



# **A global deal on climate change: the challenges between now and December in Copenhagen**

**Summary of presentations at a symposium in the  
House of Lords on 27 October 2009**

**Policy paper**

**November 2009**

**Centre for Climate Change Economics and Policy  
Grantham Research Institute on Climate Change and  
the Environment**

**The Centre for Climate Change Economics and Policy (CCCEP)** was established in 2008 to advance public and private action on climate change through rigorous, innovative research. The Centre is hosted jointly by the University of Leeds and the London School of Economics and Political Science. It is funded by the UK Economic and Social Research Council and Munich Re. More information about the Centre for Climate Change Economics and Policy can be found at: <http://www.cccep.ac.uk>

**The Grantham Research Institute on Climate Change and the Environment** was established in 2008 at the London School of Economics and Political Science. The Institute bring together international expertise on economics, as well as finance, geography, the environment, international development and political economy to establish a world-leading centre for policy-relevant research, teaching and training in climate change and the environment. It is funded by the Grantham Foundation for the Protection of the Environment, which also funds the Grantham Institute for Climate Change at Imperial College London. More information about the Grantham Research Institute can be found at: <http://www.lse.ac.uk/grantham/>

**'A global deal on climate change:  
the challenges between now and December in Copenhagen'**

**Summary of presentations at a symposium for parliamentarians  
convened by Lord Stern of Brentford  
in association with the All-Party Climate Change Group  
and chaired by the Lord Speaker**

**27 October 2009**

**Chair: Baroness Hayman** is Lord Speaker of the House of Lords. As a member of the Labour Party she was a Member of Parliament from 1974 to 1979, and became a Life Peer in 1996. Outside politics, she has been involved in health issues, serving on medical ethics committees and the governing bodies of the National Health Service and health charities. In 2006, she won the first election for the newly created position of Lord Speaker.

**Convener: Lord Stern of Brentford** is IG Patel Professor of Economics and Government and Chair of the Grantham Institute for Climate Change and the Environment at the London School of Economics (LSE). Lord Stern has been Chief Economist and Senior Vice President at the World Bank and Chief Economist and Special Counsellor to the President of the European Bank for Reconstruction and Development. He led the Stern Review on the Economics of Climate Change, which was published in October 2006.

**Speakers:**

**Lord Jay of Ewelme** is a member of GLOBE, an interparliamentary group on climate change facilitating high level discussion of policy positions from leading legislators across the G8+5 parliaments and from regional dialogues which are informed by business leaders and key international experts. Between 2002 and 2006 he held the position of Permanent Under-Secretary at the United Kingdom Foreign Office and in this role was Head of the Diplomatic Service. In 2005, he served as the UK Prime Minister's personal representative at the G8 Gleneagles summit on Africa and on climate change.

**Lord Rees of Ludlow** is President of the Royal Society and also Master of Trinity College, and Professor of Cosmology and Astrophysics at the University of Cambridge. He is also Visiting Professor at Leicester University and Imperial College London. He was appointed Astronomer Royal in 1995, and was nominated to the House of Lords in 2005 as a cross-bench peer. He was appointed a member of the Order of Merit in 2007.

**Lord Turner of Echinswell** has combined careers in business, public policy and academia. He is currently FSA Chairman, Chair of the Climate Change Committee and Chair of the Overseas Development Institute. Lord Turner is also a Visiting Professor at the London School of Economics and Political Science and at Cass Business School, City University. He was Chairman of the Pensions Commission from 2003 to 2006, and of the Low Pay Commission from 2002 to 2006.

**Rt Hon Ed Milliband MP** is Secretary of State for Energy and Climate Change. He was previously Minister for the Cabinet Office and Chancellor of the Duchy of Lancaster, where he was responsible for helping to coordinate work across Government, and leading the Government's efforts to tackle social exclusion, support the Third Sector and coordinate the improvement of public services.

