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The Stern Report on the Economics of Climate Change

Background
The most comprehensive research into the economics of climate change was published at the end of 2006, commissioned by the United Kingdom Treasury and carried out by Sir Nicholas Stern. Stern, former Chief Economist and Senior Vice President of the World Bank, is now a government economic advisor in the UK and was commissioned to investigate the economic costs of global warming under a "business as usual" (BAU) scenario versus the costs of reducing carbon emissions to stabilize the climate. He concluded that the costs of doing nothing far outweigh the costs of reducing greenhouse gas emissions, going so far as to suggest that BAU will in fact restrict, rather than encourage, future economic growth. The report's findings have generated a global push and heightened urgency for an effective policy to reduce global warming.

Business as Usual and the Cost of Doing Nothing
Under the BAU scenario, the Stern study finds that greenhouse gas (GHG) emissions could more than triple by the end of the century, resulting in a 50% risk of exceeding a 5°C global average temperature rise during the following decades. Therefore, if current trends continue, in the next fifty years or so average global temperatures will rise by 2 to 3°C, and the earth will be "committed" to several more degrees of warming.[1] This will take humans into unknown territory. At present, for example, temperatures are only about 5°C warmer than during the last ice age.

The costs of the status quo will be extremely high.[2] Stern suggests that extreme weather events (storms, hurricanes, floods, droughts, heat waves) will cost from 0.5%–1% of world GDP per annum by the middle of the century. A 5%–10% increase in wind speeds, linked to rising sea temperatures, is predicted to double annual damage costs in the U.S. Using a specific risk-based climate model,[3] Stern's analysis shows that the total costs of climate change under a BAU scenario will reduce the standard of living**,** based on consumption per person, between 5% and 20%.[4]

The effects of our actions now on future changes in the climate have long lead times. Therefore what we do now can have only a limited effect on the climate over the next 40 or 50 years. However, action in the next 10 or 20 years will have a profound effect on the climate in the second half of this century and in the next.

Costs of Mitigation for Stabilization
Annual global emissions must be reduced to below the level that the earth can naturally absorb without adding to the concentration of greenhouse gases in the atmosphere. The Stern review focuses therefore on achieving stabilization of atmospheric CO_2 at 500-550 parts per million (ppm). This will require global emissions to peak in the next 10-20 years and then fall at a rate of 1%–3% per year, so that by 2050 emissions are 25% below current levels.[5]

However, Stern suggests adaptation will also be fundamental. He puts the costs of making new infrastructure and buildings resilient to climate change in developed countries at $15 to $150 billion each year (0.05 to 0.5% GDP). In developing countries, too, the costs are likely to reach billions of dollars.

These costs will bring competitive challenges but also opportunities for growth. Low carbon energy products are likely to be worth at least $500 billion per year by 2050. Effective policies on global warming can also achieve multiple objectives. Reducing air pollution will improve respiratory health and mortality rates, and preserving forests will support biodiversity. However, the costs of mitigation will rise significantly as efforts become more ambitious or sudden; there is a high price to delay.

What Should Be Done?

The second half of Stern's review examines appropriate forms of climate policy and building an international framework for collective action. He champions three key methods to achieve greenhouse gas reductions: putting a price on carbon, advancing a technology policy, and removing barriers to behavioral change.

Stern suggests that markets which respond to climate information will stimulate adaptation among individuals and firms. Governments have a role to provide a policy framework to guide effective adaptation in the medium and longer terms. High quality climate information and tools for risk management, land use planning and performance standards, long term policies for climate sensitive public goods (such as natural resource protection), and a financial safety net for the poorest in society will all be necessary. International cooperation, including international development assistance, is essential.

Stern sees tackling climate change as the "pro-growth" strategy for the longer term. He concludes that the worst impacts are still avoidable, but it will require strong collective action in the next 10 to 20 years. Delay is costly and dangerous.

The report can be found online at:
http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

[1] These changes in global mean temperature are expressed relative to pre-industrial levels (1750 to 1850).
[2] There may be some small initial positive impacts of warming for such countries as Canada, Russia, and Scandinavia, but these are unlikely to be permanent.
[3] The climate model is called PAGE2002.
[4] There is a wide variability here depending on whether the model is made to include direct impacts on the environment and human health (non-market impacts); more recent scientific evidence which suggests that the climate system is more sensitive than previously thought; and weighting for the fact that most of the burden of climate falls on poor regions of the world.
[5] This is a range of -1% (net gains) to 3.5% of GDP.

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