

## **With Friends Like Bjorn Lomborg, Environmentalists Don't Need Enemies**

*Bjorn Lomborg, a Danish statistician who claims to be an environmentalist, has written a book attacking environmentalism that is making waves in Europe. Here we respond to some of the main arguments of *The Skeptical Environmentalist* (Cambridge University Press, Cambridge, 2001).*

Lomborg's stated intention is to use the statistical evidence to demolish what he calls the 'litany' of four big environmental fears – exhaustion of natural resources, overpopulation, extinction of species and worsening pollution.

It is odd that Lomborg should call himself an environmentalist, for it becomes apparent on reading his book that he has a poor understanding of ecology, environmental economics and environmental politics. In this review we concentrate mainly on his claims about climate change. For a critique of other areas of Lomborg's analysis, the reader may wish to refer to the recent review in *Nature*<sup>1</sup> and reviews prepared by the Union of Concerned Scientists, including ones by eminent experts such as Peter H. Gleick, Edward O. Wilson, Tom Lovejoy, Stuart L. Pimm and Jeff Harvey.<sup>2</sup> The World Resources Institute has also prepared a critique.<sup>3</sup> These commentaries describe the litany of scientific error, misunderstanding, misrepresentation and misquotation that characterise the book.

In writing his book, Lomborg has delved into a number of highly specialized areas of study. Usually when academics stray from their areas of specialization, they adopt a degree of caution and humility. Most have learned from their own disciplines how easy it is for neophytes to make fools of themselves. Lomborg displays none of this humility but writes as if he is expert in many areas where he clearly has no real expertise. As a result, much of his analysis has an undergraduate quality to it, a quality that would be amusing or irritating if the subject matter were not so serious.

### **Lomborg on climate change science**

For over a decade hundreds, indeed thousands, of the world's climate scientists have been working on how best to estimate the likely effects on the Earth's climate of increasing concentrations of greenhouse gases. Under the auspices of the UN's Intergovernmental Panel on Climate Change (IPCC) these scientists come together to carefully sift through and collate the mass of evidence and to respond to every credible scientific doubt that is raised about the research. After an exhaustive process that includes several stages of peer review, the IPCC publishes its conclusions about the likely extent of warming and associated effects on the world's climate. The third and latest report of the IPCC appeared this year.

The scores of scientists of the IPCC will undoubtedly be grateful to the Danish statistician who has now pointed out some fundamental errors in their work. The thrust of Lomborg's critique is that the IPCC scientists have failed to

understand the effects of aerosols and water vapour on the climate. Nor, he argues, do they understand how clouds work.

Anyone who reads the reports of the IPCC will have noticed how cautious they are in their pronouncements, never hesitating to point to the uncertainties in the modelling of climate change and the projections of the future. Lomborg exploits this honesty; wherever a piece of research casts doubt on some part of the analysis Lomborg will take it up and work on it. But Lomborg is only interested in uncertainty that implies that the extent of climate change may be exaggerated, a debating trick employed unashamedly by the tiny band of climate change skeptics.<sup>4</sup> For those of us who are not climate scientists, we must decide whom to believe – the several hundred professional scientists whose work is thoroughly peer reviewed and published in the leading journals, or a handful of skeptics some of whom are funded by the fossil fuel lobby and whose arguments are inexpertly recycled by Bjorn Lomborg.

## **Lomborg on climate change economics**

Lomborg claims to be an economist as well as a statistician.<sup>5</sup> We find this hard to believe. For example, his discussion of the ‘double dividend’ that may follow the imposition of environmental taxes (pp. 308-309), is so incoherent that it is impossible to know where a critique should begin. His review of parts of the double dividend literature wholly misunderstands the nature of the debate and the policy issues at stake, and seriously misrepresents the views of some of those he cites. It is impossible to pick out a wrong statement as the whole two pages in the book are gobbledygook.<sup>6</sup>

For us, one of the most bizarre features of Lomborg’s book is that he forensically examines the claims of environmental scientists to show that they are contradicted by ‘the facts’, yet he accepts uncritically the most exaggerated claims by economists of the costs of reducing greenhouse gas emissions. Thus, after chapters stressing the uncertainties associated with climate science, he writes as if economic analysis of the costs of cutting emissions were gospel. The hard-headed skeptic dedicated to ‘measuring the real state of the world’ seems blind to a mass of information that suggests that the economic estimates of costs he quotes are marred by enormous uncertainty. The hard-headed skeptic who devotes himself to exposing the exaggerations of environmentalists has chosen to ignore a large literature that exposes the exaggerations of the economists.