**Participants expressed their personal views in an informal symposium and not acting as formal representatives**

## Lord Stern of Brentford: 'State of progress on the Copenhagen negotiations'

### The targets: managing climate risks and promoting growth and development

The potential scale of the impacts of climate change is often misunderstood. *The two defining challenges of the 21st century are overcoming poverty and avoiding dangerous climate change.* If we fail on one of them, we will fail on the other. Unmanaged climate change will irretrievably damage prospects for development during the course of the century, and action on climate change which hinders development over the next two decades can never build the global coalition on which action on climate change depends. The global responses to these challenges must therefore be built with mutual understanding and collaboration. If strong action is taken now, a successful response to both challenges will be manageable and affordable. If we fail to act together now and let mistrust and squabbling prevent an agreement on strong action, the consequence will be damage and conflict on a global scale. *For the world, low-carbon growth is the only viable and sustainable form of economic growth in the future.* We confuse the issues if we try to create an artificial 'horse race' between development and climate responsibility. The risks of dangerous climate change are huge.

The current concentration of greenhouse gases in the atmosphere is around 435 parts per million (ppm) of carbon-dioxide-equivalent (CO<sub>2</sub>e). We are adding at a yearly rate of 2.5 ppm CO<sub>2</sub>e, and that rate is rising. 'Business as usual' for a century would take us to 750 ppm CO<sub>2</sub>e or more. That would create a probability of around 50 per cent of global average temperature rising by 5°C or more compared with pre-industrial levels by some time towards the end of this century or early in the next century. The planet has not seen those temperatures for more than 30 million years – humans have been around for about 200,000 years. Such a temperature rise would transform the Earth's physical geography – including the coastlines, rivers, deserts, and the occurrence and intensity of storms, hurricanes and typhoons. Hundreds of millions of people would very likely have to move, with the consequences being conflicts that are prolonged, severe and global.

On the other hand, we can understand the scale of emissions reductions necessary to radically reduce the risk, and we can see the technological and economic policies that can take us there. And we will learn very rapidly along the way.

We should not see the route to the low-carbon economy merely or mostly in terms of cost and burden-sharing. The transition to the low-carbon economy over the next two or three decades is likely to be one of the *most dynamic and exciting periods in economic history* with strong discovery and growth. This will be wider and deeper in terms of technology and geography than the arrival of the railway and electricity in industrialising countries in the 19th and 20th centuries. And when low-carbon growth is achieved it will be more energy secure, cleaner, quieter, safer, and more bio-diverse than its predecessor; in other words much more attractive. High-carbon growth has no future: it will kill itself if we try to continue – first on high hydrocarbon prices and second and more fundamentally, on the very hostile physical environment it will create. We must recognise, however, that a profound transformation is necessary with substantial investment and re-structuring of the way we generate and use energy. For example, close to zero-carbon electricity worldwide by 2050 will be essential.

The 15th Session of the Conference of the Parties (COP15) to the United Nations Framework Convention on Climate Change (UNFCCC), to be held in Copenhagen in December 2009, will be critical in determining the policies for the period beyond 2012 that succeed the Kyoto Protocol. *The Copenhagen meeting will be the most important international gathering since the Second World War.* The risks it must grapple with and the policies it agrees must be truly global. We can see the basic framework that would deliver a global deal. Whilst there will be much further work to do on detail after Copenhagen, now is the time to agree that framework.

