A NEW AGENDA ON CLIMATE CHANGE

FACING UP TO STEALTH DENIAL AND WINDING DOWN ON FOSSIL FUELS

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Action and Research Centre

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Executive summary

'To know and not to act, is not to know.'
Wang Yang-ming (Neo-Confucian philosopher 1472–1529)

This report makes a case for how Britain can take a leading role in addressing the global climate problem, based on a new agenda that faces up to pervasive 'stealth denial' and the need to focus on keeping fossil fuels in the ground. Our data indicates that about two thirds of the population intellectually accept the reality of anthropogenic climate change, but 'deny' some or all of the commensurate feelings, responsibility and agency that are necessary to deal with it.

This human response to climate change is unfolding as a political tragedy because scientific knowledge and economic power are pointing in different directions

It is argued that this stealth denial may be what perpetuates the doublethink of trying to minimise carbon emissions while maximising fossil fuel production, and also what makes us expect far too much of energy efficiency gains in the face of a range of rebound effects that lead the energy to be used elsewhere.

This human response to climate change is unfolding as a political tragedy because scientific knowledge and economic power are pointing in different directions. The knowledge of the reality, causes and implications of human-caused climate change creates a moral imperative to act, but this imperative is diluted at every level by collective action problems that appear to be beyond our existing ability to resolve. This challenge is compounded by collectively mischaracterising the climate problem as an exclusively environmental issue, rather than a broader systemic threat to the global financial system, public health and national security.

This report argues that we should focus less on those who question the scientific consensus as if they were the principle barrier to meaningful action. Those who deny the reality of anthropogenic climate change are not at all helpful, but at least they are consistent. One corollary of facing up to stealth denial is that we should turn more of our attention instead to those who, like the author of this report, fully accept the moral imperative to act, but continue to live as though it were not there.

Part of that challenge is the widespread impression that those who do act, do not by any means always succeed. Most British NGOs walked out of the recent UN climate conference in Warsaw because governments appeared to be placing the interests of the fossil fuel industry ahead of our need to retain a liveable planet.[1] Prior to that, political and public reactions to the fifth Intergovernmental Panel on Climate Change (IPCC) scientific report in the British press were mostly muted and generic, and climate change has been struggling to position itself as a pivotal consideration in national debates about energy pricing and fracking. Moreover, while Britain showed global leadership with the Climate Change Act in 2008, and we like to think we are making progress, current evidence indicates that when we factor in the embodied carbon in the imported products we consume, British emissions are going up, not down.[2]

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When asked, most British[3] people do care about climate change to some extent, but as long as the issue remains *relatively* unimportant in terms of daily concerns, competing political commitments (eg to energy prices and energy security, and to particular forms of economic growth) it will make it very difficult to create the political will necessary to de-carbonise at scale and speed. Ed Miliband's decision to focus on energy prices rather than climate change in spite of his deep understanding and record of commitment to the issue is a salient example.

Many experts working on behaviour change for sustainability believe it doesn't really matter what people think or how they feel about climate change, and we should focus simply on getting people to 'change their behaviour', which typically means using and wasting less energy. This report disagrees, because it is disingenuous to focus on the technical challenge of reducing national emissions while ignoring our political connection with the tenacity of fossil fuel production that drives the global climate problem. At the same time, it is acknowledged that people view the climate challenge from a range of values perspectives. We should not expect everybody to care or act to the same degree or in the same manner. The focus in what follows is on galvanising and informing pervasive but latent interest and concern for climate change, rather than rallying the disinterested.

The heart of the matter is that markets drive fossil fuel production and follow government signals to make energy investment decisions, while governments follow democratic signals to make political decisions. Lack of progress on climate change is caused by this mixture of vested interests, political paralysis and civic ambiguity.[4] While directions of causality on such complex matters are never linear or one-way, what we appear to need most are forms of 'behaviour change' that get (some) *people* to change, in ways that get *governments* to change, in ways that get *markets* to change.

Research process and emphasis

The overwhelming scientific consensus that anthropogenic climate change is real and poses a significant and ongoing threat to the stability of the human habitat is now well established, and is deliberately not repeated in any depth or detail here.[5] The solution to the problem does not lie in repeatedly stating that there is a problem. Indeed this familiar pattern of evidence giving rise to injunctions to act which give rise to resistance to action and a reiteration of the evidence may be part of a what Robert Kegan calls our immunity to change[6] in which we fail to face up to the competing commitments and hidden assumptions that inform our approach to intractable problems. This report attempts to walk the talk of its own message, namely that we need to start taking the climate challenge as a given and focus instead on what prevents us from dealing with it.

Twenty nine questions were devised by the RSA Social Brain Centre in conjunction with *Yougov* and answered online by a nationally representative sample of 2,024 adults, online between 10 and 14 May 2013. The main purpose of the survey was to get a fuller picture of the more subtle forms of climate change denial in the UK and how they relate to prospects for people changing their behaviour to help address the challenge.

Once the argument of the report was established, a range of experts on different dimensions of climate change were invited to an RSA

workshop on November 15 to critically engage with some of the content. Discussions on the day and feedback on presentations informed final revisions to the draft.[7]

Overview of argument

There are four major turns to the argument.

1. Diagnosis: It's about global production, not national emissions

The first and most political point is that we need to recognise that anthropogenic climate change is driven primarily by the economic logic of global fossil fuel extraction and only to a lesser extent by the social practices and infrastructure that shape national emissions.

The 21st century climate crisis has been caused largely by just 90 companies which between them produced almost two thirds of the greenhouse gas emissions of carbon dioxide and methane between 1751 to 2010, roughly half of which were emitted in the last 25 years. The vast majority of these profit-driven companies extract resources from oil, natural gas and coal provinces globally, and process the fuels into products sold throughout the world.[8]

It follows that the greatest behavioural leverage comes from those insights that help people act to prevent fossil fuels from being extracted, while the current behavioural emphasis on energy efficiency gains, though necessary and important will be insufficient unless we keep this core objective firmly in mind.

…what we appear to need most are forms of 'behaviour change' that get (some) people to change, in ways that get governments to change, in ways that get markets to change

2. Opportunity: Climate change is not just for environmentalists

The second challenge, at the level of communications, is that climate change needs reframing. Thus far it has been subsumed by a broader environmentalism, and is often conflated with a more generic concern for green issues and sustainability. Climate change does stem from ecological constraints, but it is driven by the social logic of economic activity and its effects, and has significant implications for public health, immigration, industrial policy, pensions, financial stability and energy security. It would greatly benefit from being understood at this broader and more inclusive level.

The Department of Energy and Climate Change's (DECC) 'Green Deal' policy was a double fault in this respect, because it reinforced the connection with environmentalism and was pitched to the public at the level of costs and financial incentives rather than emissions reduction. This example represents a broader problematic pattern of climate-related interventions reinforcing the idea that people are primarily consumers with financial interests rather than citizens with democratic interests. Climate change represents an opportunity to shift this pattern, but that will only happen if climate change is not viewed as a green issue that is peripheral to everyday concerns, but a social, economic and security issue that is relevant to everybody.

3. Constraints: We're in denial and on the rebound

The third (and mostly psychological) challenge is that we need to face up to stealth denial and rebound effects. The need to reframe and act on the challenge in a way that is relatively political faces two main obstacles that need to be overcome: a radical misunderstanding of the nature and ubiquity

Climate change does stem from ecological constraints, but it is driven by the social logic of economic activity and its effects, and has significant implications for public health, immigration, industrial policy, pensions, financial stability and energy security

of climate change denial as something purely cognitive, and a significant underestimation of rebound effects on emissions reductions made through energy efficiency. These two elements of the issue are rarely placed together, but appear to be closely connected; we place hope in relatively ineffectual actions because we haven't fully faced up to the nature of the problem.

Many of the actions we are currently taking to deal with climate change, including some of those in the Green Deal and Energy Companies Obligation may be unlikely to have any meaningful effect on climate change. There appears to be a very strong case that we radically underestimate 'rebound effects' eg that energy will be used more as it becomes cheaper or that energy not used for one purpose in one place will still be used for another in another place. There is still a sound financial and moral case for avoiding unnecessary waste, especially in the UK which has some of the least energy efficient homes in the world,[9] but as long as energy production is unaffected, the connection between energy efficiency gains and climate progress is a goal still to be achieved rather than something to take for granted.

4. Proposals: Credibly connect people to solutions and solutions to problems

The fourth and most practical point is that we need to more tangibly connect our place in the problem with plausible solutions. This kind of message will connect best with those who already express interest in acting on climate change, but don't do so in practice. Such people represent over a third of the population (36 percent said they would do more to tackle climate change if they knew how) and demographic information suggests they broadly correspond to what values surveys call the 'Pioneers' ie inner-directed people who have ethical concern for bigger-than-self challenges like climate change.[10] People in this kind of value profile represent a large and influential part of the population, and it would be significant progress if those who express interest and concern would show commensurate action.

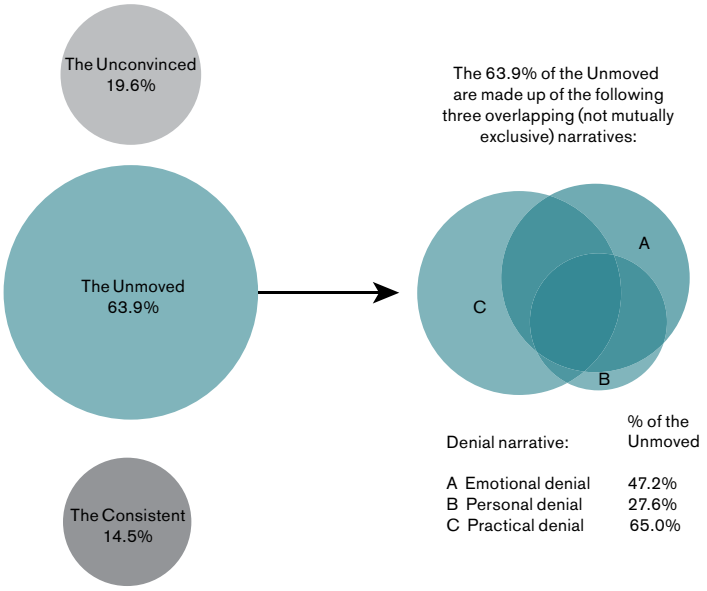
For these people, rather than for the whole population, we need to make the links between personal care and initiative and the global impacts of such action more tangible and credible. In this report, we give eight main suggestions: 1) Build a Climate Alliance with clear shared objectives that is not part of the environmental movement; 2) Consistently refocus the debate away from the existence of the problem towards competing ideas about solutions; 3) Create public platforms for people to speak to each other about climate change for more than a few minutes at a time; 4) Lobby for consumption based emissions reporting; 5) Support and promote divestment in fossil fuels; 6) Campaign for the reduction of fossil fuel subsidies and the dismantling of the European Emissions Trading Scheme; 7) As far as possible, collectively supply and manage your own renewable energy; 8) Build reciprocal international commitment by highlighting that we are not alone in our attempts to lead on climate mitigation.

Survey findings on climate denial

The survey results indicate that while only a fifth of the population are 'unconvinced' about the reality of anthropogenic climate change (19.6 percent) – those often termed 'deniers' or 'sceptics', the majority

of the population (63.9 percent) whose views are generally considered unproblematic are 'unmoved' in the sense that they do not accept the full implications in terms of their feelings, agency and complicity. This group corresponds to those who accept the reality of anthropogenic climate change, but gave answers suggesting they didn't appear to have the commensurate feelings, sense of responsibility or agency that one might expect. Only a small group (14.5 percent) seem to live in ways that are relatively consistent with their understanding of the problem.

Figure 1: Stealth denial



There is still a sound financial and moral case for avoiding unnecessary waste, especially in the UK which has some of the least energy efficient homes in the world

On this framing, the unmoved (sometimes called 'climate ignorers')[11] represents the majority of the population. **The heart of the behavioural challenge is therefore about how to better 'move' parts of the unmoved majority** to take action. Some of the main barriers are captured in the following narratives (over 100 percent because not mutually exclusive) each of which has been cross-validated with other elements in the survey.[12]

People in this group say that: 'I accept the reality of man-made climate change' but do not make the connection with their personal agency and daily lifestyle:

- Emotional Denial (47.2 percent): '*I don't feel uneasy about climate change*'
- Personal Denial (27.6 percent) '*My daily actions are not part of the climate change problem*'
- Practical Denial (65 percent) '*There is nothing I can do personally that will have any significant effect on limiting climate change*'

Other key findings from the survey indicate that many parts of the British public are:

- *Motivated by the idea of Britain taking a leading role internationally*: 39 percent of the population would like the UK to take a leading role in the world in tackling climate change, even if it meant some personal sacrifices, compared to just 27 percent when international leadership is not mentioned.
- *Genuinely unsure what to do*: Over a third of the survey as a whole (36 percent) agree that they would do more to help tackle climate change if they had a better idea of what they could do and how.
- *Accepting the need for behaviour change*: 61 percent either agreed or strongly agreed that even if technology can help in limiting climate change, we need to significantly change our behaviour.
- *Needing to talk*: Only 60 percent of the sample have *ever* spoken about climate change, and of those, 71 percent do so for less than ten minutes; 43 percent for less than 5 minutes. This last point is particularly interesting, because of what we know about conversations being cut short when they become uncomfortable, and because it highlights that there is no meaningful national conversation about climate change.

Taking the rebound effect seriously

One of the Government's main policies to reduce carbon emissions in the UK has been 'The Green Deal'. This policy aims to improve the energy efficiency of buildings in the UK with a range of interventions[13] based on the idea that the cost of changes will always be less than the resulting savings made on energy bills. However, the policy has faced numerous critiques in terms of its design, and the latest figures indicate that of the 71,000 households that received assessments under the scheme, only 384 have signed up for improvements.[14]

Moreover, an all-party parliamentary inquiry described the scheme as 'unattractive and uncompetitive'.[15] While the DECC might be right that we should take a longer view, and that the policy can potentially be improved (for instance with lower interest rates for loans to make the changes, or connecting uptake of the Green Deal to a reduction in Stamp Duty), the main question is whether the Green Deal will help to address climate change by reducing global carbon emissions, and this appears to be unlikely.

Depending on definition and measurement, rebound effects on energy efficiency savings could be anywhere from 10 percent to over 100 percent. If we think rebound effects on efficiency gains are small, it makes sense to focus efforts on behaviour change interventions of the kinds currently being trialled by the DECC and the Government's Behavioural Insights Team where the focus is on saving energy in domestic contexts.[16] However, **this report argues that rebound effects are real and significant,[17] and combine to drive a total, world-wide rebound in energy demand with the potential to erode most of the reductions in energy consumption from efficiency improvements.**

Three functions of behaviour change in the context of climate change

Our report distinguishes between three different applications of behaviour change in the context of climate change:

1. **Behaviour change to reduce energy demand indirectly by improving energy efficiency** (ie typically incentivising or promoting one-off socio-technical behaviours relating to infrastructure to minimise waste).
2. **Behaviour change to reduce energy demand directly by reducing consumption** (ie typically shaping behaviours, norms and goals relating to social practices and perceived economic imperatives: 'buying less stuff').
3. **Behaviour change to substitute our energy supply** (ie building campaign strategies, movements and policies that serve to accelerate the transition from fossil fuel to renewable energy).

The 'super wicked'[18] nature of climate change lies in the fact that, from a global perspective, there are competing commitments that militate against all of these behaviour change goals.

Direct attempts to reduce energy demand significantly is at least somewhat in tension with the perceived political imperative for economic growth, which tends to be fuelled by consumption and the embodied carbon of the products, often imported, that are consumed.

It is possible to make significant gains on energy efficiency that help to reduce waste, but a close consideration of rebound effects makes it highly questionable that these gains will have a significant knock-on effect on reducing global energy demand or substituting energy supply.

The transition to cleaner energy faces significant practical challenges relating to fuel bills and energy security, and major political and economic challenges relating to the current practicality and profitability of fossil fuels

Additionally the transition to cleaner energy faces significant practical challenges relating to fuel bills and energy security, and major political and economic challenges relating to the current practicality and profitability of fossil fuels.[19] Taking climate change seriously means leaving existing fossil fuel reserves in the ground, but companies are currently valued based on economic projections that assume they will be exploited for profit.

Part of the cause of stealth denial may be that we sense such tensions, but don't talk about them openly.

What follows for Britain?

> None of our big national parties is yet serious about climate change. It's not that they don't have policies, even some good ones. But they haven't built a conversation with the country about what climate change means in relation to their values; what it means in the context of our history and our character; what it means for the choices we now face, where we are going, and, ultimately about who we think we are.
>
> **John Ashton FRSA,** Special Representative for Climate Change for the UK Government 2006–2012, speaking at the RSA in May 2013.

Given that the global problem appears 'super-wicked' and the UK's emissions are only between 1.5 percent and 3 percent of the global total

(depending on how they are measured) it is important to face up to the understandable question of whether what happens in the UK really matters at all.

Beyond the compelling ethical point that it is incumbent on every country to do what they can, Britain still wields considerable 'soft power' (indeed a 2012 survey placed a post-Olympics Britain number one in the world for 'soft power')[20] that goes beyond our numerical influence, particularly in relation to Commonwealth countries and the EU. Moreover, if we choose to measure emissions so that imports are included, and take *those* emissions targets seriously, other countries will have greater incentive to decarbonise to remain competitive in export markets. Moreover, we are still a relatively wealthy country with a major financial industry and investments tied up with fossil fuel extraction, which gives added opportunities for global leadership, particularly in relation to investment and divestment decisions.

However, while behaviour change remains a tool that is principally about reducing energy waste, to address energy demand while ignoring energy supply is to misunderstand the systemic and global nature of the problem and fail to play our part in addressing it. We have to connect with the root causes of the climate problem, which is partly about using too much energy to fulfil socially and culturally constructed needs and desires, but is more profoundly about the price of fossil fuels that produce that energy, and political and economic structures that keep us addicted to them.

Introduction

When knowledge diverges from power

> 'Innocently pursuing their research, climate scientists were unwittingly destabilising the political and social order. They could not know that the new facts they were uncovering would threaten the existence of powerful industrialists, compel governments to choose between adhering to science or remaining in power, corrode comfortable expectations about the future, expose hidden resentments of technical and cultural elites and, internationally, shatter the post-colonial growth consensus between North and South. Their research has brought us to one of those rare historical fracture points where knowledge diverges from power.'
>
> **Clive Hamilton**[21]

Clive Hamilton's quotation above is the kind of framing of climate change that divides opinion. For many it is far too dramatic, contentious and political. Can't we 'cut the hysterics', as they say, and just view climate change as one of many environmental problems (ie a technical challenge to minimise risk by reducing carbon emissions) and otherwise go about our business as normal?