A volume could be written on this subject but here we make only the following two or three points. Lomborg quotes the collective results of 13 different economic modelling studies of the costs of implementing the Kyoto Protocol (p. 303). The costs for industrialised countries in the year 2010 are estimated by these models to range from around US\$75 billion to US\$350 billion depending on assumptions about coverage and policy measures. On this basis, Lomborg concludes that the cost of reducing emissions would exceed the cost of climate change, and that therefore we should not attempt to cut emissions.

If Lomborg had applied his ‘skepticism’ to the economic models in the way he applied it to the science of climate change, he would have asked about the assumptions that are built into them, and how those assumptions affect the results. He would have had to go no further than the author of the model review paper he uses, Stanford’s John Weyant, who has elsewhere noted the crucial influence of modellers’ assumption on model results:

Cost projections can vary by a factor of two or four across models because of differences in the models' representation of substitution and innovation processes. ... differences in assumptions about the baseline, policy regime, and emission reduction benefits can easily lead to a factor of ten or more difference in the cost estimates.<sup>7</sup>

## **Lomborg on the role of technology**

It is instructive to focus on just one of the several crucial assumptions built into these economic models – the treatment of technological change. The models assume that the only technological change that occurs is an annual fixed rate of improvement (usually around 1 per cent per annum) in the level of energy efficiency. Otherwise, the economy responds to a carbon constraint by switching between existing energy technologies. In other words, measures such as large carbon taxes do not result in any development of the technologies used to meet energy needs. The rapid technological changes that business people and market analysts expect in response to mandated measures to cut emissions can be found nowhere in the models. While this technological transformation will not be costless, the history of innovation suggests that it will dramatically reduce the costs of shifting from high to low-emission energy sources.

Without a technological response the costs of cutting greenhouse gases will be higher, perhaps even as high as the models suggest (although relaxing any one of several other assumptions can also bring the cost estimates down substantially). Yet the market has always demonstrated that it is more responsive than the economic models allow, and there is an irony in the fact that environmentalists have more faith in the ability of the market to meet emission constraints than neoclassical economists.

This technological hole in the economic models will undoubtedly come as a shock to Lomborg because elsewhere in his elaborately constructed argument he himself has given great prominence to the powers of technological change. In order to attack the IPCC's projections of growth in CO<sub>2</sub> concentrations and associated warming, Lomborg argues that the market, unconstrained by emission cuts demanded by the Kyoto Protocol, will see a natural transition from fossil fuels to renewable energy simply because the unit costs of solar technologies will continue to decline. Thus if we leave the market to itself,

global warming is not an ever worsening problem. In fact under any reasonable scenario of technological change and without policy intervention, carbon emissions will not reach the levels of A1F1 [the IPCC's worst case] and they will decline towards the end of the century, as we move towards ever cheaper renewable energy sources (pp. 283-84).

If more evidence of Lomborg's bias were needed, then here it is. He simultaneously argues that technological change will save the day without any intervention, but reports uncritically economic models that show intervention will be too costly when those models ignore technological change. We are left to conclude that technology will save us if we do nothing, but that if we attempt to cut emissions the absence of technological change will mean it is too costly.

Ever the prisoner of economic dogma, Lomborg also reproduces the old economists' refrain that there is no such thing as a free lunch (p. 311). In practice this means that there is no such thing as energy efficiency because if firms could save money from reducing energy consumption they would already be doing so.<sup>8</sup>

This is an article of faith of neoclassical economists – it’s in every textbook – and the ‘profit maximising’ assumption is built into the economic models. Profit maximization is there not just as an assumption; in most models it is built into the very algorithms that are used to solve them.

Yet if Lomborg were really interested in the ‘truth’ and had searched a little further he would have come across dozens of studies by engineers and energy experts showing that, in countries such as the USA and Australia, energy consumption and associated emissions could be cut by 20-40% *at no net cost*, enough to meet Kyoto targets and quite a bit more.<sup>9</sup>

## **Lomborg on environmental policy and politics**

For someone who claims to be a political scientist,<sup>10</sup> Lomborg displays an astonishing ignorance of how the world works. He argues, for instance, that the Kyoto Protocol will have such a small impact on global emissions that it ‘merely buys the world six years’, for the world will reach the same concentration of greenhouse gas emissions in 2106 instead of 2100 if the Kyoto protocol is implemented.

