DEPARTMENT OF ENERGY & CLIMATE CHANGE

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The UK Government's International Climate Change Action Plan

ACT ON CO2

Department of Energy and Climate Change

Beyond Copenhagen:

The UK Government's International Climate Change Action Plan

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Over 192 countries attended the Copenhagen negotiations (iStockphoto)

The UK desk at Copenhagen (© Crown Copyright)

Deforestation accounts for over 17% of global emissions (iStockphoto)

Demonstrators at Copenhagen (AFP/Getty Images)

FOREWORD

The Rt Hon Ed Miliband MP
Secretary of State for Energy
and Climate Change

While the Copenhagen conference did not agree everything we set out for, we made real strides forward.

The Copenhagen Accord commits the world to limiting temperature increases to two degrees Celsius (2°C) and contains plans for finance reaching a hundred billion dollars a year by 2020. Since Copenhagen, over 100 countries have associated themselves with the Accord and as a result of the targets and actions put forward, around 80% of emissions are covered by the agreement.

This gives us a real platform to build on.

This document sets out how we plan to do that. In particular it sets out how we will ensure the provisions of the Accord are delivered; and it also sets out how we put new life into the quest for a legally-binding treaty.

To do this we will need to respond to what the science and economics are telling us – the scale of the challenge is significant but there are benefits from taking action.

The truth is that tackling the climate problem today does not just reduce the cost of action compared with tackling the problem tomorrow, it also unlocks new opportunities for our businesses, our communities and our way of life. Innovations ranging from electric cars to carbon markets can create new industries, strengthen economies and generate finance to support action in developing countries, even in the tightened fiscal climate that has come out of the global recession.

Our strategy rests on making this transition to a low-carbon, climate resilient economy. We plan to build on the new alliances that formed in the run up to Copenhagen between developed and developing countries, between businesses and NGOs, and between citizens of countries all round the world. We believe that the best way to ensure the world takes sufficiently ambitious action on climate change is if we all move as one, within the context of a legally-binding agreement.

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We will also address the critical issue of fairness. There is no escaping the fact that developed countries must take the lead in reducing emissions, nor the fact that without action by developing countries, success is impossible. So we will take action to limit our own emissions whilst supporting developing countries to follow a low-carbon growth path and to adapt to the effects of climate change that it is already too late to avoid. And that will begin by pushing for developed countries to deliver on the financial commitments they made in Copenhagen.

While Copenhagen was not all we wanted, it did cap a year of tremendous progress which saw commitments to reduce emissions from Japan, Australia, China, India, Brazil, Indonesia, the USA, the EU and many others.

They all recognise that the challenge of climate change requires a permanent change in the way our societies work. It can only be solved through concerted international action. The world has moved a long way towards that position. We believe that this action plan will help us move further.

The Rt Hon Ed Miliband MP
Secretary of State for Energy and Climate Change

EXECUTIVE SUMMARY

Demonstrators from around the world gathered in Copenhagen (AFP/Getty images).

The UN Climate Change Conference, held in December last year in Copenhagen, was a crucial moment in the international fight against dangerous climate change.

Representatives from hundreds of governments and other organisations around the world gathered to make their voices heard. Small island states spoke about the threat that climate change poses to their survival.

The UK approached Copenhagen with ambitious goals – an agreement to limit global temperature increases to no more than 2°C. Copenhagen did not achieve everything that the UK had hoped for. Too much time was spent debating procedural issues, which meant that real debate on vital questions of substance only started in earnest in the final hours of the Conference.

Yet despite the pessimism in some quarters in the immediate aftermath of the Conference, and recent attacks on the credibility of climate science, significant progress was made in 2009. The challenge for this year is to maintain momentum towards the kind of comprehensive international action that is urgently needed. This document sets out the UK's views on how the international community should now move forward in tackling climate change.

Part one assesses what happened at Copenhagen and developments since the Conference. Climate change has moved to the political centre stage for the first time in many countries around the world. Significantly, major developing as well as developed countries have come forward with offers of action to limit emissions. The Copenhagen Accord, agreed by leaders representing 49 countries, marks a significant step forward, with countries agreeing to limit global temperature increases to no more than 2°C and making substantial commitments to support developing countries to take action, including up to $30 billion over three years to 2012, and a long-term goal of

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$100 billion per year by 2020 of public and private finance.

Since Copenhagen, over 100 countries have associated themselves with the Copenhagen Accord. More than 70 countries (accounting for around 80% of global emissions) have put forward targets and actions under the Accord which, if fully implemented, should see global emissions peaking before 2020 – the essential foundation for achieving our goal of limiting average global temperature increases to 2°C. Whilst achieving this goal will be very challenging, the commitments made at Copenhagen and subsequently give the international community a strong platform to build on.

Part two restates why we need to take action to tackle climate change. Recent controversies focussing on climate science have caused some to question the case for action. But it is important to recognise that the overwhelming weight of analysis, corroborated by many independent studies around the world, indicates that climate change is real and cannot be explained unless human activities are taken into account.

If left unchecked, climate change presents an increasing threat to our security and prosperity. Lord Stern has shown that if we do not take action, the longer term costs of tackling climate change will vastly outweigh the costs of early movement to a low-carbon, climate resilient economy[1]. And in making this transition, countries that show leadership are better placed to take advantage of new markets for low-carbon goods and services that are already worth £3.2 trillion to the global economy[2]. We believe that the UK must not fall behind other countries in the low-carbon race.

Part three sets out the action we will take to move towards a low-carbon, climate resilient economy: domestically; within the EU; and internationally. The UK's market for low-carbon goods and services is the sixth largest in the world, worth £112 billion per year[3] and accounting for 910,000 jobs. We will press ahead with plans to promote new industries such as offshore wind, in which the UK is the world leader with investment which has the potential to create up to 70,000 new jobs by 2020[4]. Through the measures set out in the UK Low Carbon Transition Plan, including support for up to four commercial scale Carbon Capture and Storage projects, we aim to deliver at least a 34% cut in UK emissions by 2020 and at least 80% reductions by 2050.

[1] Stern Review on the Economics of Climate Change (2006)
[2] Innovas (2010) "Low Carbon and Environmental Goods and Services: an industry analysis. Update for 2008/09"
[3] Innovas (2010) "Low Carbon and Environmental Goods and Services: an industry analysis. Update for 2008/09"
[4] Carbon Trust (2008) "Offshore wind power: big challenge big opportunity"

The UK will work with our EU partners to maximise the benefits of moving to a low-carbon economy. As the largest single market in the world, the EU is in a strong position to benefit from early action. We want to see strong European action to promote low-carbon infrastructure, technology and jobs; for example through the development of an EU Energy Efficiency Action Plan, development of an EU smart grid and increased investment in climate change from the EU budget. The UK continues to believe that there is a strong case for the EU to raise its emissions reduction target to 30% in the context of an international legally-binding agreement with comparable offers from others, which will drive demand for low-carbon goods and services and incentivise investment in decarbonising the power sector, enhancing long-term energy security.

At home we are committed to action to move to a low-carbon, climate resilient economy. Internationally, countries need to show high ambition in delivering their commitments to limit emissions. Developed countries need to take a strong lead. And we must ensure that developing countries which show ambition have the support they need to act. The UK will work hard to implement the Copenhagen Accord and to deliver practical action on the ground in tackling the causes and consequences of climate change. In particular:

- The Prime Minister will co-chair an international group to examine ways of achieving our long-term goal of $100 billion public and private climate finance a year by 2020.
- We will work with our partners to deliver short-term or fast-start funding for immediate action in developing countries: the UK will contribute £1.5 billion in 2010-2012 and call on other major economies to contribute fast start finance.
- We will commit £300 million of our fast-start finance to practical action to tackle deforestation.
- With our EU partners we will support the development of new Carbon Capture and Storage technologies in China. We will promote the further expansion of global carbon markets, by sharing our knowledge and expertise with others.
- We will work with the private sector, our developing country partners and international financial institutions to explore the role that public-private financing mechanisms can play in leveraging significant additional private investment into low-carbon energy and infrastructure in developing countries and, if appropriate, to design and pilot such mechanisms.

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- We will contribute £50 million over 5 years to a global Climate and Development Knowledge Network, offering more than 60 countries access to world class advice and expertise on adapting to climate change.
- We will support broader international action to promote low-carbon development, such as the agreement made by the G20 group of leading economies to phase out and rationalise inefficient subsidies which encourage wasteful consumption by artificially bringing down the costs of fossil fuels.

Part four explains why we believe countries' actions will be more effective if they are underpinned by a set of international commitments in a comprehensive, legally-binding international agreement. This will give countries confidence that the commitments others make will be delivered, that actions will be reported transparently and reviewed consistently, and give the private sector greater certainty about long-term, low-carbon investment decisions. A common framework will establish a benchmark against which we can measure the cumulative ambition of the international community, and progress towards our ultimate objective of limiting average global temperature increases to 2°C above pre-industrial levels. It will also provide a strong framework to support developing countries in adapting to climate change.

The UK wants to see significant progress in the UN Framework Convention for Climate Change (UNFCCC) negotiations towards a legally-binding climate agreement, consistent with our 2°C goal. But this will not be easy: Copenhagen was beset by misconceptions that developed countries were seeking to abandon the Kyoto Protocol. The UK position is clear: we have no intention of abandoning Kyoto. We believe that a single treaty, binding on all parties, and which upholds and builds on the Kyoto architecture, including binding economy-wide targets for developed countries and design principles for the carbon market, would be the best outcome from the UN negotiations.

We recognise that many countries are reluctant to agree to a single treaty. But a legally-binding outcome, which includes all Parties, could take many forms. To help make progress towards an agreement which commands international consensus, the UK would be prepared, as part of the EU, to commit to an appropriately designed second Commitment Period under the Kyoto Protocol, provided that countries which currently do not have commitments under the Protocol agree on a satisfactory legally-binding agreement which could operate in parallel.

We are also clear that we are not asking developing countries to take on legally-binding Kyoto-style emissions reductions targets in the same way that developed countries should. But we are asking for developing countries to commit internationally to delivering domestic mitigation actions.

To make progress this year we must strengthen the international negotiations process. Progress in taking forward the Copenhagen Accord must be fed into the formal UNFCCC negotiations. We will support Mexico, as chair of the negotiations this year, in ensuring that the informal processes supporting the negotiations are inclusive and transparent and that a broader range of countries' voices are heard. We support the efforts of the UN Secretary-General to move quickly to appoint a new Head of the UNFCCC Secretariat.

Ultimately, for an international agreement to be effective, all countries must feel it is in their interests to participate. The UK believes a comprehensive climate change agreement is in our own national interests and the interests of the international community as a whole and we will work hard to achieve this through the UNFCCC. All Parties will need to show courage and leadership to make this happen - if they do not, pressure will build to consider alternative processes and mechanisms. We do not believe this would be in the best interests of the international community, in particular some of the most vulnerable countries represented under the UNFCCC. That is why it is essential we make progress this year, in the run-up to the 16th Conference of UNFCCC Parties in Cancun in November (COP16).

Climate change is a global problem. To tackle it effectively, countries around the world must collectively achieve something very challenging – the fundamental transformation of their economies from high-carbon to low-carbon patterns of growth. We must also build our resilience to the impacts of climate change and protect some of the world's most vulnerable nations. The scale of the challenge, for governments, investors, industry, civil society and consumers is immense. But we believe that the actions and ambition of many countries leading up to Copenhagen and beyond show that the challenge can be met. The UK is committed to doing all it can to make this happen in the years ahead.

The UK desk at the UN climate negotiations
in Copenhagen, December 2009
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PART ONE

How far have we come?

In December 2009, world leaders came together in Copenhagen seeking a new international agreement to tackle climate change. The UK set ambitious goals for Copenhagen. Ultimately, the conference did not achieve all that we hoped for, and significant political issues still need to be resolved. But this should not obscure the progress that was made both in the run-up to Copenhagen and at the Conference itself, culminating in the Copenhagen Accord. Countries agreed to limit global temperature increases to no more than 2°C; for the first time major developing countries set out the commitments and actions they were prepared to take in limiting emissions; and we saw substantial progress on climate finance. Since Copenhagen, over 100 countries have expressed their support for the Accord and countries accounting for around 80% of global emissions have come forward with significant targets and actions which, if fully implemented, should be consistent with global emissions peaking before 2020. This gives us a strong platform on which to build.

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1.1 2009: a year of progress

For many people around the world, the Copenhagen Conference in December 2009 fell short of the high expectations placed upon it. Frustrations about procedure and process, which meant that issues of real substance were not debated until the final hours of the Conference, together with a failure to resolve some significant differences between countries, contributed to a perception that Copenhagen failed to deliver. Yet, in truth, significant progress was made in 2009 in the global battle against climate change.

20,000 people took to the streets of London for the Wave Climate March, December 2009 (AFP/Getty Images)

To limit global temperature increases to 2°C the Intergovernmental Panel on Climate Change (IPCC) has indicated that developed countries would need to adopt emissions reduction targets which, taken collectively, are in the range of 25-40% below 1990 levels by 2020[1]. Developing countries would need to limit their emissions substantially below business as usual. Throughout the year, many countries showed their willingness to act to limit emissions. Some developed countries – such as Japan, Norway and Australia – increased their proposed emissions reductions targets. Perhaps most significantly, for the first time major developing countries came forward with commitments to take action to limit their emissions, including China, India, Brazil, Indonesia, South Africa, Mexico, the Republic of Korea, Costa Rica, Peru, the Philippines and others. Both the G8[2] and the Major Economies Forum[3], which includes major emerging economies such as China and India, recognised the scientific view that an increase in global temperatures should not exceed 2°C. The G8 agreed that developed countries needed to cut emissions by 80% by 2050 and to set mid-term targets consistent with this goal. Many countries showed real ambition, and all around the world we saw momentum building.

[1] IPCC Fourth Assessment Report (AR4) 2007

[2] G8 Leaders Declaration: Responsible Leadership for a Sustainable Future: http://www.g8italia2009.it/static/G8_Allegato/G8 Declaration_08_07_09_final,0.pdf

[3] Declaration of the Leaders of the Major Economies Forum on Energy and Climate Change: http://www.g8italia2009.it/static/G8_Allegato/MEF_Declarationl.pdf

Upwards of 100,000 people converged in Copenhagen to demonstrate for global agreement (© Crown Copyright)

A youth demonstrator at Copenhagen (© Crown Copyright)

We also saw important progress on the central question of how best to support developing countries to take action to limit their emissions and to adapt to the consequences of climate change. In June 2009 the Prime Minister set out proposals for a new international partnership on climate change finance and called for the provision of around $100 billion per year of public and private finance by 2020, an initiative that helped shaped the international debate. The EU came forward in December with an ambitious offer of early (fast-start) finance of €2.4 billion annually from now to 2012[4], to support immediate action on the ground in developing countries, with other developed countries following suit.

More broadly, the international community took significant steps to promote low-carbon economic development. The G20 group of major economies committed to phase out and rationalise over the medium-term inefficient subsidies for fossil fuels which encourage wasteful consumption. Governments around the world chose to invest significant amounts of their fiscal stimulus in the low-carbon sector, including China, the USA and the EU. The Major Economies Forum made progress in promoting international collaboration on Technology Action Plans, setting out practical measures to support the development and deployment of low-carbon technologies.

[4] European Council conclusions December 2009: http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/111877.pdf

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This momentum was carried into the Copenhagen Conference. But as more than 190 countries gathered at the summit, the political challenges facing their leaders were formidable:

- There was pressure on developed nations to go further by taking more ambitious domestic emissions reductions targets.
- Some countries were reluctant to agree to long-term global emissions reductions targets, or see their own domestic actions captured in a binding international agreement, fearing that this would constrain their future economic growth or that it would mean they would be required to take even deeper emissions cuts in the future.
- For many countries, the question of how commitments made in any agreement would be measured, reported and verified raised difficult issues around how to balance respect for national sovereignty with the need to ensure the transparency of others' commitments.
- Many developing countries were fearful that some of the positive features of the Kyoto Protocol would be lost if a new treaty were agreed.

These issues were at the heart of the debate in Copenhagen. The processes for reconciling these differences during the conference proved inadequate and, ultimately, it was not possible to reach consensus. But despite these challenges, significant progress was made and captured in the Copenhagen Accord[5].