Most governments are doing precisely that, working on the assumption that the socio-economic systems that are concomitant with the problem are a given, with the focus being on carbon emissions as one of the unfortunate externalities such systems create. On this framing behaviour change is one of many tools forming part of a gradual transition to a carbon neutral energy system, and it has a relatively limited remit, namely to offer insights into how some curious social and automatic features of our behaviour might help to minimise energy waste and improve energy efficiency.

But for others, framing the challenge in a more explicitly political way is essential because the failure to look more deeply at the democratic, geological and macroeconomic sources of the problem is what prevents the world as a whole from changing behaviour with the requisite speed, scale and skill. On this account, behaviour change is about seeing beyond what might be merely short term tactical gains in energy savings, and extends into thinking about how the behaviour of consumers and citizens serves to perpetuate the economic and political basis of the energy production and consumption that drives climate change.[22]

The arguments that follow stem from the latter – relatively comprehensive – view, but from the outset it is essential to acknowledge the attraction and tenacity of the alternative, more technical account. Part of addressing climate change is facing up to the political complexity of the problem and the enduring disagreement this creates. Climate change

simply is not the kind of neat problem that lends itself to deductive logic flowing from rock solid axioms towards universally accepted policy solutions.[23] Rather, the scientific and cultural complexity of the challenge means that we have to try to make progress in the context of pervasive personal, local, national and international disagreement about the precise nature and extent of the problem, and the viability and acceptability (ecological, ethical, social, economic) of proposed solutions.[24]

President Obama's main contribution to addressing climate change was his decision to frame the issue in distinctly moral terms

… And a moral imperative meets a collective action problem

President Obama's main contribution to addressing climate change was his decision to frame the issue in distinctly moral terms. The climate issue is not merely about the technocratic management of atmospheric risk but about the ethical responsibility to safeguard the welfare of people we care about as well as those we are never likely to meet:

> 'Some day our children and our children's children will look us in eye they and they will ask us, did we do all that we could when we had the chance to deal with this problem and leave them a cleaner, safer and more stable world? I want to be able to say, yes we did … those of us in positions of responsibility will need to be less concerned with the judgment of special interests and well-connected donors, and more concerned with the judgment of our children … The question is not whether we need to act. The question is whether we will have the courage to act before it's too late.'[25]

This moral framing is significant and some believe it is necessary. Professor Andrew Hoffman and Environmental Law campaigner Polly Higgins are among many who compare the kind of step-change in attitude needed to address climate change to that needed to address the slave trade in the 1700s. Although they might seem radically different, arguments against the abolition of slavery were similar to those now used against a radical reduction in fossil fuel use. As Hoffman puts it:

> 'Just as few people saw a moral problem with slavery in the 18th century, few people in the 21st century see a moral problem with the burning of fossil fuels. Will people in 100 years look at us with the same incomprehension we feel towards 18th century defenders of slavery? If we are to address the problem adequately, the answer to that question must be yes.'[26]

The appropriateness of that comparison is still moot, but in light of the moral nature of the challenge, the question of what 'the courage to act' entails is central. While climate change is a *transnational* problem that requires significant levels of cooperation at an *international* level, the nature and extent of that cooperation will depend upon levels of *national* political will. However, while governments, businesses and civil society need to act at scale and with speed, the extent to which they do so depends upon citizens around the world jointly becoming clearer, more emphatic and more reciprocally reinforcing about the *kind* of action they want to see from policymakers and chief executives, while recognising some of the trade-offs such action may entail.

The difficulty is that climate change has been referred to as 'a tragedy of the atmospheric commons' and 'the mother of all collective action problems', which calls into question the hopes that many still hold for binding international agreements on emissions to solve the problem at the highest level (which face significant political obstacles and have so far failed to deliver). Instead of placing our hopes solely in efforts at this level, we need to recognise that climate change is a collective action problem from top (international agreements and global corporations) to bottom (individual consumption patterns and political engagement) and will require a range of collective action solutions. Elinor Ostrom has referred to this need for a range of actions on multiple levels as a 'polycentric' approach to climate change.[27]

To simplify the challenge, environmental researcher Ian Christie highlights three ways to respond to climate change as a collective action problem on a grand scale:

1. Individual resistance to action because of assumptions about others' actions – no-one else is acting or willing to act, so what's the point?
2. Personal commitment to action regardless of others' actions – 'I will act, whether you do or not'.
3. Reciprocal commitment to action conditional on others' actions – 'I will act, if you will act too'.

For the most part, we are currently facing massive resistance, 'all the way up' from individual consumers and citizens to global corporations and governments (eg fear of first mover disadvantage, fear of stranded assets, fear of transitional costs not being recouped). However, emphasising the need to have courage to act is less about advocating personal heroic commitment that we hope to magically spread en masse, and more about those who are already deeply committed building opportunities and platforms for reciprocal commitment to arise and spread.

A related challenge highlighted by Ian Christie is that the institutional forms that support collective agency are in decline, given the marginalisation of unions and churches in particular, but more broadly of institutional forms that contextualise ethical commitment, and connect one's personal story and journey to a shared story and journey. In addition to climate movement-building, we also need networks that work on the principles of common resource management that Elanor Ostrom has identified, for instance those embodied in carbon quota systems, feed-in tariffs, collaborative consumption and so forth (see section three below for more details).

A further implication of framing the problem from a moral perspective and as a collective action problem in need of collective solutions is that climate change begins to look less like a simple technical problem and more like an adaptive challenge (see box below 'Is climate change more like a technical problem or adaptive challenge?').

In this respect, while emissions targets help to galvanise action, they are unproblematic. This is highlighted by Tim Chatterton, an expert on behaviour change in the context of climate change:

'You could argue that in terms of a public narrative about climate change from the government, the legally binding targets of the Climate Change Act are one of the worst things that could have happened. It is now a matter of numbers – of achieving technical targets – rather than a social issue to be talked about and discussed.'[28]

Is climate change more like a technical problem or adaptive challenge?

Harvard Professor Ron Heifetz suggests that most failures of leadership stem from the tendency to treat adaptive challenges as technical problems, and this distinction has particular relevance for climate change. The point is not to frame climate change as being one or the other, because clearly it has elements of both, but 'treating adaptive challenges as technical problems' is precisely what most behaviour change interventions currently do.

Technical problems vs. adaptive challenges

(Table adapted from Heifetz and Laurie, used with permission of Groupsmith.com)

Technical problems	Adaptive Challenges
Easy to identify	Difficult to identify (easy to deny)
Often lend themselves to quick and easy (cut-and-dried) solutions	Require changes in values, beliefs, roles, relationships & approaches to work
Often can be solved by an authority or expert	People with the problem do the work of solving it
Require change in just one or a few places; often contained within organisational boundaries	Require change in numerous places; usually cross organisational boundaries
People are generally receptive to technical solutions	People often resist even acknowledging adaptive challenges
Solutions can often be implemented quickly – even by edict	'Solutions' require experiments and new discoveries; they can take a long time to implement and cannot be implemented by edict

Examples

Technical problems	Adaptive challenges
How much should voluntary carbon offsets be to make taking a flight carbon neutral?	How can we get people to say no to business flights on the ethical grounds that they have a personal carbon budget they don't want to break?
What should the right rate of interest/return be to encourage more people to take up the Green Deal?	How can we get people to take time to write to their MPs to lobby for consumption-based emissions reporting?
What is the best speed to drive at for optimal fuel-efficiency?	How can we get habitual car users to use bikes for short journeys in a way that encourages others to do the same?

Treating an adaptive challenge as a technical problem leads to all sorts of unintended consequences, because the problem is often a small manifestation of the wider challenge, and treating the problem can leave the challenge intact, which means that similar problems will keep coming back. In many ways, a failure to look closely at the rebound effects on efficiency gains can be understood as a broader failure to recognise the importance of this distinction between technical problems and adaptive challenges.

1. British behaviour in a political, economic and technological context

To understand how we should approach climate change as an adaptive challenge, we need a fuller picture of the main dimensions of the problem. This section highlights some of the major economic and financial drivers of climate change to show the strong countervailing forces working against the case for sharp reductions in energy demand. This section also outlines a range of features of human cognition that prevent us from facing up to the problem, or acting on it with conviction. While the need to reduce fossil fuel production remains the priority, it is argued that reducing energy demand helps accelerate a transition to renewable energy by weakening the counter-arguments (relating to high fuel costs and energy security) against such a transition. The role of behaviour change in the context of climate change is unpacked, showing its relevance both to reducing demand and substituting supply.

What 'the carbon bubble' means for consumers and citizens

> 'The value of oil, coal and gas reserves is the single biggest challenge to solving climate change.'
>
> **Mike Berners-Lee and Duncan Clark**[29]

Human behaviour, technological change and the wider systemic influence of money and power are the three active ingredients in any plausible attempt to significantly reduce global carbon emissions, and they are inextricably linked

Human behaviour, technological change and the wider systemic influence of money and power are the three active ingredients in any plausible attempt to significantly reduce global carbon emissions, and they are inextricably linked. If climate change were a game, the overall goal would be to reconfigure these three ingredients in a way that keeps global emissions at a level where we have a good chance of keeping most parts of the planet in a habitable state for humans, for which the current proxy is an average global temperature of 2 degrees Celsius above pre-industrial levels.[30]

Britain may be a relatively small part of the overall problem, but as indicated there is a moral case for leadership. In the UK at least, such leadership arises in the context of democratic capitalism, which means we need to reflect on the kinds of human behaviour that will have a meaningful influence on technological developments and their provenance in political and economic structures. *Zero Carbon Britain 2030* – perhaps

Britain's most thorough attempt so far to consider what climate leadership would look like – makes the point as follows:

> 'We need to fundamentally examine the implications of our dual roles as consumers and citizens in society. In this way, we will achieve more than just limiting the damage currently posed by climate change and fossil fuel depletion. We will also challenge the values, structures and processes that led to this case of overconsumption and resource depletion, and which might otherwise lead to more.'[31]

This extract is noteworthy for its reference to our dual roles as consumers and citizens, because while behaviour change applies to both, it is particularly important with respect to our role as citizens. Recent discourse analysis by the Public Interest Research Centre indicates that the relative frequency with which 'citizen' and 'consumer' are mentioned has changed radically over the last few years and decades. As an indicative measure, usage of the term 'consumer' has risen inexorably over the last half-century in both *The Times* and *The Observer*, whilst reference to 'citizen' has risen more slowly or flatlined.[32]

The fact that we increasingly refer to ourselves as consumers rather than citizens is important for a variety of reasons, but mostly because it is very difficult to address climate change without some significant short-term economic cost or at least risk, and we appear collectively to be in denial about the potential economic implications of meeting our current carbon reduction targets as indicated in Figure 2 on the carbon bubble.

Is the Global Economy resting on 'the carbon bubble'? [33]

To have a reasonable (80 percent) chance of staying within the global 2 degrees Celsius target the world can only afford to emit roughly 565 gigatonnes of carbon dioxide into the atmosphere.

To put that abstract constraint into an economic context, at the same time, (as if it were a parallel world) the value of the world's economy is based on stock portfolios that depend upon 2,795 gigatonnes of carbon from the proven oil, gas and coal reserves that haven't yet been burned.

While these fossil fuels are still physically in the ground, economically they are above ground in the sense that they are reflected in share prices, collateral for company loans and national budget calculations. Those 2,795 gigatonnes of reserves have an estimated market value of 27 trillion US dollars, which means keeping to the 565 gigatonne carbon budget is tantamount to writing about $20 trillion off the value of the global economy, which – to put it mildly – is unlikely to happen.

By way of comparison, the collapse of the sub-prime mortgage market (which triggered the last recession) only wiped out around $700 billion ($0.7 trillion) from the worldwide market. If leaving the necessary 2,130 gigatonnes of carbon in the ground would write off assets worth significantly more than the entire U.S. GDP for 2012, then the economic fallout for the global economy would be devastating.

As Climate Campaigner Bill McKibben puts it in the viral essay that highlighted the validity and significance of these numbers:

'We have five times as much oil and coal and gas on the books as climate scientists think is safe to burn. We'd have to keep 80 percent of those reserves locked away underground to avoid that fate. Before we knew those numbers, our fate had been likely. Now, barring some massive intervention, it seems certain.'

It is a collective action problem requiring us to take collective responsibility for action, and while economic incentives play a role, that sense of collective responsibility is more likely to arise from democratic norms than commercial ones

The importance of juxtaposing citizens and consumers is reflected in the simple fact that when it comes to greenhouse gas emissions, the atmosphere doesn't care *who* is emitting or *when*, *where* or *why* they are doing it. It only cares *what* kinds of gasses are being emitted and *how much* of them are cumulating in the atmosphere over time. It is a collective action problem requiring us to take collective responsibility for action, and while economic incentives play a role, that sense of collective responsibility is more likely to arise from democratic norms than commercial ones.

This applies to thinking about the carbon bubble. As always with climate change, we need to acknowledge that disagreements about probabilities and assumptions are pervasive, but if we are serious about Britain playing a leading role in addressing the challenge, we need to keep this daunting context and the need for 'some massive intervention' firmly in mind. While it might be preferable to reduce carbon in an apolitical way, the scientific assessment indicates that to avoid leaving the world radically diminished, we have no viable option but to openly challenge the interests of some very powerful companies and countries.

Why every position on climate change should now be thought of as 'radical'

The need to place emphasis on citizens rather than consumers is reinforced by Professor Kevin Anderson who argues that the situation is significantly worse than we have been lead to believe. A leading climatologist, he argues that many climate change models include figures that have been massaged in various ways, and are built on questionable assumptions (eg that India and China's economic growth will be largely based on renewable energy) made in order to make the science appear politically and economically acceptable and the two degree targets achievable. In his words: 'Orthodox economics and political cowardice are unduly influencing science.'[34]

There are various major points behind this contention, relating principally to the assumptions in climate modelling, but the take-home point for human behaviour is as follows:

'Today, in 2013, we face an unavoidably radical future. We either continue with rising emissions and reap the radical repercussions of severe climate change, or we acknowledge that we have a choice and pursue radical emission reductions: *No longer is there a non-radical option* (emphasis added). Moreover, low-carbon supply technologies cannot deliver the necessary rate of emission reductions – they need to be complemented with rapid, deep and early reductions in energy consumption.'

Not all climatologists agree with Anderson's judgment about risk, but he is by no means alone. '*The current state of affairs is unacceptable … energy-related CO_2 emissions are at historic highs*'[35] and emission trends are '*perfectly in line with a temperature increase of 6 degrees Celsius, which would have devastating consequences for the planet*'[36] In a similar vein p*w*c (PricewaterhouseCoopers),[37] the UK Government chief scientist[38] and a growing body of academics and researchers are connecting current emission trends with 4 degrees Celsius to 6 degrees Celsius futures.

The broader point applies to more modest assessments too. Either you *change radically* to stay below the 2 degree Celsius target, or you *deny or ignore radically* in the sense that you become complicit with

4 degrees Celsius is likely to be devastating to the majority of our ecosystems, and beyond our capacity to adapt

incremental changes that seem to lead us inexorably towards a future of 4 degrees Celsius or beyond.

Predictions on such matters are very difficult, but our best guesses suggest that an average of 4 degrees Celsius does not mean merely that the planet is just a bit warmer, causing occasional discomfort. Rather 4 degrees Celsius is likely to mean a planet with 40 percent less maize and rice as the population heads towards 9 billion, and it means it will be about 10 degrees Celsius hotter on our hottest days in central Europe. Four degrees Celsius is likely to be devastating to the majority of our ecosystems, and beyond our capacity to adapt. It is worth emphasising that on our current course, this kind of world could transpire within the lifetime of anyone currently below about 40 (ie by mid-late 21st century).[39]

Aiming for two degrees Celsius should be the minimal target, and if you assume that the countries with the largest emissions have responsibility for reducing them most quickly, according to Kevin Anderson the following judgment applies:

> 'What does 2°C (target) imply for the wealthy parts of the world, the OECD countries? It means a 10 percent reduction in emissions every single year: a 40 percent reduction in the next few years and a 70 percent reduction within the decade … So what do we do? We have to develop a different mind-set – and quickly.'[40]

The counter-argument to this strong claim begins by asking who 'we' represents in this context, given that developed countries no longer create the majority of global emissions. While there is certainly a case for questioning economic priorities, abrupt and significant reductions in demand for energy in the UK and comparable countries would not obviously significantly lower fossil fuel production globally, but would risk social and economic collapse, making the requsite transition harder rather than easier.

Still, the need to take a radical position remains. We do need to urgently shift mindsets and that is not possible without talking about what climate change means for the economy, and vice-versa.

Three economic approaches to ecological risk (and why none of them seem to work)

> 'Questioning growth is deemed to be the act of lunatics, idealists and revolutionaries. But question it we must.'
> **Tim Jackson**

There are innumerable benefits to economic growth, and in the midst of a global debt crisis economic growth is a near-universal political imperative. Conventional wisdom is therefore that we need to find a way to make this growth 'green', principally based on investment in and use of renewable energy and improved energy efficiency infrastructure. The underlying claim is that we should strive to increase economic output, but decouple it from climatic impact.

It is difficult to argue with that goal, but as Tim Jackson emphasises, it is essential to foreground the distinction (very often overlooked)

between 'relative decoupling' and 'absolute decoupling' because only the latter will really help us cut emissions in a way that addresses the challenge of climate change.[41]

It is a mistake to view the relationship between economic output and climatic impact as being independent of economic growth and population growth. When these factors are taken into account, most decoupling is merely relative decoupling. In other words each unit of economic output is less harmful than it was previously – which is good – but as long as there is economic growth and population growth, those ecological gains are relative to previous impact per output, not absolute in terms of overall impact, and thus you are not solving the emissions problem.

It is essential to foreground the distinction (very often overlooked) between 'relative decoupling' and 'absolute decoupling' because only the latter will really help us cut emissions in a way that addresses the challenge of climate change

If the genuine aim is to reduce overall emissions, rather than merely to be seen to be green, the only cuts in emissions that count are absolute cuts. It is conceivable that technological change will help us to achieve absolute decoupling, but at present that is largely a matter of faith. This question is about the structure of the macro economy and the logic of capitalism, so it is well beyond our power to influence directly, but significant reductions in energy demand may entail a broader cultural shift that reframes 'prosperity' as something purely economic, to something with social, relational and experiential dimensions.[42]

At the same time, it is not at all clear that a no-growth or 'steady state' economy is the solution.[43] While it may be true that increased GDP does not always increase wellbeing, not having economic growth causes significant problems, most of which affect the poorest disproportionately. Moreover, it is very hard to say for sure that we cannot achieve absolute decoupling with technological change because we have never really tried.