It is difficult to understand how anyone who has even a cursory knowledge of the process leading to the Kyoto Protocol can make such an absurd claim. Everyone knows that the Kyoto Protocol is merely a first small step on the path towards a low-emission world. Lomborg’s argument is equivalent to saying: “It is pointless walking to your front gate because it will only get you one hundredth of the way to the shops. So don’t bother.”

Lomborg’s political naivety is most apparent in his discussion of pollution. He makes the observation that:

Most forms of environmental pollution either appear to have been exaggerated, or are transient—associated with the early phases of industrialisation and therefore best cured not by restricting economic growth, but by accelerating it (*The Economist*, 2 August 2001).

This is perhaps the central claim of Lomborg’s book, yet there are so many problems with it that it is hard to know where to start. Firstly, there are several forms of pollution and waste that have continued to increase and whose effects cannot be said to be exaggerated or transient. High-level nuclear waste, plastic wastes and greenhouse gas emissions are perhaps the most obvious. But it is true that many forms of pollution have indeed been cleaned up in industrialised countries. Factories can no longer dump toxic wastes into the rivers (although some still do and their owners find themselves in court). Urban air pollution in most major cities is not as bad as it was 20 or 30 years ago.

However, these improvements have not come about because countries have become richer. They have occurred because environment groups and citizens have insisted on them and have forced legislators to pass laws banning many forms of pollution and requiring factories and cars to have pollution reduction equipment. In other words, a country’s political system, rather than its wealth, determines its response to environmental threats. By noting the association between improvements in some forms of pollution and high incomes, Lomborg has confused correlation with causation, an unforgivable error for a statistician.

Just as higher national incomes are not the cause of environmental improvements, more growth will not induce further gains. In fact, keeping pollution and toxic wastes relatively low and reducing them further requires an

unceasing battle against the effects of economic growth.<sup>11</sup> For example, while dangerous vehicle emissions in our cities have been declining – due to laws requiring all cars to have catalytic converters and requiring fuels to have lower levels of lead and sulphur – most experts believe that the sheer growth in the volume of cars is now starting to offset the benefits of better technology. As a result, urban air pollution is expected to begin to increase. At least, things will become worse unless environmentalists and citizens collectively insist on even tougher standards. It will not just happen as incomes rise, not least because tougher standards will be met with vigorous opposition from corporate interests. In Australia, for example, some oil companies are strenuously resisting the tougher fuel and engine standards that the Federal Government wants to introduce and in the USA the Bush Administration is winding back some of the environmental improvements introduced by the Clinton Administration.

Lomborg's claim that economic growth will alone solve our environmental problems has been thoroughly investigated in the literature in the debate over the 'environmental Kuznets curve', a literature that is central to Lomborg's argument but to which he does not refer.<sup>12</sup> The hypothesis is that as countries begin to industrialise pollution and waste become worse, perhaps much worse, but as they become richer, environmental problems are ameliorated and there is a general improvement in the state of the natural world. The hypothesis that there is a causal relationship between income levels of environmental quality is difficult to sustain. Some countries become industrialised yet the environment continues to deteriorate, while others do much better. The reason that the Soviet system had such an appalling environmental record is simple: there were no environmental organisations to campaign against the government and the industries causing the problems.

If today in rich countries we enjoy cleaner air and water, use less persistent and toxic agricultural chemicals, have improved safety regulations for the use of nuclear power and so on, there is no guarantee that things will continue to improve. We have already noted that air quality in some cities is expected to begin to deteriorate. We know that even a small step on the path to reducing greenhouse gases has been fought tooth and nail by powerful vested interests. The governments of some very rich countries, notably the USA and Australia, have done all they can to sabotage any agreement. Would Lomborg like to nominate the future level of per capita GDP at which he expects the USA to abandon its opposition to the Kyoto Protocol?

## **Lomborg's moral compass**

By reproducing uncritically the results of the economic models to argue that it would be too expensive to tackle climate change, Lomborg also endorses the moral viewpoint on which the models are built. The perversity of this view is perhaps obscure to the statistician, but most other people can see it. Put simply, it is the distinction between economic values and ethical values, and the impossibility of reducing the latter to the former.

