by NIMBYs. Each of these is argued to provide an inadequate means of conceptualizing objective and subjective aspects of project locations. Instead, the perspective of emplacement is proposed, drawing on social science literature on the concept of place, and particularly notions of place attachment and place identity. The practical implications of the emplacement perspective for public engagement activities are discussed.

Empirical Research on Public Engagement with Renewable Energy

Section II of the book comprises empirical research on public engagement, and is subdivided into two parts. Part 1 takes a look at stakeholder and media representations of public engagement with renewable energy.

Stakeholder and media representations of public engagement

In Chapter 6, Wolsink uses Q-methodology to investigate stakeholder representations of public engagement with wind energy development in three European countries: Germany, The Netherlands and the UK. The analysis revealed four discourses with varying presumptions of community involvement, unconditional or conditional support for development, and concerns about landscape impacts. He concluded that discourses were most polarized in the UK, while representations in Germany reflect a position of conditional support that has arisen from learning, stemming from successful implementations.

Hodson and Marvin look at transformation in urban energy systems, using London as a case study, in Chapter 7. With a predominant interest in governance, they investigate the emergent roles of new intermediary organizations in system transformation. Specifically, the authors investigate the ways in which public engagement is conceived and practised by the London Climate Change Agency as part of its Green Homes programme to reduce carbon emissions. Using documentary analysis and in-depth interviews, they identify five types of public engagement in the Green Homes programme, and conclude that the programme views publics primarily as consumers characterized by deficits of knowledge rather than active citizens willing to participate in envisioning alternative visions of urban energy systems. They conclude by calling for intermediaries to engage with a wider variety of publics in the constitution of similar initiatives.

In Chapter 8, Hannah Devine-Wright investigates how public engagement with renewable energy technologies has been depicted in the media, specifically in visual images printed in UK newspapers in the years 2006 and 2007. Informed by social representations theory, this study indicates how wind turbines are used symbolically to refer to renewable energy generally; how images have increased in number over time and have evolved to contain members of the public alongside these technologies, replacing technical experts or politicians. She concludes that despite this increased prevalence of publics in media images, the narrow focus upon passive, individual supporters fails to capture the variety of roles that individuals can take in relation to the siting of renewable energy technologies.

Cotton and Patrick Devine-Wright in Chapter 9 investigate how transmission network operators in the UK conceive and practise public engagement in the context of siting new overhead power lines, for example, when connecting new wind farms to the national grid. Using interview and document review methods, they observe that, while rhetoric of thorough, transparent community engagement was evident, in practice this was narrowly limited to seeking feedback on pre-selected routing options, thus providing little effective decision-making power to communities. This narrow form of engagement was interpreted as being founded upon NIMBY presumptions of limited technical expertise and an inability to adopt strategic perspectives. The authors conclude that the approach taken in the UK may well prove counterproductive, reinforcing public opposition rather than ameliorating it.

Public beliefs and responses to diverse renewable energy projects or initiatives

The second part of Section II focuses upon public beliefs and responses to renewable energy projects or initiatives, via specific case studies.

In Chapter 10, Ashworth and colleagues evaluate the use of citizens' panels as part of a wider stakeholder engagement programme that aimed to devise scenarios for alternative energy futures for Australia, a country facing severe threats from climate change, as well as abundant fossil fuel reserves. The panels indicated broad overall concern with climate change, yet markedly different attitudes

regarding technology futures. Analyses indicated that five broad groupings could be identified, differing primarily in their attitudes to risks associated with large-scale technologies, their concern for the future shape of society, and their willingness to accept risks as a trade-off for energy security. For many individuals, their initial views were susceptible to change when presented with new information and exposed to group discussion.

Chapter 11 is the first of four chapters on public engagement with microgeneration technologies. Abi-Ghanem and Haggett investigate residents' engagement with solar photovoltaics in homes; comparing social and private housing schemes within the UK Government's domestic field trial, drawing on literature from science and technology studies. Technology users are represented as four types: conscious, opportunistic, interested and non-users. The authors then discuss how the designers' and trial managers' perceptions of the users were built into the PV systems' design and directly influenced how people were able to engage with the technology. The success of the particular policy initiatives behind the trials is reflected upon, and the implications for the wider use of microgeneration technology discussed.

In contrast, Pasqualetti and Schwartz in Chapter 12 investigate public engagement with a 280MW solar power station in the US. They note how historically developers have tended to overlook social barriers to wind energy development, being predominantly concerned with technical aspects. They wonder whether this pattern is likely to continue in relation to solar energy, with an absence of early engagement and complete information provision leading to numerous instances in the project's development where there has been a failure to assess public values towards the project. They conclude that early and complete involvement should become an element of the planning and construction of every solar project.

In Chapter 13, Schweizer-Ries advocates inter- and transdisciplinary research, rather than the conventional technical approach, on the concept of energy sustainable communities. Through analysis of three contrasting case studies in Latin America, Europe and Africa, she characterizes alternative socio-technical approaches to solar energy development: a technically driven integration lacking participation of the communities; a socially driven one featuring technical deficiencies; and a participative integration that functioned properly and helped to further develop the community. She concludes that successful implementation of renewable energy must be based upon collaboration between social scientists, technical specialists and full participation by communities as equal partners.

'Yes in my back yard', the title of Chapter 14, is an analysis by Caird and Roy of consumer perceptions and experiences of several microgeneration technologies for generating heat or electricity at the household level. Drawing on interview and survey data, they conclude that current demand for microgeneration is largely confined to a niche market of environmentally concerned, older, middle-class householders, often those living in larger rural properties off the mains gas network. Their research reveals that, despite considerable public consideration in adopting microgeneration, the UK market is still at an early phase of the diffusion