

Economics of Climate: Nature, People, and Resources

Student Essay

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Introduction

Today we live in a world characterized by boom in development of human knowledge in sciences, technology, and arts. Economics and sciences stand out as the most advanced spheres in human development until now. Man with his reason faculty and accomplishments have transformed the resources latent in nature into material goods and benefits by the aid of advanced technology. To name a few, the invention of computer has made much easier the business process of producing goods and performing services. Robots and high-tech machines have replaced manual work and left people to deal with monitoring and controlling functions. All these advanced technological inventions have penetrated in all spheres of human life worldwide, in developed, as well as in developing countries. Man has made of nature its most cherished and good friend. So much so that the natural resources on Earth have become the primary source for progress in economics by acquiring material goods and benefits. The resources of nature, however, come to an end and gradually become more scarce and scarce; they are precious and valuable for their easy-to-find locations (e.g. land, oceans, etc) and easy-to-employ in economics and other areas for transforming inputs into outputs (goods and services).

In recent times, the issue of climate change caused by global warming due to human activity has become a widespread debate, especially in Europe and USA. It gained even greater popularity after the released in October 2006, *Report on Economics Change* by Nicholas Stern, known as the Stern Review. Sir Nicholas Stern is the Head of the UK Government Economics Service and a former chief economist of the World Bank. In this review, he together with his team present real facts and computation of global warming magnitude problem, comprising risks, effects and their costs.

The Review provides ample evidence that the climate is changing due to global warming caused by human activity. As a result, the greenhouse gases and Carbon Dioxide (CO₂) emissions in the atmosphere have reached high concentrations and have led to global warming with increase in the Earth's temperature. This tendency is going to grow, according to Stern Review and other scientists, which will cause severe changes to the physical geography of the entire planet.

The main thesis of this paper will be the following. Mankind should take a collective and individual action now to prevent the increasing spread of global warming, and thus be able to preserve the biological diversity, the ecosystems, the ocean life, people's health and lives, as well as the current level of Earth's landscape and topography. There are ways to reduce the greenhouse gas in the atmosphere, scientists say. This paper will be an attempt on my part to present in a concise form the findings of economists and other scientists in relation to climate change due to global warming. Emphasis will be placed on exit strategies and solutions, as well as to alternatives and recommendations that humankind, as a whole, has to take heed, undertake, and implement. It has to achieve an united vision from political, social, economic, and environmental perspectives for undertaking a united action now, and thus capable of reducing significantly the greenhouse gases and Carbon Dioxide emissions in the atmosphere, which will be marked by a fruitful and prosperous life in the near and distant future.

Synthesis

▪ Stern Review on Economics of Climate Change

The Stern Review is the most authoritative work at present that comprehensively and thoroughly presents the issue of climate change and its magnitude. For this indubitably

testify the supporting comment and opinions of distinguished scientists and Nobel Prize recipients.

“The Stern Review shows us with, with utmost clarity...what global warming is going to mean...Governments have a clear and immediate duty to accept the challenge it represents.” – confirms James Mirrless, recipient of the Nobel Prize for Economics in 1996. (The Economics of Climate Change, 2008).

Also, :The Stern Review of the Economics of Climate Change is a vital step forward in securing an effective global policy on climate change.” – says Prof. Jeffrey D. Sachs, Director of the Earth Institute at Columbia University and Special Advisor to UN Secretary General. (The Economics of Climate Change, 2008).

The Media does not stay aside as to make the following comment in the Times.

“The Stern Review makes two invaluable contributions. The first is that it recasts environmentalism as economics. Stern’s second serious contribution is to provide a formula for durable environmentalism; one which binds business and government.” (The Economics of Climate Change, 2008).

So according to the Stern Review, the global warming problem is global in its nature and therefore has to be taken an international collective action. He states, ”Climate change is global in its causes and consequences, and international collective action will be critical in driving an effective, efficient and equitable response on the scale required.” (Stern Report, 2006, p.1). In Figure 1, Stern presents data of greenhouse gas emissions caused by different sections of human activity in 2000. It pictures the scale of energy emissions in relation to the non-energy emissions (Lands use and Agriculture).