Following from this context, a forthcoming paper by Ian Christie argues that there are broadly three positions on global ecological risks and the economy:[44]

1. Business as usual growth – we can either disregard climate change and plough on, or hope it won't be that bad and adapt to it.
2. Green growth – a new model of capitalism that uses energy mostly from renewables and is hyper-efficient: the B Corps, Marks and Spencer's Plan A and Unilever's Sustainable Living Plan are examples of this perspective that says you can continue to generate economic growth while respecting planetary boundaries.
3. Post-growth – an economic model that eschews growth and requires a rethinking of economic systems and of means to improve human wellbeing while remaining safely within planetary ecological limits.

Business as usual has incumbent power on its side, makes immediate 'common sense' (we don't feel at risk) but is directly challenged by the scientific consensus on climate change. Green growth has at least a chance of winning more adherents in business and politics, but is still very marginal. Post-growth has ecological and thermodynamic logic on its side, but almost no adherents in business and government. Each view is accurate about the others' weaknesses. The problem for post-growth is

that there is no political and economic narrative of transition that currently makes sense, and while green growth is attractive as a transitional model it still falls foul of the objections about natural limits to growth, and looks completely inadequate if you accept Anderson's analysis about the urgent need for significant emissions cuts.

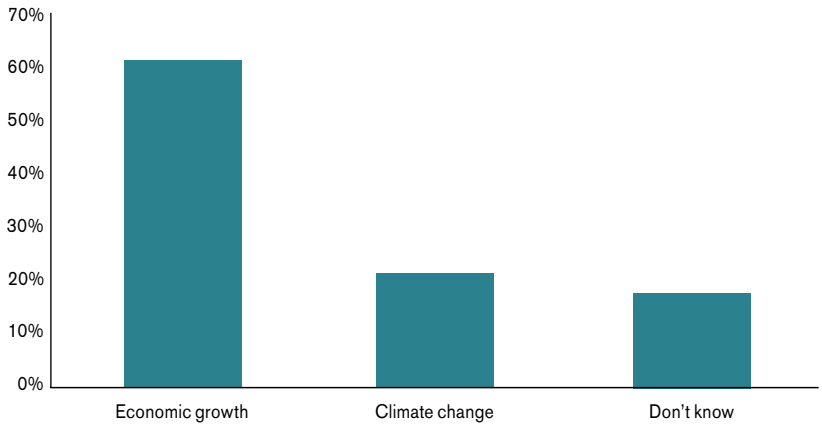
The momentum may currently be behind green growth, but the key question is whether it is really part of a transition to a sustainable (in climatic terms at least) economy with profits being reinvested in greener infrastructure

The momentum may currently be behind green growth, but the key question is whether it is really part of a transition to a sustainable (in climatic terms at least) economy with profits being reinvested in greener infrastructure, or whether it merely reinforces the global energy feedback loop and thereby props up an ecologically destructive system. There is no easy answer, but it terms of motivating swift action, it would appear that most of the British public are fairly clear about where their priorities lie.[45]

Priorities

Figure 2: 'Which one of these statements about the environment and the economy comes closest to your view?'

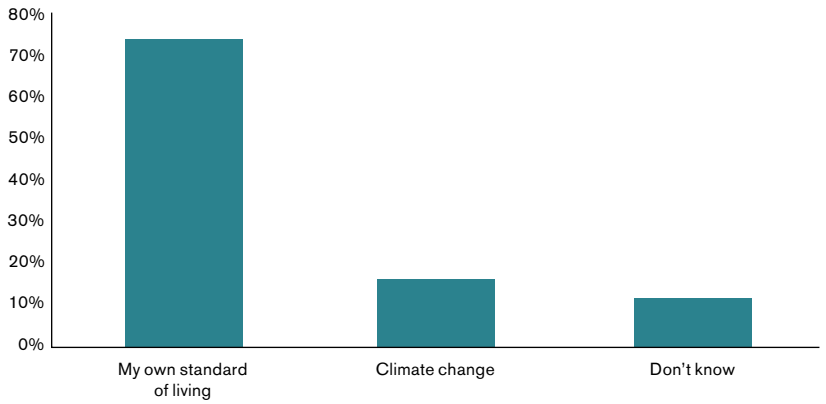
- Helping to solve climate change should be given priority, even if economic growth suffers to some extent
- Economic growth should be given priority, even if helping to solve climate change suffers to some extent
- Don't know



Survey conducted by YouGov 10–14/05/2013, n = 2,024 adults in Great Britain

Figure 3: 'Generally speaking, which of these would you say is more important to you?'

- My own standard of living
- Helping to solve the problems of climate change
- Don't know

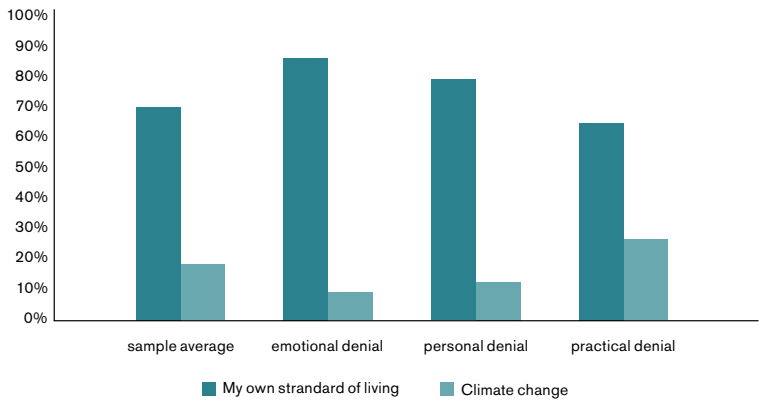


Survey conducted by YouGov 10–14/05/2013, n = 2,024 adults in Great Britain

On the one hand these findings are both emphatic and unsurprising, but on the other hand a sizeable chunk (21 percent) of the population is open to the idea that climate change might be more important than economic growth, although this goes down further when reframed in terms of personal standards of living.

The data is somewhat more revealing when examined in terms of narratives of denial (outlined in the executive summary and unpacked in more detail below) suggesting those who have a stronger emotional response to climate change are more likely to see it as more important than economic growth. Those in practical denial are more interesting still, because most of them have tried to do things themselves but felt they were futile, and are therefore open to more radical ideas relating to the structure of the economy.

Figure 4: Economic growth and climate change: patterns of denial



Survey conducted by YouGov 10–14/05/2013, n = 2,024 adults in Great Britain

Conclusions

Climate change is as much a financial risk as it is an environmental risk. To reduce emissions at a speed that is likely to keep us within the 2 degree target, we may have to question the growth imperative and rethink the structure and purpose of the economy. In light of current public attitudes, that seems politically infeasible, but at the very least we need to stop taking economic decisions as if they were not also decisions about climate change, and stop talking about action on climate change as if it didn't have economic implications.

The challenge, need, remit and depth of the requisite behaviour change

Underpinning the debate in environmental economics are questions about human behaviour. People want lots of stuff and waste lots of stuff, and in the long term, barring a major technological breakthrough, we need to understand how to want less and waste less. To do that, we need a deeper grasp of behaviour and behaviour change. This section also tries to stretch the conventional understanding of behaviour to see how it might connect to the need to substitute the energy supply from fossil fuels to renewables.

The challenge: human nature

> 'Let's start with the fact that climate change is anthropogenic. That means it's caused by human behaviour. If it's caused by human behaviour, then the solution probably also lies in changing human behaviour.'
>
> **Elke Weber, Centre for Research on Environmental Decisions**[46]

Shifting collective human behaviour to address an international challenge from particular cultural, political and economic contexts is different from 'behaviour change' as an apolitical set of tools applied to individual actions

The scale of the climate change challenge places conventional framings of 'behaviour change' in perspective. Elke Weber is right that the solution lies in changing behaviour, but from the previous section it should be clear that shifting collective human behaviour to address an international challenge from particular cultural, political and economic contexts is different from 'behaviour change' as an apolitical set of tools applied to individual actions.

Depending on how flexibly you define the term, virtually all of education and government policy is about some form of behaviour change. What makes behaviour change *feel* new is that it has become something that governments explicitly try to do[47] and has acquired a particular form in the public imagination, strengthened by charming and popular research in behavioural economics[48] and broadly successful initiatives in public policy.[49]

However, as social researcher Simon Christmas puts it: 'The phrase "behaviour change", like all verbs turned into nouns, fudges a critical question: *who* changes *what*? Beyond the philosophical and political question of how behaviour is defined, the capacious term encompasses one-off behaviours that are relatively easy to target like insulating lofts or installing new boilers, but also daily behaviours relating to diet, travel and domestic energy use that are harder to change. Moreover, as was indicated in a think tank report on behaviour change a decade ago, and still true today: 'There is no single template for behaviour-related interventions, nor an agreed formula for success.'[50]

While we need to be mindful of these major obstacles to humans responding to climate change, we cannot view behaviour change as optional

The RSA Social Brain Centre's view on behaviour is unpacked in detail in our report: *Transforming Behaviour Change: beyond Nudge and Neuromania*.[51] Our emphasis is on the social and reflexive nature of behaviour change. By reflexive we mean that the understanding of the underlying principle of some activity gives us more capacity to change it. There are many such principles of behaviour, but the main shift in understanding is to recognise that human behaviour is much less individualistic and conscious, and much more socialised and automatic than we commonly imagine. More broadly, we are embodied and constituted by evolutionary biology, embedded in complex social networks, largely habitual creatures, highly sensitive to social and cultural norms and more rationalising than rational.

This shift in perspective makes various cognitive quirks seem less surprising than they otherwise might be and brings Dan Ariely's famous statement about climate change into perspective: 'If you wanted to invent a problem that people wouldn't care about, you would probably come up with global warming.'[52]

Climate change is far removed from our everyday experience, and this problem is compounded by split incentives, namely that those who are and have been most responsible for causing the problem (the developed world, the rich) are likely to suffer from it least (at least initially). With these points in mind, behavioural economist Oliver Payne gives a particularly elegant account of why it is hard to inspire or motivate action on climate change in the developed world: '… The effects (of climate change) are distant in four dimensions: "not here", "not now", "not me", and "not clear".'[53]

The Psychologist Dan Gilbert has also stipulated four reasons – stemming from evolutionary psychology – why we don't perceive climate change to be a threat: First, there is no 'bad guy', no single enemy (although 'ourselves' and 'fossil fuel companies' are surely contenders). Second, it is not moving, or as Gilbert puts it: the climate crisis doesn't 'violate our moral sensibilities'. Third, it is not immediate enough to be experienced as a significant threat, and fourth, while the scale of the current and potential impact may be huge, it is unfolding too gradually for us to react to the cumulative effect of these gradual changes.[54]

There are lots of further curious features of human cognition that are relevant to why we don't act on information relating to climate change, mostly relating to limitations in attention, memory and information processing, referred to as 'bounded rationality'. These include the fact that we have a *'finite pool of worry'* that makes it difficult to hold climate change in mind while getting on with other life challenges and perhaps most significantly, we heavily *discount* the future relative to the present, so the motivation to act for our future selves or future generations is much less than our desire for pleasure or convenience in the present.

We also have *'single-action bias'* which leads us to be content to do one thing for environmental issues (eg recycle) rather than think more broadly about how our behaviour is implicated in the problem. This point is reflected in our survey; of the section of the population who have taken action on climate change, 50 percent admit to have only ever taken one type of action, and a further 22 percent saying they have taken no more than two.

While we need to be mindful of these major obstacles to humans responding to climate change, we cannot view behaviour change as

optional. Below we outline a range of perspectives on behaviour with different theoretical foundations, including 'Social Practice Theory', working with values and frames, and psycho-social perspectives. Our judgment about the value of these different approaches is not merely academic, and has a direct bearing on the likely success of interventions. However, while behaviour change means many different things, taken as a whole it is necessary for at least four reasons.[55]

The need: Wedge, multiplier, tempo and strategy

1. *The Behavioural Wedge:* The total amount of energy that can be saved from relatively minor behavioural changes is significant in purely quantitative terms. For instance, a peer reviewed research initiative by the Garrison Institute and the National Resources Defence Council found that roughly 15 percent of America's overall emissions could be reduced by simple behavioural changes (although arguably this analysis did not adequately factor in rebound effects).[56]
2. *The Behavioural Multiplier:* The success of new technologies or regulations often depends upon concomitant behavioural changes, partly in terms of use (eg reading smart metres in homes) and partly in terms of minimising rebound effects eg using video conferencing to meet foreign clients, but actually travelling less as a result.[57]
3. *The Behavioural Tempo*: Technological and infrastructure development is slow, while we can change our behaviour relatively quickly, creating a direct impact in the short term so that long term prospects are improved.[58] As the Ministerial foreword to *Behaviour Change and Energy Use* (July 2011) put it: 'Behaviourally based changes that reduce emissions have major advantages. First, the benefits can be very fast, unlike major infrastructure changes that can take years, or even decades – a 1 percent gain today is worth more than a 1 percent gain tomorrow'.
4. *The Behavioural Strategy:* Changing behaviour often results in changing values and attitudes too – helping to overcome denial and minimise rebound effects, while becoming an important part of attempts to influence changes at a systemic or policy level. To give a simple example, if you start cycling to work and find the experience frustrating or dangerous, your motivation to contact a political representative to change the experience for cyclists goes up considerably. At a more subtle level, research in social psychology indicates that those who are primed to change behaviour for environmental reasons rather than other reasons (eg financial) are more likely to subsequently behave in pro-environmental ways.[59]

The following arguments relating to stealth denial and rebounds seek to illustrate why the last of these four reasons is the most important, but first we need a broader idea of the range of behavioural interventions that are particularly relevant to climate change.

The remit: Energy efficiency, demand and supply

The goal of improving energy efficiency is relatively apolitical and described as climate mitigation's 'low hanging fruit' by President Obama, but as indicated in the discussion of the rebound effects below, we cannot take efficiency gains as being the same thing as reductions in energy demand with a meaningful impact on supply.

There is definitely a role for improving insulation, shifting default settings on thermostats and washing machines, and highlighting salient social comparisons on energy bills. However, the challenge to reduce rebound effects is to ensure that the framings of such interventions do not serve to normalise harmful social practices or reinforce values that lead to further carbon-intensive consumption.

Attempting to reduce energy demand more directly by reducing consumption could potentially help for two reasons. First, *if* it had a knock-on effect on global energy supply, it would reduce emissions most directly and powerfully. Secondly, and more subtly, it significantly eases the energy trilemma (see below) because it makes the necessary transition to renewables less of a threat to energy security (because we wouldn't need as much 'baseload' power) and less likely to cause fuel poverty (because people would be using less fuel). *This* is the sense in which energy efficiency may really play a key role in combatting climate change, rather than in terms of direct reductions in emissions.

If reducing energy demand was purely about removing waste, it would be an entirely positive goal, however the issue is more complex because demand for energy is driven by consumption which is driven by the perceived need for continued economic growth

If reducing energy demand was purely about removing waste, it would be an entirely positive goal, however the issue is more complex because demand for energy is driven by consumption which is driven by the perceived need for continued economic growth. There is also a perspective which says that the supply of energy creates the demand for it, or as climate change writer Duncan Clark puts it: 'energy begets energy'.[60] Whatever the directionality in the causal relationship between energy and growth (and that appears to be a major academic dispute) energy demand is driven by perceived 'need', but this sense of need is highly contingent from a historical or cultural perspective. Global perception of energy demand is driven by the social practices (see below) we come to view as normal (eg two hot showers a day, driving short distances, regular flying), features of life relating to contingent norms of cleanliness, comfort and convenience rather than inherent features of human welfare. One of the leading proponents of this perspective, Professor Elizabeth Shove, highlights the centrality of this point:

'The efficiency of one technology or another matters less than the concept of service that each sustains. The real environmental risk is of a sweeping convergence in what people take to be normal ways of life, and a consequent locking in of unsustainable demand for the resources on which these depend.'[61]

Efficiency helps reduce energy demand, but to what extent depends on rebound effects. While reducing demand by reducing consumption would appear to help, we don't have credible models of significant reductions in consumption and the concomitant demand for energy that don't have a negative impact on economic growth, which is currently perceived to be an axiomatic goal by the political class and general population. It follows that we need to think harder about how behaviour change might help to shape a substitution of the energy supply, away from fossil fuels towards renewable energy.

The depth: Practices and values

A big part of the challenge in establishing how to change behaviour is finding the right unit of analysis. Tim Chatterton's excellent overview of behaviour change in the context of reducing carbon for the DECC outlines the evidence base for a variety of approaches. Other recent work includes Elke Weber's review of behaviour change for environmental causes[62] and a range of pieces from the University of Surrey's Sustainable Lifestyles Research Group. A recent experimental trial by the Behavioural Insights Team focused on social norms, defaults and discounting, with some promising but inconclusive results.[63] Part of the challenge is captured in the following statement:

> 'People do not directly use energy, instead we carry out a range of activities or "practices" that lead to the consumption of energy: we make ourselves warm, we cook, do our laundry etc … each activity will require very particular targeting in order to achieve changes in behaviour.'
> **Tim Chatterton**[64]

The point is not just that each behaviour needs 'a very particular targeting', but that each behaviour exists within a broader cultural context of values and attitudes that are hard to measure and influence. Still, this 'social practice' perspective is a powerful way to view energy demand because it taps in to the habitual behaviours – shaped by broader social and economic forces – that drive the global energy feedback loop. Simple behaviours, when viewed as social practices, for instance boiling the kettle ('relaxing with a cup of tea') or taking a shower ('freshening up') no longer look like behaviour as such, and need to be reconsidered in terms of the competencies, materials and images that come together at the moment the individual reproduces the practice. Depending on the degree of fidelity to the underlying social theory, it can be argued that the individual is not the originator of the behaviour at all, but rather the *carrier of the practice* – which will go on after the individual has finished carrying it out.

The point is not so much to change values, as to strengthen those already latent values that are most useful with respect to dealing with climate change

In this sense, the social practice perspective is radical in its view of behaviour because it almost completely by-passes individual psychology, and pays little attention to macroeconomic pressures that drive social practices, relating to consumption in particular.[65] In so far as that can be changed, we may need a better understanding of the relationship between cultural values and social practices. This is very complex terrain, but on the face of it, they are likely to have some reciprocal relationship that has not yet been adequately theorised or measured. For those concerned to change behaviour this matters, because there is widespread agreement in the NGO community that addressing climate change means working with cultural values. The point is not so much to *change* values, as to strengthen those already latent values that are most useful with respect to dealing with climate change, principally pro-environmental or intrinsic values, and weaken those that are harmful and most often reinforced, principally consumerist or extrinsic values.

