Science Communication
Volume 30 Number 3
March 2009 305-327

10.1177/1075547008328969
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Reorienting Climate Change Communication for Effective Mitigation

Forcing People to be Green or Fostering Grass-Roots Engagement?

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Climate communication approaches expend significant resources promoting attitudinal change, but research suggests that encouraging attitudinal change alone is unlikely to be effective. The link between an individual's attitudes and subsequent behavior is mediated by other influences, such as social norms and the "free-rider" effect. One way to engender mitigative behaviors would be to introduce regulation that forces green behavior, but government fears a resulting loss of precious political capital. Conversely, communication approaches that advocate individual, voluntary action ignore the social and structural impediments to behavior change. The authors argue that there are two crucial, but distinct, roles that communication could play in engaging the public in low carbon lifestyles: first, to facilitate public acceptance of regulation and second, to stimulate grass-roots action through affective and rational engagement with climate change. The authors also argue that using communication to stimulate demand for regulation may reconcile these "top-down" and "bottom-up" approaches.

Keywords: *climate change; public engagement; legislation; regulation; environmental policy; communication; behavior change; low carbon*

The urgency of a societal response to climate change was recently reinforced by the Intergovernmental Panel on Climate Change's (IPCC) review of the most up-to-date science on climate change stating that climate warming is "unequivocal" (IPCC, 2007). In the United Kingdom, the

government's recent Climate Change Bill set an ambitious target of an 80% reduction in emissions by 2050 in order to meet a stabilization target of 550ppm atmospheric carbon-dioxide equivalent. Many commentators have argued for even lower stabilization targets to be set (e.g., Bows, Mander, Starkey, Bleda, & Anderson, 2006). This level of response to climate change has profound implications for individual choices and behavior. With over one third of many nations' carbon emissions coming from private travel and domestic energy use (DEFRA, 2005; ONS, 2004), governments across the globe recognize the urgent need to encourage individuals to adopt low carbon lifestyles. Individuals also constitute the workforce of businesses and government, implying possible indirect effects in the work place from personal engagement with climate change.

To date in the United Kingdom, government efforts to promote low carbon behaviors have principally focused on using communication campaigns to foster greener attitudes and behavior amongst the public (e.g., the UK Department for Environment, Transport, and the Regions' "Are You Doing Your Bit?" 1998-2000 campaign; the current UK Energy Savings Trust's "Act on CO2" campaign). But, whilst these campaigns may have helped increase awareness about climate change over the last decade, they have done little to foster wider public "engagement" with the issue. We define engagement as having three key components: cognitive (understanding/knowledge), affective (emotion/interest and concern), and behavioral (action; Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007). This implies that "it is not enough for people to know about climate change in order to be engaged; they also need to care about it, be motivated and able to take action" (Lorenzoni et al., 2007 p. 446).

Authors' Note: This article was originally presented at the Future Ethics Workshop on Apocalyptic Rhetoric and the Politics of Climate Change, Manchester, United Kingdom, June 2008. The authors would like to thank the participants of that conference for their useful comments and feedback. David Ockwell would also like to thank members of the School of Environmental Sciences at the University of East Anglia for their feedback on certain aspects of this article that were presented at a departmental seminar there in May, 2008. David also acknowledges the ESRC for funding (award number PTA-026-27-1376). The authors are also grateful to an anonymous reviewer and the editors of this special issue for their helpful comments and suggestions. Correspondence concerning this article should be addressed to Dr. David Ockwell, Tyndall Centre for Climate Change Research and Sussex Energy Group, SPRU (Science and Technology Policy Research), University of Sussex, Brighton, UK; Dr. Lorraine Whitmarsh, Tyndall Centre for Climate Change Research, School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ, United Kingdom; Dr. Saffron O'Neill, Tyndall Centre for Climate Change Research, Climatic Research Unit, School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ, United Kingdom

British policies aimed at encouraging energy conservation tend to rely on voluntary behavior change encouraged through economic incentives (Department of Environment; DoE, 1994; DETR, 2000; HM Government, 2006). Yet such approaches appear insufficient to produce the significant shifts in behavior required for tackling climate change. In fact, energy demand in the United Kingdom is rising in domestic and transport sectors (Department for Environment, Food, and Rural Affairs; DEFRA, 2006). Social science research (reviewed below) has identified a number of significant barriers to changing entrenched energy use behaviors and engaging the public with climate change.

In this article, we explore the role that communication can play in overcoming barriers to public engagement with climate change in order to achieve effective reductions in carbon emissions. Our aim is to identify strategic opportunities for communication efforts. We explore alternative approaches to effecting low carbon behavior and highlight the respective strengths and weaknesses and the tensions between a top-down, regulatory approach that forces green behavior and more bottom-up approaches that foster voluntary, grassroots action to reduce emissions. The paper builds on our research into the politics of climate change policy in the United Kingdom and on the social psychology of public engagement. It is based principally on findings from the United Kingdom but aims to present insights of relevance to other developed countries as well as to some rapidly developing countries such as India and China as they seek to explore pathways to state-of-the-art, low carbon economies.