[5] Full text of the Copenhagen Accord is available on the UNFCCC website: http://unfccc.int/files/meetings/cop_15/application/pdf/cop15_cph_auv.pdf

1.2 The Copenhagen Accord: an important step forward

The Copenhagen Accord was agreed by leaders representing some 49 countries[6]. It is a political agreement which includes a number of substantial commitments:

- Agreement to reduce global emissions and limit average increases in global temperature to no more than 2°C.
- Developed and developing countries pledging to put their emissions reduction targets and mitigation actions into appendices to the Accord by 31st January 2010.
- Agreement that the emissions reduction targets and mitigation actions put forward under the Accord are measured, reported and verified.
- A commitment from developed countries to provide approaching $30 billion of immediate fast start funding over the period 2010-2012 to support developing country action on mitigation and adaptation.
- A commitment from developed countries to work towards long-term public and private climate finance flows reaching $100 billion a year by 2020.

Ed Miliband hosts a press conference at Copenhagen (© Crown Copyright)

- Agreement to establish a High Level Panel to explore the potential sources of climate finance that would help achieve this $100billion goal.
- Agreement to set up a new Copenhagen Green Climate Fund (the 'Green Fund') to deliver a significant portion of this finance to developing countries.

[6] This includes EU representatives on behalf of the 27 member states.

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Delegates at work during Copenhagen (© Crown Copyright)

- Agreement to establish a Technology Mechanism to achieve greater coordination and scaling-up of global action on technology development and deployment.
- Agreement to establish a new mechanism to help developing countries tackle deforestation.
- A commitment to review progress in implementing the Accord by 2015.

Since Copenhagen, we have seen support grow for the Accord. Over 100 countries have now associated with it and more than 70 countries, accounting for around 80% of global emissions, have registered targets or actions to limit their greenhouse gas emissions.[7] A sample of national targets and actions can be found at figure one and figure two.

[7] Information provided by countries relating to the Copenhagen Accord, including on specified conditions for delivering targets and actions at the highest end of proposed ranges, is available on the UNFCCC website: http://unfccc.int/home/items/5262.php

Figure one: summary of selected developed country mitigation commitments under the Copenhagen Accord

Country	Emissions target for 2020	Base year
Australia	–5% up to –15% or –25%*	2000
Canada	–17%, to be aligned with final economy-wide emissions target of the United States in enacted legislation.	2005
EU	–20% / –30%*	1990
Japan	–25%*	1990
New Zealand	–10% to –20%*	1990
Norway	–30% to –40%*	1990
Russian Federation	–15% to –25%*	1990
USA	In the range of -17%, in line with anticipated U.S. legislation. The pathway set out in pending legislation would entail a 30% reduction in 2025 and a 42% reduction in 2030, in line with the goal to reduce emissions 83% by 2050.	2005

* Higher end ranges are subject to specified conditions being met

Figure two: summary of selected developing country mitigation actions under the Copenhagen Accord

Country	Nationally appropriate mitigation actions
Brazil	36.1% to 38.9% below business as usual emissions by 2020. List of actions provided, including reduction in Amazon deforestation.
China	To lower CO_2 emissions per unit of Gross Domestic Product (GDP) by 40-45% by 2020 compared to 2005 levels; increase the share of non-fossil fuels in primary energy consumption to around 15% by 2020; and increase forest coverage by 40 million hectares and forest stock volume by 1.3 billion cubic meters by 2020 from 2005 levels.
Costa Rica	Long-term economy-wide transformational effort to enable carbon neutrality that will help the country to significantly deviate from business as usual greenhouse gas emissions projected scenarios from now to 2021 and beyond.
Ethiopia	List of actions include: energy generation from renewables; bio-fuel development; and forestry and waste management projects.
India	To reduce the emissions intensity of its Gross Domestic Product by 20-25% by 2020 in comparison to the 2005 level.
Indonesia	26% below business as usual emissions by 2020. List of actions provided, including sustainable peat land management.
Republic of Korea	Reduce national greenhouse gas emissions by 30% from business as usual emissions by 2020.
Maldives	Achieve carbon neutrality as a country by 2020.
Mexico	Reduction in total annual emissions of 51 million tons of CO_2 equivalent by 2012 on business as usual levels; reduce greenhouse gas emissions by up to 30% from business as usual emissions by 2020.
South Africa	34% below business as usual emissions by 2020 and a 42% deviation by 2025.

PART ONE

How far have we come?

The Copenhagen Accord is a hugely significant achievement. The commitments which countries have put forward under it are consistent with global emissions peaking before 2020, which is crucial to put us on a pathway towards achieving our 2°C goal. The Accord's provisions on finance and other support for developing countries are the basis for practical international action to make this happen. The rest of this document restates why we must act now, and sets out the UK's vision of how the international community should now move forward.

The sun rising over the earth
(iStockphoto)

PART TWO

Why we must act

The overwhelming weight of scientific analysis indicates that climate change is real, and cannot be explained unless human activities are taken into account. Climate change threatens global security, prosperity and development. Left unchecked, the projected impacts and costs of future climate change are huge and, whilst all countries would be affected, these would fall disproportionately on poorer countries that are least able to cope. All countries need to make the transition to low-carbon climate resilient economies in order to safeguard global security and prosperity. And in making this transition, many countries, including the UK, have recognised the need to take early action: it is in our economic interests to keep pace with others in investing in low-carbon infrastructure, technology and jobs.

2.1 The science of climate change

"All scientists, by their very nature, are sceptics. All scientific theories are tested and questioned to determine their validity. Climate science is no different."

Professor John Beddington, Government Chief Scientific Adviser and Head of the Government Office for Science

Science works through asking questions and acquiring evidence to address these questions. It is never 'finished' and always open to challenge. Through this process of challenge and review, the overwhelming weight of scientific analysis, corroborated by many sources and many observed effects around the world, indicates that climate change is real.

Global sea levels have risen by about 17 centimetres during the twentieth century (iStockphoto)

Recent allegations about climate science at the University of East Anglia, and errors made in Intergovernmental Panel on Climate Change (IPCC) reports, have caused some to question the findings of climate science. These allegations and errors are being investigated as they should be. However, the fact remains that none of these events undermine the core scientific evidence that the Earth is getting warmer and this can only be explained by taking human activities into account. This is, and remains, the scientific consensus.

This scientific consensus is not only captured in IPCC reports. A wide range of major scientific bodies have issued statements supporting the conclusions that the IPCC and others have reached. For example, in May 2009 the national science academies of the UK, France, Germany, the USA, Japan, Canada, Russia, Italy, Brazil, Mexico, China, India and Indonesia (G8 +5) issued a joint statement recognising the problem and calling for greater urgency in addressing the causes of dangerous climate change. Evidence that the world is warming comes from a number of independent analyses. It does not depend on the work of one organisation.

"Climate change is happening even faster than previously estimated; global CO_2 emissions since 2000 have been higher than even the highest predictions, Arctic sea ice has been melting at rates much faster than predicted, and the rise in the sea level has become more rapid. Feedbacks in the climate system might lead to much more rapid climate changes. The need for urgent action to address climate change is now indisputable."

G8+5 academies' joint statement – climate change and the transformation of energy technologies for a low carbon future May 2009[1]

Around the world scientists are continuing to pull together evidence from across scientific disciplines – including physics, chemistry and biology – to give an increasingly clear picture of the risks we face from climate change.

As a result, scientists have been able to speak with increasing confidence about the human fingerprint on the warming of the Earth. We can speak with confidence about the core facts:

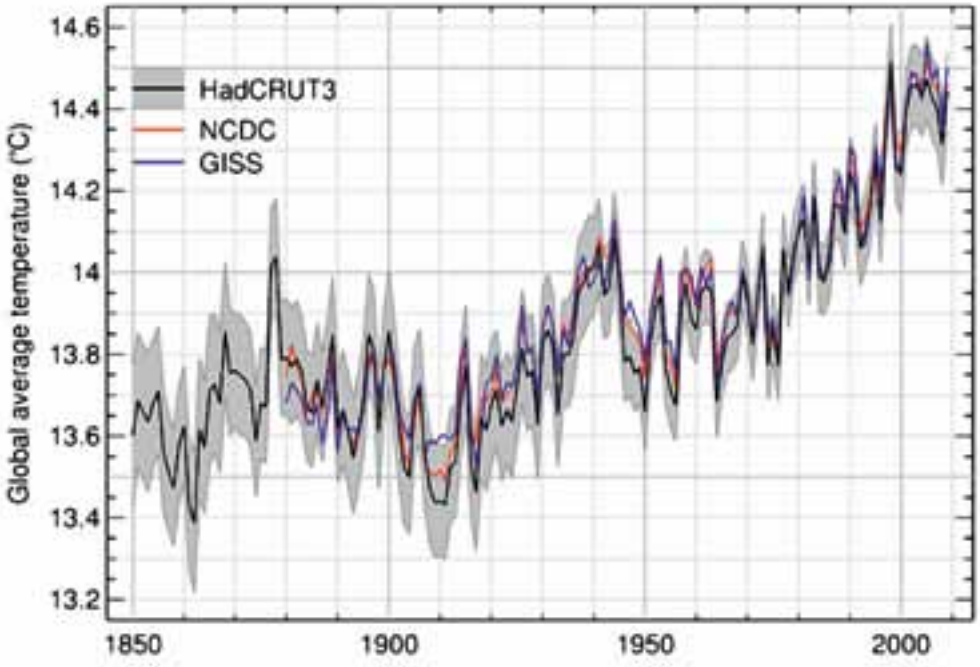
- The Earth has warmed by about 0.75°C since around 1900 and the underlying trend is still going upwards: three independent analyses from internationally renowned institutions including the Met Office Hadley

[1] http://www.nationalacademies.org/includes/G8+5energy-climate09.pdf

Centre (HadCRUT3), the USA NOAA National Climatic Data Centre (NCDC) and the NASA Goddard Institute for Space Studies (GISS) show this clearly. Figure three shows the global average temperature records of these three institutions, for the period since 1850.[2]

- Greenhouse gases such as carbon dioxide (CO_2) warm the planet, and we are continuing to emit increasing amounts of these gases. Since the industrial revolution human activities have raised the concentration of CO_2 in the atmosphere by around 38%[3].

Figure three – Global Average Temperature Record (1850 – Present)



[2] Surface temperature is calculated from weather station data on land and observations from ships over the oceans. Despite differences in the methodologies used to construct the global surface temperature analyses from the raw data, all three records are in close agreement and show a clear warming trend. This warming can also be seen in a wide range of other observed changes, such as melting Arctic sea ice, glacier retreat and rising sea levels. The black line is for HadCRUT3 which is the combined CRU and Met Office record; the red line is from the NOAA National Climatic Data Center (NCDC); and the blue line is the GISS record from the NASA Goddard Institute for Space Studies. The grey shaded area represents the 95% confidence limits, and gives an indication of the level of uncertainty in the temperature records.

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[3] Based on a pre-industrial CO_2 concentration of about 280 ppm (IPCC Fourth Assessment Report WGI Section 2.3.1) and a 2009 value of 387 ppm (World Data Centre for Greenhouse Gases).

Severe droughts are predicted to become more prevalent (iStockphoto)

Climate change could affect the distribution of food and water resources around the world (iStockphoto)

- Much of the warming in at least the last 50 years has been shown to be due to increasing greenhouse gases in the atmosphere[4]. Natural effects such as changes in the radiation from the sun are likely to have made only a minor contribution to warming[5].

- If greenhouse gas emissions from human activities are not significantly reduced from current levels, their concentrations in the atmosphere are expected to continue to rise. This is very likely to cause further warming and other changes to the Earth's climate, some of which may be irreversible. We cannot predict all the changes, but we do know that the more warming that occurs, the more serious the consequences will be for many millions of people across the planet. The likely impacts would be far reaching, including the melting of permafrost, glaciers, sea ice and ice sheets, and changes in natural ecosystems, with detrimental effects on many species.

The impacts of climate change

We are already witnessing the impacts of climate change. As a result of melting ice and warming oceans, global sea levels have risen by about 17 centimetres during the twentieth century[6]. This has increased the vulnerability to flooding of many low-lying countries, such as Bangladesh, and some South Pacific islands.

[4] IPCC Fourth Assessment Report, WG1, Chapter 9, FAQ 9.2, 'Can the warming of the 20th Century be explained by natural variability?'

[5] IPCC Fourth Assessment Report, WG1, Chapter 2, FAQ 2.1. 'How do human activities contribute to climate change and how do they compare with natural influences?'

[6] IPCC Fourth Assessment Report, WG1 Chapter 5, FAQ 5.1 'Is Sea Level Rising?'

"There are women, children and men living in the atolls made of flesh and blood. It is about our cultural survival and our survival as an island people.

It is life and death for us but it will be a choice of life-style for you."

Ursula Rakova – A resident from the Carteret Islands, Papua New Guinea

These impacts are projected to get worse as climate change continues. Millions more people are estimated to be flooded in coastal areas due to sea level rise in the latter half of this century[7]. Severe droughts and increased heat stress are also likely to become more prevalent in some parts of the world, the combined effects of which can have serious effects on crop and livestock production[8]. Global demand for food is expected to increase by up to 70% by 2050, but lack of water in some regions could strongly challenge their ability to meet increased demand[9].

Whilst impacts from climate change will vary across regions and sectors, for global average temperature rises greater than 2°C above pre-industrial levels, the negative impacts are likely to dominate and the costs associated with managing these rise sharply. Above an average global temperature rise of 2°C there is an increasing risk of decline in global food production, water stress is likely to increase markedly in some areas, and sea level rise is likely to accelerate, as is the risk of species extinction. Even an average temperature rise of only 2°C is expected to lead to negative impacts in several regions, but it would give us a better chance to adapt to and absorb the associated impacts and costs – if we act quickly enough.

As well as being a major risk to the physical environment, climate change is also likely to become an increasing threat to our global and national security. Impacts of unchecked climate change risk overstretching the capacity of some countries to respond and could therefore contribute to increased political instability, poverty and migration in some of the most vulnerable parts of the world.

If left unchecked, the projected economic, environmental, human life and security costs of future climate change are very large and fall disproportionately on poorer countries that are least able to cope. The science provides clear evidence that we need to act. The next section assesses the economic case for doing so.

[7] Nicholls, R. J. and J. A. Lowe (2006): Climate stabilisation and impacts of sea-level rise. *Avoiding Dangerous Climate Change*, H. J. Schellnhuber, W. Cramer, N. Nakićnović, T.M.L. Wigley and G. Yohe, Eds., Cambridge University Press, Cambridge, 195-202. Nicholls, R. J. and R. S. J. Tol (2006): Impacts and responses to sea-level rise: a global analysis of the SRES scenarios over the twenty-first century. *Phil. Trans. Roy. Soc. A,* 364, 1073-1095.

[8] Ciais, P., M. Reichstein, N. Viovy, A. Granier, J. Ogee, V. Allard, M. Aubinet, N. Buchmann et al. (2005): Europe-wide reduction in primary productivity caused by the heat and drought in 2003. *Nature*, 437, 529-534.

[9] FAO, 2009, 'How to feed the world 2050', http://www.fao.org/fileadmin/templates/wsfs/docs/Issues_papers/HLEF2050_Global_Agriculture.pdf

Projected climate change impacts and vulnerability

- About 25% of Africa's population (around 200 million people) currently experience high water stress. The population at risk of increased water stress from climate change and other risk factors in Africa is projected to be between 350-600 million by the 2050s.[1]
- A 5 -30% decrease in crop yield is projected for parts of Asia in the 2050s compared with 1990 levels.[2]
- The extreme European heat wave of 2003, where average summer temperatures were 2°C higher than normal, led to more than 2,000 additional deaths in the UK and about 35,000 over Europe. Such hot summers could happen every other year by the 2040s, although the impact would depend on the level of adaptation.[3]

[1]IPCC 2007, Fourth Assessment Report, Chapter 9
[2]IPCC 2007, Fourth Assessment Report, Chapter 10
[3]Met Office 2009, Warming Climate Change – the facts

2.2 The economic case for a low-carbon transition

The Stern Review on the Economics of Climate Change (2006) and A Blueprint for a Safer Planet (2009)[10] estimate that reducing greenhouse gas emissions to avoid the worst impacts of climate change could cost between

Early action will create significant new opportunities (iStockphoto)

1-2% of world Gross Domestic Product (GDP) per year by 2050. This level of investment would support a shift in the way economies and societies work. Moving to a more sustainable emissions path *"requires a fundamental change in our approach to producing and consuming energy. Whether it is re-orientating our power generation mix away from fossil fuels and towards nuclear and renewables, maximising the efficiency of our vehicles, appliances, homes and industries, or developing revolutionary technologies for the future, almost all potential sources of lower emissions will need to be tapped[11]".*

Despite the scale of the challenge that the shift to a low-carbon economy represents, and the costs associated with it, the economic case for action is clear. The Stern Review estimated that if no action is taken to reduce greenhouse gas emissions, the overall costs and risks of climate change would increase and would be equivalent to losing at least 5% of global GDP

[10] Nicholas Stern (2009) "A Blueprint for a Safer Planet" (2009)
[11] International Energy Agency: *World Energy Outlook* (WEO) 2009

each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more. The increase in individual catastrophic events as the average global temperature increases could have a major impact in terms of loss of life, asset destruction and business interruption. As an example of the scale of potential costs, in the summer of 2007 flooding in the UK resulted in an estimated 130,000 claims and £4.9 billion in insured flooding losses[12].

