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Chapter 8: A policy perspective on transport and climate change issues

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Structured Abstract

Purpose: To provide a policy perspective on the relationship between transport and climate change.

Methodology/Approach: Two key themes are identified and discussed: the meaning of a major change in a policy perspective, covering the Climate Change Act and the development of a Low Carbon Transition Plan. A theoretically informed framework applies and highlights the importance of understanding policy change from a historical perspective.

Originality/Value: The largely incremental nature of the policy change is considered in terms of whether there are real prospects of a revolutionary change in transport policy that will deliver a low carbon transport future, whilst also allowing transport to fulfil its many other roles.

Introduction

This chapter explores how policy has changed in response to the new transport and climate change agenda and reflects on why these have been selected. It looks ahead also to the potential for more radical future change and discusses the conditions under which more radical change might be enacted.

Giddens (2009) suggests that whilst there is now a wave of awareness of the need to act, there is a need to embed climate reduction policies "in our institutions and in the everyday concerns of citizens, and here,...there is a great deal of work to do" (p4). It is argued that the state is an "all important actor" (p5) from a local to an international level, in setting treaties and in enacting their delivery, in supporting embryonic technologies and in working with markets and the private sector to ensure that the true costs of climate change are reflected in prices. The market, as argued by Giddens (2009), can produce results that no other agency or framework is able to – but only if steered to do so. Marsden and Rye (2010) consider the interplay between state and non-state actors in the transport sector with respect to climate change. Whilst they agree that the state plays a critical role, they argue that much greater attention needs to be given to the policy structures and processes of policy development if more significant progress is to be made in carbon reduction in the transport sector.

The UK is an interesting case study in climate change policy. It has taken the lead on developing a framework for action. A key actor in the development of the Kyoto Protocol (1997) the UK has since gone on to become the first nation to commit itself, through the Climate Change Act 2008, to a legally binding target of at least an 80 percent cut in greenhouse gas emissions by 2050 (relative to 1990 levels). Progress is to be tracked by an interim emission reduction of 34 percent by 2020, with interim rolling five-year budgets.

To achieve such dramatic decarbonisation of the UK economy will require action across all sectors. The action does not have to be equal across all sectors or to proceed at similar rates. However, as emissions from transport represent 21% of the UK total for domestic emissions transport must play a significant role in moving to a low carbon economy (DfT, 2008). In 2009 the Department for Transport released its Carbon Reduction Strategy for Transport where it described decarbonising transport as:

"*part of the solution. This will be a major change, but moving to a low carbon economy and transport system also presents huge opportunities; not just for climate change but for our prosperity, health, and the wider environment." (DfT, 2009a, p5)*

The meaning of policy – an analytical framework

The purpose of this section is to clarify the meaning of a 'policy perspective'. This is done by unpacking the notion of 'policy', drawing primarily on Hall's (1993) approach to social learning. In doing so, the argument advanced by a number of scholars is followed that such disaggregation is valuable for understanding different dynamics at play in different aspects of policy-making.

In his oft-cited analysis of social learning in economic policy-making in Britain, Hall (1993, p278) identified policy-making as a process usually involving three variables: overarching policy goals that guide policy, the instruments or techniques used in seeking to attain these goals and the precise setting of the instruments. Hall's distinction between the means and end of policy, and between abstract and concrete features, was an important contribution to the study of policy change. It challenged the then dominant view that tended to reduce all

elements of policy into a single variable and to view all change as incremental in nature (Howlett and Cashmore, 2009, p36).

Building on this work, Liefferink and Jordan (2004) placed Hall's three variables within the category of 'policy content': a category said to exist alongside the 'subtly interrelated' variables of policy structures and policy style. Like the category of policy content, policy structures is a broad category, seeking to encompass both formal and informal notions of structure. Liefferink and Jordan (2004, p40) take it to include 'both the formal structure or architecture of the state as well as the norms and rules (both formal and informal) that govern the operation of its constituent parts'. Policy style refers to the cultural dimension or 'standard operating procedures' of national policy and is understood best in comparative perspective. This category has two aspects: (1) government's approach to problem solving, ranging from anticipatory / active to reactive; and (2) government's approach to other actors involved in policy-making, ranging from seeking consensus to seeking to impose (Liefferink and Jordan 2004, p42).

Table 1, Liefferink and Jordan's Policy Variables

Policy variables	Features
Policy content	Three levels (following Hall): overarching goal; instruments or techniques used; precise setting of instruments
Policy structures	From formal bureaucratic organizations to cultural phenomena (e.g. structures formed and rules and norms of governance)
Policy style	Two dimensions: government's approach to problem solving (ranging from anticipatory/active to reactive); and government's approach to other actors in policy-making (either seeking to reach consensus or to impose decisions)

Also building on Hall (1993), Howlett and Cashmore identified six elements of policy that can undergo change, suggesting that each of Hall's three variables should recognise his own distinctions between policy 'ends' and policy 'means'. The implication of this taxonomy is that "every 'policy' is in fact a more complex regime of ends and means related goals (more abstract), objectives (less abstract) and settings (least abstract)" (Howlett and Cashmore 2009, p38), and provides a more nuanced framework than Hall's original.

There is something useful in each of these contributions. Hall's seminal contribution feeds into the later pieces and provides insights into the notion of policy change (below). Liefferink and Jordan's taxonomy highlights policy structures and policy style as features that interact with and influence policy content and thus need to be categorised and understood. However, the distinction between structures and content is clearer than that between structures and style: the cultural/sociological aspects of policy structures elide with the cultural aspects of policy style, which may have most value for cross-national comparisons where distinctly national styles can be identified. As Liefferink and Jordan (2004, p43) suggest, it is of less use even where national comparisons are drawn from a similar pool (e.g. Europe). As this is a study of transport and climate policy in England, the notion of policy style in view is kept but this is not a major theme in the chapter.

The chapter focuses on changes in policy content as a first step to unpicking the question of how transport governance is changing in response to the climate change agenda. Howlett

and Cashmore's finer taxonomy is adopted as a starting point, which is illustrated below (Table 2). Key changes in policy structures are observed, but it is not yet possible to make firm associations between changes in structure and content.