To give a reasonable 50 per cent chance of avoiding a rise in global average temperature of more than 2°C compared with pre-industrial levels (the increase above which scientists have defined as 'dangerous' climate change), we must hold the atmospheric concentration of greenhouse gases below 500 ppm CO<sub>2</sub>e and then try to reduce from there to below 450 ppm. To do this, we must ensure that annual global emissions peak within the next 10 years and reduce to less than half 1990 levels, or below 20 gigatonnes (Gt – 1 gigatonne is 1 billion tonnes) of CO<sub>2</sub>e, by 2050. Annual global emissions of greenhouse gases were about 40 Gt CO<sub>2</sub>e in 1990; they are just under 50 Gt CO<sub>2</sub>e today. While 1990 is a natural benchmark, in terms of the UNFCCC, it is important to realise that in terms of absolute global targets, it has less relevance: today we are where we are. Thus, the challenge is to reduce from around 50 Gt CO<sub>2</sub>e in 2010 to below 20 Gt CO<sub>2</sub>e in 2050. To be on the right path, total world annual emissions in 2030, half way through this 40-year period, would have to be below 35 Gt CO<sub>2</sub>e. Thus, intermediate targets for 2020 and 2030 are necessary now for the rich countries and very soon for all countries. A statement of the targets starting from today's 50 Gt is simple: much less than 35 Gt CO<sub>2</sub>e by 2030, and much less than 20 Gt CO<sub>2</sub>e by 2050. Setting three points (50, <35, <20) on the path largely determines the shape of the path for annual emissions over the next 40 years; equivalently it determines, within a small range, the total cumulative emissions over the next few decades, which some scientists have identified as a key indicator for future climate change.

### A global deal on climate change

The political statements and actions from individual governments concerning the year 2050 do indicate an understanding of where we need to be by mid-century, but we need *more ambitious intermediate targets*.

The starting point for a low-carbon future must be *leadership in the rich countries*: they have the wealth, technology and main responsibility through past emissions for the difficult starting point. They must demonstrate that low-carbon growth is possible whilst strongly *supporting mitigation and adaptation in developing countries*.

Developing country support will be conditional on finance to support climate change action plans. Rich countries should provide US\$50 billion per year by 2015 which is equivalent to 0.1% of rich country GDP and commit to increase finance beyond 2015 to world figures of around US\$100 billion in adaptation and mitigation funding by 2020, contingent on progress and at least US\$200 billion in the 2020s as the world moves forward to a low-carbon economy (US\$100 billion for mitigation and US\$100 billion for adaptation). In the context of US\$5000 billion spent globally on reflationary packages over the last couple of years, this is not an unreasonable ask.

High-level political commitment to a clear and numerical organisational framework is still required. The two issues that must be agreed in Copenhagen are:

1. *Strong global emissions reduction targets as described above*. The prospects for achieving commitment on short-term targets (2020) will be more challenging than for long-term targets which are less contentious.
2. *Commitments by rich countries to reductions of at least 80 per cent by 2050 relative to 1990*. This would bring emissions for Europe and Japan down from roughly 10-12 tonnes CO<sub>2</sub>e per capita per year now to around 2 tonnes per capita. This is the global per capita average for a world population of 9 billion in 2050, and somewhat below 20 Gt CO<sub>2</sub>e of global emissions.
3. *Finance for developing country climate action plans*. Developed countries must deliver around \$50 billion by 2015 to support good developing country action plans with a view to provide further finance depending on success.

The details, for example about the evolution of the Clean Development Mechanism (the Kyoto Protocol structure for carbon offsets between rich and poor countries) and role of deforestation, can

be filled in later. We can, however, hope to find agreement in Copenhagen for strong global action, with financial support from rich countries, to reduce and halt deforestation. There are prospects too on technology-sharing between rich and developing countries.

On the prospects for Copenhagen:

Developing countries are insisting on keeping to the Bali Road Map, which is proving to be politically difficult for developed countries. A key aspect is the differential treatment of commitments – binding for rich countries but not for developing ones.

*Japan and the EU* are moving forward. The *Chinese* continue to work on their 12th five year plan. President Hu Jintao spoke at the United Nations last month of a “notable” reduction in emissions per unit of output, and we can be confident that the number will indeed be notable. *Korea* is also making strong commitments to targets. *India* has said it will not be an obstacle to progress, and is likely to quantify the consequences for emissions of its action plans on energy efficiency, renewables and reforestation.