To illustrate it better, according to the Review, the current concentration of greenhouse gases in the atmosphere is equal to 430 part per million (ppm) Carbon Dioxide, which before

the Industrial Revolution had been 280ppm. When the level of 550ppm of greenhouse gas and Carbon Dioxide will be reached, most likely in 2035, the temperature will increase by 2 degrees Celsius. By the end of the century it is expected the globe to warm with 5 degrees Celsius more. If this happens the Earth's physical geography would change as to rise the sea level, some cities disappear (could be Tokyo, London, Sidney), food and water would get scarce, great many people would starve to death, biodiversity reduced, and ecosystems inhibited. This is an illustration of the calculations and findings made by Stern.

For this not to happen, he proposes an international collective action to be taken now to mitigate the concentrations of greenhouse gas and Carbon Dioxide emissions in the atmosphere. The conclusion that the Review draws is that early action would considerably outweigh the costs. "The evidence shows that ignoring climate change will eventually damage economic growth...The earlier an effective action is taken, the less costly it will be." (Stern, 2006, p. 2).

Another question that Stern examines in his Review is the economics of stabilisation. Figure 2 and 3 (See the Appendix at the end of the paper) from the Review present concise data of adaptation risks and costs. Figure 4 in turn represents calculations of the costs that the stabilization process would take by 2050. The calculations imply that an average of 1% of the GDP would be needed to keep a stable and manageable concentration of greenhouse gases and Carbon Dioxide in the atmosphere.

What Stern proposes is a collective action to be taken to stabilize the level of greenhouse gases and Carbon Dioxide in the atmosphere by reaching in the next 10 – 20 years 550ppm CO₂ and then suddenly reduce the level to 1 - 3% per year. This is the feasible solution that is recommended in Stern Review. This could be done in number of ways as the most important is the international cooperation collective action to assist in the process of mitigating the greenhouse gas emissions in the atmosphere. This could be

achieved by the way of creating a low-carbon economy and growth. Other scientists speak thus about this issue. Prof. Peter Saunders doubts if the governments will listen to the voice of warning given in Stern Report. He says: “The Stern Report commissioned by the UK Chancellor of Exchequer Gordon Browns shows that doing nothing to mitigate climate change will cost us at least five times as much as if we start to act now, but will any government take heed?” (The Economics of Climate Change, ISIS press Release, 2007, p.1).

Still other authors on global warming issue add new problems to the already stated above. As the resources get more scarce, so they will become a reason for strife and war between people and nations, i.e. resources will cause war. Scarce of resources will lead to conflicts and warfare, especially in the regions of India, Malasia, Middle East, and AAfrica. The retired Marine General Anthony Ginni warns: “We will pay to reduce greenhouse gas emissions today or we will pay the price later in military terms.” (Behreandt, 2007, p.1). Similar position is presented in the article *Is This What the World's Coming to?* “With climate change placing increasing pressure on environmental resources, it is now being viewed as a threat to natural security.” (Haag, 2007, p.1).

In comments by Bill in one of the economic blogs of the Wall Street Journal on Jan 5, 2008, the following was said: “Overpopulation, pollution, lack of water and global climate change are not problems for tomorrow, they are here, right now, today.” (Underestimated Risks Warnings, 2008, p.5). This comment clearly explains that more and more people become aware of the immediate action needed to mitigate the greenhouse gas emissions in the atmosphere.

Adair Turner also supports the point that “if climate change mitigation benefits are higher than costs, we should do it, even if the short-term payback to AIDS projects is greater still – we should do both.” (Turner, 2007, p. 15). Moreover, his understanding of immediate

action to mitigate climate change is evident in the following words: “The more we care about future generations, or more vulnerable people than ourselves, the more we will choose early action. The more we value environmental balance as an end in itself, the more we will be willing to change behavior and to support taxation policies which encourage us to change it. And the more we recognize that some of our consumer behaviors are not immutably necessary to our happiness, but the products of manufactured desires and simple habits, the easier we will find it to change behavior.” (Turner, 2007, p. 16).