The models he relies on, and the whole tenor of his argument, assume that the value of an ancient forest is measured by its timber yield, the value of the Great Barrier Reef is measured by the tourist revenue it generates and the value of a species is no more than its potential contribution to medicine. The value of life is measured by forgone income. It is as if we value our children by the life

insurance premiums we pay. In fact, the models do not even go that far. Despite the accumulated evidence that many lives, perhaps millions, will be lost and ecosystems the world over may be severely damaged by climate change, the models are only interested in the impacts on the 'economy', that is goods and services whose values can be found in the national accounts.

Lomborg writes that it will be cheaper for 'the world' to adapt to climate change rather than reduce emissions (p. 318). Adaptation will include shifting populations from low-lying islands. Perhaps as part of his next world tour Lomborg could visit Tuvalu and the Maldives and inform the citizens of those sinking lands that, instead of cutting their greenhouse gas emissions, it is cheaper for the rich countries to shift them away from their ancestral homes to somewhere else on the planet. Perhaps Lomborg could visit Pakistan or the Sahel and tell the citizens that, although their crop yields are expected to decline by 30%, the rich countries would find it cheaper to 'compensate' them rather than reduce their consumption of fossil fuels.

In Lomborg's moral universe, on the basis of a cost-benefit analysis humanity can decide how much to adjust the global thermostat and transform the climate system of the Earth. To imagine that the Earth exists to satisfy human desire and that humanity can calculate how best to regulate natural systems of unimaginable complexity is not just an expression of breath-taking hubris, but reflects a contempt for the natural world and the place of humans in it. These are precisely the attitudes that environmentalism exists to oppose.

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<sup>1</sup> *Nature*, Vol. 414, 8 November 2001, pp. 149-150.

<sup>2</sup> See the website of the Union of Concerned Scientists, <http://www.ucsusa.org/environment/lomborg.html>.

<sup>3</sup> Available on the World Resources Institute's website, [http://www.wri.org/wri/press/mk\\_lomborg.html](http://www.wri.org/wri/press/mk_lomborg.html).

<sup>4</sup> Lomborg himself is guilty of gross overstatement of the end-of-the-world variety. For example: "this would require a complete cessation of all carbon emissions by 2035, essentially shutting down the world as we know it" (p. 309), and "it is likely that much of the carbon-intensive production will merely move to the developing countries" (p. 304), an absurd exaggeration that not even the economic models support.

<sup>5</sup> A claim he made in a debate on Australia's ABC Radio National on 13<sup>th</sup> October 2001.

<sup>6</sup> For a clear and balanced discussion of the issues, see OECD, *Environmentally Related Taxes in OECD Countries: Issues and Strategies* (OECD 2001).

<sup>7</sup> John Weyant, 'An Introduction to the Economics of Climate Change Policy', Prepared for the Pew Center on Global Climate Change, July 2000, p. iv.

<sup>8</sup> Lomborg claims that "several analyses suggest that the acclaimed tremendous reduction potentials are mirages" (p. 311), but does not cite any references.

<sup>9</sup> For Australia, see G. Wilkenfeld, Energy Efficiency Programs in the Residential Sector. In WJ Bouma, GI Pearman & M Manning (eds) *Greenhouse: Coping With Climate Change*, CSIRO Publishing, Melbourne, 1996.

<sup>10</sup> See Note 5 above.

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<sup>11</sup> There are many such studies. See, for example, Clive Hamilton and Hal Turton, 'Determinants of Emissions Growth in OECD Countries', *Energy Policy*, January 2002.

<sup>12</sup> Lomborg actually refers to two sources that contradict his thesis in a footnote (number 1280) but dismisses them, preferring to rely on two studies that are 8-10 years out of date. For recent, balanced views see, for example, T. Cavlovic *et al.*, 'A meta-analysis of environmental Kuznets curve studies', *Agricultural and Resource Economics Review*, Vol. 29 (2000), pp. 32-42, T. Panayotou, 'Demystifying the environmental Kuznets curve: turning a black box into a policy tool', *Environmental and Development Economics*, Vol. 2 (1997), pp. 465-484, and C. Tisdell, 'Globalisation and sustainability: environmental Kuznets curve and the WTO', *Ecological Economics*, Vol. 39 (2001) pp. 185-196.