This approach argues that it may not always be wise to attempt to encourage pro-environmental behaviour with financial incentives, as is currently happening, for instance, with the Green Deal, and indeed that it might be counter-productive:

'Undue emphasis upon economic imperatives serves to reinforce the dominance, in society, of a set of extrinsic goals (focused, for example, on financial benefit). A large body of empirical research demonstrates that these extrinsic goals are antagonistic to the emergence of pro-social and pro-environmental concern.'[66]

It follows from this perspective that strategies which aim to minimise problems of rebound and negative spill over should try to engage those values which underpin systemic social and environmental concern:

> 'While voluntary environmentalism is compatible with a neo-liberal economic outlook and the assumption of consumer sovereignty, this is not true for calls for deeper changes to the socioeconomic system. This partly explains the failure and deficiency of sustainable consumption policy to date. "Sustainable consumption runs counter to dominant tenets of neo-liberal economics and conventional political objectives".'
> **Csutora**[67]

This perspective arises from values and frames or 'common cause', based on an alliance of NGOs, including Friends of the Earth, Greenpeace, Oxfam and WWF, which presents a strong case for the need to view behaviour more deeply as a manifestation of cultural frames and values, and which suggests that challenges like climate change require us to promote intrinsic and 'bigger than self' values. However, while the diagnosis looks credible and well evidenced, it is not clear what follows.

On the one hand it seems values are fluid and respond to stimuli (primes) so it is wrong to think that people will never have intrinsic concern for climate change, but on the other hand it reinforces the perceived hopelessness of the task, because in everyday life people are confronted with stimuli that are more likely to reinforce extrinsic values. Indeed, for every pound of social marketing, several pounds are spent on commercial marketing.[68]

Another major perspective on values, called 'Values Modes' differs quite fundamentally in emphasis from common cause in the sense that it argues the way to reach 'extrinsically motivated groups' is through communication strategies that appeal to self-esteem, self-interest, financial gain and so forth. The point of contention is whether doing so helps to 'satiate' such values and move beyond them to bigger-than-self issues like climate change, or merely reinforces the values that cause the problem in the first place.

Common Cause make a strong case for why appealing to extrinsic motives merely reinforces the mindsets that cause the problem, but leading environmentalist Tony Juniper publicly took the opposing view, suggesting that we have to work within a materialistic frame due to challenges of scale and speed. However, while it might help if he were right, his argument is at odds with a position that takes rebound effects seriously[69] and leading social psychologists working with values appear to strongly support the Common Cause position.[70]

What follows for climate change? Common Cause are probably right in theory, but their position looks idealistic in practice, while Values Modes are almost certainly wrong in theory – at least about consumerist values being satiated rather than reinforced – but their position appears

much more hopeful and therefore attractive to those who think in terms of discrete behaviour changes rather than climate change as a whole.

What follows for reducing energy demand is unclear, but the overarching impression is that significant reductions in the energy currently needed to sustain consumption at scale may be incompatible with a form of capitalism that relies on consumption to deliver growth.

Conclusions

The core tension between continued economic growth and climate change mitigation is a major issue. The balance of evidence seems to indicate that taking climate change seriously at the very least requires us to make this relationship a bigger part of the public discussion. While the morale of the environmental movement depends upon belief in 'green growth', some interpretations of the scientific evidence suggest a need for rapid reductions in energy demand that would almost inevitably have a negative impact on growth. While the connection between this debate and behaviour change is not self-evident, social practice theory and values research provide conceptual resources and practical examples of the behavioural dimensions of this debate, particularly relating to the perceived 'need' for energy and some of the values that lead us to consume.

The British context: How are we doing and what are we doing

Governments have thus far connected with the public largely as consumers, but there is a need for people to act as citizens challenging governments to do more as well. This distinction matters due to the kinds of behaviour change required to bring about changes to the energy supply.

Britain should be doing relatively well. We have lessened our dependence on coal and have a cross-party consensus on the 2008 Climate Change Act, which gave us a robust framework for reducing emissions (80 percent reduction on 2000 levels by 2050). We also have access to abundant sources of renewable energy that we could in principle make more of.

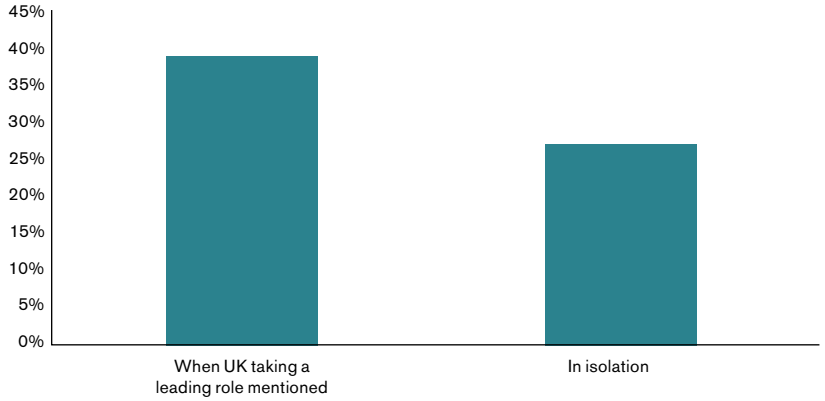
That said, there have been many less encouraging signs in recent months. The uptake on the Green Deal was disappointing, partly because the interest rates were too high, the Department for Environment, Food and Rural Affairs (DEFRA) cut the number of staff working on climate change adaptation from 38 to six, some leading government figures have suggested dismantling the 2008 Climate Change Act, the Green investment bank appears to be unable to borrow or lend, MPs voted against an interim 2030 decarbonisation target in the energy bill,[71] and the public debate over fracking often speaks of environmental harms relating to land and water, but rarely to emissions related to fossil fuel extraction and use.

British political will on climate change is flagging, and not currently fit for purpose. As John Ashton, Special Representative for Climate Change for the UK Government 2006–2012, put it while speaking at the RSA in May 2013:

> 'None of our big national parties is yet serious about climate change. It's not that they don't have policies, even some good ones. But they haven't built a conversation with the country about what climate change means in relation to their values. What it means in the context of our history and our character. What it means for the choices we now face, about where we are going and ultimately about who we think we are.'[72]

Beginning to build this conversation is the point of this report, and our survey suggests people would be more open to personal sacrifices if they felt it was part of national leadership:

Figure 5: Percentage of sample who would prioritise dealing with climate change over own living standards;



Survey conducted by YouGov 10–14/05/2013, n = 2,024 adults in Great Britain

Moreover, many groups *are* working together to think about the problem strategically, perhaps the most notable is the Zero Carbon Britain 2030 project, which has led a large coalition of scientists and social scientists to present an integrated strategy to make Britain carbon neutral within 18 years.[73]

However, this hopeful example is an illustration of the challenge as a whole because it requires, inter-alia, massive changes to the built environment and vehicles, preserving carbon reservoirs by changing patterns of land use and agriculture, an increase in carbon sequestration, a massive uptake of renewable and distributed energy, efficient energy storage and regional carbon markets. Incentivising this range and extent of systemic change is only possible with national and international policy frameworks in place, and these are not currently forthcoming due to a lack of political innovation and political will. *This,* surely, is the most fundamental challenge.

A recent report by the UK Energy Research Council (UKERC) builds on a significant body of qualitative data to show the constraints on building such political will may not be insurmountable. In general, British people don't want to waste things, don't want to harm nature, they want a secure energy system, want some choice in relation to energy supply, want energy to be healthy and for the energy system to be continually getting better. The report states: 'We stipulate that acceptability of any particular aspect of energy system transformation will, in part, be conditional upon how well it fits into this value system.'[74]

However, John Ashton's deeper point speaks to the heart of the kinds of behaviour change we need:

'You can't transform a country by stealth. It requires consent and in a democracy that means an explicit political choice. It requires mobilization and therefore a call to arms. It requires honesty about the burdens, and support for measures to help those whose communities and livelihoods depend on the high carbon economy.'[75]

Britain still exerts soft power in the world that is potentially more important than our direct climatic impact. What we do potentially has a strong persuasive influence on what happens abroad, especially in those countries in the EU and the commonwealth who are also trying to reduce emissions

And yet, being honest about burdens is difficult in the political context of short electoral cycles, especially when those asked to bear burdens may live in marginal constituencies, as indicated by Clark and Berners-Lee:

> 'The combined fear of fuel write offs, economic fallout and modest cultural change has led to a state of political paralysis in many countries. Even those policymakers who in principle want to take serious action on climate change are terrified of the short-term political backlash. There's only one way around this kind of paralysis: public pressure.'[76]

So where is the public pressure?

Six reasons there is inadequate public pressure to act on climate change in the UK

1. The belief that it doesn't really matter what we do in Britain

Given that Britain's emissions are only around 1.5 to 3 percent of the global total (depending on measurements), that Shell are drilling for oil in the Arctic, that 70 percent of India's electricity needs are fuelled by coal,[77] and and that China is planning seventy new airports over the next five years, it is fair to ask whether what Britain does about climate change really matters. Certainly, the British public thinks this question is an important one.

62 percent agreed with the statement: 'Even if people like me in Britain and the West did all we could on climate change, the gains would be wiped out by development in China, India and other countries' and 54 percent agreed that 'Even if I could do more, there is no point unless most people act in the same way around the world.'

However, as indicated, there is also appetite for national leadership: 39 percent of the population would like the UK to take a leading role in the world in tackling climate change, even if it meant some personal sacrifices, compared to just 27 percent when international leadership is not mentioned.

There seem to be four main responses to the core concern. The first is the simple ethical point that it is incumbent on us to do what we can, and hope that others feel a similar and commensurate obligation, but that may sound too worthy to be credible.

The second more subtle point concerns the international co-benefits of Britain reducing carbon emissions. For instance if we were to decide to measure emissions in terms of territorial consumption rather than production, we could also place a cost on the embodied carbon of our imports, and incentivise exporters to reduce the carbon intensity of *their* production.

The third point is that Britain still exerts soft power in the world that is potentially more important than our direct climatic impact.[78] What we do potentially has a strong persuasive influence on what happens abroad, especially in those countries in the EU and the commonwealth who are also trying to reduce emissions. As former climate change diplomat John Ashton put it,

> 'People didn't just notice we had a Climate Change Act with binding carbon budgets. They noticed that it passed with cross-party support. Outside the UK this created the impression that we had managed to build a climate response that transcended day-to-day party politics. That

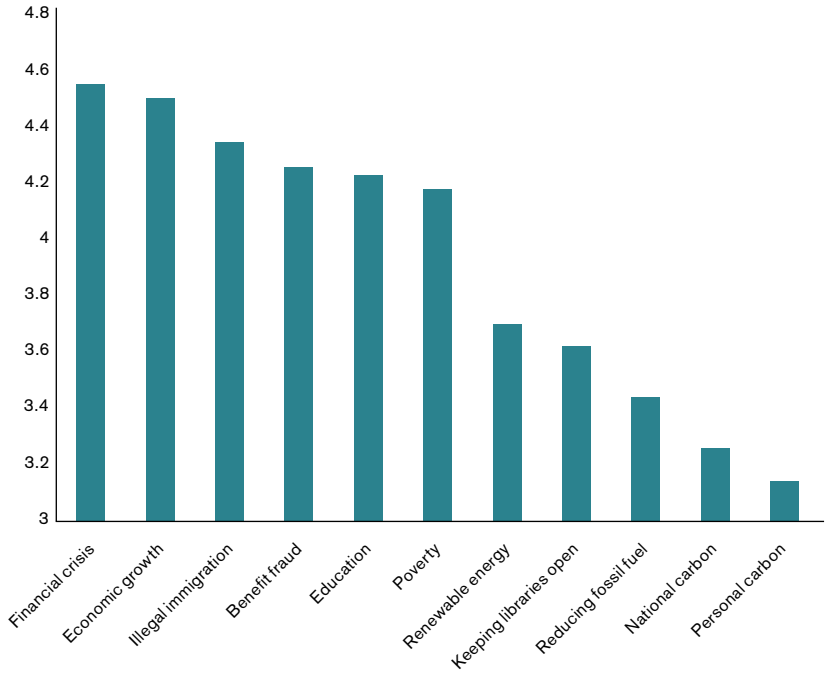
consensus gave a huge boost to British climate diplomacy in which it was my privilege to play a part. It strengthened the hand of those in other countries pressing for higher ambition. It has been one of the main stimuli for climate legislation around the world.'[79]

Finally, and perhaps most significantly, Britain is still a relatively wealthy country with many investments tied up in the extraction of fossil fuels overseas. Signalling serious efforts to decarbonise could potentially have a very significant financial impact on the value of these assets in other countries, making it less likely they will be taken out of the ground. While each of these rationales can be challenged, cumulatively they make a strong inductive rationale for why the motivation to act on climate in the UK is by no means futile.

2. Climate change is still *relatively* unimportant to people in the UK

It is noteworthy that while it is not mentioned by name, policies relating to climate change (renewable energy, reducing fossil fuels, national emissions and personal carbon footprints) are right at the bottom of the list of priorities. It is important to keep this perception of the relative importance of the issue in mind whenever we hear of public attitudes to climate change in absolute terms, which are arguably less important in terms of political or behavioural decisions.

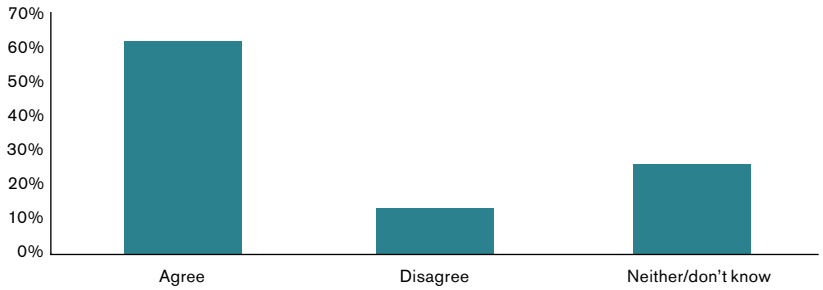
Figure 6: 'On a 1 to 5 scale, where 1 is "should not be a priority at all" and 5 is "should be a very high priority", please rank the following issues in terms of the priority you think the British government should give them.'



Survey conducted by YouGov 10–14/05/2013, n = 2,024 adults in Great Britain.

However, it is also noteworthy that a majority of the population seem to think climate change is likely to lead to significant changes in behaviour regardless of technological breakthroughs, which suggests the issue is being framed as high in importance but low in urgency:

Figure 7: 'Even if technology could help in limiting the Climate Change problem, we will still need to significantly change our behaviour.'



Survey conducted by YouGov 10–14/05/2013, n = 2,024 adults in Great Britain

Taking these two points together, the goal seems to be to connect the perceived need for behaviour change to a credible narrative of global influence, as is attempted here in the final section.

Only 60 percent of the sample have ever spoken about climate change, and of those, 71 percent do so for less than ten minutes; 43 percent for less than 5 minutes. This last point is particularly interesting, because of what we know about conversations being cut short when they become uncomfortable

3. There is no national conversation about climate change

Only 60 percent of the sample have ever spoken about climate change, and of those, 71 percent do so for less than ten minutes; 43 percent for less than 5 minutes. This last point is particularly interesting, because of what we know about conversations being cut short when they become uncomfortable, and because it highlights that there is no meaningful national conversation about climate change. The general impression that climate change has slipped off the political agenda and needs to find a way back to the kind of prominence it had before the economic crash is widespread. For a broader discussion on 'climate silence'among scientists, government and civil society, see the recent briefing paper from the Climate Outreach and Information network: *Climate Silence and how to break it*.[80]

4. The issue is currently too amorphous

> 'Climate change has moved from being predominantly a physical phenomenon to being simultaneously a social phenomenon. And these two phenomena are very different … It is a story about the meeting of Nature and Culture.'
> **Mike Hulme**[81]

The different ways we view climate change as a threat to what we value depends upon our attitude to nature, our respect for scientific authority, our perceptions of probabilities and risk, our felt sense of what is at stake, and our responsibility towards that, eg economic growth, national sovereignty, pension funds, food and water security, species extinction, the lives of people in developing countries, the habitats we identify with,

This shift in perspective is important, because solutions to discrete environmental problems will not work when what you are dealing with is more socio-economic in nature

future generations, and whether and how we can justify making make trade-offs between these things.[82]

In the context of so many dimensions, with the myriad of technical and moral questions they raise, Mike Hulme has suggested: 'Rather than asking "How do we solve climate change?" we need to turn the question around and ask: "How does the idea of climate change alter the way we arrive at and achieve our personal aspirations and our collective social goals?"'[83]

Not everybody is ready for that fundamental shift in perspective, but we need to keep it in mind. The more you consider climate change, particularly the need to mitigate (reduce its potential impact) and adapt (prepare for those impacts) for the indefinite future, the less it looks like a discrete environmental problem like a hole in the ozone layer or acid rain, and the more it looks like a persistent and systemic challenge like poverty or public health – something endemic.

This shift in perspective is important, because solutions to discrete environmental problems will not work when what you are dealing with is more socio-economic in nature. So while there is an urgency to make the problem less acute, we may act more constructively if we don't see climate change so much as 'a problem' in need of 'a solution', but more like a chronic condition that is here to stay, and needs to be managed for the indefinite future.[84]

Another important aspect of framing is that climate change is by no means exclusively an environmental issue and has considerable bearing on, inter-alia, public health,[85] immigration[86] and security.[87] Attempting to disentangle climate change from other environmental issues runs the risk of sounding disloyal, churlish, pedantic or even foolish, but it may be an important part of our attempts to reduce carbon emissions quickly. Unlike many environmental issues, climate change is relatively invisible, completely systemic and extremely urgent. It does start with an ecological problem – which makes other environmental challenges even harder – but it calls for economic and technological strategies that are not reflected in the current structuring of government departments, which is reflected, for instance, in the DECC and the Treasury often being at odds.

Difficult though it may be, attempts to address climate change may not involve any particular reverence for nature, and many issues that are relevant for sustainability more broadly conceived may not be particularly relevant for climate change, most notably overpopulation, which is a major strain on food and water reserves in the developing world, but has much less impact on climate change than obesity in the developed world.

This is a complex and sensitive issue, because many environmentalists are championing the climate change cause, but an overall strategy to motivate action on climate change involves helping people connect with each other and spread motivation through shared interests and values. As a rallying cry, 'the environment' may get in the way of that, because for many it is an abstract notion that does little to galvanise action, and comes with considerable baggage. Consider the following statement by a participant of a carbon rationing action group:

> 'Whereas I have heard of Friends of the Earth, I've heard of Greenpeace, I've heard of some of the other more local groups and […] they have this image, this perception of being a bit hair shirt, lentil munching tree

huggers sort of thing and I don't want to get into that. I mean, I drive a car, I'm an omnivore...'[88]

The characterisation may not be fair, and it is only one statement, but the broader point is shared by many. For instance, as climate analyst David Roberts put it:

'We need some route into climate concern that doesn't involve people having to sign on to the cultural signifiers and pre-existing commitments of the environmental movement.'[89]

Taking the above points together, climate change is hard to define succinctly, may not be a stable construct in the public's mind, may not be connected to energy or fuel in the public's mind, is not really 'a problem to be solved' but more like an enduring part of the policy landscape, and is not really an environmental issue.

