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Chair: Professor Lord Stern
of Brentford

14 December 2012

Dear Mr Lilley,

I am writing to draw your attention to some serious inaccuracies and misrepresentations which featured in your comments during a debate in the House of Commons on 29 November.

During the debate, which followed a statement by the Secretary of State for Energy and Climate Change, you said (Hansard, 29 November, Column 393):

“Lord Stern, whose discredited report still forms the rationale for the Government’s energy policy, calculated in 2006 the amount by which the price of hydrocarbons needed to be increased in order to decarbonise the economy. Since then, the price of hydrocarbons has risen faster and further than either Lord Stern or the Intergovernmental Panel on Climate Change thought sufficient, so why does my right hon. Friend propose to pile Pelion upon Ossa by burdening British industry and households with these tripled taxes?”

In fact, ‘The Economics of Climate Change: The Stern Review’ did not include a calculation of “the amount by which the price of hydrocarbons needed to be increased in order to decarbonise the economy”, so it is very surprising that you should make such an acutely inaccurate claim. The Review does, however, state on pages 212-213 of the version published by Cambridge University Press:

“There appears to be no good reason, then, to expect large increases in real fossil-fuel prices to be necessary to bring forth supply. Yet big increases in price would be required to hold energy demand and emissions growth in check if no other method were also available. The IEA [International Energy Agency] emissions projections envisage an average annual rate of increase of 1.7% to 2030. If the price elasticity of energy demand were -0.23, an estimate in the middle of the range in the literature, the prices of fossil fuels would have to increase by over 7% per year in real terms merely to bring the rate of emissions growth back to zero, implying a more-than-six-fold rise in the real price of energy.”

Furthermore, your assertion that the Review has been discredited is also wholly wrong. I assume that you consider that the basis for such a false claim is provided by your pamphlet on 'What is Wrong with Stern? The Failings of the Stern Review of the Economics of Climate Change', which was published in October by Lord Lawson's club for climate change 'sceptics', the Global Warming Policy Foundation. However, the case presented in your pamphlet is based on misrepresentations of the contents of the Review, along with a mixture of error and confusion about the science and economics of climate change, which means your criticisms lack any validity.

The primary complaint presented in your pamphlet relates to the following conclusion from the Review: "Using the results from formal economic models, the review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever."

You describe this finding as "simply untrue", and you dismiss the impacts of climate change on the grounds that "they will be largely in the very distant future". In fact, the Review describes in detail the robust methodology of its modelling in Chapter 6 (of 27). It uses the PAGE2002 integrated assessment model to explore the costs of climate change impacts based on the A2 emissions scenario published by the Intergovernmental Panel on Climate Change in 2001, which projects a mean temperature rise of 3.9°C by 2100 (compared to an overall combined warming range of 1.4 to 5.8°C for the six IPCC reference scenarios). Uncertainties in his 'baseline climate' scenario were explored through 1000 runs of the model, yielding a mean loss in global per capita GDP of 0.2% in 2060, rising to 0.9% in 2100 and 5.3% in 2200.

The Review used the information about how global GDP would be affected by the impacts of the baseline climate scenario, taking into account the uncertainties across 1000 runs, to estimate global welfare costs. This meant converting per capita global GDP at each point in time between 2001 and 2200 into consumption, then calculating the social utility of per capita consumption, before multiplying by global population.

This calculation for each of the 1000 model runs also took into account, through the use of appropriate discount rates, the standard economic assumption that the extra utility produced by additional consumption falls as the level of consumption rises. In essence, this means that an extra pound is considered to be worth more to a poor person than it is to a rich person.

This assumption places greater weight on near-term consumption than on consumption in the distant future, because in most scenarios for climate change, the world will be richer in the future as a result of economic growth. However, these model runs also acknowledged that climate change could substantially reduce consumption growth in the future. Different impacts across the 1000 runs resulted in different growth rates, and required different discount rates.

This approach to discounting was emphasised throughout the Review, particularly in Chapter 2, which states: “The discount rate is the rate of fall of the discount factor. There is no presumption that it is constant over time, as it depends on the way in which consumption grows over time”, and “a single constant discount rate would generally be unacceptable for dealing with the long-run, global, non-marginal impacts of climate change”.

Yet your pamphlet ignores this and instead makes the entirely false statement that the Review “adopts an ultra-low rate without explicitly disclosing it”. This mistake is compounded in the vitriolic Foreword to your pamphlet by Professor Richard Tol, which wrongly states: “The Stern Review uses a single discount rate”.