The costs of tackling climate change, whilst significant, will be lower if we act now but the costs will rise steeply if action is delayed. The International Energy Agency (IEA) World Energy Outlook (2009) estimates that each year of delay before moving to a more sustainable emissions path would add around £310 billion ($500 billion) to the global investment cost of delivering the required energy revolution, beyond the investment which would be needed simply to renew our existing energy systems.

A significant part of the cost of delay is due to high-carbon "lock-in" (the costs of taking action to prematurely replace or retrofit high-carbon infrastructure). As the IEA has found, *"A coal-fired plant has a typical lifetime of 40 to 60 years: the plants that are built today determine the CO_2 emissions for a generation"*[13]. To avoid locking in high-carbon infrastructure in the decades to come we need to ensure that today's business investments put the world on a low-carbon, energy efficient path[14].

Without incentives for up-front investment in the short-term, the longer term costs of high-carbon "lock-in" will be significant. Ambitious emissions reduction targets are needed to set the framework for countries to develop policies to ensure that:

- There are credible price incentives to encourage investment in developing and deploying low-carbon technologies.
- Innovation is fostered, helping to bring down the costs of mitigating climate change in the future.
- Behavioural barriers can be overcome.

[12] Climate Works Foundation (Project Catalyst) (2009). *The business case for a strong global deal.*

[13] International Energy Agency: *World Energy Outlook* (WEO) 2009

[14] Climate Works Foundation (Project Catalyst) (2009). *The business case for a strong global deal.*

Marks and Spencer Plan A

"Plan A" was launched by Marks and Spencer in January 2007; a commitment to change 100 things over five years that would make a positive impact on the environment and on Marks and Spencer as a business. By 2009/10 Plan A has already delivered cost savings of around £50 million and cut CO_2 emissions by 40,000 tonnes, with further measures to extend Plan A to 2015 recently announced.

A key part of delivering Plan A has been the way Marks and Spencer has worked in partnership with its suppliers through the development of "eco-factories". The 30 year-old Brandix factory in Sri Lanka was selected to become an "eco-factory" in 2007. Since the conversion of the factory there has been around a 70% reduction in water use and a 50% reduction in energy use.

In the UK, Westbridge Furniture has worked with Marks and Spencer to reduce energy usage (by 20% in 2009) and by encouraging staff behavioural changes such as car pooling.

Plan A has been driven by customer demand, but also because Marks and Spencer believes sustainable retail is now the only way to do business.

Early action: creating new opportunities

The significant investment required to tackle climate change also offers opportunities for countries and businesses in the context of a global transition to a low-carbon, climate resilient economy.

The IEA World Energy Outlook (2009) estimates that over half of the reduction in emissions in the energy industry could be carried out by increasing efficiency in both the generation and use of power. It estimates that by increasing efficiency, energy bills in transport, buildings and industry could be reduced by over £5,400 billion ($8,600 billion) globally over the period 2010-2030 and by £10,700 billion ($17,100 billion) over the lifetime of the investments.

Investing in energy efficiency and renewable energy sources also reduces oil and gas import bills, and can increase energy security by reducing reliance on these more price volatile energy sources.

Local air pollution costs would be reduced by investing in "cleaner" energy sources, particularly in developing countries. For example, the IEA estimates that a sustainable emissions path could lead to a reduction in the cost of local air pollution control in China by £19 billion ($30 billion) in 2030.[15]

[15] Ref: International Energy Agency: *World Energy Outlook* (WEO) 2009.

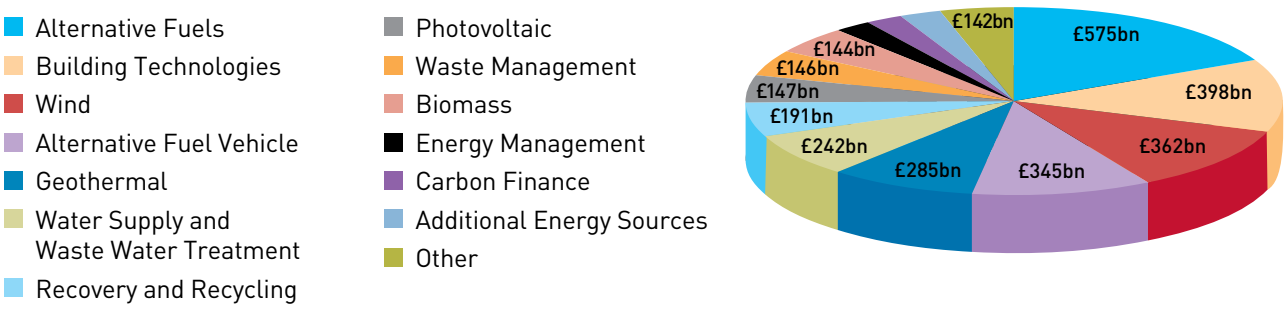
We will aim to exploit the rich marine energy resources around the UK's coastline (iStockphoto)

New markets

The transformation to a low-carbon resource efficient economy will also be accompanied by the emergence of **new global markets**, with considerable potential opportunities for growth. The global market for low-carbon and environmental goods and services (LCEGS) was worth £3.2 trillion ($5.1 trillion) in 2008/09[16] – this global market is forecast to grow by approximately 4% per year over the next 5 years[17]. Figure four below shows the economic value of this market by sub-sector.

There are strong indicators that these markets are already being recognised by investors worldwide: venture capital investment in clean technology has grown from £0.6 billion

Figure four – Global low-carbon and environmental goods and services by sub-sector 2008/09, £bn[18]



Source: Innovas Low Carbon and Environmental Goods & Services: an industry analysis 2009

[16] Innovas (2010) Low Carbon and Environmental Goods & Services: an industry analysis . Update for 2008/2009.

[17] The UK Low Carbon Industrial Strategy. July 2009 is available at http://www.bis.gov.uk/files/file52002.pdf

[18] Source: Innovas (2009) Low Carbon and Environmental Goods & Services: an industry analysis

($1 billion) in 2002 to £5.9 billion ($9.5 billion) in 2008. In 2008 total investments in clean energy reached £100 billion ($160 billion)[19].

> *"China must be firm in following the path of green development and make great efforts to bring about the shift in growth model so as to realise a well-off society, with man and nature living in harmony."*
>
> Hu Angang, Professor of Public Policy & Management at Tsinghua University and Director of the Centre for China Studies, Chinese Academy of Sciences/Tsinghua University.

Annual renewable energy investment increased fourfold between 2004 and 2008 to reach £74 billion ($120 billion) in 2008[12]. China, in particular, is seeking to build strong energy-equipment exports. In 2008 it overtook Japan to become the new world leader in photovoltaic (PV) cell production[20], and also experienced huge growth in its wind power industry to become the world's largest manufacturer of wind turbines.

Global climate revenues (e.g. from energy efficiency and energy management and low-carbon energy production) rose 75% in 2008 to $530 billion; this figure is now larger than revenues derived from the global aerospace and defence sector. On the basis of recent growth rates in revenue for global companies[21], HSBC estimate climate revenues from the equity market could exceed $2 trillion by 2020[22].

There are strong scientific and economic reasons to take ambitious action and to move at pace to a low-carbon, climate resilient economy. The next section sets out what action we will take to support this transition at the national, EU and international levels.

[19] Climate Works Foundation (Project Catalyst) (2009). *The business case for a strong global deal.*
[20] Renewables Global Status Report: 2009 Update
[21] The Morgan Stanley Capital Annual International All Country World Index
[22] Climate Change – September annual index review: Climate revenues – an industrial reality. HSBC Global Research, Sept 2009

The UK is leading the way in offshore wind (iStockphoto)

PART THREE

Delivering ambitious action

The case for action is clear and we know that we need to act now. At home we are pressing ahead in moving towards a low-carbon economy, based on the plans set out in the UK's Low Carbon Transition Plan. Within the EU we will push for greater ambition: on investment in low-carbon infrastructure, jobs and technology; and on moving to 30% under the right conditions, which will in turn help to drive low-carbon investment within the EU and make it more cost-effective to achieve long-term emissions reductions targets. Internationally we want to see early action to implement the Copenhagen Accord and we will drive practical delivery on the ground, including support for developing countries that are taking ambitious action of their own.

3.1 Opportunities for the UK

The Government believes that it is firmly in the UK's interests to play a leading role in the low-carbon race. The UK already has a strong base on which to build – the UK low-carbon environmental goods and services market is the sixth largest in the world – worth around £112 billion ($180 billion) and employing 910,000 people directly or through its supply chain. The UK low-carbon and environmental goods and services sector is expected to grow by 3–4% per annum over the next 5 years[1].

The UK is, and will remain for the foreseeable future, the largest single market for offshore wind in the world. There are real prospects for UK companies to supply this market and up to 70,000 UK jobs could be created, with £8 billion annual revenues to the UK by 2020[2].

The City of London has confirmed its world financial leadership by moving quickly to seize the opportunities offered by the low-carbon economy. With 81% of all international carbon trading now taking place in London and the City's growing expertise in carbon products, the UK represents the natural centre for innovation in the carbon market[3].

Investing in low-carbon infrastructure

The Government announced in Budget 2010 its intention to establish a Green Investment Bank, which will invest in the low-carbon sector. It will consider primarily new energy and transport projects, specifically addressing the significant risk of a gap emerging in the provision of equity capital to large, complex infrastructure projects.

The Government will start by investing up to £1 billion from the sale of government-owned infrastructure-related assets and will seek to match this with at least £1 billion of private sector investment – creating a fund of approximately £2 billion. The fund will aim to catalyse further private sector investment to accelerate the deployment of capital for low-carbon projects. It is likely that the Green Investment Bank will focus initially on offshore wind electricity generation and will consider other infrastructure as appropriate and as the need for investment arises.

Budget 2010 also announced that the Government, subject to European state aid considerations, will be launching an open competition allowing site developers to bid for funding of up to £60 million for infrastructure for the offshore wind industry. We will be expecting all bids to include contributions from local partners.

[1] Innovas Low Carbon and Environmental Goods & Services: an industry analysis. Update for 2008/09.

[2] Carbon Trust (2008) Offshore Wind Power: big challenge, big opportunity

[3] Calculations from World Bank, 'State and Trends of the Carbon Market 2009' and European Climate Exchange

The UK market is also well-positioned to develop and gain comparative advantage in key areas of environmental supply chains, such as water and wastewater treatment, and through exporting to countries looking to upgrade their current infrastructure[4].

UK action: delivering the Low Carbon Transition Plan

The Government is committed to maximising the opportunities of moving to a low-carbon economy and ensuring the UK takes a lead in reducing emissions. The UK Low Carbon Transition Plan sets out ambitious delivery plans for making the transition to a low-carbon economy, based on legally-binding domestic targets to cut UK emissions by at least 34% by 2020 and at least 80% by 2050[5].

In line with the plan we are taking action in four key areas, set out below.

Transforming our power sector

We are promoting clean energy technologies and investment in smarter energy systems. Key actions include:

- Supporting the **EU-Emissions Trading System** (EU-ETS) as a central pillar of the Government's strategy for delivering reductions in carbon emissions. The EU-ETS limits the emissions of heavy industry and power generation across the EU. This cap on emissions will deliver emission reductions of over 500 million tonnes of carbon dioxide equivalent ($MtCO_2e$) per year by 2020 compared to 2005 levels.

We are increasing our investment in lower carbon and electric vehicles (© Press Association)

- Taking the lead internationally in developing **Carbon Capture and Storage** (CCS) technology, a crucial part of the solution to climate change in the UK and globally. In the UK, we are taking forward a programme of four commercial-scale CCS projects, which we intend to fund through a new CCS incentive expected to be between £7.2 billion and £9.5 billion. All new fossil fuel power stations over 300 net megawatt electrical output (MWe) now have to be built "carbon capture ready", with all new coal-fired power stations having to demonstrate CCS on part of their capacity. On 17th March 2010 we established the Office of Carbon Capture and Storage to facilitate the delivery of CCS

[4] Innovas Low Carbon and Environmental Goods & Services: an industry analysis

[5] The UK Low Carbon Transition Plan is available at: http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx

in the UK and help to promote its rapid take-up globally.

- Working through the Office for Nuclear Development we are working to facilitate the building of new **nuclear power** stations by taking action to streamline the planning and regulatory approvals process. In November 2009 the Government published draft energy National Policy Statements (which will inform the decisions of the Infrastructure Planning Commission on applications for development consent for nationally significant energy infrastructure) for consultation along with the names of ten new sites that are potentially suitable for new nuclear power stations.

- Promoting **renewable energy**, which is key to our low-carbon energy future. As well as helping to reduce greenhouse gas emissions radically, renewables will help diversify our energy sources. Following a major consultation, we published our Renewable Energy Strategy in July 2009. This strategy sets out how we all have a role to play in promoting renewable energy, from individuals, to communities, to businesses. Under the 2009 Renewable Energy Directive we are required to submit a National Renewable Energy Action Plan to the European Commission by June 2010. Reaffirming the commitments outlined in the Renewable Energy Strategy this plan will set out how we intend to meet our target of 15% of energy consumption from renewable sources by 2020.

- We will aim to exploit the rich marine energy resources around the UK's coastline. Marine energy could bring significant carbon savings, energy security and economic benefits to the UK. The Government has been working in cooperation with industry and other key stakeholders to develop a **Marine Energy Action Plan** which will set out the key steps which will need to be taken by both the public and private sector to make mainstream deployment of wave and tidal technologies in the UK a reality over the coming decade. In July 2009 an additional £60 million funding was announced for developing marine technologies, including investment in the UK's world-beating marine testing and demonstration facilities and late stage research and demonstration support.

- We recently announced proposals to change the way in which electricity from **biomass** is supported to improve investor certainty and ensure sustainability. Subject to consultation, Government intends to set a minimum level of Renewables Obligation support for biomass installations at the point of accreditation. Later this year, we intend to consult on the introduction of sustainability criteria for biomass used for heat and power.

- We are promoting a **smarter more flexible energy grid** that can manage the energy from new technologies and respond to changes in demand. Later this year we will introduce new grid access rules to enable better use of the current onshore network.

This will help new power plants, including renewable energy projects such as wind farms, get connected to the UK's power grid in a timely way.

Transforming our homes and communities

We are promoting a range of initiatives to help householders save energy, cut their bills and reduce their emissions:

- In March 2010 we published our **Strategy for Household Energy Management**, an ambitious plan that aims to change the way we use and save energy at home in order to achieve a 29% reduction in the UK's household carbon emissions on 2008 levels by 2020.
- The strategy sets out phases to meet both the overall 2020 carbon goal, and the interim commitment to ensure that, by 2015, every household will have installed loft and cavity wall insulation where it is practical to do so. By 2020 up to 7 million homes will have received eco-upgrades, including improvements such as solid wall insulation or renewable energy generating technologies.

The Strategy for Household Energy Management has four key elements:

I. New community partnerships and an enhanced role for local authorities, including a requirement on energy companies to consult with local authorities to deliver local area-based programmes; and support for district heating.

II. Universal standards for the rented sector, including a new Warm Homes standard and proposals for regulation of the rented sector.

III. Invest to save, including replacing the existing Carbon Emissions Reduction Target mechanism with a new energy company obligation and legislation to enable pay as you save financing that would provide people with eco-upgrades without upfront costs.

