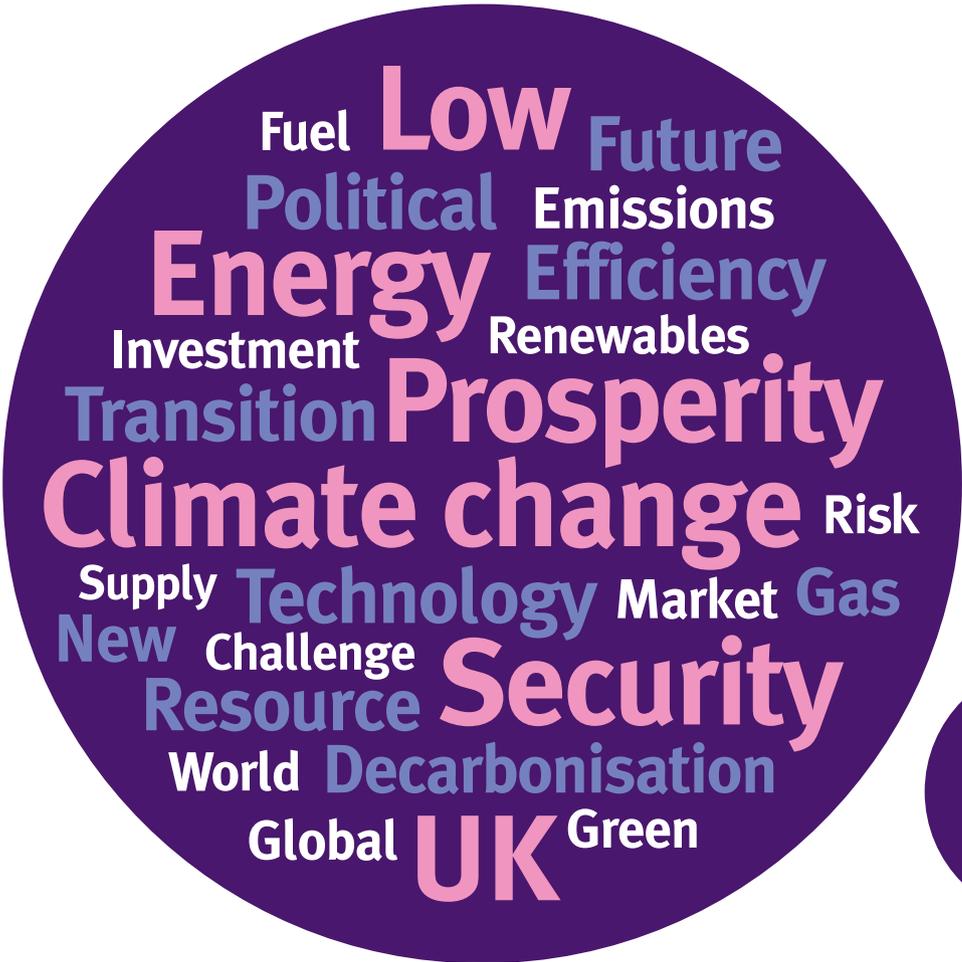
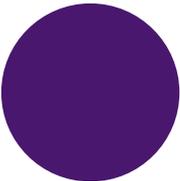
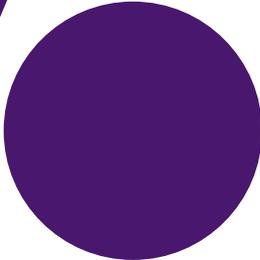


Conservatism in a changing climate

Security, prosperity and a low carbon future



green alliance...



Conservatism in a changing climate

Security, prosperity and a low carbon future

Edited by Thomas Lingard and Ben Caldecott

Published under Green Alliance's Political Leadership theme, which focuses on securing political action to tackle climate change and other environmental problems.

The views expressed in this publication remain those of the individual authors alone, and do not necessarily reflect the views of Green Alliance or its partners.

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Green Alliance

Green Alliance is an influential, independent organisation working to bring environmental priorities into the political mainstream. We work collaboratively with the three main parties, government, the third sector, business and others to ensure that political leaders deliver ambitious solutions to global environmental issues.

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Contents

Sponsor's foreword

Gearóid Lane, British Gas

6

Introduction

Thomas Lingard and Ben Caldecott

8

1 Climate change and security

Moving towards a low carbon economy: the national security rationale

Baroness Neville-Jones

13

Internationalism and green conservatism

Peter Ainsworth MP

17

2 Delivering a low carbon future

The need for a credible climate technology policy

Tom Burke

22

The costs and financing of the transition to the low carbon economy

Professor Dieter Helm

26

3 Prosperity and the transition to a low carbon economy

The economic case for climate action

Greg Clark MP

31

Resourcing our future

Professor Stephen Evans

35

Rational environmentalism? Towards an honest, trustful and more cost-effective climate change policy

Ben Caldecott

39

References

43

Contributor biographies



Ben Caldecott is a founder of the Conservative Environment Network (CEN), which advocates solutions to environmental problems that are consistent with conservative principles and brings people together who share that goal.

Ben is currently the lead on UK and EU climate change and energy policy at Climate Change Capital (CCC), an environmental investment group. Ben is developing CCC's in-house policy think tank and also advises CCC's funds and clients on the development of policy driven markets. Prior to this he held research directorships at Policy Exchange and The Henry Jackson Society, two leading UK based think tanks. In the past Ben has also worked in Parliament and for a number of different government departments and international organisations, including the United Nations Environment Programme and Foreign & Commonwealth Office. He read economics and specialised in China at Cambridge, London and Peking universities.



Thomas Lingard is deputy director of Green Alliance. Thomas is responsible for leading Green Alliance's policy team and supporting the development and delivery of the organisation's three-year strategy. Prior to this he spent nine years with Unilever where he specialised in sustainability, corporate responsibility and public affairs.

Thomas is a chartered management accountant, a member of the Oxfam Association and a trustee of Action Space, a non-executive director of the London Orchard Project and a Fellow of the Royal Society of Arts. He previously served as chair of the London Benchmarking Group and member of the Business Board of the European Academy of Business in Society (EABiS). He read Philosophy, French and Italian at Durham University, holds a postgraduate certificate in cross-sector partnerships for sustainable development from Cambridge University and an MSc in development management from The Open University.



Baroness Neville-Jones is the shadow security minister and national security adviser to the leader of the opposition. She was a career member of the Diplomatic Service from 1963 to 1996 during which time she served, among other places, in Rhodesia, Singapore, Washington and Bonn. Key appointments included chief policy planner in the Foreign and Commonwealth Office between 1982 and 1987, deputy secretary to the Cabinet and head of the Defence and Overseas Secretariat in the Cabinet Office between 1991 and 1994, and chairman of the Joint Intelligence Committee between 1993 and 1994. From 1994 until her retirement, Pauline was political director in the Foreign and Commonwealth Office, in which capacity she led the British delegation to the Dayton negotiations on the Bosnia peace settlement. From 2004 to 2007 she was chairman of the Information Assurance Advisory Council and, from 2002 to 2005, chairman of QinetiQ Group plc, a defence technology company. From 1998 to 2004, Pauline was the international governor of the BBC.



Peter Ainsworth MP is the Member of Parliament for East Surrey. He is chairman of the all party parliamentary groups for the environment and sustainable aviation, and is a member of the culture, media and sport select committee. Peter served as Shadow Secretary of State for Culture, Media and Sport from June 1998 until September 2001. Following Iain Duncan Smith's election as leader of the Conservative Party he was promoted to Shadow Secretary of State for the Environment, Food and Rural Affairs from which he stepped down in June 2002. In January 2003 he was appointed to the Environmental Audit Committee and in July 2003 he was appointed chairman. Peter returned to the Shadow Cabinet as Shadow Secretary of State for the Environment, Food and Rural Affairs in 2005 under David Cameron, and stepped down in January 2009.

Peter Ainsworth is a director of Plantlife International and a vice president of Wildlife and Countryside Link. In 2005, in recognition of his work on the environment, Peter Ainsworth was awarded the Public Affairs News 'Politician of the Year' award. In November 2009 he was named 'Environmental Parliamentarian of the Year' by the Chartered Institution of Environmental and Water Management.



Tom Burke is founding director of E3G and a trustee of Green Alliance. He is an environmental policy adviser to Rio Tinto plc and a visiting professor at Imperial College. He is a member of the Council of English Nature; statutory advisor to the British government on biodiversity; and co-chairman of the Anglo-German Environment Forum.

Tom was recently appointed an honorary professor in the Faculty of Laws at University College, London and is a fellow of the Royal Society of Arts. Since 1991 he has been a member of the Advisory Committee to the Business in the Environment Task Team. He is on the Advisory Council of the Earth Centre and advises a number of other environmental organisations. He is a founding member of the Council of the Institute of Environmental Management and served as Green Alliance's director from 1982-91.

Tom currently serves on the American Chemistry Council's Leadership Dialogue and on the advisory board for Conservation International's Centre for Environmental Leadership in Business in the US. In 1993 he was appointed to the United Nations Environment Programme's Global 500 roll of honour. In 1997, he was appointed CBE for services to the environment.



Dieter Helm is professor of energy policy at the University of Oxford and a fellow of New College, Oxford. He holds a number of advisory board appointments, including chairman of the Academic Panel, Department of Environment, Food and Rural Affairs and member of the Advisory Panel on Energy and Climate Security, Department for Energy and Climate Change. He is a member of the expert panel for the Department of Transport's Review of the Regulation of Airports. He was a member of the DTI's Sustainable Energy Policy Advisory Board from 2002 to 2007, of the Prime Minister's Council of Science and Technology from 2004 to 2007, and of the DTI's Energy Advisory Panel from 1993 to 2003. Dieter is an associate of the Smith School of Enterprise and the Environment, and associate editor of the Oxford Review of Economic Policy.