Table 2. A Taxonomy of Policy Components

	High Level Abstraction	*Programme Level Operationalization*	*Specific-On-the-Ground Measures*
Policy ends or aims	**GOALS** **What general types of ideas govern policy development?** (e.g. environmental protection)	**OBJECTIVES** **What does policy formally aim to address?** (e.g. control of carbon emissions)	**SETTINGS** **What are the specific on-the-ground requirements of policy?** (e.g. % reduction in carbon for the transport sector, a mode or a city)
Policy means or tools	**INSTRUMENT LOGIC** **What general norms guide implementation preferences?** (e.g. welfare maximising rational economic paradigm)	**MECHANISMS** **What specific types of instruments are utilized?** (e.g. vehicle ownership taxation)	**CALIBRATIONS** **What are the specific ways in which the instrument is used?** (e.g. levels of charges to target particular types of vehicle)

(based on Howlett and Cashmore 2009, p39)

As well as providing a taxonomy and framework to describe policy change, it is also important to understand how policy changes. Hall's point of departure for explaining policy change through social learning (Hall, 1993) was to set out the position of state theorists on this, which had three features. First, this position emphasised the importance of previous policies in shaping current policies, rather than prevailing social and economic conditions the idea of 'policy legacies' (or what might now in historical institutional terms be described as 'path dependence). Second, it identified 'experts' as the key agents in promoting policy learning, rather than politicians – experts either working for the state or located at the interface of bureaucracy and the 'intellectual enclaves of society'. Third, it stressed the capacity of the state to act autonomously from societal pressure in shaping policy (Hall 1993, p277-8).

In response to this position, Hall argued for a clearer definition of social learning, described as "a deliberate attempt to adjust the goals or techniques of policy in response to past experience or new information. Learning is indicated when policy changes as a result of such a process" (1993, p278) and for the concept to be disaggregated. Here the distinction of policy-making as a process that usually involves three different variables (overarching goals,

instruments and instrument settings; above) is important in allowing analysis of policy change in areas of policy of a different order and thus may be subject to very different process. Specifically, he identified three orders of change in policy-making.

First order change refers to changes in the settings of policy instruments in the light of experience and new knowledge, while keeping the overall goals and instruments unchanged. Second order change refers to changes in the instruments themselves as well as their settings in response to experience, while the overall policy goals remain unchanged. Third order change – the least likely – refers to wholesale changes in policy instrument settings, the instruments themselves and the overarching hierarchy of goals behind them. While first and second order changes might be considered normal policy adjustments within a stable paradigm, third order change is generally associated with a paradigm change ((Hall 1993, p278-9). Moreover, while first and second order changes are likely to be characterised by incrementalism – analysis consistent with the state theorists' approach to policy learning – third order change is unlikely to be incremental, but more radical. Moreover, first and second order changes do not necessarily lead to third order change: each paradigm is shaped by a different ontology in relation to how the (policy) world operates and thus judgments about how best to proceed are not simply technical. Hall identified three important aspects of paradigm change:

. The replacement of one policy paradigm by another is likely to be more sociological than scientific. That is, although expert opinion is a factor, the choice between paradigms ultimately rests on 'more political judgments' and the outcome dependent 'not only on the arguments of competing factions, but on their positional advantages within a broader institutional framework, on the ancillary resources they can command in the relevant conflicts, and on exogenous factors affecting the power of one set of actors to impose its paradigm over others' (Hall 1993, p280, see also Dudley and Riachardson, 2000 for evidence in a transport context).

. Authority over policy is central to paradigm change. That is, particularly where complex issues are at stake, the shift from one paradigm to another 'is likely to be preceded by significant shifts in the locus of authority over policy' (Hall 1993, p280).

. Experimentation and policy failure are likely to play a key role in paradigm change. That is, attempts to respond to anomalies and challenges to the existing paradigm will lead to it being stretched in response, but this is likely to eventually undermine the coherence and precision of the paradigm: 'if the paradigm is genuinely incapable of dealing with anomalous developments, these experiments will result in policy failures that gradually undermine the authority of the existing paradigm and its advocates even further' (Hall 1993, p280).

Hall's challenge to the orthodox incrementalist approach to policy change led to a long scholarly debate, which Howlett and Cashmore (2009, p34) suggest has been replaced by a new 'postincremental' orthodoxy as scholars have accepted the idea that 'periods of marginal adaptation and revolutionary transformation are typically linked in a "punctuated equilibrium"pattern of policy change'. This orthodoxy is characterized by an acceptance of the need for historical analysis of policy development; an understanding that political institutions and their policy subsystems are the primary mechanisms of policy reproduction; recognition that paradigmatic change tends to take place only when the policy institutions themselves are transformed; agreement that paradigmatic change or 'punctuations' are usually the result of 'external perturbations' that disrupt existing ideas, institutions and practices (Howlett and Cashmore 2009, p35-6). This orthodoxy generates three expectations:

. that policy processes are typically stable (explained by path dependent institutionalization);

. that policy change (‘punctuated equilibrium’) results from the breakdown of an institutionalized ‘policy monopoly’;

. this typically occurs through an alteration in policy subsystem beliefs and membership due to some external (societal) 'perturbation' (Howlett and Cashmore 2009, p36).

Howlett and Cashmore's critique of the new orthodoxy is two-fold: they suggest that it is based on a taxonomy that conflates very different elements of policy (hence their six-fold categorisation) and, related to this, that it has an under-developed classification of the different types of changes that different policies undergo. This leads to 'erroneous conclusions being drawn by Hall and others about the factors underlying policy dynamics and their appropriate modelling' (Howlett and Cashmore 2009, p37). They suggest that the reality is far more complex than the binary distinction promulgated by the incremental vs. paradigmatic debate.

In summary, this section has sought to flesh out the dependent variable in our study of policy. Doing this requires us to both outline what should be measured in empirical investigations and to identify the most appropriate data for empirical investigation (Green-Pederson, 2004). This second task is returned to below. In relation to the former, Howlett and Cashmore's framework highlights the need for greater precision in disentangling the policies that are being studied; to distinguish between changes that move in different directions at different times but do not deviate significantly from the policy equilibrium from those that move in the same direction over time (cumulative change); and to take care in attributing change to either endogenous or exogenous sources, when the reality might be a complex interaction of the two. The main theoretical claim is that policy change takes place through a process of social learning based on past experience or new information.

