



Building a low-carbon future: The politics of climate change

Edited by **Anthony Giddens, Simon Latham and Roger Liddle**

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Stephen Hockman
David Kennedy
Peter Mandelson
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policy network

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About Policy Network

Policy Network is an international thinktank dedicated to promoting progressive policies and the renewal of social democracy. Launched in 2000 with the support of the then heads of government, Tony Blair, Gerhard Schröder, Guilano Amato and Göran Persson, it facilitates the sharing of ideas and experiences among politicians, policymakers and experts on the centre-left.

Policy Network's president is Peter Mandelson, UK secretary of state for business, enterprise and regulatory reform. Chair and vice chair are Giles Radice and Roger Liddle, respectively. The director is Olaf Cramme.

Through its international programme of research, publications and events, Policy Network seeks to promote international best practice and provide innovative answers to shared problems, equipping social democrat modernisers with the intellectual tools necessary to meet the policy and political challenges of the 21st century. Currently our research programme and core activities encompass the following themes:

Progressive Governance

Since its launch in 1999, the Progressive Governance Network of international policymakers and academics has been at the heart of Policy Network's activity, with major conferences and summits held in Washington, Berlin, Stockholm, London, Budapest and Johannesburg over the past decade. This year's event, dedicated to the theme of "responses to the global crisis: charting a progressive path" took place in Chile in March 2009 and brought together over 200 senior policy-makers, including Gordon Brown, Luiz Inácio 'Lula' da Silva, Joseph Biden, Michelle Bachelet, and José Luis Rodriguez Zapatero.

Foresight: forging common futures in a multi-polar world

Foresight is an international programme of investigation and debate structured around the challenge of forging common futures in a multi-polar world, organised by the Alfred Herrhausen Society, the international forum of Deutsche Bank, in partnership with Policy Network. The initiative aims to foster better multilateral understanding of the key challenges facing today's major players in order to promote a fairer and more functional international order. It was launched in June 2008 with a major symposium in Russia. The

next international symposium of the project, Foresight USA, will take place in June 2009 and is being held in Washington in partnership with the Brookings Institution. Further events are planned in Europe, Brazil, India and China.

An EU “fit for purpose” in the global age

This is an interdisciplinary, cross-party investigation of policy options for the EU post-2009 that aims to establish what kind of Europe is fit for purpose in the global age. It involves analysis and discussion of how the EU can reform itself both internally and externally to respond to the challenges of globalisation. A forthcoming publication, which builds on the project’s substantial synthesis report “Options for the EU post-2009”, will include three volumes of work: EU solidarity, legitimacy and governance; A new socio-economic settlement after the financial crisis; Leadership and security in the global age.

Globalisation and social justice

This research programme looks at the changing facets of progressive policy with reference to the pursuit and enhancement of social justice in light of rapid global change. The recent publication of the book *Social Justice in the Global Age* (Olaf Cramme & Patrick Diamond, Polity Press, 2009), builds on the programmes findings to date, developing a robust theoretical and public policy framework which can help sustain new forms of equity and solidarity.

Managing migration in times of economic crisis

This new research programme examines the interaction between the politics and economics of migration, recession and recovery in Europe. It explores changes in the rates of inward and outward migration during an economic downturn to develop insights into the impact of migration on labour markets and public spending at different stages of the economic cycle. A key question explored in this programme is the role that migration plays in voter behaviour during a recession, and what implications this has for centre-left parties in different European countries.

Acknowledgements

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Our next debt is to the authors who have contributed to this pamphlet for engaging so positively with this initiative, which we hope will prove to be a suitably worthy and thought-provoking intervention in the climate change debate to match the high quality of the pieces they submitted.

Our third debt is to the other members of the team at Policy Network. In particular, we would like to thank Annie Bruzzone, Alfredo Cabral, Isra Jawad, Elena Jurado, Priya Shankar, Elvira Thissen and Suzanne Verberne-Brennan for the support they gave us in recent weeks. Extra special thanks go to Jade Groves for her excellent work over the course of the project and to Michael McTernan and Kathryn Skidmore for their diligent and thoughtful approach to the design and editing of the pamphlet. Olaf Cramme, our director, has been an incomparable source of intellectual guidance and practical advice.

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Anthony Giddens, Simon Latham and Roger Liddle
London, May 2009

Chapter 1

The politics of climate change: our role in the debate

Policy Network

Policy Network decided to enter the climate change debate for three main reasons. These illuminate the distinctive contribution we hope to make.

Firstly, the weight and objectivity of scientific opinion about the dangers posed by climate change has clearly been a vital clarion call for action. Finding the requisite solutions and alternatives to decrease our consumption of dangerous greenhouse gases poses a huge technological challenge and necessitates the formulation of a sophisticated economic response to correct what Nicholas Stern has rightly described as the biggest market failure in history (Stern, 2007). But to facilitate these technological breakthroughs and more rational economic frameworks in order to tackle climate change effectively requires profound change in politics and public policy and the perspectives through which politics is currently conducted and policy is presently framed.

Secondly, our aim is to facilitate a cross-party and inter-disciplinary approach to this issue. Policy Network, as its name suggests, is a “network” that brings together experts academics, senior business stakeholders, politicians and policymakers from different countries for the purpose of debating comparative experience of common challenges. The study of cross-country comparisons in devising effective public policies to tackle climate change is both a suitable subject for Policy Network and relatively underdeveloped as an analytical field.

Thirdly, we are seeking to move the climate change debate beyond questions pertaining to the likelihood of bargaining trade-offs in and detailed design of an international emissions reduction agreement in Copenhagen, and focus analysis on national action in developed countries. At present, there is no shortage of interest and debate about how we might secure a global agreement to reduce carbon emissions to a sustainable level.

The question of whether and how an international agreement is reached at Copenhagen on a global commitment to carbon reduction is rightly an issue of the first order – and we remain optimistic that a positive agreement will be reached. But while international agreement has a key role to play in setting targets, distributing responsibility for reaching them, and acting as a discipline on free-riding, in our view effective action beyond Copenhagen, whatever the outcome there, essentially depends on action by industrialised countries to develop effective national policies that make a real difference on the ground. So what other developed countries are doing, how effective their efforts have been, and what these cross-country comparisons mean for UK policy has been a central focus of this project's work. The issues raised by this sharing of cross country comparisons and experience are innately ones of politics and public policy.

Building a low-carbon future: the argument

This pamphlet argues that at the moment we lack an effective politics of climate change in the developed world and that to realise a low-carbon future requires a strong political narrative of hope and opportunity, underscored by a revitalised co-existence of markets and the state. The contributions herein, therefore, support the conclusions made by Anthony Giddens in his book, *The Politics of Climate Change* (2009), which grew out of a series of expert seminars addressing these and related issues from a comparative perspective, organised by Policy Network at the London School of Economics and Political Science in the latter half of 2008.

The idea behind this pamphlet is to begin a focussed and comprehensive analysis of how the lack of an effective politics of climate change can be redressed. The pamphlet is divided into three sections: the first analyses five central dilemmas of *domestic policy* in advanced economies; the second looks at how to develop and entrench an international emissions reduction agreement in key nation-states; and the final section examines the United Kingdom as a leading low-carbon case study.

The dilemmas of domestic policy in advanced economies

There are five important dilemmas in domestic policy that must be redressed in order to develop an effective politics of climate change in advanced economies.

The *first dilemma* is how we deal more effectively with the interrelated challenges of two profound market failures: the “credit crunch” and the excessive consumption of greenhouse gases that will lead to severe climate change. The election of Barack Obama as US president has made a huge difference in this area, particularly given that a prime objective of his planned fiscal stimulus is to build a new, more environmentally sustainable economy in the US in place of, to use Obama’s rich New Testament metaphor, the “house built on sand”. Similarly, the UK government has begun to stress the crucial role that the transition to a low-carbon economy can play in building new sources of strength for the UK economy to reduce its dependence on a severely weakened financial services sector. Clearly, in light of the priority given in both the United States and Europe to the rescue and

resuscitation of the automobile industry, sceptics will argue that these policy responses are clearly partial and flawed from a climate change perspective.

In his contribution, Terry Barker argues that both the “credit crunch” and the climate change challenge can ultimately be traced to the unrestrained pursuit of monetary wealth by corporations and individuals without considering how this would impact upon social and environmental concerns. Barker illustrates how government responses to the global financial crisis recognise the links between these crises, but argues that the restoration of pre-“credit crunch” investment and consumption patterns must be resisted, since the reconstruction of the global economy offers the best socio-economic opportunities for an expedient shift to a sustainable and decarbonised path of economic development at a much earlier date than had been ordinarily envisaged.

The *second dilemma* domestic policy agendas will encounter is the return of energy as a central concern of policymakers, particularly security of supply and energy efficiency. This is a big contrast to twenty years ago when a political consensus had developed that energy was an area of public policy in which government should largely withdraw and leave provision to appropriately regulated markets. The question today is whether the pursuit of a new energy security can be aligned with low-carbon transition.

In his chapter, Jim Watson argues that threats to energy security can be divided into four categories. First, there are potential threats due to disruptions to fossil fuel supplies in international markets. Second, energy security can be threatened by a lack of investment in energy infrastructures. A third threat is based on the challenges of re-configuring electricity supply networks to cope with dependence on renewable sources of energy, while a fourth category includes threats from terrorism and domestic opposition to certain forms of energy supply. Arguing that there is no automatic relationship between a reliance on domestic energy resources and a secure energy system, Watson contends that energy security is different to climate change mitigation, since it combines many attributes ranging from the reliability of consumer supply to the capacity margins in electricity and the exposure of road transport to oil price volatility.

The *third dilemma* for domestic policy is how to develop new and sophisticated forms of government planning to ensure that long-term emission reduction targets are achieved. The climate change challenge is such that it poses complex problems of governance that the current composition of the state makes it difficult to overcome. This is because it cuts across the normal boundaries of departmental responsibility and established public policy priorities. It also requires a greater steering role for government in the economy, especially in the long-term planning of infrastructure that is necessary to facilitate a low-carbon economy. This need for “planning” goes against the neo-liberal orthodoxies that have dominated approaches to public policy for the last generation, while at the same time requiring governments to avoid the mistakes of centralised economic planning in the post war era.

In his paper, Felix Christian Matthes makes a bold and persuasive case for re-casting state planning to allow for its “renaissance” in climate change mitigation. In particular, Matthes argues that in order to unlock new options and technologies to reduce emissions, it is essential to plan and develop infrastructure provision that will allow for major uncertainties *vis-à-vis* what types of technologies will be invented and pursued in the context of a fast-paced global investment process. Matthes argues, however, that this provision can only be orchestrated through a system that acknowledges the fundamentals of democratic procedures and institutions, as well decentralised co-ordination and decision-making, in our societies.

The *fourth dilemma* in domestic policymaking is how to maintain and entrench political consensus in developed democracies. At present there remain formidable challenges in mobilising and sustaining public support for action. Public concern about climate change has reached a salience where governments in most of western Europe, the United States and rest of the OECD as a general rule want to look “green”. Yet until recently, right-wing governments in Australia and the United States were deeply sceptical about climate change, but the “Blue-Green” example of David Cameron in the UK suggests that the successors to George W Bush and John Howard may not take such an unconstructive view. Indeed, it is clearly vital to effective action on what is a long-term challenge and process that the maximum cross-party consensus is achieved.

But climate change policy has to move beyond political positioning and must not be monopolised by one political party or ideology. The chief problem with the popular presentation of climate change in terms of a “threat” is that it comes across as both overwhelming and existential, yet at the same time unspecific and distant. This makes politicians anxious to be identified on the side of finding solutions to the problem, but reluctant to make the tough choices arising from it. Few are willing to admit that low-carbon transition involves higher prices for fuel and power, even though this seems to be an inevitability, if our existing dependence on energy that is cheaper but higher carbon-emitting is to be reduced. Thus politicians hold back or pause when confronted with the changes that will logically need to be made to patterns and (associated costs of) living or the need for industrial restructuring. The risk is that hard decisions that involve short term costs are dodged or postponed, while at the same time commitment to carbon reduction is demonstrated by accepting and stretching long-term targets, like in the UK case where commitments carry the force of statute and by vigorously pursuing and prioritising international negotiations.

Hugh Compston and Ian Bailey tackle this dilemma head on, arguing in their chapter that the success of future climate policy hinges as much on the political strategies used to build support for action, as on the specific instruments used to curb emissions. A “policies-and-instruments” approach, though it has successful focussed attention on core consequences for climate change like effectiveness and economic efficiency, has paid insufficient attention to the problem of how to build political support for climate change

policy. This is despite the fact that the brief history of climate change policy in the UK and beyond is littered with good ideas that had to be, at best, diluted, or, worse, abandoned, due to negligible support from the public, industry and special interests, not to mention obstacles within governments, legislatures and political parties.

The *fifth dilemma* here is the complex issue of how welfare provision must be re-fashioned to accommodate the risks of a low-carbon society. The key problem in this area is how to protect the less well-off and most vulnerable in the transition to a low-carbon economy. This is not an easy question to answer. The distribution of carbon use does not match the distribution of income in a clear or linear way and there is no simple compensation mechanism available for higher energy prices that does not result in a complex pattern of winners and losers.

Roger Liddle and Simon Latham argue that overcoming climate change requires a new politics of social justice in developed countries. This requires policies that help the biggest “losers” in society adjust to high energy prices. But it is difficult to devise simple formulae for redistribution through tax and benefits that fulfil both carbon reduction and social justice objectives. Rather a portfolio of policies will need to be developed to make low-carbon transition politically acceptable. The challenge will be to generate the necessary public support for large scale investment in renewable energy, as well as sustainable housing transport and communities. Indeed, this investment will need to take priority over current private consumption and public spending.

Building an international framework for action

As we have already noted, the prospects for reaching an international emission reduction agreement continue to command widespread political attention. While the question of how, for instance, emerging economies can be integrated into an agreement that allows their rapid growth to continue relatively unhindered is rightly worthy of discussion, the acceptance of emission reduction targets at the international level does not automatically translate into action at the national level, where they will ultimately have to be delivered upon. To this end, two essays in this pamphlet address some of the most difficult issues that arise in securing an international agreement from the perspective of how they will impact upon national action.

In the first instance, the issue of enforceability and international arbitration of climate disputes is assessed. In his paper about how to overcome this problem, Stephen Hockman advocates a radical new proposal for an “International Court for the Environment”. Hockman argues that this Court would be compulsory and include: a broad coverage international convention on the right to a healthy environment; accessibility, alongside states, by NGOs and private parties; transparency in proceedings; a scientific council to assess technical issues; and a mechanism to avoid legal forum “shopping”.

Yet, Copenhagen may only achieve modest progress towards Stephen Hockman’s

ambitious goal. A detailed agreement seems unlikely unless a means can be found to offer China, India and others clear incentives for their participation. Mutsuyoshi Nishimura sets out a basis on which this might be done, arguing that the first step in forging an agreement in Copenhagen and beyond is reliant on developed countries demonstrating a strong and clear commitment to low-carbon transition by establishing ambitious and legally-binding emissions reduction targets. He also proposes the negotiation of Nationally Appropriate Mitigation Actions with key emerging countries whereby a commitment to targets would be backed by offers of money and technology to help deliver them from the rich parts of the world.

The United Kingdom: the politics of low-carbon transition

The final section of the pamphlet turns to UK government policy, with three diverging perspectives. As a post-industrial economy that has only recently begun to seriously address the public policy implications of the climate change challenge, the UK provides, in many respects, the best example of a country that has already committed to low-carbon transition but remains hamstrung by many of the dilemmas inherent in the development of a domestic policy agenda and the pursuit of international action.

Peter Mandelson argues that the move towards a low-carbon society demands an approach that transcends politics in the “party-political” sense. He argues that is vital to make policy which stresses the economic advantages and business opportunities of low-carbon transition. This means seeing low-carbon transition as a problem for industrial policy in the broadest possible sense, of which there must be three central principles: a long-term strategic approach; using the power of government to supplement the market; and ensuring that UK-based companies are equipped to cope with the new demand created by UK government policy.

Samuel Fankhauser, David Kennedy and Jim Skea argue in their contribution that the UK has the most advanced climate change legislation in the world in the form of the recent Climate Change Act, adopted with broad support across all political parties. While Fankhauser, Kennedy and Skea argue that the UK could meet the carbon budgets proposed in the Climate Change with considerably less fiscal expenditure than the cost of addressing the present financial crisis, they do acknowledge that the socio-economic effects of fuel poverty and unilateral action on business are of serious concern, despite legislative provisions to mitigate any negative consequences.

Neil Carter argues in the pamphlet’s final contribution that, despite the UK’s reputation abroad as a climate change leader, this international success has deflected attention from a very modest domestic record that has seen many key targets being missed. In particular, Carter highlights the UK’s reliance on carbon offsetting and minimal R&D spending as impediments to a focussed and long-term approach to climate change policy, while he argues that the government has only shown limited ambition to date with its spending on energy efficiency measures and should, for instance, be making it a legal requirement

for all new homes to be fitted with renewable energy heating systems.

Building a lasting consensus for a low-carbon future

In our view, a more promising politics of climate change needs to be built around credible plans for national action within an international framework. Among the future dilemmas that need to be resolved, the following appear the most difficult and important:

- As part of a binding global deal at Copenhagen, there should be agreement on the transfer of cash and technology to help emerging economies mitigate carbon emissions and sustain their rapid economic growth, despite the fact that this will be prone to populist attack as a subsidy for competitors to diminish certain forms of employment in advanced economies.
- Business requires more investment certainty if private capital is to be tapped and technological innovation promoted. An economic framework should be established that signals a predictable and significantly rising price for carbon that incentivises long-term private investment in carbon reduction. The pioneering EU ETS has so far not succeeded in this objective and needs to be strengthened either by introducing an EU-wide reserve price in carbon auctions or a complementary carbon tax.
- Investment in the necessary infrastructure should begin now to support new renewable forms of electricity generation, new types of electric and/or low-carbon vehicle, better urban and inter-city public transport, and a more sustainable pattern of housing and employment. Such investment requires a long-term economic steering plan by government. While a good deal of this investment should be privately funded, it is also likely to require substantial public resources at a time of highly constrained public expenditure. In the UK, for instance, planned reductions in public investment in the years ahead require urgent examination of new hypothecated sources of finance for low-carbon transition like motorway tolls and congestion charges.
- While energy and carbon efficiency can be promoted successfully through regulation and targeted subsidies, higher energy prices have to be part of the mix. Government has to find a way both of publicly endorsing this and producing a plan to mitigate the impact on the social justice of the less well off who lose out.
- Government should work closely with business to devise a framework for low-carbon transition, sector by sector. This framework would aim to determine the appropriate balance for each sector of regulation, public subsidy and pricing to achieve national carbon budgets. Part of this sectoral policy should involve a new industrial policy that considers which new technologies to back with public support and how firms in the domestic supply chain can build the capabilities to win contracts fairly.

In order to press for better public policy towards climate change, Policy Network's objective is to help secure a lasting political and policy consensus on this issue. At the moment consensus is fragile. From the left there is pressure from a "green" lobby which sees climate change as proof of the failure of market capitalism and the need to build a different form of society to replace it. From the right there is a reluctance to accept the validity of climate change science and through this "climate scepticism" to reject pressure for urgent international and domestic action. However, there is as yet no robust consensus of the centre. Our task now is to build one.

Section I
The dilemmas of
domestic policy in
advanced economies

Chapter 2

Will the reconstruction of the global economy be positive for mitigating climate change?

Terry Barker

The global economy has begun a severe contraction after the “big crunch” of 15 September 2008, when Lehman Brothers went bankrupt and the event confirmed that the global investment banks were essentially insolvent without government support. The contraction has progressed month by month, slowing after the first phase as the reduction in holdings of current stocks comes to an end, but expected to continue as consumers’ expenditure responds to lower real incomes. The current consensus is for a reduction in global GDP for 2009, with every major industrial country in decline, and world trade falling more strongly.

This paper considers how the solution to the economic crisis may or may not be positive for mitigating climate change. A positive outcome would take the form of the required co-ordinated intervention by governments being focused on investment in low greenhouse gas options for climate change mitigation. A negative outcome would be if governments attempted to restore pre-crisis investment patterns, and continued the high-carbon production and consumption patterns that have led to the climate change problem from the beginning.

The outcome as of May 2009 remains unclear, but as the paper explains, the fiscal stimulus so far is well below what is needed to restore the global economy to pre-2007 rates of capacity utilisation and growth. Too many countries are relying on the extra spending in the US and China to pull them back to growth. And the “green” component of the stimulus is mainly in China, South Korea, with a smaller (proportionate) effort in the US. It may be even less in other countries. The green stimulus is also diffused across many worthwhile projects, especially in improving water supplies and quality, but with only a small and uncertain component specifically allocated to mitigating climate change.

The financial crisis and the climate crisis: causes and consequences

Both crises can be traced ultimately to unrestrained pursuit of monetary wealth by individuals and corporations, without consideration of the social consequences or environmental effects of their actions. In the events leading to the financial crisis, now leading to mass unemployment, existing regulations were weakened and new regulations opposed in order to promote profit in spite of the obvious risks. The climate crisis has long been recognised by governments but vested interests have lobbied to undermine political and scientific efforts to introduce policies to address market failures and assert social priorities and objectives.

The pursuit of self-interest in a market economy is seen as a virtue by Adam Smith but, as Foley argues, this thinking is based on the fallacy that the pursuit is necessarily “guided by objective laws to a socially beneficial outcome” when instead it involves moral choices at both personal and social levels (Foley, 2006, p. xiii). The effects of the pursuit of self-interest by the bankers are evident from the May report from the Washington-based Center for Public Integrity (2009). The report provides evidence that US investment banks were instrumental in promoting subprime lending in the US through specialised dealers, now mostly bankrupt, and in lobbying against regulation to curb the risky behaviour, with the banks profiting through the repackaging of loans. The bankers profited personally by the banks’ generous bonus schemes, which operate even when the banks make record losses.

Similarly, the self interest of those in the fossil-fuel industries, both producing and consuming the fuels, is evident in their unrestrained pursuit of profit in cases where the damages to future generations have become highly likely in the scientific terms of successive IPCC reports. The lack of corporate restraint is obvious where no adequate global regulations or pricing of environmental damages is in force, such as in the development of bunkering facilities in northern Canada, in expectation of new shipping routes through previously frozen Arctic waters. The inevitable consequence of such a development is more soot deposits on the Greenland ice sheet and hence more melting, exacerbating the sea level rise as global temperatures rise.

These are instances of massive market failures associated with systemic risks: firstly, the market failure of the financial system when the banks fail to take account of the risk that house and other asset prices might fall, and hence undermine their solvency; and secondly, the market failure associated with climate change, that is the use of the atmosphere as a free waste disposal for greenhouse gas emissions from burning of fossil fuels and biomass in market-induced deforestation. Both are highly non-linear systems failures leading to extreme events in the economy, e.g. the collapse of Lehman Brothers bank on 15 September 2008, and in the environment (such as climate-change-induced hurricanes). And both threaten the world’s economies with catastrophic collapse.

The solution to both market failures is a combination of effective regulation and long-term pricing of risk, in the forms of international standards for banks in creating risky assets, a long-term and reliable global carbon price, and international standards for low-greenhouse-gas technologies and products to reduce the costs of mitigation.

Of course there are striking differences between the two market failures. The financial crisis has been sudden, starting in early 2007, although its roots go back to the financial deregulation that began in 1971 in the UK and US. The climate crisis on the other hand is long term, since it is associated with the accumulation of greenhouse gases in the atmosphere rather than with emission fluctuations from one year to the next, and the effects of the accumulation have timescales of hundreds if not thousands of years (sea level rise). The risks are also different: the financial risks lie in a collapse of trust in money with the consequent risks of unstable prices and global depression; the climate risks are of wild weather over the indefinite future. The other key difference in the crises is in their respective solutions. The financial crisis has required an immediate solution to prevent or manage the collapse of the insolvent banks. The climate crisis is slow and ongoing and has not required immediate action, and so it has been more easily delayed and weakened by special interests.

The direct effects of the finance-led economic collapse on greenhouse gas emissions

The collapse of the global investment banks, with the consequent reduction in lending, instability of prices and falls in investment and trade, has led to reductions in industrial output, personal incomes, household expenditures, and hence in energy use and in greenhouse gas emissions. Since there is a data lag in the reporting of emissions, it is not yet clear how large the reduction will be, but it is likely to undermine earlier scenarios of continuous increases in emissions assumed in IPCC and other climate-mitigation reports. However, at the same time, the global price of oil has fallen substantially from the highs in 2008 of \$140/bbl to \$50/bbl or lower in April 2009. Lower oil, gas and coal prices will encourage a switch back to fossil fuels in energy demand, offsetting the effect of the reduction in overall energy demand on CO₂ emissions.

