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The Copenhagen Consensus, conducted at four-year intervals, is an explicit attempt to prioritise solutions to many of the world's most pressing problems. In its 2008 exercise (CC08) (Lomborg, 2009), a panel of eminent scholars, on the basis of the input of a larger number of field experts, ranked proposed solutions to ten leading problems (see Table 1). Although we are pleased that one of the proposed solutions to climate change was raised from the bottom of the list in the 2004 exercise (Lomborg, 2004)) to the middle of the current list, we have several problems with the study design and the manner in which its results are being interpreted. As authors of the paper on climate change evaluated by the CC08 panel (Yohe *et al.*, 2009), we are concerned that the

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Table 1. The ten challenges in the Copenhagen Consensus 2008.

Air pollution
Conflicts
Diseases
Education
Global warming
Malnutrition and hunger
Sanitation and water
Subsidies and trade barriers
Terrorism
Women and development

report gives a misleading impression of the magnitude of the climate change problem, which in our opinion is in need of more serious attention than suggested by the Consensus Director in recent comments (Eilperin, 2009; Lomborg, 2008a, 2008b; Werth, 2009).

As a metric for evaluating policy proposals across a diverse set of issues, the Copenhagen Consensus focuses on each policy's benefit-cost ratio (BCR), which compares the value of the damages a policy avoids (its benefits) to the costs of the policy in percentage terms. The ranking of proposals according to this metric is one way to identify the "biggest bang for the buck" opportunities to address environmental and social externalities. For a charitable foundation or venture capital fund, this is likely a reasonable approach to allocating limited resources. A higher BCR implies a higher return on capital invested, so funding should be directed first to the projects with the highest return. However, any BCR greater than one implies a positive return, so from a societal perspective, all qualifying proposals are worth pursuing.

Moreover, when considering the relative merits of diverse policy proposals as a society, the sheer scale of the costs and benefits must be taken into account. CC08 asked each team of experts to limit the cost of its proposal at $75 billion spent over four years. While for some issues this constraint was not binding, in the case of a long-term problem like climate change, such an investment is a fraction of what many studies suggest will be necessary (Barker *et al.*, 2007; Weyant, 2004; Weyant *et al.*, 2006). Suppose, for example, we were to assume an equivalent investment over the rest of the century (roughly 0.05% of gross world product) and calculate the resulting benefits. We find that under this assumption, both the numerator and denominator of our BCR figures were much larger than those of the other proposals in the study. Thus if the *net benefit* (total benefit – total cost) were compared for each policy proposal, the climate policy packages would likely be ranked higher than most, if not all, options considered.[1]

[1]We note that we make no attempt to find the level of investment that equates marginal benefits and marginal costs.

For example, the top-rated proposal for provision of vitamin supplements to small children had a cost of $60 million annually and a benefit of ~$1 billion annually for a BCR of ~17 and net benefit of $0.94 billion annually (Lomborg, 2009). Our most comprehensive climate policy package had a (discounted) cost of $800 billion over the century and a benefit of $2.1 trillion, for a BCR of 2.7 but net benefit of $1.3 trillion in present value, three orders of magnitude larger than the top-rated proposal (Yohe *et al.*, 2009). In this case, evaluation in absolute terms is potentially more relevant to policymakers than the percentage-based BCR metric.

We examined three alternative sets of proposals for addressing the climate problem: (1) mitigation policy alone, (2) technology research and development (R&D) plus mitigation policy; and (3) a portfolio of R&D, mitigation, and adaptation assistance policy. Only proposal (1), mitigation policy alone, had a BCR less than one (0.9) and therefore failed the benefit-cost test. We note, however, that even in this case the result could have been different with alternative and equally plausible assumptions. A slightly lower discount rate (well within the range of current discussion [(Portney and Weyant, 1999; Arrow *et al.*, 1996; Nordhaus, 2007)]) would be sufficient to overcome the shortfall. Also, we only include the quantifiable and monetizable impacts of the climate change in the calculation of damages avoided, and we ignore uncertainty (Weitzman, 2009). We limit abatement to the rich countries, and spend a constant amount each year. If we had relaxed the latter assumption, and optimized the abatement effort over time, the benefit-cost ratio would have been well above one (Manne and Richels, 1999; Wigley *et al.*, 1996). If we had allowed rich countries to invest in emission reduction in poor countries, the benefit-cost ratio would have risen even higher (Babiker *et al.*, 2000; Edmonds *et al.*, 2008).