IV. Support for consumers, including plans for a universal advice service and new standards for installation.

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- We have extended the **Carbon Emissions Reduction Target** (CERT) to 2012 with energy companies set to invest £3 billion in delivering household emissions reductions.
- The roll out of schemes under the **Community Energy Saving Programme** (CESP) will increase throughout 2010, delivering energy efficiency measures through local partnerships between energy companies, local authorities and third sector groups on a house by house, street by street basis. Households benefiting from CESP will see permanent cuts in their energy bills of up to £300 per year.
- We have published a consultation on the design of a new financial incentive to support renewable heat at all scales – the **Renewable Heat Incentive** (RHI), from domestic through to industrial. The RHI will offer individuals, communities, public sector and large commercial and industrial companies a financial incentive to switch from using fossil fuels for heating to using renewable sources of heat. We aim to introduce the RHI in April 2011.
- The introduction of **feed-in tariffs** from 1st April this year will incentivise small-scale, low-carbon electricity generation, allowing small-scale producers to receive cash back for any surplus low-carbon electricity that they generate. Through the use of feed-in tariffs we hope to encourage organisations, businesses, communities and individuals who are not traditionally engaged in the electricity market to invest in small-scale low-carbon electricity, in return for a guaranteed payment both for the electricity they generate and export.
- This year we will also publish a **smart meter prospectus** for the first phase of smart meter roll-out. Smart meters will help people to better understand their energy use and modify their behaviour to save money on bills.
- We are continuing to strengthen the **energy performance requirements of new homes**. From 2016 all new homes must be zero-carbon.

Transforming our work-places and jobs

The policies set out in New Industry, New Jobs (launched in April 2009) have significantly changed the way the Government invests in the UK's capacities for growth and investment. The Low Carbon Industrial Strategy identified a number of sectors of opportunity for the UK, in particular offshore wind, marine, nuclear and ultra low emission vehicles. In Budget 2009 we announced £405 million to help establish the UK as a market leader in low-carbon technology and advanced green manufacturing, on top of the existing Environmental Transformation Fund. A further £150 million was announced in the pre-budget report in December 2009. The announcement of a Green Investment Bank in Budget 2010 will further strengthen the framework for low-carbon investment.

Building on this work, key actions include:

- We are working with partners to build on regional capabilities and focus on regional challenges through the creation of new Low Carbon Economic Areas (LCEAs). Eight LCEAs have been announced so far, ranging from marine technology in the South West to advanced automotive engineering in the Midlands. LCEAs are helping UK regions to attract inward investment, build effective supply chains, address skills provision and drive innovation.
- **A review of global low-carbon business opportunities** led by the Department for Business Innovation and Skills (BIS), the Department for Energy and Climate Change (DECC) and UK Trade and Investment (UKTI). This review will match our strengths and competitive advantages to emerging opportunities in overseas markets both in the short-term and against a 2050 horizon.
- From 1st April 2010 the **Carbon Reduction Commitment for Energy Efficiency Scheme** will drive emission reductions from large private and public sector organisations, primarily through the uptake of cost effective energy efficiency measures. The Government estimates that by 2020 some £1 billion per year will be saved by participants and that the scheme will have contributed emissions savings of at least 4MtCO_2 per annum to the workplaces and jobs sector. Similar to the EU-ETS, the CRC will limit the level of emissions from the sector by placing a cap on the total emissions that can be made by qualifying organisations. This cap will be reduced over time.
- This year we aim to agree new and ambitious **Climate Change Agreement** targets up to 2015 with all sectors, to further encourage energy intensive industries to improve energy efficiency whilst remaining competitive.
- We are continuing to strengthen the **energy performance requirements of new non-domestic buildings**. From 2019 all new non-domestic buildings must be zero-carbon.

New transport options

Our domestic transport currently contributes a fifth of total UK greenhouse gas emissions, and these are growing. In July last year the Government published a low-carbon transport strategy (Low Carbon Transport: A Greener Future) which set out a number of measures to reduce UK emissions from transport, including increased investment in public transport infrastructure and investment in lower carbon and electric vehicles. Key actions include:

- Supporting a shift to **new technologies and cleaner fuels** including EU regulation on new car and van CO_2 emissions standards and on sustainable road transport biofuels, as well as action to promote plug-in cars, green buses and other low-carbon technologies.
- Promoting **lower carbon choices** by providing lower carbon public bus and rail transport, promotion of sustainable travel policies and encouraging eco-driving.

- Using **market mechanisms** to encourage a shift to lower carbon transport by ensuring that the carbon impacts of our transport choices are taken into account. For example this could be done by promoting the development of trading systems, price signals through fiscal measures, and through the pricing of public transport.

As a result of the measures set out in the transport strategy, and other policies already in place prior to its publication, emissions from the transport sector are likely to be around 14% lower by 2020 than they were in 2008.

The UK's low-carbon transport strategy: promoting 'plug-in' cars

In February 2010 the first three locations to benefit from the £30 million Plugged-in-Places scheme for electric vehicles charging infrastructure were announced. Over the next 3 years over 11,000 charging points will be installed in London, Milton Keynes and the North East.

Also announced in February 2010 was the Plug-In Car Grant scheme, which, from January 2011, will give consumers 25% off the price of an electric or plugged-in-hybrid vehicle up to a maximum of £5,000.

Effective long-term delivery

A low-carbon transition requires effort right across government – that is why we have introduced carbon budgets for each department. Government departments are publishing Carbon Reduction Delivery Plans setting out how they will deliver their departmental carbon budget focusing on the period up to 2022. The Government will publish its response to the Committee on Climate Change's annual progress report towards the end of 2010, and in the 2011 budget the Government will make an announcement on the level of the fourth carbon budget.

The UK's existing policy framework has delivered well, and will continue to deliver to 2020. However, the challenges beyond 2020 are significant and will increasingly place pressure on the energy market in its current form. Significant investment will be needed in the electricity sector by 2020 to deliver carbon reduction, renewable and energy security goals. As a result, Budget 2010 announced that the Government will bring forward proposals for changes to the electricity policy framework for consultation this autumn – with a White Paper setting out conclusions by spring 2011; and in the shorter term a summer consultation on the most appropriate mechanisms to provide greater certainty for low-carbon investors.

In March 2010, we published the initial findings of our 2050 roadmap analysis. This analysis explored ways of reaching the UK's 80% emissions target by 2050, while ensuring security of energy supply and promoting economic opportunities for the UK. The initial findings of this analytical work have significant

The Thames Barrier (copyright Defra)

implications for the development of future strategy. Further work will be informed by the Committee on Climate Change, which will provide ongoing analysis and advice on the appropriate carbon budgets that will need to be met on the way to 2050, as well as energy market participants and other stakeholders, both in the UK and internationally. Additional analysis will be published later this year.

A just transition to a low-carbon economy

Whilst many UK regions will benefit from the opportunities emerging from the transition to a low-carbon economy, we must also ensure that the transition is carefully managed so that all parts of the country benefit from it. For this reason the Government has created the Forum for a Just Transition, which focuses on the distribution of impacts in the transition to a low-carbon economy. The Forum involves representatives from central government, regional bodies, trade unions, business organisations and third sector parties.

We need to ensure that UK and European climate change policies minimise the risk of carbon leakage. This is a risk for energy intensive industries and in a number of UK regions. As a result, specific measures have been put in place to mitigate this risk in the EU-ETS.

Adapting to climate change in the UK

To help build the climate resilience of our economy, the UK has established a domestic Adapting to Climate Change Programme. The programme builds on the ground-breaking UK Climate Projections (2009) which provide the most detailed picture to date of the changes currently considered likely in the UK as a consequence of climate change. The programme includes the development of a UK Climate Change Risk Assessment by 2012 to look at how climate change may affect the UK; raising adaptive capacity at a local level by highlighting best practice and encouraging joint working through the Local and Regional Partnerships Board; and using reporting mechanisms under the Climate Change Act (2008) to ask public bodies and utilities companies to identify and plan for future climate risks.

Departmental Adaptation Plans will identify possible climate risks and the steps that government departments are taking to respond to them. We are making our adaptation methodologies and experience readily available and continue to share information and best practice with others, including working with the UNFCCC and the EU.

Departmental Adaptation Plans will identify possible climate risks and the steps that Government departments are taking to respond to them. We are making our adaptation methodologies and experience readily available and continue to share information and best practice with others, including working with the UNFCCC and the EU.

3.2 Opportunities for the EU

The UK believes that as part of the EU there are important advantages of moving to a low-carbon economy. As countries across the world make the low-carbon transition, the EU is in a good position to benefit from early global action as the largest importer and second largest exporter in the world[6]. It also has a robust delivery framework in place with the existing EU Emissions Trading System (EU-ETS) creating a carbon price signal that incentivises investment in low-carbon technology and enables the market to ensure emission reductions are made where it is cheapest to do so.

The EU pavilion at the Copenhagen negotiations (AFP/Getty Images)

The UK Government believes that as the world economy gears up for a low-carbon future, economic innovation and leadership will increasingly be built on energy-efficient and carbon-reducing technologies. Countries will have to compete with those that are at the forefront of the coming low-carbon revolution. Already, global demand for green technologies is on the rise, with China and other emerging economies making huge strides in this direction.

[6] http://europa.eu/abc/keyfigures/tradeandeconomy/index_en.htm

"First-mover advantages can be gained by exploiting the potential of EU environmentally-friendly industries, services and technology through fostering their uptake by enterprises, especially Small and Medium Enterprises, and designing the appropriate regulatory environment.

An industrial base which is modernised to use and produce environmental-friendly technologies and which exploits the potential for energy efficiency is the key to sustainable growth in Europe".

Political guidelines for the next Commission: José Manuel Barroso (President European Commission), September 2009

EU Member States are already becoming market leaders in some areas. For example, Germany is second only to China in photovoltaic (PV) cell production (used for solar power). However, the low-carbon economy is only an opportunity for EU growth and jobs if there are effective policy incentives in place, for example a tighter emissions trading system cap, and action from other countries.

EU action

"Sustainable growth means building a resource efficient, sustainable and competitive economy, exploiting Europe's leadership in the race to develop new processes and technologies, including green technologies, accelerating the roll out of smart grids using Information and Consumer Technologies, exploiting EU-scale networks, and reinforcing the competitive advantages of our businesses, particularly in manufacturing and within our Small and Medium Enterprises, as well as through assisting consumers to value resource efficiency."

EU 2020 Strategy Communication[7]

In line with the action we are taking at home, we want to see action across the European Union (EU) to accelerate the transition to a secure, climate resilient, low-carbon economy. The EU has already set itself targets to reduce greenhouse gas emissions, increase the amount of renewable energy in its energy mix, and improve energy efficiency by 2020. Achieving the 2020 renewable energy target alone means the number of employees in the renewable energy sector across the EU could rise to 2.8 million in 2020, and 3.4 million by 2030[8].

[7] EUROPE 2020 A European strategy for smart, sustainable and inclusive growth http://ec.europa.eu/eu2020/index_en.htm

[8] EmployRES – The impact of renewable energy policy on economic growth and employment in the European Union. April 2009 http://ec.europa.eu/energy/renewables/studies/doc/renewables/2009_employ_res_report.pdf

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Last year the EU supported an ambitious long-term objective of reducing emissions by 80-95% on 1990 levels by 2050, in the context of comparable action by developed countries as a group and developing countries contributing adequately[9]. Since then the European Commission has committed to identifying a pathway for the EU's transition to a low-carbon economy by 2050, with further analysis expected over the coming year. The UK welcomes this initiative.

We want the Europe of 2050 to be powered primarily by low-carbon energy sources, supplied by a technologically advanced and efficient "smart" grid. This is a Europe where the sources and routes of the EU's imported energy supplies have been diversified and EU energy markets are better integrated. Where, through its research and innovation policies, Europe is a global leader in low-carbon and adaptation technologies and significant energy savings have been made, further reducing emissions and boosting productivity and efficiency in Europe's businesses.

The role of standards in driving delivery

Under the Energy Using Products Directive, the EU sets minimum energy efficiency and energy labelling standards which manufacturers must meet if they wish to sell their products in the European Single Market. Ambitious standards have been agreed for 10 energy-using products so far, including televisions and domestic lighting.

These standards will deliver significant energy and carbon savings across the Union: in the UK alone they will reduce UK emissions by over 7 $MtCO_2e$ per year by 2020 and save the UK economy £900 million per year. Further standards for heating systems and commercial refrigeration currently under negotiation could save the UK at least another 7 $MtCO_2e$ each year and £14 billion in energy costs between now and 2030.

Setting Europe on the right path towards achieving this vision is one of the main challenges facing the EU over the next five years. We have made a start, but it is clear that the EU needs to take further action now if we are to achieve our short and longer term energy security, climate change and competitiveness objectives both within the EU and globally. During the coming year, the EU is due to debate a new Energy Action Plan, its strategy for jobs and growth ("Europe 2020")

[9] October 2009 European Council conclusions http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/110889.pdf

and reform of its budget. It is vital that these policies reflect the need to move towards a low-carbon, resource efficient economy and are part of a coherent strategy for low-carbon growth to 2050. The UK sees five priorities for action:

- **Creating the networks and markets needed for a secure low-carbon energy future.** We need to create the right regulatory framework in order to drive the massive investment which will be required to achieve the EU's 2050 goals, while also ensuring energy security. We are already working with EU partners to implement new rules on market liberalisation and take forward regional co-operation with a view to developing frameworks for incentivising cross-border investment within the EU and potentially with neighbouring regions. Later this year, the EU will be reviewing its policies on promoting trans-European energy networks. It is important that these support the creation of the bigger, smarter grids of the future. Smarter EU grids would support the move to a low-carbon economy by integrating renewable energy generation in a cost-efficient way and allowing the network operator to influence consumer behaviour through demand management, while maintaining secure, high quality and safe energy supplies. Smart grids will also enable a widespread roll-out of electric vehicles and electrical heating technologies. Without action at EU level, our own transition is likely to be more costly.

- **Supporting the technologies needed to decarbonise the economy and secure the EU's international competitiveness.** This includes measures to deliver greater ambition through the EU-ETS in the context of an ambitious global agreement which strengthens carbon price signals; the mobilisation of public and private finance; launching the European Industrial Initiatives under the EU's Strategic Energy Technology Plan designed to accelerate the development and commercialisation of key energy technologies; and support for the development and use of ultra-low-carbon vehicles, including, for example, the development of standards for interoperable charging infrastructure for electric vehicles across Europe.

- **Reshaping the EU Budget.** The UK believes that the forthcoming review of the EU's Budget should lead to EU finance being redirected to address the key challenges which matter to citizens today. This includes tackling climate change through support for well-targeted research, development, demonstration and deployment of low-carbon technologies and supporting EU Member States to meet their international commitments on climate change and to adapt to its unavoidable impacts.

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- **Measures to reduce energy consumption through a stronger EU Energy Efficiency Action Plan.** A smooth cost-effective transition will require a step change in energy efficiency across all sectors of the economy. The EU should review the effectiveness of its current plans and focus on the development and implementation of dynamic energy efficiency standards and effective labelling schemes, while building up capacity and mobilising finance to ensure the fulfilment of existing commitments (e.g. on building standards) and to achieve the EU's target of a 20% reduction in energy consumption by 2020.
- **Maximising the EU's global impact.** Europe should continue to use its global impact to influence international energy and climate change policy, building up strategic partnerships and making greater use of the regular summits held with international partners such as the USA, China, India, Russia and Brazil. In doing this, the EU should continue to act as a leader in international climate negotiations; promote co-operation on the development and deployment of low-carbon technologies globally; and work towards greater openness of international energy markets.

Moving to higher EU ambition

"The EU must continue to take leadership. The most convincing way Europe can do so is by taking tangible and determined action domestically to become the most climate-friendly region in the world. It is in Europe's own interest. If we do it intelligently, it will enhance our competitiveness, strengthen our energy security, stimulate green economic growth and innovation, and by that we will create new jobs."

Connie Hedegaard, EU Climate Action Commissioner March 2010

Collectively all countries will need to deliver the highest end of their ambitious mitigation offers and put in place well-designed cost-effective domestic measures to reduce emissions if we are to meet our 2°C goal. The UK stands ready to support an EU emissions reduction of 30% by 2020 in the context of an ambitious global agreement in which developed countries make sufficiently ambitious commitments and developing countries contribute adequately.