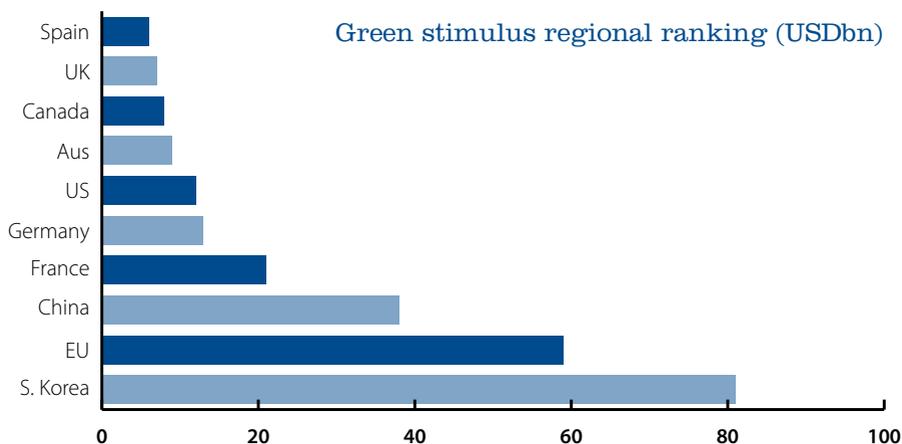
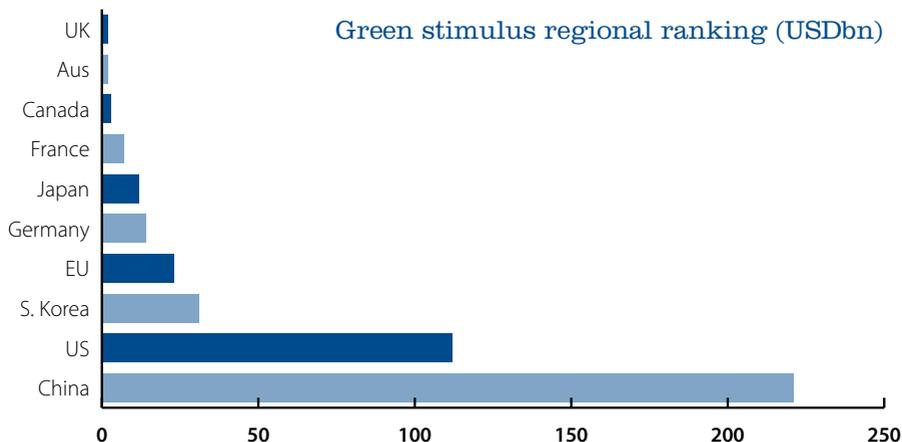
The long-term effect will depend on the length and depth of the global recession. During the Great Depression, from 1929-1934, global CO₂ emissions fell by 25%, but in the current crisis, which is expected to last at least until 2012, the energy system is substantially different, with coal use largely confined to electricity generation, and transportation a much larger share of overall energy demand. Both sources of demand for fossil fuels are likely to be more responsive to the fall in demand than in the Great Depression, but the industrial use of coal, which collapsed in the US 1929 to 1934, is much less important now. In addition, the lower relative cost of coal (the dominant source of CO₂ emissions) and the greater potential for substitution towards coal in modern electricity generation, may lead to more use of coal instead of both gas and the capital-intensive renewables, especially in developing countries. In other words, it is not yet clear how much CO₂

emissions will fall over the next year or so. Much depends on the responses of developing country governments to the crisis. If they take the opportunity to modernise or replace their polluting coal-fired electricity plants, switching to gas and renewables, then the emissions may fall rapidly.

Current policies to restore the global economy to sustainable growth

The critical response affecting climate change mitigation will be the extent to which governments choose to reflate their economies in 2009 and 2010 through a “green new deal” as a component of the general fiscal packages being introduced in many countries to reconstruct their economies after the financial collapse. Co-ordinated international action on climate change has the potential to raise global incomes and employment, provide additional rural employment – especially in areas with limited alternative opportunities in developing countries – and improve human wellbeing through reduced air pollution and associated environmental benefits.

However, in spite of the G20 meeting in London to agree a co-ordinated recovery plan, there has been very insignificant co-ordination of the fiscal stimulus. The main outcome of the meeting was an agreement to increase the size of IMF and World Bank potential lending to developing countries to support their monetary and exchange rate policies. The fiscal reflations that have been announced are nearly all national, with both the absolute size and the green new deal components varying substantially between countries. Charts 1(a) and (b) from the HSBC report ranks the different countries’ announced green stimulus packages up to the end of January 2009 in absolute amounts (a) and relative to the overall package (b). Since then more have been announced, particularly by Japan. The ranking reflects the scale and urgency in which different governments are tackling the problem. China has responded fastest and at scale, bringing forward substantial infrastructure projects, such as investments in rail and urban transport, to fill the gap created by collapsing exports. The new Obama administration in the US has also recognised the need to combine policies which support energy security in the future with policies to counter unemployment, at the same time reducing future greenhouse gas emissions.



Charts 1(a) and (b): Announced “green” stimulus in post-September 2008 fiscal recovery packages (HSBC, 2009)

The overall green stimulus is some \$436bn out of \$2796bn, but these totals are of direct government spending spread over 2 or more years (2009-2010 for China, over 10 years for the US) so the annual amounts may be half or less. Much of the spending is on energy efficiency improvements, but without a carbon price there may be substantial rebound effects, maybe as high as 50% (Barker et al, 2009). The rebound comes as the users of energy take some of the benefits of the increased efficiency in the form of more energy services, such as more comfort or more travel, so offsetting the hoped-for reduction in energy use and hence greenhouse gas emissions. This rebound effect seems likely to be stronger in developing countries, where consumption of energy in the home is well below saturation levels.

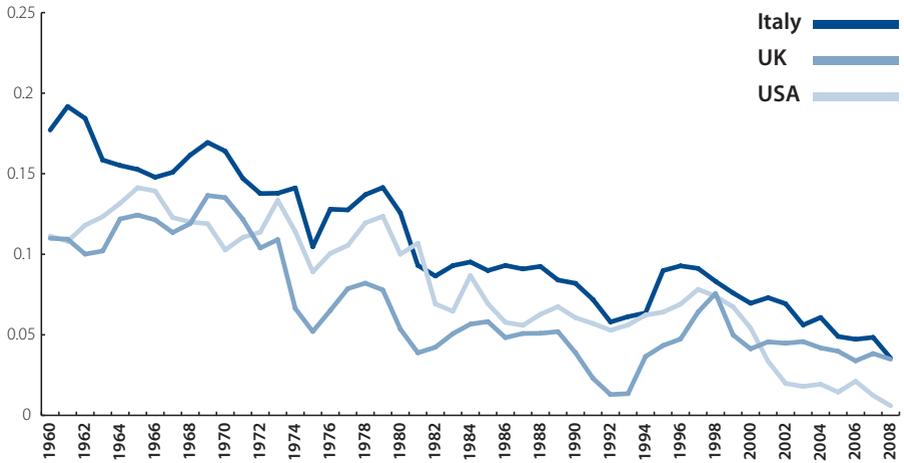
The IPCC in its 2007 report concludes that a global carbon price of at least \$50/tCO₂ (2000) by 2030, and rising thereafter, is needed to achieve the modest 550ppmv CO₂-eq stabilisation by 2100; more stringent targets, e.g. the limitation to less than 2 degrees above pre-industrial temperatures, will require much higher carbon prices. Few credible carbon-price policies have been announced and the emission trading schemes that have been implemented have been weakened by extensive exemptions and free allocations of permits.

The scale of green spending compares with the estimate of 1% of GDP for the low-carbon economy and sustainable transport called for by the UNEP report on the Global Green New Deal (Barbier, 2009). A 1% of GDP pa spent indefinitely on climate mitigation options was estimated by the Stern Review (2007) as appropriate for achieving the chosen 450-550ppmv stabilisation target. This translates to some \$656bn pa globally, \$138bn pa for the US, \$144bn pa for the EU and \$71bn pa for China, using 2007 US CIA (2008) estimates of global GDP. The estimated spending by China of \$110bn a year 2009-2010 is well above the 1%, but other estimates, at least for the major economies, fall far short of the 1% target.

The overall scale of the reflation packages also appears to fall short of what is needed, world-wide, to stabilise the world economy. Apart from China and South Korea, the proposed scale of spending will not offset the decline in investment and net exports in most other countries, and their GDP will decline in 2009. Globally, the reflation packages appear insignificant in relation to (1) the collapse of investment and (2) the likely fall in consumption in economies such as the US and the UK.

The collapse in investment is due to the volatility of prices and exchange rates evident since the banking crisis began in 2007, and the fall in expected aggregate demand witnessed after the Lehman Brothers bankruptcy in September 2008. BAU assumptions were no longer credible to many, and they decided to postpone investment plans, sell off current stocks, and wait until their markets were back to normal. The world economy entered a new unknown regime, since the outcome of the financial crisis and the effectiveness of monetary and fiscal policies were unknown. The reduction in stockbuilding will end as the stocks are sold off. The steep falls in investment and international trade will also slow as replacement investment recovers.

Chart 2: Savings ratios for Italy, UK and USA



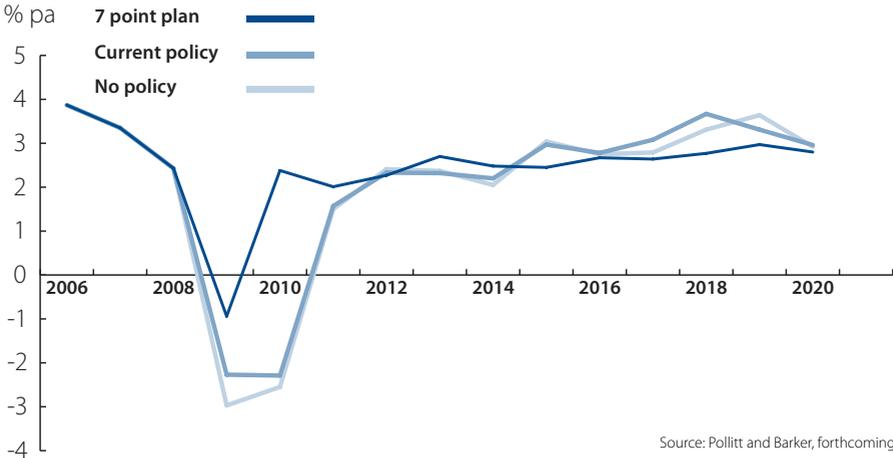
Source(s): AMECO database, Cambridge Econometrics.

In Italy, the UK and the US and several other OECD economies, savings ratios have fallen to near zero, partly as a result of the expansion of credit to households by the banks over the last 15 years (see Chart 2). If, as seems likely, households attempt to restore their levels of savings, then the savings ratios will rise, perhaps sharply – they are reported to be back to around 4% in the US in January 2009. There are several reasons for such household behaviour. First, it is clear that the growth supply of easy mortgage and credit card lending has stopped and that debts are being called in as the banks retrench. Second, households’ net wealth has fallen as house and stock market valuations fall, year on year. Third, the fear of unemployment becomes stronger as the actual counts rise. Fourth, the growth in incomes has slowed, if not stopped, and falling incomes are experienced by those relying on interest-yielding financial assets. Dividends are also likely to fall as the recession proceeds.

Chart 3 shows projections using the global model E3MG taken from Pollitt and Barker (forthcoming). The no-policy scenario assumes that governments did not react to the crisis, banks cut their own investment, encouraged more savings from the personal sector, cut back their own lending, and that investment and consumption are substantially reduced as described above. The depth and length of the recession has been estimated by taking into account earlier regional recessions engendered by financial crises (Reinhard and Rogoff, 2008). The difference, however, between earlier crises and the current one is that the earlier ones were all localised, but the current one is global – and there is no “rest-of-the-world” to help pull the depressed region out of the recession. The world economy is projected to fall by 3% in 2009 and another 3% in 2010 with no policy; and the policy measures announced as of February 2009, make less than 1% increase in GDP in 2009 and less in 2010 as the effects of the earlier stimulus wear off. It should also be noted that the

return to growth in 2011 and 2012 depends on banks resuming full lending, which is not guaranteed, since they may still be continuing to restore their balance sheets.

Chart 3: World GDP growth rates: projection as of February 2009



The conclusion on prospects under current policies is that first decline and then possibly slower growth in the world economy will lead to lower greenhouse gas emissions than previously expected, but these will be partly offset by a shift towards more use of coal in countries without climate policies. The green recovery plans, especially in China will reduce prospective CO₂ emissions, but there is a risk of rebound effects if carbon prices are not high enough. The overall picture is that greenhouse gas emissions seem likely to resume an upward trend after the recession, unless much more substantial action is taken to promote a green recovery and other mitigation actions at the Copenhagen UNFCCC meeting in December 2009.

A 7-point plan to restore confidence and resolve the financial and climate crises

In 2009 governments across the world appear not to understand the depth and scale of the financial crisis. The situation remains unresolved beyond the governments taking over the risks to the banking system and meeting to decide new rules on transparency and integrity. The key fact is that co-ordinated actions over 10–12 October 2008 to the time of writing have not yet restored the interbank markets to “normality”.

One solution after another has so far failed to calm the markets since the scale of the problem was revealed by the bankruptcy of Lehman Brothers on 15 September 2008. There is a risk that the crisis will continue to get worse. It may be that in order to restore

trust in markets and get the global economy back on an even keel, something even more radical needs to be done.

A seven-step co-ordinated and sequenced plan is proposed (see Barker, 2009, for more details and Pollitt and Barker, forthcoming, for estimated effects).

1. Allow the markets to work without more interference. Let the markets work so that banks go bankrupt if they become insolvent. When the potentially bad banks are declared bankrupt (if that is the market verdict), then the bad money would be flushed out of the system. The institutional knowledge in the banks can be preserved by maintaining the employment structure, but replacing the boards of directors. Small depositor and shareholder protections should be instituted or kept in place for equity reasons.

2. Nationalise banks with substantial public ownership after the bail-outs. Such banks can be provided with specified funding for long-term projects, such as those associated with climate change mitigation, with social discount rates set at the central bank's lending rates, near zero at present, and appropriately below market rates in normal times.

3. Return temporarily to a fixed exchange regime with capital controls. Institute a new regime of fixed exchange rates and temporary capital controls, making explicit the huge behind-the-scenes fixing that may be going on. A modest USD and GBP devaluation is probably wise, calculated to restore balance (eventually) to the balance of payments. It would greatly help to establish simultaneously other global prices as signals to support accelerated decarbonisation of the global economy, namely the carbon price and the prices of the main fossil fuels. This involves recognising existing and instituting new cartels, but it will encourage consuming countries to compete for carbon rents by raising carbon taxes and tightening their targets in trading schemes. It could also be extended to encourage the supplying countries to lock undeveloped fossil resources into the ground and biomass sinks in place, by providing new rents for untouched fossil and forests.

4. Consolidate the toxic and weak debt into regional bad banks. The debt should be frozen until it is either restored in value as the economy recovers, or shown to be worthless, with help and advice given to debtors. The Norwegian/Swedish 1992 model is a good one.

5. Reflate via agreed global scale investment, supported by the good banks, especially the newly nationalised banks. Announce massive investment programmes (but not in banking and associated services) of the scale of the failing-bank investment and let the remaining banks consolidate and retreat from their past excesses. The new investment should be justified by cost-benefit analysis

expanded into multi-criteria analysis, allowing for risks, effects on human health and life, and effects on the environment. The investment programmes should be co-ordinated in macro scale but of course tailored by governments to specific regional and national needs and conditions.

6. Institute/reform global regulatory authorities. Reform global regulatory standards and institute a World Regulatory and Standards Authority. The Standards Authority could also usefully consolidate many other proposed and existing standards to support low-greenhouse gas products and processes.

7. Reform international company law. Reform company law to require all companies to take into account the effects of their actions on the global biosphere over the indefinite future. We clearly need a strong signal that unethical and self-interested behaviour is unacceptable for companies as for people. The ratings agencies should explicitly include environmental performance when rating companies.

Without such co-ordinated action it seems very likely that the economic crisis will continue to deepen and develop into a twenty-first century Greater Depression. Good policy design and frameworks will be essential in achieving the greatest benefits from international coordination during the reconstruction of the global economy. Businesses need clear signals and incentives to invest and hence increase employment during the recovery.

One component of this plan (point 5) is for a green new deal, as also supported by many other commentators (Barbier, 2009; Bowen et al., 2009; NEF, 2008; Pollin et al., 2008; Spilimbergo et al., 2008), but it will require unprecedented international co-operation if costs are to be kept low through standardisation, specialisation and trade and the recovery in employment to be widespread and sustained. A framework establishing a reliable global carbon price, e.g. via a scheme for decarbonising international transportation, will support the new deal in climate change mitigation and encourage innovation and rapid acceleration of investment in low-carbon technologies.

Conclusions

The transition to a low-carbon global economy is a system-wide change and the global financial collapse is a system-wide catastrophe. The reconstruction of the global economy could be the best opportunity we have to shift to a sustainable path, in the sense of achieving the decarbonisation of the global economy at an earlier date than has been thought possible. A rapid planned transition seems likely to improve global employment by prioritising employment-intensive mitigation options, such as energy efficiency in homes and cultivation of biomass on degraded land. It can also improve general wellbeing by reducing associated air pollution e.g. through shifting energy sources away from coal and towards renewables and shifting transportation towards zero-emissions electric vehicles. However, the scale of the fiscal stimulus appears to be shorter than

of what is needed to curb the recession and the proportion countries are allocating to climate change mitigation, with the possible exception of China, will have small effects on global greenhouse gas emissions.

Chapter 3

Is the move toward energy security at odds with a low-carbon society?

Jim Watson*

The return of energy security

Energy security has risen up the global political agenda during the past few years. There are many reasons for this: rapid increases in oil and gas prices, particularly in 2008 before the recession hit; heightened awareness of terrorism in the wake of 9/11; the war in Iraq; and the blackouts that have hit several electricity networks – particularly in summer 2003.

Energy security is not a new issue. It dominated the energy policy debates of the 1970s and early 1980s – and in some countries, it never really went away. However, its return to the top of energy policy agendas has consequences for other priorities. There is now an imperative for radical action on a global scale in the face of climate change. What does a renewed emphasis on energy security mean for climate change policy? This paper explores this question in two ways. First, it unpacks what energy security means, and analyses the key security threats to the UK energy system. Second, it assesses the tensions and synergies between the climate and security agendas in UK energy policy – and asks how these two objectives can be reconciled.

The global prominence of energy security as a critical policy driver is clearly reflected in the UK policy debate. According to official government statistics, the UK rejoined the club of energy importers in 2004. Supplies of primary energy sources such as coal, oil and gas fell below the level of consumption. The UK had previously been a net exporter of energy (mainly as a result of North sea oil and gas) for most of the previous 20 years.

** The thinking in this paper was informed by interactions with a number of Sussex Energy Group colleagues, particularly Alister Scott, Raphael Sauter and Andy Stirling.*

To compound matters, international prices of oil and other fossil fuels began to rise in the early 2000s after 15 years at relatively low levels. In addition, there was increasing anxiety about the UK electricity sector – due to the prospect that many existing coal and nuclear power plants were due to close in the near future.

This shift in the UK context is very clear when the energy policy White Papers of 2003 and 2007 are compared. The 2003 White Paper, set out a radical low-carbon vision for the future. Four familiar policy drivers were discussed: climate change mitigation, energy security, maintaining affordability and tackling fuel poverty. Within this, it was clear that climate change mitigation represented the overarching priority for policy. The government accepted the recommendation of the Royal Commission on Environmental Pollution that the UK should cut its carbon dioxide emissions by 60% from 1990 levels by 2050.

Fast forward only two years and the politics of energy had changed dramatically. In late 2005, a further review of Energy Policy was announced by Prime Minister Tony Blair. High fossil fuel prices and the UK's return to the status of energy importer were emphasised as rationales for this. But at the heart of the change of direction was a desire to have an active policy in support of new nuclear power stations. In his speech, Tony Blair said:

“Round the world you can sense feverish rethinking. Energy prices have risen. Energy supply is under threat. Climate change is producing a sense of urgency. I can today announce that we have established a review of the UK's progress against the medium and long-term [2003] Energy White Paper goals ... It will include specifically the issue of whether we facilitate the development of a new generation of nuclear power stations”

The results of the review led to a second energy White Paper in 2007. This document still emphasises the importance of climate change mitigation but gives equal weight to energy security as a policy driver. This shift in priorities is embodied in the title of the White Paper's first chapter: *Energy and climate security – a global challenge*. Since publication, UK climate change policy has been strengthened further. The Climate Change Act became law in November 2008, and includes legally binding targets for reducing all greenhouse gas emissions. These include an 80% reduction by 2050 from 1990 levels, and an ambitious interim target for 2020. As a recent report by the UK Energy Research Centre has shown, meeting these targets is not only a matter of reducing emissions much more steeply than in recent years. The task is made even more difficult by the need for a low-carbon energy system that is also resilient to a range of energy security threats.

What do we mean by energy security?

Energy security is a multi-dimensional phenomenon. Threats to energy security come in many forms. Some threats can disrupt the provision of energy to consumers and businesses (e.g. through power blackouts) while others affect the price of energy (e.g. price spikes as a result of geopolitical tensions). Threats can be immediate or longer term, and can originate from inside or outside the country affected. Furthermore, the impacts

of insecurity can be uneven. For example, energy intensive businesses and fuel poor households are particularly vulnerable to the effects of high energy prices.

Many threats to energy security are familiar and regularly make headline news. A good recent example is the impact of Russia's disputes with neighbouring countries about gas supplies, and the consequent impacts on some European consumers. But there are other threats that are less prominent in debates – but have often had a more important impact on UK energy security than those that dominate the headlines. For example, the UK's domestic gas infrastructure has suffered several failures in recent years. These have had an impact on our gas prices and availability in a way that Russia's disputes with its neighbours have not.

Given this complexity, there is a need to be clear about what the key threats to energy security are. This is a pre-requisite for any sensible debate about the extent to which measures to reduce greenhouse gas emissions can also strengthen energy security. Broadly speaking, threats to energy security can be divided into four main categories.

First, there are potential threats due to fossil fuel scarcity or disruptions to fossil fuel supplies from international markets. Many discussions of energy security confine themselves to these threats. This tendency is understandable in the light of the pervasive economic impacts of fossil fuel price shocks. Most industrialised economies are dependent on fossil fuels for the vast majority of their energy needs. Furthermore, the reserves and production of these fuels (particularly oil and gas) is highly concentrated in the Middle East and Russia.

The prospect of absolute scarcity of oil has returned to the energy debate in recent years. Despite the inaccuracy of many past predictions of a global peak in oil production, the view that such a peak is now imminent has gained ground. However, sceptics of the "peak oil" argument point out that it stems from a static view of fossil fuel reserves, and downplays the impact of fossil fuel prices and extraction technology on future availability. Even if the optimists are correct, bodies such as the International Energy Agency acknowledge that the era of cheap oil may be over as developers shift to non-conventional reserves.

The second category of threat is closer to home. Energy security can be threatened by a lack of investment in national energy infrastructures. Access to energy by consumers does not only depend on accessing supplies of primary fuels, but also on timely investment in power stations, transmission lines, gas grids and storage facilities. Within the UK debate, there has been a particularly prominent debate about the prospect of an "electricity gap" as old power plants reach the end of their lives or are closed due to environmental regulations. A strong indication has been given by some that a crisis is imminent. However, this argument neglects the track record of high investment in new generation capacity that has been set since the electricity industry was privatised – and the queue of projects under development.

Perhaps what lies behind the “electricity gap” rhetoric is the fact that many of the new plants being built will burn gas. The UK’s position as a net importer of gas lead to concerns that are linked more to the first category of threat. However, there is also a related threat to security from underinvestment in the UK gas infrastructure. Analysts such as Jonathan Stern argue that the UK debate has neglected home-grown threats to our gas supplies. The Rough gas storage facility fire in early 2006 and the disruption to a major North sea gas pipeline in 2007 both led to abrupt price increases. There is a case for arguing that this was due to a lack of redundancy in the UK’s gas pipeline networks and storage facilities. Therefore, action to strengthen the UK gas infrastructure is essential for both gas and electricity security.

The third category of threat is due to technology and infrastructure failures. Technical failures due to faults or external stresses such as extreme weather are a feature of all large infrastructure systems. They are usually absorbed due to redundancy. But if they become widespread “class failures”, the consequences can be more serious. A good example of this in the UK is the series of faults that affected gas-fired power plants in the 1990s. Ample capacity margins meant that the effects could be managed even when these failures coincided with the winter demand peak – but only just.

Weather impacts on energy infrastructures can also be serious. The predicted impacts of climate change are likely to make them more frequent. The underperformance of France’s nuclear power plants in summer 2003 occurred due to intense heat. The reduced output from these plants was a contributing factor in the blackout that affected a large part of continental Europe at that time. Other examples within this category include the effect of hurricanes such as Katrina on offshore oil and gas facilities in the Gulf of Mexico. Reliability and redundancy are therefore important features of a secure energy system.

The fourth category includes threats due to domestic activism and terrorism. Threats of this kind – particularly non-terrorist ones – are often underplayed. Yet in the last quarter of a century, some of the most important threats to UK energy security have taken this form. The miners’ strike of 1984/85 caused the electricity industry serious difficulties in maintaining supplies. Similarly, the fuel protests of 2001 exposed the vulnerability of distribution systems to targeted blockades of just a few key depots. Historically speaking, non-fossil energy sources such as renewables and nuclear power have been less vulnerable to such disputes. However, nuclear power plants are obvious potential terrorist targets – as are other parts of the energy infrastructure such as gas pipelines, LNG terminals and oil tankers.