We begin by exploring the barriers to public engagement with climate change and the reasons why current communication efforts are unlikely to effect low carbon behavior change. We then discuss how a top-down approach to regulating people's behavior might overcome these barriers but why governments currently do not favor such options. Finally, we end by recognizing the multiplicity of roles climate change communication approaches can take, particularly emphasizing the potential for communication approaches to nurture the social demand for regulation. This approach can bridge the tensions between top-down and bottom-up approaches to promoting low carbon behavior, however, it requires communication efforts to be both politically and psychologically smart.

Barriers to Behavior Change

Whether human agency or social structure is more salient in determining action and bringing about change is a long-standing debate in the social sciences (e.g., Giddens, 1984; Blake, 1999).

It is clear, however, that efforts to promote low carbon behavior change are constrained by the high carbon infrastructure and institutions within which we live, travel, and work.

From the perspective of infrastructural constraints, towns, villages and houses have been built and located around the availability of cheap oil. Housing stock is often old and energy inefficient (or, indeed, new and inefficient). In many countries, alternatives to driving are not only more expensive than motoring (e.g., DfT, 2007), but they may also be less reliable and safe (e.g., Davies, Halliday, Mayes, & Pocock, 1997).

Similar structural constraints affect financial incentives to low carbon behavior. Basic economic theory shows that the extent to which people are likely to respond to price increases, such as the recent rises in the price of petrol (whether due to fluctuations in the market or deliberate government intervention via taxes), is constrained by the price and availability of substitute goods. The high cost and, in some places, lack of availability of public transport therefore constrains the extent to which people are likely to drive less due to high petrol prices (e.g., DEFRA, 2002). A recent survey showed that over 50% of the UK public agreed with the statement "I would like to reduce my car use but there are no practical alternatives" (DEFRA, 2007). The same logic applies to other energy choices. Solar hot water systems, for example, are unlikely to be widely adopted if they entail an extensive initial outlay of money and access to specialist skilled labor for installation.

Structural constraints also operate at the level of institutions. Quarterly energy bills, for example, provide individuals with no direct feedback on the amount of energy they use day-to-day or on which devices are consuming the most energy (is it an inefficient fridge or a large TV?). People interested in investing in micro-generation (e.g., solar panels, biomass, or wind turbines) are constrained in many places by the fact that they cannot get paid for energy sold back into the grid (or as in the case of the United Kingdom, payments are not frequent enough to be economically viable for many individuals investing in expensive technologies). At a more basic level, certain domestic energy conservation measures, such as installing insulation or solar heating, will only be viable for home owners rather than renters (McKenzie-Mohr & Smith, 1999). Thus structural conditions of this kind have been found to determine intentions to adopt energy conservation actions (Black, Stern, & Elworth, 1985; Eden, 1993; Gardner & Stern, 1996; McKenzie-Mohr & Smith, 1999; Schwartz, 1977).

Perhaps more constraining still is the fact that institutions and society co-evolve with available technologies (Geels & Schot, 2007). Hence our road systems and regulations have evolved around the internal combustion engine, which in turn has become a status symbol with desirable cars a

proxy for social standing and success (e.g., Kay, 1999). These elements lead to "socio-technical lock-in" (e.g., Geels, 2005; Nykvist & Whitmarsh, 2008a) into a mutually reinforcing, high carbon trajectory for social and technological development.

Structural and institutional barriers to low carbon behavior require direct government intervention and are clearly an important constraint on individual agency for low carbon behavior change. This represents an important challenge to the efficacy of communication-based approaches to facilitating such change. Indeed, as Maibach, Roser-Renouf, and Leiserowitz (2008) point out, such efforts might be more effective if they combine communication campaigns with structural and institutional changes. Maibach et al. give the example of the Hood River, Oregon, in the United States where a 15% reduction in energy use was achieved via a combination of a communication campaign to raise awareness and the provision of financial incentives and in-house assistance to adopt energy-saving devices.

Despite the clear importance of structural interventions to facilitate low carbon behavior change, there are many areas where individuals still have a degree of agency to change their behavior by ignoring (and perhaps transforming) existing social norms and making choices that reduce their carbon emissions. In many cases, for example, people can choose to walk, cycle, use public transport, or car share. They can buy more efficient cars, turn off lights, use energy-efficient light bulbs, not leave things on standby, turn the heating down and wear a jumper, recycle, compost organic waste, fly less or not at all, and so on. These are all behavior changes that the UK government's communication campaigns have attempted to encourage, but have they been effective in changing population behavior?