In the *US*, signs are mixed. Positive signs of movement include Republican Senator Lindsey Graham of South Carolina’s public announcement of support for climate legislation with Democratic Sen. John Kerry of Massachusetts (in a joint article in the *New York Times* on 12 October). However, it is clear that the US still remains the difficult partner in the global preparations for Copenhagen. The problem is not the Administration but they are very cautious about what they can deliver with Congress. The climate change bill will not be passed before Copenhagen so the negotiations will have to deal with intentions from the US, although they will not be alone in that position.

If the *leaders of the world attend, and increasing numbers are planning to*, we have a great chance of a good global deal.

Parliamentarians can play a key role in communicating the importance of the negotiations to civil society and raising the ambition of their peers internationally for the Copenhagen meeting.

**Lord Jay of Ewelme: 'Activities by the Global Legislators Organisation for a Balanced Environment (GLOBE) ahead of Copenhagen'**

Intense negotiations in the process set up at the UNFCCC meeting in Bali two years ago have reduced the outstanding issues to be faced at the UNFCCC meeting in Copenhagen in December to the following:

- *what emissions reduction targets will the rich countries accept?*
- *what financial package can the rich countries agree to fund technology transfers to developing countries and to help them adapt to climate change?*
- *what actions will developing countries be prepared to take to reduce emissions as part of a global deal?*
- *what legal or administrative framework will be set up to ensure that any deal at Copenhagen is monitored and verified?*

No agreement has yet been reached on any of these linked issues, and time is short. Much will depend on the two remaining senior officials meetings to be held in Barcelona in early November and in Copenhagen in early December, and on the European Union Heads of Government meeting at the end of October and the G20 finance ministers meeting in November. Encouragingly, the Danish government, who host and chair the Copenhagen meeting, are taking an increasingly active role in searching for an agreement, at the level of Prime Minister and Environment Minister. As a result, *there are reasonable chances of an agreement at Copenhagen, but it is still too early to say whether whatever agreement is reached will be judged to be satisfactory.*

The negotiations at Copenhagen are the responsibility of Governments, but *whatever is agreed there will only enter into force if ratified by national parliaments.* In this context, the role of GLOBE international, which brings together the parliaments of the key rich and poorer countries, has been important over the last two years in showing that Parliaments can reach agreement on even the trickiest of issues, thereby putting pressure on governments to do the same. The latest GLOBE meeting, in Copenhagen at the end of October, broke new ground in agreeing a set of legislative principles on climate change which all representatives agreed to seek to introduce into their own parliaments.

## Lord Rees of Ludlow: 'The scientists' view of the Copenhagen negotiations'

*The science is complex - but its complexity is as nothing compared to the economics and politics.*

Two basic aspects of the science are uncontroversial.

First, it's *uncontroversial that CO<sub>2</sub> is a greenhouse gas* - it was identified as such by Sir John Tyndall 150 years ago.

Second, it's also *uncontroversial that the measured CO<sub>2</sub> concentration has been rising for the last 50 years - because we're releasing coal and oil deposits laid down over geological timespans*. The concentration is already higher than it has been for millions of years. If we pursue 'business as usual', it will reach twice the pre-industrial concentration by 2050, and three times that level later in the century.

Those considerations alone would justify concern it would seem. But of course we now have more quantitative modelling.

The IPCC studies still quote *substantial uncertainty in just how sensitive the temperature is to the CO<sub>2</sub> level*, and what regions will be affected most. It is the *'high-end tail' of the probability distribution that should worry us most - the probability of a really drastic climatic shift* - something grave and irreversible: rising sea levels due to the melting of Greenland's icecap; runaway release of methane in the tundra, and so forth.

It's sometimes said that these *IPCC reports* are accepted uncritically. But on that I'd like to make two points. First, they *are conservative*. For instance, because the contribution to sea level rise from melting ice is uncertain, they took it as zero; they included only the rise due to thermal expansion.

