

## Foreign Relations Committee Senate Testimony 19<sup>th</sup> March 2009

### Professor Lord Nicholas Stern

*Chair of the Grantham Research Institute on Climate Change and the Environment  
and IG Patel Professor of Economics and Government at London School of Economics  
and Political Science*

#### **Overview**

The world currently faces both an economic crisis and an even deeper climate crisis. This global economic recession, triggered by a major financial crisis, draws into sharp focus the economic and social impact of not taking into account the risks of our actions. The climate crisis is altogether of a different scale and magnitude. Continuing with current practice will, by the end of the century, take the world to a point where eventual global warming of more than 5°C is more likely than not. Temperature increases on this scale would disrupt the climate and the environment so severely that there would be enormous consequences for where and how people lived their lives. Large scale migration, possible of hundreds of millions of people, would probably result in extended conflict. In other words, the current path of high carbon growth cannot sustain itself over the long term. Low-carbon growth is the only sustainable growth path for the future. Moreover, the transition to a low-carbon global economy offers substantial opportunities for a surge in economic growth led by innovation, investment and job opportunities, whilst supporting energy security and a cleaner, safer, quieter and more bio diverse environment. Many of the necessary technologies are already understood, but new ones will be created along the way offering substantial opportunity for investment. Those countries which act early are likely to reap significant economic rewards and ensure their growth will be resilient to climate change in future. Those countries who fail to anticipate change will be left behind. The US has an historic opportunity to lead the transition to a global low-carbon economy, demonstrating that low-carbon growth is feasible and affordable. Moreover, the US has a critical role to play if the world is to achieve a global deal on climate in Copenhagen in December 2009.

#### **The case for action**

The basic science is well understood. The rising concentration of greenhouse gases in the atmosphere, due to emissions from a wide range of human activities, is increasing average global temperatures. This process affects the timing, distribution, averages and extremes of temperatures as well as the intensity of rain fall, likelihood of extreme weather events and pace of sea level rise. Without strong action the world will, in the next decade, commit future generations to a temperature rise of at least 2°C relative to pre-industrial levels – a level which many scientists already deem too dangerous. A temperature rise of at least 5°C is unknown territory for humans and greater than the difference between now and the last ice-age. There would undoubtedly be catastrophic consequences for the planet.

Climate change is already having an impact in the US. Increases in weather extremes such as storms, floods, droughts and heat waves have already led to significant economic damages in both rural and urban areas and further impacts and increasing damages are forecast. Globally, it is the poorest countries and poorest within those countries that will be hit earliest and hardest but these impacts will be felt worldwide. The risks of severe hardship and dislocation, water stress, mass migration and rising conflict will pose a severe foreign policy challenge for the US in future. The need to manage risks to US economic, national and energy security therefore dictates early and strong action on climate change.

Climate change policy is not only sensible risk management. It is also the means for boosting growth today whilst laying the foundations of stable and sustainable growth for future generations. It is vital that all countries act together in order to achieve emissions cuts on the scale required. The US has an important leadership role to play and can lead the world in the transformation to a low carbon global economy, generating new investment and employment opportunities and positioning itself as a global leader in new innovative technologies. Policies for a “green recovery” will create a pathway for more sustainable growth whilst also sharply reducing climate change risks. This is the only growth strategy for the future.

### **Future growth must be low carbon growth**

#### 1. Economic opportunities in early and strong action on climate change

The question of what economic opportunities strong action on climate change could bring should start with an overview of what the policy framework should look like. The following key components make up the essential elements:

- Placing a price on carbon to correct market failures by making it possible for markets to reflect the right signals,
- Policies to stimulate the development and deployment of low carbon technologies through addressing market failures and bottle necks,
- Encouraging behavioural change, particularly energy efficiency,
- Promoting adaptation to climate change that is already unavoidable,
- Globally, bringing an end to deforestation.