In the European Commission's recent communication on international climate policy post-Copenhagen, the Commission undertook to *"prepare analysis of what practical policies would be required to implement a*

30% reduction"[10] ahead of the June European Council. The UK welcomes this commitment, and calls on the Commission, as part of ongoing work to scope the implications of a move to a higher target under the right conditions, to consider the following points:

- **The extent to which early action could help put us on a more cost-effective trajectory towards ambitious emissions reductions in the longer term.** As Lord Stern's analysis has shown, taking global action now would cost significantly less than it will to prevent climate change in the future as we become "locked-in" to long-lived, high-carbon technologies. As highlighted in part two, the International Energy Agency (IEA) has estimated every year of delayed action could add an extra $500 billion (€380 billion) to the investment needed at the global level between 2010 and 2030 to reduce emissions in the energy sector.[11] To help drive achievement of a 2°C trajectory, the EU has set a long-term objective to reduce greenhouse gas emissions by 80%-95% by 2050 in the context of reductions from other developed countries and a reduction from business as usual emissions by developing countries[12]. Lord Stern and the IEA's analyses suggest that taking early action could be a more cost-effective way of the EU achieving such a long-term objective.
- **The contribution that a higher carbon price could make in stimulating low-carbon investment.** The EU Emissions Trading System (EU-ETS) is one means by which the EU incentivises emissions reductions at least cost. A move to a 30% target supported by a tightening of the ETS cap, should increase the carbon price. Alongside other complementary measures, this will help to encourage low-carbon investments. While it will put upward pressure on energy prices, a higher carbon price should reduce the extent to which the UK and EU need to rely on other less cost-effective tools to drive low-carbon investment[13] although we would need to manage the risks to certain sectors.
- **High ambition on mitigation will help to ensure high carbon market finance flows.** In the Copenhagen Accord, developed countries committed to a goal of mobilising $100 billion public and private finance a year by 2020 *"in the context of meaningful mitigation actions and transparency on implementation"*[14]. A well-functioning carbon market, in which developed and developing countries participate and countries move to the ambitious end of their mitigation offers will be fundamental to mobilising the $100 billion.

[10] EU Commission International climate policy post-Copenhagen: Acting now to reinvigorate global action on climate change http://ec.europa.eu/environment/climat/pdf/com_2010_86.pdf

[11] International Energy Agency World Energy Outlook 2009

[12] EU Environment Council Conclusions (21st October 2009) http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressdata/en/envir/110634.pdf

[13] Energy Markets Assessment 2010 http://www.hm-treasury.gov.uk/d/budget2010_energymarket.pdf

[14] The Copenhagen Accord December 2009

- **Opportunities which a higher EU target could offer low-carbon businesses.** We believe that a global transition to a low-carbon climate resilient economy is essential if we are to meet our 2°C goal. In making this transition, there are business opportunities for new and emerging low-carbon sectors of the UK economy. The global industry in low-carbon goods and services is already worth €3.5 trillion a year. If all countries including the EU take ambitious action to reduce their emissions this will increase the global demand for low-carbon technologies. UK and EU low-carbon businesses would be well placed to benefit from this expanding market.

- **Effectively managing the risks to energy intensive industries of a higher target.** It is important to ensure that the competitiveness of British and EU business is not adversely affected by a higher target, for example through increased energy costs passed through the supply chain, and that the UK and EU economy does not suffer from carbon leakage. With our EU partners we have already taken steps to ensure UK and EU business, in particular energy intensive industries, are guarded against the risks of carbon leakage through the mechanisms set out in the EU-ETS Directive, which provide for 100% free allocation of allowances for sectors at risk of leakage and the possibility of financial compensation for indirect emissions. The European Commission will be setting out its post-Copenhagen analysis on the situation of energy intensive industries in the event of carbon leakage by June 2010. But as we have always said, the best way to manage the risk of carbon leakage would be to secure a legally binding international climate agreement.

3.3 Global action

The UK and EU are taking action to move to a low-carbon climate resilient economy. But the UK accounts for only 2% of global emissions and the EU for 13%[15], so if we are going to deliver our 2°C goal we will need to build on the ambition we saw in 2009 and encourage all but the poorest countries to take action to reduce emissions in all major sectors of their economies.

To be consistent with a 2°C trajectory, we need global emissions to peak and start to fall significantly before 2020 and be at least 50% below 1990 levels by 2050. To achieve a 2°C trajectory we need to take action on several levels:

- We need to see ambitious action to reduce emissions from key sectors. This can be done nationally (as countries deliver the emissions reductions offers they have put forward since Copenhagen) and internationally through multilateral action (through international agreements on product standards or by phasing out inefficient fossil fuel subsidies).

[15] Climate Analysis Indicators Tool (CAIT) 2005

- We need to provide support to ensure that countries which want to take ambitious action to limit emissions, have the means to do so. This includes financial support (both public and private); the development and deployment of low-carbon technologies; capacity building; and the development of policy mechanisms such as the carbon market which will help to finance action to limit emissions.
- We must put in place international systems and processes to ensure that the measurement, reporting and verification of countries' performance in meeting their commitments to limit emissions are robust and transparent. This is essential if the international community is to be able to judge whether, collectively, we are on track to meet a 2°C trajectory.

Alongside this, we need to ensure that countries, in particular some of the poorest and most vulnerable states, have the financial and technical support they need to adapt to the unavoidable consequences of climate change.

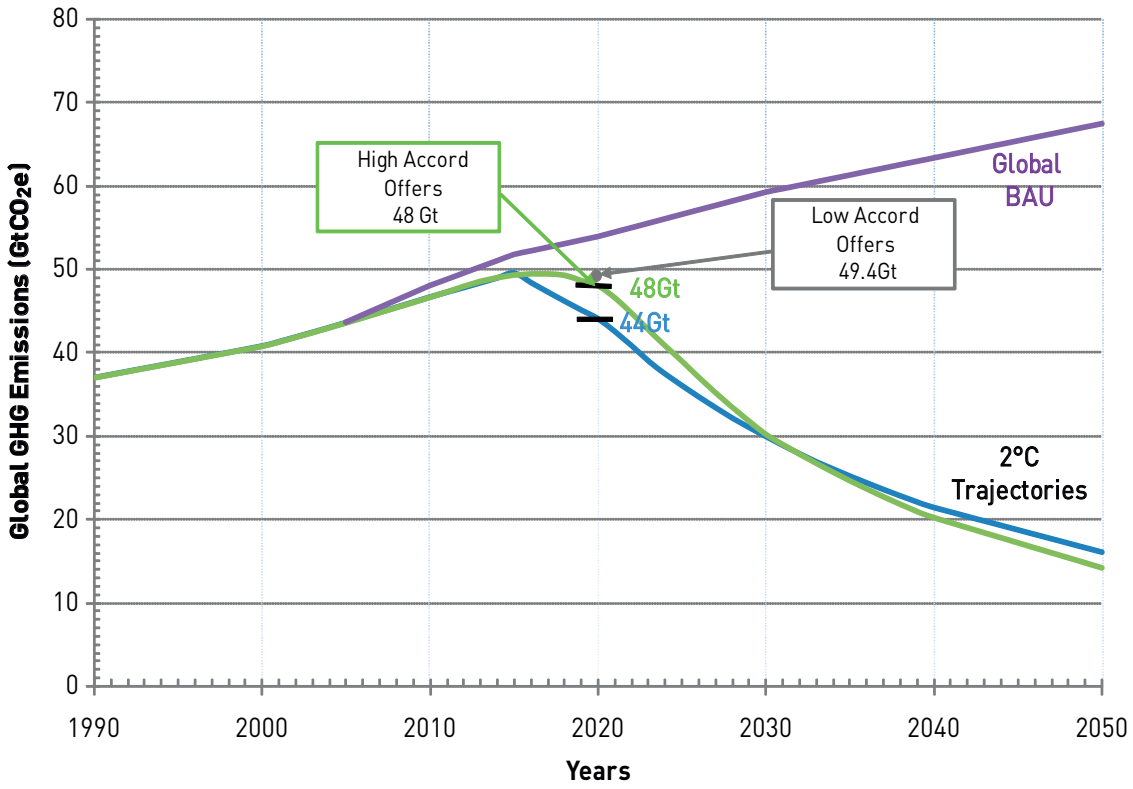
The mitigation challenge

Globally, emissions are currently around 47 billion tonnes (Gigatonnes or Gt) carbon dioxide equivalent per year. If we are to meet our 2°C goal, we need global emissions to peak and start to decline, ideally to around 44Gt by 2020 and to be at least 50% below 1990 levels by 2050 (19Gt or lower). Our analysis shows that as long as those countries that have put forward emissions reductions targets and actions under the Accord deliver at the highest end of the ranges they have offered, global emissions would have peaked and be around 48Gt by 2020. Low Copenhagen Accord offers would deliver 49.4Gt. Both are short of the 44Gt in 2020 which would represent a more cost-effective trajectory and, as such, mean that achieving a 2°C goal will require more challenging cuts after 2020. But it is not impossible and the Accord provides an essential basis for global action.

Starting from the Copenhagen offers, we can still reduce annual emissions to the 19Gt or lower needed by 2050 to keep within reach of a 2°C goal. Such a pathway will require faster and deeper reductions in global emissions in the period 2020 to 2050 than would be required if we acted more urgently and reduced emissions to 44Gt in 2020, and overall is likely to be a more expensive path. Collectively, countries will need to deliver at the high end of current offers, work with others to identify where we can go even further by 2020, and increase our level of ambition in later years.

Figure five shows an assessment of the mitigation offers which countries have made under the Copenhagen Accord. The purple line shows business as usual emissions. The blue line shows an ideal 2°C trajectory. The green line shows that if fully implemented, the high end offers countries have put forward would bring global emissions down to 48Gt by 2020 meaning that a 2°C trajectory would require significant global effort in later years to reduce emissions faster and to lower levels.

Figure Five – Mitigation offers under the Copenhagen Accord compared to a business as usual trajectory and a more ambitious trajectory to 2°C[16]



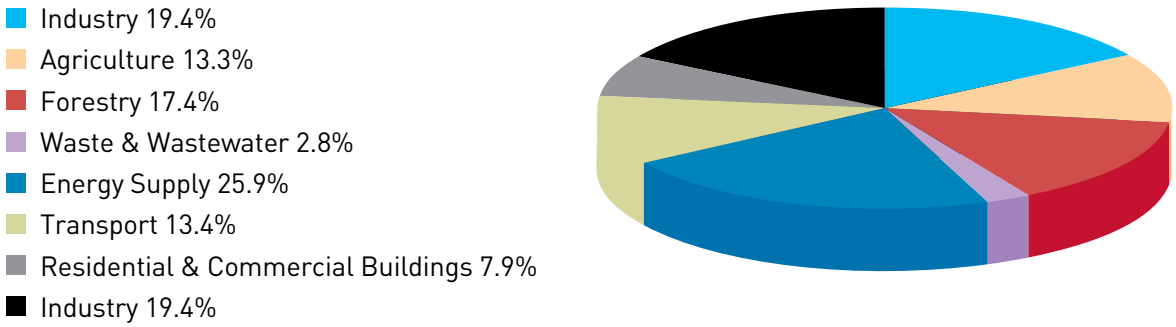
It is essential that countries implement the political commitments made by leaders in the Copenhagen Accord. The UK calls on all countries to stand by the offers they have put forward and take urgent action to implement them.

Underpinning the targets and actions which countries have put forward, we need action targeted at all major sectors. Figure six shows a breakdown of global emissions by sector in 2007.

[16] Accord estimates based on DECC analysis and 2°C trajectories based on underlying data from Bowen, Alex, and Nicola Ranger. 2009. Mitigating climate change through reductions in greenhouse gas emissions: the science and economics of future paths for global annual emissions. Policy Brief. Grantham Research Institute & CCCEP, LSE http://www2.lse.ac.uk/granthamInstitute/pdf/bowenRangerPolicyBrief.pdf

Our analysis shows that in the period up to 2020 there are significant opportunities to reduce emissions in a cost-effective way in a range of sectors: particularly forests, the power sector and associated energy industries. Post-2020 emissions reductions potential in the power sector will become increasingly important; achieving this will include developing new technologies such as Carbon Capture and Storage, improving energy efficiency, and the greater deployment of renewable technologies. Figure seven sets out the potential emissions reductions (abatement) that interventions in different sectors could have against a business as usual emissions trajectory (the reference scenario), for example end-use interventions such as improving the efficiency of domestic appliances.

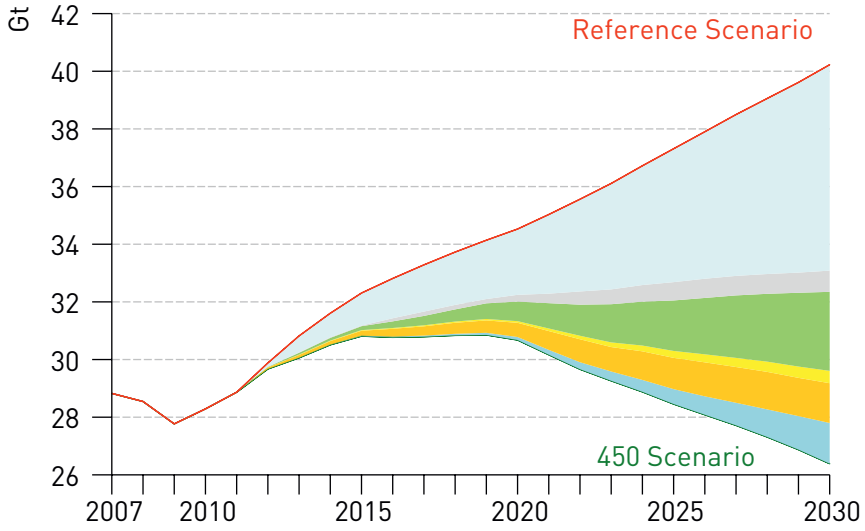
Figure Six – Global Green House Gas Emissions by Sector (2007)[17]



Source: Innovas Low Carbon and Environmental Goods & Services: an industry analysis 2009

[17] IPCC Fourth Assessment Report 2007

Figure Seven – Emissions reduction potential by intervention[18]



	Abatement ($Mt CO_2$)	
	2020	2030
Efficiency	2 517	7 880
End-use	*2 284*	*7 145*
Power plants	*233*	*735*
Renewables	680	2 741
Biofuels	57	429
Nuclear	493	1 380
CCS	102	1 410

Supporting ambitious action to tackle climate change: Indonesia

In the run up to Copenhagen, the Government of Indonesia committed to reducing its greenhouse gas emissions by 26% below business as usual levels by 2020, or by as much as 41% with international assistance. It has since produced a new five year national development plan which seeks to mainstream climate change into the Government's overall objectives. A Climate Change Action Plan – which will set out how the emissions target will be achieved and how individual sectors, such as forestry, agriculture, transport and energy will contribute to the 26% reduction target – is due for publication in April.

Under an extended development partnership on climate change between the UK and Indonesian Governments, £50 million of UK development assistance funds will be used over the next 5 years to help Indonesia achieve low carbon, equitable and climate resilient development. This work will focus on addressing the economic and administrative issues underlying land use change and deforestation, responsible for roughly 80% of Indonesian emissions.

[18] International Energy Agency World Energy Outlook 2009

Global action in key sectors

Aviation and maritime

Emissions from the aviation and maritime sectors each account for approximately 2% of global emissions. Taking action in these sectors is therefore a key priority. The UK will continue to press for global sectoral targets for the international aviation and maritime sectors consistent with our 2°C goal. We will work with the UNFCCC, International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) to take this forward. During 2010 we will:

- work towards a draft resolution on global measures to reduce emissions from aviation for the 2010 ICAO Assembly.
- promote an agreement on limits on CO_2 emissions from aircraft which is being considered by the ICAO Committee on Aviation Environmental Protection (CAEP).
- press for countries to work together in the IMO to develop a new convention to deal with greenhouse gas emissions from ships through global market-based instruments.

Within the EU, aviation will be included in the EU Emissions Trading System from 2012.

Energy: tackling fossil fuel subsidies

Phasing out inefficient fossil fuel subsidies around the world could have an enormous impact on carbon emissions – the Organisation for Economic Cooperation and Development (OECD) has estimated that removing all fossil fuel subsidies could reduce world greenhouse gas emissions in 2050 by 10%. The IEA estimates that, globally, consumer subsidies are worth more than US$500 billion per year. The UK strongly supports the agreement made in the G20 in 2009 to rationalise and phase out over the medium-term inefficient fossil fuel subsidies that encourage wasteful consumption. G20 countries have committed to develop national implementation strategies setting out how they will achieve this, ahead of the next G20 Summit in June 2010.