A key message from this analysis of different energy security threats is that there is no automatic relationship between a reliance on domestic energy resources and a secure energy system. As the Cabinet Office Energy Review of 2002 pointed out:

“Experience with coal in the 1970s and 1980s, and the fuel protests of 2000 suggest that the equation of “domestic” and “secure” does not always apply. Imports of energy are not necessarily less secure than domestic sources”

This runs counter to some political rhetoric which emphasises the need for more independence from international sources of energy. Instead, it emphasises energy security as being a challenge of interdependency. There are both foreign and domestic threats to UK energy security. Equally, improvements to security can be achieved through investments in the UK to improve energy system resilience, but also through international co-operation.

Climate security

Before discussing strategies to mitigate these threats to energy security – and their compatibility with policies for emissions reduction – there is a further relevant dimension of the security debate. Advocates of strong action to reduce global emissions have used the likely impacts of climate change on international security to win support for their position. These impacts go much wider than energy security. Security in this wider strategic sense is often seen as a “top level” international issue which has historically carried more weight in policy circles than environmental issues such as climate change.

The use of these security arguments has led some to focus on the notion of climate security. This is designed to emphasise the way in which climate change could lead to new security threats. In 2004, a leaked report for the Pentagon made international headlines. At the time President Bush was repeatedly accused of ignoring climate scientists and siding with those seeking to deny any human involvement. The Pentagon analysis warned of large disruptions to many advanced societies due to temperature changes, sea level rises and resource wars if climate change continued unchecked.

More recently, the climate change adviser to the UK foreign secretary has been at the forefront of efforts by the UK to reframe climate change as a security issue. In speeches, adviser John Ashton often cites the conflict in Darfur as evidence that climate change is already exacerbating conflict and insecurity. In an interview last year with the BBC World Service, he argued that:

“[I]n this resource dependent, resource constrained interdependent global economy we can’t enjoy a prospect of food security, water security, energy security unless we also are dealing effectively with climate change”

A clear manifestation of such reframing was the United Nations Security Council debate on climate change, held in April 2007 and instigated by the UK. In a background paper from the UK government, the case for debating climate change in this forum was predicated on six climate-related threats to global security. These included border disputes, migration, threats to energy security and impacts on the availability of other resources. Not all nations

were convinced, however. Many large developing countries argued that this was a step too far and argued that the Security Council was not the appropriate forum in which to debate climate issues.

Such moves to emphasise the broader security threats that climate change may bring are understandable. Reframing climate change as an international security issue may have helped to build political support for climate change action in some quarters. However, this is not necessarily helpful when it comes to understanding the interaction between energy security and climate change. Talk of climate security risks conflating these two complex sets of issues and could obscure rather than illuminate their interdependencies. The geopolitical flavour of climate security discussions also risks reinforcing the common tendency to overlook domestic threats to energy security.

Energy security confronts climate mitigation

Interactions between strategies for climate change mitigation on one hand, and energy security on the other, can be illustrated through contemporary examples. In this paper, two have been chosen to illustrate some of the ways in which these interactions can play out.

The classic UK example is the plan by utility E.ON UK to build a new coal-fired power station at Kingsnorth in Kent. From a climate policy point of view, new coal plants like this are unacceptable unless they are fitted with equipment to capture carbon emissions (carbon capture and storage or CCS) from day one. Otherwise, they would risk increasing UK emissions – and would also send a signal to other coal-dependent economies such as the US and China that the UK is not really serious about its climate leadership.

From an energy security point of view, building Kingsnorth now without full scale CCS makes more sense – at least if analysed superficially. It would use coal, and help to compensate for the expected closure of a number of existing coal-fired power stations. If constructed alongside a number of similar plants, Kingsnorth would also maintain UK energy diversity. These plants would act as a bulwark against overdependence on imported natural gas. But does that necessarily mean that the UK's energy system would be better, and more secure, if Kingsnorth goes ahead? The answer is “not necessarily”. UK gas supplies are increasingly sourced from a diversity of countries via a diversity of supply routes. As noted above, many recent threats to UK gas security have not come from abroad – but from problems within our own gas infrastructure.

A second example is investment in renewable energy. Under an EU agreement, the UK is committed to increasing the share of energy sourced from renewables from the current low level of 2% to 15% by 2020. On the face of it, this expansion of renewables is good for climate mitigation and energy security. Renewable technologies such as wind, solar and biomass have low carbon emissions. Many of the investments to meet the 15% target will reduce the need for high carbon investments in fossil fuel power plants, gas-fired heating systems and petrol-driven cars. Furthermore, the reduction in fossil fuel demand when

compared with BAU will reduce the UK's dependence on these fuels and the exposure of the economy to the impacts of volatile prices.

But is renewables investment always a win-win scenario? Again, the answer is not a straightforward one. While the security benefits are clear, an expansion of renewables will also bring about new security challenges. Illustrative scenarios for the UK target include a large role for intermittent renewables – particularly wind power but also solar heating and solar electricity. This won't be a problem in the early years of renewables expansion. The UK's existing energy systems can absorb much more intermittent plants – most studies say at least 20% of electricity – without entailing large costs or threats to reliability. However, meeting the target is likely to mean well over 30% of electricity from renewables. Some additional investment in flexible power generation plants will be necessary to maintain system security. This future system is also likely to see large numbers of small scale projects in homes, public buildings and businesses. Some electricity distribution companies may have to deal with much more complexity in their networks, and to invest in smarter grids to prevent technical failures.

Can policy achieve both simultaneously?

These two examples illustrate some of the tensions that could arise between climate mitigation and energy security strategies. They also emphasise the multi-dimensional nature of energy security. Strategies to mitigate one type of energy security threat (e.g. exposure to fossil fuel price volatility) can heighten exposure to other threats (e.g. underinvestment in infrastructure) if not thought through carefully.

Of course, there are measures that are much less likely to lead to such tensions. Measures to increase energy efficiency and/or reduce energy demand have the virtue of being genuine contributors to both climate and security goals. Loft insulation in a fuel poor house does not only reduce the exposure of some of the most vulnerable UK citizens to risks from high fossil fuel prices, it is also one of the cheapest ways to cut carbon emissions. On a more general level, a lower level of energy demand within the UK in the future will generally be associated with a lower requirement for complex, resilient infrastructures to supply and deliver low carbon energy.

In cases where such synergies are not so easy to achieve, what should policymakers do to resolve the very real tensions that will arise? One way to illustrate this is to return to our two examples.

First, the case of new coal-fired plants in the UK: for climate change diplomacy reasons, it is essential that the government takes a tough line with Kingsnorth and other new coal-fired plants. As the government has recently proposed, all new coal stations must be used as demonstration sites for CCS technology. Going further, their operators must be compelled to close these plants if they do not scale up their use of CCS to 100% of their capacity by 2025.

Whether CCS technology is developed successfully or not, there is a clear need to strengthen the resilience of the UK gas infrastructure. Gas is used widely for home heating and industrial processes – so building power stations that are not gas-fired does not make gas security problems go away. Investments to strengthen gas system resilience have already been made. The UK is in a relatively good position when it comes to threats such as the recent Russia-Ukraine crisis. New LNG terminals and pipelines and diverse sources of imports means that it will be a long time before the UK is significantly exposed to disruptions to Russian gas supplies. However, there is a clear need for more strategic storage in the UK. The UK has only a quarter of the storage capacity of Germany for example. Increasing the UK's capacity will help to guard against disruptions.

With respect to the case of renewables, there are different potential responses to the security implications of large-scale deployment. As noted earlier, the most important security implications are likely to affect the electricity system. Conventional wisdom suggests that significant parallel investments in other forms of power generation capacity (often fossil fuel based) is needed to balance and back up intermittent sources of renewable electricity. Sometimes, this conventional wisdom exaggerates the extent of the need for balancing plant. However, there are limits to the amount of renewables the system can absorb before threats to system security become significant.

Another way to look at this is to think about more creative ways in which the energy system could change as new low carbon technologies – including intermittent renewables – are deployed. Smarter grid technologies are now being pioneered by countries such as Denmark which can increase the capacity of electricity grids to absorb wind power. The way in which electricity and heat are provided to consumers could also change – away from the expectation that every single appliance should have a 100% reliable supply. Some appliances such as fridges do not need constant electricity 24 hours a day, 7 days a week. Other appliances require a more stable supply. My late colleague Shimon Awerbuch talked of the need for mass customisation of electricity to take this into account. Implementing this in practice is a technical challenge (with a particularly large role for IT systems) and also a challenge to established consumer expectations and behaviours. One further possibility is that electric vehicles could be used as a source of electricity storage. If the current emphasis on these vehicles proves to be more than just hype, millions of them could help the system become much more flexible.

As these examples illustrate, energy security is undoubtedly more important than it was just five years ago. High fossil fuel prices, geopolitics and worries about investment have all contributed to this shift. Strategies to reduce greenhouse gas emissions are increasingly scrutinised to determine their impact on energy system security. Wider concerns about security are also more salient for climate policy. The security implications of climate change have been used with some success in building the case for urgent action.

Some strategies to mitigate greenhouse gases are also good for energy security. But this statement cannot be generalised. There are very real tensions between these policy drivers – and between strategies to deal with different kinds of energy security threat. The examples explored here illustrate some of these, and the ways in which they could be resolved. In some cases, resolution requires radical innovation – for example to harness the power of information technology to make the energy system more flexible and allow large scale renewables deployment. In others, investment is required to compensate for tough climate policies – for example to strengthen the resilience of UK gas supplies. Government needs to put in place clear targeted incentives for innovation and investment to take place.

There is a wider policy conclusion from this analysis. The nature of energy security is different to climate change mitigation. Mitigation of greenhouse emissions can be measured in a relatively straightforward way – so it is clear whether policies are going in the right direction. Energy security cannot be measured in this way. It is a combination of many attributes which might include the reliability of supplies to consumers, the diversity of gas imports, overall import dependency, capacity margins in electricity and the exposure of road transport to oil price volatility. Therefore, security needs to be assessed from a system perspective that takes all of these attributes into account. Policymakers cannot be expected to predict and respond to each individual security threat that might arise. Instead, policy needs to ensure that the overall resilience of the UK energy system is high enough to withstand disruptions as we implement the low carbon transition.

Chapter 4

Do we need the return of state planning to overcome the climate change challenge?

Felix Christian Matthes

Global climate change is probably the most significant challenge that the world will face in this century. If the efforts to combat global warming prove to be insufficient, the consequences of climate change will lead to large-scale disruptions to ecosystems, economies, societies and international relations. If the world is to effectively and sufficiently move towards a low-carbon economy, fundamental changes in economies and technologies, as well as in societies and human behaviour will be required.

Recent research underlines the scale of the challenge ahead. For instance, in order to limit the global mean temperature increase to 2°C below pre-industrial levels, a carbon dioxide emissions budget of 1,000 billion tonnes would need to be set for the first five decades of this century. However, approximately one fifth of this budget has already been emitted since 2000.

For industrialised countries this will require an almost complete decarbonisation together with the transformation towards an ultra-low-carbon economy, all within the next four decades. While developing and emerging countries will be expected to achieve major emissions reductions by 2050 compared with BAU trends. Given the short period of time in which these deep emission cuts need to be achieved, state planning, within the context of an ambitious climate change policy, may have an increasingly important role to play in efforts to overcome the climate change challenge.

Two clarifications should be made at this point. First, state planning is understood as a certain type of state intervention in a democratic society and market economy. Thus democratic procedures and institutions, decentralised coordination and decision-making are the cornerstones of society and the economy. Second, the range of (climate policy-

driven) state interventions goes far beyond state planning, as the range of (necessary) state interventions is much broader than the specific issue of state planning which is the topic of the following argumentation.

The role of the state in the climate policy mix

One could argue that the radical changes required to decarbonise the global economy (i.e. technological innovations and socio-economic changes at all levels of society) constitute a fundamental antagonism to state planning. Indeed, it is difficult to consider state planning as a major tool of climate change policy if decentralised coordination processes and innovations remain crucial in facilitating these radical changes at the required scale.

As a consequence, the conventional wisdom of climate change politics during the last two decades has been governed by the fundamental assumption that the state should define long-term targets, enable the effective exchange of information via markets and allow the transformation process to decentralise decision making. While this remains a fascinating vision – at least for economists – the effectiveness of climate change policy over these last two decades suggests that faster and more effective political approaches are needed, and thus that we need to take a fresh and more in-depth look at the role of state planning in the climate policy mix.

At this point, the important question is how do we enter a renaissance in state planning for the specific but far-reaching topic of climate policy in the face of the deep scepticism that has characterised such interventionism over the past three decades?

In the following sections I will argue that an ambitious climate policy should be defined by a much broader range of activities, in which state planning plays an essential role.

In this respect, target setting, carbon pricing, unlocking key options for emission reductions, developing and deploying backstop technologies, rolling-out essential infrastructures in the framework of major uncertainties and enabling a fast and global technology and policy diffusion process present both traditional and new challenges. The creation of these new frameworks and interventions must encourage decentralised activities and discovery processes in new qualities and quantities. Balancing the necessary and indispensable range of state planning with the need for new quantities and qualities of decentralised activities and coordination is probably the key challenge for an effective climate policy.

Transformational target setting

Climate policy analysts and planners from most schools of thought will register little dissent in accepting that state planning should play a crucial role in target setting. Accepting that climate change has a deep-impact externality dictates that there is no alternative to state planning, at least for the necessary internalisation approaches.

However, there is limited consensus on the need for state planning beyond this point. Should the target setting process focus more on incrementally short to medium-term targets? Or should it also define accountable long-term targets which reflect the transformational changes needed? Should the target-setting be strictly limited to emissions reduction goals or should it also focus on a set of sub-targets that could stimulate a wider range of measures?

First of all, we have to reflect on an acceptable time frame for the levels of transformation required. Given the transformational changes that we need to see occur within the next few decades and the lifetime of the respective capital stock, it is clear that the majority of these changes must be addressed in parallel with one another rather than individually addressed on a consecutive basis. For example, it takes more than ten years to licence and build new infrastructures; the lead-time for innovative energy technologies is in the range of 10 to 20 years in many cases; modern power plants have a technical and/or economic lifetime of about 40 years; buildings have a lifetime of 100 years and renovation cycles lasting about 40 years; and settlement patterns are in many cases inflexible for more than 100 years.

The setting of binding targets may be the more realistic and politically feasible approach for the short and medium term, yet the anticipation of longer-term targets which are subject to regular updating and revision can change the appraisal of investment decisions significantly. For example, in the framework of a 10–20% overall emissions reduction target over the next ten to fifteen years, the substitution of outdated coal-fired power stations by new coal plants, which are 30% more energy efficient, seems to be a consistent strategy. However, if a wider view is taken, which reflects an additional 70% emissions reduction in the subsequent 30 years, the more incremental modernisation approach without fundamental technological change creates more difficulties. On the one hand, it is no longer consistent with the targets, and on the other hand counterproductive lock-in effects are probably created.

Therefore, a carefully balanced and regularly updated set of adequate and ambitious short, medium and long-term emissions reduction targets will create the necessary transparency within the climate policy framework. It is the core, as well as the starting point, for state planning in climate policy.

The merits of backcasting

Based on long-term political targets like the 2°C goal mentioned above, backcasting will play an increasingly important role for achieving the targets set for 2050. It offers a new and much more sophisticated approach to target setting than controversial assessments of feasibilities and costs measured at the lowest common denominator. For example, McKinsey-style greenhouse gas emission reduction cost curves, which combine emissions reduction potentials with the specific costs of emission abatement, are a simple and

therefore often extremely attractive tool for the discussion of climate policy approaches. Yet the interactions between different dimensions of energy and other policies, as well the time frame of the related windows of opportunity, require a much more comprehensive view of the appropriate starting points and targets.

Energy security and vulnerability

Climate policy is probably the most significant but hardly the only policy objective with respect to the energy sector. In a world of finite fossil fuel reserves and major shifts in global energy supply and demand patterns, energy security and an increasing vulnerability to high, volatile energy prices are emerging political issues. Indeed, with regard to energy security and vulnerability, the ancillary benefits of certain dimensions of climate policy cannot be highlighted enough. As without major progress in energy efficiency in households, industry, the tertiary and the transport sectors, ambitious climate targets cannot be reached and the vulnerability of economies and consumers to supply problems, high and/or volatile energy prices will not be manageable.

Over the coming years renewable energy sources might prove to be more expensive than conventional sources (at this point without respect to the external costs of fossil and nuclear energies), but additional costs must be assessed against the wealth transfer created by rising energy bills from suppliers of fossil energies.

As a preliminary result, one could argue that strong state planning efforts are essential to establish, assess and update short, medium and long-term emissions reduction targets, as well as to introduce accountable targets on the expansion of energy efficiency and renewable energies. The key analytical and political challenge will be to ensure at least general consistency between the targets.

Empirical evidence from the European Union's set of 20-20-20 targets (20% emissions reduction, 20% renewables, and 20% more efficient use of energy) shows that the combination of (comparatively) ambitious targets for renewable energies, and (comparatively) weak emissions reduction targets, alongside the introduction of a (comparatively) generous allowance for the use of international emissions reduction credits, could lead to consistency problems. It may also produce weak carbon price signals from the EU ETS, which could create major implications for investment-related lock-in effects and longer-term innovations.

The central lesson of recent EU climate policy decisions is that strengthening analytical capacities will be the key to managing the necessary but complex planning processes involved in establishing a comprehensive set of accountable targets. Although the introduction of targets, in terms of timeframes and scope, is primarily a reference point for the implementation, monitoring and updating of policies (state planning in the narrow sense), the wider effects of target setting must be emphasised. Transparent and accountable target setting at the state level also incentivises decentralised players, from

companies to municipalities, to develop their own visions and strategies within the framework of an ambitious climate strategy. This is far beyond a state planning approach but should nevertheless be acknowledged as an important and intended dimension of target setting.

Carbon price signals

If comprehensive target setting is a crucial starting point for – and an essential element of – a state planning approach, then the creation of appropriate carbon price signals is an imperative second dimension to any comprehensive climate policy mix.

Traditional prices-versus-quantities debate may regularly come back to the academic and political arena, however, in the real world carbon pricing via emissions trading will remain the most appropriate and robust link between politically set targets and timetables on the one hand, and state planning and decentralised coordination, discovery and innovation processes on the other hand.

The empirical evidence, especially from the EU, impressively highlights the multiple options and opportunities which exist to protect certain players from the carbon price signal. These include excessive free allocation of allowances and ex post-adjustments of free allocation or other perverse approaches.

Maintaining an undistorted carbon price signal is without any doubt not subject to state planning but is, nevertheless, a key state responsibility within a comprehensive policy mix. Having said this, it should also be emphasised that even the experience of the EU ETS shows that markets can deliver important results. The scheme has delivered measurable emissions reductions in its first years and, more importantly, it has broken some serious deadlocks. For example, after nearly a decade of debate around if and when the chemical industry could implement reduction measures at a large scale for the greenhouse gas nitrous oxide (which has the 310-fold effect of carbon dioxide on global warming), the introduction of a price on carbon broke the “chief engineers cartel” and showed that these emission reductions were incentivised and quickly implemented at a cost of a few Euros per tonne of carbon dioxide equivalent.

Yet, market-based instruments will only deliver effective and cost-efficient results if they are complemented with a competitive market, in which price signals can make a difference. The return of monopolies and regulated markets could lead to major erosion of emerging gains from market based instruments, but this does not necessarily mean that today’s market designs can or must be maintained. Fundamental and climate policy-driven structural changes of technologies, for one, could very well require major adjustments in market designs. We will come back to this later.

Trial and error: backstop technologies and infrastructures

In an ideal world where we do not have time constraints, yet we have perfect markets which

allow for the sufficient internalisation of externalities, target setting and maintaining the respective prices signals would be sufficient to trigger the transformation to a low- or ultra-low-carbon economy. Unfortunately, these starting points do not meet the real-world challenge of climate policy. More importantly, the emission reductions that are necessary must be achieved in a period of time which only allows for limited trial-and-error cycles in the markets. If the economic lifetime of key investments exceeds the time frame which is available for major emissions reductions, complementary policies will be indispensable. In other words, target setting and carbon pricing will be necessary but not sufficient for an effective climate policy.

But how can we differentiate between the counter-productive micro-management of technologies, business-models and lifestyles on the one hand and the state's key responsibility to enable effective emissions reductions within the required timeframe?

Although there is no perfect answer to this – and a trial-and error process on climate policy-driven state planning will be necessary – at least two key areas can be identified with regard to this challenge: backstop technologies and infrastructures.

The empirical evidence on market-based instruments in climate policy shows that these instruments tend to be short-to-medium term clearing mechanisms. Therefore they can hardly be expected to deliver long-term scarcity signals and thus will not be fundamental drivers in delivering the necessary innovation and transformation.

The recent EU emissions trading scheme generates price signals of 10 to 30 Euro per ton of carbon dioxide. These price levels can generate significant emission reductions which are consistent to the targets for the coming one or two decades. However, for deeper cuts in greenhouse gas emissions additional abatement options must be made available for 2020 and beyond. With respect to lead times of more than 10 years for emerging abatement options and more than 15 years for abatement options which are still in the conceptual phase, complementary policies and planning approaches must be undertaken. If we understand innovation as a complex challenge of technological development and commercialisation in a very wide sense (for example, including acceptance and necessary market designs) choices must be made at the planning level at least with regard to the main options.

There is an increasing consensus that wind energy and carbon dioxide capture and storage (CCS) are the significant backstop technologies among the emerging energy supply technologies – this does not discount from solar and ocean energy which could play a major role in the long-term. But, nonetheless, if we take these examples as a reference point, it is obvious that technological improvements and cost reductions must be achieved. In this sense major progress can be attained through ambitious and focused research and development programmes but also with early market deployment and dissemination strategies.

Yet, the question arises about the suitability of today's design of electricity market and whether it meets the requirements of a climate policy-driven transformation of the energy system where intermittent power production, local power sources and at the same time long-distance power supplies cover a large share of the generation portfolio. If the recent market design, relying on marginal cost-based power pricing does not deliver a sustainable framework for wind power and/or CCS plants, the transformation of power market designs (such as adding capacity markets and introducing allocational signals for plant locations) is a longer-term challenge which has to go along with the innovation process for the respective technologies.

Against this background, choices have to be made at an early stage of development and strong priorities must be set. There will be mistakes (and nuclear energy might be seen as one of these wrong tracks) but there is probably no alternative if we want to see the early identification of key backstop technologies triggering an effective and low time-consuming innovation process. These options and the necessary adjustments in market designs are key tasks for state planning in the future when it comes to energy and climate policy.

Infrastructure regulation

Another key challenge in the transformation towards an ultra-low-carbon economy is the role of infrastructures in the energy and transport system. This is in fact quite critical as infrastructure, and the regulation of infrastructure, is a well established field for policymaking and even for planning. As it stands, without major upgrading and adjustment in transport infrastructure the efficiency gains from rail transport, for example, cannot be achieved. If electricity distributions systems do not become smarter the necessary coordination and efficiency gains between energy supply and demand will not be attained. If the power transmission system is not strengthened and upgraded, wind power will not be able to play a major role in the future power system and without the roll-out of a well-developed infrastructure for transport and storage of carbon dioxide, the CCS option will remain to be a niche-technology.

The roll-out or adjustment of infrastructures requires comparatively long lead-times and major capital investments. At the same time, infrastructures as natural monopolies are subject to intensive regulation, yet there has not been a sufficient approach to infrastructure investments.

We can identify three different approaches to infrastructure regulation which have only poor links today:

Traditional infrastructure regulation – sees its main task as making infrastructure available on a non-discriminatory basis to all interested parties at the lowest cost. Recovering the costs of major infrastructure investments is mostly restrictively regulated. This is even more the case if the roll-out, upgrade or adjustment of infrastructures is related to major uncertainties on how and when the infrastructure must be ready for a

fundamental, adjusted energy and transport system.

Carbon regulation – as it has emerged during the last decades is mostly focused on either the supply from low-carbon energy sources or the efficient use of final energy. In the past, the role of infrastructures as the crucial link between supply and demand patterns was almost ignored. Even for emerging technologies like CCS, the focus is mainly on the technologies of carbon capture, its costs, and safety concerns for the storage sites. The challenge of infrastructure needs is almost considered as a side-topic.

Energy security – the third field of infrastructure regulation is a relatively new topic. From an energy security perspective, the diversification of infrastructures for fossil energy supplies from abroad seems often not to be interlinked with the debates on remaining carbon budgets within an ambitious climate policy.

In order to integrate these three different regulatory approaches to infrastructure, the state must take a key planning role. This is a complicated but at the same time inescapable task if we also consider the manifold and complex uncertainties of this issue. If electricity infrastructures for offshore wind power generation or carbon dioxide infrastructures for CCS are not planned and developed at a time when, in the best case scenario, the timeframe of commercialisation is uncertain, the respective technologies can face serious infrastructure constraints a decade later.