The other two combinations of policies appeared to be well worth undertaking even with such conservative assumptions about the efficacy of mitigation policy. That is, R&D plus mitigation — with or without adaptation assistance — had a BCR well above one. In these proposals, we assumed that an advanced portfolio of climate-friendly technologies (including carbon capture and storage, low-cost renewables, and accelerated energy efficiency improvements) could be developed at a cost of $2.5 billion per year for two decades.[2] During this timeframe, the remaining budget was spent on mitigation; in subsequent decades, all effort was focused on mitigation. Because R&D has made new technologies available, substantially more abatement (and therefore avoided climate damages) can be bought for the fixed budget.

Unfortunately, the panel chose an R&D programme by itself (not a proposal on our list) as the preferred climate policy approach. R&D is undoubtedly crucial, as most observers agree that it is not politically or economically feasible to deeply cut greenhouse gas emissions with currently available technologies (Edmonds *et al.*, 2004; Pacala and Socolow, 2004). At the same time, successful R&D only puts new technologies on the shelf. Mitigation policy is needed to take technologies off the

[2]This is an increase $1.4 billion per year over current funding of $0.9 billion (EPRI, 2007).

shelf and put them to work in the marketplace (Richels and Blanford, 2008). Although including mitigation effort along with R&D in the benefit-cost calculation leads to a lower BCR (still greater than one), it substantially increases net benefit by internalizing the externality of climate damages. We stress again that the magnitude of avoided damages from mitigation in our analysis most likely exceeds that of any other policy measure studied in CC08. That policies to address other issues also make sense must not be used as an excuse to ignore the single largest environmental threat we currently face.

Further, the Consensus Director has reduced our proposed portfolio of R&D investment to a single technology: "The answer is to dramatically increase research and development so that solar panels become cheaper than fossil fuels sooner rather than later", (Lomborg, 2008a). Technological progress and markets are unpredictable. If solar panels does not become economical in its own right it will not be deployed, in the absence of mitigation policy. Under uncertainty, it is always unwise to put all our eggs in one basket. In our analysis, we consider a broad R&D portfolio. Diversification increases the likelihood that a suite of advanced climate-friendly technologies will be available to extend the reach of our mitigation dollar.

When adaptation assistance is included in the policy proposal, we slightly reduce the budget for R&D and mitigation (by less than 5%), and spend the money to take away some of the most significant impacts of climate change in the short run (Tol, 2005). Specifically, we propose to co-fund the ongoing efforts to combat diarrhoea and malaria, to the extent that these diseases are induced by climate change. Because such efforts are as cheap as they are beneficial, the benefit-cost ratio for the portfolio becomes even larger. The CC08 panel did not accept this option, because it proposes to devote substantial resources to health care anyway. If the effort to eradicate infectious diseases is successful, there is indeed less need to adapt to climate change. But we find that their dismissal of adaptation on these grounds alone is counterproductive, as the health example was only meant to be illustrative of the high payoff from investments in adaptation. Many types of adaptation will be required to deal with climate change (Adger *et al.*, 2007; Fankhauser *et al.*, 1999; Yohe and Tol, 2002) — far too many to analyse in a single study.

In conclusion, we believe that our contribution to CC08 makes a strong case for a portfolio approach to climate policy, and does so on the basis of fairly conservative assumptions. The portfolio consists of R&D, mitigation and, adaptation, whether funded from climate policy or other resources. The panel accepted the benefit-cost ratios provided in the climate chapter for these proposals, which implies that they are all worthy of investment. It is regrettable that the Director of the exercise has not seen fit to highlight this conclusion.

References

Adger, WN, S Agrawala, MQ Mirza, C Conde, KL O'Brien, J Pulhin, R Pulwarty, B Smit and K Takahashi (2007). Assessment of adaptation practices, options, constraints and capacity,

in *Climate Change 2007: Impacts, Adaptation and Vulnerability — Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, ML Parry *et al.* (eds), Cambridge: Cambridge University Press, 717–743.