Manufacturing: raising product standards internationally

Effective performance standards for products, such as home and industrial goods, road transport and the materials used in buildings, could deliver up to 28% of the carbon abatement required by 2030 (5.3 $GtCO_2$ globally)[1]. Critically, these savings are amongst the cheapest abatement options; realising them will reduce the costs of climate change and reduce energy bills, improve security of supply and improve air quality. We will work with other countries to introduce stretching performance standards in the sectors described above as well as working to eliminate the least efficient products in each class.

[1] Energy efficiency policy recommendations (2008) International Energy Agency

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We recognise the need to address the challenge of delivering future emissions reductions fairly. Developed countries have to take a lead in terms of their own ambition. But even if developed countries reduced their emissions to zero by 2050, it would still not be enough to keep average global temperature increases below 2°C because of the rate that emissions are growing in major emerging economies.

To achieve our 2°C goal, and ensure that developing countries are able to develop in a low-carbon, climate resilient way it will be essential that developed countries meet their commitments to provide sufficient financial and technical support in addition to existing development aid, to augment developing countries' own action. This is a big ask: countries which grew in a high-carbon way have to not only transform their own economies but also help developing economies to take a radically different growth path.

The adaptation challenge

Our emissions stay in the atmosphere for centuries and historic emissions mean that some climate change is already unavoidable. Countries all over the world will feel the effects of this change, but the poorest and most vulnerable countries will be hit the hardest. The Copenhagen Accord therefore rightly recognises that urgent action is required to support developing countries build their climate resilience and reduce their vulnerability to the impacts of climate change.

In supporting this work it will be important to take immediate steps to help developing countries take a more integrated approach to adaptation and development planning – moving away from a project by project approach to adaptation towards mainstreaming climate resilience into national plans and planning processes.

Key fact:

A quarter of the world's population still lives on less than $1.25 a day. One billion people lack access to clean drinking water; 1.6 billion, electricity; and 3 billion, adequate sanitation. A quarter of all developing country children are malnourished. Addressing these needs will get harder, not easier, with climate change.[19]

The sections below describe actions we will take to support developing countries both in limiting emissions and in adapting to climate change.

Finance

The Prime Minister's interventions on climate finance last year shaped the international debate. This year the UK wants to see early action on delivering fast-start finance; action to scope the potential sources of longer term finance, including leveraging private finance; and good progress in designing the mechanisms by which finance will be disbursed.

Fast-start

The UK is calling for countries to move quickly to deliver the commitments they made in Copenhagen to provide approaching $30 billion of fast-start finance to help developing countries build their capacity to reduce emissions and respond to the impacts of climate change. We are working with other EU and developed countries to ensure that we report progress on the delivery of this finance clearly and openly. We will report how much has been provided in time for COP 16 in Cancun and annually after that. The UK will provide £1.5 billion of fast-start finance in the period to 2012, balanced between adaptation and mitigation (including forests, technology, and capacity building).

Longer term finance

The Prime Minister is co-chairing (with Prime Minister Meles of Ethiopia) the new High-Level Advisory Group which will look at different sources of climate finance to help us meet the longer term target of mobilising $100 billion of public and private finance a year by 2020. Fast-start finance to 2012 is vital, but finance flows will need to be scaled up significantly thereafter. The task of the Advisory Group will be to examine a wide range of new and additional sources of finance, both public and private – investigating their feasibility, the sums they could raise, their equity and their wider economic and social impacts. As Co-Chair, the UK will help co-ordinate the Advisory Group which will consult widely with other governments, stakeholders, and international

Prime Minister Gordon Brown proposes $100bn initiative on climate finance, in June 2009 (© Crown copyright)

experts to develop robust recommendations that the UN Secretary General can report to the UNFCCC at COP 16 in Cancun in November 2010. It is important that the Advisory Group is able to narrow down the best options for mobilising climate finance to build confidence that the international community will be able to deliver on its long-term financial commitments.

Countries' climate finance commitments should not be met by diverting finance away from helping developing countries to reduce poverty and provide basic services for their people. From 2013 onwards, the UK is committed to providing some climate finance that is additional to our international development aid commitment to deliver 0.7% of our Gross National Income (GNI) as Official Development Assistance (ODA). We have also committed to limiting the amount of development aid that we spend on climate change to up to 10% of our total aid budget. We will continue to encourage other countries to make similar commitments.

The section on EU action above describes how we believe it is important to reshape the EU budget to focus on critical issues such as climate change. In the longer term, the UK wants a reformed EU budget to make a greater contribution to international climate finance flows, particularly through contributions to multilateral funds, for example to the "Green Fund" described in the Copenhagen Accord to help developing countries to reduce their greenhouse gas emissions while assisting the most vulnerable communities to adapt to the unavoidable impacts of climate change.

Leveraging private finance

The private sector has a critical contribution to make in supporting the transition to low-carbon, climate resilient economies – for example by scaling up investment in developing countries. The private sector currently contributes approximately 86% of existing investment in low-carbon infrastructure, technology and energy generation and this is likely to increase significantly in the future.

To maximise the private sector's contribution, appropriate incentives need to be created and potential barriers to investment need to be overcome. Achieving an international legally binding agreement, and creating greater clarity over the future carbon price, will be key to this. However, there are additional things that can be done to help overcome specific market failures, and encourage private finance flows in the immediate term. Some of the barriers to low-carbon investment may include a lack of access to finance, political and regulatory risk, or financial non-competitiveness of low-carbon projects when compared to other forms of investment.

Governments and international financial institutions have a role to play in helping the private sector overcome these risks and therefore catalyse private investment in low-carbon alternatives. For example, access to capital may be enhanced by the provision of low interest rate loans; technological and regulatory or political risks can be mitigated through insurance and guarantee instruments; and expected returns from an investment into renewable energy can be enhanced by offering feed-in tariffs. As investors tend to face a

[19] World Bank http://siteresources.worldbank.org/INTWDR2010/Resources/WDR10-main-messages.pdf

number of investment barriers at once, it is often necessary to package such instruments together (via funds or other facilities). Evidence suggests that, if appropriately designed, such packages (or public-private financing mechanisms) can leverage up to 15 times more private finance compared to the public finance contribution.

The UK is already active in exploring ways to help mobilise private finance and investment. For example, the Clean Technology Fund (CTF) will help reduce barriers and mobilise private investment in clean technologies in developing countries. The results to date are promising. Nine investment plans have received $3.3 billion from the CTF, and we expect the parallel private sector financing to amount to $9.3 billion. For every dollar of CTF funding an additional average of $3 of private sector financing is being leveraged.

Going forward, we will be scaling up our engagement with developing country partners, international financial institutions and the private sector (and in particular institutional investors, such as the P8 – a group of the largest global pension funds), to further understand the role that public-private financing mechanisms can play in helping catalyse private investment in developing countries.

Last year Lord Stern led work with a range of private sector experts to explore ideas, including bonds and different types of funds (e.g. clean pool funds in which governments and multilateral development banks would provide start-up financing to attract private investment, and then use the finance raised to invest in other funds supporting low carbon projects in developing countries). This year, we will work closely with Critical Mass – a public-private initiative spearheaded by the World Economic Forum, the International Finance Corporation and the UN Foundation – to further develop these ideas, with a view to piloting the best ones and informing the work of the High Level Advisory Group on alternative sources of climate finance.

We will also work closely with the Asian Development Bank, the International Finance Corporation and institutional investors to explore the scope and feasibility of piloting specific public-private financing mechanisms for Asia. A key meeting will be the P8 summit in Korea in June, where the private sector and developing as well as developed country representatives will consider such potential initiatives in the context of what can be done to reduce investor risk over time, so that pension funds and others can support with confidence the investment needs identified in developing countries' low-carbon development plans.

How finance is spent

The UK strongly supports the establishment of an international Green Fund for climate change, as set out in the Copenhagen Accord. We will engage with others to develop detailed design proposals for this fund for discussion in Cancun. A well designed Green Fund could deliver a significant portion of climate finance

UK priorities for the Green Fund

The UK would like to see a Green Fund that has the following key features:

- It should provide finance for the following themes: adaptation, mitigation, forests, technology, and capacity building.
- It should have an overarching governance committee with equal representation of developed and developing countries.
- This committee should be supported by thematic committees for adaptation, technology and forestry. These committees should also have equal representation of developed and developing countries.
- Finance should be allocated against country owned plans and investment decisions should be made at the local level.
- The review of national plans should be a technical not political process.
- It should be open and transparent about its operations: for example it should make the minutes of committee meetings publicly available.
- It should engage with all major stakeholders e.g. international financing institutions, civil society and the private sector on a regular basis.
- It should offer a range of financial products, including grants and low interest rate loans.
- If fiduciary risks allow, it should be possible for finance to be delivered directly into developing country treasuries orbudgets or into national trust funds rather than via a third party.
- Finance from the Green Fund should be coordinated with other international finance and fiduciary risk, monitoring and other requirements streamlined.

to developing countries. See box on page 63. However, finance flows outside the Fund will still be substantial and it is important that we look at the governance and delivery arrangements for climate finance more broadly to ensure that money is allocated and delivered in a fair efficient and effective way.

The UK believes that developing countries willing to take ambitious action on climate change must have the support they need to do so. We will work with others to further consider the case for strengthening the financial incentives for action, for example by providing access to carbon finance and long-term public finance for those countries committed to climate action.

The UK believes that 50% of all global fast start finance should be committed to adaptation and that adaptation finance should be prioritised to help the poorest and most vulnerable countries adapt to climate change. We will encourage others to support this principle.

In 2010 we will:

- Work with developed countries to ensure arrangements are in place to deliver approaching $30 billion fast start finance by 2012.
- Aim to agree the key design principles of the Green Fund at COP 16 in Cancun in November.
- Support the work of the High Level Advisory Group on sources of climate finance, and look forward to recommendations that the UN Secretary-General can report to COP16 in Cancun, so that countries can indicate which sources they would support in the context of an ambitious, legally binding deal.
- Scale up our engagement with the private sector in order to understand the role that public-private financing mechanisms can play in mobilising private finance for climate change, and if appropriate to design and pilot such mechanisms.

Carbon markets

The UK is committed to using the carbon market to drive emissions reductions in both the developed and developing world. The carbon market is one of the most important tools to support mitigation action because of its potential to deliver emission reductions at low cost and to deliver financial flows to the developing world.


(iStockphoto)

By the time of COP16 in Cancun in November this year, we want to see progress at the international level to take forward reform to the Clean Development Mechanism and agreement to introduce new, large-scale carbon market mechanisms to allow developing countries to scale-up their participation. Elsewhere in the world, we expect progress on the ground as a number of major developing countries take forward legislation to introduce emissions trading systems.

Linking carbon markets

Mark Lazarowicz's report on Global Carbon Trading[20] shows that a well designed global carbon market could reduce the cost of emissions reductions by up to 70%, allowing the world to reduce emissions by an additional 40-50% at the same cost. To help achieve that goal, the UK wants to see Emissions Trading Systems (ETS) in developed countries begin to link with each other to increase efficiency and reduce costs.

Many major developed countries including Japan, the USA, Australia, New Zealand and South Korea continue to push forward climate legislation with emissions trading as a way of delivering their emissions reductions targets. The UK is interested in how we might link these systems into an international emissions market, including the EU Emissions Trading System (EU-ETS). We have a strong base on which to build: EU Emissions Trading System transactions in 2008 were valued at US$92 billion, representing nearly a 90% year-on-year growth over 2007[21]. The global carbon market is forecast to be turning over up to $2 trillion per year by 2020 and we want to see linked national trading systems so that companies can see a common international carbon price[22].

The UK also supports the increased participation of developing countries in carbon trading, both through reforms to the Clean Development Mechanism (CDM) and the creation of new, large-scale, carbon market mechanisms which have the potential to be more effective, efficient and equitable than the current CDM. These new instruments should move away from the project-by-

[20] Mark Lazarowicz MP (2009) "Global Carbon Trading: A framework for reducing emissions"

[21] World Bank State and Trends of the Carbon Market http://siteresources.worldbank.org/EXTCARBONFINANCE/Resources/State_and_Trends_of_the_Carbon_Market_2009-FINALb.pdf

[22] http://www.researchrecap.com/index.php/2008/05/30/global-carbon-market-may-grow-to-2-trillion-by-2020/

project approach favoured under the CDM. They should focus on including whole sectors of an economy and help to drive emissions reductions beyond the level set out by a country's own commitments.

Sharing expertise

In 2010 we will work closely with developed and developing countries who are implementing national emissions trading policies and share our expertise. We will work to strengthen the international dialogue between countries committed to the implementation of cap and trade systems, including through our active membership of the International Carbon Action Partnership (ICAP).

To support the development of a global carbon market and build capacity in developing countries to engage with it, the UK will seek to offer practical support to countries who are taking forward their own domestic market-based emissions reductions policies, and examine how those schemes could be linked to the international carbon market. Through the UK's Climate Change Projects Office (CCPO) we have already led a number of trade and capacity building missions to a variety of countries including Ghana, Nigeria, China, Tanzania, Colombia, Peru, Indonesia, Malaysia and Philippines to share experience and offer advice on how they can scale up their participation in the carbon market.

Over the next year we will focus on sharing our expertise and building capacity in three areas: working with developed countries with planned or existing trading systems (e.g. Japan, USA, Australia and New Zealand), advanced developing countries that may introduce new mechanisms or trading systems (e.g. China, India and Mexico) and least developed countries where there is more capacity building needed for them to be able to participate under the CDM.

Reforming the Clean Development Mechanism

We will continue our efforts through the UNFCCC process to improve and develop the CDM. For instance, we are keen to see a standard approach to setting emissions baselines and determining whether projects are delivering emissions reductions that are additional to business as usual investment. We would also like to see a more programmatic approach to CDM investments. Standardised approaches could help to reduce costs and risks for project developers and could help increase participation in the market by those countries and sectors that are currently underrepresented. We will work with other countries to seek agreement to this approach ahead of COP16.

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In 2010 we will:

- Continue to push for an overarching international agreement which provides a strong long-term framework for the global carbon market.
- Aim for agreement by COP16 on the key design principles for scaling up the carbon market in developing countries, including through:
  - introducing a standard approach to setting emissions baselines and demonstrating additionality in the CDM, moving away from the project by project approach.
  - seeking agreement to introduce new, large-scale carbon market mechanisms.
- Provide support and expertise to those countries and regions around the world who are in the process of establishing emissions trading systems.
- Work with other international institutions, such as the World Bank and UN Development Programme (UNDP), to provide technical and financial assistance to those developing countries looking to implement their own market based mechanisms.
- Work with partners to explore ways to support greater participation of low income countries in the carbon market.

Forests and Land Use

Reducing emissions from deforestation and associated land use change will have a critical impact on whether we achieve our 2°C goal. Emissions from this sector account for over 17% of total global emissions. Reducing emissions from tropical deforestation and forest degradation, as well as conserving and enhancing forest carbon stocks, and sustainable forest management are collectively known as REDD+. Effective action on REDD+ action will depend on providing substantial finance to support the efforts of forest nations.

Our overarching goal remains to reduce emissions from deforestation and degradation by at least 50% by 2020. Key developing countries have come forward in 2009 with ambitious offers to reduce emissions from deforestation. This includes Brazil, which offered to reduce their total emissions by 36.1 to 38.9% below BAU by 2020, of which 0.67Gt would be emissions reductions from tackling deforestation, and Indonesia's plan for voluntary reductions in national emissions between 26% by own action, and 41% with international assistance, focussing on seven areas including peat emissions and deforestation. During Copenhagen the UK along with France, Australia, Norway, the USA and Japan committed $3.5 billion fast-start finance to support REDD+ activities in developing countries between 2010 and 2012. The UK has committed £300 million to this package. We are

pleased that at the high level meeting hosted in Paris on the 11th of March, other donors including Germany, Spain, Slovenia, Finland and the European Commission came forward with fast-start commitments to support REDD+ action. This has helped put us on track to achieve the 20% ($6 billion) of global fast-start finance that the Prime Minister suggested in December last year would be needed for forests over the period 2010-2012.