Transport policy in England (1998 – 2009)

The previous section identified the need to review change in terms of policy content and policy structures to better understand change. This could be undertaken at many levels (from local to international). Climate change is clearly a problem which does not respect administrative boundaries and binds state actions with those of non-state actors and institutions. This argues for the analysis of climate change policy through the lens of multi-level governance (Bache and Flinders, 2004 and Marsden and Rye, 2010). In selecting the case, there are difficulties with a model of asymmetric devolution in the UK characterised by multi-level governance processes in the different constituent parts (England, Northern Ireland, Scotland and Wales) that produce some increasingly divergent public policies. In this context, our analysis is developed around climate change and transport policy in England at a national level. The reasons for selecting England are that 86% of vehicle kilometres travelled in the British Isles are in England and its actions on climate change are therefore pivotal in attaining the UK's commitments on climate change. The focus is on the national level as the Department for Transport holds a pivotal place in the governance system, exerting stronger control than in many other European countries (Marsden et al., 2011). Moreover, the national level provides a space in which policy across all of the different transport modes can be integrated (in contrast to the local level where aviation, rail and maritime are often marginalised and the European level where the principles of subsidiarity and the need to appeal across the EU-27 members limits the degree to which UK urban transport policies are shaped by the EU). Such an approach makes this analysis tractable but provides clear limitations:

1. In the UK the impacts of devolution to Northern Ireland, Scotland and Wales has led to some divergence in policy compared to England (MacKinnon et al., 2008). This may influence policy in England although recent analysis suggests that this has only been

in a very limited manner with respect to climate change (Marsden and Rye, 2010).

2. Cities are important sources of policy and innovation in their own right and there is evidence of city level policy making that seeks to bypass aspects of the nation state as part of wider Europeanization (Kern and Bulkeley, 2009).

In picking the national level for analysis, there are also searches up, down and out from the nation state in terms of policy development and seek to understand how national government represents its role in this complex policy area.

The period from 1998 to 2009 was selected for study to enable an understanding of change over time. The time period for adoption captures the main policy documents from the period of the Labour administration beginning with the 1998 Integrated Transport White Paper and ending in the publication of the 2009 Carbon Reduction Strategy for Transport. Dudley and Richardson (2000) suggest that longer periods of time might be necessary to fully capture the dynamics of policy change in the transport sector, even if third order change processes can be observed over periods of two to three years. However, 1998 represented an important change in the nature of transport policy as it was the first transport White Paper for 21 years and confirmed the departure from the large scale roads programmes that preceded it (Roads for Prosperity was published in 1989 setting out a plan for £23 billion investment in 500 road schemes). 2009 was selected as the final date for analysis as the incumbent Conservative-Liberal coalition government has yet to publish a national White Paper although some changing signals from more recent policy announcements are highlighted. A timeline of key events and policy documents can be found in Table 3..

Table 3. Timeline of key events

1998	**Transport White Paper** – A New Deal for Transport Better For Everyone (DETR,1998) **Introduction of the New Approach to Transport Appraisal** (NATA)
1999	**Greater London Authority Act 1999** – The control of London's Buses, Trains, Underground System, Traffic Lights, Taxis and River Transport moved to TfL **SACTRA Report** – Transport and the Economy (SACTRA, 1999)
2000	**Local Transport Act 2000** – Included the requirement for the production of local transport plans in England and legislation to allow road user charging and workplace parking charges **Transport 10 Year Plan -** (DETR, 2000a) **Guidance on the First Local Transport Plan issued** (DETR, 2000b) ***Creation of the Sustainable Development Commission***
2001	**Creation of the Department for Transport Local Government and the Regions (DTLR)** (previously DETR) – The remit for the environment moved to DEFRA
2002	***DTLR was reformed as the Department for Transport (DfT)***
2003	**Start of the London Congestion Charging Scheme** **Aviation White Paper** – The Future of Air Transport (DfT, 2003) **EU Biofuels Directive** (2003/30/EC) **Energy white paper** - Our Energy Future - Creating a Low Carbon Economy (DTI, 2003)
2004	**Rail White Paper –** The Future of Rail (DfT, 2004a) **Transport White Paper** – The Future of Transport (DfT, 2004b) **Guidance on the 2nd Local Transport Plans issued** (DfT, 2004c) **Smarter Choices** – Changing the way we travel – Cairns et al (2004)
2005	***EU Emission Trading Scheme (ETS) starts (phase 1)*** **UK Government Sustainable Development Strategy** – Securing the Future DEFRA (2005)
2006	**NATA - updated to include monetising carbon dioxide emissions** **Climate Change and Sustainable Energy Act 2006 Stern Review on the Economics of Climate Change** (Stern et al , 2006) **The Eddington Transport Review** (Eddington, 2006)
2007	**Rail White Paper**– Delivering a sustainable Railway CM7176 (DfT, 2007a) **King Review** – The King Review of Low Carbon Cars (King, 2007) **Transport White Paper** - Towards a sustainable transport system: supporting economic growth in a low carbon world (TASTS), (DfT, 2007b)
2008	**Local Transport Act 2008** **Climate Change Act 2008** **Carbon Pathways Analysis** – Informing Development of a carbon reduction strategy for the transport sector (DfT,2008) **EU Emission Trading Scheme (ETS) Phase 2 starts** **Creation of the Department of Energy and Climate Change (DECC)** – bringing together Climate Change Mitigation Policy and Energy Policy(previously covered by DEFRA and BERR respectively)
2009	**Low Carbon Transport Plan** – Low Carbon: A Greener Future, (DfT,2009a) **Guidance on the 3rd Local Transport Plans Issued** (DfT, 2009b)

This period can be divided into three broad epochs that will be used for the analysis in the

next section of the Chapter.

1. Early (1998 - 2000) – An integrated vision

The Labour government entered office on 2nd May 1997. Shortly after, in June of the same year the Department for Environment, Transport and the Regions (DETR) was formed (amalgamating the Departments of Transport and Environment). The Ministry was under the purview of the Deputy Prime Minister, John Prescott, who came into power committed to introducing an integrated transport policy. The White Paper that was published in July 1998 was to signal "a radical change in transport policy" (DETR, 1998, Foreword). The thinking behind the paper was heavily influenced by the government's advisor Phil Goodwin who had, through his work on the new realism, established widespread acceptance of the proposition that it was no longer affordable, environmentally acceptable or practically feasible to build roads to cut congestion and therefore a new approach to travel demand management was required (Goodwin et al., 1991, Docherty and Shaw, 2011).