Given that it is hard to build political pressure around something so amorphous and unhelpfully associated with a more general environmentalism, there is a prima facie case for a climate alliance that is allied to, but independent of the broader environmental movement, to frame policy goals for people to get behind.

As a rallying cry, 'the environment' may get in the way of that, because for many it is an abstract notion that does little to galvanise action, and comes with considerable baggage

5. It's only one part of the energy trilemma and not viewed as the most important

The UK Energy Minister Michael Fallon recently commented that the most important issues were 'security of supply, affordability, and playing our part in combating climate change. And that for me is the order.' This seemingly innocuous statement is hugely significant because it publicly acknowledges the key trade-offs at the heart of energy policy, and candidly takes a clear position on it. Building public pressure on climate change means making this trilemma more explicit, and making the case for a different order of priorities. *(See box below, The British Energy Trilemma.)*

6. About two-thirds of the British population disavow the problem

The following section covers this point in more depth, but it would appear that the majority of the British population need to shake off the hold of 'stealth denial' to motivate political pressure at any scale. While it makes sense to apply political pressure to a slow burning existential threat to mankind, it makes less sense to apply political pressure on a problem you don't feel enough for, don't feel responsible for, and don't imagine you can do anything about.

Conclusions

There is a strong case for Britain to take international leadership on climate change and good reason to think that such action could make a meaningful contribution to the global problem. There are significant barriers to building the requisite political pressure on Government, and while many are related to challenges of framing the problem more effectively, the biggest is connected to pervasive and subtle forms of denial.

Building public pressure on climate change means making this trilemma more explicit, and making the case for a different order of priorities

The British Energy Trilemma

The three horns of the trilemma in question are climate change, energy security and fuel poverty.

Such 'trilemmas' are every bit as real and pervasive as dilemmas, but they are not as widely discussed because they are significantly more complicated, and debates surrounding them are more difficult to follow.

There is wide political agreement that we *have to* try to reduce the impact of anthropogenic climate change, which means significantly reducing and gradually eliminating fossil fuels from our energy supply, and improving energy efficiency at scale.

However, we also *have to* retain a secure and stable energy supply, which is harder with renewable forms of energy that are generally less reliable than the baseload power offered by fossil fuels ('the sun doesn't always shine, the wind doesn't always blow') and complex if you are simultaneously interfering with the energy market to lower prices. This was the argument (strongly contested) recently used by British parliamentarians to justify extending the life of the country's dirtiest power stations – that it was necessary to 'keep the lights on'.

And we also *need* to keep fuel prices affordable, especially for those facing acute fuel poverty who sometimes literally freeze to death because they can't pay for their heating. Keeping costs low is not easy with a transition to renewables, which is costly in itself, and because renewable energy is currently more expensive. On current form, energy companies will inevitably pass on such costs to consumers.

It is hard to argue with the general validity of each of the three imperatives – energy security, fuel poverty and climate change – but we can question whether they deserve to be treated with equal strength and importance, and challenge some of the assumptions underpinning them. Indeed, how you do so represents the new political fault line on the energy debate.

However, a recent report by UKERC highlights that public attitudes to energy, climate change and fuel bills are not expressed in straightforward ways because the links between these things are not always understood in the same way as they are spoken about by experts: 'Motivations underlying public reasons for wanting change do not align in direct ways with those underpinning policy, though they are closely related; ie climate change is transmuted into a more general concern about environment and sustainability.'[90]

In other words, the energy trilemma is not part of public discourse, and making it so might help to increase the salience of climate change by linking it more directly to everyday concerns. Moreover, the value of trying to reduce energy demand through changing behaviour is that all three aspects of the trilemma become easier to address. However, the continuing validity of the trilemma depends on contentious debates within energy policy.[91]

2. Stealth denial and rebound effects

The following section is about the subtle forms of denial that we have both theoretical and some empirical reasons to suspect are pervasive in the British population. While the survey findings are nationally representative, the results can only be indicative due to the complexity of what is being measured and the fact that this is the first attempt to do so. While we didn't test to prove this point, the impression that about two-thirds of the population are in a form of 'stealth denial' may explain why we struggle to diagnose the climate problem more fully, and persistently over-rate the effectiveness of some of the actions we currently undertake, especially on energy efficiency.

The spectrum of denial

> 'Denial is due to a surplus of culture rather than a deficit of information … To a greater or lesser extent, we are all climate deniers.'
> **Clive Hamilton**[92]

While it makes sense to apply political pressure to a slow burning existential threat to mankind, it makes less sense to apply political pressure on a problem you don't feel enough for, don't feel responsible for, and don't imagine you can do anything about

The late Stanley Cohen described the human capacity to deny as an 'amazing human phenomenon, largely unexplained and often inexplicable.'[93] Cohen was also clear that denial was 'neither a fixed psychological mechanism nor a universal social process'[94] but rather a multi-faceted phenomenon and 'a product of the sheer complexity of our emotional, linguistic, moral and intellectual lives.' The very notion of denial, in which we somehow simultaneously know something and yet choose not to face up to that knowledge – is perplexing when the working assumption is that human beings are unitary, rational and self-consistent. However, denial begins to look normal, even adaptive, when you realise that our sense of self is constructed from a coalition of fragments, that most of what we do is unconscious, that we are motivated to keep feeling good about ourselves, and that we are, in many ways, strangers to ourselves.[95]

> 'Persistent denial is taken to indicate personal pathology (dissociation, disintegration, splitting) and political atrophy (living the lie, cultural amnesia). But it only makes sense to see denial as a problem if we retain the modernist assumption of unity. The postmodern self, by contrast, is fragmented and accepts fragmentation.'
> **Stanley Cohen** [96]

Denial is by no means unique to climate change. We deny all sorts of atrocities all the time. The meat industry is arguably built upon collective denial of animal suffering that happens every day in our name[97] and in Cohen's taxonomy, denial is not merely an individual phenomenon but has multiple dimensions in time and space and is often collective.

Weintrobe introduces three main forms of denial. Simple '*negation*' involves saying that something that manifestly is, is not, usually because accepting the truth is too painful or threatening. '*Denialism*' is more assertive, involving campaigns of misinformation seeking to misdirect people's attention from the truth with means and methods documented in Oreskes and Conway's classic work *Merchants of Doubt*[98] and in modern Britain, propounded by the Global Warming Policy Foundation.

In '*disavowal*', reality is accepted, but its significance is minimised. Disavowal includes aspects of what Cohen calls interpretive denial ie a shift in the meaning of facts, and implicatory denial ie the moral, psychological or political implications of facts are downplayed. Disavowal often requires the special paradox of 'knowing and not knowing at the same time'. This is what Cohen calls 'true denial', and it is argued here that this is the kind of denial that matters most for addressing climate change.

When faced with an uncomfortable concept, disavowal is a quick fix to resolve the discomfort because it frees us from the emotional distress of confronting the problem head on. Sally Weintrobe, speaking at the RSA workshop, explained that disavowal undermines our capacity to care, love, or show concern. Further, without care there is no action, so disavowal hinders our capacity for creative solutions because we just don't care enough.

Not only is disavowal a route to complacency via avoidance of an uncomfortable problem, but also it is a form of protection against feeling worthless.[99] It may be that someone is ready to confront the uneasy feelings of climate change, but finds it too difficult, painful, or frightening to test out their sense of agency by actually trying a few worthwhile actions. For the process of acting but subsequently seeing no evidence that these actions had any meaningful effect, may evoke a reduced sense of agency or self-worth.

George Marshall puts this in context as follows: 'Active denial remains a significant response to climate change science, and this is joined by several forms of interpretive denial against different aspects of the science, such as the scale and speed of its impacts. Other rationalisations for inaction or limited action demonstrate different forms of implicatory denial. These rationalisations help assuage guilt, reinforce victim status, justify resentment or anger towards others, and heighten the costs of shifting away from comfortable lifestyles…'[100]

One thing that is hard to judge is how the outright denial of a small group, who actively pursue 'denialism', influence those with more subtle forms of denial. As Clive Hamilton puts it[101] 'It is not so much the fanaticism of the small minority of active deniers that concerns us, but the vulnerability of the majority to their influence.' Professor Chris Rapley highlights why this approach is so powerful:

> 'The climate-dismissive think tanks and organisations have been effective because they have understood and put into practice the insights of social science. They deliver simple messages that are crafted to agree

with specific value sets and world views. Their flow of commentary is persistent, consistent and backed up with material that provides deeper arguments. Their narrative is spread and amplified by sympathetic sectors of the media and politics that they have nurtured in person. In contrast, the climate-science community delivers messages to policy-makers and the public that are often highly technical and detailed. These tend to be fragmented, emphasise uncertainty and are oblivious to the emotions and associations that they trigger. There remains a widespread reliance on the flawed information-deficit model, in which non-experts are viewed by experts as empty vessels who can simply be filled with the "truth".'[102]

While a simple survey question cannot provide empirical evidence for the impact of denialism on more subtle forms of denial, we tried to explore it as follows:

Q: 99.83 percent of peer reviewed Scientific papers on the subject published between 1991 and 2012 agree that human actions have caused and continue to contribute to climate change. However, a prominent politician recently said:

'Scientists all over this world say that the idea of human-induced climate change is one of the greatest hoaxes perpetrated out of the scientific community. It is a hoax. There is no scientific consensus.'

Which of these describes your response to these remarks? (Please tick all that apply):

1. It makes me feel uncertain as to whether the scientific evidence for climate change can be trusted (21 percent).
2. It makes me angry that a prominent person is denying something that there is strong scientific evidence for (26 percent).
3. It makes me feel less inclined to do anything to help deal with climate change (5 percent).
4. It makes me laugh because what the politician is saying is so ridiculous (20 percent).
5. It makes me concerned that other people might be influenced by what the politician is saying even though it is wrong (29 percent).
6. It makes me want to check the evidence for myself (17 percent).
7. It makes me happy that someone is standing up to climate scientists and telling the truth about the issue (15 percent).

The relatively large agreement with point five is worth reflecting on, because our thoughts on what other people will think have a direct bearing on our own behaviour.[103]

Where the human unconscious meets the national survey

While designing the survey questions, the original intention was to build on a theoretical construct of different forms of denial devised from the literature, but it proved to be almost impossible to match the empirical reference points (multiple choice questions) to the theoretical frame in a way that felt credible. A reference from Cohen illustrates why this kind of attempt to catch the complexity of denial in a theoretical framework was probably doomed from the outset:

> 'Literal denial alone, in the "not knowing" sense, could mean: I didn't even think of that, I hid the truth from myself, I suspected, I partly knew, I knew some of the time, I thought that I didn't know but I must have known … Thankfully, the subterfuges of everyday consciousness undermine any attempt to covert these five dimensions into a neat scheme.' …
> **Cohen** [104]

As indicated in the introduction, this survey's attempt to make sense of complex forms of denial was the first of its kind and a great deal has been learnt about how to do it better next time. Survey questions are a blunt instrument to get at the rich psychology of denial, and there are huge methodological compromises and normative judgements being made in the process of making these claims. The main achievement of this part of the survey was to give empirical reference points for the idea that there are forms of inconsistency of view in the general population that might be considered 'denial', especially because this appears to capture the majority of the population.

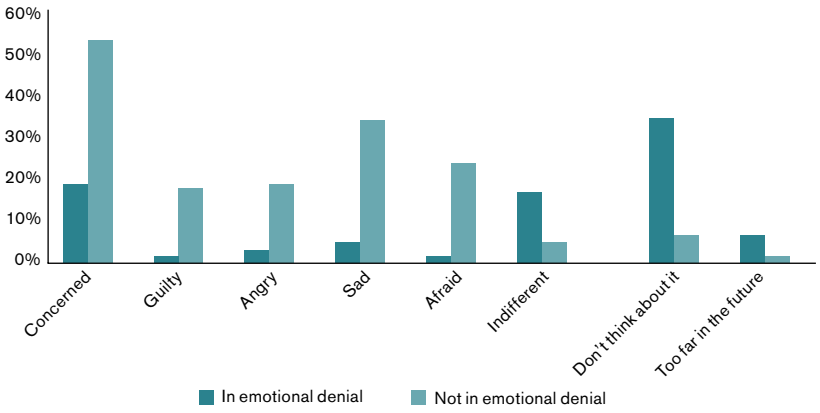
The following 'narratives of denial' (over 100 percent because not mutually exclusive) were cross-validated with other elements in the survey (see Appendix) and appear to be capturing genuine tensions and contradictions that people hold within themselves. These narratives are not mutually exclusive, and the overall figure of 63.9 percent that appear to be in 'stealth denial' are those who have at least one of these narratives. As indicated in the Appendix, there were close connections between emotional and personal denial, while practical denial appeared to mostly capture those who had already tried to act on climate change in some way, but had become disaffected.

People in these groups agree that: 'I accept the reality of man-made climate change' but do not make the connection with their personal agency and daily lifestyle:

- Emotional Denial (47.6 percent): '*I don't feel uneasy about climate change*'
- Personal Denial (27.2 percent) '*My daily actions are not part of the climate change problem*'
- Practical Denial (65 percent) '*There is nothing I can do personally that will have any significant effect on limiting climate change*'

To illustrate how we checked for construct validity (ie that the questions were measuring what we meant them to measure) it is worth looking at emotional denial in a little more depth. The choice of 'uneasy' for emotional denial was related to a desire to capture emotions like guilt and anxiety without making them explicit. This statement's connection to 'emotional denial' is supported by findings from the 'How does Climate change make you feel' item in that emotional denial was positively associated with reporting feelings of: 'Indifferent', 'The problems are far in the future so I don't feel much' and 'I don't think about it enough to feel anything', and negatively associated with reporting feelings of: 'guilty', 'afraid', 'concerned for future generations but not for myself/family', 'angry' and 'sad'.

Figure 8: Emotional denial construct validity



The demographic picture of those in emotional denial showed them to be relatively less well educated (GCSE or lower vs Undergraduate degree or higher), likely to read *The Telegraph*, *The Sun* or the *Daily Mail*, more likely to prioritise the financial crisis, illegal immigration and benefit fraud over other political issues such as poverty, and were most likely to vote Conservative.

Emotional denial seems to be a significant barrier to taking action on climate change. 76 percent of them indicated that they had taken no action because of their feelings about climate change, and they were much less likely to agree with the statement 'I would do more if I had a better idea of what and how'. Those in emotional denial were also likely to believe that 'there is nothing significant people like me can do to help deal with climate change', and to disagree with 'I would do more if I had a better idea of what and how', 'It would make it easier for governments and businesses if they had the support of people like me', 'If everybody did small things it would have a significant impact' and 'I would like the UK to take a leading role in tackling climate change'. For further details, see Appendix.

While the survey itself does not make this case, 'stealth denial' may help to explain why people in these forms of 'denial' are not politically mobilised on climate change, and why policy-makers and businesses who are trying to address the problem may significantly underestimate re-bound effects – which are a large part of the reason that global emissions are going up in spite of significant efforts to bring them down.

Rebound effects: the second inconvenient truth?

> 'Energy efficiency is important to combatting climate change if part of a wide-ranging policy-package. If not, it can in fact directly increase emissions, since the savings made may simply be spent on other carbon-producing activities.'
>
> **Anthony Giddens**[105]

The title of Al Gore's celebrated 2006 documentary film *An Inconvenient Truth*[106] encapsulated public attitudes to climate change at a time when there was still lack of knowledge about the threat of significant climate

change, and doubt that it was being caused by humans. In 2013, it feels like the debate has moved on, and is now principally about competing solutions to a widely accepted problem, but the inconvenient truth of climate change has reappeared in another guise: the rebound effect.

In his major speech about climate change in 2013, President Obama referred to the 'Low hanging fruit' of energy efficiency that he suggested could save 30 percent of energy without any change to lifestyles. But is he right?

In his major speech about climate change in 2013, President Obama referred to the 'Low hanging fruit' of energy efficiency that he suggested could save 30 percent of energy without any change to lifestyles.[107] But is he right?

At first blush, behaviour change is perfectly suited to rush in and 'grab' that low hanging fruit, and indeed, many behaviour change interventions are often directly concerned with using less energy to travel eg fuel efficient driving tips to get from A to B,[108] or meet domestic needs eg turning the thermostat down and insulating one's home. From the moral perspective of minimising unnecessary waste, and the financial perspective of saving money, such efficiency gains are an unalloyed good and should be celebrated. However, from the perspective of tackling climate change, the inconvenient truth is that the situation is far less clear.

Challenging the benefits of efficiency gains can appear churlish, because many people of good will want to do what they can to address climate change, and the appetite for 'low-hanging fruit' is therefore huge. However, when you consider the evidence, the assumption of a linear and direct relationship between improved energy efficiency locally and decreased energy demand globally (which is what matters for climate change) simply does not hold.

The relationship is complex and indirect, because while energy efficiency gains do indeed allow us to use less energy to get the same amount done on particular tasks or in particular places, by making energy more productive we are also therefore inclined to produce more energy, and do more with the energy we have than we otherwise might have done. In this context, relying on simplistic quantitative measures of efficiency gains as our contribution to the global reduction of carbon emissions begins to look like a mixture of optimism, speculation and even delusion.

Rebound effects

The point is not to give up on low hanging fruit, but to understand the complexity of efficiency gains well enough to establish behaviour change that really works, not just tactically and locally, but strategically and globally. In this respect there is a great deal of confusion and debate over the nature of such 'rebound effects' and how important they are, which we highlight here and take an informed guess about, but cannot fully resolve.

To give a recent illustration of the intractable nature of the question, in late January of 2013, the prestigious Scientific Journal *Nature* featured an article: 'The Rebound effect is overplayed', arguing that rebound effects were generally 'less than 10 percent, and unlikely to exceed 60 percent.' The implication was that 'even though increased efficiency may prompt changes in behaviour, energy is still saved overall.'[109] Just a month later there was a response in the same prestigious journal: 'Don't belittle the rebound effect', suggesting the aggregate figure was more like 60 percent[110] and that energy efficiency gains were rarely cost efficient.

Moreover, some believe the figure could well be higher. When you begin to factor in indirect rebound effects relating to the supply of energy in the global economy and the cultural impact of making energy gains a

matter of cost savings and potentially fuelling further energy-intensive spending, the rebound effect could be over 100 percent, which is known as 'backfire'. As one recent thorough study of the issue suggested:

> 'Realisation of the economy-wide rebound makes backfire a non-trivial possibility. Although there is no unequivocal econometric evidence supporting it, the suggestive evidence and sound theoretical arguments make it a topic that deserves more attention.'[111]

The main message here therefore is, even if we can't agree on the magnitude of the problem, let's face up to the rebound effect, and design our behavioural interventions while thinking of how to minimise rebound

Depending on definition and measurement, rebound effects on energy efficiency savings could therefore be anywhere from 10 percent to over 100 percent. Getting further clarity and making our best guess is not a mere academic exercise – we need to make a judgment to inform our action. There appears to be no empirical measure that will resolve the question conclusively, so we have to make a call.