Arrow, KJ, WR Cline, K-G Maeler, M Munasinghe, R Squitieri and JE Stiglitz (1996). Intertemporal equity, discounting, and economic efficiency, in *Climate Change 1995: Economic and Social Dimensions — Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change*, JP Bruce, H Lee and EF Haites (eds), Cambridge: Cambridge University Press, 125–144.

Babiker, MH, JM Reilly and HD Jacoby (2000). The Kyoto Protocol and developing countries. *Energy Policy*, 28, 525–536.

Barker, T, I Bashmakov, A Alharthi, M Amann, L Cifuentes, J Drexhage, M Duan, O Edenhofer, BP Flannery, MJ Grubb, M Hoogwijk, FI Ibitoye, CJ Jepma, WA Pizer and K Yamaji (2007). Mitigation from a cross-sectoral perspective, in *Climate Change 2007: Mitigation — Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, B Metz *et al.* (eds), Cambridge: Cambridge University Press, 619–690.

Edmonds, J, J Clarke, J Dooley, SH Kim and SJ Smith (2004). Stabilization of CO_2 in a B2 world: Insights on the roles of carbon capture and disposal, hydrogen, and transportation technologies. *Energy Economics*, 26(4), 517–537.

Edmonds, J, L Clarke, J Lurz and M Wise (2008). Stabilizing CO_2 concentrations with incomplete international cooperation. *Climate Policy*, 8(4), 355–376.

Eilperin, J (2009). Group advocates geoengineering solutions to warming, *Washington Post*, September 4.

EPRI (2007). *The Power to Reduce CO_2 Emissions: The Full Portfolio*. Palo Alto: Electric Power Research Institute.

Fankhauser, S, JB Smith and RSJ Tol (1999). Weathering climate change: Some simple rules to guide adaptation decisions. *Ecological Economics*, 30, 67–78.

Lomborg, B (ed) (2004). *Global Crises, Global Solutions*, Cambridge: Cambridge University Press.

Lomborg, B (2008a). A better way than cap and trade, *Washington Post*, June 26.

Lomborg, B (2008b). McCain, Obama and hot air, *The Guardian*, July 3.

Lomborg, B (ed) (2009). *Global Crises, Global Solutions*, (2nd edn), Cambridge: Cambridge University Press.

Manne, AS and RG Richels (1999). The Kyoto Protocol: A cost-effective strategy for meeting environmental objectives? *Energy Journal* (Special Issue on the Costs of the Kyoto Protocol: A Multi-Model Evaluation), 1–24.

Nordhaus, WD (2007). Critical assumptions in the Stern Review on Climate Change. *Science*, 317, 201–202.

Pacala, S and R Socolow (2004). Stabilization wedges: Solving the climate problem for the next 50 years with current technologies. *Science*, 305(5686), 968–972.

Portney, PR and JP Weyant (eds.) (1999). *Discounting and Intergenerational Equity.* Washington, DC: Resources for the Future.

Richels, RG and GJ Blanford (2008). The value of technological advance in decarbonizing the US economy. *Energy Economics*, 30(6), 2930–2946.

Tol, RSJ (2005). Emission abatement versus development as strategies to reduce vulnerability to climate change: An application of FUND. *Environment and Development Economics*, 10(5), 615–629.

Weitzman, ML (2009). On modelling and interpreting the economics of catastrophic climate change. *Review of Economics and Statistics*, 91(1), 1–19.
Werth, C (2009). The black sheep. *Newsweek*, July 2.
Weyant, JP (2004). Introduction and overview. *Energy Economics*, 26, 501–515.
Weyant, JP, FC de la Chesnaye and GJ Blanford (2006). Overview of EMF-21: Multigas mitigation and climate policy. *Energy Journal* (Multi-Greenhouse Gas Mitigation and Climate Policy Special Issue), 1–32.
Wigley, TML, RG Richels and JA Edmonds (1996). Economic and environmental choices in the stabilization of atmospheric CO_2 Concentrations. *Nature*, 379, 240–243.
Yohe, GW and RSJ Tol (2002). Indicators for social and economic coping capacity — Moving towards a working definition of adaptive capacity. *Global Environmental Change*, 12(1), 25–40.
Yohe, GW, RSJ Tol, RG Richels and GJ Blanford (2009). Climate Change, in *Global Crises, Global Solutions*, 2nd edn., B Lomborg (ed), Cambridge: Cambridge University Press.