The creation of a 'super ministry' was ultimately symbolic more than practically important as it was disbanded in 2001 (Beecroft, 2002). Nonetheless, the White Paper offered an early window on the underlying ideology for transport policy under Labour. The White Paper followed soon after the landmark Kyoto protocol negotiations (in which Prescott was the lead UK Secretary of State) where many developed nations agreed to commit to reduce their climate change emissions. The UK agreed, as part of a broader European commitment, to a 20% reduction by 2020 compared with 1990 levels. The White Paper established, for the first time, the importance of climate change and transport's role in that.

"with our new obligations on climate change, the need for a new approach [to transport] is urgent..." (DETR, 1998, Foreword).

The White Paper contained some important provisions. It established a requirement on local authorities in the UK to produce five year Local Transport Plan strategies; it signalled the introduction of legislation for local road user charging schemes; and, whilst not attempting to unpick the privatisation of the railways, sought to bring greater governmental influence to rail policy through the establishment of an arms length planning body (the Strategic Rail Authority). However, by the year 2000 the government was being attacked for being strong on ideology and weak on delivery. It launched a 10 Year Plan for Transport that set out what it hoped could be achieved and provided a long-term significantly enhanced funding envelope to achieve it (DETR, 2000a). By this stage, the Royal Commission on Environmental Pollution had concluded that the UK should put itself on a pathway to a 60% CO_2 emission reduction by 2050 (RCEP, 2000). This epoch concluded with the fuel duty protests of September 2000 (where farmers and hauliers blockaded oil refineries in protest to the fuel duty escalator), which were widely identified as a major reason for the Labour government stepping away from its radical approach (Marsden, 2002).

2. Mid (2001 - 2005) – Events and a crowded agenda

Only one month later, the Hatfield rail crash and the ensuing collapse of Railtrack was to change the direction of policy making. In May 2002, the Transport Select Committee published a highly critical review of the likelihood of the government achieving the goals set out in the 10 Year Plan, in particular the congestion reduction target (HOC, 2002). Alistair Darling replaced Stephen Byers as Secretary of State and set about the task of reorganising the rail industry and reducing the media focus on the failure to reduce congestion.

Four important policy publications were produced in this period with a bearing on transport policy. The Social Exclusion Unit, working out of the Cabinet Office, produced its report "Making the Connections" (SEU, 2003). This identified transport as a potentially important part of the broader social inclusion agenda and led to a requirement for all local authorities to

prepare an accessibility plan for their area that tried to address these issues (whilst climate was not seen to be a local priority). The Aviation White Paper set out the framework for airport expansion in the UK (the first since 1986), anticipating a doubling or trebling of passenger numbers by 2030, an increase that would bring acknowledged increases in

climate change emissions (DfT, 2003). A Rail White Paper (DfT, 2004a) set out the new structure for the rail industry with the new not-for-profit Network Rail being directed by central government once again with the abolition of the Strategic Rail Authority. In addition, a new overarching Transport White Paper was published (DfT, 2004b) alongside a report into the feasibility of a national road pricing system and a report into Smarter Choices (Cairns et al., 2004). The Smarter Choices report presented the case for an enhanced investment in measures such as commuter travel plans, walking and cycling and personalised travel planning as a cost effective means of reducing congestion and emissions as well as promoting healthier travel.

3. Late (2006 - 2009) – External advice

The policy direction was subsequently influenced by a series of influential expert reports, all commissioned in part by the Treasury. The Stern review on the economics of climate change has had a global significance, setting out the potential range of economic costs that could be incurred as a result of climate change. Critically it advanced the argument that the costs of early action would be lower than the costs of inaction and identified benefits to the competitiveness of the UK national economy in taking a leading role in the new green economy (Stern et al., 2006).

The Eddington review (joint with the Department for Transport) looked at the competiveness and connectivity of the UK transport system and made recommendations for how best to prioritise spending to improve the economy. It concluded that small scale network improvements, investment in cities and at key congestion hot spots were critical and that road pricing would be beneficial (Eddington, 2006). The report said little about the environment even though it was produced concurrently with the Stern Review.

Finally, the King Review of low carbon cars (King, 2007 – joint with DfT, DEFRA and BERR) examined the potential to decarbonise car transport. The King Review came down heavily in favour of hybrid electric and electric vehicles being a part of the transition path to a decarbonised car fleet. Whilst at this stage it has not been possible to understand the motivation for Treasury involvement, it is noted that there is a substantial history of Treasury involvement in influencing the policy frame and long-term funding programme for the sector (Dudley and Richardson, 2000).

In response to these expert reports a new Transport White Paper, “Towards a Sustainable Transport System (TASTS)” was launched. The White Paper anticipated the introduction of the Climate Change Act (2008) which makes the UK the only country to have a legally binding framework to cut climate change emissions. “The Act requires that emissions are reduced by at least 80% by 2050, compared to 1990 levels.” (CCC, 2011). Five-yearly budgets are also set for a fifteen year period to provide a trajectory for progress. The budgets set for the UK as a whole are shown in Table 4.

Table 4. UK Carbon Budget Targets (Source: DECC, 2011a)

http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/carbon_budgets/carbon_budgets.aspx

	Budget 1 (2008-12)	**Budget 2 (2013–17)**	**Budget 3 (2018–22)**
Carbon budgets ($MtCO_2e$)	3018	2782	2544

Percentage reduction below 1990 levels	22	28	34

The timing of the TASTS White Paper meant that further details of how transport was to contribute to the reductions required was still to be provided. This came in the form of the 2009 Low Carbon Transport plan (DfT, 2009a), published as part of a whole government Low Carbon Transition Plan. The change from the Blair to Brown-led Labour Government also brought some further changes in approach with the coming to the fore of High Speed Rail to the North of England which, under Eddington's thinking, had been put to one side.

This Section has provided a brief overview of some of the key events that have occurred that have shaped the transport debate. The analysis of policy change that follows focuses on climate policy within the transport sector. The discussion above illustrates that climate change is one of many competing policy agendas which influence transport and which, over time, seem to exert different levels of influence. These contextual factors will be drawn on where relevant to explain why climate policy in transport has not followed a smooth growth in importance over the period. The four key documents the analysis is based on are the transport White Papers of 1998, 2004 and 2007 and the Low Carbon Transport Strategy of 2009.

Policy Content

Goals

Framework: What General Types of Ideas Govern Policy Development?