The short answer is no; there was a 5% increase in emissions from domestic energy consumption and a 10% increase in emissions from transport in the United Kingdom between 1990 and 2005 although a decrease in emissions from domestic energy consumption was observed between 2005 and 2006 (DEFRA, 2008). Research in the United Kingdom on climate change attitudes and behaviors demonstrates widespread awareness of the issue and some level of concern (DEFRA, 2002, 2007; Whitmarsh 2008a). However, although surveys show that concern about climate change has increased over the past two decades (DEFRA, 2002, 2007), climate change is still accorded a low priority in the context of other issues including other environmental issues (e.g., Poortinga & Pidgeon, 2003). The low ranking of climate change as a concern reflects a widespread perception amongst the public that the issue is removed in space and time, that is, affecting future generations and other countries. Whilst it is considered socially relevant, most individuals do not feel it poses a prominent personal threat. A BBC survey found that 52%

of people in the United Kingdom believe climate change will have little or no effect on them personally (BBC, 2004); while an Energy Saving Trust study (EST, 2004) in the same year found that 85% of UK residents believe the effects of climate change will not be seen for decades.

Perhaps more worrying, only a minority of the public take measures to reduce their energy consumption. Surveys indicate around one third of the public are making an effort to drive and/or fly less (DEFRA, 2007). When asked what actions they would be willing to take to address climate change, recycling and home energy conservation are the most frequently mentioned, while there is considerable resistance to changing travel habits (DEFRA, 2007). In relation to energy policies, incentives and technological solutions receive more support from the public than taxes or higher bills (BBC, 2004; DEFRA, 2002; O'Connor, Bord, & Fisher, 1999).

It is striking to note, however, that surveys demonstrating low levels of behavior change also demonstrate high levels of public understanding as to which behaviors contribute most to the problem. For example, a large UK survey (n = 3,600) found that more than 75% of respondents believed "using a car less" and "flying less" would have a "medium or major impact" on reducing the UK's contribution to climate change (DEFRA, 2007). The same survey, however, showed that less than 25% of people believed that the UK public would be willing to take these actions.

So why is there limited public engagement with climate change? The disparity between public awareness about climate change on the one hand, and the limited behavioral response on the other is consistent with the widely-reported "value-action" or "attitude-behavior" gap in psychology (e.g., Blake, 1999; Kollmuss & Agyeman, 2002; Ungar, 1994). In other words, people often do not act in accordance with what they know or feel. The attitude-behavior gap points to the complex interactions of psychological, social and environmental factors in the production of behavior (e.g., Jackson, 2005; Stern, 2000). Indeed, behavior is not always preceded by conscious deliberation at all, notably in the case of habits. This is particularly true in the case of transport choices (e.g., Verplanken, Aarts, van Knippenberg, & Moonen, 1998). Furthermore, climate change in particular, as a complex, uncertain, global, and long-term issue, is particularly difficult to understand and relate to at the individual level.

Our research highlights various barriers to increasing public knowledge, interest, concern, and—above all—action in relation to climate change. These barriers exist at two interrelated levels: individual and social (Lorenzoni et al., 2007). These include lack of knowledge, skepticism, and distrust of information, feeling disempowered, other priorities and values, perceived inaction by others, social norms (to consume), and physical/infrastructural impediments (as reviewed above).

Although some of these barriers, such as lack of knowledge, can be removed relatively easily through information provision, most are intractable psychological, social, and structural barriers that imply a need for profound—and costly—social change. Currently, action is only taken by a minority and often not for environmental reasons (Whitmarsh, 2008b). Other people are unwilling to take action because they find it too difficult or costly, or because they consider it a waste of time when the majority is doing nothing (the so-called "free-rider" effect–see, for example, Cornes & Sandler, 1987; Demesetz, 1967; & Oates & Portney, 2001). Often, individuals blame businesses and other countries for climate change. They look to government to take responsibility for tackling it, to make being green easier and more attractive for the public (Lorenzoni et al., 2007). Evidently, the existence of these widespread and ingrained social barriers poses challenges for climate change mitigation efforts and undermines reliance on voluntary action by individuals.

Forcing People to be Green

So if relying on voluntary action is not working, should the government force people to be "green" by introducing strong legislation? There are several areas, such as transport, where regulation can be an effective option for reducing carbon emissions. The London Congestion Charge (a fee charged for driving a vehicle into central London), for example, has led to a dramatic fall in the number of vehicles in the city centre (although it is notable that this measure was accompanied by reinvestment of the revenue raised into improving public transport e.g., improved buses, electronic bus timetables; Transport for London, 2006). Other possible regulations include road tolls, fees for rubbish collection, differentiated parking and road charges based on vehicle emissions, and the increasingly high profile idea of personal carbon allowances (e.g., Seyfang, Lorenzoni and Nye, 2008).