Greg Clark MP is shadow secretary of state for energy and climate change. He entered the shadow cabinet in October 2008, having previously been shadow minister for charities, social enterprise and volunteering. Before entering politics, Greg worked for the Boston Consulting Group, and was posted to the USA, Mexico, South America and Iceland, as well as working for clients in the UK. Greg was special advisor to the secretary of state for trade and industry, the Rt Hon Ian Lang MP, from 1996 until the general election in 1997. Subsequently, he was appointed the BBC's controller, commercial policy. Before becoming an MP, Greg was director of policy for the Conservative Party from March 2001 for three successive leaders: William Hague, Iain Duncan Smith and Michael Howard, before being elected to parliament in 2005.



Stephen Evans is professor of life cycle engineering at the School of Applied Sciences, Cranfield University. His research explores how industry can bring environmental and social sustainability concerns into its design and manufacturing practices. His work includes sustainable factories, food systems for people with reduced access to food, and sustainable city re-generation design.

He is the Vice-Chair of UK Manufacturing Professors, and board member of the Centre for Sustainable Engineering. He was recently Specialist Adviser to the House of Lords Inquiry in Waste Reduction. Steve previously spent 12 years in industry, finally as Engineering Systems Manager at Martin-Baker Engineering, the world leading manufacturer of ejection seats.

Sponsor's foreword

Gearóid Lane, managing director British Gas Communities and New Energy



British Gas is delighted to sponsor this timely and thought provoking publication. A growing imperative to meet the climate change challenge has seen a sharpened focus on carbon reduction strategies across the globe. Here in the UK, stringent and legally binding carbon reduction targets have been backed up with targets for renewable energy that imply a ten-fold increase in renewable generation by 2020.

Large scale wind will deliver the lion's share, and wave and tidal technologies could start to contribute towards the end of the next decade. But we should not underestimate the contribution that millions of homes and businesses across Britain can make. Better energy efficiency, smart meters and the mass deployment of microgeneration and heat technologies could all have a profound impact on energy demand. Smart grids and dynamic demand reduction could, in time, take this to another level and we welcome the Conservative party's exploration of the opportunities that smart grids offer.

At the same time the UK is facing profound changes in how energy security of supply is delivered. Indigenous gas from the UK Continental Shelf is now declining quickly, and by 2015 around 75 per

cent of the gas we need will be imported. Increasing the proportion of energy generated from low carbon sources can help minimise the impact of this. Ensuring we have the right import infrastructure: pipelines and liquid natural gas facilities, as well as more gas storage, will also be necessary. And we need to retain the flexibility to incentivise big users to suspend operations or switch to other fuels when gas demand spikes. The roll-out of smart meters will help smaller users, including Britain's 25 million households, to manage their demand in response to price spikes in gas and electricity. All of this will require the government to have a strategic vision for the UK's energy future to ensure that the necessary infrastructure, investment incentives and public understanding and engagement needed to realise it are in place.

These things together can deliver the diversity that is at the heart of energy security. Opening up the EU gas network and storage facilities will also be crucial and will help to prevent the UK being the gas lender of last resort, with a corresponding negative impact on gas prices.

In the next decade too, a significant proportion of the UK's coal-fired power stations will be retired to comply with EU legislation. The scheduled retirement of some of the UK's current nuclear generating plants will also begin. New low carbon generation will be needed to replace this demand and to provide fossil

fuel back up for an increasing amount of variable wind energy. We need to make sure that as much of our energy mix as possible is low carbon. The window of opportunity to secure this will not be open for long and, again, will require foresight on the part of the government in power to provide the policy clarity and investment security needed to drive the development of low carbon power.

And let's not forget that there will be a cost to delivering this investment. Whilst the recent reduction in energy demand as a result of the recession has created an opportunity to reduce investment in energy infrastructure significantly, that demand will go back up and the scale of investment needed, and the urgency, remains huge. A recent study by Ernst and Young suggests that up to £90 billion of investment needs to be made across the energy supply industry by 2015 if the UK is to meet its 2020 renewable targets, get on the path to low carbon generation and deliver security of supply.

Assuming that the funding for this investment continues to come from consumers through their energy bills rather than the taxpayer base, the costs to consumers will grow. Making sure that the money is well spent, that the costs are transparent, and that the most vulnerable people in our society are protected from the worst impacts of rising prices through a cohesive government fuel poverty strategy are critical.

The scale of the challenge is clearly immense, but the rewards could be significant. The UK could emerge as a world leader in delivering carbon reductions, and large numbers of jobs could be created in the new green economy. British Gas, for example, plans to create around 1,700 new green

jobs in our smart metering business alone, part of the 3,200 green jobs we plan to create across our family of businesses.

More expensive low carbon generation will need to be incentivised. Our electricity networks will need to be upgraded to cope with wind capacity being deployed on an increasingly large scale and for a big increase in decentralised generation. Higher levels of gas storage and import infrastructure will be needed to deliver security of gas supply, and a renewed planning regime which better enables all of this remains fundamental.

UK consumers will need to be educated about the need for new infrastructure, as well as the opportunities for them to be more energy efficient, and to generate their own power and heat. We believe new partnerships will emerge, with local authorities playing a bigger role, and we will seek to build on the successful examples of this that we have already developed.

Above all, the clear message is that investment certainty is absolutely critical to achieving all of the possibilities I mention above. The UK's energy companies stand ready to make this investment and if we have confidence that the next government, of whatever political hue, is committed to taking the country towards a low carbon future, much can be achieved. We welcome this publication, which we believe is an important contribution to that debate.

Introduction

By Thomas Lingard and Ben Caldecott

“...Conservatism and the environment agenda go hand-in-hand. Conservatives believe in social order and security, and it is obvious that our continued reckless disregard for our planet endangers this.”

David Cameron, 2007

The environmental movement has been catapulted into the heart of UK politics over the last four years. David Cameron and his ‘Vote Blue, Go Green’ mantra has helped to make environmentalism politically mainstream. The additional attention given to environmental problems within the centre-right is encouraging, but there is much still to do to explore the ideological rationale for action on the environment.

With this publication we aim to contribute to that debate, showing that the environment is not simply another issue to be addressed, but a context which brings additional saliency and urgency to traditional centre-right concerns such as security, technology, prosperity and efficiency.

It follows on naturally from Green Alliance’s publication *A greener shade of blue* and is the next step in our exploration of whether the centre right could be the source of successful solutions to the issues posed by climate change, resource scarcity and energy security.

Many environmental groups, including Green Alliance, require persuasion that the current approaches of many centre-right parties can successfully meet the challenges posed by global environmental problems. It’s up to us to influence that approach, and support those on the centre-right who are seeking to develop approaches that can and do secure the outcomes we desire. We hope that this publication will encourage others to engage in that task.

We expect the papers in this collection to be challenging to many groups: challenging to those parts of the centre-right that still cling to the deeply misguided view that environmental issues are second order policy issues not worthy of their attention, but also challenging to those engaged parties on the right who continue to believe that a purely laissez-faire approach to the issue is sufficient, even when inaction by government puts so much at risk.

By bringing together leading voices from politics, policy and academia, we set out a diverse collection of interrelated essays, linking climate change and security, national leadership and international action, technology and finance, economic rationalism and investment, and systems thinking and resource efficiency.

Not all readers will agree with all the arguments proposed in this collection. In fact, it would not warrant publication if they did. But we hope the breadth of argument and the new ways of thinking about these issues will lead to a deeper understanding both of the issues themselves and how to make them resonate with those who have previously been disengaged and outside of the debate.

This is a publication in three parts. Within conservatism one of the primary responsibilities of national government is to protect its citizens from war, terrorism, risks to economic stability and other threats. So in the first part, **security & internationalism**, we explore why the global problems of energy and climate security represent a major threat to Britain’s long-term security, prosperity and economic stability.

Baroness Neville-Jones, shadow security minister opens the debate, arguing that climate change and energy security policies must be complementary, and that as far as the energy market is concerned, a wholly market-based, laissez-faire approach is no longer sufficient to protect the national interest. In an important context-setting contribution, Neville-Jones reminds us all that the likely results of climate change will include desertification of many areas currently responsible for food production and the migration of many millions of people from affected areas. A country such as Britain which is dependent on a stable global economic trading environment for its ongoing successes would be foolish to think that an isolationist approach can succeed in the face of such an intrinsically global problem. Her recommendations for targeted interventions in the domestic energy market, together with leadership on the international stage, offer a progressive centre-right solution to many aspects of the energy and climate security challenge.

Building on Neville-Jones’ contribution, **Peter Ainsworth MP** also highlights the crucial importance of effective international action on climate change. He argues that the centre-right can and should support international action, and rejects the arguments of those who suggest that euroscepticism and action on climate change at European level are incompatible. He highlights the need for any future Conservative government to work in Europe to exert both global influence and secure agreements to energy and transport policies that lead to emissions reduction in the UK. With centre-right attitudes to Europe unlikely to change in the near term, there will be many who hope, against their best expectations, that his analysis proves correct.

The second part of this publication examines the role of **technology policy and the financing of infrastructure investment**. Many are predicting that the next industrial revolution will be the energy technology revolution. But the scale of the challenge is great. McKinsey have estimated that we need a ten-fold increase or more in carbon productivity to achieve a stable climate.¹ They argue that the carbon revolution must be achieved in one third of the time taken by the equivalent transformation in labour productivity achieved in the Industrial Revolution. Ensuring the right technological mix is essential, and **Tom Burke**, founding director of E3G, sets out the case for a better technology policy that will ensure the right kind of investment is made.

While some elements on the centre-right have traditionally sought to highlight the limits of state intervention in markets, we believe that the shift to a low carbon economy requires bold interventions to create long-term certainty for investors in the value of carbon emission reductions. In the energy industry for example, existing market structures were designed to maximise the efficiency of extracting value from existing assets rather than to finance long term, large scale investment. This is a crucial difference and **Dieter Helm** sets out both a sobering assessment of what the level of investment now required might be, and how the market and regulatory system might be reconfigured to deliver the finance needed in the cheapest way possible. His proposal to extend the Regulated Asset Base concept into electricity generation and other areas such as high speed rail is one way to do this and he sets out how it would work and why in his opinion, it might be our best option.