If we think rebound effects on efficiency gains are small, it make sense to promote behaviour change interventions where you can measure efficiency gains and think progress has been made. However, if rebound effects are large, and efficiency gains could even backfire, it may prove that the 'low hanging fruit' is a little further up the tree than we initially thought, and new tools may be required to fetch it.

The challenge here is that in the absence of objective and authoritative scientific judgment, disagreement about the size of the rebound effect looks like a proxy war for deeper ideological conflicts. What Tim Jackson calls 'Ecological modernisers' *want* rebound to be low, because it strengthens a worldview that says technological improvements and efficiency gains can be driven by economic growth.[112] Maybe they are right, but those who are unsure of the costs and benefits of economic growth and look to climate change as a catalyst for wholesale social and economic transformation *want* the rebound effect to be large, because that opens the door to other interventions relating to values and changes in social practices.

An exhaustive analysis of rebound effects would distinguish between direct and indirect effects, the effect on energy use with different kinds of objects (eg fridges, ovens, kettles) and activities (driving, flying, heating, purchasing) and would distinguish between how rebounds compare in each case, and across sectors and countries.[113] Researchers are beginning to do that kind of work, but the level of doubt and equivocation remains very high because the measurement challenges are enormous. While we need to acknowledge measurement difficulties, we can also use our judgment, and what follows indicates why it seems rational to suppose that rebound effects are likely to be very high.

A detailed peer reviewed paper in 2011 covering over 96 published journal articles, one of the largest reviews of the peer-reviewed journal literature, indicated that energy efficiency measures drive a rebound in energy consumption that erodes much and in some cases all of the expected energy savings, and from a conventional economic perspective, this should not be surprising:

> 'Economists have long observed that increasing the productivity of any single factor of production – whether labour, capital, or energy – increases demand for all of those factors. This is one of the basic dynamics of economic growth … today, no economist would posit that an X percent

> improvement in labour productivity would lead directly to an X percent reduction in employment. In fact, the opposite is widely expected: labour productivity is a chief driver of economic growth and thus increases in employment overall. There is no evidence … that energy is any different, as per capita energy consumption everywhere on earth continues to rise, even as economies become more efficient each year.'
>
> **Jesse Jenkins, Ted Nordhaus and Michael Shellenberger**[114]

This finding is supported by a 2007 UK Energy Research Centre (UKERC) study commissioned by the British government which came to a similar conclusion as the Breakthrough Institute's *Energy Emergence* report.

> '"Rebound effects have been neglected by both experts and policymakers – for example, they do not feature in the recent Stern and IPCC reports or in the Government's Energy White Paper," the paper concluded. "This is a mistake. If we do not make sufficient allowance for rebound effects, we will overestimate the contribution that energy efficiency can make to reducing carbon emissions."'[115]

The main message here therefore is, even if we can't agree on the magnitude of the problem, let's face up to the rebound effect, and design our behavioural interventions while thinking of how to minimise rebound. Some of this requires interventions that are not strictly behavioural in nature, which is consistent with the earlier point about behaviour change needing to be embedded in a wider systemic and structural understanding of the climate problem.

The purpose here isto move the debate from whether or not anthropogenic climate change is happening and whether or not we should act, towards the much more constructive terrain of how we should act, and how we might find a constructive place for ourselves in that 'we'

The following table, based on reviews of recent research on rebound, gives an overview of reasons to think that rebound effects are at least significant enough to challenge the idea that the principal emphasis of behaviour change should be on improving energy efficiency, or perhaps that it should be reframed as 'efficiency plus'– gains that are consolidated by attempting to mitigate potential rebound effects.

What does the scale and range of rebound effects mean for attempts to deal with climate change? In the first three cases (cost rebound, saving rebound and psychological rebound) there is a clear place for interventions targeting attitudes and values. As Berners-Lee and Clark put it:

> 'In either situation, the carbon impact will depend on what gets purchased. If the money gets spent on buying a solar panel or enlarging a tropical reforestation project, then the environmental benefits of saving energy will be multiplied. If on the other hand, the savings tip the balance of a decision in favour of taking a weekend flight then the emissions from that trip may be substantially more than the carbon saved in the first place. An individual case could therefore go either way, but *why* the person or company saved the energy probably has a big influence on the nature of substitute spending.'
>
> **The Burning Question**[116]

In cases four and five (supply rebound and socio-technical rebound) it becomes harder, but as far as possible we need to balance the focus on 'end use' energy with an understanding that shifting energy demand

should bring the collateral benefit of becoming more aware of our role in energy supply, for instance in terms of how our pensions may be being used to invest in fossil fuel infrastructure. Supply rebound also indicates why we need to have consumption-based emissions reporting instead of or in addition to production-based emissions reporting.

With respect to rebounds six and seven (cultural rebound and global rebound) the recurring question to ask of any drive towards efficiency is: does it feed the global energy feedback loop? That question, however, may not be easy to answer:

> 'With so many ripples and rebounds at work, trying to quantify the overall global impact of any efficiency gain or local carbon saving is impossible. The effects are too numerous, too complex and too subtle.'
> **Berners-Lee and Clark** [117]

Taxonomy of Rebound effects:

Rebound effect one: 'Cost rebound'
Cheapness boosts consumption. Lower prices for activities requiring energy lead to higher demand for them eg cheap energy efficiency light bulbs lead us to install more lights in our homes and to feel more relaxed about leaving them on.

Ideas for minimising rebound: Personal carbon budgets, or at least greater awareness of carbon footprints.

Rebound two: 'Saving rebound'
Saving leads to spending. Money saved on explicit energy expenditure (ie electricity, gas and fuel bills) is still spent on implicit energy expenditure (eg flights abroad, embodied carbon in food). Even when money saved stays in the bank, it is often invested in energy-intensive activity. For instance, if somebody is highly energy efficient on multiple fronts throughout the whole year, saving, say, £500, in most cases the carbon saved is easily wiped out by a single additional flight.

Ideas for minimising rebound: Money saved from energy efficiency gains can be strategically reinvested in renewable energy infrastructure or social marketing on climate change.

Rebound three: 'Psychological rebound'
Carbon friendly actions drive out or disincentivise other Carbon friendly actions. In environmental behaviour in general, there can be a tendency towards single-action bias, eg since I do lots of good recycling, I've 'done my bit', and also relates closely to moral licensing eg therefore it doesn't matter if I take an extra flight.

Ideas for minimising rebound: Perhaps we need to expand the criteria for 'doing your bit', to make it harder to earn.

Rebound four: 'Supply rebound'
Others absorb the slack. Energy supply may drive demand as much as demand drives supply. If one person/country/region uses less energy, others may therefore use more. When we demand less of something, it becomes less scarce, prices go down until demand goes up again, and this can happen inter-regionally or inter-nationally. Meanwhile energy extraction and combustion continues, leading to continued energy consumption *somewhere*.

Ideas for minimising rebound: We need to acknowledge that energy supply creates demand, and put downward pressure on both at the same time.

Rebound five: 'Socio-technical rebound'
Technology designed to remove the need for activities sometimes indirectly encourages them.

For instance, it is conceivable that video conferencing may increase the total demand for flying since it makes it easier to establish new international contacts you wouldn't otherwise make and whom you therefore want to meet.

Ideas for minimising rebound: Any apparently energy saving technology should ideally be valued for the energy it saves, as well as the convenience it provides.

Rebound six: 'Cultural rebound'
By placing emphasis on the money saved through energy efficiency, we tend to reinforce materialistic values that serve to perpetuate unsustainable levels of consumption.

Ideas for minimising rebound: Efficiency gains should be framed as intrinsically rewarding behaviour where possible, and connected to the wider goal of reducing our ecological debts.

Rebound seven: 'Global rebound'
Energy savings in the rich world are currently cancelled out by increases in the developing world. What we traditionally called the developed world, the US, Canada, Europe, Japan, Australia and New Zealand, now accounts for a minority of global emissions. In this developed world, the total amount of energy used and carbon emitted is falling (though arguably not nearly quickly enough) but the global carbon curve continues on an unflinching exponential path.

Ideas for minimising rebound: Ultimately, a global carbon cap or budget and an agreed price for carbon may be necessary, but in the meantime a switch from production-based reporting to consumption-based reporting would help.

Conclusions

Neither denial nor rebound effects are easy to measure, but both are pervasive and represent complex phenomena well worth understanding as well as possible, because they inform the kinds of meaningful action that we need to take. For those unfamiliar with the climate debate, the emphasis on rebounds might seem misplaced, but since so much effort is currently applied to improve energy efficiency in the name of climate change, we need to be more open about the limitations of efficiency gains.

So what should we do about climate change in the UK?

The final session of the RSA workshop on November 25 was focused on the very general question: 'What should we do about climate change?' Many participants remarked on the difficulty of answering the question at that level of generality, and the fact that it is rarely posed in such a direct unvarnished way. In any case, we are now in a better position to answer it.

What we can contribute in terms of quantitative emissions reductions is much less important than what we can contribute in terms of leadership, social and financial innovation and soft-power

As indicated previously, the very idea that climate change is a discrete problem to be solved is not quite right, because the issue is implicated in every aspect of life, and due to historical and cumulative emissions, it is here to stay. We also need to keep the significance of British action in perspective. If the essence of the global climate challenge is to keep fossil fuel reserves in the ground, since we hold a tiny fraction of global reserves, what we can contribute in terms of quantitative emissions reductions is much less important than what we can contribute in terms of leadership, social and financial innovation and soft-power to keep fossil fuels from being extracted.

What follows are not so much cast iron 'solutions' as suggested steps in the right direction. While each idea follows from the foregoing argument, they are all complex enough to represent a whole report and can only be briefly summarised here. Moreover, there are a range of ideas that are not mentioned at all, including finer details about research and development, the pros and cons of different forms of renewable energy, whether or not we need nuclear power, and strategies for resolving disputes in international negotiations and so forth. The ideas that follow instead keep 'stealth denial' in mind, and seek to shape social, political and economic dimensions of climate action that might help to overcome it.

The purpose here is to move the debate from whether or not anthropogenic climate change is happening and whether or not we should act, towards the much more constructive terrain of *how we should act*, and how we might find a constructive place for ourselves in that 'we'.

The following table offers an overview of ideas, and each idea is unpacked in a little more detail below.

3. Eight ways to overcome climate stealth denial in the UK

Dimension	Objective	Behavioural principles/rationale	Who, where, how?
Institutional	Build a powerful non-partisan climate alliance independent of the environmental movement, with clear campaign objectives.	**Framing, narrative and values:** Climate change is more than an environmental issue; those who understand the urgency and broader significance of the problem need to work together to address it by increasingly their collective influence and bargaining power.	The RSA is exploring the possibility of convening such an alliance with the support of scientists, social scientists, climate activists, third sector organisations, politicians, businesses and policymakers. We plan to begin looking for funding for this process early in 2014.
Media Communication	Assertively and consistently refocus the debate away from the existence of problems towards competing ideas about solutions.	**Social Norms and Messenger effects:** At present, public debates focus around the question: do you believe in climate change? Instead we want them to ask: 'What do you think we should do about climate change?' We need this conversation to be led by people we admire and trust, including celebrities and local leaders.	Media pundits, Journalists and Executives need to use media time and space to debate particular ideas, not to amplify the science and merely call for 'action'. Viewers should give feedback accordingly.

Civic Communication	Get more people talking to each other about climate change for more than a few minutes at a time.	**Social norms, commitment devices, feedback and salience:** Climate change needs to become a topic of conversation in the way 'the economy' or 'schools' or 'the NHS' is at present. To get there, we need leadership from those who are already interested/ motivated and institutional support.	Social Enterprises that work with individuals and businesses to expertly facilitate small group discussions, for instance in public libraries. Create platforms for 'carbon conversations' throughout the country.
National Emissions Measurement	Lobby for consumption-based emissions reporting.	**Feedback/ incentives/salience** Factoring in imports into emissions reporting is an important part of measuring climate progress, and a more meaningful form of feedback to incentivise further progress.	The House of Commons select committee recommendation shows there is already political will for this change, but it needs to be reinforced, for instance by writing or meeting with MPs, or lobbying the ministers at DECC directly.
Financial Influence	Divestment: Reduce demand for shares in fossil fuels. Reduce availability of debt for fossil fuel investment. Redirect investment into renewable technologies.	**Social norms/ defaults** Divestment, at heart, is about stigmatisation. The impact on company balance sheets will initially be minimal, but the impact comes from making fossil fuel investment more socially transparent and less socially acceptable.	Since divestment works at the level of stigma and social norms, it is most effective when it is done at an institutional level. Alumni can sign up to divestment campaigns at universities and employees can ask employers to ensure pension contributions are not invested in fossil fuels as a default.
Macroeconomic policy	Introduce a revenue neutral carbon tax at the point of extraction.	**Salience/feedback/ incentives** Receiving a dividend for a carbon tax makes climate change a salient issue for millions who wouldn't otherwise think of it. The flat fee will offset rises in domestic energy prices and have greater benefit for those using less energy at home, which is a progressive way to promote behaviour change at the level of citizen and consumer.	This suggestion is the most fundamental but also the most complicated to explain. The case for 'fee and dividend' needs to inform policy reviews of political parties and would need provisional interest or support from HM Revenue & Customs and DECC to gain traction.

Social Initiative	Localise energy responsibility through renewable energy feed-in-tariffs and extend Carbon rationing action groups.	**Social norms, feedback, reciprocity, endowment effect, affect** Shared ownership of energy makes it less likely it will be wasted, while normalising the shared reduction in carbon footprints.	Driven by local governments in conjunction with local businesses. eg Newcastle in Austrialia has a ClimateCam® billboard showing hourly updates on electricity consumption in comparison to the City average and the 'Cosy Devon' branding campaign led to triple the number of enquiries that they would usually expect (Tim Chatterton).
International Reinforcement	Use every opportunity to demonstrate reciprocal commitment to climate change.	**Reciprocity, Salience** It is motivating to know that local and national progress is matched internationally, dealing with the claim that we are naïve to act when others are not.	Use social media to demonstrate and learn from success stories from other countries eg The 10:10's online campaign '#itshappening'[118]

1. Institutional: Build a climate change alliance that is independent of the broader environmental movement with clear objectives

One aspect of stealth denial is a lack of identification with the problem, and for many that stems from a lack of identification with environmentalism or green issues more broadly. There are a huge range of climate campaigns and a well-established environmental movement fighting hard on climate change, but there now appears to be a need for a climate movement that is not comprised exclusively or even predominantly of environmentalists.

While climate change is an ecological phenomenon, and makes many existing environmental problems (eg food and water scarcity) worse, it is fundamentally about the energy that permeates every aspect of the socio-economic order we take for granted, and has implications for social policy relating to inequality and immigration, and carries attendant risks not so much to 'the planet', but to our financial stability, our public health and our national security. 'Environmental' doesn't capture the breadth and systemic nature of this challenge. If anything it distracts us from it.

With this broader context in mind, and in light of the mixed successes of the environmental movement on climate change thus far, there appears to be a place for major new voices in the public debate that can attract and sustain the attention of those who see the real and present danger of climate change, but are either ambivalent or antagonised by the broader 'brand' associations of environmentalism.

There are many ways to try to do this, but the RSA may be ideally placed to lead such an alliance due to its non-partisan position, a broad and established concern for sustainability but no history of

environmental*ism* as such, a large membership of 27,000 Fellows, established relationships with academics, public, private and third sectors, prestigious public and online platform and growing independent research capacity.

Such an alliance could begin to reclaim climate challenge as a mainstream issue that is not completely subsumed by an environmental frame, but instead highlights the broader socio-economic dimensions of the climate question. The public platform and Fellowship networks also provide an established infrastructure for the kinds of 'carbon conversations' outlined below as necessary, our established relationships with Whitehall may help gain policy traction and our growing international network will help link initiatives in the UK with the bigger global picture. If support from other organisations and funders could be secured, such an alliance would seek to rally round a range of research and policy initiatives to make the injunction to 'act' on climate change more tangible, and help to build political will accordingly.

2. Media communications: Consistently refocus the debate away from the existence of a problem towards competing ideas about solutions

If stealth denial is caused partly because of, rather than in spite of, an intellectual acceptance of the need to act, we need to make much better use of the limited air time and column inches given to climate change. Two mistakes to be avoided are to waste time amplifying the scientific warnings and to make generic calls for 'action'. Crossing the tipping point from climate change being a scientific fact to an established social fact means beginning to debate solutions to a problem that we need to start tacitly taking as a given.

The Climate Outreach and Information Network have advocated a relatively empirical approach to communication, based on unearthing values and principles of particular groups and using particular forms of language and narratives to connect, and from that connection bridge to discussions on dealing with climate change.[119] The Cultural Cognition group lead by Dan Kahan at Yale Law School takes a similar approach, for instance illustrating that discussing geoengineering as a prospective *solution* to climate change can lead climate sceptics to be more accepting of the *problem* because it is framed as a market-based technical solution that validates a world view that might otherwise be threatened.[120]

However, with respect to both these nuanced contributions, the heart of the matter might be much simpler. Regardless of cultural frames, having a clear culprit (fossil fuels) and a clear sense of purpose (keep them in the ground) might be enough to communicate very powerfully to most people, as indicated by Duncan Clark, co-author of *The Burning Question*:[121]

> 'Somehow talking about the big picture and taking it head on … even though everyone says oh don't say anything too scary because it's off putting, seems to have exactly the opposite effect … it gets people fired up … .Every social movement in history has had an enemy that has been pushed against … In climate change "the enemy is us as bad people" doesn't work … (but) when you have the fossil fuels as the people you are up against, somehow that is much more exciting and engaging.'