In an article of the Sidney Morning Herald in October 2006 states that “the International Energy Agency predicts that \$US 15 trillion US\$ 20 trillion of investment in new energy sources will be required during the next 15 years.” (Burton, 2006). That much would cost for the move to a low-carbon energy system. These figures speak for themselves, further comments are useless.

If we want to consider the correlation and relations between “nature”, “resources:”, and “people: in the climate change, we would be fascinated by the deep, interdependent, interrelated, and interwoven connections that exist between the three. People use resources from the nature, the resources get scarce and this affect the overall life of the planet, from nature to geography to people.

Exit Strategies and Recommendations for Action

As the problem at hand is characterized by global causes, so it will require a more holistic and compact approach for solution by taking into rigorous consideration the problem from different perspectives – social, political, economic, and environmental.. We are all aware that a complete solution would never be reached but there are different ways to mitigate the impacts of climate change caused by global warming. So the holistic approach will consist of both collective and individual efforts to mitigate climate change. The suggestions that follow can be viewed as opportunities for solution and show how beneficial it will be to take a timely

response and action on mitigating climate change risks and damages in the near and/or far future.

Collective action and approach:

- Social approach – if timely action is taken internationally, peace and security will be established, social welfare will be available, which would mean less conflicts and no war over scarce resources. The needs of all people should be considered. The social contact and awareness of many people will be achieved by providing relevant school and university programs for educating people all over the world about the issue of global warming. Conflict resolution techniques and win-win approaches could be used to prevent border conflicts, land use disputes, and conflicts over water in Africa and/or Asia.
- Environmental approach – Preservation and protection of nature should be the paramount target that each government should pursue in its state constitution. This would incorporate preservation of the biodiversity, ecosystems, animal and plant worlds, cleaner atmosphere provided by low-carbon green manufacturing and green technology. “However, Fuerth points out that in the case of extreme climate change outcomes, more radical measures might be needed. He cites examples such as the potential development of superior materials through nanotechnology and suggestions for planetary “geoengineering” such as erecting mirrors in the space to reflect sunlight.” (Haag, 2007). Stopping deforestation is another measure that could assist the mitigation process of greenhouse gas emissions in the atmosphere. This is suggested in the Stern Report and supported by other scientists, as well - Brent Sohngen, Ralph Alig, Birger Solberg in their Forestry Climate Survey conducted in 2007. (Sohngen, et al, 2007).

- International Political Cooperation – establishing policy making and taxation on carbon emitting manufacturers should be provided by governments. They should also give to manufacturers an allowable upper limit of greenhouse gas emissions. An international agreement by governments would establish a common set of policies in regards to the greenhouse gas emissions. The people to breach the agreement will be severely sanctioned and punished by penalty fees, and if persist to continue to breach the agreement, the business will be stopped and allconfiscated. A control organ should perform regular checks for keeping the agreement. The strategy of collective intergovernmental action policy on climate change mitigation should be the baseline. (96% of High Importance for implementation).

Regardless of poor or rich country, each one should be responsible for the environment protection and preservation. (90% High Importance for implementation). International Cooperation supported by powerful international organizations and states such as UN, EU, USA, and others. Education in schools and universities worldwide plays a key role in achieving overall people's awareness of the importance that the problem of climate change presents to us. (97% High Importance for implementation). There should be school and university programs and training in establishing not only sufficient knowledge on the matter, but also implementing latest developments in green manufacturing and green technology. (90% of High Importance). Turn toward low-carbon technologies, such as nanotechnology, solar energy, wind energy, and others to improve the overall condition of the environment.

Major business corporations can assist in providing economic perspective and solutions to the problem. They are also the ones that have the financial means and funds to assist the mitigation process of greenhouse gas and Carbon Dioxide emissions in the atmosphere.