In the final section of our report we examine the broad theme of **prosperity and the transition to a low carbon economy**.

In a new and important contribution to this debate, **Greg Clark MP**, shadow secretary of state for energy and climate change, sets out the economic case for climate action from a centre-right perspective, breaking down the apparent costs of tackling climate change into three constituent and very different parts: first of all come efficiency investments, which represent savings not expense in the short to medium term; second are investments in wealth-creating infrastructure and assets that would have the effect of strengthening the British economy and third, the real costs which are needed to deploy those low carbon technologies which are necessary to prevent catastrophic consequences, and avoid even higher costs, but which are uneconomic without direct financial support. This nuanced and helpful analysis will prove useful in distinguishing between the myriad types of investment that will be required to get us on a path to the low carbon economy.

However, the most helpful point Clark makes, concerns the nature of the shift from fossil fuel power to renewable energy. Highlighting that the price of fossil fuel energy is driven by the price of the fuel itself, whereas renewable energy is dependent on the price of the assets used to generate it, Clark makes the fundamental point that the shift to renewables moves the most significant variable cost in our economic system (the price of energy) away from something that the UK government has little or no control over (the price of fuel) to something it can influence directly (the cost of capital for infrastructure projects). In doing so he

makes a clear case for government action to reduce Britain's exposure to the risks associated with the volatility of fossil fuel prices in a future where both average prices and levels of volatility are set to rise. This is a powerful argument and one that holds true regardless of one's view of climate change and its likely impacts, as the scarcity and volatility issues have their own independent drivers.

A coherent centre-right approach to the environment needs to encompass other issues too and **Stephen Evans** from Cranfield University broadens the horizon. In his chapter, he looks at our total resource use within the economy, and argues that we need to move away from a poorly designed and excessively wasteful industrial system, to a more rational husbandry of resources and one which sits more comfortably with traditional Conservative values of responsibility, duty and efficiency.

This new industrial revolution would place the same focus on system-level resource efficiency that the Industrial Revolution placed on financial efficiency, with the benefits being increased economic resilience as resources become increasingly scarce. Evans suggests that we need to look overseas to countries like Japan whose innovative approach to environmental regulation is business led, but government enforced, ensuring targets are realistic and that innovators in efficient technology are rewarded with first mover advantage.

Finally, **Ben Caldecott** sets out a case for 'rational environmentalism' in which greater transparency about the scale of the challenges and how the costs will be met will drive an inclusive conversation about the most cost effective way of achieving our

goals. Rather than trying to bury the costs of the low carbon transition in consumers' energy bills we should aim to improve awareness of the investments that need to be made in response to the threats we face, and compel politicians to convince the public that such investments are essential. Critics will argue that the risks are too great, that politicians will not be up to the task and that the result will be public pressure to reduce investment and therefore costs. Caldecott argues however that only by crediting the public with enough intelligence to know what's good for them will they trust the politicians enough to maintain support for the increasingly bold political action that will be necessary in the years to come.

Together these arguments present a compelling case for all on the centre-right to rethink and deepen their thinking on how best to tackle these pressing contemporary challenges. They underline the potential for centre-right thinking to contribute positively to the debate on how best we can ensure our continued prosperity and how we can take action both domestically and internationally to enable Britain to become more secure and resilient in our interdependent world.

1 Climate change and security



Moving towards a low carbon economy: the national security rationale Baroness Neville-Jones

Climate change and the generation and supply of energy are two closely linked national security issues. Climate change is a driver of insecurity domestically and internationally, and is itself driven by greenhouse gas emissions which have caused the gradual move towards low carbon economies. There are two other 'golden threads' that link the issues of energy security and climate change. First, achieving a low carbon economy is essential from a hard-headed security point of view since it will diversify energy sources from their present heavy concentration on hydrocarbons and thus help reduce the UK's energy insecurity. Second, however, even with a low carbon economy, the UK will still be dependent in the long term on a mix of imported hydrocarbon and renewables. The steps that are needed now to secure supply chains will still be relevant after 2050. This chapter explores how climate change and energy security policies must be complementary.

Two reasons for action

There are two security related reasons why the United Kingdom must move towards a low carbon economy.

Energy underpins all essential sectors of the economy and all aspects of daily life for which we are increasingly reliant on foreign imports. After decades as an energy-secure nation, safely reliant on fossil fuel supplies from the North Sea, the United Kingdom has added itself to the long list of import-dependent nations. Given the tight energy markets

that are likely to subsist for the indefinite future, and the extent of political control over them and the unavoidable transit of supplies through unstable parts of the world, these imports are not assured. A key way to increase this country's energy security is therefore to diversify the sources of supply. Achieving a low carbon economy based on carbon capture and storage, biogas, renewables, a smart grid and the decentralisation of energy generation will contribute to this significantly.² To be safe in the long term, we need to go green.

But there is a second reason why reducing our reliance and use of hydrocarbons is so important. Greenhouse gas emissions are resulting in permanent change to geographical conditions, including rising temperatures and sea levels. These changes intensify natural hazards which are increasing in scale and frequency. The most recent climate change predictions for the UK indicate not only that severe weather events will increase in future, but that as a country we will have to adapt to warmer seas and rising sea levels.³

On an international level, quite apart from the growing incidence of natural disasters, in the response to which the UK usually assists, climate change puts pressure on finite resources such as water, food and energy and, thereby, increases the potential for competition and even conflict over them. It can lead to desertification, crop failure and the wholesale migration of starving people.

The potential for these problems is already bringing about the purchase of fertile land in Africa to feed populations in other continents, which may in due course aggravate the difficulties that the African continent may experience.

To suggest that Britain can isolate itself from these problems ignores the effects of globalisation. It also ignores the UK's dependence on orderly international markets and stable trading conditions for our national livelihood.

In the short term the relationship between supply and demand in the UK is not bright. As domestic generating capacity declines while demand increases, the UK will be more reliant on foreign imports. The government estimates that up to the

“a low carbon economy is essential from a hard-headed security point of view”

mid 2020s demand will increase by 0.5 per cent per annum.⁴ Overall, the government suggests that in 2020 the UK's level of energy import dependence is likely to be in a range between 39-43 per cent of total energy consumption and by 2025, 47-50 per cent. But at current levels these imports will not be sufficient. For example, current projections of gas demand imply that the UK will need to increase its gas import capacity by 15-30 per cent by 2020.⁵ This is a tall order and shortages affecting households and businesses cannot be ruled out. These could come as early as 2013-14, a risk the government could and should have planned against.

In the longer term also one should not be mistaken into thinking that a low carbon economy means that

the UK will no longer be reliant on any hydrocarbon imports, or that all renewables will be indigenously generated. In 2050 imported fossil fuels could still account for 40-60 per cent of consumption, with virtually all oil and gas coming from abroad.⁶ And even as the UK's reliance on fossil fuels comes down, the country's reliance on imported renewables such as hydrogen, biomass and biofuels will increase. There are no detailed figures publicly available, but the government apparently expects the UK to increase its volume of imported biofuels and suggests that in 2050 hydrogen imports could account for 11 per cent of the UK's energy mix.⁷ So even in the long term it will still be important to be able to secure energy supply chains coming from abroad.

Securing energy supplies

Government should not substitute itself for the energy market or private sector operators but in a situation where the greater part – some say up to 90 per cent – of the world's known reserves are controlled by government owned enterprises, not all especially friendly, the UK cannot just leave everything to the market: a totally laissez faire approach is no longer sufficient to protect the national interest. In conjunction with the private sector and regulators, an important function of government in the future will be more sustained and systematic monitoring of the international supply situation and that of demand as a basis for planned investment. Government should focus on three particular things.

First, it should monitor the physical state, capacity and redundancy of the energy network. The nation's resilience should be about responding sturdily to shortages and/or extreme events as well as meeting projected demand.

In relation to responding to shortages or extreme events, the UK's current strategic gas storage capacity for emergencies is equivalent to just 15 days. This compares with much larger storage capacities elsewhere in Europe: 99 days in Germany and 122 days in France. Although there are plans, assuming they survive the current investment downturn, to increase this capacity to 36 days by 2020, it seems doubtful in the face of the multiplicity of risks in the international market place and the vulnerability of the UK to them, if this will be enough even to ensure supply through crisis.

On meeting projected demand, over the next decade the UK will lose one third of its electricity generating capacity as coal and nuclear stations are retired (many over 40 years old). This could result in blackouts by 2014-15.⁸ This must also be set in the context of long term socio-demographic trends, the UK being one of the only countries in Europe with a forecast increase in population over the next 20 years, to approximately 70 million by 2029. Quite apart from the immediate generating shortfall, this will place further demands on the energy grid.

“to be safe in the long term, we need to go green.”

So government, in co-operation with industry, must have a role in monitoring the state of critical infrastructure to ensure its robustness. In addition to ensuring increased storage government must look at capacities for power generation, transmission and distribution and, if important gaps are seen, require the relevant companies to upgrade the energy infrastructure. The remit of the regulators, which is currently focused on short term pricing, needs to be changed to reflect this.



Second, government needs a policy in relation to the risks which exist to international supply chains. Resource nationalism is on the rise and politically motivated disruptions of supply are on the increase. Experts have estimated that there were at least 330 terrorist attacks on oil and gas facilities worldwide between 1990 and 2005.⁹ Piracy is a growing challenge on international shipping routes. Russia plays a petro power game and gas pipelines supplying Europe are also vulnerable to a number of 'frozen conflicts' in the Caucasus and Black Sea areas.