And the *IPCC results have been critically scrutinised*. That would have been clear to anyone who attended the several lively discussion meetings on this theme - open to all - at the Royal Society.

Developments since the 4th IPCC report, which itself was very worrying, have actually *raised the level of concern*. Apart from the sea level rise I mentioned, CO<sub>2</sub> concentrations are rising at the higher end of projections; methane concentrations have also started to rise.

The main downsides of even the CO<sub>2</sub> already emitted lie decades in the future. However, it seems that *the global warming has already begun*. The last decade has been warmer, on average, than any other decade in the last 150 years. But whilst there is a strong underlying trend, there isn't a steady rise, because this 'forcing' by CO<sub>2</sub> is superposed on all the other climate changes: El Niño, La Niña, etc.

Everyone quotes a 'headline figure' of predicted global temperature rise - 2, 3 or 5°C. But the rise isn't uniform: the models predict shifting global patterns of climate. Recent Hadley centre models show that a 4°C global rise would lead to a warming of 10°C in western and southern Africa. Indeed *the worst effects of any level of warming may be in Africa and Bangladesh, which have contributed least to the emissions*.

The models are starting to offer spatial resolution - where will droughts be worst - where will storms increase? What will happen to the monsoons?

The Hadley Centre has recently also produced a map attempting to show what will happen in England - with 25-kilometre resolution, important for planning flood defences, etc.



*It's the consensus view that to ensure a better than evens chance of avoiding a potentially dangerous 'tipping point', the mean temperature rise must be held below 2°C. To achieve this, global CO<sub>2</sub> emissions must, by 2050, be brought down to half the 1990 level. This 2050 target corresponds to two tonnes of CO<sub>2</sub> per year from each person on the planet. For comparison, the current US level is 20, the European figure is about 10, and the Chinese level is already 5.5 and the Indian is 1.5.*

As Lord Stern has emphasised, it's urgent to develop 'cleaner' and more efficient technology soon enough that the Asian per capita emissions never need to rise to European and US levels, and the West's go down to converge towards Asia's.

But, realistically, coal, oil and gas seem set to dominate the world's every-growing energy needs for at least 30 years.

That's why an *essential priority must be a coordinated international effort to develop carbon capture and storage - CCS*. To jump-start a programme of demonstration plants would need several billions dollars a year of public funding worldwide. But this is a small price to pay for bringing forward, by five years or more, the time when CCS might be widely adopted and the graph of annual CO<sub>2</sub> emissions turned around. I say 'might' because the jury's out on whether CCS on a global scale is feasible.

*But new technology is essential if the world is to make the transition to a low-carbon economy - technology that could enhance rather than impede our growth or quality of life, and give us energy security.*

#### The 'clean energy' options for the UK

What are the 'clean energy' options - for this country in particular?

There is *wind* - onshore and offshore. There's wave and tidal energy. Here, the UK could lead. We have the geography - a large tidal range, and capes round our coast with fast-flowing tidal currents - and we have marine technology from the North Sea oil and gas.

And there are *biofuels*. There's rightly been ambivalence about first generation biofuels - there is a trade-off with land use for food production, and forestation. But in the longer run genetic technology may have a lot to offer.

Another need is for improved *energy storage* - lithium batteries and super-capacitors - for transport, and to smooth over peaks and troughs in demand, and to complement unsteady power sources such as sun and wind.

What is the role of *nuclear power*? I'd myself favour the UK having at least a replacement generation of power stations - and resumed R&D worldwide into 'fourth generation' reactors. But the non-proliferation regime is fragile, and before being relaxed about a world-wide programme of nuclear power, one would surely require the kind of fuel bank and leasing arrangement that has been proposed by the IAEA.

And nuclear fusion deserves to remain an important area of research that could have long-term potential.