3. Civic communications: Get more people talking to each other about climate change for more than a few minutes at a time

> 'I am constantly dropping climate change into conversations with strangers, talking about the weird weather or something similar. I'm always casual about it … but however I say it, the result is almost always the same: the words sink and die in mid-air and the conversation suddenly changes course. This is hard to describe, but anyone who tries it knows exactly what I mean. It is like an invisible force field that you only discover when you barge right into it. Few people ever do, because, without ever having been told, they have somehow learned that this topic is out of bounds.'
> **George Marshall**[122]

Stealth denial is partly caused by not managing to experience feelings commensurate with the climate challenge and also by the absence of social indicators that climate change is a socially acceptable thing to talk about in polite company

Stealth denial is partly caused by not managing to experience feelings commensurate with the climate challenge and also by the absence of social indicators that climate change is a socially acceptable thing to talk about in polite company. While media messages inform what we say to each other too we need to learn to think and talk more productively to each other about the issue as well. Doing so helps us make sense of our existing individual and collective behaviour and how it needs to change. In this respect, Ro Randall, a British psychotherapist and co-founder of the community interest company Carbon Conversations, is clear that changing 'behaviour' alone is not enough:

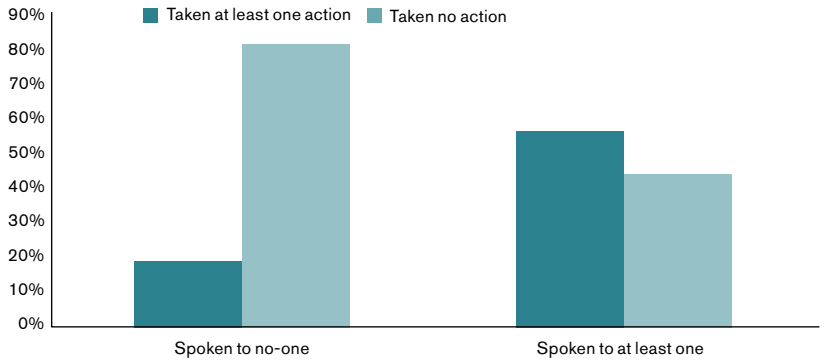
> 'Behaviour is a surface phenomenon. Beneath it lie more complex motivations and meanings and the turmoil of emotion … more imaginative and personal responses are required in working with people to achieve change in their individual and family lives.'[123]

Coming from a similar perspective, Sally Weintrobe suggests we need:

> 'A radical, felt and lived reorientation in our relationships to ourselves, to others, and to nature.'[124]

Both sentiments may be true, but we cannot replicate psychotherapy at a large scale so the challenge is to talk about climate change in a way that normalises the issue, and brings associated feelings to the surface. In this respect, the survey did give some interesting insight into the link (correlational rather than causal) between talking and doing:

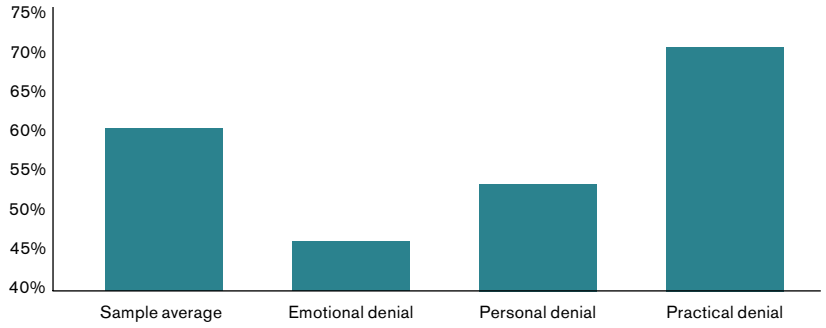
Figure 9: Relationship between talking and acting



Survey conducted by YouGov 10–14/05/2013, n = 2,024 adults in Great Britain

Moreover, it gets even more interesting to see how much people talk by denial type:

Figure 10: Duration of conversations by denial type

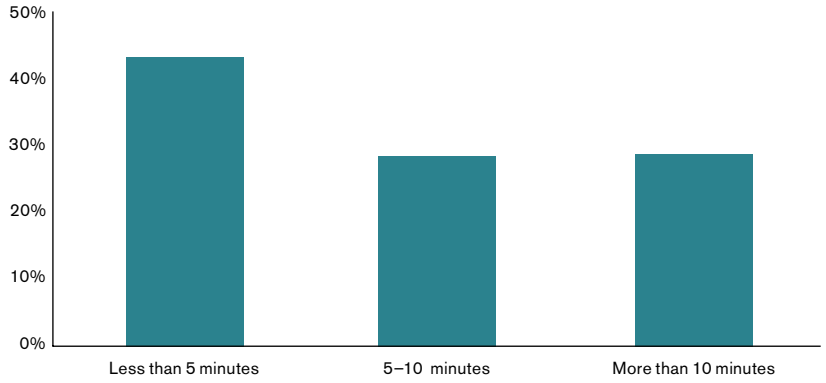


Survey conducted by YouGov 10–14/05/2013 n = 2,024 adults in Great Britain, emotional denial n= xxx N= 609, personal denial n = xxx N= 356, practical denial n = xxx N-839

This suggests that those who don't feel uneasy about climate change and who don't feel they are significantly responsible towards the problem, are much less likely to talk about it, which at least opens the question of whether talking more would change that.

Moreover, the time taken speaking about the issue matters, because the longer you speak about it, the more the really important issues, and our relationship to them, arise. As if to illustrate this, of the people who had spoken to at least one person about climate change, those in emotional denial were less likely than others to have spoken about it for more than five minutes. By contrast, those in practical denial (who have typically *tried* to act in the past) were more likely to have had longer conversations about it.

Figure 11: 'When you have conversations with these people about climate change, how long do you usually spend discussing this issue?'



Survey conducted by YouGov 10–14/05/2013, n = 2,024 adults in Great Britain

Research from Carbon Conversations indicates that those who do invest time to talk about climate change can easily feel overwhelmed by the challenge, but by making responsibility proportionate, and showing that progress is possible it helps people feel like part of the solution rather than part of the problem, creating hope, building political will, and leading to tangible reductions in personal carbon footprints.[125]

Part of the British solution is to find a way to spread versions of the carbon conversations approach at scale and with groups who would not typically engage in such discussions. One suggested way to do this would be to use public libraries for this purpose to increase the social salience of the process, but how to fund such programmes is an open question. Moreover, while it is essential to own up to our feelings about climate change, we also need ideas and actions we can believe in, which helps to make such conversations not merely therapeutic, but cathartic and productive as well.

4. Measurement: We need consumption-based emissions reporting

People like feedback, and part of the tenacity of climate stealth denial may be the impression that even if we were to try to 'act' on climate change, we would not know whether or not we were having any positive effect. This is a valid concern, because measurement problems are formidable, but we do have ways to measure personal footprints that are fairly credible[126] and at the very least we can apply political pressure to ensure that our national measures reflect the national behaviour, including our own.

Indeed, if 'what gets measured, gets done' the problem at the moment is precisely that we are doing the wrong things because we are not accurately measuring our contribution to the climate problem. For instance, between 1990 and 2008, developed countries as a whole cut their emissions by 2 percent, but their total carbon footprint in the same period actually grew by around 7 percent.[127] And the UK was a typical 'culprit' in the sense that we basically outsourced our emissions. The following statement from a House of Commons Report in 2012 is rather damning:[128]

> 'There is a clear divergence between the UK's territorial emissions and its consumption-based emissions. The UK's territorial emissions have been going down, while the UK's consumption-based emissions, overall, have been going up. The rate at which the UK's consumption-based emissions have increased have far offset any emissions savings from the decrease in territorial emissions. This means that the UK is contributing to a net increase in global emissions … If the Government wishes the UK to continue its lead on climate policy it must recognise the growth in the UK's consumption-based emissions.'

Measuring consumption-based emissions is important because it offers an explicit recognition and more visceral understanding that climate change is a global production problem rather than a national emissions problem

The report goes on to make clear that this does not mean abandoning existing measures, but rather to help Britain continue to play a leading international role on climate change.

> 'The Committee is not proposing that consumption-based emissions become the primary driver of policy at DECC. Neither is the Committee suggesting that consumption-based emissions should replace territorial emissions as the basis for negotiations under the United Nations Framework Convention on Climate Change (UNFCCC). However, an acknowledgement that the UK's consumption is driving up emissions in other countries could increase the Government's leverage over those emissions. The UK has to address its consumption if it is to make an effective contribution to a global reduction of greenhouse gas emissions.'

Measuring consumption-based emissions is important because it offers an explicit recognition and more visceral understanding that climate change is a global production problem rather than a national emissions problem. While there are significant measurement challenges, having this fuller picture makes what Clark and Berners-Lee call 'the global energy feedback loop' much more salient, and therefore helps focus attention on the core of the problem.

Those who wish to 'act' on climate change could do worse than lobby their local MP to do whatever they can to help implement the committee's suggestion, and can start at www.writetothem.com

5. Financial influence: Support divestment in fossil fuels

If stealth denial is partly about not feeling that one holds some personal responsibility for the climate problem and partly about not feeling there is anything meaningful one can do to address the problem, the link between pension funds and fossil fuel reserves is invaluable. Pension funds view fossil fuels as good investments, and most people with pensions are inadvertently complicit in perpetuating that association. As Clark and Berners-Lee put it: 'Almost anyone with a financial stake in global society is a part-owner of a fossil fuel reserve.'[129]

President Obama's use of 'divest', a single word tucked inside a long speech on climate change, was described by *The New York Times* as having, for certain young ears, 'the shock value of a rifle shot.'[130] American divestment campaigns on college campuses have become a major part of climate campaigning in the US, and Obama's use of the term represented a kind of endorsement for years of campaigning, led by 350.org's Bill McKibben to get over 300 colleges to stop investing in fossil fuels.

Similar strategies are not as developed in the UK but the Quakers recently took a collective decision to divest in fossil fuels and the student movement, People and Planet, are beginning to make divestment in fossil fuels a bigger part of their work, so divestment is becoming an important part of the repertoire of approaches for tackling climate change. There may also be scope for trade unions to exert great influence on behalf of their employees when company pensions are being invested in fossil fuel stocks.[131] Divestment is a hugely powerful tool in general but for climate change it has the added potency of disrupting the unhelpful disconnect in the public mind between finance and energy. As founder of Avaaz, Jeremy Heimans put it while speaking at the RSA:

Divestment is a hugely powerful tool in general but for climate change it has the added potency of disrupting the unhelpful disconnect in the public mind between finance and energy

'If you think about the power in the world today, pension funds and mutual funds have more power than just about any entities and yet no one … can name more than one or two of those.' Tony Manwaring, chief executive of Tomorrow's Company echoes this sentiment: '(Pensions) are the point at which we connect to the financial system – which is complicated and alien and appears not to meet our needs. Yet they are an odd black hole of economic democracy.'[132]

Divestment is about shedding light on this 'odd black hole of economic democracy'. The point is not to bankrupt the fossil fuel companies, who have very deep pockets and whom we need to keep current economic structures functioning in the short term. The point is to stigmatise their product, using personal agency to shape social norms and influence future market investment decisions so that fossil fuel companies accelerate the transition to other forms of energy. In this respect The University of Oxford's *Stranded Assets* report in 2013 highlights three strategic goals behind divestment: 1) Reduce demand for shares in fossil fuels; 2) Reduce availability of debt for fossil fuel investment; and 3) Redirect investment into renewable technologies and outputs. The report puts the broader point as follows:

> 'The outcome of the *stigmatisation process*, which the fossil fuel divestment campaign has now triggered, poses the most far-reaching threat to fossil fuel companies and the vast energy value chain. Any direct impacts pale in comparison.'[133]

The point is that while we might need fossil fuels in the short term, they are not 'ok', and we need to rapidly move away from them. Britain currently lacks a figure comparable to 350.org's Bill McKibben in the US, but the divestment movement is picking up steam. The target would be for major institutions to divest and make the case public. For instance, if the research universities in The Russell Group ensured their endowment funds divested from fossil fuels that would represent a major public signal: not only is anthropogenic climate change real, but just as important, the extraction of fossil fuels is the main part of the problem.

6. Macroeconomic policy: Stop subsidising fossil fuels, charge a fee for carbon at the point of extraction and distribute the dividend equally to the population

If part of stealth denial, particularly emotional and personal denial, is that climate change feels remote from every day experience and concerns, we need our major climate policies to connect more directly with the

everyday domestic concerns and become a more salient and comprehensible part of the energy debate.

London School of Economics (LSE) Professor Nicholas Stern famously said in 2006 that climate change represented the greatest market failure the world has ever seen, and economists have been working hard to address that. There is a huge and highly complicated literature on carbon pricing, budgeting, capping, taxes, subsidies and trading that we cannot do any justice to here. However, we do need to briefly engage with this material to connect with the core question of overcoming stealth denial to keep fossil fuels in the ground.

The first point is that while there is little clarity on what exactly constitutes a 'subsidy' in the context of energy (eg tax breaks, insurance, infrastructure investment) Parliament's environmental audit committee suggests that the British government appears to subsidise the fossil fuel industry to the tune of up to £12 billion. The way subsidies are currently defined makes it possible for the Government to subsidise shale gas drilling as an immature technology that needs help to compete, while claiming this is not a fossil fuel subsidy. This has to stop, and those who want to 'act' on climate change should lobby for a commitment to clarify the definition and purpose of subsidies in a way that supports the substitution of renewable energy rather than the continued use of fossil fuels in the manifestos of the main political parties.[134]

The more general point is that, in light of the complexities of global free trade, any national proposal on energy economics is only as good as international compliance with it. From the perspective of keeping fossil fuel reserves in the ground, the ideal solution would be a binding international agreement on a stringent global carbon budget with a commensurate globally recognised and stable price for carbon. In such an ideal world, that would make fossil fuel investment and extraction look increasingly risky or unprofitable and/or incentivise the development of Carbon Capture and Storage technologies, while also encouraging the expansion and improved storage of renewable forms of energy.

Divestment is about shedding light on this 'odd black hole of economic democracy' … The point is to stigmatise their product, using personal agency to shape social norms and influence future market investment decisions so that fossil fuel companies accelerate the transition to other forms of energy

But realpolitik gets in the way. Almost half of the global fossil fuel reserves are geographically located in the USA, Russia and China and owned by a small group of fossil fuel companies.[135] Why would those who own the reserves or who have the right to tax the revenue from them agree to binding legislation that would keep them much poorer than they might otherwise be?

Without public pressure, they won't, and perhaps one of the reasons public pressure is not forthcoming is because our current economic policy does nothing to galvanise it. In this respect the current EU Emissions Trading Standards scheme, often called 'cap and trade', is not serving the UK well. In addition to the range of criticisms brought against the scheme, the basic problem is that this particular market-based mechanism doesn't have any meaningful connection to your average consumer, not to mention citizen.

If climate change is viewed as a purely technical problem about reducing emissions, it may be difficult to judge whether we should advocate dismantling an existing system that, for all its flaws, is still the largest carbon market on the planet, and the envy of other parts of the world.[136] However, when climate change is viewed as an adaptive challenge to overcome stealth denial and keep fossil fuels in the ground, it seems essential that we try do so.

The carbon economy debate tends to revolve around cap and trade and various forms of carbon taxes, both of which have limitations: taxes leave no upper limit for emissions and may not prevent production, while trading in the context of limits tends to be gamed in various ways. As James Hansen puts it:

> 'Cap and trade is a hidden tax. An accurate name would be cap-and-tax, because cap and trade increases the cost of energy for the public, as utilities and other industries purchase the right to pollute with one hand, adding it to fuel prices, while with the other hand they take back most of the permit revenues from the government. Costs and profits of the trading infrastructure are also added to the public's energy bill.'
>
> **James Hansen**

'Fee and dividend' (also called 'tax and dividend', 'direct tax', 'direct carbon tax' and 'carbon tax shift' even though it is technically not a tax because the proceeds don't go to Government) is a way around this kind of gaming, and is both much easier to administer (far fewer production points than distribution points) and provides a much more direct connection between individual experience and the global problem, while serving to stigmatise the product (eg at the oil well) rather than the consumer (eg at the petrol station). Hansen describes the contrast as follows:

> 'Fee and dividend, in contrast, is a non-tax. The fee collected at the first sale of oil, gas and coal in the country does increase the price of fossil fuel energy. But 100 percent of the fee is distributed monthly to the public as electronic deposits to the bank account or debit card of all legal residents, with half shares for children, up to two children per family … By the time the fee reaches $115 per ton of carbon dioxide (equivalent to $1 per gallon of gasoline) the dividend will be $2,000–$3,000 per legal resident per year – $6000–$9,000 for a family with two or more children … *People who keep their carbon footprint smaller than average will make money.* The fee will rise gradually so people have a chance to choose more efficient vehicles, insulate their homes, and so on. The dividend will help people afford these investments. Jobs will be created as society retools the economy from high–carbon to low.'

As policies go, fee and dividend has a great deal going for it. The Citizens Climate Lobby in the US supports it for two main reasons: 'First, it's probably the simplest carbon pricing option', 'Second, it's probably the most feasible option to implement, from a practical and political standpoint.' [137]

Moreover, the higher cost of extracting fossil fuels should encourage energy suppliers to make greater use of renewables and encourage consumers to use less energy. British Columbia successfully rolled out a fee and dividend scheme in 2008. Per capita consumption of petroleum fuels in the province fell by 17.4 percent (even as overall fuel production continued to grow, highlighting the insatiable export market) while petroleum fuel use grew by 1.5 percent nationally over the same period.[138]

The idea of fee and dividend is simple to comprehend, practical to implement, progressive and gradual – it is a credible way to support a transition to a lower carbon economy at scale. It appeals to both intrinsic

If climate change is viewed as a purely technical problem about reducing emissions, it may be difficult to judge whether we should advocate dismantling an existing system that, for all its flaws, is still the largest carbon market on the planet, and the envy of other parts of the world

(environmental concern) and extrinsic (financial gain) sets of values and can appeal to both sides of the political spectrum, but it has one very significant weakness, especially for the UK, which is that its simplicity breaks down when you are not dealing with domestic fossil fuel production but with imports.

In that case, you can only disincentivise production of fossil fuels in other countries by charging a fee to the importer, which may compromise energy security if other countries are not doing the same. The relevant 'action' on climate change would therefore be for Britain to play a leading role in Europe in advocating a shift from cap and trade to fee and dividend, while simultaneously trying to produce as much energy as possible domestically.

7. Social initiatives: Collectively supply and manage your own renewable energy

If part of stealth denial, particularly practical denial, is feeling that you can only make a significant difference if others do likewise, collective action solutions of all kinds should be carefully considered. Policies and practices that lead groups to take shared ownership and/or responsibility for renewable energy production and rationed consumption are particularly promising, but require some civic capacity to bring into being.

The most ambitious expression of this ideal comes from Jeremy Rifkind's vision of 'The Third Industrial Revolution', in which 'buildings become power plants', energy is readily stored as hydrogen, and the energy market is redesigned on the model of the internet, with regional energy markets. Achieving this requires political will in the form of the 'lateral power' demonstrated in the spirit of the Arab Spring.[139] It is a bold and inspiring vision, but I share Anthony Giddens's scepticism about it, if only on the grounds that it is not clear that technology drives history in the way Rifkind assumes.[140]

However, many of Rifkind's underlying principles seem right. Not only do we need a transition to renewables, but we need to design the energy infrastructure in a much less centralised, vulnerable and remote way, as suggested by Rebecca Willis and Nick Eyre of Green Alliance:

> 'Only 50 years ago, most households were directly aware of the amount of energy they used from the weight of coal carried into the house. Today it flows in unseen through pipes and wires, and embedded in the multitude of products purchased, most of which are manufactured out of sight from consumers. The pervasive attitude that new energy infrastructure should not be seen may well be one of the reasons behind opposition to renewable energy installations. But a sustainable energy system will not be an invisible system. Reconnection of people with the energy system is a precondition for the low carbon transition.'[141]

Feed-In Tariffs ('FITs') for electricity and the Renewable Heat Incentive for heating is a relatively recent form of clean energy cashback scheme that pays people for creating their own 'green electricity'. The tariffs have been introduced by the Government to help increase the level of renewable energy in the UK towards our legally binding target of 15 percent of total energy from renewables by 2020 (up from under 2 percent in 2009).