British strategic energy interests and security of supply should be at the heart of Foreign and Commonwealth Office (FCO) and Ministry of Defence (MoD) priorities and decisions; for the FCO in relation to the level and location of diplomatic representation abroad, and for the MoD in the tasking of our armed forces, especially the Royal Navy, concerning the security of the sea lanes and the safety of maritime traffic.

Third, while these are all vital steps which need to be taken here in the UK, energy security is ultimately not just a national issue but a shared goal. International institutions have a role to play and the

UK government should actively encourage this. NATO forces, for example, should help police sea lanes and provide solidarity and mutual assistance in the event of major disruption to energy supplies to member states. The EU must develop a coherent and consistent strategy in relation to Russia, improve the physical links in the European gas grid and take further internal liberalisation of the European energy market.

Responding to climate change

The rising frequency of natural disasters is a hazard against which much greater protection and emergency planning than has hitherto been undertaken is needed domestically. Under appropriate civilian control, the armed forces should have a more structured and predictable role in responding to domestic catastrophic natural disasters. There will also be a continuing place for them in international disaster response and recovery activities. Climate change interacts in complex ways with natural events, the increase in the speed of the global transmission of pandemics being one example. So the FCO must work with other countries and international institutions to ensure that effective detection and surveillance systems are in place,

“British strategic energy interests and security of supply should be at the heart of priorities and decisions”.

encouraging the development of best practice in national policies round the globe, as well as planned and co-ordinated international responses.

While the Conservative Party has put forward proposals to achieve a low carbon economy by 2050, we should be clear that the UK cannot tackle climate

change alone: it accounts for just two per cent of global greenhouse gas emissions.¹⁰ That is why securing an ambitious global climate deal is so important. Britain must work for a global deal that

“a totally laissez faire approach is no longer sufficient to protect the national interest”

will limit emissions and provide financial resources to complement the existing work that the Department for International Development does to help poor countries to manage and protect themselves from the effects of climate change.

Conclusion

The current economic downturn is, however, hostile to creating a more secure energy market situation and, intimately related to this, tackling climate change. This is demonstrated by the recurrent dispute between Russia and Ukraine over supply price and transit fees, with resulting implications for European energy supplies, and by the danger that the downturn will hold back necessary investment for better equilibrium between hydrocarbon supply and demand and the transition to low carbon economies.

Keeping lockstep between increasing energy security and reducing carbon dependence will not be easy, but is essential for the future well being of the British economy.

Internationalism and green conservatism

Peter Ainsworth MP

We are in uncharted territory. There will be no solution to the threat posed to world security by dangerous climate change which is not global, political and economic; but the precedents for international cooperation in dealing with environmental challenges, such as the 1987 Montreal Protocol, fine as far as they go, don't go far enough.

The politicians who gathered at Copenhagen to seek a worldwide agreement on climate change had to deal not with specific sectors of economic activity, but with the entire economy of the planet; not with a single pollutant, like CFCs; nor with a single environmental impact, like acid rain; but with a threat to the entire biosphere. And they had to consider how to prevent not only ecological damage but social, cultural and economic damage too, and the inevitable military threats which would ride in behind it.

Sadly, the outcome of those negotiations has proved that the world's politicians are not up to the task. They are, after all, politicians and not saints; and politicians are acutely vulnerable, especially in democracies, to the tug of immediate priorities and wider political opinion, as well as to self-interested lobbying by vested commercial interests in their own nations.

The present government's biggest weakness in the run up to the Copenhagen Summit was its failure to deliver green growth at home. I commend the efforts

that the government has made on the international stage to take forward positive and constructive measures to reach international agreement. I deplore the timidity, prevarications and contractions which have beset domestic policy under both Tony Blair and Gordon Brown.

“it is an uncomfortable fact that the ability to sustain life and civilisation depends on today's generation of politicians.”

It is an uncomfortable fact that the ability to sustain life and civilisation as we have collectively enjoyed, or endured, it since the ascent of mankind depends on today's generation of politicians. I put it that way because our response to the science of climate change, whatever it may be, will not be about saving the planet. The planet will look after itself but, unlike governments, nature doesn't do bail outs. What is at stake is human civilisation, culture, lives; and for starters the lives of the least well off in the world who have done less than anyone to cause the problem in the first place.

There are those on the left who put the short term interests of smoke-stack and polluting industries above the interests of our children; and there are still some Conservative inclined people who think that the whole climate change agenda is a left-wing plot.

It has not been as easy as it should have been to convince some Conservatives that rising to the opportunity presented by climate change is a challenge to be embraced wholeheartedly, passionately, and with confidence in our political heritage and vision.

What kind of political toolkit is required to take on this great task?

- First of all, a belief in order and security; these are two benefits of civilisation which are immediately threatened by the consequences of climate change.
- Second, a willingness to engage in effective international action, recognising the shared interests that come with global stewardship. This calls for an approach which is neither insular nor self-serving; but global and generous.
- Third, we need an understanding of the responsibility which we owe to future generations.
- Fourth, we will require a commitment to enabling local action to happen in the places where we live, and to empowering our communities.

Last, we must understand that, whilst politicians need to set the framework for action, it is markets, enterprise and a passion for endeavour and, yes, reward, which will drive the change we need. The paradox is inescapable, but the power of the market, which got us into the mess in the first place, offers the only sure way out of it.

So we will need an overarching commitment to security; a willingness to reach out to the world; a passion for local empowerment; a sense of duty to the future; and an understanding of the power of markets. That sounds like Conservatism to me.

But what of the role of the EU? It has become a default position of our political opponents to allege



that a eurosceptic view is incompatible with an ability to engage, through the EU, on climate change. It has also been suggested that our opposition to the tenets of the Lisbon Treaty in some way affects our ability to influence the EU's effectiveness on climate change. And it is alleged that the new alignment which Conservatives in the European Parliament have made somehow impedes our effectiveness on green issues. All these allegations are utter nonsense.

“the planet will look after itself but, unlike governments, nature doesn't do bail outs. What is at stake is human civilisation.”

The Lisbon Treaty contains six relevant words, for those who are interested, they are “and in particular combating climate change”. There is nothing in the Lisbon Treaty which advances or impedes the EU's ability to play a leading role in the international climate change negotiations. The fact that the EU has already been doing this for several years confirms the point.

Conservatives have always understood the importance of diplomacy; it was Liberals rather than

Tories who, in the 19th Century, were rather keener to add the words “gun boat” to the delicate business of international relations. In short, as a pragmatic party we have always been prepared to negotiate for outcomes which best serve our international and domestic interests. In the case of climate change, those interests are more than ever indivisible. Long gone are the days when we could expect the rest of the world to listen and obey. Britain no longer has the economic muscle to command much global attention or respect and, as recent events in Afghanistan have laid bare, we no longer have the modern equivalent of enough gunboats.

What Britain has is knowledge and connections, and what we need is a big, and different, voice within the EU where our influence can be brought to bear. We have some of the very best climate scientists in the world, including those at the Met Office who are funded, interestingly, by the Ministry of Defence. We also have excellent contacts and cultural attachments throughout the Commonwealth, where India, to name but one example, has a vital role to play in the global response to climate change. Where we cannot use the economic and military authority we have lost, let us use our knowledge and connections within the EU and around the world.

The Conservative alliance with some political parties in the European Parliament which contain a few spectacularly outspoken climate change sceptics, is an irrelevance. Consider the fierce resistance to the adoption of a progressive EU approach to climate change which was put up to by our former partners in the German CDU. They were assiduous in representing the short term interests of their domestic car and aviation sectors; and it was largely thanks to the fortitude of Conservative MEPs that the

EU become a first mover in recognising the need for urgent global action to tackle the problem.

Conservatives tend to be exasperated by EU directives. It's a powerful gut reaction. We do not like the idea of ‘directives’ at all, even the word has totalitarian connotations. We don't like the idea of being led by the EU, we don't like having to comply with the EU's instructions. We don't like being led by anyone other than the people we have chosen to lead us— and, even then, we are prone to being questioning and tricky. But on climate change and other environmental

“where we cannot use the economic and military authority we have lost, let us use our knowledge and connections within the EU and around the world.”

issues, Europe can and should play a leading role. Looking back, European leadership was critical to the negotiation and the ratification of the Kyoto Protocol. David Cameron has rightly highlighted climate change as one of the top three future priorities for European action.

Europe can exert global influence through action with China, India and others, and we in the UK should play our part in that co-operation. We can and should also exert influence over action on energy (including renewable energy targets and the EU carbon trading scheme), and by setting standards in areas such as fuel efficiency. In doing so we can increase our influence in the world, and drive down the costs of action by ensuring that businesses are subject to similar standards and costs.

Conservatives may oppose the creeping political union in Europe, and we may not want to jettison

our currency in favour of the Euro, we may believe in a more flexible, democratic and less intrusive EU, but we have always accepted that, when it comes to environmental issues, the nations of Europe must work together. This is one of the key differences between Conservatives and isolationists.

But we do not need the EU to be active across the whole terrain of environmental issues. We should not need the EU to tell us what to do about our local environment or the welfare of our shared natural resources. This is our stuff and we should do it ourselves.

“there will be no solution to the threat posed to world security by dangerous climate change which is not global, political and economic”

We also do not need to wait for Europe. The UK waited until the last minute to enact EU rules on cutting harmful emissions from fridges and recycling electronic goods. What was the point of dragging our feet? The end result, apart from fridge mountains, was our enterprise stifled, our waste exported and our businesses losing out.

But let us be realistic. The Conservative opposition can sharpen the Labour government's stance on climate change, and we have done so; the British government can influence the EU's approach to the continuing international negotiations, and it has done so; and the EU can influence global political opinion on the nature of any future global climate deal, and it will; but the greatest power lies elsewhere.