There has been a significant shift in the importance of climate change as a goal of transport policy. The 1998 White Paper was the first to signal the relationship between transport and climate change, describing the importance of climate change as a reason to adopt a new approach to transport, quoting the Kyoto protocol as a motivation for tackling the environmental impacts of transport. Climate change is however, treated as a sub-objective of 'environment', one of five overarching goals of the 1998 White Paper. An analysis of the number of references to climate change (or related terms) within the 1998 White Paper relative to other important goals (Fig. 1) shows that it received the same attention as local air quality and less than one quarter of those of road safety.

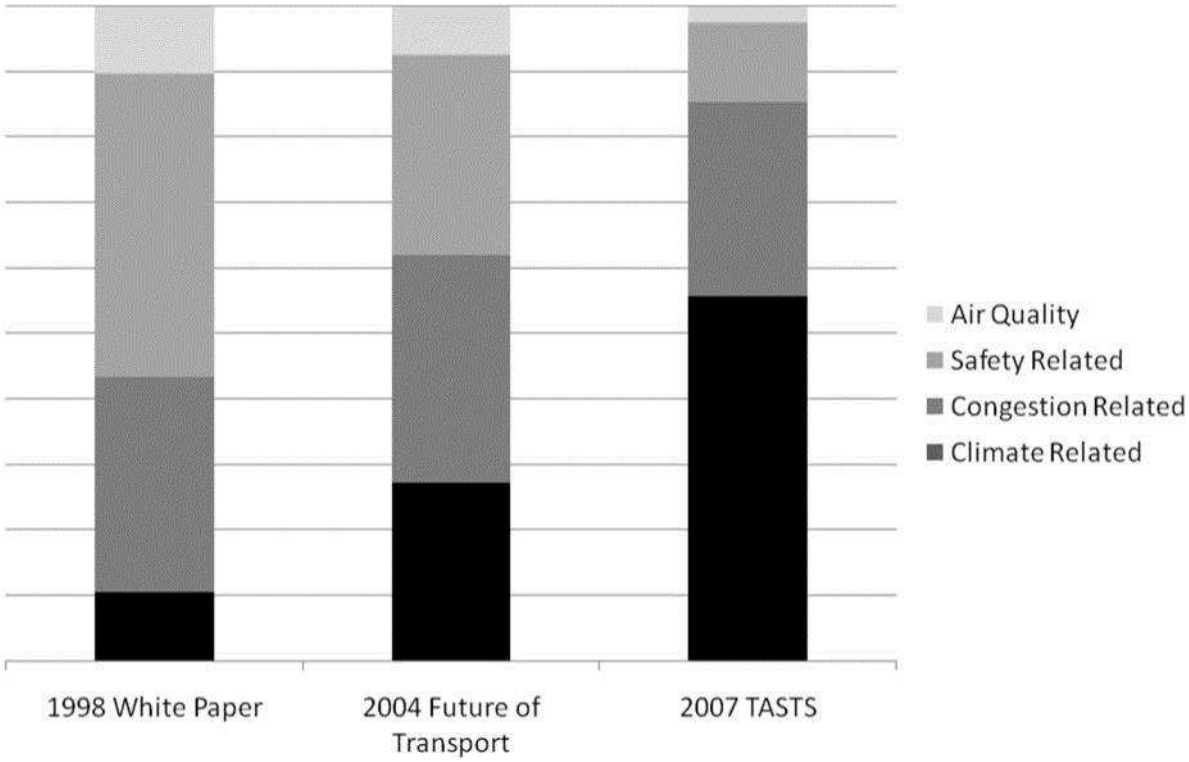

Fig. 1. Prevalence of policy goals featured in the Transport White Papers

The analysis from Fig. 1 appears to suggest a growth in the importance of climate change in the 2004 White Paper. Whilst it is trailed in the Foreword by Prime Minister Blair, the strategy is described as being built around the three key themes of sustained investment, improvements in transport management and planning ahead. Climate remains part of the environment goal. There is a more significant change in 2007 where climate change was elevated to one of five goals: "Goal 2 is to address climate change, by cutting emissions of carbon dioxide (CO_2) and other greenhouse gases" (DfT, 2007b, p9). The first goal was to maximise competitiveness and productivity with the remaining three being 'safety, security and health', 'quality of life' and 'equality of opportunity' (DfT, 2007b, p10). The analysis in Fig. 2 underlines the importance of the first two goals with congestion (and its links to productivity) and climate dominating the discourse on goals.

Objectives

Framework: What Does Policy Formally Aim to Address?

As an overarching government objective, cutting CO_2 emissions has remained a consistent theme since the Kyoto protocol was formulated in 1997. This began with a formal commitment to the EU of a 12.5% reduction by 2010 compared with 1990 levels and a national goal of a 20% reduction by 2010. From 2003 (signalled in the Energy White Paper) the Government committed to "putting the UK on a path to reducing CO_2 emissions by around 60% from current levels by 2050" (DfT, 2004b, p23) in line with the recommendation of the Royal Commission on Environmental Pollution.

The objective was further crystallised with the development of the Climate Change Act (2008) and the subsequent decision to adopt an 80 per cent carbon reduction goal across

the economy in 2008. This changed the panorama for transport as it is responsible for over 20 per cent of all domestic greenhouse gas emissions. A 60 per cent reduction would allow for a relatively moderate reduction in transport related greenhouse gas emissions if other

sectors such as energy production effectively decarbonised. The adoption of an 80 per cent reduction commitment meant that the transport sector had to become a significant part of the solution. The Department for Transport's 2009 strategy stated that "the effective decarbonisation of the transport sector will play a big part of achieving this goal" (DfT, 2009a, p20).

Settings

Framework: What are the Specific On-the-ground Requirements of Policy?

The specific requirements for the transport sector with respect to carbon reduction have changed over the period in line with an increasing necessity to make a contribution to the overarching goal as outlined above.

The 1998 White Paper talks in terms of quite significant reductions in climate change emissions, e.g. "even without a major change in behaviour, with the key measures in the New Deal for transport, there is the potential to reduce forecast 2010 road traffic CO_2 emissions by 22-27%" (DETR, 1998, p27). However, the subsequent 10 Year Plan for transport was acknowledged as focussed on congestion reduction and not climate emissions reduction (DTI, 2003). It did not propose a formal target for carbon reduction despite targets being set for many other aspects of transport (Marsden and Bonsall, 2006 and Docherty and Shaw, 2011). Even were the 10 Year Plan to have delivered in full on its promises it would have achieved only a 1.6MtC reduction in CO_2 emissions over doing nothing, which equates to an absolute reduction of 0.9MtC or less than 1% of surface transport emissions in the year 2000 and an increase on 1990 levels (DETR, 2000b). The approach to carbon emissions management could be characterised as being an approach to stabilising or limiting the absolute growth in emissions rather than cutting them.