#### International technology policy

A widely favoured long-term bet for Europe is *solar energy* - huge collectors in the Sahara generating power that's distributed via a pan-European smart grid. Achieving this will require vision, commitment and public-private investment on the European level.

Developed countries can progress some of the way towards the target cuts by measures that actually save money (energy-efficient buildings, for instance).

But they can exert disproportionately larger leverage on the world's climate by spearheading the novel technologies the world needs.

Efforts to develop a whole raft of techniques for economising on energy, storing it and generating it by low-carbon methods deserve higher priority and commitment. In the US, President Obama has declared that energy R & D should have the same national priority that the Apollo programme had in the 1960s. I can't think of anything that could do more to attract the brightest and best into science than a strongly proclaimed goal to provide clean energy for the developing and the developed world.

Some pessimists about Copenhagen argue that the international community should, as a fallback, contemplate a 'Plan B' - being fatalistic about the rise in CO<sub>2</sub> emissions, but intervening to combat its warming effects by (for instance) putting reflecting aerosols in the upper atmosphere, or even vast sunshades in space. Such '*geoengineering*' would not "*solve*" *climate change* - it would at best buy time, probably at inordinate cost. And rising CO<sub>2</sub> would acidify the oceans. And the political problems may be overwhelming.

The Royal Society has just published a study of *geo-engineering*. This exercise puts a damper on some of the enthusiasm - and highlights the fact that there is no realistic substitute for mitigation efforts.

The UK is only 2 per cent of the world's emissions. But we have leverage: political leverage in Copenhagen stemming from the UK's strong record on the subject in the last five years; and our technological expertise could give us leverage that could be to our long-term economic benefit.

Finally, this is the first century when one species – ours - risks irreversibly degrading our entire planet's environment. Our concerns need to be spatially global, and extensive temporally too - extending to the next century and beyond. But because of the nature of the threat - the cumulative build up of CO<sub>2</sub> - these long-term concerns require urgent actions to change our current course. That's why the signal sent by the outcome of Copenhagen will be so crucial.

## Lord Turner of Ecchinswell: 'Copenhagen and the UK Committee on Climate Change'

The Committee on Climate Change published its first annual report to Parliament on 12 October 2009, assessing progress towards the *UK's targets of reducing its greenhouse gas emissions by 34 per cent compared to 1990 levels by 2020, and a cut of 42 per cent by 2020 once a global deal on climate change is reached.*

The report concluded that a *step change is required in the pace of UK emissions reduction to meet carbon budgets*, and that in some areas, new policy approaches will be required to deliver the Government's Low Carbon Transition Plan.

The *Climate Change Act* requires the Committee to report each year on emissions reductions relative to the UK's carbon budgets. Complete sets of emissions data are not yet available for the initial year (2008) of the first budget. In this first monitoring report, the Committee therefore focused on analysing progress in the years running up to the first budget period, understanding the impact of the recession on emissions, and identifying leading indicators (e.g. investments or policies which need to be in place) which the Committee will track to ensure early warning of future possible under-achievement versus budget.

The Committee's key findings were:

- In the 5 years 2003-2007, emissions reductions averaged 0.5 per cent per annum: going forward, reductions of 2-3 per cent per annum will be required to meet the carbon budgets. *A step change in the pace of reduction is needed.*
- Declining economic activity is likely to have produced an emissions cut of around 2 per cent in 2008, and recession could reduce emissions in the first budget period by a total of 40-70 million tonnes. But recession induced reductions must not be confused with underlying progress, which could be undermined by a recession induced fall in the carbon price. *The UK should now aim to overachieve emissions reductions in the first budget period.*

Analysis of the actions needed to ensure delivery of the first three carbon budgets (2008-12, 20013-18, 2018-22), suggests a need to *revise or strengthen policy in three particular areas: electricity generation; residential and commercial buildings; and road transport.*

### On electricity generation

*Rapid decarbonisation of electricity generation is a crucial priority*, and scenarios to achieve a reduction in grams per kWh from today's 540 g CO<sub>2</sub>/kWh to less than 300 g CO<sub>2</sub>/kWh in 2020, could include 23 GW of new wind capacity, up to 3 new nuclear stations and up to 4 CCS demonstration plants by 2016.