If applied in the right way, policies to tackle climate change present both short term benefits during the current global recession and underpin large and growing investment opportunities for decades to come. For example, pathways for green global recovery include short-term policies that can stimulate employment creation and investment, all of which can play a vital role in supporting aggregate demand and growing out of recession. In the medium to long term there are clear win-wins from a strong policy framework to tackle climate change, including the stimulus to innovation from structural change, addressing long

standing market failures and barriers preventing behavioural change and uptake of new technologies, and important co-benefits such as a cleaner environment and greater energy security. The era of low carbon growth promises to be exciting, creative and transformational.

For these reasons, the debate around climate change action should not be seen purely through the lens of containing and managing economic costs. There will indeed be costs of transition, but these can be managed through carefully targeted policies and programmes. More importantly, there will be investments with very high returns. Moreover, taking action today is crucial to avoid the high costs of delay. Continuing business as usual emissions will build stocks of CO<sub>2</sub> in the atmosphere, resulting in higher concentrations and making the starting point for reductions both more challenging and more expensive. Slow initial action not only increases the chances of going above 2°C, but also means that low cost mitigation options are missed and high-carbon technologies and infrastructure are locked in. It is therefore vital to strengthen the understanding among governments, businesses and consumers of how key policies to tackle climate change, both domestically and at a global level, can promote and sustain economic recovery and growth in the future.

The economic arguments that climate change policies can be growth enhancing have most recently been debated in the context of the economic stimulus and recovery packages implemented in many of the world's major economies. At time when declining demand in the world economy is driving economic downturn, causing a sharp deterioration in the economic outlook, the case for a fiscal stimulus becomes clear cut - helping to sustain demand, use otherwise idle resources, save money through improved energy efficiency and create jobs. To be effective, however, fiscal policies need to be timely (with a significant proportion of expenditures being carried out within the next year), well targeted (with long term social returns, positive lock-in effects and use of under-utilised resources) and time-limited without bringing into question the long term credibility of the fiscal framework.

In several recent papers<sup>1</sup> on this issue, public spending aimed at stimulating private investment to reduce green house gas emissions was seen to perform very well against these criteria for an effective stimulus, whilst increasing energy efficiency and security. Through addressing market failures and stimulating private investment, these measures generally avoid crowding-out private sector activity. Such policies not only make sense in the current economic context, but also more generally as the drivers of future innovation, job opportunities and to lay the foundations for growth in future that is far more sustainable than the path the world is currently on. Crucially, these policies avoid the risk of locking in high-carbon infrastructure for the coming decades.

---

<sup>1</sup> "Towards a green global recovery – recommendations for immediate G20 action", O. Edenhoffer and N. Stern, April 2009. And, "An outline of the case for a green stimulus", A. Bowen, N.Stern, S. Fankhauser and D. Zenghelis, February 2009.

## 2. Key areas for investment and action

A key example of this is in spending to improve energy efficiency. All major economies have the potential for substantial energy efficiency improvements, which in total could make up a significant proportion of the emissions reductions required to meet global stabilisation targets. Energy efficiency measures have a high multiplier effect (raising aggregate demand through fiscal spending) being concentrated in sectors strongly affected by the decline in global demand, such as construction. Furthermore, lower spending on energy costs frees up income that can be spent on the products from other sectors of the economy. Energy efficiency measures also lay the foundation for a more sustainable future, simultaneously reducing emissions and energy costs, cushioning against future resurgent oil prices. In all countries, substantial potential for energy efficiency improvements remain. The IEA<sup>2</sup> has identified 25 energy efficiency policies, including in buildings, transport, appliances and industrial sectors that can be implemented at low or negative cost impacting economic activity in the short term and reducing consumer energy bills in the future.