If smart grids are not developed, decentralised load management for electric vehicles will not be possible and could create high costs for additional power generation capacities or additional emissions from non-carbon-free sources.

If major upgrades for the rail system are not implemented at the right time, a change of the modal split towards a bigger share of public transportation or freight transport for the railway system will be not be possible in the longer perspective.

Such counterproductive effects or delays in bringing low-carbon options into the system will not be consistent with the medium- and long-term goals of climate policy. Making the infrastructures ready for future technologies and establishing appropriate regulatory approaches requires a clear vision of the future demands, a clear idea for the development of the energy and the transport system and at least a clear vision on the role of key technologies. At this point the link between future backstop technologies and their infrastructure demands is obvious. If there is a role for state planning with regard to backstop technologies there must be a key role for the state to play in managing the necessary infrastructure adjustments and the related uncertainties.

Comprehensive analysis and planning by the state as the key driver of long-term climate policy is of crucial importance for the major changes in the necessary infrastructure systems.

Global climate policy

Last but not least, a sufficient global climate policy will require heavy transfers from industrialised to developing countries to enable them to bring their future greenhouse gas emissions significantly below the BAU trend. If we consider that industrialised countries were responsible for 80% of the cumulative carbon dioxide emissions in the period from 1900 to the present day, and that in 2050, considering the enormous growth of emissions from China and India, they will still account for about 60% of carbon dioxide emissions in the period from 1900 to 2050, then it speaks for itself that massive transfers will be a fundamental precondition for an ambitious global climate policy. Long-term perspective estimates on the required transfers range from \$100 to \$150 billion annually. If there is no clear vision on how to spend these amounts of capital in an accountable manner, it is unlikely that these transfers will be achieved. Without any doubt, developing blueprints for the spending side of the capital transfers to developing countries will emerge as a new dimension of state planning in climate policy.

Conclusion

The role of state planning will definitely increase given the scale necessary to meet overarching and ambitious climate goals like the 2°C-target. Setting multi-dimensional targets for different time horizons, focused support for key backstop technologies and the development of appropriate market designs, adjusting, upgrading and rolling-out of key infrastructures as well as the respective regulatory regimes, and organising large-scale and targeted capital transfers to developing countries mark the need for state planning at a new scale. However, this bigger role of state planning must be complemented by the need to activate and to incentivise decentralised activities and coordination. Market-based instruments, undistorted carbon price signals, competitive markets but also long-term visions and goals from state planning will play a crucial role on this. Overall, the scope and the intensity of political interventions will be broader and stronger within a policy mix which is sufficient to overcome the climate challenge. State planning will serve as the starting point of climate policy and will be essential to deliver key results in the available period of time. A clear definition of challenges to be overcome by state planning can help to deliver the necessary legitimization of state planning and state intervention. Modern, focused state planning within an ambitious climate policy is by far more than target setting, internalisation of externalities and maintaining the integrity of markets. However, even extended and more complex state planning approaches are only half way to overcome the climate challenge. Without an enabling framework and much stronger incentives for discovery processes, coordination, innovation and transformational changes at the decentralised level, climate policy cannot be sufficient and successful. Therefore new high-quality forms of policy and an advanced theory of how to mix policies will be needed for the coming century's battle against climate change.

Chapter 5

How can we build political support for action on climate change in western democracies?

Hugh Compston and Ian Bailey

Introduction

Numerous policies, initiatives and instruments have been developed over the last decade in an effort to curb human emissions of greenhouse gases. Some have been more effective than others and to an extent the search for the “holy grail” policy goes on, with emissions trading perhaps the nearest to achieving this status. This “policies-and-instruments” approach has focused attention on many core concerns for climate policy (effectiveness, economic efficiency and equity) but arguably pays insufficient attention to the problem of how to build political support for climate policies, despite the fact that the short history of climate policy in Britain and elsewhere is already littered with good ideas that, due to lack of support from the public, industry and special interests – as well as obstacles within governments, legislatures, departments and political parties – had to be abandoned or diluted to the point where they lost most of their impact.

A political strategy approach in contrast focuses on the tactics that governments might employ to maximise the chances of strengthening climate policies while avoiding the loss of significant amounts of political support. This approach deals less with normative views of what climate policy should look like in a hypothetical world free from political constraints and instead focuses attention on how policies can be structured, linked and presented to weaken potential opposition. Here we summarise early results from an international project aimed at identifying political strategies that may enable governments to take more effective action on climate change without suffering significant political damage (Compston and Bailey 2008, Compston forthcoming 2009). Although it may seem presumptuous for academics to advise politicians and officials on political strategy, so far those involved in policymaking have not been able to deliver a programme that will

bring climate change under control, and academic perspectives bring different theories and analytical methods to bear on the problem.

Our analysis indicates that political strategies for strengthening climate policies can be divided into four broad categories: playing it safe, improving communications, changing the rules of the game, and venturing beyond consensus.

Playing it safe

1. Stick to consensus policies

The most obvious way for governments to maximise political support for climate policy is to stick to policies on which they have already secured the prior agreement of the main affected political actors and, implicitly, of the electorate as indicated by the results of opinion polls. This approach has pervaded much of the climate politics of western democracies. One indication of this is the profusion of voluntary or negotiated agreements whereby industry groups agree to reduce their emissions in exchange for the non-imposition or delay of legal requirements or economic instruments. The classic example of this was the granting of 80 per cent reductions in the UK's climate change levy to energy-intensive sectors that signed climate change agreements. The disadvantage of the consensus approach, of course, is that it can impede further progress due to the effective veto that the perceived need for agreement gives to all stakeholders.

2. Small steps on many fronts

Strengthening policies in repeated small steps is a well-recognised technique for getting something done while not arousing political opposition and, in addition, enables experimentation with new ideas before they are rolled out on a large scale. Although restricting policy changes to incremental steps can make it difficult to introduce entirely new types of climate policies, the impact of this strategy can be maximised by moving on as many fronts as possible. This approach too has been widely adopted by western governments.

3. Take advantage of windows of opportunity

Although it is impossible to be certain of a causal link in individual cases, research indicating that climate change is responsible for an increase in the frequency and seriousness of extreme weather events has fuelled media speculation about this link whenever weather-related disasters occur (Boykoff 2007). Similar spikes in coverage have occurred with the publication of high-level scientific reports on climate change. Consequent rises in public concern about climate change create potential windows of opportunity for governments to introduce or strengthen climate policies while sustaining less political damage than might be the case at other times. In some cases governments might even benefit politically, as appeared to happen in Germany in 2002 when the Elbe floods were instrumental in the government introducing new targets (Michaelowa 2008).

In Australia, prolonged droughts were utilised effectively by Kevin Rudd's Labor Party first to win the 2007 election and then to push through Kyoto ratification and the Carbon Pollution Reduction Scheme.

It follows that one effective tactic for governments is to have policies ready to go in order to take advantage of these windows of opportunity when they occur, provided that these policies are properly thought through in order to avoid accusations that they are ill-considered, "knee-jerk" reactions. Although events can also draw attention away from climate change, as has occurred since the onset of the global economic downturn, if climate scientists are right we can expect windows of opportunity caused by extreme weather events to occur more and more frequently as time goes on.

4. Continue to push for international agreements

Pressing for international agreements has the advantage, if successful, of both getting more countries involved in carbon reduction and reducing the likelihood that domestic climate policies which increase business costs will be undermined by foreign competition and/or carbon leakage. One tactic is for governments to steer international debates by making strong declarations prior to major conferences. This was used by the EU prior to the UNFCCC Bali negotiations when it issued a unilateral declaration that it would reduce its domestic emissions to 20% below 1990 levels by 2020 and by 30% if other major emitting nations followed suit. International agreements also can be used to develop alternative approaches, as occurred with the Asia-Pacific Partnership on Clean Development, where the USA, Australia and Japan enlisted China, India and South Korea into joint initiatives on technology transfer and sharing of best practice. Whatever criticism might be levelled at the partnership, it does offer an alternative to the "targets-and-timetables" approach of the Kyoto Protocol by instead focusing on the means of implementing climate policy, and arguably drew leading developing economies into more active participation than the UNFCCC had managed.

5. Improve policy design

Policies need to be not only technically and economically well-designed but also politically well-designed. For example, climate policies that are seen to distribute costs equitably, or which also contribute to the achievement of other policy objectives, such as energy security, should encounter less political opposition than policies that are perceived as being unfair or which have no co-benefits.

6. Offer tradeoffs

Obtaining the agreement of powerful political actors to policy changes in one area in exchange for policy concessions in another is a well-known feature of governance. The finer skill here is to identify concessions that are not especially significant to the government but are significant enough to the political actor(s) concerned to elicit their acceptance of new and/or strengthened climate policies. One example, discussed by Macdonald (2008),

is the case of the Canadian federal government providing its oil-dependent provinces and major oil companies with subsidies for technological development in return for their acceptance of a carbon tax.

7. Introduce spillover policies

Spillover policies in this context mean policies that: (1) are relatively easy to transfer to other countries; (2) are difficult to reverse once introduced; and/or (3) create functional or political pressure for further strengthening or the introduction of related measures, for instance policies that increase investment and employment in the renewables sector and in so doing increase pressure on governments to take further steps in this area. Policies that tend to increase pressure for new or stronger policies at European level have been used extensively by the EU across its policy areas. In relation to climate policy perhaps the best example is the EU emissions trading scheme, where the Commission initially accepted a relatively decentralised system and undemanding targets during the scheme's first two phases but used this experience and the problems encountered during these periods to garner support for a more centralised system and stronger targets.

Improving communications

This is a complex area, a fuller exploration of which can be found in Moser and Dilling (2007). Below are a few of the more obvious communications strategies.

8. Reports and targets

One of the most frequently used communication strategies is the provision of information about the causes and effects of climate change along with information about effective and practical responses. This tactic has formed an integral part of the Assessment Reports of the Intergovernmental Panel on Climate Change, particularly the 2007 report, which included regional as well as global assessments and placed strong emphasis on mitigation options. Maximising the transparency of potentially popular policy initiatives is especially important. When not used cynically, reporting can play an important role in persuading stakeholders and voters that effective action is both necessary and possible. Similarly, targets can assist in shifting debates on climate change from the issue of whether action is necessary to the issue of which policy instruments should be chosen. One useful future move here would be to place greater emphasis on envisioning more clearly the characteristics of a future low carbon society in order to make it easier to trace the policy steps needed to achieve this (backcasting).

9. Emphasise co-benefits

Another way of fostering support for climate policies, already used in several countries, is to stress any contribution they make to the achievement of other social or economic objectives. One example of this is the promotion of renewable energies as means of increasing energy security and employment (locally as well as nationally), while measures to encourage modal switches in travel behaviour (from private cars to public transport or "alternative" travel) can be popularised as combating traffic congestion as well as reducing

emissions. Pointing out ancillary or co-benefits enables actors who support these other objectives to be recruited to swell coalitions favouring policies such as feed-in tariffs for renewable energy generation.

10. Keep the message simple, clear and tailored to the audience

Messages aimed at the general public need to be kept simple and clear if they are to be widely understood. For this reason it is vital to focus on just a few selected indicators of climate change impacts along with a small number of projected solutions that voters can readily comprehend. The use of metaphors and analogies can make it easier for citizens to understand complex ideas, provided they are not overly patronising. The chosen message then needs to be repeated often enough to become embedded. One example of the effect of clear, simple and repeated messages is the progressive embedding of recycling as a social norm. However, it needs to be kept in mind that such messages require periodic reformulation to ensure they retain their impact, especially when other events capture public attention (Pralle 2009).

As awareness of the audience is fundamental to political communication, messages about climate change and responses to it need to be formulated in ways that strike a chord with particular audiences. Stressing the health impacts of climate change, for example, appeals to the concerns of a wide variety of people, while focusing on economic impacts or implications for national security may be more relevant for business and security-conscious audiences respectively. Further devices to increase the impact of communications include stressing regional and local impacts to reduce spatial and temporal disconnections between climate change and everyday concerns, and employing credible spokespeople who can explain how climate change is affecting them. Examples of this include using farmers when addressing a rural audience, using organisations like the World Business Council for Sustainable Development when communicating to companies, and using knowledgeable television personalities when addressing general audiences (Pralle 2009).

11. Stress the moral dimension

Issues with a moral or ethical dimension often attract very passionate followers, as the issues of abortion and stem-cell research amply demonstrate. For this reason communication strategies may seek to stress the disproportionate effects that climate change is likely to have on poorer sections of society (nationally and globally) and on people who have not benefited from the ready availability of cheap energy (Pralle 2009). One danger here, of course, is that moralising can lead to a backlash if and when the governments concerned are perceived to be acting hypocritically.

12. Be positive

One problem with communications on climate change is that they often engender feelings of demoralisation and helplessness because of the mismatches between the scale and causes of the problem and the capabilities of individuals and local communities

to act effectively. It is therefore essential to blend negative messages – which are needed to raise concern – with positive messages that explain how individuals and communities can make a difference (Moser and Dilling 2007).

13. Get the framing right

Related to these points is the idea that persuasion in politics is less a question of rational logic than of narrative logic, and that political actors compete to secure support for their definition of reality using narrative devices, such as plot and characterisation, that add to their persuasive power (Hajer 1995). Issues to explore here include how to devise frames for climate change and climate policies that are credible and salient, and how to promote these frames. Recent attempts to innovate in this area include the idea of a Green New Deal, while in the US the Apollo Project evokes analogies between dealing with climate change and efforts during the 1960s to land on the moon (Pralle, forthcoming 2009).

Changing the rules

Other strategies are designed to change the way policies are made by altering the organisation of government and/or the distribution of power resources between the government and other stakeholders. Such strategies are especially important to the extent that (1) power is unevenly distributed among government ministries, with environmental ministries enjoying less influence than economic ministries in cabinet discussions where policy interests overlap; and (2) industry groups are granted more routine access to, and a greater say in, decision-making processes than environmental groups or other civil society actors.

14. Alter the organisation of government

The most obvious approach to increasing the relative weight of climate policy interests within government consists of reorganising government departments and ministerial responsibilities, for example by creating a separate climate ministry to raise the political profile of climate policy, or by moving responsibility for energy from an economic to an environmental ministry. Britain has done both recently with the establishment of the Department for Energy and Climate Change, while the introduction of an independent Climate Change Committee is an attempt to depoliticise climate policy just as monetary policy was (largely) depoliticised with the granting of independence to the Bank of England in 1997.

Governments may also alter the organisation of interactions with political actors outside government. In some circumstances giving an actor who opposes certain climate policies access to the policymaking process – via consultations and committees – may lead to a more cooperative attitude and increase the chances of their accepting initiatives they had previously opposed. In other circumstances, excluding uncooperative actors may make it easier for public administrations to introduce contested climate policies by removing the expectation that these must be agreed by the actors concerned, although this advantage may be offset if excluded actors then air their grievances publicly. A third tactic

would be to introduce new actors to counterbalance the influence of existing ones. One possibility here would be to provide seats for independent experts and/or environmental nongovernmental organisations on all official climate change-related committees on which industry is represented. This approach has already been adopted to a certain extent in the composition of the UK's Sustainable Development Commission and the Climate Change Committee, although the link between such committees and policy decisions must be sufficiently strong to avoid this becoming, or being seen as, a tokenistic gesture.

15. Change the distribution of power resources

One way of searching for new political strategies is to use theories of policymaking to identify the logical possibilities. In this regard what might be called the resource dependency version of policy network theory is especially useful. This holds that public policy is largely determined by resource exchanges between members of policy networks that are held together by the dependence of political actors on each other for resources. From this perspective policymaking can be conceptualised as consisting typically of public actors exchanging policy amendments, or at least access to policymaking, for resources controlled by other public and private actors such as formal approval, information, political support, help with implementation, and investment (for more detail see Compston, forthcoming, 2009a). In relation to climate policy, then, official proponents of stronger measures would be expected to have to exchange policy amendments for needed resources such as the approval of key decision-making bodies (such as cabinet and parliament), investment and cooperation with implementation on the part of industry, and political support from the media and voters.

The important thing here, however, is that the logic of this approach suggests that governments can also try to alter policy outcomes by altering the terms of resource exchange.

First, they can seek to influence the pattern of interdependency by acquiring additional legal powers to coerce other actors. Moves by national governments to acquire additional legal powers over planning permission, for example, would add to their resources by enabling them to offer benefits to firms that a more restrictive planning system would not allow. Recent moves by the Labour government in Britain to streamline planning permission are at least in part designed to make it quicker and easier for firms to establish new wind farms and nuclear power stations by taking veto powers away from planners and objectors. More radically, governments could take direct control of selected private firms by buying or nationalising them. This might seem unlikely, but so was nationalising banks until very recently. An alternative possibility would be to form state agencies to undertake needed tasks that private firms are simply not carrying out, such as building coal-fired power stations that are equipped with carbon capture and storage.

Second, governments may cultivate alternative sources for obtaining key resources. New sections of the electorate, for example, might be cultivated to compensate for losses in

electoral support caused by the introduction of new climate policies.

Finally, governments may deny other actors alternative sources for obtaining resources that these actors want from government, for example by imposing stricter controls on international transactions in order to make it harder for firms to shift investment elsewhere if they object to certain climate policies. However, the EU's recent discussions on the introduction of border tax adjustments – higher tariffs for goods imported from countries with less stringent emissions-control policies – suggests that such moves are problematic from the point of view of current international trade rules. Another example of this strategy would be to nurture cross-party consensus on climate change in order to limit the extent to which business groups or voters who object to certain climate policies can shift their political support to parties that oppose these measures.

Beyond consensus

Focusing on measures on which the agreement of powerful actors can be obtained has enabled governments to introduce and strengthen a number of climate policies at relatively low political cost. Once relatively uncontroversial policies have been negotiated and implemented, however, continued acceptance of the need to obtain broad agreement impedes the introduction of more radical measures by giving all stakeholders an effective veto on government action. This combined with the fact that consensus strategies have not (yet) delivered emissions cuts of the magnitude required to mitigate climate change effectively (IPCC 2007), suggests that governments will at some point need to impose more radical policies against the wishes of powerful actors and/or voters.

16. Spend political capital

The first and most obvious strategy is simply for governments to spend some of their political capital on unpopular climate policies. The problem, however, is that while some governments may choose to do this, others will choose to spend their political capital on other things, or will lack sufficient expendable political capital. This is therefore not a strategy with wide applicability.

17. Selective imposition of more radical policies

While this approach clearly carries greater political risks than consensus strategies, some tactics that can be employed to limit these risks include:

- Introducing unpopular policies during the early years of an administration to allow time for opposition to subside and for the benefits of such policies to become apparent before the next election arrives. This follows the old political maxim that governments tend to introduce their most radical policies during their first 100 days in office;
- Targeting economic sectors that are able to pass on at least a proportion of their extra costs to consumers, as this may facilitate the internalisation of environmental

costs without government being blamed directly – although the media is often quick to publicise how carbon/energy taxes, for example, lead to higher prices for consumers;

- Adopting policies that target losses on small sections of society, particularly groups that are least able to inflict political damage via the ballot box or to exercise threats to withdraw investment from the country;
- Compensating powerful actors for the imposition of more progressive climate policies even when their explicit agreement to these cannot be obtained, in order to weaken their resistance by reducing the costs they incur as a result - although this approach is open to accusations of unfairness if these groups are responsible for large quantities of greenhouse gas emissions.

One obvious problem with these strategies, however, is their potential to create inequities in the distribution of costs and benefits arising from climate policy, as this may erode existing support and lead to new sources of opposition. Any political strategy that effectively accords weight to stakeholder concerns in proportion to their ability to make trouble for governments, therefore, must be approached with extreme care (Dryzek, 1997).

At the same time, however, it is important to be clear that basing climate policy on the notion that consensus is always achievable is likely to lead to damaging delays in the introduction of measures that are commensurate with the increasingly severe warnings about climate change being issued by scientists. In other words, there may be fewer easy political choices in the long run.

Conclusion

In this chapter we have briefly reviewed a number of ways in which governments might build support for greater action on climate change, and indeed go beyond this without incurring significant political retribution. Most of these are already well-known, yet greenhouse gas emissions continue to rise. As well as indicating that known strategies need to be evaluated carefully and pursued more vigorously, this suggests a need for further work to identify new and innovative strategies. Perhaps the most promising lines for future development are in the areas of making policy design more politically acute, for example by a greater stress on spillover policies; using tradeoffs and compensation more creatively; telling better stories; making further changes in the policymaking process; and formulating more creative approaches to selective policy imposition. Whatever the precise outcomes of such investigations, it seems clear that the success of future climate policy hinges as much on the political strategies used to build support for actions as on the policy instruments used to curb emissions.

Chapter 6

How can the response to climate change be socially just?

Roger Liddle and Simon Latham

The need for a new “climate justice” paradigm

This paper is about renewing the welfare state for low-carbon transition. It urges politicians and policymakers to address the social justice implications of the necessary long-term policy commitments that our societies will have to make in order to reduce greenhouse gas emissions, principally by significantly raising the price of carbon by one means or other. It argues for the need to ensure that our low-carbon future is neither inequitable nor punitively regressive for some groups in society, as it otherwise threatens to be. This is both right in itself and necessary because the political consensus to support low-carbon transition is vital. One of the chief pre-conditions of successfully implementing and sustaining low-carbon transition is that this process must be both consensus-based and long-term in order to eschew the partisanship of day-to-day party politics.

The welfare state at present is both ill-equipped and ill-prepared for low-carbon transition. Indeed there are grounds for believing that the welfare state as traditionally conceived in terms of transfer payments and social care will not in itself prove fully up to this task. In addition, considerable public resources will have to be found for long-term investment in sustainable homes, communities and transport – and government will need to embrace a stronger steering role in the economy in order to promote both jobs and the creation of new sources of comparative advantage in low-carbon sectors.

Our societies now need to devise a credible strategy for transition to a low-carbon future at the same time as the global deregulatory consensus in political economy has broken down in the aftermath of the “credit crunch”. Many people believe that the impact of the global recession will be to lower the priority that governments give to climate change. In

our view, the crisis in market neo-liberalism and the imperative of low-carbon transition should be viewed as a fortunate coincidence that will allow the state to re-cast itself thoroughly as both more active and developmental, not least in order to plan how – through highly integrated governance – emission reduction targets are to be met over successive decades without compromising the collective prosperity of society.

The risks of turning market failure into *social failure*

In one of the most important interventions in the climate change debate to date, Nicholas Stern (2007) argues that climate change “presents a unique challenge for economics: it is the greatest example of market failure we have ever seen. The economic analysis must be global, deal with long time horizons, have the economics of risk and uncertainty at its core, and examine the possibility of major, non-marginal change.” Yet, for low-carbon transition to be successful, it is vital to acknowledge that the climate change challenge could also result in severe *social failure*. The potential for emissions reductions resulting in regressive measures that penalise those least well-off in our societies will be high and there is a significant risk of a ground-swell of public support against climate change policies that could seriously undermine the tentative consensus for low-carbon transition that has now been built in most advanced democracies.

Economists theorise that it is possible to achieve both efficiency and equity through a mix of policies to raise the price of carbon and simultaneously increase social transfers to mitigate the impact on the less well-off. The desired reduction in carbon emissions would be achieved through either imposing a universal carbon tax or putting in place a watertight regime of “cap and trade” emissions trading; the desired protection of losers by a mix of raising social benefits for the poor, workless and families with children and, if the aim is labour market activation, taking low paid workers out of the tax and social contribution net.

There is, in practice, a wide range of policy instruments available to governments in meeting their emission reduction commitments. These include carbon taxes; tradable emissions quotas; subsidies that trigger behavioural change; and regulation. The most prominent and widely accepted means to reduce greenhouse gas emissions is to place some form of “carbon pricing” mechanism on them to limit consumption. The most notable example of carbon pricing to date is the EU ETS which commenced operation in January 2005 as the world’s largest multi-country, multi-sector trading scheme. The creation of the EU ETS is a sizeable political and economic achievement. But it has been weakened by a number of interrelated deficiencies that are illustrative of the problems that carbon pricing policies may encounter as they are introduced across the industrialised world over the next few years. The first is their vulnerability to the short term economic cycle in that the global economic crisis has dramatically reduced the price of oil and natural gas, and simultaneously deflated the price of carbon. While an efficient futures market should take care of this problem, it has exposed a second more challenging issue: to secure the acceptability of carbon trading, governments have pressed for too large quotas in order

to appease vested industrial interests. Third, in the EU these quotas have been awarded for “free” to energy producers, effectively offering them windfall gains. In the current US debate, Congress is attempting to insist that these “windfall gains” are passed on to consumers, but this goes against one of the main objectives of carbon trading in the first place: to put up prices and change behaviour as a result. Politicians find this logic difficult to accept, at least in public.