It was clear for a long time that the outcome of the Copenhagen talks would rest primarily on negotiations between the USA and China, with India and Brazil playing important supporting roles in the drama. That is not to belittle the voice of the less developed world, which must be heard and accounted for; nor is it to say that the EU, Russia and others can have no influence at all. It is merely to state the rather obvious fact that, in the end, the result of the Copenhagen Summit depended on the attitudes of the world's two largest economies.

Copenhagen was long seen as the make or break moment on climate change. But it was not, quite, our last chance. The negotiations that continue into 2010 must quickly reach agreement on the key elements of a legally binding treaty, and a clear timetable for international negotiations to secure that treaty in 2010.

It may fall to a future Conservative government to take the lead in Europe and in the wider world in this huge cause. In doing so it will be able to fortify itself, and the British electorate, by drawing upon a philosophical inheritance which rests on order, responsibility, diplomacy, knowledge and enterprise.

2 Delivering a low carbon future



The need for a credible climate technology policy

Tom Burke

Climate change will transform the prosperity and security of 60 million Britons. This is true whether climate policy succeeds or fails. If it succeeds the transformation will be in the way we provide the energy services we need for prosperity. If it fails, the transformation will be in the way we live as rising temperatures undermine economic and political stability around the world.

The choice is ours. Either we can choose to change our energy system or events will change our lives and in ways that will please no-one. We know that the technologies to build a successful low carbon economy are already available or within reach. We also know that there are no fundamental economic barriers to deploying them although there will be deep changes in the structure of the economy.

The International Energy Agency (IEA)'s current World Energy Outlook projects global primary energy demand to grow by 1.6 per cent a year to 2030. By then fossil fuels will account for 80 per cent of the world's primary energy mix with demand for coal rising faster than any other fuel. This will drive energy related carbon dioxide emissions up 45 per cent to 41GtCO₂ a year.

* Carbon dioxide is just one of the greenhouse gases. The others must be added in to give the full increase in the total carbon burden in the atmosphere. This effect is expressed as the equivalent amount of carbon dioxide - CO_{2e}

Adding in the carbon dioxide emissions from agriculture, deforestation and land-use changes and those from all the other greenhouse gases leads to total emissions of 60GtCO_{2e} by 2030*. The energy sector would be contributing nearly 70 per cent of

“we know that the technologies to build a successful low carbon economy are already available or within reach.”

the annual addition to the total carbon burden. At this rate, there would be no prospect of keeping the eventual rise in global temperatures below the 2C that world leaders have defined as the threshold of dangerous climate change.

Without an increase in energy services on the scale projected by the IEA sustaining the economic growth necessary to maintain economic and political stability will be impossible. But if that energy growth is delivered primarily by current fossil fuel intensive technologies, as projected, then avoiding the dangerous climate change which will also undermine economic and political stability becomes impossible.

This is a true dilemma. Choosing one of the horns means being driven to an equally unacceptable outcome by the other. Nor is searching for an illusory trade off between the horns a solution. This simply increases the risk of achieving neither a sufficient increase in energy services nor avoiding dangerous climate change. True dilemmas must be

resolved by meeting both goals simultaneously, by using investment, innovation and ingenuity to step out from between the horns.

Resolving this dilemma successfully therefore puts a very high premium on technology policy. The effectively irreversible nature of climate change and the cumulative nature of the build up of carbon in the atmosphere add to this premium. Not only can we not afford policy failure, but we must achieve policy success within a very specific timeframe: global carbon emissions must peak before 2020 and then decline rapidly to succeed.

If we fail to deploy enough of the right energy technologies quickly enough to avoid the dangerous climate change threshold, we cannot make up for it later. This sets a much sterner test for low carbon technology policy than we are accustomed to meeting.

“the smart grids, high speed rail links and other infrastructure needed for the energy transformation will not be delivered without a committed effort from government today”

This test will not be met by resorting to the simplistic notion dominating today's orthodoxy on technology choice. The view that government cannot pick winners and that technology choice must be left to the market is deeply entrenched in our political culture, especially among Conservatives. It takes its legitimacy from some very bad experiences in the sixties and seventies.

But it is equally true that markets are often not very good at picking winners. We have just had a brutal

wake up call about the dangers of leaving systemic risks to be managed by the market in the financial world. Commercial technology failures tend to disappear from history rather quickly: nobody remembers them. Think Sony's Betamax or the Sinclair C5.

The reality is much more complex. Governments sometimes pick technology winners, choosing radar before the Second World War or laying the foundations of the Internet, which markets then deploy widely. Building a carbon neutral energy system over the next few decades will require a much more sophisticated approach to policy than simply reiterating vacuous slogans.

In fact, both governments and businesses make strategic commitments that they then find difficult to unwind when circumstances change and a different strategy becomes necessary. This is particularly true in the case of the high capital, long-life investments, which form the basis of our energy system. Both governments and businesses are strongly resistant to deviations from business as usual.

The urgency of the energy-climate security dilemma means there is no business as usual. Stepping out from between the horns successfully will require a very different conversation on technology policy than that currently taking place between government and business. We have little experience with the design of the transformational policies that will be necessary to resolve this dilemma.

Transformational change cannot be accomplished by incremental policy measures designed to influence technology choice at the margins. Current policy is too reliant on a volatile carbon price driven by



“without confidence in the provision of infrastructure, energy investors will make incremental changes in technology at best.”

political agreements whose future is uncertain. This generates a risk environment that reinforces market conservatism for investors in energy technologies.

Since this is the exact opposite of what is needed to resolve the energy-climate security dilemma a more mature and better articulated conversation between energy investors and government must be created. This will need to identify much clearer priorities for action and a more reliable definition of the respective roles of government and business.

Above all, government needs to avoid the trap of trying to please all of the engaged constituencies. It is correct to say that there are no silver bullets to solve this problem. But it does not follow that it is therefore also correct to try to do everything. This simply increases the risk of doing nothing very much and letting events rather than choices determine outcomes. Whilst this might be a prudent approach on some issues, it is very unwise in dealing with a systemic risk as profound as climate change.

The top priorities are already clear. First among them is energy efficiency, which has a suite of advantages for both the economy and the environment. By improving productivity it goes straight to both the family and corporate bottom line. But it also buys time for the deployment of the other technologies we need to take us to a low carbon economy.

A low carbon world is one that will be increasingly dependent on electricity for the delivery of energy services. It is not a world in which millions of Britons will be driving vehicles powered by petrol or heating space and water with domestic gas boilers. Both must be replaced by electricity. This makes carbon capture and storage the second priority.

Unless we can use coal and gas to make electricity without adding to the accumulation of carbon in the atmosphere there is no way to maintain energy security without destroying climate security. Neither the renewables nor nuclear can displace enough coal and gas fast enough to avoid dangerous climate change. In fact, even if the world could build new nuclear power stations at fifteen times the present rate this would displace no coal at all from electricity generation before 2030.

The third priority is the very rapid development and deployment of electric vehicles. This is even more important for energy security than it is for climate security. Demand for oil will continue to rise faster than production can keep up. An ever-larger share of the world's oil will come from politically unstable parts of the world. An accelerated deployment of electric vehicles will not only reduce carbon

“building a carbon neutral energy system will require much more than simply reiterating vacuous slogans.”

emissions and reduce the impact of price shocks on the economy; it will also significantly reduce the vulnerability of essential transport and logistics systems to potentially devastating interruptions.

Setting out and sticking to clear technology priorities is the first step to mobilising markets to play their proper role in transforming our energy system. The second step is to be equally clear about the role of government. Above all, this lies in providing the enabling infrastructure to support these technology priorities.

Building the infrastructure for a low carbon energy system resilient both to price and climate shocks will be as essential for economic success in the 21st century as was building the motorway network in the 20th century. That network would never have been built without government taking responsibility for its creation.

The smart grids, high speed rail links, vehicle recharging networks and carbon capture and storage infrastructure needed for the energy transformation will not be delivered without an equally committed

effort from government today. Without confidence in the provision of this infrastructure energy investors will make incremental changes in technology at best.

No-one should be under any illusion that this change will be cost free. As well as the additional capital and operating costs for the initial deployment of low carbon energy technologies there will be significant social adjustment costs to address the changes of employment and skills patterns in the energy industries.

Deciding how the burden of these costs should be properly apportioned between taxpayers, consumers and shareholders will be at the heart of the politics of making the energy transformation. Unless we can summon the political will to make these choices, events will decide the future for us.

“the choice is ours, either we can change our energy system, or events will change our lives in ways that will please no-one.”

A credible climate technology policy must include a transparent rationale for that burden sharing. It is no more helpful to expect none of the burden to fall on taxpayers as to argue that most of it should. Successfully tackling a systemic risk as pervasive as climate change benefits taxpayers, consumers and shareholders. It is both morally and theoretically right that therefore all three should carry a fair share of the burden of managing that risk. The default mode, with systemic climate failure, as with systemic financial failure, shifts an unacceptable level of risk to the taxpayer.

The costs and financing of the transition to the low carbon economy

Dieter Helm

The scale of the challenge

To date, British climate change policy has been more about political rhetoric than decisive action. Grand claims have been made to ‘global leadership’ and in 1997 the incoming Labour government’s manifesto committed to reduce domestic carbon emissions by 20 per cent from the 1990 levels by 2010. There was much talk too of renewables targets, and energy efficiency transformations.

Progress, by contrast, has been slow, and largely down to factors beyond government policy. Emissions have fallen in line with the overarching Kyoto targets, but this has been more to do with the switch from coal to gas in electricity generation, and the outsourcing of energy intensive industries to China and other non-Kyoto developing countries. Indeed, even progress on Kyoto is faltering: if carbon emissions are calculated on the basis of carbon consumption (adding back aviation and shipping, and allowing for carbon intensive imports), the Kyoto reduction in carbon production of around 15 per cent between 1990 and 2005 translates into an increase of carbon consumption of around 19 per cent.¹¹

The only policy that has really put a dent in Britain’s carbon consumption is the recession. On renewables, progress has been so poor that a lower 15 per cent target of total energy by 2020 has been granted to the UK under the EU Renewables Directive.¹² So far our performance betters only Malta and Cyprus in the EU.