International cooperation in taking a collective action is of great importance. In some states where political instability is prevalent, international organizations, such as the UN, EU, USA and other powerful states should impose on the political unstable state governments the international policy to implement in their countries. If those states refuse to act in accordance to the international policy, the international forces should implement them in those countries, even if this would mean using force. War should not be the natural aftermath and conflict when the resources get scarce. Just and equitable allocation of resources among nations should be the responsibility of the international organizations stated above. Mankind has everything in its power to combat the climate change, including high development in sciences, economics, technology to convert manufacturing into low-carbon products and goods. The life standard in the western world will not only improve, but will also impose healthy habits and behaviors on people, thus protecting the environment.

- Economic approach – this was elaborated in the synthesis part.

From individual perspective, every single person should be intrigued, interested, and thoroughly acquainted with the high importance of taking an action in their daily life as to changing some unhealthy habits into ones that will take into consideration the necessity of protecting the environment, In practical terms, this would mean quitting smoking tobacco, separate garbage collection and recycling, as well as healthy food habits.

Conclusion

Scientists have presented enough evidence for climate change deteriorating in global warming, which will affect the whole environment and planet. In the politicians and governments lay the responsibility to listen to the call and appeal of the scientists to act now, implement relevant strategies, and take into account the recommendations given by them.

Individuals should embrace this problem as its own and act in accordance to the above-mentioned appeal and suggestions for implementation in their everyday life, thus consciously creating a healthy environment beneficial to poor and rich (win-win approach).

Creating a global awareness and consciousness as caring world citizens who would say: “I am a world citizen living on the planet Earth, I’m caring about the globe environment diversity and would do anything to preserve it.”

APPENDIX

The following Figures 1, 2, 3, and 4, come from the Stern Report, The Economics of Climate Change