The troubled politics of carbon pricing

John Hills (2009) has recently identified “environmental sustainability” as a major and potentially divisive factor for the future distribution of income. While a European Commission study has illustrated how social and environmental inequities are in general terms mutually reinforcing (Pye et al., 2008), the effects of adapting to and mitigating climate change will be felt differently both within and between communities, regions and countries. The links between environmental and social inequalities are in practice problematic for three reasons. First, taxation and carbon pricing schemes tend to be innately regressive and place more of a socio-economic burden on the poorest citizens and households in our societies. Second, it is the least well-off that suffer most from the decline and decimation of the environment and ecosystems. Third, while the wealthiest contribute more to greenhouse gas emissions in absolute terms, inequality in incomes tends to be far greater than inequalities in carbon consumption with the clear implication that they are better able to afford higher carbon prices.

There are no simple distributional solutions to the fact that increasing the cost of carbon and other greenhouse gases will affect the poor relatively harder than the rich (Hills, 2009). In the UK, 42% of emissions are accounted for by direct household consumption of domestic fuel and personal transport, including aviation. The rest arises from other forms of consumption, like food, services and manufactured goods. Thus, the substantive costs of emission reductions will inevitably fall on households and increase the burden on the poor: Dresner and Ekins (2006) show that a third of households in the poorest three-tenths of the distribution would be “losers”. Incomplete take-up of equalising measures like tax credits accounts for this, but particularly important here is the fact that domestic fuel consumption varies so widely between households regardless of income. This form of tax would also be punitive for those households that suffered from deficient infrastructure, like poor home insulation and thermal efficiency levels.

These equity issues pose considerable challenges for the design and implementation of climate justice. While these innate inequities are generally mirrored in the provision of other public services where it is the least well-off who receive the poorest quality services in under-performing schools, strained hospital care and low-grade housing, there is a significant risk that low-carbon transition will only serve to further accentuate such inequality and increase the burden on the least well-off in society. Indeed, it is not beyond the realm of possibilities that low-carbon transition would result in the regression of the positive lifestyle changes that have allowed the mass of people to travel more widely,

thanks to the advent and availability of low-cost air travel, or become home owners in new low-cost owner-occupied estates, which may nonetheless be energy inefficient and involve longer travel to work distances.

“Climate justice” will, therefore, involve a new balance of higher carbon prices and transfer payments. While this approach has powerful attractions, however, it is very difficult to compensate the “losers” from higher carbon prices fully through a mechanistic formula of redistribution. The costs for the less well off who are high-carbon users could be severe – and while it can be argued that these costs would be “transitional” until people and lifestyles adjusted to the new set of carbon prices and social transfers, many would end up being trapped in a transition from which the escape routes would not be obvious or easily available. In this context more complex and sophisticated strategies for “climate justice” need to be devised.

This offers new opportunities for how social policy is conceived and delivered. James Meadowcroft (2008) notes that in seeking to prevent and overcome the negative impact of climate change on societies, there will be significant scope to advance new and existing welfare objectives in the same way that some economists regard the financial crisis as an opportunity to ensure that multi-trillion dollar fiscal stimulus packages prioritise low-carbon investment. “Rather than seeing climate change policy as a distraction from urgent social issues (ageing, growing income inequalities, immigration, and so on) those in the social policy area should see it as an emerging reality which opens up possibilities for change in places which have proven resistant”.

The false temptations of personal carbon quotas

It has been suggested that personal carbon quotas would be a more progressive policy solution. But personal carbon quotas are neither feasible nor functional. Hills (2009) argues that there would be “major distributional consequences” if citizens were given an equal personal carbon quota, since those with high consumption would either have to purchase unused quotas from individuals with lower consumption (and typically with comparably low income) or make significant changes to their lifestyles. Although in principle those with lower consumption would gain since they could sell their surplus quota to those with high consumption, in practice consumption patterns differ widely within and between income groups and different forms of consumption create varying levels of carbon content. As Hills (2009) notes: “Those with high incomes spend a much greater proportion of income on average on air travel than those with low incomes. Those with low incomes tend to spend a much greater proportion of income on domestic fuel than others.”

Indeed, indirect emissions arising from direct spending on domestic fuel, petrol and diesel are twice as much per adult for those with the top 10% of incomes as for those in the bottom 10% (Thumin & White, 2008). Although this excludes emissions arising from public transport and aviation usage, as well as indirect emissions from other forms of

spending, this twofold multiple in direct domestic expenditure between top and bottom is clearly not in proportion to income. Ultimately, the most cogent argument against the application of a personal carbon trading system on domestic fuel and road transport usage is that though 71% of the poorest third of society end up “winning” from their tradable quota, the remainder of this segment would still be “losing” (Thumin & White, 2008).

Although personal carbon quotas are in principle highly progressive, the above cited evidence suggests in practice there would still be significant “losers”, especially among low-income earners. The central impediment here is that it is low-income earners who suffer most from deficient infrastructure and this would necessarily increase the cost of their carbon consumption. Energy efficiency is extremely negligible in social housing stock and rented homes, while there is little to no incentive for the renter to invest capital in energy saving even if the resources were readily available.

A climate justice agenda for welfare state reform

Meeting the climate change challenge requires the recalibration of our existing economic and social models (Hemerijck, Rhodes & Ferrara, forthcoming 2010), not the abandonment of economic growth and the consumer lifestyles and personal freedoms it has facilitated. In the mid-twentieth century, the establishment of the Keynesian welfare state saved capitalism from itself. But by the end of the 1970s a reaction had set in against what were perceived to be the inefficiencies of central state planning, a big state with high taxes to finance it, and the growth of welfare dependency. But while there was a retreat from state planning and interventionism and some retrenchment of social benefits, the basic framework of public services and welfare remained largely intact, especially in continental western Europe. By the 1990s a new reform agenda began to emerge around the idea of “social investment”. This was deployed in education, skills and lifelong learning to meet the economic challenges of globalisation; in childcare and flexible working to support the dual earner couple in a world of increasing gender equality; in tackling child poverty and investment in “early years” to overcome the embedding of social disadvantage through the generations; and in active labour market policies to raise employment participation and meet the demographic challenges of an ageing society.

This “social investment” reform agenda now needs to be supplemented by a “climate justice” reform agenda. Our argument, therefore, is that to accrue the requisite levels of political acceptability for emissions reductions and prevent the implementation of regressive tax and price mechanisms, a very sophisticated set of policies that deals with complex problems like energy efficiency in poor households and commuting costs for low income families would need to be developed to ensure that the burden of low-carbon transition would be equitable.

When Tony Blair was UK Prime Minister he stated that making “the shift to a more sustainable lifestyle is one of the most important challenges for the 21st century.” Yet the

question of how to orchestrate such a shift remains one of the chief obstacles that low-carbon transition will encounter over the coming few decades. Despite the above outlined difficulties in introducing a carbon pricing mechanism, the reality is that the “lifestyles” most citizens enjoy in western societies will have to evolve in a more sustainable fashion in future. This is crucial to prevent citizens incurring further costs as emissions reduction targets are heightened.

Creating low-carbon communities

There is a distinct lack of clarity about what a “sustainable”, or more appropriately and less normatively, a *low-carbon lifestyle* amounts to, not to mention how they might foster durable patterns of consumption in individuals and how this relates to broader questions of reforming welfare provision (Evans & Abrahamse, 2008). Some have used climate change, especially in the context of a global economic recession, to call for new models of consumption that fundamentally re-cast the rewards and impact of social and economic growth (Degryse & Pochet, 2009). This call is, in essence, an anti-consumerist critique of western political economy. But as we have already argued here, it is our belief that there is a grave risk of provoking widespread resistance to low-carbon transition if punitive lifestyle changes are advocated which in turn are seen as burden on the poorest segments of society. Moreover, the regulation and administration of measures designed to promote lifestyle change could put great strain on what ordinary people regard as fair and equitable.

In their analysis of an impressionistic sample of individuals living “sustainably” in south-east England, Evans and Abrahamse (2008) found that they all stressed the need for government and industry to assume more responsibilities and make changes to facilitate their lifestyles. Indeed, it is our argument that government must introduce a radical programme of infrastructural improvement and construction to decrease the burden of cost on citizens. While we accept that this sort of transitional change will inevitably be incremental, the ultimate goal of public policy in western countries over the coming years must be to prioritise energy efficiency improvements in existing infrastructure and the construction of new infrastructure that is already entirely, or with the capacity to be, low-carbon once new technologies have been introduced. This change will also inevitably be generational. Here the priority must be to address how entire communities can become low-carbon. This requires effective local planning and a long-termist approach to finance. The following two examples are instructive.

First, all communities must be able to provide low-cost and integrated public transport links to workplaces. In principle this could be financed through congestion charging or road pricing. But, as the case of the UK testifies, political support for such initiatives outside London has died because it is apparent that voters will not pay what they regard as a penalty charge for essential car use, until they can actually see an adequate and affordable public transport alternative being put in place. The unavoidable implication is that government money has to be invested up-front.

Second, better insulated, more energy efficient housing stock is vital; much can be achieved through better regulation, but the implications for cost and affordability need to be taken into account by government, especially in a housing market where in future, as a result of the global financial crisis, 100% mortgages may be difficult to obtain. This suggests that it will be difficult to achieve the objectives of housing and climate change policy without some form of government subsidy to the initial capital costs of new property, which might be recouped over time – or much wider availability of shared equity schemes.

There are also implications for employment. Although means can be found to protect high energy using industries temporarily from the impact of higher prices for carbon, in the longer term industrial adjustment is unavoidable. The development of low-carbon employment must therefore be a crucial component of transition. It is essential that government invests heavily in low-carbon skills and training not only as a pre-emptive response to changing employment patterns but as means to ensure competitiveness in a low-carbon global economy. As Anke Hassel (2009) notes, this adjustment must be intelligently conceived in order to ensure that the pressures felt most acutely by low-skilled workers are adequately addressed. Depending on country-specific conditions, governments must implement an appropriate blend of institutional reforms and more “activist” industrial policy interventions to allay concerns about the decline of old sectors and promote employability, education and economic security. This will require a commitment to maintain sufficient levels of social protection, while at the same time new sources of competitive strength in low-carbon sectors of the economy such as energy saving technology, as well as renewable and nuclear power are developed.

Climate justice to ensure an equitable and sustainable globalisation

Social policy, properly conceived, seeks the public management of present and future risks to society. Climate change is arguably the gravest and most wide-ranging risk to western societies since the massive growth in the welfare state in the immediate post-World War II decades. This, however, is not to suggest that developed countries, faced with climate change and its societal consequences, need to abandon the basic precepts of welfare capitalism and switch to some radical new social and economic development that abjures growth. The purpose of the welfare state is, after all, twofold; it seeks simultaneously to lean against inequality and protect people from social risks, but also to sustain political support for market capitalism by managing its adjustment costs and thereby promote collective prosperity. The heterogeneity, openness and positive freedom that western societies have accrued for their citizens over the past century deserve in our view to be respected and preserved.

It is similarly important to work within the context of globalisation – an economic paradigm which affords unprecedented social, cultural and economic opportunities and rewards to both the developed and developing worlds. Globalisation will, more importantly, be

crucial to facilitating the necessary flows of investment and technologies for transition to become a reality. However, globalisation needs to be much better managed to be sustainable and socially equitable. In this sense the climate change issue is an inextricable part of the globalisation challenge. Without a better managed globalisation, global warming will put intense pressure on some of the poorest countries in the world through for example desertification in central Africa or flooding in Bangladesh. It will amplify pressures for migration in an extreme way. That is why for developed countries a global package deal on climate change should appeal strongly to their self-interest as well as altruistic concerns for the future of the planet.

But globalisation is also an added reason for thinking through how welfare states need to be reformed at national level. International economic competition accentuates the risks of polarisation within developed societies. Pressures for increased migration that will flow from the realities of climate change add to those pressures. This is why, as Cramme and Diamond (2009) have argued, “social justice ought to be a central driver of domestic policy.” Thus, the focus of domestic policy should now be on how the state is re-configured to strengthen regulatory structures and develop a sophisticated set of policy instruments in order to anticipate and facilitate the manifold socio-economic challenges of low-carbon transition.

Section II
Building an international
framework for action

Chapter 7

How can commitments on greenhouse gas emission reductions be entrenched in the international legal system?

Stephen Hockman QC

Introduction: a new proposal

In his foreword to the first edition of “Principles of International Environmental Law” by Philippe Sands, the late Sir Robert Jennings QC, fellow of Jesus, Cambridge, sometime Whewell professor of International Law, and former president of the International Court of Justice, wrote;

“It is a trite observation that environmental problems, although they closely affect municipal laws, are essentially international; and that the main structure of control can therefore be no other than that of international law”.

Jennings wrote those words in 1995, many years before the potential effects of climate change had transformed public perceptions of this topic. And yet, even today, after all the many millions of words that have been written on the subject of climate change and its causes and consequences, many may think that we are hardly any further forward in establishing, in Jennings words, a “*structure of control*!”. Indeed, Jennings’ observation that the problem is mainly to be solved by legal means might now seem, not so much “trite”, as unorthodox, bold or even eccentric.

Of course no-one doubts the scale of the problem. When Jennings wrote in 1995, the problems were perceived mostly in terms of major cases of environmental pollution which were regarded as having potentially international implications. Perhaps the most infamous case of environmental liability on the part of a trans-national corporation occurred on 2nd December 1983 in Bhopal, India, when Union Carbide, a multi-national company incorporated in the US, released 40 tonnes of toxic methyl isocyanate from

its plant, killing 3,500 people and affecting over 200,000 others. Proceedings brought in the US courts, having failed, the injured parties settled the ensuing litigation in the Indian courts for some \$470 million (an average of about \$15,000 per deceased person). Since then, the Indian courts have on occasion shown great imagination in responding to environmental claims, but in 2006, yet again, cases brought on the basis of the common law tort of public nuisance by a number of claimants against the five biggest US power companies were likewise dismissed. The argument for the plaintiffs had been that the carbon emissions from the defendants' power plants (contributing approximately 10% of all carbon dioxide emissions from human activities in the US) were a public nuisance, in that they were causing injury or threat of injury by contributing to global warming and giving rise to a substantial and unreasonable interference with public rights.

The potential effects of climate change have of course been given an altogether new and critical focus by a number of recent developments, including reports by the Intergovernmental Panel on Climate Change and by Sir Nicholas Stern on behalf of the UK Government. Few now deny the urgency of a solution to these problems, though even fewer claim to have to hand a serious and comprehensive set of solutions. Statements emanating from international summits only confirm the diplomatic efforts involved in attaining linguistic (not to mention policy) consensus.

In these circumstances, it seems timely (a) to review those international legal instruments which already exist to facilitate a solution to the problem, and (b) to suggest that the creation of a new instrument deserves consideration.

Dispute resolution

The oldest legal institution dedicated to resolving international disputes is the Permanent Court of Arbitration, established at The Hague by inter-governmental agreement in 1899. The PCA has jurisdiction over disputes when at least one party is a state (or an organisation of states) and when both parties to the dispute expressly agree to submit their dispute for resolution. It has been suggested in the past that the Permanent Court of Arbitration might be an interim forum for resolving international environmental disputes. However, as already indicated, at least one party to any dispute must be a state, the court has no compulsory jurisdiction and, importantly, its decisions are not made available for public inspection.

The International Court of Justice was established (as a successor to the earlier Permanent Court of International Justice) in 1945. In this case, jurisdiction depends on whether two or more states have consented to its jurisdiction. While the International Court of Justice may accept cases that are environmentally related, only states have standing. The International Court of Justice established within its structure in 1993 a chamber specifically to deal with environmental matters. However, no state ever submitted a dispute to that environmental chamber.

In 1992, representatives from 176 States and several thousand NGO's (non-governmental organisations) met in Brazil for the United Nations Conference on Environment and Development. At this conference, often referred to as the Earth Summit, there was adopted the Rio Declaration on Environment and Development, Principle 10 of which provides that;

“States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be available.”

The Rio Declaration of 1992 (and accompanying Framework Convention on Climate Change) famously led on to the Kyoto protocol signed in Japan on 11th December 1997. This protocol, for the first time, contained international obligations requiring countries to reduce their greenhouse gas emissions below specified levels. It had been agreed that the Kyoto Protocol would only come into force when countries emitting 55% of the world's carbon dioxide had proceeded to ratification. The 55% trigger was finally met in February 2005 after ratification by Russia. The protocol was ratified by Australia in December 2007, leaving the US as the only developed nation not to have ratified. In the view of many critics, however, the Protocol, even if complied with on paper, has been ineffective in achieving significant reductions in emission levels.

The 15th conference of the parties to the Kyoto Protocol in December 2009 in Copenhagen may be the last point at which a transition to a new framework can be agreed if this is to take effect in 2013. The framework, it is hoped, will provide a new, global carbon-trading system, linking commitments from both developed and developing countries together, including the US and the BRIC economies (Brazil, Russia, India and China). Negotiators aspire to a fully functional, truly global carbon-trading market that extends the current boundaries of the Kyoto Protocol and includes a revision of the much criticised Clean Development Mechanism (CDM) – the Protocol's main instrument, which allows fully industrialised economies to meet their greenhouse gas emission restrictions by purchasing emission reduction credits in developing countries.

At the European level, the EU has, for many years, legislated on environmental matters; and compliance with European environmental law is regulated by the European Commission, with disputes being referable to the European Court of Justice in Luxembourg. Within the EU, there was established from January 2005 an emissions trading scheme, based on the allocation and trade of carbon allowances throughout the Union. Significantly too, in 1998, European states entered into the so-called “AARHUS Convention on Information Public Participation in Decision-making and Access to Justice in Environmental Matters”, ratified by the UK in February 2005. Recent studies (including a report by working group under the chairmanship of Sullivan J) suggest that a number of member states within the EU may not be fully in compliance with AARHUS' requirements concerning access to justice.

A new proposal

In these circumstances, it may be thought that the establishment of a new institution, an International Court for the Environment, is a valuable goal that would add to the body of jurisprudence in international environmental law and provide a forum both for states and for non-state entities. Ideally, such a court would be compulsory and would include (i) an international convention on the right to a healthy environment, with broad coverage; (ii) direct access by NGO's and private parties as well as states; (iii) transparency in proceedings; (iv) a scientific body to assess technical issues; (v) a mechanism (perhaps to be developed by the court itself) to avoid forum shopping.

This is not a wholly new idea. Such a proposal was mooted as long ago as 1999 at a conference in Washington sponsored by a foundation which had been set up to investigate the establishment of an international court for the environment. The proposals then considered defined the functions of the court as including:

- adjudicating upon significant environmental disputes involving the responsibility of members of the international community;
- adjudicating upon disputes between private and public parties with an appreciable magnitude (at the discretion of the president of the court);
- ordering emergency, injunctive and preventative measures as necessary;
- mediating and arbitrating environmental disputes;
- instituting investigations, where necessary, to address environmental problems of international significance.

A similar proposal has been under consideration by a foundation based in Rome.

Let me illustrate the possible role of the court by referring to a particular issue currently calling for international adjudication. Consider the carbon emissions by China. The full extent of the west's responsibility for Chinese emissions of greenhouse gases has been revealed, according to recent press reports, by a new study. The report shows that half of the recent rise in China's carbon dioxide pollution is caused by the manufacturing of goods for other countries – particularly developed nations such as the UK. Last year, China officially overtook the US as the world's biggest CO₂ emitter. But the new research shows that about a third of all Chinese carbon emissions are the result of producing goods for export. The research, due to be published in the journal *Geophysical Research Letters*, underlines "offshore emissions" as a key unresolved issue in the run up to the Copenhagen summit, at which world leaders will attempt to thrash out a deal to replace the Kyoto Protocol.

Under Kyoto, emissions are allocated to the country where they are produced. By these rules, the UK can claim to have reduced emissions by about 18% since 1990 – more than sufficient to meet its Kyoto target. But research published last year by the Stockholm Environment Institute (SEI) suggests that, once imports, exports and international transport are accounted for, the real change for the UK has been a rise in emissions of more than 20%.

As we all know, developing countries are under pressure to commit to binding emissions cuts in Copenhagen. But China is resistant, partly because it does not accept responsibility for the emissions involved in producing goods for foreign markets.

Whether the forthcoming international meeting at Copenhagen will seek to address this kind of problem is unclear, but even if it does, it is overwhelmingly likely that the outcome will at best be, as Professor Lord Giddens predicts in his recent book, *The Politics of Climate Change* (published by Polity Press) as “anodyne”. Only a high-level international arbitral body would be able to convert such aspirations into more specific obligations on the ground.

A related example of an issue which might require international adjudication arises from the rules of the World Trade Organisation. At the recent Commonwealth Law Conference in Hong Kong, Professor Gillian Triggs, Dean of the Law Faculty at the University of Sydney, explained that there is a risk of trade disputes over measures adopted to reduce carbon emissions where the measure is inconsistent with WTO rules. She discussed the potential tensions between the Kyoto regime and WTO trade rules, albeit pointing out that, to date, the WTO Appellate Body has been astute to try to ensure a “*practical accommodation*” between the two regimes.

Thus, the potential benefits of an International Court for the Environment, particularly for the global business community, would include:

- a centralised system accessible to a range of actors;
- the enhancement of the body of law regarding international environmental issues;
- consistency in judicial resolution of international environmental disputes;
- increased focus on preventative measures;
- global environmental standards of care; and
- facilitation and enforcement of international environmental treaties.

Such a court could also influence the world business community to develop risk management programmes and improve present practices which would produce a corresponding reduction in the risk of environmental catastrophe.

To those who doubt the feasibility of any such proposal, an encouraging precedent (albeit in a very different context) is the establishment, after sustained pressure by NGOs and others, of the International Criminal Court.

Recent steps

On 28th November 2008, at the British Library in London, my chambers hosted a symposium on “climate change and the new world order”, at which the speakers included the former minister Nigel Griffiths MP and Oliver Tickell, author of the well known publication “Kyoto2”. This has led on to further meetings from which a more specific campaign has evolved.

The objective of this campaign is the establishment of a Coalition for an International Court of the Environment (ICE). Under preliminary draft proposals, features of the ICE would be as follows. It would sit above and adjudicate on disputes arising out of the UN “environmental” treaties, including the UN Convention on Biological Diversity 1992 and the UN Framework Convention on Climate Change 1992, the UN Convention on the Law of the Sea 1982, any other applicable UN environmental law and, in addition, customary international law. The ultimate aim would be for it to incorporate all of the work of the existing tribunals under the existing UN environment treaties (e.g. the Kyoto Protocol Enforcement Branch). However, to the extent that any such incorporation is not possible or not possible to start with, there would be a “carve out” of the ICE’s jurisdiction so as to prevent overlap with these existing bodies. The aim would be, ultimately, to achieve one single court dealing with all UN environmental law. There might be a restriction to investigate only the “most serious” breaches – in line with a similar restriction upon the International Criminal Court’s jurisdiction.

The ICE would have jurisdiction over the territories of signatory states. In addition it might have “back door” jurisdiction over non-signatory states by having jurisdiction over corporations domiciled or incorporated in signatory states with operations in non-signatory states. It would also have jurisdiction, ideally, over private individuals (including corporate persons) resident/incorporated/domiciled in signatory states. Importantly, it would have jurisdiction over these entities, even where the relevant activity took place in a non-signatory state. It is open to question whether jurisdiction would extend to branch offices/subsidiary companies within a signatory state of corporations incorporated or domiciled in a non-signatory state.

The following would have standing before the ICE:

- Signatory states;

- Private individuals (including corporate individuals) resident/incorporated/domiciled in signatory states;
- “Interested parties” including environmental groups and relevant NGOs (in a similar way to the standing of such groups under the EU Environmental Liability Directive).

The sanctions imposed could include declaratory relief, fines and, along the lines of the EC ELD, sanctions of restoration and rehabilitation of damaged habitats. The ICE could also hand down declarations of incompatibility as regards signatory state legislation where it conflicts with the UN environmental rules. In addition it might sanction signatory states for failures to permit enforcement of judgments. There would also be provision for interim measures, specifically, injunctions, enforceable in signatory states.

It is suggested that the ICE could produce a half-yearly or annual report listing its activities and naming and shaming wrongdoers (be they those who have breached the law or signatory states which permit failures to enforce judgments). It is also suggested the ICE has a panel of environmental experts to assist it.

In addition to the long-term aim of establishing the ICE, it is important to work on what is achievable and practicable in the short run, in particular, at the national level. On the assumption that a coalition is set up to promote the ICE, that coalition could also be used to fundraise for test cases at the national level where environmental cases might not otherwise have been brought, due to lack of funds. For example, the English courts are sometimes willing to exert “long-arm” jurisdiction and to apply English law to “foreign” cases, including environmental cases. A serious and rapid impact could be achieved on the environmental practices of international corporations if they could more readily be held to account in England (with its strong and enforceable remedies) for wrongs committed in developing countries.

Overall conclusion

The best way to drive forward these projects, both international and national, may be to establish just such a body as the coalition for an ICE. As Professors Boyle and Redgwell say in the third edition (2008) of their seminal work, “International Law and the Environment”, at p.378:

“Climate change potentially affects all elements of the global environment, including land use and food supply, sustainable water resources, preservation of biodiversity, sea levels and the marine environment, the polar ice caps, the survival of tropical forests, and human health. Unchecked, it may change the world as we know it irreversibly. Tackling it represents probably the greatest challenge the UN system has ever faced.”

Chapter 8

What should an international agreement on climate change at Copenhagen look like?