Policies to upgrade physical infrastructure are another good example of measures to create short run benefits whilst laying the foundations for future sustainable growth. Investment in infrastructure can have a high multiplier effect in times of economic recession. If well targeted, it can also have strong implications for the profile of emissions in future. This is nowhere truer than in the power sector. Ageing capital stock in industrialised countries presents an excellent investment opportunity, for example in the transmission and distribution grid, storage of electricity and other elements of the network to absorb innovative low carbon technologies and avoiding lock-in of high carbon systems. Investing in networked technologies to ensure energy is produced, distributed and consumed more efficiently through integrated 'smart' systems which monitor and reduce waste also have great potential to save money and reduce emissions. Investment in public transport is another strong example, contributing to the decarbonisation of infrastructure, for example through setting emissions standards for CO<sub>2</sub> and local air pollutants and supporting the switch from petroleum to electricity.

Policies to support clean energy technology are a further crucial part of the mix, contributing directly to job growth and fostering innovation, creativity and comparative advantage in a key future growth sector. If the world is to put itself on a path to achieve the necessary cuts in emissions, a fundamental transformation is required in the way energy is produced and consumed. Key technologies including renewable energy (solar, wind, hydro, tidal, wave, biomass and geothermal), nuclear and carbon capture and storage for coal will require significant investment for demonstration and deployment if growing world energy demand is to be met. The IEA estimates \$1 trillion a year in energy supply investment between now and 2030 is needed. The difficulties caused by current credit market

---

<sup>2</sup> "A clean energy new deal: Ensuring green growth in a time of economic crisis", December 2008

constraints and other bottlenecks make this challenge even more daunting. Nonetheless, there could be significant economic opportunity for early movers who strive to get ahead of the curve. As we learn more about technologies from research and experience and exploit economies of scale, costs fall over time. Moreover, the job growth potential in the clean energy industry is increasingly clear, with countries such as Denmark and Germany amongst many others already reaping rewards. Early investment in low carbon technologies also makes clear sense from a cost perspective, reducing a key source of uncertainty about the scale of future mitigation costs. Furthermore, it can promote energy security through securing against future supply disruptions and support resistance to future price shocks.

These are only three examples of policy areas that can secure the immediate benefits of stimulus and employment creation, whilst laying the foundations for a low carbon world. Governments around the world are already taking strong action in this direction, evidenced by the \$430 billion fiscal resources dedicated to climate change investment themes as part of recent stimulus packages. This includes the \$65 billion committed by the US administration to green energy, through spending and tax incentives. In the UK 2009 budget, £1.4 billion new spending was announced to support the low carbon sector. China and South Korea are also major economies with policies for low carbon growth making up an important part of their fiscal stimulus packages and approaches to future wealth creation and sustainability. There are many more positive examples at the firm level, where globally competitive companies are embedding energy savings and low carbon policies at the centre of their business planning. Recent research shows that better managed firms generally tend to be more energy efficient, reducing energy usage without hurting their employment and output. In the US, companies such as include Cisco, IBM, DuPont, Dow Chemical, General Electric and Duke Energy are at the forefront of the climate change debate, recognising that strategic global importance of low carbon growth and energy savings to their business models.

The current global financial crisis has clearly brought into sharper focus the need for an economic recovery which leads to a more sustainable global economy. Action currently being taken around the world is only the beginning of the pathway that is necessary to achieve a low carbon global economy, consistent with the international targets necessary to avoid dangerous climate change. In future, there is both a need and an opportunity to deepen these policies at the national level and make them even more impactful through globally co-ordinated action. Without this, it will not be possible to stimulate the global flows of trade and investment that is vital to support deep emissions cuts on the scale required, whilst sustaining economic growth and supporting the international development and diffusion of critical low carbon technologies. The US has an historic opportunity to lead the world in the era of low carbon growth, acting early to create new forms of comparative advantage and foster a sustainable growth path for itself and others in the future. Leadership has already been shown in some US states, such as California, to introduce

regulation, cut emissions and support low carbon industry. Furthermore, there is enormous scope for developing the renewable industry in the US, given its natural resource endowments.

