

## **Enabling an “Eco-efficient” economy**

**By Lord Nicholas Stern\***

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

1. 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 have not been seen on the planet for more than 30 million years and 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, if the right policies are put in place, the transition to a low-carbon global economy will offer substantial opportunities for a surge in economic growth led by innovation, investment and job opportunities, whilst leading the way to growth which is more secure, cleaner, safer, quieter and more bio-diverse. 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 on reducing emissions are likely to reap significant economic rewards. By anticipating and adapting to inevitable climate change, they can ensure their growth will be resilient to climate change in future.

### **The case for a “green” fiscal stimulus**

2. The economic arguments that climate change policies can be growth-enhancing have been set out in the context of the economic stimulus and recovery packages implemented in many of the world’s major economies. To be effective as a responsible stimulus, however, fiscal policies need to be timely (with a significant proportion of expenditures being carried out within the next couple of years), well targeted (with long-term social returns, positive lock-in effects and use of under-utilised resources) and time-limited so that they do not bring into question the long-term credibility of the fiscal framework.
3. Public spending to reduce greenhouse gas emissions has been seen to perform very well against these criteria for an effective stimulus, whilst increasing energy efficiency and security<sup>1</sup> - particularly if aimed at stimulating private investment in such areas as well. Through addressing market failures and utilising underemployed resources, 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 and job opportunities. Low-carbon and energy efficient investments will be key drivers of growth in the next three or four decades comparable to railways, electricity and information/communication technology earlier periods. Further, they lay the foundations for growth in future that is more attractive and sustainable than the path the world is currently on.
4. 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. 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 transition to and the era of low-carbon growth promise to be exciting, creative and transformational.

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<sup>1</sup> See also Alex Bowen, Sam Fankhauser, Nicholas Stern and Dimitri Zenghelis, *An outline of the case for a “green” stimulus*”, Grantham Research Institute, February 2009 and “*Towards a green global recovery – recommendations for immediate G20 action*”, O. Edenhoffer and N. Stern, April 2009.

## **Key areas of investment and action**

5. Key elements of a policy framework for achieving low carbon growth comprise the following measures:
  - Placing a price on carbon to reflect the cost to the environment, correcting market failure. This is about making markets work well.
  - Policies to stimulate the development and deployment of low-carbon technologies through addressing market failures and bottle-necks (beyond the carbon externality)
  - Encouraging behavioural change, including local collaboration in communities, particularly in energy efficiency
  - Promoting adaptation to climate change that is already unavoidable,
  - Globally, putting a halt to deforestation

We focus here on the first three and their relevance to the European Union.

6. Pricing carbon: Placing a price on carbon to correct the market failure must be at the centre of any strategy for tackling emissions. This can be achieved through various measures, including tax, regulation or cap and trade. Global emissions trading would enable abatement to take place where it is cheapest, enable significant flows of finance to developing countries and be an important driver in delivering finance and incentives for development, deployment, and transfer of low-carbon technologies. The European Emission Trading System (EU ETS) is the most ambitious plan in the world to trade carbon quotas and its launch in 2005 was a major milestone in the global efforts to tackle climate change. The key lessons over phases 1 and 2 will inform and support future regional trading schemes, enabling these to be linked together in the future. The design changes in phase 3 will improve the effectiveness and efficiency of the system, though further changes would be needed, in particular:
  - a. Securing a tighter cap to create a better functioning market and ensure a strong and pervasive signal for emissions reductions,
  - b. Ensuring greater auctioning of allowances, thereby limiting free allowances and the risk of windfall profits and rent-seeking in the sectors covered by the scheme and ensuring efficient allocation,
  - c. Dealing appropriately with concerns over competitiveness and carbon leakage. It is important to understand and quantify these impacts as closely as possible, to ensure that they are neither overstated (they often are) nor ignored. These are best dealt with key collaboration across countries. Any compensation programme should be well targeted and proportionate and should not be an excuse for covered protectionism.
  - d. Expanding carbon pricing into new sectors (such as aviation and shipping)
7. 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, particularly in the near term. Energy efficiency measures are expected to have a high multiplier effect because they are aimed at sectors, like construction, that are suffering severely from the current demand reduction and where employment is at serious risk. Providing the right incentives for modernisation and early replacement of buildings and appliances, for example, can trigger large private investments that would otherwise be put on hold. Measures such as retrofitting buildings should be a priority. However, investments are often not undertaken, because of market failures, inadequate information and barriers to behavioural change. In all instances, public finance and targeted policies have a crucial role to play. The public sector should lead, investing in greener public buildings. Enhancing green public procurement rules, particularly if coordinated across nations or cities, would create the scale for dynamic market growth.
8. Infrastructure: Policies to start upgrading physical infrastructure are another good example of measures to create benefits whilst laying the foundations for future sustainable growth. Public finance should support investments in “green infrastructures”. This includes, as a matter of priority, investments in smart grids. Grids now need to be upgraded so that they can absorb substantial volumes of fluctuating electricity flows from

renewable. Grid-related investments usually have long lead times. However, some extensions to the transmission grid can be implemented very quickly, as plans for grid upgrades have been under preparation for several years in many countries. For instance, additional cables can be added to existing electrical towers. This is also possible at already congested cross-border connections in Europe.

These investments can have a high multiplier effect in times of economic recession. If well targeted, once in place, they can also have strong implications for the profile of emissions in future, avoiding lock-in of high carbon systems. They should also be designed to take advantage of new opportunities for clean transportation of power over large distances thereby expanding the scope of generation options.

Investing in networked technologies to ensure energy, as well as goods and services, 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.

9. Investment in public transport is another strong example, contributing to the decarbonisation of infrastructure. Managing infrastructure well, can reduce waste and emissions from congestion. In both public and private transport, emissions can be reduced by setting emissions standards for CO<sub>2</sub> and local air pollutants and supporting the switch from petroleum to electricity. Encouraging modal shift from road to rail in passenger as well as freight transport, shortening trips through improved urban planning and supporting electrification of transport are all effective ways forwards.
10. Clean technology market: 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 power and carbon capture and storage for fossil fuels, particularly coal, will require significant investment for demonstration and deployment if growing world energy demand is to be met. Moreover, the renewable energy industry appears to be more labour intensive than the existing energy sector, particularly at the initial construction, manufacture and installation stage that is most relevant for a short-term stimulus and it is likely to lead to net creation of jobs. At this stage, it is sensible to include a broad range of technological possibilities to allow options to develop whilst examining the economic and environmental consequences of them all.
11. The difficulties caused by current credit market 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. 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.
12. The case for public support for R&D is especially strong for newer technologies and for technologies that are furthest from the market. It is here that capital markets, given the risks, may not function well. There are numbers of possible mechanisms for support. Those that involve basic R&D are likely to be best oriented through institutions such as universities and research establishments: often in collaboration with private or public firms. In all these cases good practice encourages the combination of public and private investments to align incentives.
13. Like any adjustment process, there will be costs of transition inherent in transforming the economy to a low-carbon growth path. 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. They are small relative to the great benefits of strong action. Complementary policies to support adjustment at the firm level, innovation and uptake of new technologies, to encourage behavioural change and collaboration within communities, and to enable trading will help support least cost abatement potential and keep costs at a manageable level.

## **Conclusion**

14. 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 understand better 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 path 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.
- We can see the necessary scale of action, the technologies and the relevant economic instruments. We will learn much more along the way. We now need political will and policy action.

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