The Committee suggested, however, that current electricity market arrangements together with the EU emissions trading scheme are unlikely to deliver required sector decarbonisation, and would instead lead to increasing dependence on imported gas. The Committee therefore called on the *Government to undertake a review of alternative arrangements to reduce investor risks and ensure delivery of investment in low-carbon technologies.*

Options to be considered include carbon price strengthening, providing more certainty on the price paid for low-carbon generation (e.g. through feed-in tariffs), and ensuring low-carbon investment (e.g. through a low-carbon obligation or emissions performance standard).

*Progress on CCS demonstration plants is vital* to assess whether CCS will be a viable technology to achieve further decarbonisation in the 2020s. The Committee reiterated its previous

recommendation that there can be no role for conventional coal generation in the UK beyond the early 2020s.

#### On residential and commercial buildings

*Energy efficiency in homes could be improved by 35 per cent by 2020 with an ambitious program of improved insulation (e.g. covering 10 million lofts, 7 million cavity walls and 2 million solid walls), the installation of 12 million energy efficient condensing boilers, and major improvements in electrical appliance efficiency.*

But achieving this program is likely to require a shift from the existing Carbon Emissions Reduction Target (CERT) approach in which electricity companies meet their supplier obligation through specific measures (for example, the supply of energy efficient light bulbs). Whole house approaches (simultaneously implementing the full range of measures) and street-by-street approaches involving local government and energy companies within a strategy defined by national Government are likely to be required.

For *commercial and public buildings*, a key policy initiative commencing in April 2010 will be the Carbon Reduction Commitment. The Committee will advise in 2010 on the future trajectory of caps under this system. This policy should however be buttressed by:

- Roll-out of Energy Performance Certificates (EPCs) and Display Energy Certificates (DECs).
- A commitment that the public sector will implement all cost-effective measures to improve energy-efficiency by 2018.
- A policy to ensure that all SME's should achieve a minimum EPC rating of 'F' or higher by 2020.

#### On road transport

As outlined in the Committee's first report in December 2008, road transport emissions need to be reduced via a combination of *efficiency improvements* (reductions in grams per km) and measures which will *constrain growth in traffic volumes*: emission cuts of 30% by 2020 are possible.

The Committee reiterates its belief that the carbon-efficiency of new cars can and should be reduced from above 160g/km today to 95g/km by 2020. This reduction could be achieved by improvements to fuel efficiency on conventional cars, but further reductions beyond 2020 will require a significant role for electric cars.

Manufacturer announcements of electric car initiatives have progressed even more rapidly than the Committee envisaged, and significant progress on battery cost reduction continues.

But to ensure rapid progress, two new mutually reinforcing government policies are required: Support for new car purchase to drive initial volumes and help manufacturers achieve economies of scale; and support for battery charging infrastructure.

#### Next steps for the UK

In a world where carbon budgets are achieved we will meet more of our energy needs from low-carbon power, live in well insulated homes with energy efficient boilers and appliances; we will also work in energy efficient offices and drive more carbon efficient cars including hybrids and electric vehicles. Taking action will also improve the *security of energy supply and air quality*.

With the carbon budgets in place, we now need to achieve a step change in the pace of emissions reduction. The Government needs to build on its 'Low Carbon Transition Plan' and put in place a

comprehensive delivery framework. *What we have proposed is achievable and affordable but action needs to be taken now if we are to make our contribution to combating climate change.*

**Rt Hon Ed Miliband MP, Secretary of State for Energy and Climate Change:**

There is no doubt that it remains a *challenge to get a strong deal at Copenhagen, which covers emissions, finance for developing countries, support for new technology, action on forestry and a clear and short track to a legally binding treaty.*

*But we are seeing progress.* Nobody should be in any doubt that the December deadline is concentrating minds.