Mutsuyoshi Nishimura*

A long-term shared vision to save the planet

A successful international agreement on climate change at Copenhagen must give hope, if not confidence, to the people on the street that planet earth will finally be saved from impending catastrophe.

If this hope is to be realised in the Danish capital, it is crucial that countries agree on a limit for the amount of green house gases (GHG) that can be safely emitted worldwide. Global emissions must be capped. Countries must accept that a limit is necessary, firmly fix the cap on the basis of what science tells us and agree to stick within these newly set boundaries.

In short, Copenhagen must place an effective global cap on future GHG emissions lest hope to save the planet be lost. By agreeing to reduce GHG emissions globally by more than 50% over the present level by 2050, this hope can be retained.

Can governments agree on this? It is a tall order indeed, yet there is a glimmer of hope. There is broad agreement among industrialised countries about the need to reduce GHG emissions by more than 60-80% – or in some countries by as much as 95%, by 2050.

In addition to this, developing countries are also beginning to look at GHG emissions through a long-term lens. South Africa is now committed to seeing its emissions “peak, plateau, and decline” –specifically, their emissions must stop increasing by no later than

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2025 and must begin their decline in absolute terms by around 2030-2035. Brazil's climate plan commits to cut deforestation in half by 2018, while Mexico has proposed to cut their emissions by 50% below today's levels by 2050. Furthermore, China is undertaking a huge effort to improve its energy-intensity and is committed to improving it per GDP by 20% for the entire economy. "The developing countries, while developing their economies and fighting poverty, should actively...reduce their emissions to the lowest degree", China's white paper says, implicitly recognising that countries should not emit carbon limitlessly.

The most recent climate negotiations in Bonn in April 2009 further underlined this recognition. At Bonn, discussions centred on what has been termed the "limited carbon budget" and how this budget should be divided and shared equitably. Having drawn attention to this, it is at this stage important to mention that it is wrong to assume that developing countries are recklessly and mindlessly emitting GHG under the pretext of the historic responsibility of the industrialised countries. Rather, all developing countries want equity and fairness to govern any climate deal. This is reflected in the fact that they have been espousing the notion of a limited carbon budget for several years. The encouraging sign, emanating from meetings like Bonn, is that these discussions have recently become more open.

Furthermore, governments across the world are showing a greater willingness to work together in ways that transcend traditional dividing lines; the driving mechanism behind which is the aspiration to move towards a low-carbon economy. The closer one moves towards a low-carbon system, the more one is likelier to benefit, as dependency on shrinking fossil resources is reduced, energy security is enhanced and the subsequent increase in competitiveness creates more jobs, growth and the associated benefits which come with it.

One dares to hope that countries will agree to an effective carbon budget as part of a mutually beneficial, forward-looking and comprehensive Copenhagen deal.

Short-term commitment by developed countries

A successful international agreement on climate change at Copenhagen must determine commitments on near-term emissions cuts for both industrialised and developing countries. It is imperative, however, that developed countries take the lead in solving this problem, which is largely of their own making. They must show strong and clear commitment to the climate agenda and establish ambitious, legally-binding emissions reduction targets if overall agreement is to be reached in Copenhagen.

Acting on its own accord, the EU has already committed to reduce its emissions to 20% below 1990 levels by 2020 and plans to increase its reduction targets to 30% if other countries display comparable efforts to reduce their emissions. In the US, President Obama has called for a cap-and-trade system to return emissions to 1990 levels by 2020, while the Australian government will reduce GHG emissions by 25% on 2000 levels by

2020, if there is a global agreement sufficient to stabilise GHG at 450ppm CO₂-equivalent or lower by 2050. Canada has adopted a 20% reduction below 2006 levels by 2020 and a 60-70% reduction below these levels by 2050. Japan is to announce its mid-term target in June 2009, but has already decided to commit to a 60-80% reduction below present levels by 2050.

The key question is whether developed countries can act collectively, as the stronger and more coherent their commitments are, the greater the likelihood of meaningful action in developing countries.

Another factor, crucial to progress, is that developed countries must reach a joint agreement on which stabilisation scenario they aim for collectively (i.e. whether they commit to keeping worldwide temperatures within viable scenarios, such as below 2°C). It also holds that they each accept a comparable and equitable share of responsibility. They must declare to the world's public that together they will take robust action to help realise a global GHG peak in or around 2020, while unilaterally declaring that they will commit to cutting their emissions even further so as to achieve the required reduction as set by the 2050 target. This kind of decisive leadership and responsibility will help cement a clear sense of unity between developed countries, and following such a display of collective commitment, they would be in a much better position to invite developing countries to join forces, offering them assistance to come on board and avert a climate catastrophe.

Short-term commitment by developing countries

With scientific evidence indicating that the situation is worse than previously thought, one of today's most pressing issues is that of how to get developing countries to commit to significantly deviate their emissions from BAU. It is imperative that developed countries help developing ones realise such pledges, so that together a global GHG peak can be achieved in or around the year 2020.

A number of developing countries, such as China, India, Brazil, and South Africa, have already developed national climate change or energy strategies and have put in place national laws that will decrease BAU emissions (growth) considerably. In Copenhagen, the central challenge will be to incorporate these existing policies into the deal. Under an agreement, developing countries should preferably commit in numerical terms to deviate away from BAU or another such baselines. Binding commitments in Copenhagen may not be feasible, but a credible system to ensure improved efficiency in major developing countries, coupled with a provision mechanism for international assistance, could set them on the right track to significant emissions reductions.

The intensity commitments of developing countries could also be written down into Nationally Appropriate Mitigation Actions (NAMAs) that should cover all key emitting sectors, especially the power, transport, major energy-intensive industries, forests and agriculture sectors. Furthermore, a mechanism should be established to ensure that

national priority actions for energy efficiency be matched with international assistance, financial as well as technological.

The Bali Roadmap represents a breakthrough instrument in that it provides a new architecture, in the form of NAMAs, for developing countries to act to mitigate climate change. For the first time in the history of the UNFCCC, it is now expected that developing countries will come on board and push for global mitigation in a responsible manner. However, NAMAs must be activated in the context of sustainable development, and supported and enabled by technology financing and capacity-building in a measurable, reportable and verifiable manner. Thus the mitigation actions of developing countries are inherently interlinked with developed country support. The crucial test is whether Copenhagen will make the most of NAMAs and advance developing countries' mitigation efforts.

Commitments in narrative terms as opposed to numerical terms will not quantify how much mitigation should be achieved, and consequently are not going to help the world ensure climate stability in the long-term. Therefore the challenge lies in setting quantifiable aggregate emissions reductions that are realisable.

Finance, adaptation and technology transfer

For developing countries, participation in a global agreement in Copenhagen is contingent on rich countries providing them assistance. So, evidently, the challenge for Copenhagen is to establish a credible mechanism that can provide developing countries with both technological and financial support in a way that encourages them to: do more towards mitigation; adapt themselves effectively; build local capacities; and accelerate the introduction of advanced clean technologies.

In view of the huge scale of the resources required, the sources of financing must include a wide variety of private and public funding, grants and loans under Overseas Development Assistance (ODA), all the resources of international financial institutions, and where possible resources from market mechanisms. On top of this, the domestic resources must also be mobilised, particularly in the area of energy efficiency, where the right inductive government policies could leverage a large amount of private funding.

An overarching system is needed to regulate multiple funding streams and ensure that money and technology are appropriately distributed to the various mitigation (and adaptation) projects around the world. For example, any plan to renovate coal-firing power plants in major developing countries could be considered and administered by such a scheme.

On the basis of this plan, countries could start working more congenially and effectively to procure the most efficient and fitting clean technologies; procure finance, both public and private; encourage mutually beneficial business linkages; help build local capacities;

and deal with intellectual property rights and all other related issues. Thus in creating a new sense of trust and partnership they will bring about quicker results.

There is broad recognition that Copenhagen must deliver on the need to provide specific and targeted financial support for crucial mitigation (and adaptation) projects and make sure they are linked up to the appropriate technologies. Establishing a large, all-purpose international coffer is therefore not considered as a viable option. NAMAs can instead play an important role in acting as an overarching and catalysing mechanism, and in this sense serve as a platform for genuine north-south cooperation and partnership in the fight to halt global warming.

In search of a definitive solution...

Copenhagen will certainly succeed in creating renewed momentum for global climate efforts – however much will remain to be done. The timing of the US domestic legislation is unknown, and major developing countries have yet to fully come to the fore with a concrete pledge. The absence of this commitment means that the world, while welcoming the developing countries on board, will merely watch on as they deviate away from the baseline.

Furthermore, since the Copenhagen deal will most likely be structured around a national capping system – where countries as a rule tend not to do more than their neighbours – the aggregate volume of reductions committed to in Copenhagen by developed and developing country alike will not be enough to ensure climate stability at the required level. On the other hand, if the international community is sufficiently mobilised by Copenhagen and rises up to the challenge of climate change, then we stand a chance of success.

If Copenhagen does not provide a definitive solution, post-Copenhagen must. National governments for the sake of their credibility must be certain that their mitigation strategies are incurring the lowest possible cost, therefore, even without the economic and financial crisis, they need to be sure that they are taking the optimal strategy in solving the climate change problem; hence the continued search for a definitive solution.

The surest way of achieving an acceptable level of climate stability is to cap, not national nor company specific emissions, but global GHG emissions. Once this global cap is in place, it must then be forcefully decreased over the coming decades until we reach a point of climate stability. The most cost-effective means of achieving this is to allow the abatement to take place wherever it proves cheapest worldwide.

These two requirements point to a global emissions trading system with a strict descending world cap as the only plausible way forward. Without a descending global cap, there will be no definitive climate solution. Aggregate national reductions will not ensure climate stability at an acceptable level.

A global emission trading system designed on an upstream basis would create a single common carbon price worldwide. It is not growth-restraining, as businesses can burn as many fossil fuels as needed if they remain competitive in relation to the carbon price, thus forcing fossil fuels to be burned in the most rational and competitive way possible. It would also compel individuals and businesses to spearhead energy efficiency and invest in cleaner technologies. In following with this, a technology development treaty coupled with a set of regulatory and standard policies and measures would also help greatly.

A global carbon market may still seem a long way off. Yet, momentum is gathering. People are looking at the mitigation issue as a way of sharing the limited carbon budget rationally and equitably. Rather than trying to constrain national emissions, people are viewing a global cap in a positive way – as something compatible with their growth strategies.

The EU has announced that it aims to have Emission Trading Systems linked among OECD countries by 2015, and for a global ETS to be established by 2020. Furthermore, it has also said that it will soon start a series of design consultations with interested parties, including the US.

Developing countries' officials and their experts are now increasingly talking about the possibility of a limited carbon budget. Notably, at the Poznan COP of December 2008, a group of Chinese experts presented the concept of a global carbon budget at China's official fringe event.

The most frequently discussed issues in the US debate on the cap and trade bill are "safety valve" and "off-sets". This indicates American concern regarding a potential carbon price hike. The hard truth of the matter is that the emissions reduction efforts of any country would not be confined within their borders if there were a descending global cap on global emissions. Concern over a carbon price hike would be greatly reduced as the global emissions trading systems would allow countries to abate wherever it proves cheapest.

The climate situation will most certainly deteriorate further, resulting in an even stronger demand for urgent implementation of a definitive solution in order to prevent a climate catastrophe. There will be a stronger demand to transcend national borders and sovereignty in order to save the planet. Furthermore, in the context of the global financial crisis, the current situation dictates that any solution must be as inexpensive as possible.

An elaborated global emissions trading system, accompanied by regulations, standards and technological innovation policies, is the most effective solution for stopping global warming while guaranteeing economic growth.

Section III
The United Kingdom:
the politics of
low-carbon transition

Chapter 9

Climate change: the political and business challenge

Peter Mandelson

The societal move to low carbon is clearly an issue that transcends – or should transcend — politics in the “party-political” sense. The scale of the social and infrastructural change that it will require here and across the global economy puts it in a class of its own as a problem that must engage parties across all serious parts of the political spectrum.

However, this does not mean that the politics of the transition to low carbon do not matter. In fact, the opposite is true. The need to capture the popular imagination, to generate a sense of popular urgency and endeavour make the move to a low-carbon society an intensely political problem. Because the transition to much greater resource efficiency will change our patterns of consumption and the way we do almost everything in our lives that involves the use of energy, it will inevitably have to engage people to break from established habits.

The great achievement of climate science and the green movement over the last two decades has been to establish the incontrovertible evidence for destructive and man-made global warming and to push the issue to the centre of mainstream politics. The danger is that the very starkness of the warning that has driven this growing awareness produces not public action for change but public resignation. The scale of the problem seems overwhelming to individuals. The immediate costs lie over the horizon, either literally in parts of the world distant to most Europeans, or in the future, where they can be easily discounted against the benefits of existing lifestyles or the costs of change. Contrary to its intention, the grim narrative of global catastrophe encourages many people not to act, but to believe that it is too late to act, or that their individual action can make little difference.

The only way to break this leap from awareness to resignation is to build a positive political story around the transition to low carbon. This is not to argue that we should minimise in public debate the huge changes that we will have to make as individuals in the way we consume resources, or pretend that the economic benefits of the transition are not likely to outweigh the costs of change in the short term. But the politics of climate change ultimately need to be rooted in a positive picture of change. In particular, alongside the obvious environmental benefits of action, we need to stress the potential economic benefits of change.

This is not simply a question of the long term. As powerful as it is, the argument of the Stern Report and others that action now will ultimately save our economies from the long-term costs of unchecked global warming is very abstract for a business or individual. Our focus must instead be on the immediate economic benefits of the shift to low carbon, especially for those economies that are able to capture the first mover benefits. The politics of climate change need to both stress the business benefits of the transition to low carbon, and actively seek to prepare companies and workers to compete for and benefit from the opportunities that will come from that transition.

This means seeing the transition to low carbon as a problem for industrial policy in the broadest sense. How does government work with market forces to create the economic incentives to change? How do we ensure that government sends clear, consistent and unambiguous signals that it is committed to change so that businesses can make their own investments? How do we ensure that the technologies required to enable the shift to low carbon are developed and commercialised with the necessary speed? How do we ensure that UK businesses are equipped to be in the vanguard of these industries and thus benefit from the transition here and elsewhere? In effect: how do we help build a positive politics of climate change by showing that the transition to low carbon has tangible, immediate business benefits? In this chapter I want to provide some preliminary answers to these questions. The rationale I will set out here underlies the Low Carbon Industrial Strategy that the government will publish in summer 2009.

The global market for low-carbon goods and services

Although we inevitably focus on its costs, the transition to low carbon is also a significant economic opportunity. The global market for low carbon goods and services is already substantial and is projected to grow rapidly. Although estimates vary depending on what is counted as “green” goods and services, the global market for both has been estimated to be worth around £3 trillion, with prospects to grow by half that again by 2015 (Innovas, 2009). The United Nations Energy Program estimates that the global renewable energy sector alone employs more than two million people (UNEP, 2007).

We have legislated in the EU and in the UK in a way that will inevitably expand demand for low carbon goods and services. We have committed to binding targets for emissions that oblige us to reduce greenhouse gas emissions by 80% by 2050. We have committed to

biding EU obligations to provide a significant tranche of our energy through renewables by 2020. We have shouldered vehicle emissions targets that will require us to cut the contribution of transport to green house gas emissions substantially by the same date. As the measures required to meet these targets begin to bite, and as others adopt a similar approach, demand for low-carbon goods and services will increase substantially.

In principle, European companies are well positioned to benefit from this growing market, and Britain is a European leader in the sector. Low-carbon industries and their supply chains employ more than 880,000 in the UK and contribute around £107 billion to UK GDP. Even through the current downturn the sector is projected to maintain positive growth rates and by some projections could employ around 1.3 million people by 2015. As just one example, the UK's long coastline and considerable experience with offshore oil and gas extraction means that UK companies have the sophisticated engineering and maritime skills required for offshore wind and wave energy generation. Indeed, the Carbon Trust estimates that the wind energy sector alone could add 70,000 jobs and £8 billion in annual revenues to the UK economy by 2020 (HMG, 2009).

Although many of these strengths are in manufacturing, UK companies also have considerable expertise in environmental services such as low-carbon consultancy and carbon finance. The UK is home to the world's largest carbon trading market and accounts for 40% of the European market for low-carbon venture capital. The UK is also well placed to develop the software and the ICT services that will support the low-carbon economy. The British "green sector" is larger as a proportion of its economy than that of the US, Germany, France and Japan (Innovas, 2009).

These existing strengths are not an argument for complacency. While the global market for low carbon will continue to grow, others will also strive to replicate the UK's comparative advantages. Maintaining the comparative advantages of UK low-carbon businesses, and ensuring that the UK is among the best places in the world to start or develop low-carbon businesses will require:

- a clear regulatory framework that enables and encourages them to commit to long term investment;
- the necessary infrastructure to support a transformation of our energy and transport networks to low carbon;
- support for the research and development that underwrites experimental green technologies at the pre-commercialisation stage;
- a steady flow of venture or growth capital to low-carbon firms;
- a workforce equipped with the skills to handle new technologies and processes;

- where appropriate, incentives to drive demand for low carbon goods or practices.

I will look at each of these policy challenges briefly in turn. Although I will put them in an explicitly British context, they are equally relevant and applicable to the EU as a whole. They are collectively defined by the need for a consciously strategic approach from government, and a clear need for a partnership between the public and the private sector.

A strategic commitment to change

Because the cost of investing in many low carbon technologies is, in many cases, very high, it requires a policy environment that is as coherent and stable as possible. The primary obligation for government is to commit to a strategic vision of the required transition in the UK and to stick to it. It has taken substantial steps in this direction by legislating binding obligations on the UK to reduce its green house gas emissions, the environmental impact of its transport fleet and the balance in its energy mix between renewables and other forms of energy generation. In principle, meeting these targets will require that every unit of output in the UK economy in 2050 will have to be produced using, on average, one tenth of the carbon used today. To meet our 2020 renewables targets, we will need to increase energy from renewable sources by nearly ten-fold. These legislative commitments are clear signals that enable companies to invest with greater confidence in technological solutions for meeting these targets.

However, a number of further government commitments have also been necessary to ensure the UK is in a position not just to meet its carbon emissions targets but also to maximise the business benefits of the shift to low-carbon. These all relate to areas where the costs of investment are prohibitive for the private sector without absolute clarity on long term government intentions, and where government policy has, until recently, been ambiguous or unsettled. Two significant commitments stand out. First, a clear commitment to Carbon Capture and Storage for coal-fired power stations. The government provided this in April 2009 when it announced that all future coal-powered energy generation in the UK must incorporate carbon capture technology, part funded. This commitment, along with public support for technology demonstration and support from the EU will create a clear incentive to test and develop the costly technology required to capture and sequester carbon emissions from coal-fired energy generation.

Second, a similar clear commitment to enabling a new generation of nuclear power stations in the UK. This was delivered in 2008 and has been reinforced since. In particular, the progress made to ensure energy companies pay for the waste and decommissioning costs of new power stations and the work underway to identify potentially strategically suitable sites have further clarified the future of nuclear power in Britain. Industry has responded positively and aims to have new power stations operating by 2017/2018. EDF have invested more than £12 billion with their purchase of both British Energy and NDA land at Bradwell. A RWE / EON joint venture has purchased NDA land at Wylfa and Oldbury.

Each new power station represents a considerable opportunity for it has the potential to be worth up to £2 billion to the economy and offer up to 9000 jobs (HMG, 2009).

The infrastructure of a green economy

However, the viability of major low-carbon business investment hangs not only on the wider commitments of government to specific technologies but on the infrastructure that they depend on. While commercial incentives will produce some of this infrastructure – as it has for example in enabling the partial roll out of broadband digital communications – comprehensive coverage, delivered in such a way as to incentivise parallel private sector investment will require some facilitating role for government. The UK's energy grid is clearly critical in this respect. Large scale expansion of renewable and local energy generation will only be viable if the existing energy infrastructure is fully adapted to micro-generation and other energy sources. On top of almost £5 billion of investment already underway or planned for the next five years, the government expects to invest further in the grid's capacity to integrate new renewable generation from, for example, on and off-shore wind. National Grid has already identified scope to advance some new connections for Scottish renewables generation by a number of years. Adapting the national grid in this way is clearly a prerequisite for private sector investment in renewable energy generation in the UK.

A similar viability question relates to the UK's transport infrastructure, especially for low-carbon vehicles. Large scale deployment of electric or hybrid vehicles is clearly dependent on a basic infrastructure for charging them. While these technologies are still evolving, government must ensure that low carbon vehicle technologies are not made unviable solely because they lack the infrastructure to make them work. As part of the government's ultra-low-carbon vehicles strategy in April 2009 it announced £20 million in additional assistance for a small number of urban centres willing to take the lead in installing charging networks for ultra-low-carbon cars and vans (HMG, 2009b).

Supporting green innovation

Government will also need to work with business to support the development of technologies like ultra-low-carbon transport before they reach the commercialisation stage. UK businesses, prior to the recession, were investing around £1 billion a year in low-carbon technologies, encouraged in part by an effective research and development tax credit system. However, the UK remains comparatively weak among developed economies on investment in research and development. Between 2008-2011 the UK government will fund around one and half billion pounds worth of low carbon research, development and demonstration. The largest tranche of this – £500 million – will be invested by the Technology Strategy Board, which has joint public-private programmes in place for developing low carbon vehicle technologies and low carbon aerospace technologies such as composites. In recognition of the increasing centrality of its role, in 2009, the government increased the TSB's funding by £50 million, drawing from the £750 million Strategic Investment Fund created by the 2009 Budget. As part of its ultra-

low carbon vehicles strategy it also expanded funding for the TSB's low-carbon vehicle demonstration scheme, ensuring that the programme will put almost 300 demonstration models on British roads over the next eighteen months. A number of other low-carbon technology demonstrator facilities, which are vital to testing the commercial viability of new low-carbon technologies, are also being considered for investments through the Strategic Investment Fund, where private sector support is not available.

Finance for low-carbon businesses

This links to the wider question of access to the necessary finance to launch and develop low-carbon businesses. The UK has well developed venture capital markets, but there is good evidence that an equity gap exists in the UK and Europe for small capital injections of between £250,000 and £2 million (HMG, 2009c). This gap appears to be linked to the relative due diligence cost of making investments on this scale. This is, however, finance that can be critical to companies in very early development or at the first expansion stage. There is also some evidence that UK venture capital is retreating from the UK's regions (BVCA, 2007). Obviously the highly constrained credit environment of the banking crisis and a gradual economic recovery only exacerbate this problem. As a response the government is currently assessing options for developing a new public private investment partnership similar to the Industrial and Commercial Finance Corporation created after the Second World War. This would use public investment commitments to leverage private growth capital for innovative small firms, many of which would inevitably be in the low-carbon sector. Any new government initiative would build on the success of the eight small-scale Enterprise Capital Funds currently part-funded by the government and the £75 million Capital for Enterprise Fund established in 2008 to increase the supply of risk capital to innovative businesses through the downturn. In addition, at Budget 2009, the government announced that UK low-carbon firms stand to benefit from up to £4 billion in new capital lending from the European Investment Bank, either in the form of direct loans or intermediated bank lending. The government will act as a facilitator, bringing together developers, banks and the EIB.

Building a low-carbon workforce

No green revolution in business will be possible without people with the necessary skills to manage new technologies and new processes. Within a decade, low-carbon skills will need to be fully embedded in the UK workforce. This will be especially important in manufacturing and construction, where an understanding of low-carbon processes will become part of the basic skillset. To make this happen the government needs to work with employers to stimulate demand for low-carbon skills, and to some extent to anticipate the growth in demand for low-carbon skills. As part of the *New Industry New Jobs* agenda the government has committed to developing with the UK's Sector Skills Councils and the UK Commission on Employment and Skills a new practical and analytical capacity to collect and deploy intelligence on skills needs in low-carbon sectors and markets quickly and effectively. This will be backed up by a new Skills Funding Agency that will ensure that the funding is available to rapidly develop skills to support low carbon industries (HMG, 2009c).

Driving demand for low-carbon

Finally, where appropriate, government needs to be ready to act to drive market demand for the shift to low-carbon. Obviously, the government's various emissions targets will have this effect, as they will require increasing measures to raise the cost of carbon. However a number of targeted measures now to drive demand also make sense. The government has identified two initial areas for this. The first is encouraging both public and private organisations to invest in energy efficiency. While some incentives to do this already exist, especially the costs imposed by high or volatile energy prices, many firms do not prioritise energy efficiency either because they are unaware of the potential economic benefits, or unable, in the case of many SMEs to fund the initial outlay, especially in the current environment. The Carbon Trust and others have estimated the potential value of such energy efficiencies at more than £3 billion per year to the UK economy (HMG, 2009a). At budget 2009 the government committed a further £165 million to expand government loans to public sector organisations and small businesses to improve their energy efficiency. A further £200 million was allocated to expand public subsidies for the renovation of existing social housing stock and to drive up energy efficiency standards for new social housing. This is part of a wider government programme announced in September 2008 to retrofit the entire social housing stock of the UK to high standards of energy efficiency. Meeting the demand created by these various programmes will create a major incentive for the UK construction industry to develop the necessary skills in insulation, retrofitting, heating technologies and other forms of greater energy saving.