In 2004, the Department for Transport was made jointly accountable for the overall carbon reduction goal through a Public Service Agreement to "Reduce greenhouse gas emissions to 12.5 per cent below 1990 levels in line with our Kyoto commitment and move towards a 20 per cent reduction in carbon dioxide emissions below 1990 levels by 2010, through measures including energy efficiency and renewables, Joint with the Department for Environment, Food and Rural Affairs and the Department of Trade and Industry." (DfT, 2004b, p136). No formal attribution of responsibility for goal achievement was set however and the 2004 White Paper forecasted an increase in emissions from transport by 2010 with the prospect of the achievement only of meeting 1990 levels by 2020 (see Fig. 2).

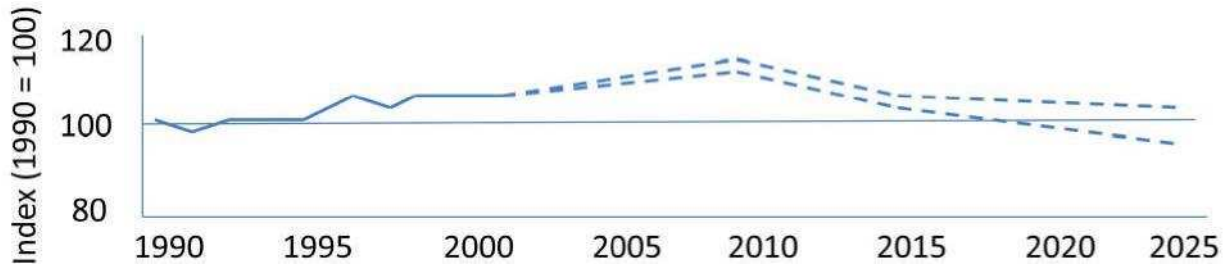

Fig. 2. 2004 Future of Transport White Paper estimates of road traffic based CO_2 (Source: DfT, 2004)

By 2007 the TASTS White Paper was explicitly acknowledging that transport had to play a

more significant role in the proposed aim of achieving a 60 per cent reduction of CO_2 emissions by 2050. By 2009 an acceptance that transport would have to significantly decarbonise was evident (see previous section). The setting moved from a cross-departmental Public Service Agreement to a formal legislative commitment across

government within the Climate Change Act. Indicative budgets for each Department were set in 2009 although these are not formally binding. The new Conservative-led government has however abandoned an outcome budget approach in favour of an action plan reporting framework where the progress of specific policies and initiatives are assessed (DECC, 2011b).

The settings have swung from a loosely specified aspiration to limit the increase in climate change emissions to a more formalised cross-government commitment to achieve specific carbon reduction targets. Whilst it is clear that transport must contribute to these cross-governmental goals it still remains unclear by how much and over what timescale. That is not to say that (as in Fig. 3) there are not expectations of what might be achieved but that the expectation for transport appears to be driven by what it possible not what is necessary.

Instrument Logic

Framework: What General Norms Guide Implementation Preferences?

The transport sector in the UK has a strongly market-led approach with governmental decision-making processes driven by welfare maximising economic principles. This is evidenced by the privatisation of the bus and rail industries and the adoption of a large-scale public-private partnership (PPP) for the London Underground, for example. The decision-making processes adopted for prioritising transport decisions are based largely around cost-benefit analysis. The initial approach developed and applied to early projects such as the M1 motorway was largely based on pure economic costs (construction and operation) and benefits (time and operating cost savings). 1998 signalled the broader evolution of practice into a more open multi-criteria assessment of a range of factors (including environmental degradation, largely in response to major environmental protests (Dudley and Richardson, 2000)). Whilst the cost:benefit ratio is still critical to the decision-making process the benefits have increasingly incorporated a broader range of social benefits (including a shadow price for carbon). A review of the 1998 roads programme showed that other factors such as qualitative environmental assessments were also influencing the decision-making process (Nellthorp and Mackie, 2000).

The underlying instrument logic has remained largely unchanged with a central approach of the various White Papers to be to ensure that market prices reflect, where possible, the full social costs of journeys made (including the environmental externalities) and that these are also reflected in the prioritisation processes of central government. Over the period, the detail of how this has been articulated and implemented has evolved. The emerging EU Emissions Trading System (ETS), which the European aviation sector will join in 2012, is developing a tradable market price for CO_2 whereby the values are based on expected EU ETS allowance prices. Aside from aviation, transport is in the non-traded sector and relies on the incorporation of a shadow price for carbon in appraisal for government investment decisions. The 2007 White Paper stated that “Fundamentally, we need to get the prices right to cover environmental and congestion costs of transport” (DfT, 2007b, p5), whilst the 2009 Low Carbon Transport Strategy takes this further: “Factoring carbon costs into the prices we pay for transport provides incentives for us to be either more energy-efficient or to opt for lower carbon alternatives. It also sends the right long-term signals for investment.” (DfT, 2009a, p86). This suggests a fairly strong adherence from the Department for Transport to the quasi-market based logic of the Treasury. The Department for Transport acknowledges though that “carbon pricing is a complex matter. The price itself can be subject to a range of uncertainties” (DfT, 2009a, p87).

This allows climate change to be incorporated directly into the existing decision-making processes in transport, although challenges still remain. Whereas in some sectors (e.g. electricity generation), the costs of technology improvement to cut climate emissions can be

given a direct cost, for most transport policies (i.e. not solely technology) there are co-benefits in congestion reduction and health impacts which makes identifying the attributable costs of carbon reduction challenging. This may contribute to the transport sector appearing expensive as a source of emissions reductions compared with other sectors (DfT, 2004b). It also allows for schemes which provide more immediate time savings (which support economic growth) to be constructed whilst doing little to reduce CO_2 emissions.