We will continue to encourage developing countries to commit to taking action on REDD+, and encourage more developed countries to come forward with offers of early (pre-2015) forest finance to support these efforts, working together through a partnership on REDD+. The Prime Minister announced in December last year that $25billion of forest finance would be needed for a 25% reduction in emissions from deforestation by 2015, with developed countries paying the majority. We will continue to work towards this internationally.

The Copenhagen Accord calls for immediate action through the establishment of a "REDD+ Mechanism" – a package of funding measures and institutional arrangements which would support developing countries to reduce emissions by tackling deforestation. This mechanism should be consistent with the design of the "Green Fund" (described above).

Key facts[23]

- The world's total forest area is just over 4 billion hectares or 31% of the total land area.
- Total deforestation is about 13 million hectares per year, due mainly to conversion to agriculture.
- Taking plantations and natural regeneration into account, net forest loss is about 5.2 million hectares per year (an area just over the size of Slovakia) down from 8.3 million hectares in the 1990s.
- The area of forest in national parks, wilderness areas and other legally protected areas has increased by more than 94 million hectares since 1990 and it now equals 13% of total forest area.
- Forests are among the world's chief carbon sinks. The carbon stored in forest biomass, deadwood, litter and soil together is more than all the carbon in the atmosphere.
- Forests provide support for nearly half the 2.8 billion people living on less than $2 per day[24].

[23] Food and Agriculture Organization of the United Nations (2010) Key findings – Global Forest Resources Assessment 2010
[24] World Bank (2004) Sustaining Forests – a Development Strategy.

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Community Sustainable Forest Enterprise worker takes a break in Cameroon (Copyright: Andrew Inglis and DfID)

We are committed to working with others to improve the transparency, coordination and delivery of forest finance and action. We will work through the coalition of countries supporting the process to establish an interim REDD+ Partnership Arrangement by the Ministerial meeting that Norway is convening in May, to agree how best to coordinate and deliver forest finance now and in the future, and to develop proposals on the detailed design of the REDD+ mechanism for discussion in Cancun. We will also continue to engage with multilateral institutions and processes, including the World Bank and the UN, on our emerging thinking, building on the call for them to improve cooperation and coherence made by the Prime Minister and other countries last year.

We will also work with countries through this emerging REDD+ Partnership and through the formal negotiations this year to agree on the outstanding forest issues which we could not resolve in Copenhagen.

We would like to agree a way of setting 'reference levels' against which we would measure progress in reducing emissions. Reference levels are the rate at which deforestation would take place if no action is taken. We would like to agree a way of setting national reference levels which maximise the incentive to take additional action to avoid deforestation by combining historic deforestation rates and an understanding of the past and future pressures on forests. We recognise that countries have different drivers

of deforestation, patterns of land management and forest governance, so for some countries, setting a national reference level straight away may be difficult. Where necessary, sub-national levels could be used but they would need to be in the context of and moving towards national targets. We also want to agree a way of monitoring safeguards which minimise the impact of REDD+ action on biodiversity, the environment, local communities and indigenous people.

Taking practical action on the ground

We will support forest nations build their capacity to reduce emissions by tackling deforestation through our contributions to the Forest Carbon Partnership Facility and the Forest Investment Programme. These multi-donor programmes are helping developing countries to prepare and implement national REDD+ action plans. We have also pledged to provide £50 million to the Congo Basin Forest Fund, to help build sustainable livelihoods in that region.

Brazil's satellite monitoring system

Brazil's National Institute for Space Research (INPE) has led the way in developing a space technology programme to monitor Brazil's natural resources. Since the late 1980s, the Institute has used medium resolution satellite data to estimate the rate and extent of gross deforestation in the Brazilian Amazon, an area of more than 5 million square kilometres.

INPE conducts annual assessments, accurately estimating the annual rate of deforestation and forest degradation by logging and forest fires in a region that covers almost 60 per cent of Brazil. Their data is publicly available and free for open access, allowing external review of the results and analysis. The Brazilian Government uses this data to evaluate its policies to reduce deforestation and forest degradation in the region.

Brazil continues to improve its forest monitoring activities and is developing a new satellite equipped with a camera which has been designed, built and financed by the UK, which will collect images at high spatial and temporal resolution. This will allow INPE to monitor deforestation, forest degradation, selective logging and fire at closer to real time.

INPE has recently signed a memorandum of understanding with the UN Food and Agriculture Organization (FAO) to promote capacity building activities for developing nations interested in using Brazil's methodologies and technologies. INPE will provide this access completely free of charge, including its GIS system and software to handle large datasets.

Progress on deforestation and the commitment of finance to slow, halt and eventually reverse deforestation in developing countries, were areas of considerable progress in Copenhagen (iStockphoto)

The drivers of deforestation

The UK will work with key forest countries to support action to address the drivers of deforestation. This is vital if we are to help ensure that trees are worth more when they are standing than when they are cut down. The UK is supporting efforts to curb illegal logging through the EU Action Plan for Forest Law Enforcement Governance and Trade (FLEGT). We are calling for a new Regulation aimed at prohibiting illegal timber from entering the EU markets. And we will continue work with the private sector to promote sustainable production and consumption of major commodities, such as palm oil.

Land use in developed countries

There is also significant mitigation potential from land use, land use change and forestry (LULUCF) in developed countries. We will work to improve the rules for accounting for emissions from this sector in developed countries and encourage developed countries to make more ambitious mitigation commitments that take account of emissions from LULUCF. We recognise that this raises a number of complex technical issues, such as how to account for the different ages of trees and the capacity of developed countries to monitor emissions from LULUCF, but we will work to ensure that these risks are mitigated and that there are sufficient incentives to reduce emissions as a result.

In 2010 we will:

- With other developed countries, aim to ensure the international community is on track to deliver $6 billion of fast start finance to 2012 to tackle deforestation.
- Launch a REDD+ Partnership in Oslo in May, to improve coordination and effective delivery of fast start finance and develop proposals for the REDD+ mechanism.
- Aim to launch the REDD+ mechanism in Cancun, setting out a package of funding and institutional support for developing countries in tackling deforestation.
- Aim to agree in Cancun longer term REDD+ targets and finance, how to set reference levels and monitoring safeguards, and accounting rules for LULUCF which will increase action in this sector and the overall ambition of developing countries.

Development and deployment of technology

To achieve the global transition to a low-carbon climate resilient economy, we need to support and incentivise increased investment in the development of new technologies at the same time as accelerating the worldwide deployment of existing technologies.

We need worldwide commitment to this technological transition, and we made progress on this at Copenhagen. We will now work with other countries to take forward work on the Technology Mechanism that was agreed in the Copenhagen Accord. This mechanism should be consistent with existing institutions and the proposed Green Fund. It should support enhanced international efforts to assess and guide progress on technology development and deployment; increased capacity building in developing countries to enable them to implement appropriate policies and programmes; and the accelerated development and deployment of technologies in developing countries.

We must also focus on progress that can be made in parallel to the UNFCCC process. The UK will work with other countries to take forward the Technology Action Plans that were developed under the Major Economies Forum in 2009. We will work through the USA-convened Clean Energy Ministerial meeting in July 2010 to get agreement on concrete actions that governments can take to promote the development and deployment of low-carbon technologies in developed and developing countries.

Supporting investment in technology

In order to drive the development and deployment of these technologies, national governments need to put in place policy frameworks and infrastructure that incentivise investment. The UK will work to promote international agreements on policies that will drive the development and deployment of these technologies, support the implementation of new policies and programmes in developing countries, and provide finance to support the deployment of these technologies.

In 2010 the UK will support developing countries to develop the policy frameworks, infrastructure and human capital needed to accelerate the deployment of climate technologies. We will support the establishment of at least three pilot Climate Innovation Centres, building on the work currently planned or underway in India, Kenya and Brazil. Like the UK's Carbon Trust, these centres could help catalyse the development and deployment of low-carbon and climate resilient technologies by supporting technology cost-reductions and adaptive innovation, developing and piloting new business models, and facilitating access to project finance.

We will support and help to shape the work of international technology institutions such as the International Renewable Energy Agency (IRENA) and the Renewable Energy and Energy Efficiency Partnership (REEEP) to provide countries with information and assistance with a view to scaling up technology deployment.

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Promoting low-carbon business in China

Over the next two years the Department of Energy and Climate Change and the Carbon Trust will invest up to £5 million in a joint project with the China Energy Conservation Investment Corporation (CECIC) who are also investing £5 million. This project is a first-of-its-kind, bringing together investment from the UK and Chinese governments that aims to accelerate the development and deployment of low-carbon technology and promote innovative British low-carbon companies and technologies in China.

The investment will support early-stage low-carbon technology businesses in establishing themselves in China, and invest in UK and Chinese businesses seeking to develop and deploy low-carbon technologies.

This could deliver significant emissions savings, leverage substantial private investment in low-carbon business in China and create value for UK companies. Our aim is to show that successful collaboration between governments and businesses, in an international context, can provide value for all participants, and drive the private investment needed to make the transition to a low-carbon future, globally.

With the creation of the International Partnership for Energy Efficiency Co-operation (IPEEC) the G8 has signalled its commitment to higher global standards of energy efficiency and we will work with the G20 to rationalise and phase out inefficient fossil fuel subsidies and market distortions to encourage the move to a low-carbon economy, particularly via improved energy efficiency measures and high efficiency products.

In addition the Foreign and Commonwealth Office's Strategic Programme Fund (SPF) will support other governments to develop and implement policies necessary for a transition to a low-carbon economy.

The protection of intellectual property rights provides an important foundation for accelerating the development and deployment of climate technologies. Following on from the successful launch in 2009 of the UK's 'green patent fast track' scheme, which was well received by business and has now been duplicated in other countries including the USA, Japan, South Korea and Australia – we will continue to work with our international partners in 2010 to develop other practical measures which can support the protection, application and management of intellectual property in a manner that maximises innovation in climate change technologies and promotes their deployment in developing countries.

Carbon Capture and Storage is an innovative method of reducing the amount of carbon emitted by energy generation (DDP/Getty Images)

A woman tends to maintenance of solar street lighting in her village in India (Abbie Trayler-Smith/Panos Pictures/DFID)

Taking practical action on the ground

In 2010, the UK will directly support projects to ensure the rapid development and deployment of low-carbon technologies. As part of our contribution to the Climate Investment Funds we are supporting the Clean Technology Fund (CTF), which finances scaled-up demonstration, deployment and transfer of low-carbon technology in middle income countries, and the Scaling-up Renewable Energy Programme (SREP) which will support the demonstration and deployment of renewable energy technologies in low income countries. Through our contribution to the CTF, we are committed to supporting the large scale deployment of existing technologies, including initiatives such as a North African solar demonstration project.

We will also work with other countries to support joint research into key technologies which are not yet at commercial scale to increase the speed at which these technologies can be deployed. We have already jointly funded, with India, a £10 million Solar Research project.

To ensure that the world has access to new ways of managing carbon emissions, we must work to develop innovative new methods of reducing the amount of carbon emitted by energy generation. Carbon Capture and Storage (CCS) is one of these key technologies and, in addition to the investment we are already making in CCS, we will look to develop a high ambition international partnership on CCS to ensure that we can work towards the IEA's suggested 100 CCS projects by 2020[25].

[25] International Energy Agency (IEA) (2009) Technology Roadmap Carbon Capture and Storage

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We will work towards the launch of Phase II of the EU-China collaboration on Near Zero Emissions Coal (NZEC) to select and design an integrated commercial scale CCS demonstration project in China. This would be the first collaboration of its kind on CCS in a developing country. The UK has pledged £6 million to support this work.

In 2010 we will:

- Take forward work on the Technology Mechanism proposed in the Copenhagen Accord.
- Seek to use the Clean Energy Ministerial in July to agree commitments to specific actions, based on the Technology Action Plans developed under the Major Economies Forum, to promote the development and deployment of low carbon technologies.
- Support the establishment of at least three pilot Climate Innovation Centres in India, Kenya and Brazil.
- Support the development of Carbon Capture and Storage technologies in China with our £6 million pledge to the EU-China Near Zero Emission Coal project and £400,000 for a CCS study in Guangdong province

Building developing country capacity to plan and deliver

It is essential to support developing countries and build their capacity to prepare and deliver effective national plans both to limit emissions and adapt to climate change. The UK is providing substantial assistance to support this work: we are supporting the Clean Technology Fund (CTF) which has already helped 13 countries and regions prepare ambitious national plans to reduce their emissions and will also provide some of the investment necessary to deliver these plans.

In addition, the UK is supporting developing countries to mainstream climate resilience into their national planning processes through its contribution to the Pilot Programme for Climate Resilience, which is already supporting 8 countries (Bangladesh, Bolivia, Cambodia, Mozambique, Nepal, Tajikistan, Zambia, Yemen) and two regions (Pacific and Caribbean) to develop integrated climate resilience plans.

We are supporting the design and implementation of the Adaptation Fund as a board member, and by providing start-up funding. We expect to see the first adaptation projects and programmes submitted by poor and vulnerable countries to the Adaptation Fund for approval in 2010.

Sharing Knowledge and Research

To be able to plan effectively and manage the impacts of climate change, developing countries need access to knowledge about how and when climate change will affect them. The UK is providing £50 million over 5 years to support the establishment of a global Climate and Development Knowledge Network, which will support 60 countries to access world class advice and knowledge and bring together existing southern and northern research institutions.

We are also supporting research into how to protect the most vulnerable sectors of economies to the impacts of climate change. The UK has provided £24 million to the Climate Change Adaptation in Africa programme (CCAA) that investigates how to help rural and urban communities to adapt, such as coping with the impacts of more extreme weather on agriculture and shifting patterns of disease such as malaria. The CCAA programme is also supporting a range of projects that look particularly at women's needs, for example a Nigerian radio drama disseminating information on adaptation to illiterate farmers and a project working in Ghana and Ethiopia with women and other vulnerable groups to develop better water management systems in rapidly growing cities.

In 2010 we will:

- Deliver support to 12 countries and one region in preparing low carbon development plans through a contribution to the Clean Technology Fund.
- Support nine countries and two regional pilots in mainstreaming climate resilience into their national planning processes through our contribution to the Pilot Programme for Climate Resilience.
- Support the establishment of a global Climate and Development Knowledge Network enabling some 60 countries to access advice and knowledge about adapting to climate change.

Measurement, reporting and verification

In the Copenhagen Accord, countries agreed to strengthen the existing framework for measuring, reporting and verifying (MRV) action to tackle emissions. This included agreement by developed countries that both the emissions reductions targets and financing should be measured, reported and verified in accordance with international guidelines. Developing countries agreed to produce national communications (including national inventories of emissions) every two years which would set out the actions they have taken and the progress they have made. Developing countries also agreed that in addition to establishing their own domestic measurement, reporting

and verification systems for mitigation action, their actions would be subject to international consultation and analysis under guidelines that would respect national sovereignty.

It will be a high priority this year to reach a common understanding of how these commitments should be implemented and to make significant progress on developing the detailed guidelines for how this system will work in practice. The UK will work with others to design a system which builds on countries' existing data collection systems and help them meet their own information needs. The system must not be too burdensome and we need to make sure that we learn lessons from our previous experiences. We can usefully build on the guidelines and processes that already exist under the UNFCCC and the Kyoto Protocol. There are also other international processes that can provide valuable lessons including the Organisation for Economic Cooperation and Development (OECD) peer review process, the UN Human Rights Council periodic reviews and the World Trade Organisation's trade policy reviews. We will continue to work closely with our international colleagues to seek to design a system which strikes the right balance between transparency and national sovereignty.

Practical support on the ground

In parallel we will increase our efforts to help developing countries build their capacity so that they can prepare national progress reports and develop national processes and data collection mechanisms. We are supporting the Global Environment Facility (GEF), to which we are currently the fourth largest donor, to help developing countries prepare their national communications.

UK MRV support to Brazil

In partnership with the Sao Paulo State Environment Secretariat, the Foreign and Commonwealth Office (FCO) supported a capacity building mission to the UK on MRV and carbon markets. During the visit, Sao Paulo's carbon emissions inventory methodology was shared with international experts and areas for improvement have been identified. As a result, these areas will be addressed before the publication of the inventory in November.

The visit established a partnership between the Department of Energy and Climate Change (DECC) and the Sao Paulo State on MRV, with agreement to undertake a bilateral peer review of the Sao Paulo State greenhouse gas inventory.