Whilst there are many examples of regulatory interventions that can be used to either incentivize or force green behavior, a note of caution must be raised regarding potential indirect effects. For example, congestion charging in large conurbations might lead to people driving further to avoid these charging zones thus resulting in a net increase in emissions. There is also evidence to suggest the existence of a "rebound effect" where energy efficiency measures free up resources that can be spent on other energy consuming activities thus reducing the net decrease in overall energy consumption. The most comprehensive reviews of the rebound effect to date (see Herring & Sorrell, 2008; Sorrell & Dimitriopolous, 2007; & Sorrell, in press), however, suggest that, whilst rebound effects do exist and therefore need to be accounted for, they are unlikely to result in a net overall increase

in emissions; rather, they simply reduce the net decrease in emissions from individual energy efficiency measures (see also Ockwell, in press). Such concerns point more to a need for well-designed and properly assessed regulation rather than the rejection of regulation as a means to encourage green behavior. So, for example, congestion charging combined with reinvestment in improved public transport, as practiced in London, results in corresponding increases in public transport use rather than people driving further. And energy efficiency measures that account for associated rebound effects can avoid any over estimation of resulting reductions in energy efficiency.

Government regulation that forces people to be green is, at least in theory, consistent with public expectations for the government to take action on climate change (see Lorenzoni et al., 2007). It can also help address the "free-rider" effect; if everyone is playing by the same rules, they will be more willing to see their action as part of a concerted effort to address climate change. In addition, it can reduce the attitude-behavior gap in that people have to change their behavior no matter what they think and help overcome intractable antienvironmental opinions and social norms (e.g., the individualists and fatalists in Thompson, Ellis, and Wildavsky,'s (1990) cultural theory). Forced behavior change might also have more chance of delivering emissions cuts within the time the science suggests is necessary.

Another justification for introducing regulation to limit carbon emissions from individuals is that it provides an incentive for social innovation in the same way that limits (or threatened limits) to carbon emissions from, say, new vehicles (e.g. SAM & WRI, 2003) have catalyzed the development and commercialization of hybrid vehicles. Social innovation is the process in which people collectively adjust their behavior. While much research already exists on low carbon technological innovation (e.g., hybrid vehicles), there is now increasing attention given to community as the locus for low carbon *social* innovation (Seyfang & Smith, 2005; Smith, 2007). Examples of low carbon social innovation include the development of car clubs where groups of individuals share access to a vehicle, walking buses where groups of school children walk to school together under adult supervision to reduce reliance on cars, and community managed organic vegetable box delivery schemes.

But despite regulation being a seemingly useful way of overcoming barriers to low carbon behavior, governments are generally reticent to take regulatory action. Instead, across the political spectrum in both UK and US governments, there is a great interest in the latest methods to "edit choices" or "nudge" lifestyles in a desired direction through cost-effective economic or informational approaches. Behavioral economists (e.g., Thaler & Sunstein,

2008) and psychologists (e.g., Cialdini, 2006) are therefore consulted on "how governments can influence behavior without huge centralized bureaucracy" (Letwin, cited in Chakrabortty, 2008).

So why doesn't government introduce regulation to force green behavior? A recent study of the UK Labour government under ex-Prime Minister Tony Blair (Carter & Ockwell, 2007) demonstrated that one of the main reasons government is reluctant to regulate is because it fears a negative public backlash (see also Lucas, Brooks, Darnton, & Elster Jones, 2008). The environment is widely viewed as "bad politics" where precious political capital is often wasted on unpopular, vote-losing policies. Respondents to the study who had been in and around the Labour government between 1997 and 2007 regularly cited fuel protests in 2000, where UK truck drivers blockaded fuel depots, effectively bringing the country to a halt and forcing government to remove the "fuel duty escalator" (a fuel tax introduced in 1993, which increased annually ahead of inflation). Sara Eppel, Director of Policy at the Sustainable Development Commission, said "it [the fuel protests] put the fear of God into them and it is used rather too frequently now as a justification for not doing much with transport" (Carter & Ockwell, 2007, p.156). More recently, public outcry over part of the UK government's proposed climate change legislation that allows local councils to charge households for disposal of excessive amounts of domestic waste also nearly forced a government U-turn. The government also backed down over the introduction of road charges after an on-line petition attracted over a million signatures. Both the current Labour and previous Conservative governments have been forced to back down over suggested policy that would increase the amount of value added tax on domestic energy. And in the recent London Mayoral elections, the current incumbent lost his seat amid public disquiet over his proposed policy to differentiate the London Congestion Charge on the basis of vehicles' carbon emissions.

There are, however, precedents where potentially unpopular legislation has been politically neutral or even positive. For example, despite initial public resistance, the London Congestion Charge met with improved public support after it was introduced (Downing & Ballantyne, 2007). It was, however, introduced as a regulation that aimed to reduce congestion (thereby improving business efficiency, attracting visitors, and improving quality of life) rather than as an environmental policy per se (Transport for London, 2002). Another example is the recent smoking ban in the United Kingdom that would, in the very recent past, have resulted in electoral defeat for any government attempting to introduce such a ban. Evidently, public engagement with the smoking issue has increased and attitudes have significantly

changed. A similar point could be made regarding legislation aimed at reducing drunk driving or encouraging the use of seat belts in cars. With all these examples, however, and particularly the smoking example, changes to people's routine behavior have taken decades to achieve. This is time we do not have in relation to climate change.