On the one hand, by offering cash incentives FITs may appear to reinforce the consumerist frame, but whatever negative impact this may have, the process also reinforces social norms promoting renewable energy and cooperation because they tend to be shared by more than one household or business at a time. There is a strong case for encouraging FITs on the grounds that as Willis and Eyre put it, it 'reconnects people to the energy system.'

While collective provision of energy is part of that reconnection, keeping track of demand is relevant too. While previous governments have considered Personal Carbon allowances (PCAs), our best evidence on voluntary measurement of personal emissions relates to Carbon Rationing Action Groups (CRAGs). Since 2006, the stated aims of Crags have been: 1) To make us all aware of our personal CO_2 footprint; 2) To find out if it can help us make radical cuts in our personal CO_2 emissions; 3) To help inform similar schemes at a national and/or international levels; 4) To build up solidarity between a growing community of carbon conscious people; and 5) To share practical lower-carbon-living knowledge and experience. [142]

When viewing climate change as the challenge to overcome stealth denial and keep fossil fuels in the ground, the following two statements illustrate the value of such approaches:

> 'I saw it initially as a group that was aimed at addressing one's own personal carbon footprint and I thought "well we're doing what we can anyway" but [our son and daughter-in-law] were arguing quite strongly to us that joining a group made it clear that one was part of that and made some sort of political impact …'[143]

> '… a thing I've come to realise increasingly about being in a group and being part of a wider network is that […] it's becoming obvious to other institutions, particularly government, that there are people out there who are not burying their heads in the sand, who are not afraid of the implications, who want government and industry to squarely face the issues instead of constantly dodging.'[144]

If part of stealth denial is the chasm between one's sphere of concern (the climate crisis) and one's sphere of influence (political and economic decisions), it is crucial to know that one is by no means alone in one's attempts to address the problem, either at an individual level or an international level

In this respect 'acting' on climate change means exploring possibilities to bring 'FITs' and 'CRAGS' into your own communities.

8. Build reciprocal commitment through international reinforcement

If part of stealth denial is the chasm between one's sphere of concern (the climate crisis) and one's sphere of influence (political and economic decisions), it is crucial to know that one is by no means alone in one's attempts to address the problem, either at an individual level or an international level. There is positive news to report on climate change, and a range of examples from other countries to inspire action in the UK. The leading campaign in this area at the moment is 10:10's #itshappening online platform, which celebrates examples from around the world of significant progress on dealing with climate change. Some examples include:

'One day in November 2013, Denmark was powered entirely by wind (with some left over!)' and 'Bangladesh installs 1,000 solar power systems a day', and 'Cyprus heats hot water almost entirely from roof solar panels' and 'the UK now gets one sixth of its electricity from clean sources like wind, solar and hydro. That's up 56 percent on this time last year.'

… climate change is not about a few storms for unknown people in distant countries in the unimaginable future, it's more about a whole planet that could become virtually uninhabitable within the 21st century

On the one hand this might sound like cheerleading, and the #itshappening campaign from 10:10 is unashamedly a feel-good campaign, but is by no means facile. A core impediment to action on climate change is the idea that there is no point in one country acting alone and that it doesn't matter what Britain does. Such examples are a vital way to overcome the idea that small acts are futile and they can also serve to build deeper climate alliances and shared commitments.

At this level, 'acting on climate change' means doing what you can to share your progress with similar people and groups internationally. Existing web platforms like #itshappening are a good start, but longer term the aim would be to build more substantial links in civil society to get governments cooperating for greater influence on the international stage.

Conclusions

The eight suggestions above have emerged from the analysis in the earlier part of this report but they should be viewed as provocations rather than tablets of stone, and are designed to provoke debate. If there is 'a take-home message' from this report it is that acting on climate change is a moral imperative, but that effective action depends upon a fuller grasp of the complexity of the problem.

As indicated above, climate change is not about a few storms for unknown people in distant countries in the unimaginable future, it's more about a whole planet that could become virtually uninhabitable within the 21st century. It is not really about 'emissions', it's more about fossil fuel production. It is not really about protecting the environment, it's more about seeing the fragility of the socio-economic fabric that we tend to take for granted. It is not really about consumers using energy more efficiently, it's more about citizens collectively striving to substitute our energy supply. It is definitely not a utopian transformation of global consciousness, but it is about facing up to human feelings that we tend not to talk about and to set aside. The moral imperative to act may not be a welcome message, or a message for everybody; it's more about those who already 'get it' finding the courage, initiative and support they need to live as though they do.

About the Author

Dr Jonathan Rowson is Director of the Social Brain Centre at the RSA. After degrees spanning a range of social science disciplines from Oxford and Harvard, Jonathan's Doctoral research at the University of Bristol featured an analysis of the challenge of overcoming the psycho-social constraints that prevent people becoming 'wiser'. He writes for *The Guardian*'s Behavioural Insights Blog, has a weekly column in the Herald newspaper, has authored three books, and is a chess Grandmaster and former British Champion (2004–6).

About the RSA Social Brain Centre

The RSA (Royal Society for the encouragement of Arts, Manufactures and Commerce) seeks to understand and enhance human capability and uses its public platform, research capacity and 27,000-strong Fellowship to bring about a more creative, inclusive and responsible society.

Since its inception in early 2009, the RSA's Social Brain project has sought to make working theories of human nature more accurate through research, more explicit through public dissemination, and more empowering through practical engagement. The core understanding is that human behaviour is much more social and automatic, and much less autonomous and considered than people tend to assume. Our work has grown from being a stand-alone awareness-raising project to a much wider programme of research, consultancy and thought leadership, formally recognised by the launch of the renamed Social Brain Centre in early 2013. We take a broad and deep view of 'behaviour change' to inform educational practice, support personal development, and improve financial and environmental behaviour, and we work with a variety of partners and funders in public, private and third sectors.

Acknowledgments

In the process of writing this report I was very glad to have the chance to discuss climate change with a large range of people working on the subject, and I hope I have done justice to the many ideas gleaned in the process.

I would like to begin by thanking our funders, The Climate Change Collaboration, for making this work possible and for their flexibility and support more generally.

I would also like to thank my former colleague Dr Emma Lindley who made a major contribution to the design of the survey, but died tragically while the report was being written. I missed her warm and astute insight several times in the process of writing.

I am grateful to Laurence Janta-Lipinski and Yougov for conducting the survey, Karim Secker for helping to analyse the results, and to Soapbox for designing the report.

For general advice on climate change or particular advice that informed this report I am grateful to the following people: Alice Bell, Simon Christmas, Jamie Clarke, Nick Stanhope, Kathleen Collett, Liz Owen, Adam Corner, Paul Dee, Emily Farnworth, Sian Ferguson, Florence Miller, David Hall, Adrian Hilton, Jean Leston, George Marshall, Guy Newey, Ro Randall, Sue Riddlestone, Dr Steve Sorrell, Dave Timms, Daniel Vockins, Sally Weintrobe, Dr Daniel Welch, Dale Southerton, Elizabeth Shove, Chris Rapley, Kevin Anderson, Jonathan Rose, Anthony Leiserowitz, Rennee Lertzman, Clive Hamilton, David Uzzell. A special thank you to Ian Christie who made two major conceptual contributions that helped to clarify and refine the argument. RSA colleagues Nathalie Spencer, Travis Wentworth, Conor Quinn, Luke Robinson, Julian Thompson and Janet Hawken gave invaluable help, particularly towards the end, but any errors that remain are my own.

Appendix

Defining 'climate change'

It is hard to know how people understand the term 'climate change' and how stable and informed that understanding is. There has been some work exploring 'mental models' of climate change and how it relates to weather,[145] how the term differs from global warming,[146] and how knowledgeable people are about the science of climate change[147] and a recent review of qualitative studies suggested there is great variation and sometimes direct contradiction between these pieces of research. This not only points to a need for further refinement in our knowledge of public understanding and engagement, but also simply to accept that no one theory will explain the variation in human experience of climate change and action in response to it. [148]

While we regularly ask the public for their views on climate change, how important it is to them, what they think we should do about it and so forth, we should keep in mind that aggregate views in response to 'climate change' will hide some very specific and erroneous interpretations. Consider the following fairly extreme but nonetheless instructive example from a DEFRA focus group discussion in April 2008, when members of the group were asked for their initial thoughts on climate change:

> 'I think taking the oil out of the ground, that was a buffer to keeping the centre of the earth stable, but it's pushing that out. If you take all that out, there's nothing else going back in, so I think it could very well be the oil surrounding the crust of the earth is the buffer to keeping everything cool. What we need to do is put all the oil back in and we'll get over climate change. Whether anybody else has got any ideas on that, I don't know.'
>
> **Participant in DEFRA group discussion, April 2008**[149]

Whatever our working assumptions on the public understanding of climate change, the reach and quality of the understanding is at least partly related to how often and how well the media present the issue. While this question is not within the direct scope of this report, many others, including the Climate Outreach and Information Network in the UK, are researching it, and it is a crucial consideration when thinking about behaviour change interventions at scale.

For the purposes of our survey, we tried to gauge the nature of climate denial without clarifying how 'climate change' was understood, but to inform the remainder of the survey where we asked about behaviours and attitudes relating to climate change we included a short definition:

RSA Social Brain Centre short working definition of 'climate change'

'The earth's climate is complex and has always changed over long periods, but there is now a scientific consensus that the climate system is being disrupted rapidly, as a result of human actions.

According to a significant majority of scientific experts in the field of climatology, disruptive climate change is being caused principally by those human activities that currently depend upon energy derived from the burning of fossil fuels like coal, gas and oil.

These activities have resulted in a growing concentration of greenhouse gases in our atmosphere, which over time is likely to make weather patterns increasingly irregular and unpredictable.

The human impact of this change will vary from place to place but might include an increased prevalence of storms, droughts and flooding, and could undermine the security of water, food and energy supplies.'

There is a meta-question on what basis one should judge the quality of a definition, and we cannot tell how many people in the sample would have arrived at something like this definition if asked to produce their own, but the representative national survey indicated that 59 percent of the UK population found this definition fairly convincing or very convincing.

Construct validity: Emotional, Personal and Practical Denial

With our survey, we deliberately opted not to do a classic segmentation, along the lines of Yale's six Americas, or values modes because we have been impressed by research that indicates how easily latent values can be activated by priming, and which suggests that people's views and values are relatively fluid. Perhaps the strongest example shows that even people with very extrinsically motivated values can quite swiftly become more intrinsically motivated.[150]

In the report we present three narratives of stealth denial on climate change, emotional, personal and practical, but in the survey we had included questions to gauge what we called 'pragmatic denial', which was broadly the narrative that said: 'It's happening, I feel uneasy about it, I am part of the problem, I could do more about it, but I don't because I tend to focus on the short-term challenges of my current lifestyle.' However, when we tested for the construct validity of this form of denial, it appeared we didn't have a stable construct, so we left 'pragmatic denial' out of the survey. Researchers interested in knowing more are welcome to contact me about this or any other aspect of the survey.

Construct validity for emotional, personal and practical denial held up much better, but in each case we are of course conscious about the implicit assumptions and value judgments being made.

Emotional denial construct validity:

'Climate change makes me feel not very uneasy, or not at all uneasy.'

The choice of uneasy was related to a desire to capture emotions like guilt and anxiety without making them explicit. This statement's connection to

'emotional denial' is supported by findings from the 'How does Climate change make you feel' item in that emotional denial was positively associated with reporting feelings of: 'Indifferent', 'The problems are far in the future so I don't feel much' and 'I don't think about it enough to feel anything' and negatively associated with reporting feelings of: 'guilty', 'afraid', 'concerned for future generations but not for myself/family', 'angry' and 'sad'.

In terms of building a demographic picture of those in emotional denial as a group, the survey showed them to be less well educated (GCSE or lower vs Undergraduate degree or higher), were likely to read *The Telegraph*, *The Sun* or the *Daily Mail*, were more likely to prioritise the financial crisis, illegal immigration and benefit fraud over other political issues such as poverty, and were most likely to vote Conservative.

Emotional denial seems to be a significant barrier to taking action on climate change. 76 percent of them indicated that they had taken no action because of their feelings about climate change, and they were much less likely to agree with the statement 'I would do more if I had a better idea of what and how'.

They were also likely to believe that 'there is nothing significant people like me can do to help deal with climate change', and to disagree with 'I would do more if I had a better idea of what and how', 'It would make it easier for governments and businesses if they had the support of people like me', 'If everybody did small things it would have a significant impact' and 'I would like the UK to take a leading role in tackling climate change'

Personal denial construct validity:

> 'I disagree or strongly disagree that my daily actions are part of the problem of climate change.'

How much responsibility do people like me bear for climate change?

Those in personal denial were more likely to feel that 'people like me' bore not much or no responsibility for climate change (64 percent of them believed this, versus only 27 percent of those not in personal denial). 81 percent of those in personal denial felt that their actions and those of people like them contributed to climate change not very much or not at all.

Personal denial overlaps significantly with emotional denial, and it is worth considering that these two narratives may well go hand in hand. Certainly a feeling of personal responsibility may make emotional detachment that much harder. Like emotional denial, personal denial was associated with lower education levels, voting Conservative and prioritising the financial crisis, benefit fraud and illegal immigration. Those in personal denial also followed the same pattern of responses to 'how do you feel about climate change' as emotional denial, and also thought that 'there is nothing significant people like me can do to help deal with climate change'.

As with emotional denial, personal denial also correlated negatively with the statements: 'I would do more if I had a better idea of what and how', 'It would make it easier for governments and businesses if they had the support of people like me', 'If everybody did small things it would have a significant impact', and 'I would like the UK to take a leading role in tackling climate change'.

Practical denial construct validity:

> 'I agree or strongly agree that there is nothing I can do personally that will have any significant effect on limiting climate change.'

The aim of this survey item was to assess the degree to which the UK population feel they have courses of action open to them to help deal with climate change if they chose to. There is evidence that it was at least partly successful in that those in practical denial are more likely to agree or strongly agree with the statement:

> 'I would do more if I had a better idea of what and how.'

However, there is also some evidence that many respondents are interpreting the practical denial survey item as something along the lines of 'I feel overwhelmed by the scale of climate change, and that my actions need to be part of a larger movement in order to have the desired results', rather than what I believe the survey was originally trying to access of 'I want to do something about climate change but I see no courses of action open to me'. The evidence for this is as follows:

1. Those in practical denial are the only denial group (including non-deniers) who were more likely than not to have taken part in at least one form of action because of their feelings about climate change.
2. The vast majority (751, or 83 percent) of those in practical denial believe that 'people like me could help deal with climate change'. Even though most (623 or 69 percent) of those in practical denial also believe that not enough people are *willing* to help, this still shows that they cannot simply think there is literally nothing they can do of any significance. By way of highlighting this, of the 164 respondents who think that 'people like me can and will successfully help deal with climate change', 78 percent were in practical denial. This suggests that those in practical denial feel more empowered to help deal with climate change than those in any other position on the denial spectrum, so long as they feel their actions are part of a wider effort.

Those in practical denial are also more likely to agree with the statement 'Even if I could do more, there's no point unless most people act in the same way around the world', and also with 'Even if most people in Britain and the West did all we could, the gains would be wiped out by India and China.' We would certainly expect this for the 'overwhelmed' interpretation of the practical denial item. It's hard to say whether we would expect this according to the original 'courses of action' interpretation. If you think there are literally no actions you can take that will have a significant outcome on climate change, then are you more or less likely to think that, if such actions did exist, they would depend on everyone around the world doing likewise? In this context, it's hard to say.

Those in practical denial were less likely to agree with the statement 'If everybody did small things we could make a significant impact'. This

seems strange as this statement seems to be saying something similar to the previous two. If you agree that there's no point doing more unless everybody does, then you also ought to agree that if everybody did indeed do more, then it would have a significant impact. This could be taken as supporting the idea that this group feel overwhelmed by the problem of dealing with climate change, in that they feel that everyone doing 'small' things will not be enough to have a real impact.

It is worth mentioning that practical denial correlates positively with both emotional ($R=0.390$, $p<0.001$) and personal ($R=0.373$, $p<0.001$) denial. If the item were mainly capturing a sense of feeling 'overwhelmed' by climate change we would not expect this, especially in the case of the relationship with emotional denial.

Given the evidence, the practical denial question has probably captured a combination of the two interpretations. For future research, we would need to disambiguate the item by rewording to avoid casting the significance of your personal actions against the entirety of the climate change problem, perhaps something along the lines of 'I feel that there are meaningful courses of action I can take toward helping deal with climate change if I so choose'.

Given these qualifications regarding exactly what practical denial means in this survey, we can say the following about those who are in practical denial: they are more likely to be highly educated, read *The Times*, *The Guardian* or the *Mirror* and vote Liberal Democrat. Practical denial is strongly associated with the following feelings about climate change: 'guilty', 'afraid', 'concerned for future generations but not for myself/family', 'angry' and 'sad'. It is negatively associated with feeling: 'indifferent', 'The problems are far in the future so I don't feel much' and 'I don't think about it enough to feel anything'.

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4. I am grateful to Marshall Clemens for this framing.

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12. These figures capture the total population with the 'unconvinced' taken out ie the percentages correspond only to those who gave answers consistent with accepting the reality of anthropogenic climate change.

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149. I am very grateful to Liz Owen, now Head of Consumer Insight at the Department of Energy and Climate Change for sharing this previously unpublished extract from her research while she was working at DEFRA.

150. "Although all the participants in the study had been selected because they held extrinsic values to be more important, we found marked differences between, on the one hand, the way in which participants who had been asked to reflect upon extrinsic values spoke about bigger-than-self problems, and, on the other, the way in which participants who had been asked to reflect upon intrinsic values spoke about these problems. Compared to those primed with extrinsic values, participants primed with intrinsic values spoke about social and environmental challenges in ways that conveyed a stronger sense of moral duty, and a greater obligation to act to help meet these challenges." – From the Introduction to Chilton, P., Crompton, T., Kasser, T., Maio, G. and Nolan A. (2012) *Communicating bigger-than-self problems to extrinsically motivated audiences*, Climate Outreach and Information Network; Campaign to Protect Rural England; Friends of the Earth; Oxfam; WWF -UK. See http://assets.wwf.org.uk/downloads/extrinsically_oriented_audiences1.pdf

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