Response to the Stern Review discussion paper

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Thank you for the opportunity to comment on your Discussion Paper. I consider it a very good start. My main purpose in this submission is twofold: to support the adoption of a renewables-based economy in the context of a global, equitable framework; and to provide examples from ecology that might clarify the apparent reluctance among industry and the public, and especially the government, to embrace practical useful levels of change.

There is no doubt that climate change presents a series of unprecedented challenges to human society. If the present trends of fossil-fuel consumption and associated greenhouse gas (GHG) emissions continue, many of the world's major cities may be effectively uninhabitable within 100 years. People in developing countries especially will be further disadvantaged, resulting in increased poverty and death.

There are many submissions to this review which portray the likely consequences of inaction, and the potential ways we might mitigate the worst effects, and lead to stabilisation or reduction of global GHG emissions.

The economics of replacing our total reliance on fossil fuels with a balanced strategy of energy conservation and renewables is fraught with difficulty. We cannot afford serious mistakes in the transition or there will be great economic consequences.

The most cost-effective way to reduce emissions is, of course, energy conservation, it being seven times cheaper than generating new electricity by any means, But there remains the problem of new supply, and this must be renewable. If a mix of energy conservation and reduced use of fossil fuels is adopted in order to reduce emissions, industry is likely to expand to utilise a proportion of the energy saved, and there will come a point where a very energy-efficient industrial sector releasing unsustainable quantities of GHG emissions, is faced with environmental imperatives to cut emissions. In this scenario, economic collapse follows.

An alternative to this must be found, and this must involve caps on GHG emissions and new supply from renewables, which should be deployed alongside energy conservation measures.

The option of nuclear power is not really an option at all. It would not solve the problem, it is much too expensive, and it has major consequences for security and health, essentially forever (see e.g. Mobbs 2005). The pursuit of nuclear power as a

response to the problems of climate change will be an unnecessary, wasteful and harmful dead-end.

As mentioned in the Discussion Paper and submissions, it is critical to obtain international agreements before workable plans can be effective, and there is an urgent need for a trading scheme with which to allow developing nations such as China and India to grow whilst developing their own renewable energy supplies.

The best such scheme, which combines agreed global targets with equity of emissions, appears to be *Contraction and Convergence* (Meyer 2000). It is important, indeed I would say vital, to adopt this proposal immediately.

The governmental reluctance to embrace, or even mention *Contraction and Convergence*, parallels a perceived reluctance to embrace renewable or mitigating technologies such as solar, or efficient design (e.g. Sorrell *et al.*, 2004). This is regarded as a block to their adoption.

In nature, this is a normal response to progressive change seen in many systems, and stems from the actions of stabilising mechanisms which reinforce the status quo. The idea of *alternative stable states* is common in ecology (May 1977, Irvine *et al.*, 1989, Scheffer *et al.*, 2001), and can be manifested as two distinctly different regimes that can exist under the same general external influences. For example, under the same level and balance of nutrient income, a lake might have clear water and many flowering water plants, or may be a turbid pea soup; an area of land might be grassland or forest. Each state has functional mechanisms that keep it in that state, often in the face of strong environmental pressures to move to the alternative state, until a sudden perturbation forces change.

The same thing can be seen in societies. In Durham, increasing congestion led to a car-charging zone being established in the centre, which led to a reduction of 30% in the number of cars and an increase of 29,000 bus passengers during the morning peak. This was environmental pressure followed by a perturbation. Once the (stabilising) inertia of the previous, car-rich state had been broken, stabilising mechanisms started to develop, making it easier to leave the car at home e.g. there were more buses, people learned new routes, they found a shop to visit on the way home from work, they found they were getting more exercise, and so on. Once land-use planners start to build-in more permanent stabilising mechanisms, a new stable state will form.

There is bound to be a similar response to a new technology such as renewable energy supply and, therefore, it is important that a strong incentive is provided in order for these measures to be adopted i.e. provide a perturbation and stabilising buffers for the new (desired) state. The threats of climate change alone are a force for this, so economic incentives from the government need not be great.

When considering the economics of mitigation measures, the consequences of inaction should be borne in mind. The economic costs incurred through loss of ecosystems, for example through developments, usually go unrecognised because the developers and governments generally gain from them, even where there is a net loss, as is common (Balmford *et al.*, 2002). When nobody gains, as in environmental damage from climate change, everybody loses.

References

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End of submission