Another issue contributing to the lack of government action to regulate carbon-emitting behavior is the mismatch between the timescale of environmental issues that is typically in the order of several decades and electoral cycles which are typically only 4 to 7 years (e.g., Hinchliffe, 1996). This has resulted in "mid-termism" where the environment becomes an issue only during the middle of a government's term in office but drops off in favor of "safer" issues such as the economy, health, and education closer to elections (Budge, Klingemann, Volkens, Bara, & Tanenbaum, 2001; Klingemann, Volkens, Bara, Budge, & MacDonald, 2006). This is also reflected in voter attitudes. In the 2005 UK election, for example, the environment was the most important issue for only 2% of voters (Whiteley, Stewart, Sanders, & Clarke, 2005).

As well as the reluctance of government to regulate people's behavior, there are also uncertainties and risks involved in a top-down approach that forces people to be green. For example, people's behavior might revert if the "forcing factor" is removed (Dobson, 2003). Top-down policies like green taxes or regulations only influence action at a superficial level; they do not properly engage the public in the issue at hand. Once the tax or regulation is removed, people might revert to their former (often self-interested) ways of behaving although it can be argued that this is not a concern if regulations are kept in place. There are also areas of our behavior that cannot be regulated. For example, you can't force people to turn off lights, turn the heating down, and so on (although the idea of personal carbon allowances could potentially achieve this). It also confronts difficult issues relating to basic human needs for shelter and warmth and related equity issues such as fuel poverty.

A further risk associated with imposing regulations on the public is expounded in "motivation crowding theory" (e.g., Frey & Jegen, 2000), which states that external intervention (e.g., economic incentives, regulations) may reduce individuals' intrinsic incentives to act (e.g., out of environmental concern) because (a) they identify responsibility for action with others (e.g., government) and (b) the "reciprocity norm" is violated (i.e., people don't assume others will act, so aren't motivated to do so either—as in the free-rider effect). However, according to this theory, you can *encourage* intrinsic motivations to act (e.g., to conserve energy out of environmental

concern) through communication, social interaction, and participation (rather than adopting command-and-control interventions, which only support extrinsic motivations). Frey and Stutzer (2006) state that three factors are required for bolstering crowding-in interventions. The first is an emphasis on personal relationships and recognition of the benefits offered by team- or community-based structures for motivating change. Second, they state the importance of reciprocal communication for learning about and acknowledging responsibilities. Last, Frey and Stutzer stress the importance of participation in decision making stating that the more involved individuals are in the decision-making process, the more likely it is that these individuals will adopt decisions as their own.

These ideas highlight some of the tensions between a top-down approach that forces green behavior and more bottom-up approaches where policy interventions seek instead to encourage and facilitate change. Decisions about top-down versus bottom-up approaches for climate change policy go to the heart of our beliefs about the boundaries of public and private, the limits of state control, and the rational behavior of individuals (Lewis, 2007). At the extreme, this could be characterized as a case of democracy versus benign dictatorship—a concern constantly alluded to in the British press in recent years where regulatory interventions such as charging for rubbish disposal are slighted as the actions of a "nanny state." This is, however, based on a flawed interpretation of democracy. More deliberatively oriented notions of democracy in particular, such as those of theorists like Dryzek (1990, 2000), provide perfectly well for the development of regulation via public deliberation. Here deliberation takes place as a social process within the wider public sphere of civil society and concerns: "the ebb and flow of public debate carried on in the media, in private conversations, in formal and informal settings (Mansbridge, 1999), from pubs to parliaments and back again" (Parkinson, 2004, p.380). Even liberal notions of democracy (which authors such as Dryzek position themselves as distinctly in opposition to) would still view regulatory interventions, based on central decision making, as perfectly valid products of democratic decision making. There is then nothing undemocratic about regulating people's behavior—the main contention for democratic theorists would be the nature and inclusiveness of the deliberative processes that underpin decisions on such regulation. In either extreme of more deliberative or liberal democratic theory, there is no a priori reason that regulations aimed at engaging people in low carbon behavior could not constitute legitimate products of democratic decision making. In the next section, we move on to ask whether, if for the reasons discussed above the government is unlikely to

force people to be green, we can achieve public engagement with climate change via more bottom-up approaches.

Fostering Grass Roots Engagement

Approaches that attempt to foster grassroots engagement with climate change chime more closely with ideas of democratic governance than a forced approach. They are also more likely to engage people in the long term. Commentators such as Andrew Dobson (2003), for example, have argued for education to foster "environmental citizenship," which teaches that environmental rights are conditional on environmental responsibilities. In other words, if we want to use a shared environmental resource like the atmosphere, we have a duty to preserve and protect it so that others can also access it. This implies a profound shift in how society perceives and values the environment and the supporting structures that reinforce this human-nature relationship.