The result is that there is a mountain to climb if Britain is to decarbonise in line with the EU requirements, and to meet the demands laid down by the new Committee on Climate Change and the domestic legally binding targets. Just on renewables, there would need to be a shift from less than five per cent to over 30 per cent wind energy in the next ten years, with an estimated price tag of perhaps £100 billion. Add to this the energy efficiency programme, smart meters, the upgrading of the grid, the new build for nuclear, the new coal plants with partial carbon capture and storage (CCS), and the investments in bringing down transport emissions, and the total may well exceed £200 billion.¹³

The costs

If the government has promised much and delivered very little, it has also added to the complacency by telling the electorate that the eventual bill will be low. The Stern report¹⁴ played a key role here: Stern argued that the cost of decarbonising would be around one per cent GDP and unsurprisingly this is the most widely quoted number from the report.

How could anyone think that a radical decarbonisation of the economy could cost so little? The answer is that Stern (and the Department for Business, Enterprise and Regulatory Reform and its successor the Department of Energy and Climate Change) assumed the costs of low carbon technologies, and assumed these costs would fall over time. These assumed technology costs are then implemented into the



economy without any serious policy costs. In other words, energy and environmental policy would pick the winners, and in the right order, and hence the assumed costs would turn out in practice to be correct.

Other assumptions have been added: that much of the energy efficiency is already profitable without support, and that the price of oil will rise sharply and stay high. With enough enthusiasm (and support from

“to date, British climate change policy has been more about political rhetoric than decisive action.”

lobbyists) politicians can convince themselves that decarbonisation is low cost. Add in the odd 400,000 new green jobs (and forget about the brown jobs lost) and consumers (and voters) can be reassured.

In the UK low carbon transition plan,¹⁵ it is at least finally admitted that bills will rise. But the promise is that the consumer faces only an eight per cent increase by 2020, trivial compared with the oil price movements. It is assumed that all the energy efficiency works, so although the price of green energy goes up, people

buy less and hence the total effect is small. This is at best disingenuous, and at worst dangerous. The Stern approach fails to recognise the impact of the political economy of climate change.¹⁶ In Britain the most expensive technologies have been given overwhelming priority: offshore wind makes even nuclear power look cheap, and the depreciation of sterling has raised its costs significantly. The specific form of support for renewables in Britain, the Renewables Obligation and the Renewables Obligation Certificates, is about the most expensive subsidy scheme in the developed world outside Italy. There is little co-ordination between the networks and the offshore wind, and the key regulator body Ofgem is promoting competing networks offshore. With just ten years to go, the time for experimenting is over. The danger is that when consumers (and voters) realise the true costs there will be a backlash against politicians who promised a very different outcome.

Raising the money

£200 billion is a large number in the best of times, and it will have to be raised in competition with lots of other infrastructure investment demands in the British economy over the same period, perhaps £500 billion in total.¹⁷ Investors will want to know that when they sink their capital, they will get it back, and they will charge a cost of capital commensurate with the risks they face. For every one per cent premium on the cost of capital, the annual consequent charge to customers will be £2 billion higher.

Many of these risks are political and regulatory: indeed the investment programme as a whole is driven by government targets, EU directives, and policy instruments. It is precisely this sort of risk that investors find hardest to handle. Short of political lobbying, there is nothing much they can

do about it. Placing this risk on the private sector inevitably drives up the cost of capital.

A key part of the low carbon policy framework is the management of risk, and the extent to which the customers, taxpayers and shareholders carry it. There are two extreme ways of thinking about this risk allocation: to place it on customers through rate of return regulation; and to place it on shareholders through competitive markets. In the former case equity risk lies with customers and, hence, investors can rely on debt finance. The customer gets the risk, the shareholder gets a low cost of capital. This was

“customers cannot have a free lunch: they cannot have a new set of low carbon assets without paying, however much politicians try to convince them otherwise.”

the US approach for much of the post Second World War period. In the latter case, it is the shareholder who takes the business risk and the policy risk, and hence the cost of capital is correspondingly high.

Thus far Britain has opted for the second approach, on the basis that the efficiency of the private sector in building new assets will outweigh the cost of capital premium. It has worked tolerably well as there has been little investment on which to pay the cost of capital premium. But the context has changed: investment, not asset sweating, is the priority. It is implausible to think that the efficiency gains could now be so large as to outweigh the cost of capital premium on £200 billion.

Fortunately we can have the best of both worlds. In the utilities, the assets which have been completed

are protected by the duty to finance functions placed upon the regulators. Once constructed, they go into the Regulated Asset Base (RAB), and they get a guaranteed return. Thereafter there is no management input required: the return is automatic. As a result, once completed, assets are effectively rate of return regulated and, as the risk passes to customers, they can be financed by debt. Investors sink their capital, and customers get the assets, and in return guarantee to pay for them.

Customers do not however need to take the risk that management fails to deliver the projects on time and to budget, nor do they need to take the risk that they are badly run. This is risk that management should, and ought to, take, and here competition has a key role to play.

Take this utility approach and apply it to wind farms, barrages and nuclear. The private sector builds the assets. It raises project finance and it bears the risks, and takes the rewards, for efficient delivery. Once built, the assets are transferred to the RAB (the customers' account). Investors build the assets on the understanding that if they carry out the investments efficiently, they will be paid back. There is a long term contract between the private sector and the customers.

This hybrid model maximises competition for construction, and it gets the private sector to focus on what it is good at. It also maximises commitment. Customers cannot have a free lunch: they cannot have a new set of low carbon assets without paying for them, however much politicians try to convince them otherwise.

The impact of this model on the numbers is dramatic. Since investors can sell their assets into the

RAB, they need only raise project finance. This will be expensive, but short term, whereas finance for the RAB will be cheap and long term. The net result is to pull down the overall cost of capital by several percentage points, and remember every one per cent may be worth £2 billion per annum.

The policy framework

The hybrid model outlined above fits neatly into the broader policy framework. It is the job of government to set the targets. That is the political content. Government is not however good at delivery, and it is the private sector that has to build the assets. Between the State and the market lies the bargain between customers and investors. The State provides the contract: it ensures that the appropriate costs are passed through. This could take the form of a low carbon obligation.

To ensure customers pay, there needs to be a charging mechanism. That can either be via a supply levy (as in effect the Renewables Obligation is, and as in the proposed CCS levy), or through the transmission and distribution charges. The latter have RABs, because they are monopolies, and hence their charges are inescapable. A low carbon RAB is the obvious mechanism. The debt is secured against the duty to finance the new assets, in the certain knowledge that the customers will pay. This can and should be separate from the existing balance sheets of the distribution and transmission companies. There could even be a new low carbon RAB company and, as a further step, it could act as a channel for pension funds and private savings.

This structure is necessary if costs are to be minimised, but not sufficient to secure decarbonisation. There needs to be other interventions, notably a long term

carbon price (not just a short term, volatile and very political EU emissions trading scheme), and a proper support framework for research and development. And there needs to be appropriate vigilance on competition to build and operate the assets.

Conclusions

Policy to date to reduce carbon emissions has been feeble compared with the challenge, and now there is a massive investment to make in just ten years. The chances of delivering on the renewables target by 2020 are small, and they have not been helped by politicians, pretending the costs will be low, risking a serious backlash as the costs mount up in the next decade. It is not even clear that achieving the target will make much difference to climate change.

But given the commitment to the renewables target, it matters greatly that the costs are minimised and the investment is efficiently delivered. That requires a bargain between customers and investors: customers commit to pay for the assets, and investors take the risks in building and operating them. The RAB concept borrowed from utility regulation is a good way forward, and at a much lower cost of capital.

Carrying on present lines will court disaster, repeating the dismal performance since 1997. Britain has paid amongst the highest prices for amongst the lowest renewables delivered. The good news is that the scope for improvement is enormous; the bad news is that even a well designed policy will be expensive. It would be better to tell the truth, and recognise that Stern's one per cent is grossly misleading, than to perpetuate the myth that a project on the scale of decarbonising the whole economy can be done for little more than small change.

3 Prosperity and the transition to a low carbon economy



The economic case for climate action

Greg Clark MP

Some say that action on climate change is all about costs and sacrifice, not about benefits. Moving to a low carbon economy will, they argue, push up energy bills, worsen fuel poverty and harm our economic competitiveness. I believe the exact opposite; that the biggest threat to our prosperity, social fairness and economy will be staying on our current increasingly volatile, expensive and inefficient high carbon path.

The British economy has paid a high price over the past year for its over reliance on high risk, unsustainable investments. The transition to a low carbon economy gives us the opportunity to rebuild our economy on the firmer ground of hard infrastructure and greater efficiency, which will result in a more resilient, and more equitable, form of national prosperity in the future.

To prove this point, we need to look at the apparent costs of climate change policy, and show that far from coalescing into one undifferentiated sacrificial lump, they fall into three very different categories, each with their own justification.

Efficiency

First of all we have costs, which are not costs at all, because they are savings: the money you don't spend on the energy you stop wasting. There is nothing sacrificial about this. On the contrary, using less energy to produce the same level of service is one of the fundamentals of cost reduction and competitive advantage.

To give a recent, and rather grand, example: the Empire State Building in New York City is undergoing an energy efficiency refit that will cut energy use by almost 40 per cent, generating annual cost savings of over \$4 million and CO₂ reductions of 100,000 tonnes a year.

Yes, this will cost money up front. But with a payback period of three years and a substantial rise in rental value on top of the energy savings, it is clear that this is not a cost, but a wealth creating investment. And compared to other investments available in downtown Manhattan in recent times, it is a very safe one.