### 3. Fostering the transition and managing the costs of adjustment

Like any adjustment process, there will be costs of transition inherent in transforming the economy to a low carbon growth path. Placing a price on carbon, whether through cap and trade or a carbon tax, requires the market to readjust. There will clearly be winners and losers from this process, as with any adjustment process. However, with the right policy framework these costs should be manageable and are not a reason to delay strong action. Complementary policies to support adjustment at the firm level, innovation and uptake of new technologies, to encourage behavioural change and to enable trading will help support least cost abatement potential and keep costs at a manageable level.

Concerns about competitiveness and carbon leakage are often heard and are important considerations for any government. It is important to understand and quantify these impacts as closely as possible, to ensure they are not over-stated and that any compensation programme can be well targeted. Existing research shows that these concerns are mainly relevant to a small number of specific industries and sectors rather than the wider economy. In the US, only 1.6% of GDP and 1.7% of employment are generated from carbon intensive sectors. Moreover, the influence of small carbon costs on location decisions is dwarfed by commercially more important factors such as access to markets, raw materials, skills, technologies and infrastructure. Recent research by the Pew Centre<sup>3</sup> confirms that the competitiveness impacts from a unilateral US climate policy on domestic manufactures as a whole are small (approximately 0.7%) for a \$15 per tonne CO<sub>2</sub> price. This implies policies are most efficiently targeted at supporting the transition in specific industries. Protectionist trade measures should be avoided. They are blunt measures and risk affecting unrelated industries if trade dispute results.

Equally important are the concerns around costs to consumers and households through energy price rises, brought about by placing a price on carbon. Whilst cost pass-through of the carbon price from industry to the consumer does occur as part of the clear price signal that is necessary to incentivise behavioral change, the average cost to household budgets can be contained through careful measures, including through compensating low income households. Moreover, encouraging companies to improve their efficiency and allowing companies access to cheaper abatement opportunities abroad would reduce the price of emission permits, leading to lower cost being passed-through to the consumers. Household energy consumption can also be reduced through behavioral change, awareness, low-cost

---

<sup>3</sup> "The competitiveness impacts of climate change mitigation policies", J. Aldy and W. Pizer, Resources for the Future, May 2009

actions, and investment decisions. Capturing such opportunities would mean less income spent on energy, and hence help keep cost down for vulnerable families. In other words with the right flanking measures, a carbon price should not necessarily entail excessively higher cost to consumers.

### **Achieving a global deal on climate change – a leadership role for the US**

A global deal on climate change is necessary if the world is to achieve the necessary global targets. The timing is urgent, with the negotiations for a post-Kyoto framework shortly to get underway in the build-up to Copenhagen 2009. Both developed and developing countries have a role to play in building positive momentum for a global deal. This must be global collaboration on a scale never witnessed before in our lifetimes. The US has an historic opportunity to play a crucial international leadership role to achieve this. The world will look to US leadership in setting clear and strong midterm targets for 2020, on a credible pathway to achieve its goals by 2050. The rest of the world will watch the domestic debate on US climate legislation more closely than ever before, and if the US demonstrates strong ambition for its own emissions reductions the rest of the world will follow. Moreover, the support which developing countries require to achieve low carbon growth, including vital flows of finance and technology, can only be successfully designed and implemented with strong US backing. The chances of achieving a credible and enduring global deal on climate change depend on the US playing a central role.

### **Conclusion**

Strong action on climate change is feasible and affordable and creates substantial economic opportunity. The economic and climate arguments for the green fiscal stimulus have enabled governments around the world to better understand the framework for supporting opportunities, whilst managing the economic costs. Fiscal stimulus measures for example in energy efficiency, investment in alternative power infrastructure, low carbon RDD&D, infrastructure and transport will both enable a green recovery and lay the foundations for future more sustainable growth. This is only the beginning of what needs to be done to set the world on a pathway for avoiding dangerous climate change. The scale of the challenge is daunting, but full of opportunities. The task now rests with Governments to put in place as quickly as possible a clear, consistent and credible set of policies and measures to support the transition to a global low carbon economy, bound into an international framework.