Similarly, Crompton (2008) argued that we should use scant communication resources better—namely, to change values and not to reinforce materialism and self-interest. He argued, "as long as campaigns to encourage us to change our behavior are based on appeals to self-interest or financial incentive [e.g., change a light-bulb to save money], they will be fraught with difficulties." These difficulties include the tendency for people to revert to prior, unsustainable behavior once economic incentives are removed (Dobson, 2003).

Instead, Moser and Dilling (2007) argued for the creation of positive visions surrounding climate change, which link to individual deep desires to live a good or meaningful life. Individuals are not only motivated by pure economics but also by values and attitudes (Dobson, 2003). Crompton (2008) stated that "Environmental organizations can help to embolden business and political leaders to begin to inject public debate with values that move far beyond self-interest and materialism." The values Crompton advocates include personal growth, community involvement, and a sense of connection with nature.

But how might this be achieved in practice? Certainly, there are many examples of participatory approaches that have been very effective in engaging people in reducing their carbon emissions. Global Action Plan, for example, has led initiatives that recruit small groups of people (e.g., mother and baby groups) to take part in a trial over a number of months where they are educated about their energy use and helped to make money-saving changes to reduce it. The rise in the popularity of allotments and "grow your own"

might also be viewed as a successful grassroots emissions-reducing movement. Similarly, voluntary carbon offsetting schemes, Carbon Reduction Action Groups (CRAGs; e.g., Seyfang, Lorenzoni, & Nye, 2007), the UK "Transition Town" movement, car pooling, and plastic bag bans in certain towns due to local campaigning could all be viewed as positive grassroots initiatives. As highlighted above, it has also been suggested that "green niches" such as these are important sites of social innovation where people reorganize themselves socially to the benefit of themselves and the environment—car clubs being a classic example (Seyfang & Smith, 2005). A recent report (NEF, 2007) estimates there are currently between 2,000 and 4,000 community-based groups working on climate change either to raise awareness, stimulate practical action, or provide spaces where people can discuss the challenges posed by climate change. The report highlights the potential for these civil society associations to improve citizens' responses to climate change and strengthen civil society.

It is, however, questionable as to how adequate these grassroots changes are for responding to the scale and urgency of the climate challenge. Most of the examples above are relatively limited in scale and we have no idea how long it would take for them to roll out across the whole of society. As argued above, the kind of social innovation that they represent might be more likely to happen, and perhaps happen faster and on a wider scale, if people were faced with flexible regulations that encouraged innovative, imaginative behavioral reactions. This includes personal carbon allowances that forces people to limit their carbon in whatever way they see as appropriate.

Fostering Demand for Climate Change Regulation

A third approach to achieving public engagement with climate change, and one which potentially bridges the divide between top-down and bottom-up approaches, is use of communication to foster societal demand for environmental regulation, that is, via lobbying/advocacy. In this way, change comes about via a process where the public engages with the issue and takes voluntary action (bottom-up). But this action also involves demanding the government take (top-down) action by introducing regulations to control high carbon behavior. Maibach et al., (2008, p. 14), for example, point out in their review of the role of communication for fostering climate change action "When government policies are contributing to the problem, however, NGO- and citizen-sponsored campaigns can be used to advocate changes in government policy. The public health literature uses various concepts and terms to describe the capacity of communication and marketing to influence

the attributes of place in this manner. These include policy advocacy, media advocacy, and dissemination of evidence-based practices. Organizations in the private sector have a different set of concepts and terms to describe these activities including business-to-business marketing and lobbying."

An example in the United Kingdom of where communication has aimed to foster societal demand for policy change is the Jubilee "Drop the Debt" campaign, launched in 2001 to lobby for developed countries to cancel third world debt (www.jubileedebtcampaign.org.uk). Similarly, environmental NGOs, such as Friends of the Earth (www.foe.co.uk/campaigns/climate/press_for_change/index.html) focus much of their information campaigning on mobilizing their members to lobby politicians for action on climate change.

A major barrier to this role of communication is the widespread political disengagement amongst the UK public. Hansard's latest Audit of Political Engagement (Hansard, 2008) shows that interest in politics has fallen 3% down to 51%; more than half the UK public claim to know not very much or nothing at all about politics (55%, an increase of 4% since last year); and only around 12% of people are politically active (defined as having done at least 3 of 8 political activities in the last 2-3 years; 48% haven't done any). The survey also highlights the lack of political self-efficacy amongst the UK public: less than one third of people believe that "when people like me get involved in politics, they can really change the way the country is run." This profound political disenfranchisement, distrust, and fatalism amongst the British public have been noted elsewhere (Grove-White 1996; MORI, 2005; Poortinga & Pidgeon, 2003). There has been a decline in electoral participation in recent decades, and while there has also been a rise in nonelectoral forms of social participation and protest, this has largely been the preserve of highly educated groups who also vote (Curtice & Seyd, 2003). In many countries, such as the United Kingdom, there is an increasing tendency for the public to question those in authority (House of Lords Select Committee on Science and Technology, 2000) and to feel their opinions are irrelevant to policy-makers (Macnaghten & Jacobs, 1997).