It is clear from your criticism that you favour high discount rates, which would mean that even if huge damages mount over the next few centuries from unmanaged climate change, they should be treated today as being of negligible importance on the grounds that everybody will be much richer.

The Review points out that when social utility is calculated and aggregated across different possible outcomes over time, the resulting measure could most immediately be expressed in terms of expected ‘utils’. But the significance of ‘utils’ would be difficult for most people to grasp, so instead the Review applied the balanced growth equivalent, which essentially measures the utility generated by a consumption path in terms of the consumption now that, if it grew at a constant rate, would generate the same utility. Your pamphlet describes this as a “novel and misleading practice”, when in fact the balanced growth equivalent was first described in the ‘Journal of Economic Theory’ in 1972 by Nicholas Stern and James Mirrlees, who was awarded the Nobel Memorial Prize for Economics in 1996.

The Review concludes from the model runs, using the balanced growth equivalent, that: “Climate change is projected to reduce average global welfare by an amount equivalent to a permanent cut in per-capita consumption of a minimum of 5%”. But it also explicitly acknowledges that this is likely to be an underestimate of the costs of unmanaged climate change.

First, in each of the 1000 runs, it was assumed, as a simplification, that “the world instantaneously overcomes the problems of climate change in the year 2200 (zero damages and zero adaptation) and all runs grow at an arbitrary 1.3% into the far-off future”. Second, the Review notes that integrated assessment models do not fully incorporate all of the potential consequences that could arise from climate change, including ‘socially contingent’ impacts such as migration and conflict.

So it is clear that your central criticism of the Review is based on a combination of misrepresentations and bad economics. But your pamphlet is also fundamentally mistaken in its criticisms of the presentation of the science of climate change in the Review. You claim that your pamphlet “takes the IPCC assessment of the scientific literature as given”, but you then contradict the IPCC Fourth Assessment Report, which was published in 2007, throughout. For instance, your pamphlet states that

“Stern draws heavily on non-peer reviewed and alarmist literature to paint an exaggerated picture of the key risks of global warming”. That is simply an absurd claim. The references sections at the end of each chapter of the Review show that the overwhelming majority of citations are to peer-reviewed journal articles.

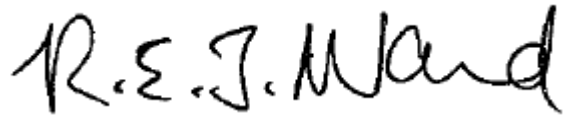
Your pamphlet suggests that rising sea level “is the most iconic fear aroused by global warming”, but then indicates that “the oceans are set to rise at a rate similar to the average of the last 18,000 years”. In fact, the Fourth Assessment Report states: “Global sea level rose by about 120 m during the several millennia that followed the end of the last ice age (approximately 21,000 years ago), and stabilised between 3,000 and 2,000 years ago. Sea level indicators suggest that global sea level did not change significantly from then until the late 19th century. The instrumental record of modern sea level change shows evidence for onset of sea level rise during the 19th century.”

Your pamphlet also complains that “Stern highlights the number of people forecast to suffer increased water stress, although twice as many will enjoy reduced water stress”. In fact, the IPCC Fourth Assessment Report states: “Water stress is modelled to decrease by the 2050s on 20 to 29% of the global land area (considering two climate models and the SRES A2 and B2 scenarios) and to increase on 62 to 76% of the global land area...The change in the number of people under high water stress after the 2050s greatly depends on emissions scenario: substantial increase is projected for the A2 scenario; the speed of increase will be slower for the A1 and B1 emissions scenarios because of the global increase of renewable freshwater resources and the slight decrease in population.”

It is blatantly obvious why you dislike the Stern Review so much: it acknowledges the risks identified by robust scientific analysis, instead of downplaying or dismissing them, and it uses rigorous economic methods to evaluate the potential future impacts of unmanaged climate change, rather than simply disregarding the welfare of future generations. Far from being discredited, as you wrongly claim, the Review remains a highly-regarded and influential document, and its reputation has been strengthened by subsequent research and analysis which have shown that the risks posed by unmanaged climate change are huge, while sensible preventative action is both affordable and attractive. The Review created vigorous debate among economists when it was first published six years ago, and its contributors have subsequently published a number of peer-reviewed papers that have elaborated on the analysis, addressed criticisms and offered clarifications – I have enclosed a list of them with this letter so that you may obtain and read them.