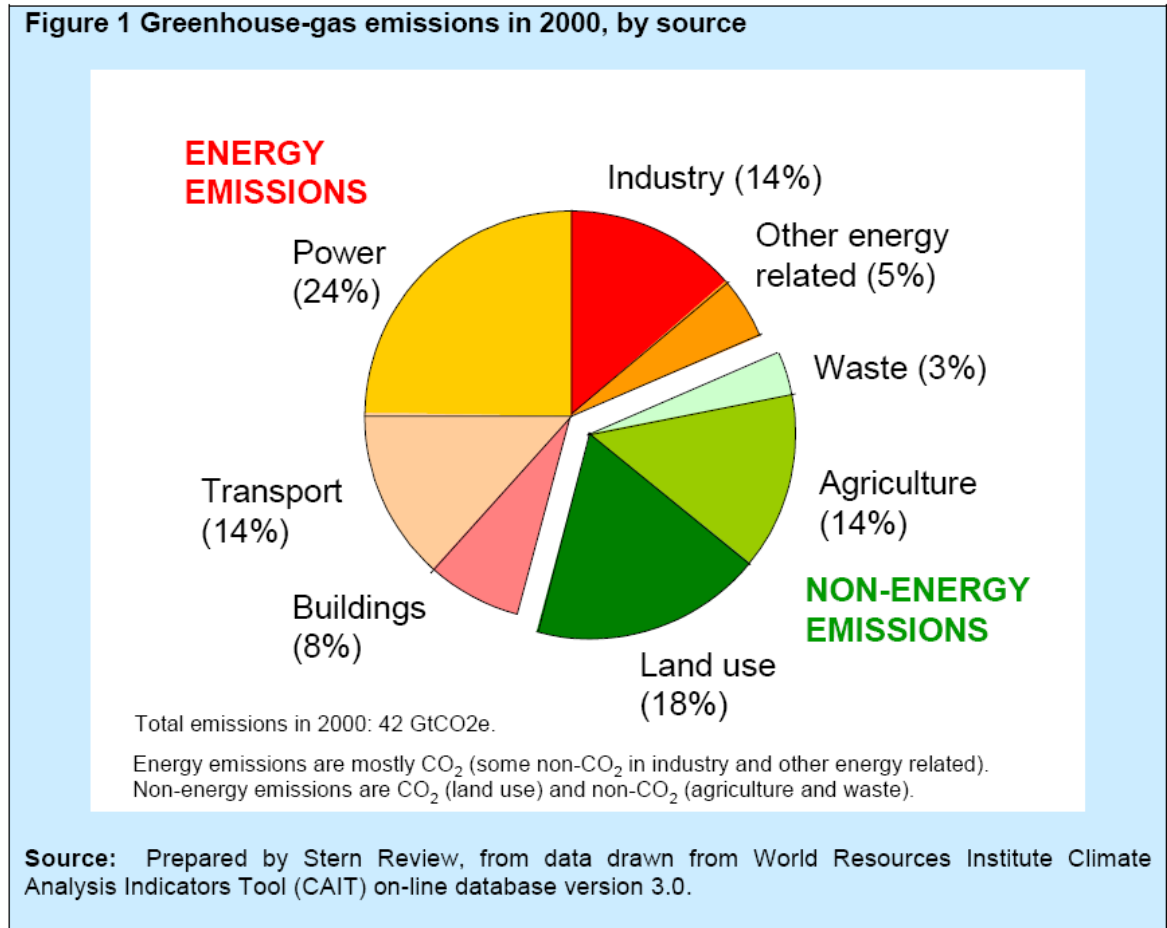


Figure 2 Stabilisation levels and probability ranges for temperature increases

The figure below illustrates the types of impacts that could be experienced as the world comes into equilibrium with more greenhouse gases. The top panel shows the range of temperatures projected at stabilisation levels between 400ppm and 750ppm CO₂e at equilibrium. The solid horizontal lines indicate the 5 - 95% range based on climate sensitivity estimates from the IPCC 2001² and a recent Hadley Centre ensemble study³. The vertical line indicates the mean of the 50th percentile point. The dashed lines show the 5 - 95% range based on eleven recent studies⁴. The bottom panel illustrates the range of impacts expected at different levels of warming. The relationship between global average temperature changes and regional climate changes is very uncertain, especially with regard to changes in precipitation (see Box 4.2). This figure shows potential changes based on current scientific literature.