The other area where the government sees a key role for government in shaping market demand is in the low carbon vehicle sector. As part of its ultra-low carbon vehicles strategy in April 2009 the government announced £230 million to provide subsidies to consumers purchasing low carbon vehicles from 2011. The government is also using its weight in the market as a procurer to create demand for low carbon vehicles. The Department of Transport has launched a Low Carbon Vehicle Procurement Programme which aims to increase the introduction of electric and low carbon cars and vans into the public sector vehicle fleet.

Conclusion: principles for a low-carbon industrial policy

This is a necessarily brief summary of some of the key policy decisions that will or are already shaping a positive business environment for low-carbon goods and services in the UK. They aim to ensure that UK companies have the necessary clarity and certainty to invest in change and access to the skilled workforce, innovation and science base, and finance to realise and commercialise low-carbon technologies and the huge array of support services that will underwrite a low-carbon economy. This kind of activist "industrial policy" for a low-carbon transition needs to be guided by three basic principles:

First it must be rooted in a **long term strategic approach** from government, recognising that certainty in government's own stable commitments to a low-carbon economy is critical to the confidence of businesses in investing in change and individuals investing in training or consumer choices. In sending these signals governments must ensure that their message is clear and consistent: infrastructure, planning and the full suite of government policies must all be aligned to the goal of facilitating low-carbon business investment and growth.

Second, we must be willing to **use the power of government to supplement the market** in certain ways if we are to make the transition to low-carbon quickly and effectively. At the most fundamental level this can mean intervening in the market to raise the cost of carbon in certain ways, and to a level that forces a genuine change in behaviour. It can also mean public sector interventions to ensure that Britain has the necessary infrastructure to support low-carbon technologies, that UK-based companies can draw on a quality science base and the resources to develop and commercialise low-carbon technologies, that Britain is training people with the required skills and that finance is available for viable low-carbon companies. None of these things will be provided by the market alone. Where appropriate, it will also mean government intervening in the market to generate demand that will accelerate the transition to low-carbon: support for consumers purchasing the first generation of ultra-low-carbon vehicles, government procurement programmes that increase demand for ultra-low-carbon vehicle fleets and assistance for businesses wanting to invest in greater energy efficiencies are all practical examples of how this can be done sustainably. Recognising this essentially pragmatic balance between the roles of the market and the state in driving the transition to low carbon is one of the keys to the politics of climate change.

Finally, government has a responsibility to **ensure that UK-based companies are equipped to compete for the new demand created by government climate change policies**. This means looking at the supply chain implications of its decisions to commit to renewables obligations, nuclear new build or greater energy efficiency standards. Where UK-based firms have the clear potential to compete to supply this demand, government should develop, in partnership with business, strategies for ensuring that funding for research and development, training for workers and finance for investment are available. This approach is part of the activist approach to equipping UK-based firms to compete in a globalised economy set out in the government's *New Industry, New Jobs* paper in April 2009.

Identifying, advocating and equipping ourselves for the potential business benefits of the transition to a low-carbon economy must be an integral part of a positive politics of climate change. Such an agenda is not an attempt to sidestep the very real questions about the sustainability of patterns of resource use or economic growth that climate change compels us to answer. It is certainly not to argue that climate change should be presented as cost-free to business or consumers: the economic costs of the transition

to climate change are real and patterns of resource use and consumption will have to change dramatically. The rising cost of carbon will — and indeed must — make many current business models increasingly expensive and untenable.

But these negative incentives for change can only be half the story. The level of public engagement that the politics of climate change will require must be built on a political narrative of opportunity as well as profound and even difficult social change. This is all the more important in the context of the current recession, where investment in the transition to low-carbon has the potential to play an important part in our economic recovery and renewal. Maximising these business opportunities will require a close partnership between the private and public sectors and a pragmatic approach to using both the dynamics of markets and the influence and capabilities of the state to drive change.

Chapter 10

The UK's carbon targets for 2020 and the role of the Committee on Climate Change

Samuel Fankhauser,
David Kennedy and Jim Skea*

Introduction

The United Kingdom has the most advanced climate change legislation in the world. In November 2008 parliament adopted a new Climate Change Act with broad support from all political parties. Together with new legislation on energy and planning, enacted at the same time, and the creation of a new Department for Energy and Climate Change a month earlier, the act defines Britain's policy approach to climate change and puts in place the institutional arrangements needed to meet its ambitious objectives.

The act breaks new institutional ground in at least three respects. First, it sets a legally-binding long-term emission target for 2050. The act obliges the UK to reduce its greenhouse gas emissions by at least 80% below 1990 levels by mid-century. Policymakers around the globe have endorsed such long-term goals, including the leaders of the G8 nations at their 2007 and 2008 meetings. However, the UK is the first country so far to put this commitment into law. The target is formulated as a minimum requirement, which leaves open the option of further cuts if necessary.

Second, the act puts in place a framework through which the long-term target can be achieved. It commits the UK to a series of legally-binding five-year carbon budgets that will guide the country toward the long-term goal. The budgets provide a benchmark against which the country's emissions performance can be measured. They help to create regulatory certainty for investors, while maintaining enough flexibility for mid-term

** The paper draws heavily on the inaugural report of the Committee (CCC 2008). However, the views expressed in this article are our own and do not necessarily reflect those of the Committee. We are grateful to the members of the Committee and the staff of the CCC Secretariat. A summary with an emphasis on the analytical and methodological underpinnings of the CCC recommendations is Fankhauser et al (2009).*

corrections. The five-year time horizon is thought to be long enough to absorb short-term fluctuations in emissions, for example due to weather extremes or fluctuations in the business cycle.

Third, the Climate Change Act establishes a new independent body, the Committee on Climate Change (CCC), which advises the government on carbon budgets and monitors progress in meeting them in an annual report. Applying a transparent, evidence-based approach to setting and meeting budgets, the CCC helps to support the development of robust carbon strategies and increase the likelihood of meeting the ambitious emissions reduction targets it helps to set. The legal framework requires the discussion of CCC advice and its annual progress reports in parliament, lending the CCC considerable leverage to hold the government to account.

The CCC, which had been active in shadow-form since February 2008, issued its first set of recommendations in October 2008, when it advocated a long-term emissions reduction objective for the UK of at least 80%, relative to 1990, and the extension of the target to all greenhouse gases, not just CO₂. These recommendations were subsequently adopted and incorporated in the Climate Change Act.

In December 2008, the Committee published its first full report (CCC, 2008). The report elaborates on the reasoning behind the 80% recommendation and proposes emissions targets for the first three carbon budgets (2008-2012, 2013-2017 and 2018-2022). It recommends that by 2020 UK greenhouse gas emissions should come down by 42% as part of a stringent international agreement that builds on the current Kyoto commitments. Until such an agreement is reached the UK should commit to a 34% unilateral cut.

This paper summarises the rationale behind the CCC's 2008-2022 recommendations. It shows how the proposed 2020 targets can be met through a combination of measures in energy, transport, housing and industry. And it asks what the wider social and economic consequences of the carbon budgets might be, including the likely cost to the economy, the impact on competitiveness, fuel poverty, energy security and the fiscal position and the implications for the devolved administrations. (There is a method for allocating responsibility for administering aviation emission under the EU ETS, but this would not remain tenable if full international agreement were to be reached. In shipping there is a major problem with the "leakage" of emissions).

The proposed carbon budgets from 2008 to 2022

The introduction of five-year carbon budgets is arguably the key institutional innovation of the Climate Change Act. The recommendations for the UK's first three carbon budgets, up to the year 2022, were therefore at the core of the CCC's inaugural report.

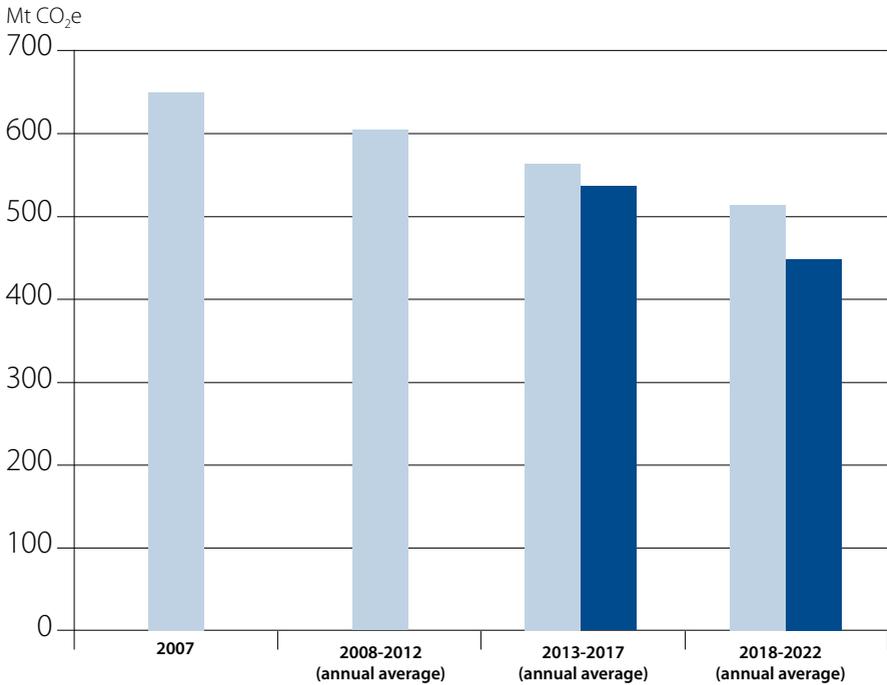
The recommendations for 2008 - 2022:

- Each carbon budget constitutes a distinct five-year target. However, the CCC used the year 2020, the mid-point of the third budget period, to take a “sighting shot” at appropriate budgets for periods one to three. The CCC recommended a two-track approach with two state-contingent targets (see Chart 1):
- An interim target of -34%, relative to 1990, to which the UK should commit unilaterally; and
- An intended target of -42%, relative to 1990, which the UK should adopt if a meaningful successor to the Kyoto Protocol can be agreed.

Consistent with the long-term target the carbon budgets cover all Kyoto gases despite uncertainty in the measurement of non-CO₂ emissions, particularly in agriculture. However, the CCC recommended excluding emissions from international shipping and to some extent aviation until a transparent and sensible way is found to allocate emissions to the national level. The CCC recognises the importance of international transport emissions though, and will monitor them in its annual progress reports. The level of ambition in the proposed budgets reflects likely progress in reducing emissions in aviation and shipping, and both sectors are included in the 2050 target.

Although the budgets are set for the country as a whole, the underlying analysis distinguishes between the traded sector and the not-traded sector of the economy. The traded sector includes high emitting industries like energy, metals and ceramics that are covered by the EU ETS. As of 2012, the EU ETS will also cover aviation. The emissions targets for the traded sector are set at EU level and firms have the option to buy and sell emissions permits across the EU. They may also import a limited number of emission reduction credits from international offset schemes like the Clean Development Mechanism. The carbon budget records traded sector emissions net of these cross-border transactions.

Chart 1: CCC recommendation for the 2008-2022 carbon budgets



Source: CCC (2008).

The non-traded sector includes transport, residential and non-residential buildings and the non-EU ETS part of the economy (e.g. the service sector, small and medium sized enterprises). Domestic policy levers are needed to influence non-traded emissions. In principle, it would be possible to use international offsets to net out emissions in the non-traded sector. However, the CCC recommended that this should not be allowed under the interim budget. The rule may be relaxed under the intended budget, when international offsets may be used to ease the move to the tighter target.

Carbon budgets in the wider climate change context

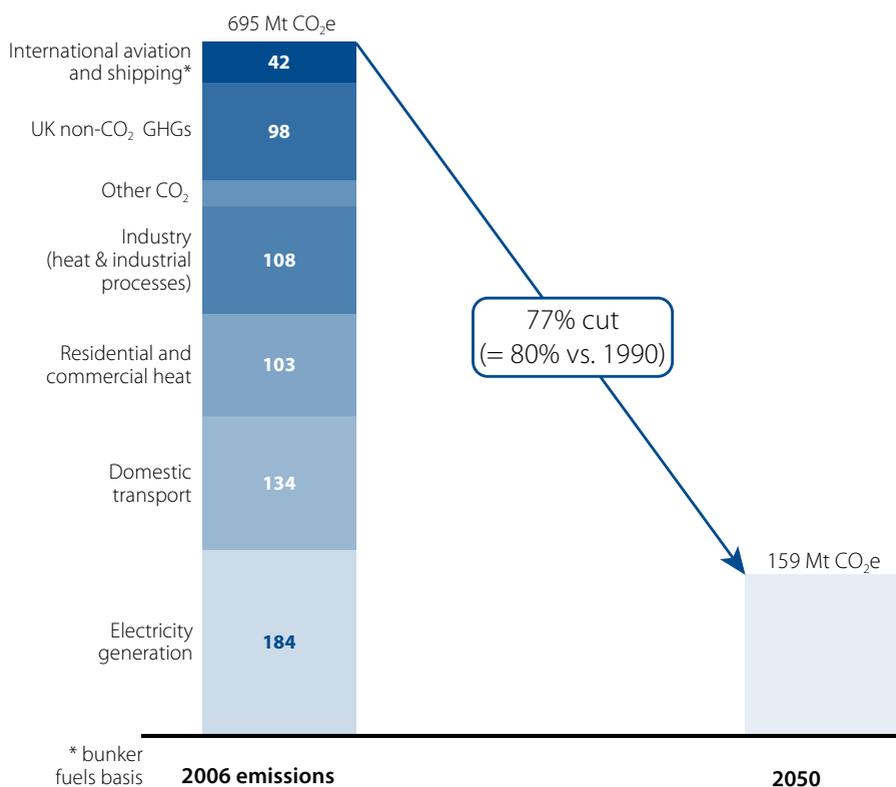
In recommending the three carbon budgets the CCC was guided by three key concerns: (i) the need for consistency with EU-wide energy and climate change policy, (ii) the need to be consistent with the 2050 objective and make an adequate early contribution to the 2050 target; and (iii) the need for budgets that are ambitious but technically and economically feasible.

The distinction between an interim and intended budget was a direct result of the desire to align the targets with EU policy, which distinguishes a “unilateral” target (a 20% EU-

wide emission cut) and a “global cooperation” target (a 30% emission cut). The CCC felt this was an appropriate way to approach the international negotiations for a post-2012 agreement. The targets proposed for the UK are roughly consistent with the obligations that the EU-internal burden sharing methodology imposes on the UK.

The proposed budgets set the UK on course to meet its 2050 target. The 2050 target requires Britain to reduce its greenhouse gas emissions from 695 MtCO₂e in 2006 to 159 MtCO₂e in 2050 (see Chart 2). This is equivalent to an annual average reduction of 3.3% over the next 40 years. The proposed carbon budgets start off with a lower reduction rate of 2.8% per annum until 2020 for the intended budget. This would then have to increase to 3.5% per annum between 2020 and 2050. Although the initial reduction rate is lower than the long-term average, the CCC felt it was adequate. In an environment of high uncertainty, the proposed targets also provide the flexibility to make cost-effective mid-term corrections should new information become available (Watkiss et al., 2008).

Chart 2: Current UK emissions and the 2050 target



Note: UK emissions in 2006 (including international transport) were 16% lower than in 1990. Hence, a 80% emissions cut relative to 1990 translates into a $(1 - 0.20/0.84) = 77%$ reduction from today. Source: CCC (2008).

To test whether the proposed carbon budgets are technically and economically feasible – the third consideration in setting the targets – the CCC systematically assessed the emission reduction potential in each of the main sectors of the economy. We turn to this analysis next.

Meeting the 2008-2022 target

The CCC used a bottom up approach to identify emission reduction opportunities in the UK and thus ascertain the feasibility of the proposed targets. Detailed marginal abatement cost curves were derived for all relevant sectors, including electric power, transport, buildings and industry and the non-CO₂ sectors.

The potential for cost-effective abatement

In establishing the overall abatement potential, the main focus was on options costing less than a central cut-off price of £40 per tonne (the assumed carbon price in 2020). However, in many cases more expensive measures were also included based on their “dynamic efficiency” – that is, their long-term potential for deep emission cuts later on – or to start driving down the costs of promising technologies.

A distinction was made between the theoretically feasible potential and the realistically achievable potential, which takes into account barriers in the uptake of measures. The realistic potential reflects a judgment on the prevailing policy framework, the way it might be strengthened and the incentives it gives to take up theoretically feasible abatement options. In this respect, the CCC distinguished between three policy scenarios:

- **The current ambition scenario** includes measures which cost less than the £40 per tonne cut-off, or which are covered by existing policies, but is cautious about their realistically achievable potential. The scenario includes significant progress towards low-carbon electricity generation, and some progress on improving fuel efficiency in new cars.

- **The extended ambition scenario** includes “more ambitious but still reasonable assumptions” about the realistic reduction potential of existing policies, plus a number of measures which would cost more than £40 per tonne, but which are “important stepping stones on the path to 2050”. The scenario is “broadly in line” with policies to which the government or the EU are committed in principle, but which have yet to be implemented.

■ **The stretch ambition scenario** adds further abatement options for which there is no policy commitment at the moment, for example “more radical new technology deployment and more significant lifestyle adjustments”.

The CCC concluded from this analysis that in order to meet the interim target, the existing policy framework would have to be strengthened to reach “extended ambition” level or more. If this is done there would be no need to resort to the purchase of international offset, and the CCC advised against this option for the interim budget.

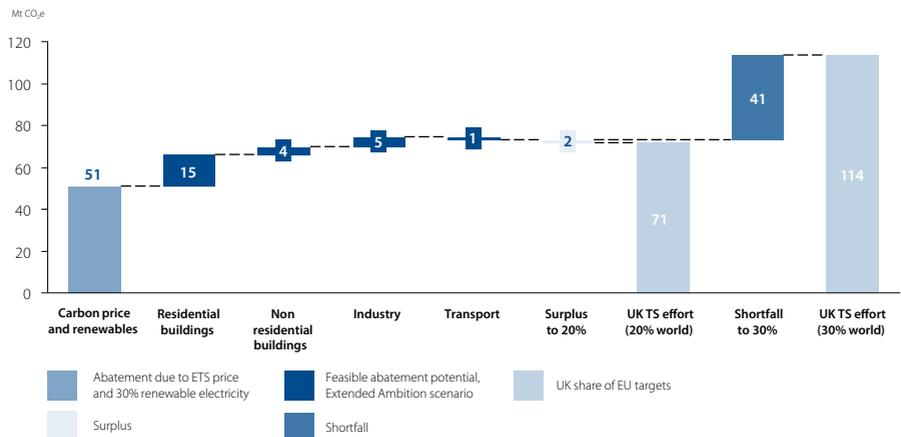
For the intended target, “extended ambition” would have to be combined with an increased reliance on carbon offsets or additional measures envisaged under the “stretch ambition scenario”. The more generous use of offsets could thus help to move from the interim to the more ambitious intended target.

Reduction potential by sector

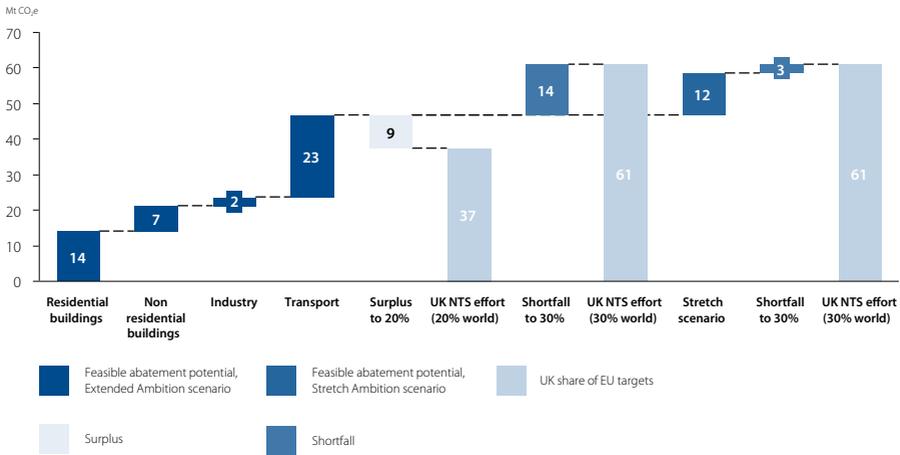
Chart 3 details the emission reductions each sector of the economy may contribute to the overall target. Two thirds of the emission reductions required under the interim target is expected to come from the traded sector, that is installations covered by the EU ETS. Within the traded sector a large part of the emission cuts will have to occur in the electricity sector. Decarbonising the electricity sector is central to meeting the 80% mid-century target and initial steps towards that goal will have to be taken by 2020.

Chart 3: Delivery of the Carbon Budgets

(a) Emission reductions in sectors covered by the EU ETS (2020)



(b) Emission reductions in non-traded sectors (2020)



Source: CCC (2008).

Several low-carbon power generation options are available in the first three budget periods, including renewable technologies like onshore and offshore wind. Although storage issues remain, nuclear power is also likely to be attractive, particularly if the pace of renewable energy deployment is insufficient. A range of policies will be required to support the deployment of these technologies. Chief among them is the creation of a clear carbon price signal within the EU ETS over the long-term, but additional policy levers will also be required (e.g. relating to planning and transmission).

Carbon capture and storage (CCS) remains untested and will contribute little during the first three budget periods. However, it will be important to demonstrate the technical and commercial feasibility of CCS during this period at industrial scale, as the government now intends to do. The CCC recommended that conventional coal-fired power plants should only be built on the expectation that they will be retrofitted with CCS equipment by the early 2020s.

In the non-traded sector, there is a large potential for low-cost emissions cuts in residential and non-residential buildings through energy efficiency improvement and lifestyle changes. However, realising the full potential would require a much stronger policy framework, for example in the form of stricter appliance standards, higher-powered incentives for Supplier Obligations (or Carbon Emission Reduction Targets (CERT) as it is currently known) and perhaps changes in the delivery mechanisms and business models for energy efficiency. The realistic potential is therefore only about half the technical potential. Even more ambitious would be attempts to unlock the considerable, albeit more expensive, potential for renewable heat (mainly biomass) and micro-generation (e.g. solar energy). This would require considerable additional policy levers.

The long-term decarbonisation of transport will ultimately require a switch away from fossil-fuel-based combustion engines to electric vehicles, biofuels or hydrogen technology. The best approach to decarbonisation may vary in different segments of the transport sector. However, only electric cars are expected to make a meaningful contribution to the first three carbon budgets. In the short-term, the main contributions from the transport sector will come from improvements in current technology and demand-side measures like changes in modal split, more efficient driving or a switch to smaller cars. The main lever will have to be policies at EU level to bring down the carbon efficiency of new cars from currently around 160 grams of CO₂ per kilometre (in the UK) to 100 g/km or less.

The potential to reduce emission reduction also exists for non-CO₂ gases, for example in agriculture and waste (a sector which has already cut emissions by half since 1990). However, this potential is as yet less well understood and emissions are more difficult to measure.

The wider social and economic impact

In making its recommendations, the potential social and economic implications were an important concern for the CCC. The Climate Change Act explicitly requires the CCC to have due regard for the wider social and economic impacts from the carbon budgets, in particular the effect on industrial competitiveness, fuel poverty, security of supply and the government's fiscal position. Another key concern is the impact on the UK's regions and the devolved administrations.

The CCC found that the social and economic impact of the budget was manageable, but complementary measures will be needed to mitigate some of them, in particular in the case of fuel poverty and the competitiveness of selected industries. The CCC concluded that the UK could meet the proposed carbon budgets at a cost of less than one percent of GDP – considerably lower than the cost of addressing the current crisis in the financial sector.

One of the main concerns is fuel poverty. The CCC acknowledged that the higher energy prices required to meet the carbon budgets would, without compensating action, increase the number of fuel poor households (defined as households that spend more than 10% of their income on energy). However, the instruments to mitigate this effect – energy efficiency improvements, income transfers or social tariffs – are available and the costs of doing so are manageable. The CCC noted in particular the merits of energy efficiency improvement amongst fuel poor households, which can serve both environmental and social objectives.

Another key concern is the impact of unilateral action on business. Again, the CCC felt that adverse effects on UK competitiveness can easily be mitigated through an appropriate design of the policy framework. Competitiveness effects are potentially important for only a small number of industries (e.g. steel) that are both energy intensive and operating in a

globally competitive market (and thus unable to pass on higher costs to consumers). The instruments to address competitiveness issues include border carbon price adjustments, the free allocation of permits to selected industries and the negotiation of globally binding sector agreements. It is appropriate to deal with competitiveness concerns at the European, or even global, levels, and the issue featured prominently in the design of the third phase of the EU Emissions Trading Scheme.

Important in the current economic context, the CCC found that the carbon budgets would not undermine the sustainability of public finances. The budgets have a number of fiscal implications. On the one hand, revenue from auctioned permits for the EU ETS will raise additional revenues. On the other hand, there will be a loss in fuel duty revenues (unless the way it is levied is revised), and perhaps VAT and corporate tax revenues (depending on the economic impact of the budgets). Overall, the fiscal impact is expected to be mildly negative in the early years, but should become positive by 2020.

