

## Referee Report

“Climate Risks and Carbon Prices: Revising the Social Cost of Carbon” is an excellent example of climate advocacy that is typical of environmental advocacy magazines. It carefully mixes facts and fantasy to tell a pleasing story about how only the costs of carbon mitigation matter, not the damages. Citing selective results, the authors suggest one can spend as little as \$150 to \$500 per ton of carbon dioxide to cap concentrations at 400 to 450 ppm. The cumulative uncontrolled emission path according to the A2 SRES scenario implies there will be 6,500 billion tons of emissions over the next century. If the author’s assumptions hold, the undiscounted cost of their program would be between \$975 and \$3250 trillion. That is certainly not a trivial expenditure.

Further, it is likely to be optimistic. The current concentration of greenhouse gases is already at 450ppme. Given available technology, most energy models argue it is already too late to hold greenhouse gas concentrations at 450ppme. It is not technically feasible and certainly not at that cost. The expenditures suggested by the authors are likely to lead to much higher costs. And even these estimates are based on the globe developing efficient and universal controls. Failure to achieve universal cooperation is likely to double these costs. How large are the damages from climate change that one does not even have to count them?

The authors argue that the end of the world is likely if one does not cap concentrations of carbon dioxide at 450 ppm. Why 450 ppm? What would happen, for example, if concentrations were capped at 500ppm or 550ppm? The authors hang on the possibility that the climate sensitivity of the earth could be as high as 10. Just doubling greenhouse gas concentrations to 550 ppme may warm the earth by 10C this century. That certainly would be disastrous. Of course, there is no scientific evidence that the earth is that climate sensitive. One simply cannot prove such a phenomenon is impossible. However, if the earth was that climate sensitive, a concentration of 450 ppme (which is a 64% increase above the historic levels of 275 ppme) would imply a 6.4C warming, which would also be disastrous. In this fanciful world, the logical conclusion may be to do nothing since after spending this vast fund on abatement, we still perish.

However, getting back to reality, the likely climate sensitivity of the planet is between 1.5 and 5. As one moves from 450 ppm to 550 ppm, damages increase. At the low end, the cumulative damages would be in the hundreds of billions of dollars. At the high end, the cumulative damages may well be in the tens of trillions. However, they are not high enough not to count them. And they do not dwarf the expenditures proposed by the authors. In fact, just the opposite is true. The authors are exchanging a certain large loss for a very uncertain gain.

Climate change deserves serious attention. The careful melding of science and economics is critical to guide the best strategy to manage this problem. Polemic writings that fail to rely on both science and economics do not serve the public interest.