Efficiency savings are also the most effective and permanent way of reducing fuel poverty. Over five million households in Britain were living in fuel poverty last winter. Comprehensively insulating the UK housing stock, as Conservatives have ambitious plans to do, will reduce fuel bills, create over 70,000 jobs, grow our economy and save up to 9.4 million tonnes of CO₂ per year.

This effort should be even more of a public policy priority during a recession, particularly if we wish to avoid additional fuel poverty under fossil fuel price spikes that may return with renewed economic growth.

Investment

The second cost category is that of investment. Compared to efficiency savings, the payback period

for low carbon ventures may be longer, but the returns are still sufficient to provide a purely financial justification for investment, over and above the climate benefits.

Even before the collapse of the credit markets, investment had become a much devalued term in this country.

My colleague, the shadow chancellor, George Osborne recently said: “The charge of short termism and under investment in long term productive assets has frequently been aimed at Britain’s economic model, and with some good reasons... in key sectors this is an important part of the explanation for our long-standing productivity gap with countries such as France and Germany. Our physical infrastructure is older and far more congested than the average for OECD countries, particularly our transport and energy networks.”

Britain must return to investments which are truly worthy of the name, ones that create genuine wealth. Our energy policy can assist in this reconstruction in two ways:

- We can ensure that Britain continues to produce a significant proportion of the energy we use. Given the decline of our North Sea oil and gas reserves, and the balance of payments crunch that will come with it, that means we need to generate a lot more low carbon energy.
- There is significant wealth to be created in the manufacturing, construction and process industries that will grow to supply this new market.

Britain has all the core competencies and comparative advantages to move in this direction; with some of the best wind, wave, tidal and carbon storage resources in



the world. We also have the marine engineering expertise of our oil and gas industry, world class research institutions in our universities and access to the financial resources of the City of London.

“the biggest threat to our prosperity, social fairness and economy will be staying on our current volatile, expensive and inefficient high carbon path.”

The question should not be whether we want to make the most of all these advantages, but more how, in the light of the global economic and energy situation, can we afford not to?

Real costs

Third, and finally, we get to the costs of climate change policy that are in fact real costs, because not every low carbon technology will pay for itself as a conventional financial investment.

Why, then, should we make any such investment if it exceeds the price of its fossil fuel alternative? The answer is that these costs are justified by the avoided costs of climate change. Of course, we don’t know for sure quite how high the economic, security,

environmental and social costs of a dangerously unstable climate system may be, but there are some risks, such as the release of methane from melting permafrost, which are so dangerous, and so global in their impact, that they cannot be tolerated.

We have come to know these risks as ‘black swans’, a term made infamous by the collapse of the financial markets, where conventional risk management techniques came unstuck. When faced with a black swan risk the only way to protect yourself is to reduce your exposure in the first place.

In the case of climate security, that means ending our grand experiment with the planet’s atmosphere. If we had hundreds of planets to experiment with, or even dozens, our current level of risk may be excusable. But we only have one, and so we must be more risk averse with it.

The net costs of decarbonising the economy should therefore be regarded as an insurance policy: much as any sensible householder would pay to insure themselves against the risk of fire or flood. It is interesting to note that those who say that action on climate change poses a dire threat to economic growth are usually those who applauded the unregulated financial excess that has destroyed wealth globally on a scale that dwarfs the likely cost of decarbonisation.

Not just climate risks

It is also worth noting that a low carbon future insures us not just against climate instability, but also against a future in which high and volatile oil prices are the new norm.

While one can have endless debates around ‘peak oil’, few experts doubt that the age of cheap oil will



not last. This is not because the resource is running out, but because the easy to reach, conventional, oil is running short.

There will be plenty more oil to come, but it will be from unconventional sources and places, and so will come at unconventional prices. There is no more business as usual for fossil fuels; as with our global climate, we have entered an age of fundamental uncertainty. We must treat this ‘fossil black swan’ as we do the ‘climate black swan’: by dramatically reducing our exposure to its risk. Fortuitously, both threats are minimised by the same solution: the conversion to a low carbon economy.

“the net costs of decarbonising the economy should be regarded as an insurance policy, much as any sensible householder would pay to insure themselves against the risk of fire or flood.”

The cost of fossil fuel powered energy basically depends on the price of its fuel. Renewable energy is different. It is driven by the costs of development.

The fuel is free. This cost distinction is all important, because Britain's ability to influence global commodity prices is severely limited, whereas the capital costs of project development are very much under our control.

This transition from a commodity to a capital centric view of energy will give Britain's finance sector a chance for a fresh start. Investments can now be channelled into the productive capacity of a new, domestically fuelled, energy sector, secured by the certainty of megawatts, rather than the vagaries of the credit markets.

This has significance for our society, not just our economy. In reducing our climate risk and the exposure associated with dependence on fossil fuels, we will also be transforming our debt culture into a savings culture. The long term, low-risk opportunities offered by energy efficiency and other low carbon investments will drive our economy, relieve fuel poverty and act as one of the rocks on which we rebuild our national capacity for genuine wealth creation.



“Britain has some of the best wind, wave, tidal and carbon storage resources in the world.”

Resourcing our future

Stephen Evans

Adam Smith explained to the industrialising world of the late eighteenth century how efficiency would arise from competition. After describing the relationship between money and technology, he went on to explain the organisational contribution to the industrial revolution that was occurring and coined the phrase ‘division of labour’. Two hundred and fifty years of technological development and specialisation have given many humans a quality of life undreamed of even fifty years ago. But whenever we call for joined up thinking, we are tackling the negative consequences of that division of labour.

A true story as illustration: an established supermarket consolidated its purchasing of refrigeration maintenance, saving some £500,000 a year (refrigeration is one of the biggest contributors to supermarkets’ energy costs and climate change impact). But the lowest cost supplier was not the best performer. Soon the supermarket was spending over £1.5 million more each year on refrigeration energy. With the benefit of hindsight we can see that the purchaser did not fully consider the consequence of their decision. This is not unexpected, as they are unlikely to be experts in refrigeration maintenance techniques, and here we see the division of labour at work in its negative guise.

This example illustrates that without understanding what each part of a system is good at, why it exists, and what the consequences are for the greater system, we cannot hope to change that system easily. In the

vast majority of systems we can see how each part optimises its own efficiency, and how Smith’s invisible hand of the market works to improve efficiency of the whole. But there is no system that is more dysfunctional than the system of extracting and using resources, and managing waste. Indeed our industrial language of produce, consume, waste, emphasises the separation of the major parts of our resource system.

Waste is one of the most challenging outcomes of a poorly designed industrial system. In fact, the industrial system we currently have has emerged rather than been actively designed. Our current system lacks mechanisms to encourage producers to create products that generate less waste – after all they largely do not pay the cost of waste management. The result is a linear system: we extract, produce, use and dump our resources, with each stage optimising its own efficiency but failing to address the consequences of the whole. Less than ten per cent of extracted raw materials become products that customers pay for, and the vast majority of products are used and discarded within weeks. Such levels of extraction of our planet’s resources, sometimes called natural capital, cannot be maintained indefinitely. Major companies already hold lists of endangered materials that they have to wean themselves off.

Our personal instincts have also come under pressure from our throwaway society. You might find it

increasingly difficult to repair a broken toaster and are more likely to throw it away, no matter how annoying. This is no one person's fault because there is no single 'designer' of the linear resource system, but we cannot allow that situation to continue to drift to some difficult future. We are living off our natural capital and not on our earned interest, and if this seems foolhardy for a household, it is more so for a planet that cannot seek outside help when the account hits zero. The move toward a circular resource economy must therefore begin now.

The potential solutions, however, are limited: to use much less through consuming less (behaviour change); to wait for new materials to emerge (technological change); or to create a new resource

“there is no system that is more dysfunctional than the system of extracting and using resources, and managing waste.”

system (system change). Behaviour change as the sole answer is unpalatable and unnecessary, while technological change is slow and unlikely to deliver the efficiencies we need, thus leaving a system change from a linear resource economy to a circular resource economy as our final option.

A system change towards a circular resource economy requires only small changes in consumer behaviour and in technology. In a circular resource economy we do not extract new raw materials each time we wish to make a new product, instead we reuse materials from products that have ended their useful life. We only take from the ground as a last resort. This seems to be a rational husbandry of resources, which no sensible person would argue

against. But this is not taking place because no one organisation, including national governments, has sufficient power to enforce it.

For example, it is currently deemed unreasonable to expect a toaster manufacturer to organise a system for collecting that broken toaster at the end of its life, so the decision on whether or not to design the toaster to be disassembled and fully recycled is influenced more by local authority collection systems than by the technical potential for recycling. Neither the mining company, the toaster manufacturer, the retailer, the owner/user nor the local authority have sufficient power to change the overall system. With luck, and because of the waste electrical and electronic equipment (WEEE) legislation, we might get back much of the steel and copper for reuse, and the plastics may be captured and turned into a very low-grade plastic filler material. Any displays, circuit boards, switches or other valuable materials will be lost. This is considered a success story.

But if we can imagine a country which has learnt how to move from a linear to a circular resource economy we can see that such efficiencies in material use should lead to reduced total cost, and to increased competitiveness; a country that the world comes to for advice. Building this economy will require co-ordination of government, business (the many parts thereof) and citizens; it will also require leadership.

For those of us who spend our days working on resource efficiency there are a number of key themes. We seek a circular resource economy where limited material resources are kept in the economic system, being used many times and delivering value time



and again. This is not technically difficult, but once our waste reaches landfill in a fantastically mixed-up mess, it is economically difficult.

For the very best businesses, it is normal practice to separate different wastes and so create pure waste streams that are easier and cheaper to reuse. For the smaller local businessman however, it is difficult to know where to send such separated waste and so they often use contractors who take away mixed

“waste is one of the most challenging outcomes of a poorly designed industrial system.”

waste (to reduce their own costs). Without collaboration between the material suppliers and their waste contractors our beleaguered toaster factory is unlikely to find a market for its small quantity of waste plastics. Without a steady market willing to buy that recycled plastic the waste contractor cannot guarantee to take away the plastic. Collaboration and trust is at the heart of the best current arrangements. At the factory I visited recently their waste contractor regularly advised them on ways to improve the value of their waste (how to

keep it separate and avoid contamination) which resulted in the waste company paying more for the higher quality waste. Previous contractors had withheld such information because they believed that it increased their own value.