In the UK, the fight against climate change generally goes hand in hand with attempts to improve energy security. Decarbonising power generation and increasing energy efficiency will reduce the UK's exposure to volatile oil and gas prices, and reduce the risk of supply interruptions. There are technical security of supply concerns arising from the intermittent nature of renewable energy sources like wind. However, since these can be addressed through back up capacity, intermittency is ultimately an issue of cost, rather than security of supply. Regulatory incentives may be needed though, to ensure that adequate back up capacity is provided by the liberalised market.

The social and economic impacts of the carbon budgets are not spread uniformly across the country. Competitiveness and fuel poverty concerns, in particular, are more important in some regions than in others. But there are also opportunities to cut emissions, with some variation, across all sectors - power, buildings, industry transport and agriculture – in each of Northern Ireland, Scotland and Wales. National authorities have an important role to play in unlocking this potential given the balance of reserved and devolved powers.

The road ahead

The inaugural report of the CCC concludes that;

“deep emissions cuts in the UK are required both over the next fifteen years and in the period out to 2050 as part of a wider global emissions reduction effort. ... The challenge now is for the Government to strengthen the policy framework and for individuals and businesses to respond. Meeting this challenge is vital if we are to avoid dangerous climate change and the significant consequences and costs that this would involve.”

With the Climate Change Act the UK has put in place an institutional framework through which it can begin to address this challenge. The response to the CCC's first report, both by government and the wider public, has been encouraging.

The CCC recommendations on the long-term target were adopted straight away and are part of the Climate Change Act. In spring 2009, the government adopted the CCC's 34% interim target for 2008-2022. It acknowledged that the interim target would have to be revised once there is a new international agreement, but did not endorse the CCC's intended target of 42%. Instead, the CCC will be asked for an updated recommendation once the details of the new agreement are known. The first three carbon budgets need affirmative resolutions in both houses of parliament and are expected to be approved by June 2009.

The government also followed the CCC's advice on the use of international offsets, which will be restricted to the quota the EU ETS has set for the traded sector. Consistent with the CCC's position on coal-based electricity, the government further announced that new coal-fired power stations will have to demonstrate carbon capture and storage and be retrofitted with this technology once it is proven.

However, climate change is a long-term problem and the current momentum will have to be maintained for years. This will be difficult. Inevitably, other issues will come to the fore, competing for resources and ministerial attention. We already see some of these dynamics at work in efforts to deal with the present economic crisis, although encouragingly climate change has remained on the political agenda. In fact, a powerful case has been made for low-carbon investments as an effective way to kick-start the flagging world economy (Bowen et al 2009, Edenhofer and Stern 2009).

The real test of Britain's climate change framework will be how it responds if UK emissions veer off track. The carbon targets in the Climate Change Act are legally-binding, statutory commitments. So the government could in principle be pursued through the courts if it fails to meet them. How this would work in practice is not clear, though. In a similar case, a claim for judicial review of the government's failure to meet its fuel poverty targets was dismissed in autumn 2008. Although the two pieces of legislation are worded differently this suggests that the judicial route may not be straightforward.

Perhaps the more powerful weapon will be political pressure from parliament and public opinion. Importantly, the Climate Change Act had the overwhelming support of all political parties. Only four votes were cast against it in the House of Commons, and many of the amendments tabled in fact aimed at making the act more ambitious. This will make it very difficult for future governments, of whatever persuasion, to water down its provisions. Moreover, the act is designed to make it inconvenient for the government to renege on its obligations. Performance under the carbon budgets will be monitored and discussed in an annual report by the CCC. If targets are not met, the Secretary of State will have to put before parliament detailed proposals on how to compensate for the excess emissions in the future.

The initial work of the CCC was about setting targets, both over the long term (2050)

and more immediately for the first three carbon budgets (2008-2022). Pending a recommendation on the fourth budget period due by the end of 2010, the focus of the CCC is shifting to monitoring, its second key duty.

The immediate challenge for the 2009 annual report, due in September, will be to devise a framework of indicators that reveal, with sufficient lead time, whether the UK is on track in meeting its carbon budget obligations. Such lead indicators are likely to cover policy developments (e.g. changes to the renewable energy framework), implementation issues (e.g. uptake of new incentive schemes), investment (e.g. clean generation capacity under development), innovation (e.g. progress on CCS pilots) and technological change (e.g. the carbon efficiency of new cars). Particularly salient in the current economic environment will be the need to distinguish between structural, policy-induced change and temporary effects due for example to fluctuations in the business cycle.

The CCC will also seek to deepen its understanding of sectors and mitigation options that have not been fully covered in the first report. This includes, for example, the issue of agricultural emissions, technology options in the heating sector, demand-side measures in the transport sector and the impact of a large-scale shift to low-carbon technologies on the functioning of the electricity market. There is also the question of how to tackle airline emissions and bringing international aviation and shipping into the carbon budgeting system. The role of aviation will be the subject of an aviation review carried out in 2009.

Finally, the CCC will start looking at adaptation with the creation of an adaptation sub-committee. The adaptation provisions in the Climate Change Act have received less publicity than the parts on mitigation, but there can be no doubt that mitigation and adaptation will be of equal relevance going forward. The UK is vulnerable to climate change, as weather events over the last years have shown. Adaptation is therefore important – and mitigation is as much about enlightened self-interest as it is about good global citizenship.

Chapter 11

Can the UK reduce its greenhouse gas emissions by 2050?

Neil Carter

The UK is often regarded from abroad as a climate change leader, a reputation enhanced by the efforts of Tony Blair to push the issue up the international agenda. This international success has distracted attention from a modest domestic record: put bluntly, a weak climate change programme has resulted in key targets being missed. Yet since 2007 there has undoubtedly been a step change in the government's approach to climate change and some significant policy developments, notably the Climate Change Act (CCA), which set a more ambitious target of an 80% reduction in greenhouse gas (GHG) emissions compared to the 1990 baseline, introduced carbon budgets and established the Committee on Climate Change (CCC). The new 2050 target represents a tough challenge. It is extremely doubtful whether the current strategy will put the UK on the right trajectory to meet it; existing policies will fail because they are insufficiently ambitious and because they will not deliver the emission reductions they promise. This chapter will focus on the 2020 target as a reasonable proxy for the long term 2050 target.

Tougher targets, but they need to be tougher still

There is a broad consensus that any serious climate change strategy must achieve an early curtailment of cumulative emission increases and an early reversal of emissions growth. The CCC recommended an "interim" target of a 34% reduction in baseline emissions levels by 2020, thereby strengthening the existing 26-32% target. It also proposed an "intended" 2020 target of 42% – representing the likely UK share of a higher EU target that will kick in once an international treaty is agreed — with most of the 8% difference to be achieved through carbon offsetting projects in non-EU states. The government has now taken the important step of adopting the 34% target and published the first three five-year carbon budgets (2008-2022), which are intended to deliver it, with a vague promise to "increase

the level of ambition of carbon budgets once a satisfactory global deal on climate change is reached” (HM Treasury 2009: 137).

Unfortunately, the UK has missed an opportunity for climate change leadership. The willingness to plug the short-term gap through offsetting sends the message that the UK will pay poor countries to make our cuts for us, whilst carrying on in a business-as-usual manner, and ignores serious doubts about the “validity” of carbon cuts achieved via offsetting mechanisms. The UK should adopt the “intended” 42% reduction budget immediately because eventually it will have to make those reductions anyway, so any delay risks “locking-in” bad practices. It would also set a good political example to everyone involved in the post-Kyoto treaty negotiations.

Will the UK meet its 2020 targets?

Since 2007 the government has finally introduced some significant new climate change policies. Indeed, it claims that the UK will meet the first two carbon budgets (up to 2017) and is within range of the third (2018-2022) (HM Treasury 2009: 137-8). So why should we be concerned about the chances of meeting the 34% target (let alone the intended 42% target or the long term 2050 target)?

One reason is the government’s unimpressive record of achieving its modest reduction targets. Whilst emission cuts achieved in the 1990s will ensure that the Kyoto target will be met, it had long been obvious that the UK would miss its tougher domestic goal of a 20% reduction in CO₂ emissions by 2010. Yet, as illustrated by the unimpressive Climate Change Programme 2006, the government remained extraordinarily complacent.

Although the government has upped its game, it is hard to believe that it can deliver the stringent policies needed in the following three core sectors by 2020:

Renewable energy must contribute an increasingly large share of electricity generation. The UK has an EU target to provide 15% of all energy from renewable sources by 2020, leading the CCC to suggest that by then over 30% of electricity generation must come from wind energy, which is the only commercially viable renewable energy source. Yet in 2007 just 4.9% of electricity was generated from renewable sources, far short of the longstanding target of 10% by 2010.

Energy consumption must be slashed, yet the government has been very slow to develop effective policies to improve energy efficiency in public and private buildings. Established schemes have encouraged energy suppliers to concentrate on easy, low cost measures such as insulating cavity walls and lofts. Future gains will require more challenging energy efficiency measures, such as solid wall insulation, which will confront a deep inertia among householders to such measures.

The transport sector has the fastest growing emissions and the most ineffective

policies. Government policy has focussed on technical solutions to the problem of vehicle emissions, but the abject failure of car manufacturers to abide by their voluntary agreement to reduce new car emissions across the EU has undermined this strategy. Although international aviation (and shipping) are not included in the formal reduction targets they cannot be ignored, yet the traditional “predict and provide” approach still prevails, illustrated by government support for new runways at Heathrow and Stansted airports.

What do we need to do?

The policy solutions suggested below are not original and are largely drawn from independent expert sources, such as the first CCC report. To a large extent they involve the government doing more of what it is doing now; put differently, it is doing many of the right things, but not to a sufficient scale or degree.

This wish list starts with three general principles that the government must embrace.

Raise the price of carbon

Much depends on the price of carbon being high enough to act as an incentive to change behaviour: for example, the success of the EU ETS; the competitiveness of offshore wind and nascent renewables; the willingness of householders, businesses and public organisations to invest in energy efficiency measures and technologies; choices about what mode of transport to use. So the government should exploit every opportunity to impose stringent taxes on carbon.

Regulation

A comprehensive climate change strategy requires the use of a wide range of policy instruments, but many tasks remain where regulation is the most effective tool, including building regulations and vehicle emission standards.

Public expenditure

Although the fiscal crisis means that all governments will be strapped for cash for some time, there is no escaping the need for serious investment in low carbon measures. One idea for shifting some of the direct cost away from the government would be to set up some kind of “green bank” with the purpose of raising capital – perhaps through “green bonds” - to invest in low carbon projects that cut emissions and create jobs.

Turning to specific sector solutions:

Low carbon electricity

The primary aim must be a massive increase in the amount of electricity generated from renewable sources. The CCC aspiration for wind to generate 30% of electricity by 2020 is ambitious, yet it requires only the same growth rate as Germany has achieved over the last 12 years. Onshore wind has become cost competitive, but it provokes a wide

range of objections on the grounds of visual intrusion, noise and environmental impact. Offshore wind circumvents many such objections, but it is much more expensive due to the various engineering challenges posed by underwater construction — although the collapse of aluminium and steel prices in the recession will help.

The Energy Act 2008 should help wind farm proposals pass through the planning system more speedily, but the government must invest far more money in wind energy. The Renewables Obligation will provide a significant subsidy to wind of over £1 billion in 2010, rising to over £2 billion by 2020 – and recent reforms will encourage offshore wind. But infrastructure investment is badly needed; in particular, offshore wind and tidal power will need a decentralised offshore grid to enable them to be competitive and more efficient. The government must make a significant contribution towards the cost of between £10-15 billion, which needs to be seen as a social cost that is spread across all users, including the coal and nuclear industries.

The feed-in tariff promised for 2010 needs to be sufficiently generous, as in Germany, to provide an effective stimulus to household microgeneration and community low-carbon heating schemes. The UK should also follow the recent German law requiring all new homes to be fitted with renewable energy heating systems.

A big increase in R&D is essential: beyond 2020 technologies such as tidal power could provide the kind of certainty that wind cannot deliver, and there are potential economic benefits because the UK is one of the world leaders in developing this technology.

Further emissions reductions will result from the closure of one third of coal fired power stations by 2015 following the implementation of the Large Combustion Plant Directive, although this benefit will be counterbalanced because most remaining nuclear reactors will also shut down. The resulting electricity gap will only partly be filled by renewable sources. The timescale is too short for nuclear to make a significant contribution, as no new reactor will be operational until 2018. The decline of North Sea gas raises concerns about energy security and the prices that will limit further development of gas-fired power stations.

The government clearly regards new coal fired power stations as the most practical solution, but Carbon Capture and Storage (CCS), which promises eventually to capture around 90% of carbon emissions, is unlikely to be commercially viable until at least 2022. The government will invest in four CCS demonstration projects to hasten the process of making CCS technically and commercially sound. But the government must stick to its new regulation that no coal-fired power stations will be consented unless they fit at least partial CCS (a minimum of 300MW net capacity), and that full CCS be retrofitted within five years of opening. This policy will allow new power stations to be built before CCS is finally proved to plug the generation gap; even though where post-combustion CCS technology is used as much as 80% of emissions will escape.

Longer term, both major parties are committed to nuclear re-build. Any new construction must be conditional upon the nuclear industry not receiving the kind of explicit or hidden subsidies that it has received historically; taxpayers not having to pay for the massive long-term decommissioning and storage costs; and an acceptable solution is found to the problem of long-term storage of nuclear waste. If so, putting aside unresolved environmental and safety concerns, nuclear could play an important part in meeting the longer-term 2050 emissions reduction target.

Energy efficiency

All governments should be spending massively on energy efficiency measures, particularly for public and private buildings, because they can deliver timely and targeted boosts to the economy, warmer homes and lower fuel bills for those on low incomes, as well as important emissions reductions. The government has finally woken up to the “triple dividend” potential of energy efficiency, yet despite recent increased expenditure, the ambition remains limited.

The UK needs a comprehensive strategy that puts low carbon buildings at the heart of economic recovery. The government can make huge savings in the public sector and it must implement a programme to make one million homes per year “super-efficient”, which would involve investing around £10,000 per home, making total expenditure approaching £10 billion per annum (Ekins 2009). The inertia of householders can be overcome through a combination of grants, low cost loans, higher energy prices, greater awareness of energy use within the local building industry and amongst householders, and requiring tougher energy efficiency criteria in house sales. Important lessons can be learnt from Germany, where most homes built before 1978 (around 50% of total housing stock) will be refurbished over the next 20 years to make them more energy efficient.

Transport

The new EU auto emissions directive should produce significant emission reductions over the next decade. But the government needs to supplement its focus on technical solutions with policies that promote modal shifts to more sustainable forms of transport, reduce the need to travel, cut the distance travelled by private car and increase vehicle occupancy levels.

The full panoply of vehicle taxes and fuel duties needs to be used both to encourage consumers to choose lower emission vehicles and to discourage them using private transport at all. The gap between the high and low vehicle excise duty bands needs to be several thousand pounds. Now that the fuel duty escalator has been reinstated, it should be made much more stringent. Road pricing must be put back on agenda with the intention of introducing a range of pilot schemes over the next few years.

There needs to be significant new investment in public transport: buses, railways and possibly new metro schemes. Rather than building new high speed railways, bigger

emissions cuts may be obtained from investment in electrification, new rolling stock, reopening old lines and subsidising fares to make trains more affordable.

The new runways at Heathrow and Stansted must be blocked.

It is essential that sustainable transport issues are built into the planning process and all forms of urban development, so that communities are constructed where people can work, shop and enjoy leisure activities locally, with good public transport links, and street design that privileges the pedestrian and cyclists, rather than the private vehicle.

So why don't we have better policies?

Environmental politics

A major obstacle to the development of effective climate change policies has been the low salience of environmental politics in the UK. The environment has not been the subject of intense partisan rivalry between the major parties: it doesn't shape the way people vote and it has never been a major issue at a general election. Indeed, politicians clearly regard some of the more draconian climate change mitigation measures, such as higher green taxes, road pricing or restrictions on air travel, as electorally disastrous. However, David Cameron has played an important role in transforming the party politics of the environment. He made it a signature issue for his reform of the image of the Conservative Party, and his party has adopted a range of progressive climate change policies (see Carter 2009). The sharp improvement in Labour's climate change policies since 2007 was part of this "Cameron effect". Indeed, the government has appropriated several policies first espoused by the Conservative Party, including the CCA, reform of aviation tax and feed-in tariffs.

It is essential to maintain the new cross-party consensus on the need for tougher action on climate change, without losing the party competition that has contributed to policy change. The establishment of five-yearly carbon budgets for which the government is formally accountable to Parliament will provide a new focal point for the opposition parties to put pressure on the government. But that cross-party consensus does not yet permeate throughout the Conservative or Labour parliamentary parties. The Labour government has faced little pressure from its own backbenches to act on environmental issues, whilst Cameron's embrace of green politics is not matched by the third of Conservative MPs who reported that they were climate change deniers in a ComRes poll in July 2008. The challenge therefore is to "green" the grassroots of both parties so that they provide a constant pressure on their leaders to act on climate change.

The green lobby must also do its job more effectively. Although it exercised limited influence during the first two Labour administrations, it has achieved more success in recent years. The Friends of the Earth "big ask" campaign undoubtedly helped get the CCA onto the statute books – not least in persuading David Cameron to offer his support

— and several ENGOs combined to strengthen many aspects of the Bill as it passed through parliament. The green lobby needs to organise more of these innovative, popular campaigns and to strengthen its lobbying role in parliament; the carbon budgets will provide a focus for such activity.

Another potential source of pressure is the business community, which has traditionally been regarded as, for good reason, a major obstacle to progressive climate change policies, typically resisting proposals for a new regulation or tax. However, the Stern Report (2006) persuaded many corporate leaders of the powerful economic case for action. Corporate lobbying has helped persuade the government that the private investment required to nurture a low carbon economy requires medium to long term certainty, such as is provided by the third phase of the ETS and the three carbon budgets. But enlightened thinking has not yet penetrated the hearts and minds of all boardrooms (and none of them on all occasions), and has exerted least impact in the SME sector. Probably the best way of winning over a wider range of businesses is to demonstrate the commercial benefits from ecologically modern policies that cut energy costs and encourage new green industries.

Environmental governance

Environmental governance is used here to refer to the capacity of the government machine to design and deliver effective climate change policies. An effective climate change strategy requires horizontal and vertical policy integration across and within departments, the use of a broad mix of policy instruments and strong political leadership pushing those initiatives through the system.

The cross-cutting nature of climate change poses a major challenge for the functional administrative structure of the UK government, in which ministries are based on distinct policy sectors and typically pursue narrow sector-based objectives with little consideration of their impact on climate change. Consequently, there are significant institutional barriers to a fully integrated climate change strategy, as illustrated by two recent examples:

- the Autumn 2008 fiscal stimulus package did more harm than good for the environment because laudable investments in energy efficiency and public transport were outweighed by the investment in 520 miles of new roads.

- the car scrappage scheme gives owners of cars more than 10 years old £2,000 towards the cost of a new vehicle. This scheme: a) is a subsidy for private transport; b) does not even require recipients to purchase a low-carbon vehicle, so the money could be spent on a sports car or SUV!

Nevertheless, there have been some positive institutional developments that should enhance integration.

The creation of the Department of Energy and Climate Change (DECC) brings together key energy and environment portfolios with the aim of providing leadership in coordinating and pushing climate change strategy across government. The integration of portfolios within DECC has already played a critical role in delivering the shift in government policy on coal-fired power stations announced in Budget 2009. A positive future development would be to include the transport portfolio within DECC, which might help realign the priorities of that pro-car ministry whilst creating a super-department that would, hopefully, attract top ministers and exercise political clout within government. It might be objected that the brief sojourn of transport within the Department of Environment, Transport and the Regions (1997-2001) left transport largely unaffected, but it was given little time to reform and the subsequent ascendancy of climate change and the new CCA would act as powerful catalysts for change. The new carbon budgets, which will be the responsibility of every department to deliver, and the independent Committee on Climate Change, which has already shaped government policy, represent positive integrating developments.

Treasury

The Treasury is probably the most powerful institution within Whitehall, but its power has too rarely been used to further environmental goals.

The environment has never been an expenditure priority for any government. Will DECC win a bigger share of resources to climate change policy? Certainly, both the Autumn 2008 economic fiscal stimulus and Budget 2009 saw significant increases in expenditure on, for example, the Renewables Obligation and energy efficiency measures. Yet, despite government rhetoric about its commitment to a low carbon economy, the expenditure on climate change measures was relatively small compared to fiscal stimulus packages elsewhere, such as France, China and South Korea, and a long way short of Stern's litmus test that 20% of a national stimulus package should be devoted to low-carbon investment.

Treasury resistance to new regulatory measures has also been a significant obstacle to various climate change initiatives proposed by different ministries. Yet many possible climate change mitigation measures require extensive new regulation, ranging from banning the standby button to toughening building regulations.

The Treasury has been more sympathetic to some MBIs, particularly emissions trading schemes. The UK ETS was innovative and the Government has been a strong supporter of the EU ETS. Indeed, it has probably put too much emphasis on this approach, whilst downplaying eco-taxes: for example, between 1999 and 2007 the burden of taxation on private road transport declined in real terms (the 2000 fuel protests cast a long shadow). Yet emissions trading requires the price of carbon to be high enough to act as an incentive for businesses to cut their emissions. The Treasury needs to be brave enough to face down the political unpopularity of new or higher eco-taxes. But it can sugar the pill by discarding its traditional opposition to hypothecation. The investment of the London

Congestion Charge revenues into better tubes and buses shows that if citizens recognise that the revenues from a green tax are going on an environmental or social good then the tax becomes more palatable. Also, where the costs of green measures fall regressively on the poor, such as increased domestic energy prices, the Treasury must implement redistributionist welfare policies to alleviate their impact (e.g. to reduce fuel poverty).

Conclusion

Perhaps the biggest obstacle to governments taking a more radical approach to climate change is the electorate. Rightly or wrongly, politicians perceive the public as unwilling to accept policies that will impose significant costs or require lifestyle changes. In short, climate change is often regarded as “bad politics” – a vote loser.

But we have reached the point where the Government must confront opposition head on. That doesn't require a bare knuckle fight. As Compston and Bailey (this volume) make clear politicians can be highly strategic about winning political support for ambitious climate change policies – and there is also a wide range of tactics available. The Government needs to “persuade” us more effectively to change our behaviour. Many policies, such as domestic energy efficiency measures, can be “marketed” far better to overcome public resistance. The right package of regulations and market incentives could exert a dramatic impact on the transport choices of individual citizens. The government can do so much more to lead people in the right direction.

Yet it would be naive to deny that the wish list outlined above contains some potentially unpopular policies. So now is the time for genuine political leadership. Much may depend on David Cameron, as the probable next prime minister. Cameron “talks the talk” on climate change, and his actions suggest he recognises the importance of radical action, but will he deliver? It is essential that Cameron invests a significant chunk of the political capital he will possess – especially if he secures a big victory – in setting out a vision for a low-carbon Britain and backing it with ambitious initiatives. And he should do it early in his premiership, when he has the support of the country and the goodwill of his party. There is no doubt that Cameron will face strong resistance from the reactionary forces in his party who are not yet persuaded of the urgency of the problem. What we don't yet know is whether Cameron has the personal strength and commitment to face them down – and start the UK on the path towards a low-carbon economy.

Abbreviations

- BAU** – Business-as-Usual
- BRIC** – Brazil, Russia, India, China
- CCA** – Climate Change Act
- CCC** – Committee on Climate Change
- CCS** – Carbon Capture Storage
- CDM** – Clean Development Mechanism
- DECC** – Department of Energy and Climate Change
- EC ELD** – European Community Environmental Liability Directive
- EIB** – European Investment Bank
- ENGO** – Environmental Non-Governmental Organisation
- ETS** – Emissions Trading Scheme
- EU ETS** – EU Emissions Trading Scheme
- GDP** – Gross Domestic Product
- GHG** – Green House Gas
- ICE** – International Court of the Environment
- ICT** – Information and Communication Technology
- LNG** – Liquefied Natural Gas
- NAMAs** – Nationally Appropriate Mitigation Actions
- NGO** – Non-Governmental Organisation
- ODA** – Overseas Development Assistance
- OECD** – Organisation for Economic Co-operation and Development
- PCA** – Permanent Court of Arbitration
- SME** – Small and Medium Enterprises
- TSB** – Technology Strategy Board
- UNEP** – United Nations Environment Programme
- UNFCCC** – United Nations Framework Convention on Climate Change

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Building a low-carbon future:

The politics of climate change

Will the reconstruction of the global economy be positive for mitigating climate change? Is the move toward energy security at odds with a low-carbon society? Do we need the return of state planning to overcome the climate change challenge? How can the response to climate change be socially just? How can we forge an achievable but also equitable and legally secure international emissions deal at Copenhagen?

By addressing these questions, leading international thinkers and practitioners put forward a compelling new account of climate change politics and policies in this pamphlet, demonstrating how a low-carbon future can be built by a revitalised co-existence of markets and the state, as well as a strong political narrative of hope and opportunity.