There is also a lack of trust and credibility in the underlying logic for pricing, exposed by the incoherent messages produced at the time of the Fuel Duty protests in response to the Fuel Duty Escalator (Marsden, 2002). There is no direct link between fuel taxation and transport spending. Fuel duty is a reasonably good proxy for climate externality costs and these are largely covered by current duty levels. The main externality not accounted for is congestion and whilst the language of the White Papers suggests setting in place the right long-term signals for climate emissions "the Government has no plans to introduce a national system of road pricing" (DfT, 2009a, p92), a position maintained by the current Conservative-led government.

Mechanisms

Framework: What Specific Types of Instruments are Utilized

There has been a fluctuation in the types of instruments that have been ascribed to tackling climate change as shown in Fig. 3.

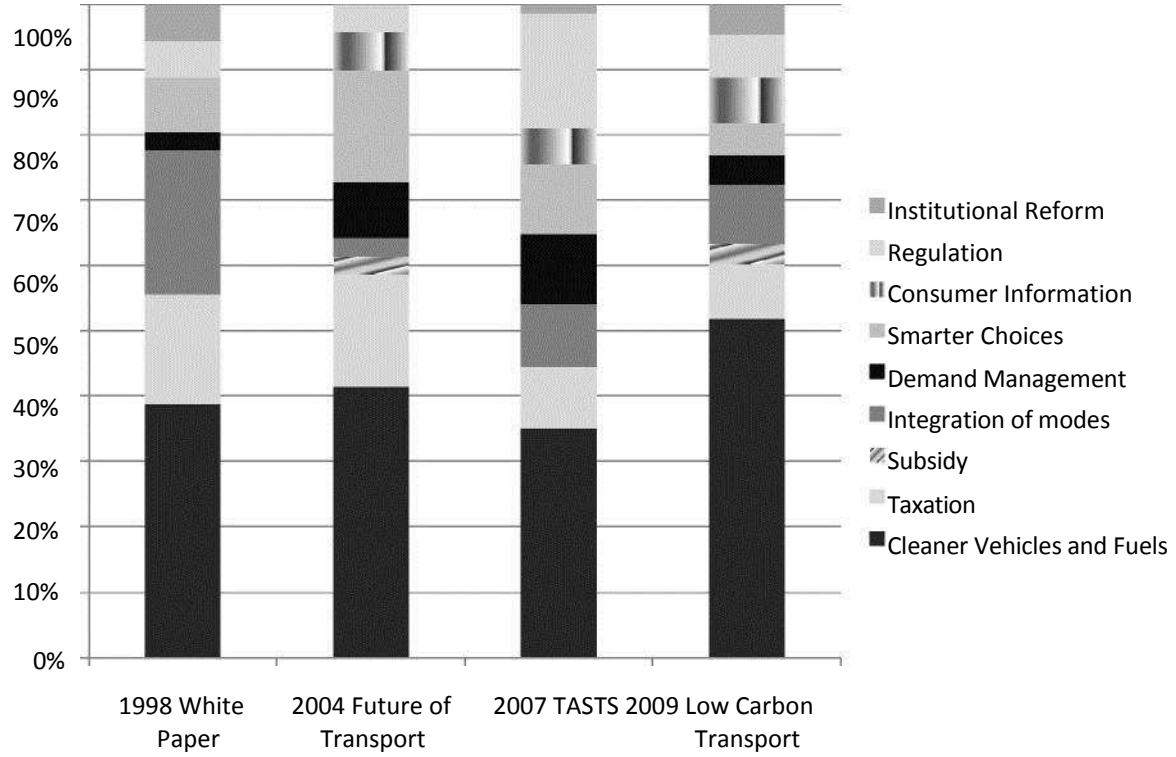

Fig. 3. Types of Instruments proposed to tackle climate change emissions

Technological development dominates with around 40% of all references to carbon reduction relating to vehicle technology or fuel technology improvements up to 2007. This has increased significantly in 2009, which is a reflection of the influence of the King Review and the prevailing

necessity to decarbonise the transport sector. Whilst the earlier White Papers discussed biofuels and the potential in the longer term for hydrogen fuel cell vehicles, the 2009 strategy firmly underlined the role of electric vehicles and plug-in hybrids as part of a transition pathway. This has signalled substantial subsidy for new vehicle purchase and for the establishment of new infrastructures for recharging vehicles.

Taxation has been a consistent theme across the various documents with major changes being made to fuel duty, Vehicle Excise Duty and company car taxation over the period, to provide incentives which are more aligned with lower carbon choices. Subsidy is generally limited, focussing on initiatives such as low carbon buses, new ultra-low carbon car purchases and grants for intermodal freight transfer (to rail and shipping). This implies integration with the Treasury as it has responsibility for setting these taxes and agreeing spending on subsidies.

The integration of transport modes was unsurprisingly a major feature of the 1998 White Paper. Despite the potential offered by the Smarter Choices report for carbon emissions reduction, this was largely seen as important to congestion and although frequently cited in the 2004 White Paper was not identified as having a major impact on climate policy. The 2007 and 2009 analyses put more emphasis on the importance of local and regional solutions as 64% of CO_2 emissions from transport are identified as coming from journeys of under 25 miles in length (DfT, 2009a, p28).

Regulation has grown in importance, relative to other mechanisms, and also in terms of specificity over the period. There are some common themes. International aviation and maritime emissions fall outside the purview of the UK and European authorities to some extent, requiring agreement by the International Civil Aviation Authority and the International Maritime Organization respectively and these decision-making bodies have generally been slow to react. This has led to the EU seeking to take action where it can, for example through the inclusion of flights within the EU in the EU Emissions Trading Scheme. This was not a feature of the 1998 White Paper, was a possibility in 2004 and was in process by 2009. The car manufacturing industry is also global in its nature (although with a strong European base) and the UK government works within a European framework to influence the efficiency of new cars. This has included a voluntary and now mandatory commitment to the EU to reduce the CO_2 emissions of new cars. Nationally, there has been a shift in emphasis with all forms of transport related regulation incorporating climate objectives. The 2009 Low Carbon Strategy signalled for example, that the rail sector will include environmental performance objectives in the next round of franchise renewals.

Overall, the development of a specific Low Carbon Transport Strategy underlines an increase in the number and sophistication of the mechanisms that can and are being applied to tackle climate change. A note of caution is necessary however, as not all of the policies reported are necessarily effective and the strategy has yet to be reintegrated into a broader national approach. For example, the increase to 100% concessionary fares for over 60s in England (introduced in 2006) is branded as a climate reduction policy when in reality it serves a social inclusion function and may encourage additional bus based trips rather than reducing car travel per se. The decision to pursue high speed rail is also included as a pro-environmental policy when the environmental benefits form only a small fraction of the overall scheme benefits (Gonzalez-Gonzalez et al., 2010). There may be strong economic arguments for high speed rail in England but as a climate reduction policy there are very limited co-benefits compared to the opportunity cost of an estimated £16bn investment.