So each part of the system has to trust the other parts to operate as promised to deliver a more efficient whole. Accepting responsibility for one's own part is a central component of a circular resource economy. Such an economy would be economically resilient, better able to deal with periodic increases in commodity prices or scarcities in material availability by using less than competing economies.

But we live within a global industrial system that seems too big to change. The UK led that first industrial revolution which has been so instrumental in improving prosperity for many, helping to free them from the daily struggle for food and shelter. The first industrial revolution was national and created changes that were highly visible at a national scale; the implications for the planet as a whole, however, were virtually invisible. Few predicted that industrialisation would create the unintended consequences that are now evident, consequences that result from exceeding sustainable levels of raw material extraction, emissions and waste. With strong leadership the UK could be at the heart of the next industrial revolution, one that puts energy and resource efficiency alongside financial efficiency.

What would we have to do to get there? The circular resource economy cannot be forced into place by government. But government can encourage and reward efficiency and innovation, and government can provide the leadership needed to coordinate change across many organisations.



“reward efficiency and innovation; and provide the leadership needed to coordinate change across many organisations.”

First we need to make the resource ‘shadow’ of our products and services visible through labelling and minimum standards that explain how much resource has been used to create the product. This will allow us to see which suppliers are more

resource efficient. Then we must begin to reconnect the linear system by implementing individual producer responsibility (where the manufacturer gets their old products back when abandoned) and by giving all government procured items back to the deliverer. Over time government can support innovation by increasing minimum standards using the market: the Japanese ‘top-runner’ scheme takes the current best efficiency performance and makes that the minimum standard a number of years into the future, hence rewarding the innovators. Reconnecting the circular economy through government leadership is the final and toughest challenge: government can and should take a central role in facilitating an effective programme of responsibility deals with a range of relevant actors, with the potential for regulation if results are not forthcoming.

The ambition must be to move to an economy that uses much less material to generate equal wealth, creating a resource efficient economy that can compete internationally and an economy that is more resilient to future changes in resource availability.

Rational environmentalism? Towards an honest, trustful and cost-effective climate change policy Ben Caldecott

Climate change has been catapulted into the heart of UK politics over the last four years. It has become obvious that many more people are aware of and care about the challenges we face from this global threat. For political parties both in Britain and further afield, mitigating and adapting to climate change has become an important part of government policy making. In Britain this process is in no small part down to David Cameron’s efforts at greening the Conservative Party.

There are, however, a number of things that could undermine this progress. As climate change has shot up the political agenda, policy-makers have rushed to introduce new laws, regulations, taxes and incentives to try and drive down greenhouse gas emissions. Although much of this should be welcome, there is growing evidence to suggest that some policies are likely to be unnecessarily expensive and/or ineffective. More importantly, many have simply not been designed to address the scale of the challenge we face. The science is telling us we must do more sooner, yet many of the policies we have were designed when there was less urgency and when emission reductions were much less of a political priority.

Left as they are, these flaws will end up undermining efforts to manage the risks of climate change. Moreover, the presence of ineffective and unnecessarily costly climate change policies,

particularly in the fiscally constrained times we are now in, is likely to result in a tabloid-fuelled public backlash. This would be deserved, but must be avoided if we are to build a stable and long lasting political commitment to the decarbonisation project.

To avoid all of this, the centre-right should put forward an approach to climate change that is much more honest, efficient, effective, intelligently designed and trustful than the version that has dominated the environmental movement for so long. This is the only way to build confidence in climate change policies, whilst developing a more capable framework for decarbonisation.

There is still time to solve these issues and there is an opportunity to be at the forefront of doing so. Leadership now is essential. Centre-right politicians may well be in government within a year and must meet new responsibilities during a critical period. They must also lead the way as this new approach is part of a progressive centre-right world view, one that seeks progressive ends through the utilisation of markets and devolved power, whilst delivering at least cost to the taxpayer.

Honesty deficit

At the heart of this approach to climate change policy is accepting both the scale and nature of the problem. Achieving the 80 per cent reduction in UK

greenhouse gas emissions by 2050 as defined in the Climate Change Act 2008 will actually require a total decarbonisation of the economy. This is because the biotic processes that feed us account for around 20 per cent of UK greenhouse gas emissions. Without a major technological breakthrough, this segment of emissions will be almost impossible to reduce. The transition to a low carbon economy is in fact a transition to a zero carbon economy.

To date the political discourse has largely failed to adequately discuss or convey the actual scale of this challenge: a zero carbon economy by 2050. Perhaps unsurprisingly, this has led to policies that are inadequate to the task at hand, whether it's the Carbon Emissions Reduction Target, the UK government's current renewable energy strategy or the EU emissions trading scheme. Until we are honest about what needs to be achieved and by when, we will fail to reach our rightly ambitious goals and cause an unintended 'lock in', where we fail to leap frog intermediate technologies (for example with biofuels in cars) at great cost.

So a more effective approach to tackling climate change should begin with being honest about the challenge. But honesty should obviously not stop there. It must also extend to explaining and justifying the costs of the rapid transition to a zero carbon economy. Under the current model, politicians have been doing their level best to hide the costs of climate change policies in the depths of customer's energy bills, much like stealth taxes, instead of being transparent with customers and voters.

This has to change if we are to prevent a rising tide of public scepticism. We need to be able to communicate that there are both significant costs

and dramatic benefits. The idea that there are only very small upfront costs is false and confuses the public who are told one day that climate change is the biggest crisis facing humanity, and the next told that it's cheap to fix and can be achieved by changing light bulbs and recycling plastic bottles

Only recently (in DECC's UK Low Carbon Transition Plan) has the government admitted that there are costs and that these are likely to rise. This is too little

“a more effective approach to tackling climate change should begin with being honest about the challenge.”

too late. For the public to have confidence that energy prices reflect real and reasonable costs as well as those created by government policies, a transparent and honest breakdown of costs should be finally made available. At the same time, the case for justifying those costs can and should be made.

Risk management

Honesty also means being frank about the nature of the risk, the probabilities involved and how we must prepare for failures. Even after (as yet unachieved) dramatic global reductions in greenhouse gas emissions we may only have a 50:50 chance of preventing a two-degree rise in global temperatures. So even with the best will in the world, the risk of significant climatic change taking place is high. In fact, human-induced climatic change is already occurring and it is likely to get worse because our efforts at mitigation are failing.

This doesn't mean that we should stop trying to take collective action to significantly reduce global emissions – quite the opposite. It does mean though,



that measures to manage the consequences of climate change need to be put in place. Doing this isn't giving up hope or leading us up a blind alley, as some green groups and activists would say, it's facing up to the reality of the situation we're in. The centre-right, with its traditional emphasis on national security, should be at the forefront of developing policies that can help us manage the profound risks that climate change is already and will continue to create for domestic and international security.

In people we trust

Being honest about the chances of success has important implications, not least spending more time putting together a robust set of adaptation strategies, but also looking at how an international effort to

research sensible geo-engineering options might be funded, regulated and then deployed. The latter area has long been irrationally berated by many in the environmental movement, largely because of a fear that people will stop considering the importance of climate change mitigation and emission reductions. This is unfounded and goes to the heart of another profound and recurring problem within the current approach: a lack of trust in people and communities.

In profound contrast to this, we need to be able to trust that people are sufficiently concerned about their own prosperity and that of their children for them to see the benefits of decarbonisation once the case is honestly and effectively presented to them and they're sufficiently incentivised. The vast

majority of people can understand that preventing a disease in the first place is much more cost-effective than focusing on the cure. In the case of climate change the cure has yet to be developed.

The centre-right should challenge the view that we can't trust people to know what's good for them. After all, such a view is antithetical to concepts such as localism, decentralisation and the post-

“the centre-right should put forward an approach to climate change that is more honest, efficient, effective, intelligently designed and trustful.”

bureaucratic age that define the progressive centre-right. If people don't get it it's in large part down to a democratic deficit, where people have been excluded from the important debates and decisions that have and must continue to take place if we are to address climate change.

Trusting communities to take important decisions is also important. People that oppose wind farms are not necessarily climate change deniers. Decarbonisation efforts need to be tailored to local communities as much as possible. We should challenge Ed Miliband's statement that, “opposition to wind farms should become as socially unacceptable as failing to wear a seatbelt” position, because framing the debate in this way alienates people from the decarbonisation project at a time when more than ever we need everyone engaged in a constructive debate. Development of energy assets of whatever kind (wind, nuclear, fossil fuels) will receive a range of objections, some legitimate, some less so, and we need a grown up conversation in each case to help us identify which are which.

Moving towards a more effective framework

Finally being honest about the scale of the challenge, the costs involved and how we'll manage the risks of failure, as well as trusting individuals and communities to make the right decisions once properly engaged, will allow for the development of a more rational and cost-effective set of climate change policies. This is a genuinely progressive centre-right approach.

This approach will allow us to better secure long term public and political support for the decarbonisation project. Being transparent about the costs of decarbonisation will help us develop more cost-effective policies, whilst engaging with individuals and communities on important climate change decisions will help us secure support for the dramatic changes that are required.

Together it will enable us to start radically improving the inadequate policy framework we've been lumbered with in Britain, by building policies up for the job of dealing with the multifaceted challenges that climate change creates.

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“we know that the technologies to build a successful low carbon economy are already available or within reach.”

Tom Burke, CBE

“the biggest threat to our prosperity, social fairness and economy will be staying on our current volatile, expensive and inefficient high carbon path.”

Greg Clark MP, shadow energy and climate change secretary

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