When it comes to climate change, the same picture of disenfranchisement and lack of self-efficacy emerges. Although most people in Britain say they "would be prepared to change the way they live in order to lessen the possible impact of global warming," little over half the population (54%) believe that changing their own behavior would not have any impact on climate change (BBC, 2004). Further, a minority believes the government shares their own views on the issue or listens to public concerns (Poortinga & Pidgeon, 2003). Although public and community involvement in decision making

about climate change is something the public has explicitly stated should happen, when asked whether they would personally like to be consulted in policy-making decisions about climate change, agreement is much lower (Poortinga & Pidgeon, 2003). This suggests apathy and disengagement from political processes has become customary for many people, who perhaps are skeptical about the utility of contributing to political debates.

There is also a prevalent view that the British government is doing little to protect the environment (DETR, 1997) and a lack of awareness of climate change policies and information in the United Kingdom (Norton & Leaman, 2004). In terms of public information, few people (8%) feel the government provides the public with all relevant information about climate change (Norton & Leaman, 2004) or indeed about environmental issues in general (DETR, 1997). Furthermore, half the population feel it is a waste of time trying to tackle global warming in the United Kingdom without international agreement (Norton & Leaman, 2004). The majority also lack confidence in the government to tackle climate change believing it to be unduly influenced by industry in responding to the issue (Poortinga & Pidgeon, 2003). This distrust and perceived governmental inaction in relation to climate change, which is evident across Europe (Querol, Swartling, Kasemir, B., & Tabara, 2003), undoubtedly influences public beliefs about the need and efficacy of individual action. Furthermore, many feel that individual efforts to respond to climate change are wasted because other members of society are not taking action (Hinchliffe, 1996). As Bibbings (2004, p. 103) noted, the public accepts in theory that responsibility for environmental problems should be shared between society, business, industry, and government but perceives that, in practice, "nobody is living up to their side of the bargain."

What Role for Communication?

Thus far, we have explored three alternative approaches to engaging the public in low carbon behavior change. In this final section, we suggest a new emphasis for communication efforts directed toward overcoming the barriers to public engagement with climate change and effecting real reductions in carbon emissions.

Clearly, both forcing people to be green and fostering voluntary grassroots engagement have their limitations. Voluntary action may not work fast enough because of the entrenched social and structural barriers to individuals adopting low carbon lifestyles, while forcing people to be green is politically unpopular, undemocratic, and ultimately unlikely to change values and lifestyles in the long term. Perhaps then, the third approach, stimulating

social demand for regulation, offers the most effective focus for communication efforts. In the process of stimulating such demand, communication efforts might also serve the purpose of facilitating public acceptance of regulation (i.e., make the environment good politics instead of bad) and, simultaneously, stimulate grass-roots action through emotional and rational engagement with climate change and environmental citizenship–the kind of solution that politicians like to call "win-win-win."

This implies communication efforts need to be both politically and psychologically smart. They need to be politically smart insofar as they must be directed toward the most effective means by which to stimulate social demand for climate regulation and insofar as they should be directed toward efforts that will provide the most rapid feedback to politicians that the public is demanding such regulation. This will provide politicians with the sense that using political capital to introduce environmental legislation represents a positive investment and will be rewarded rather than punished by the voting citizenry.

Understanding the nature of politically smart communication initiatives highlights a key role for political scientists in informing these efforts. Information is required, for example, as to how social demand for regulation has, in the past, been generated. It also requires knowledge of what influences politicians' sense of the public mood. Are they, for example, swayed more by media coverage, or by focus groups, or the mood in swing constituencies? Or is direct action the most effective means of demanding policy action? It was certainly very effective in the fuel protests in the United Kingdom in 2000 and, as the analysis above demonstrates, has had a sustained resonance in government. Making the environment a party political issue also seems to have had a high impact in driving the implementation of climate change policy in the United Kingdom. This was evident when the new leader of the UK Conservative party (the main opposition party), David Cameron, began campaigning on the environment, it spurred the government on to introduce its Climate Change Bill (Carter & Ockwell, 2007). What drove Cameron's choice to campaign around the environment? Where did the perception that climate change would be politically popular amongst voters at that point in time come from? These are all questions that need to be carefully analyzed if climate change communication is to get politically smart.