Calibrations

Framework: What are the Specific Ways in Which the Instrument is used?

It is not possible here to review all of the mechanisms set out above so a small number of key exemplars are used:

- Vehicle Excise Duty was reformed in 2005 to incentivise the purchase of lower CO_2 vehicles. Nine bands were established which related to a combination of CO_2 emissions and other toxic air pollutants. In 2010 this was expanded to 13 bands to provide greater differentiation and incentives for purchasing lower carbon vehicles. A specially enhanced first year VED rate was also included which was set at £0 for the lowest carbon vehicles and ranges up to £950 for the highest carbon vehicles.
- The UK was part of a voluntary agreement within the EU for manufacturers to reduce the fleet average new car emissions rates to an average of 140 g/km of CO2 by 2008 (a 25% reduction from the 1995 level). As a result of slightly disappointing progress (on average) and because of the need to make more ambitious improvements in the coming decades a new agreement to 2020 has been formalised with a target of 95 g/km with manufacturers facing fines for every vehicle sold for each g/km above the threshold.
- An operating subsidy is provided to all bus companies, now referred to as the Bus Service Operators Grant (BSOG). BSOG was, in 1998 a simple Fuel Duty Rebate with operators refunded on the basis of the amount of fuel used. Such an incentive is clearly not well aligned with fuel use reduction but reform to a per passenger subsidy has proven difficult to implement (HoC, 2011). In 2009, an additional rebate was given to low carbon buses, which provides some correction to this.

In general, the calibration of climate related instruments has become more sophisticated over time, as has the evidence base that underpins it. Light goods vehicles and the freight sector more generally appear relatively poorly understood and are not currently treated with the same sophistication as surface passenger transport and efforts here are focussed proportionately more on gathering the evidence base.

The approach to tackling the efficiency of vehicles is far clearer than the approach to reducing the amount of travel and transport activity that takes place. The 2007 White Paper looked ahead to a 2.25 per cent increase in transport spending in real terms per annum up to 2018-19, which would have more than doubled government expenditure on transport from 1997-98. However, little headway was made in curbing the growth in road transport and providing the radical change promised in 1998 with the funds available to 2010 (Docherty and Shaw, 2011). There seems little prospect of a more coherent and ambitious approach to this strand of the strategy in the current environment of reduced funding.

Conclusions

Returning to the analytical framework, most evidence of first order change can be shown as relating to the settings of policy instruments, as might be expected. Broadly speaking, the same types of instruments and market-based logics have remained in operation over the period, but there have been subtle recalibrations to adjust to new conditions and in response to experience consistent with Hall's expectations on social learning (Hall, 1993). However, this is only part of the story and social learning alone by no means captures all developments. Alongside established instruments such as fuel taxation, new ones have emerged (e.g. EU Emissions Trading and Air Passenger Duty) suggesting elements of second order change. It would be difficult to argue for paradigmatic change though: wholesale changes in policy are not evident and do not appear to be an immediate prospect. While it might be argued that expert opinion points in this direction, this would require a political shift that appears unlikely even with a new government ostensibly committed to becoming the 'greenest ever'.

The framework has proven a useful tool in separating the dimensions of policy change and describing what policy is supposed to achieve (the ends) and what is put in place to achieve it (the means). Further interpretive work is required to understand the appropriateness of the

settings and how those in one sector link with those in other (e.g., transport with energy and planning) to understand consistency across policies. In addition, the framework invites but does not formalise an evaluative tier which would consider the degree to which the policies are implemented and how, in a real-world setting, their effectiveness might be impacted by other conflicting or synergistic policies within (e.g. rising bus fares) or outside transport (e.g. the opening up of school choice). In other words, providing a greater focus on the question of 'what difference does this make when policy is put into practice'?

Might current conditions lead to is a radical shift in policy? The Climate Change Act creates some of the conditions for such a proposition to emerge in that it provides a framework against which progress will be assessed. This, in turn, might create pressure from outside of the transport sector for accelerated change. The uncertainty and upward trajectory of oil prices may drive greater industrial and individual action more than government policies are able to do and might provide a rare window of opportunity for radical initiatives that would lock in the benefits of change. However, the combination of high oil prices and economic recession also dampen travel demand and allow the government to achieve its short term ends with limited additional action, perhaps instead creating a window to watch and wait while relevant technology advances.

Whilst the policy of cutting carbon emissions seems relatively uncontested, the politics of developing the solutions are not. The current policy discourse is framed around the potential technological revolution, in the form of a zero emission vehicle fleet, which could also support a green economy and expanding choice. Whilst the prospect of tackling climate change largely through technology exists, it is difficult to see the political need to risk more aggressive behaviour change policies. More restrictive policies are likely to be difficult to implement and hold strong equity implications. Thus, while there are plans for a transition to lower carbon technology, other measures that might reduce the growth of traffic are marked by less commitment. Paradoxically, the transition to lower carbon technology will also, over time, lower the per-mile costs of travel which could create significant adverse impacts on congestion and other aspects of quality of life.

This Chapter has used the case of England to explore how climate change policy is being conceptualised and operated and has focussed on a national level analysis. Within this important influences from the European Union have been demonstrated, from within government but outside of the transport sector and from outside government in the form of external bodies and the role of the private sector in delivering and influencing technological change. The difficulties in adopting an effective long-term strategy under the uncertainty of the future pace of climate change and technological progress and the complex actor networks that define the implementation field are not unique to England. The analytical framework presented here reinforces the importance of understanding the evolution of climate change policy in the broader context of the norms, practices and traditions of area of study and should inform future cross-comparative work. It also suggests that a broad range of analytical tools may be required to fully understand why policy changes.

The analytical framework requires us to resist a snapshot analysis of events and take a longer view. Periods of marginal adaptation can suddenly shift to transformational change, particularly where circumstances external to the policy subsystem change. Such change is less predictable than incremental change and can be prompted by external crisis (war, financial meltdown, natural disasters). The unfortunate irony in this case is that the gradual and incremental nature of change increases the chances of 'external' shock in the form of major environmental change.

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