I am confident we can get a comprehensive agreement that is consistent with the science and the need to limit climate change to no more than two degrees of warming. That means a deal which will ensure that global emissions peak by 2020 at the latest. This would be a historic result because it would be the first time in the industrial history of the world that we have reversed the inexorable rise in emissions.

But the truth is that treating this like a conventional negotiation will fail. The route to an agreement at Copenhagen this December which safeguards the future of the planet must be based on a willingness to abandon traditional negotiating tactics.

Some are already saying that we are in danger of summit overhype. Attempts at agreements come and go. Kyoto, Doha, Gleneagles. Maybe a global deal matters less than piecemeal arrangements, they argue.

Kyoto, where promises were made but not kept, does show that agreement aftercare is essential, but it also teaches us that *without everyone signed up, we cannot succeed. Copenhagen is the world's chance to get the global buy-in we need.* The prize is a deal that means global emissions peak and start to fall in time to keep temperature rises to less than 2°C. For the first time in the industrialised history of the world, greenhouse gas emissions would be under control.

To achieve this, *developed countries need to cut their emissions, not just in 2050, but now.* But even if rich countries clean up their act, *we won't succeed without developing countries, such as China and India.*

They have much lower emissions per person, hundreds of millions of people in poverty and are growing much quicker than developed countries, so they won't be able to cut their emissions straight away. But they do need to take meaningful action to slow the growth in their emissions, in advance of cuts.

*The December deadline is focusing minds and forcing action. World leaders are beginning to hear the ticking of the environmental clock.* President Obama has changed the American approach, Japan just announced a dramatic upping of its ambition, India will legislate for actions to tackle emissions, and China is willing to take action too.

So some of the pieces of the jigsaw for an agreement are there, but without ambition and imagination from all countries, they won't fit together. *Politics is still lagging behind science, domestic opposition is strong in many countries, the demands of finance are enormous and the technological leaps required are great.*

To succeed, we need to *avoid traditional finger-pointing and act collectively.* Every country faces its own compelling constraints: whether it is the United States, where the debate about climate change has been held back, or India, which has at least 300 million people living on less than US\$1 a day.

And yet despite compelling constraints, Nick Stern has suggested that we are on the way to the emissions reductions we need by 2020. His analysis suggest that a 'climate responsible' goal is a limit on emissions of about 44 gigatonnes in 2020. Pledges already made leave us about 5 gigatonnes over that goal. The world needs to act together to identify how we make the further cuts we need.

So we must be in this together rather than looking for whom to blame. The fate of every nation on earth hangs on the outcome of Copenhagen. It is too important to play the cards close-to-your-chest poker games that marked diplomacy of the 20th century. Just as we are realising that the way we do politics has to change at home, so it has to change in international negotiations. *Without an open honest dialogue we will never clear the logjams that are in the way of a deal.*

In particular, we need to *persuade developing countries that rich nations understand their historical responsibility for the problem.* They need to know that we will help support the transition to a low-carbon economy and the adaptation needed to deal with the effects of climate change it is too late to avoid. That's why, well *in advance of the summit, Gordon Brown has proposed a deal for developing countries worth \$100 billion a year by 2020.*

Finally, we also need the issue to be brought out of the airless rooms and into the open. What haunts me is that this moment passes by without people realising how high the stakes are.

*That's why politicians have a duty to lead in our actions and explain why this matters. And we need the public to do what they can do best, to move the politics by making their voice heard.*

The climate change debate can be frustrating because it sometimes seems to veer between denial and defeatism, the people who say we don't need to act and the people who say we can't. Both are wrong and dangerous.

Summits do come and go. But if the world can really get global emissions under control, we will be charting a new course for our economies and societies. *We can't afford to fail.*