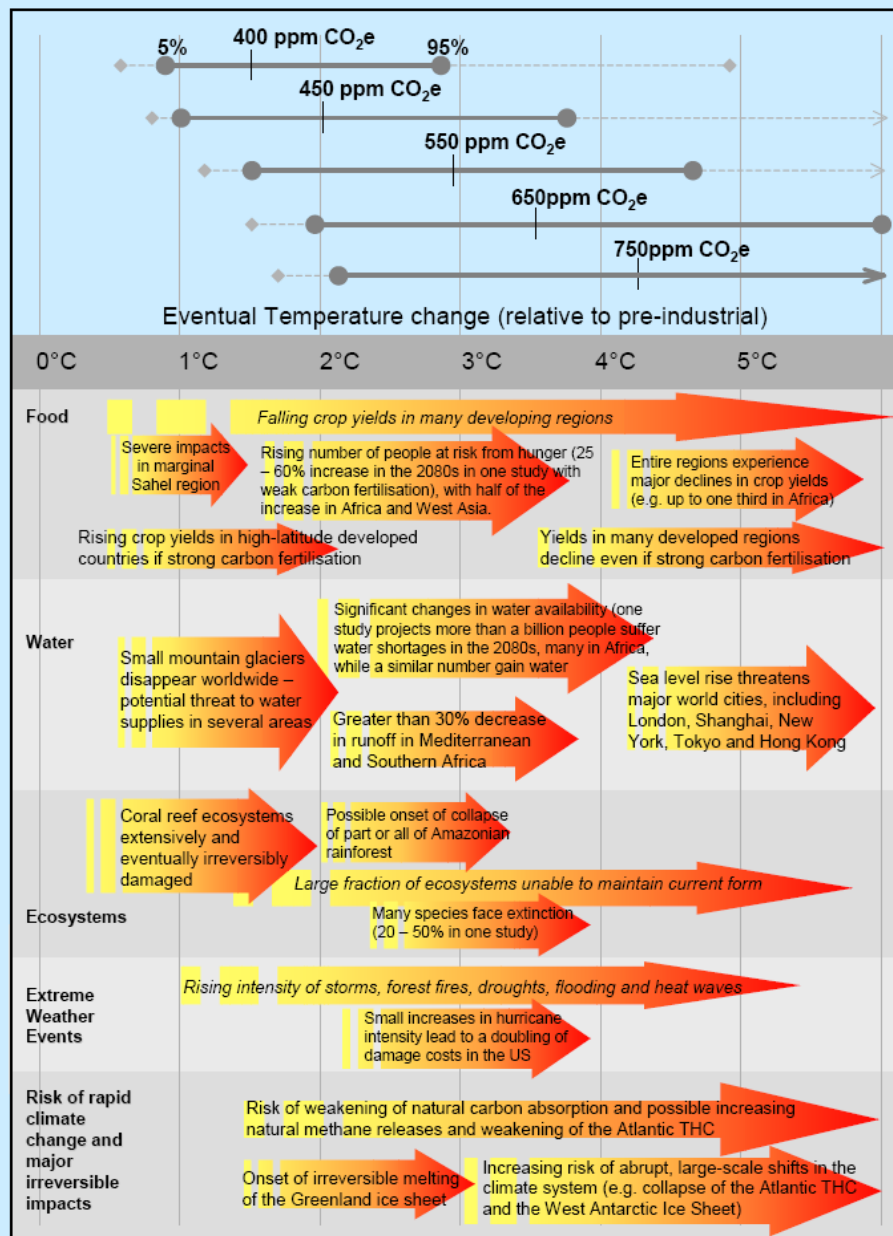
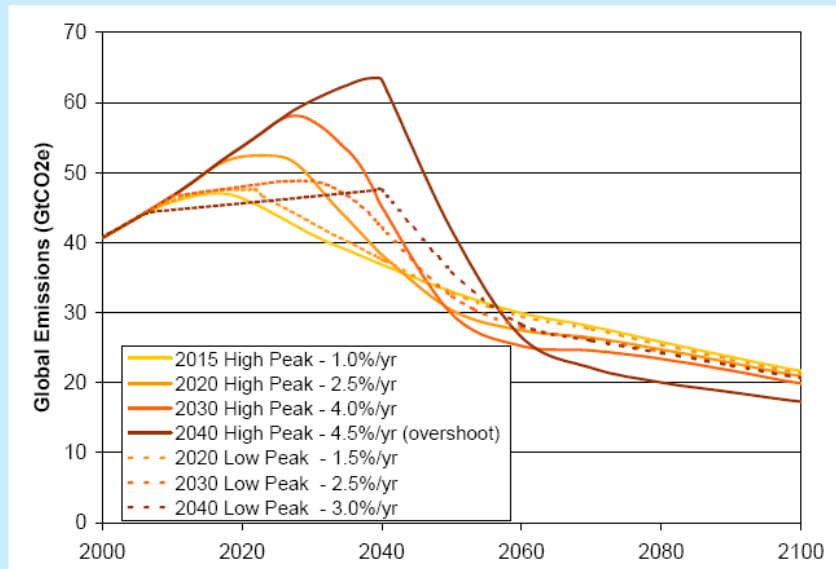