Improving data quality

We also need to improve the quality of the data reported. National inventories should be more closely aligned with more accurate, installation-specific data reported under national policies (such as emissions trading systems). Further work is also required to ensure that emissions from agriculture

and other land use activities are accurately reported, in particular in relation to non-CO_2 gases such as methane. We encourage countries to adopt country based approaches which reflect national circumstances in place of default values. We are working hard to ensure the adoption of the 2006 IPCC guidelines for national inventories at the UN and providing capacity building through various FCO funded projects at national, sub-national and sectoral level.

Sharing UK expertise

The UK is also willing to share its experiences of undergoing in-country review. At the beginning of March 2010 the UK's 5th National Communication (5NC) was reviewed by a UNFCCC Expert Review Team made up of climate change experts from other countries. The 5NC sets out the UK's performance against our international climate change targets. The preliminary conclusion of this review was that the 5NC complies broadly with the UNFCCC reporting guidelines and that we are fulfilling our international obligations.

The Expert Review Team (ERT) also considered the UK Low Carbon Transition Plan, published in July 2009, as a centrepiece of UK climate policy and commented that the UK was the first country to be subject to an in-country review by the UNFCCC, not only because our 5th National Communication was delivered first but also because it was judged to be of a high standard and that we are a good role model. The Review Team was impressed by our comprehensive, well designed policies and strategies to meet our established and challenging goals and strongly encourages us to share our expertise and experience with other countries. The report will now be finalised and should be available on the UNFCCC website by June 2010.

The UK will support practical measures to strengthen the international MRV system by providing experts to support the existing international Review System for national inventories and national communications. We currently provide three Review Experts and we are seeking to double this number by 2012.

In 2010 we will:

- Aim to agree the key design principles and work programme to put into effect the commitments in the Copenhagen Accord to measure support and analyse countries' actions.
- Work toward ensuring effective capacity building support for countries in preparing national communications.
- By 2012, aim to double the number of experts we provide to carry out in-country reviews.

The UK is working for a comprehensive legally-binding international agreement (iStockphoto)

PART FOUR

Towards a comprehensive legally-binding agreement

Practical action to tackle climate change will be more effective if underpinned by a stable set of international commitments, building confidence in countries' actions, increasing transparency and providing certainty for long-term investment decisions. The UK believes a comprehensive legally-binding international agreement is the best way to achieve this. Copenhagen showed that this will not be easy to achieve: we need to respond to the concerns raised at Copenhagen and show that we are committed to an international agreement which distinguishes between the obligations placed on developed and developing countries. All countries need to be flexible in working creatively for a comprehensive agreement to ensure that progress made in taking forward key elements of the Copenhagen Accord is reflected in the formal negotiations. We also need to strengthen the UNFCCC negotiating process itself to ensure we make substantive progress this year.

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4.1 Why we need a comprehensive legally-binding agreement

As part three describes, there is a huge amount that can be done to support practical action on the ground to tackle climate change. The UK strongly supports this. But to maximise the impact of this action, we believe the world needs a stable, long-term international framework in which to work. The UK believes a comprehensive legally-binding international agreement is the best way to achieve this.

It would:

- **Provide a greater degree of certainty that governments will deliver their mitigation and finance commitments.** Experience shows that the very act of entering into an internationally binding agreement increases the likelihood that countries will meet their commitments. International agreements can also help by establishing an agreed set of priorities for the allocation of finance – this will be particularly important for ensuring that adaptation finance is prioritised for the poorest and most vulnerable countries.
- **Provide the private sector with greater clarity about the long-term policy framework in which to make investment decisions.** Whilst domestic legislation – like we have in the UK and EU member states – can provide the necessary basis for the private sector to make investments, an international framework would give business greater confidence that governments would be held accountable for future climate policies and are therefore more likely to deliver on them.
- **Provide confidence that emissions reductions are real and that everyone is counting them in the same way.** A robust and common system for measuring the actions of different countries will be an important part of any agreement. Crucially, it will provide assurance that emissions reductions are real and that a tonne of carbon reduced in one country is the same as a tonne of carbon reduced in another. This will give countries the confidence to trade carbon on the international market. The alternative would be a system where each country or region sets its own rules. This could create doubt about whether countries are delivering their commitments and about the quality of emissions reductions data. In turn, this could affect the flows of carbon finance between developed and developing countries as investors are unsure how much carbon reduction they are actually buying.

Prime Minister Brown, President Obama and other world leaders negotiate during the final stages of the Copenhagen conference (Getty Images)

- **Help to ensure action to avoid climate change is shared fairly between countries and is effective.** Without a legally-binding agreement that all countries sign up to, it becomes more likely that only a select number of countries will take action. This raises risks that if one country acts to reduce emissions in a particular sector, their effort will be wasted as other countries that are not taking action to reduce their emissions could step in and continue to produce a higher carbon, lower cost alternative (this is known as "carbon leakage"). A global framework gives us a better chance of setting rules which reduce these risks.

But Copenhagen showed that reaching consensus on a legally-binding agreement will not be easy. We need to address the reasons why.

4.2 Unblocking the negotiations

Copenhagen was beset by misconceptions and suspicion about whether developed countries remained committed to the key principles of the Kyoto Protocol, with some countries fearing that many Kyoto Parties wished to abandon their commitments. They feared that a single treaty would blur the distinction between the nature of the obligations on developed

countries and those on developing countries, or allow developed countries to abandon legally-binding emissions reductions targets.

The UK position is clear. We have no intention of abandoning the Kyoto Protocol. We believe that a single treaty, binding on all parties, and which upholds and builds on the Kyoto architecture, including binding economy-wide targets for developed countries and design principles for the carbon market, would be the best outcome from the UNFCCC negotiations.

We recognise that many Parties are reluctant to agree a single treaty. But there are many forms that a legally-binding outcome, which includes all Parties, could take. The UK wants to see significant progress in the negotiations towards a legally-binding agreement. To help achieve this, the UK, as part of the EU, would be prepared to commit to an appropriately designed second Commitment Period under the Kyoto Protocol, provided that certain conditions are met – including that countries which currently are not covered by commitments under the Kyoto Protocol reach agreement on a satisfactory legally-binding outcome which could operate in parallel, and that issues such as handling of surplus Assigned Amount Units (AAUs – emissions allowances), Land Use, Land Use Change and Forestry (LULUCF) and accounting rules are satisfactorily addressed. The UK will work with the EU and other Kyoto Parties on this – we welcome the European Commission's commitment to explore this further.

Before and during Copenhagen, the nature of developing country commitments was hotly debated. Whilst many larger developing countries recognise that they need to take action to reduce their emissions, we need to respond to the concerns they expressed about how these actions and commitments would be reflected in a legally-binding agreement and how they would be held to account for the emissions reductions they sign up to deliver.

Before Copenhagen the UK stated that we are not asking developing countries to take on legally-binding Kyoto-style emissions reductions targets in the same way that developed countries should. This remains the case. Indeed, we understand that developing country emissions will necessarily continue to grow for some time yet, though we believe it will be possible for developing countries to continue to pursue economic growth whilst reducing their emissions. But we are asking that developing countries internationalise, in a legally-binding agreement, the mitigation actions they take domestically. Whilst we agree that developing countries should not be held accountable for delivering specific emissions reductions *outcomes* (i.e. tonnes of CO_2 abated), we ask them to instead commit internationally to implementing mitigation *actions*, (both those they are paying for themselves and those which are delivered with international financial support). In all this, we would not envisage developing countries being subject to any punitive compliance measures.

The UK, as part of the EU, would be prepared to commit to an appropriately designed second Commitment Period under the Kyoto Protocol, provided that certain conditions are met (DDP/Getty Images)

Ed Miliband co-chairs the October 2009 meeting of the Major Economies Forum in London, along with Mike Froman, US Deputy National Security Advisor (© Crown Copyright)

The UK would welcome a dialogue with non-Kyoto Parties and developing countries through the different international meetings and processes that will take place in 2010 about the form of legal commitments they would be prepared to adopt. Copenhagen showed that a more creative debate is needed about finding forms of agreement that are binding on all Parties whilst maintaining the principle of "common but differentiated responsibilities".

4.3 Strengthening the international process

If we are to make progress this year, we need a stronger negotiating process in which all Parties have confidence. Copenhagen exposed a number of procedural challenges. Discussions on process meant that real questions of substance were not debated until the final hours of the conference. At Copenhagen too many countries felt excluded from discussions which led to a failure in narrowing the gap on many of the key political issues. Progress made in informal political processes that took place during the months leading up to the summit, such as the Major Economies Forum, G8 and G20, was helpful but did not always translate into the formal negotiations. Many smaller developing countries raised concerns that these processes did not enable their voices to be heard.

Despite these challenges the UNFCCC has shown in the past that it can deliver results and it remains the only body with the legitimacy and scope to reach a comprehensive global climate agreement. The UK is committed to the UNFCCC. But we believe it is essential to strengthen the negotiating process in the run-up to COP16 in Cancun to address the challenges that Copenhagen exposed, and to build trust between all Parties.

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Demonstrators at Copenhagen (© Crown Copyright)

We believe this should be done in the following ways:

- **First, it is essential that countries stand by the political commitments they have made in the Copenhagen Accord and help ensure these are reflected in the UNFCCC negotiations.** The UK strongly supports the Accord and is committed to action to implement its key components. We believe that progress under the Accord should feed into, and help drive forward, the formal negotiations. The UN process should not re-open negotiations on the content of the Accord, but it will play an important role in negotiating the detail of how it can be implemented.
- **Second, we need to ensure that the informal processes supporting the negotiations are inclusive and transparent.** The UK welcomes the efforts of the Mexican Government, as incoming chair of the COP, to take a consultative and inclusive approach by establishing a contact group of countries representing a diverse range of international opinion, reinforcing the UNFCCC process. We believe such a group offers a useful opportunity to facilitate discussion on the outstanding political issues in the negotiations; to generate a manageable negotiating text; and to ensure that progress made under the Copenhagen Accord is reflected in the formal negotiations. The UK also welcomes Chancellor Merkel's initiative to co-host, with Mexico, a ministerial meeting in May to establish an informal dialogue about how best to resolve key outstanding issues in the negotiations.
- **Third, we want to strengthen the UNFCCC Secretariat.** We support the efforts of the UN Secretary-General to move quickly to appoint a new Head of the UNFCCC Secretariat. To give this post additional authority we would support the UN Secretary-General in any decision to upgrade this role to Under-Secretary-General.

In the medium-term, more far-reaching reform of the international decision-making process may be needed. The UK welcomes the announcement by Secretary-General Ban Ki-moon that he plans to establish a High-Level Panel on global sustainability. The UK will participate fully in this work. The UK believes that this panel can make a useful contribution to the review of the international institutional arrangements for climate change and sustainable development - tackling climate change is one of the highest priorities for

the multilateral system. We hope the panel will explore a range of options for reform, for example:

- Ideas around establishing a permanent governing council for the UNFCCC, with developed and developing country representation, which could give political guidance to the official-level negotiations.
- A permanent location for UNFCCC meetings, capable of supporting the negotiations on an ongoing basis.
- An enhanced institutional structure for overseeing implementation, monitoring and verification of countries' commitments and actions.
- Improvements to the decision-making process under the UNFCCC.

The UK is also committed to playing its full part in other multilateral processes such as the G8 and G20, and working informally with a wide range of countries. We will want to ensure that there is a clear link made between progress in these fora and the formal negotiations under the UNFCCC.

Ultimately for an international agreement to be effective, countries must feel that it is in their interests to participate. There is more to gain from being in a treaty than not. The UK will focus all its efforts on reaching a comprehensive agreement. But if countries are to retain confidence in the current international architecture, then all parties will need to show courage and leadership in making these arrangements work. If they do not, pressure will build to consider alternatives. We do not believe this would be in the long-term interests of the international community, in particular some of the most vulnerable countries represented under the UNFCCC. That is why it is essential that all countries do their utmost to make progress this year.

The next section summarises what the UK is aiming to achieve by the time of COP16 in Cancun in November this year.

After five months of training in solar power engineering, a woman in Tinginaput, India, brings solar energy to her village (AbbieTrayler-Smith/Panos Pictures/ Department for International Development)

PART FIVE

Towards Cancun: our priorities for 2010

By the time the international community gathers for the next UN Climate Conference in Cancun in November this year, the UK wants to see substantial progress in the international fight against climate change. At Cancun our aim is to agree a package of measures building on the Copenhagen Accord and reflected in the decisions of the COP. We will press ahead with early action to implement key elements of the Copenhagen Accord: to get fast-start finance to flow and design long-term finance arrangements; to support action to tackle deforestation; and to establish practical co-operation on low-carbon technologies. We want to see the first submissions from vulnerable countries to the Adaptation Fund with a view to funds flowing as early as possible. During this year, if countries show leadership in building on the commitments made at Copenhagen, we believe that at Cancun the international community can make substantial progress towards a comprehensive, legally-binding outcome to tackle climate change, which puts the world on a trajectory consistent with our 2°C goal.

BEYOND COPENHAGEN

Priorities for 2010

The UK is committed to driving forward ambitious action on climate change this year at home and internationally.

We will work with our international partners to act on the political commitments made by leaders in the Copenhagen Accord. The backing we have seen for the Accord since Copenhagen demonstrates the will of the international community to work together to tackle climate change. Over 100 countries have associated themselves with the Accord, over 70 have submitted details of their proposed mitigation commitments and actions to its appendices, and we have seen statements of support from countries around the world, including the USA, China, India and others.

This year all countries need to press ahead ambitiously in implementing their mitigation targets and actions if we are to keep the 2°C goal within reach. The UK will play its full part. **At home,** we will continue with our long-term plans to reduce emissions by at least 80% by 2050 on 1990 levels; with investment in low-carbon technologies such as Carbon Capture and Storage and promotion of renewable sources of energy.

Within the EU, we will support action to invest in low-carbon jobs and growth through the EU 2020 Strategy. We want to see the EU make progress in developing low-carbon infrastructure such as smart grids. We want to see the EU's budget increasingly focus on tackling key challenges such as climate change. And we support the EU increasing its emissions reduction target to 30% by 2020 on 1990 levels in the context of an ambitious global agreement.

Internationally, by Cancun we want to see real progress on practical measures to support countries around the world in delivering ambitious action on reducing emissions and adapting to the impacts of climate change including:

- Agreement on the design principles of the new **Green Fund** for disbursing climate finance at scale.
- Substantial progress in rolling out **fast-start** funding, consistent with developed countries' commitments in the Accord to provide finance approaching $30 billion over three years to 2012.
- Recommendations from the **High-Level Advisory Group** on sources of climate finance which enable the Cancun Conference to assess how the goal of $100 billion per annum by 2020 can best be achieved in the context of an ambitious global deal.
- The launch of a new **REDD+ mechanism** providing a package of finance and technical support to help developing countries tackle deforestation, designed in a way which complements the Green Fund. The UK will contribute £300 million for forestry in the fast-start period.

- A strengthened dialogue between countries in the process of establishing **emissions trading systems,** with the UK sharing expertise and support.
- Agreement in Cancun on implementing the Copenhagen Accord commitment to establish a **technology mechanism** to support the development and deployment of low-carbon technologies.
- During the year, the first adaptation projects and programmes submitted by poor and vulnerable countries to the **Adaptation Fund** for approval, with a view to the release of funds as quickly as possible.

Progress on these issues will help create the conditions for success in the wider UNFCCC negotiations. At Cancun we want to see progress on a package of measures, based and building on the Copenhagen Accord, reflected in COP decisions. We strongly support the efforts of the Mexican Government to create an inclusive, representative dialogue in the run-up to Cancun and will work closely with them to support their work during the year.

This dialogue must address the issues that proved most challenging at Copenhagen: the nature of the commitments which countries are prepared to include in a binding international agreement and the processes by which these commitments will be scrutinised. The UK believes that with creativity and leadership we can resolve these issues. The proposals we have set out about the circumstances in which we would be prepared to move, as part of the EU, to a second commitment period under the Kyoto Protocol aim to facilitate this debate.

If countries build on the commitments made at Copenhagen, we believe that at Cancun the international community can make substantial progress towards a comprehensive, legally-binding outcome to tackle climate change, which puts the world on a trajectory to limit average global temperature increases to no more than 2°C. That is an enormous prize and the UK is determined to do all it can to help secure it.

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