As well as being politically smart, communication efforts need to be psychologically smart. This means conducting and applying state-of-the-art communication, marketing and public engagement research, including segmenting and appealing to specific sectors and audience segments (e.g., Futerra, 2005). Indeed, segmentation is the focus of the UK Department for

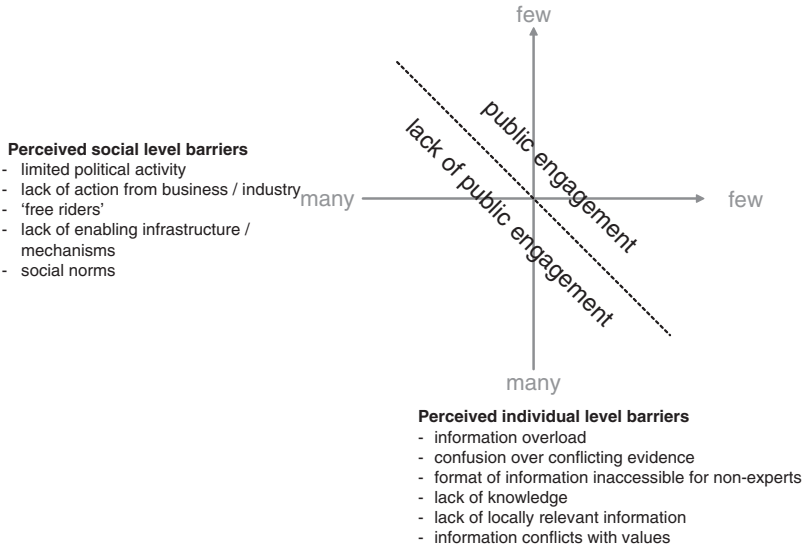
Environment, Food, and Rural Affairs' current strategy to engage the public in more proenvironmental practices (DEFRA, 2008). In terms of mitigation, a constructive way of linking information to personal concerns and interests may be to explicitly link climate change to local environmental issues and personal concerns, emphasizing the additional benefits to reducing emissions, such as saving money, improved air quality, quieter streets, and personal fitness (Betsill, 2001; Whitmarsh, 2008a).

At the same time, communication should aim to achieve meaningful engagement in all three facets: understanding, emotion, and behavior. Existing communication approaches—whilst they may inform—often fail to meaningfully engage, as they do not consider the implicit values, emotions and attitudes of individuals. Rational reasoning is well covered by current communication approaches, which utilize messages linking energy reduction to saving money, for example. While this may be effective, particularly when providing information at the point of energy use or purchase decisions (e.g., via smart meters and eco-labels; see Boardman & Darby, 2000; Burgess & Nye, in press), this approach does not necessarily foster affective engagement with climate change or address prevailing cultural values or social norms such as using cars for transport even when walking or cycling is feasible.

Communication approaches often rely on the outdated psychological "information deficit model." This model assumes that the public are "empty vessels" waiting to be filled with useful information on which they will then rationally act (e.g., Irwin & Wynne, 1996). Yet decision making is often more complex than traditional, linear models assume; it may be influenced by underlying heuristics and by emotions. Instead, what is required is an approach based on a better understanding of how to engage people at an affective, emotional level: for example, through exploration of bottom-up, nonexpert climate perceptions rather than top-down, expert understandings.

Finally, communication must endeavor to overcome the political disenfranchisement evident in many societies. This poses a major challenge to communicators, but—as we have suggested above—may be addressed through more participatory methods of policy making and advocating the concept of environmental citizenship. A sense of political efficacy might also be fostered through political education, emphasizing the importance and value of individual political engagement within society. In effect, this political engagement represents a crucial fourth dimension of public engagement with climate change—in addition to the three described by Lorenzoni et al., (2007)—which is necessary for effective public involvement in efforts to address (and demand broader societal action in response to) climate change.

Figure 1
The Need to Address Both Bottom-Up and Top-Down Barriers to Engagement



Conclusions

It is only via a combination of both top-down and bottom-up approaches that the unprecedented challenge of climate change can be effectively addressed, and as the discussion above highlights, one cannot be achieved without the other. This is illustrated in Figure 1. The horizontal axis represents societal level barriers to decarbonization, which could be overcome with strong, top-down legislation. But this is only achievable and can only be sustained if accompanied with positive measures that aim to overcome barriers amongst individuals by fostering real engagement with climate change. These individual level barriers are represented by the vertical axis in Figure 1. It is only via positive action to address both types of barrier that wide scale behavior change can be achieved.

There is an urgent need to continue developing our understanding of the ways in which people emotionally engage with climate change. More urgently still, this understanding must be developed and applied within

well-targeted, well-funded communication campaigns. We believe there is potential for politically and psychologically smart communication approaches that stimulate demand for climate regulation by building on grassroots engagement and accompanying it with strong legislation to effect rapid low carbon behavior change.

This strong top-down government leadership, together with bottom-up facilitation of public acceptance to regulation, would address many of the barriers to action outlined in Lorenzoni et al., (2007) and expanded upon above. By facilitating public acceptance of regulation, the environment could be made good politics instead of bad: addressing such concerns as the disparity in timescales between climate change and electoral cycles. A stimulation of grassroots engagement, with particular emphasis on public acceptance of—and demand for—regulation could be achieved using communication approaches which utilize emotional, rational, and political routes to engagement with climate change and environmental citizenship.

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