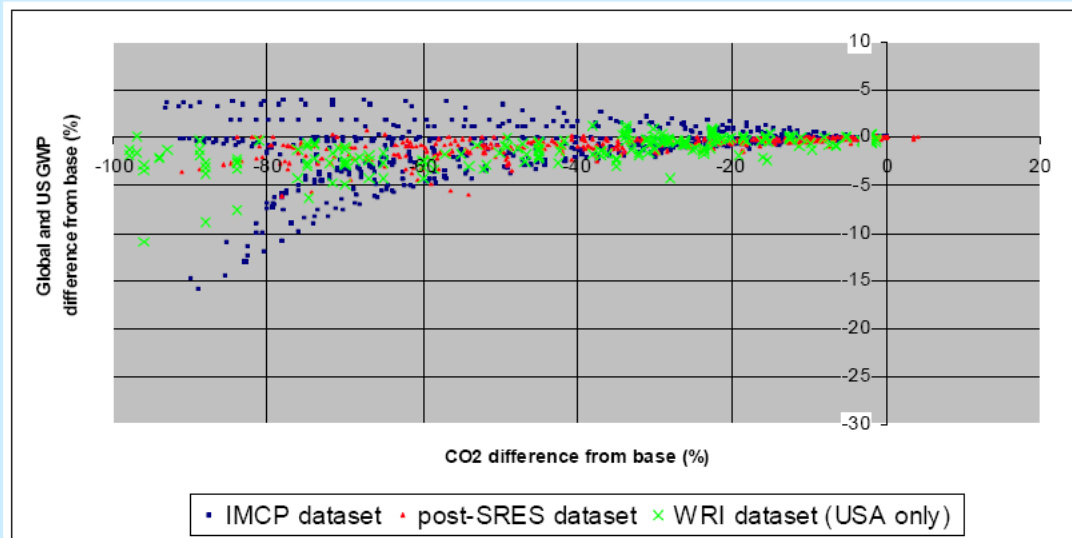
Figure 3 Illustrative emissions paths to stabilise at 550ppm CO₂e.

The figure below shows six illustrative paths to stabilisation at 550ppm CO₂e. The rates of emissions cuts given in the legend are the *maximum* 10-year average rate of decline of global emissions. The figure shows that delaying emissions cuts (shifting the peak to the right) means that emissions must be reduced more rapidly to achieve the same stabilisation goal. The rate of emissions cuts is also very sensitive to the height of the peak. For example, if emissions peak at 48 GtCO₂ rather than 52 GtCO₂ in 2020, the rate of cuts is reduced from 2.5%/yr to 1.5%/yr.



Source: Reproduced by the Stern Review based on Meinshausen, M. (2006): 'What does a 2°C target mean for greenhouse gas concentrations? A brief analysis based on multi-gas emission pathways and several climate sensitivity uncertainty estimates', *Avoiding dangerous climate change*, in H.J. Schellnhuber et al. (eds.), Cambridge: Cambridge University Press, pp.265 - 280.

Figure 4 Model cost projections scatter plot
Costs of CO₂ reductions as a fraction of world GDP against level of reduction



Source: Barker, T., M.S. Qureshi and J. Köhler (2006): 'The costs of greenhouse-gas mitigation with induced technological change: A Meta-Analysis of estimates in the literature', 4CMR, Cambridge Centre for Climate Change Mitigation Research, Cambridge: University of Cambridge.

A broad range of modelling studies, which include exercises undertaken by the IMCP, EMF and USCCSP as well as work commissioned by the IPCC, show that costs for 2050 consistent with an emissions trajectory leading to stabilisation at around 500-550ppm CO₂e are clustered in the range of -2% to 5% of GDP, with an average around 1% of GDP. The range reflects uncertainties over the scale of mitigation required, the pace of technological innovation and the degree of policy flexibility.

The figure above uses Barker's combined three-model dataset to show the reduction in annual CO₂ emissions from the baseline and the associated changes in world GDP. The wide range of model results reflects the design of the models and the choice of assumptions included within them, which itself reflects uncertainties and differing approaches inherent in projecting the future. This shows that the full range of estimates drawn from a variety of stabilisation paths and years extends from -4% of GDP (that is, net gains) to +15% of GDP costs, but this mainly reflects outlying studies; most estimates are still centred around 1% of GDP. In particular, the models arriving at higher cost estimates make assumptions about technological progress that are very pessimistic by historical standards.

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