In view of this, I suggest that you both subject your pamphlet to a fundamental revision, so that you might correct the numerous and substantive errors in it, and refrain from making further false public statements which misrepresent the contents of the Stern Review. I am copying this letter to the Secretary of State for Energy and Climate Change and to the Chair of the House of Commons Select Committee on Energy and Climate Change so that they may also take note of these serious errors in your public statements.

Yours sincerely,

A handwritten signature in black ink that reads "R.E.J. Ward". The letters are cursive and connected, with a large initial "R" and "W".

Bob Ward
Policy and Communications Director

cc Rt Hon Ed Davey, Secretary of State for Energy and Climate Change
Tim Yeo, Chair of the House of Commons Select Committee on Energy and
Climate Change

Papers about the Stern Review by its contributors

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Lorraine Hamid, Nicholas Stern and Chris Taylor (2007). Reflections on the Stern Review (2): a growing international opportunity to move strongly on climate change. *World Economics*, volume 8, number 1, pages 169 – 186: <http://www.world-economics-journal.com/Contents/ArticleOverview.aspx?ID=271>

Simon Dietz, Dennis Anderson, Nicholas Stern, Chris Taylor and Dimitri Zenghelis (2007). Right for the right reasons: a final rejoinder on the Stern Review. *World Economics*, volume 8, number 2, pages 229 – 258: <http://www.world-economics-journal.com/Contents/ArticleOverview.aspx?ID=292>

Simon Dietz, Chris Hope and Nicola Patmore (2007). Some economics of ‘dangerous’ climate change: reflections on the Stern Review. *Global Environmental Change*, volume 17, issues 3–4, pages 311–325: <http://www.sciencedirect.com/science/article/pii/S095937800700043X>

Simon Dietz and Nicholas Stern (2008). Why economic analysis supports strong action on climate change: a response to the Stern Review's critics. *Review of Environmental Economics and Policy*, volume 2, issue 1, pages 94-113: <http://reep.oxfordjournals.org/content/2/1/94.short>

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Simon Dietz and Nicholas Stern (2009). Note—on the timing of greenhouse gas emissions reductions: a final rejoinder to the symposium on “The Economics of Climate Change: The Stern Review and its Critics”. *Review of Environmental Economics and Policy*, volume 3, issue 1, pages 138-140: <http://reep.oxfordjournals.org/content/3/1/138.short>

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Dennis Anderson (2007). The Stern Review and the costs of climate change mitigation: a response to the ‘Dual Critique’ and the misrepresentations of Tol and

Yohe. *World Economics*, volume 8, number 1, pages 211 – 219: <http://www.world-economics-journal.com/Contents/ArticleOverview.aspx?ID=273>

John F. Mitchell, Julia Slingo, David S. Lee, Jason A. Lowe and Vicky Pope (2007). Response to Carter et al. *World Economics*, volume 8, number 1, pages 221 – 228: <http://www.world-economics-journal.com/Contents/ArticleOverview.aspx?ID=274>

Nigel Arnell, Rachel Warren and Robert Nicholls (2007). Response to ‘The Stern Review: A Dual Critique’. *World Economics*, volume 8, number 1, pages 229 – 231: <http://www.world-economics-journal.com/Contents/ArticleOverview.aspx?ID=275>

Andrew Glikson (2007). A response to ‘The Stern Review: A Dual Critique’. *World Economics*, volume 8, number 1, pages 233 – 238: <http://www.world-economics-journal.com/Contents/ArticleOverview.aspx?ID=276>

Ian Simmonds and Will Steffen (2007). Response to ‘The Stern Review: A Dual Critique—Part I: The Science’. *World Economics*, volume 8, number 2, pages 133 – 141: <http://www.world-economics-journal.com/Contents/ArticleOverview.aspx?ID=287>

Weitzman, Martin L. (2007). A review of The Stern Review on the Economics of Climate Change. *Journal of Economic Literature*, volume 45, number 3, pages 703-724: <http://www.ingentaconnect.com/content/aea/jel/2007/00000045/00000003/art00004>

Geoffrey Heal (2009). The economics of climate change: a post-Stern perspective. *Climatic Change*, volume 96, number 3, pages 275-297: <http://www.springerlink.com/content/2866362w164531tg/>