

Controlling climate change

Bert Metz
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I can summarize this book in one word: excellent. It ought to be required reading for anyone interested in understanding what humanity can do to limit climate change. I should mention at the outset that the author does not argue the case for accepting the anthropogenic theory of climate change. The findings of the Intergovernmental Panel on Climate Change, as reported in the Fourth Assessment Report, are taken as a given; nor does he advocate any form of geoengineering. Essentially he describes the viability of stabilizing atmospheric greenhouse gas concentrations by reducing anthropogenic emissions, using proven technology coupled with economic and political incentives.

This is a textbook: the chapters begin with a box describing what is covered and are divided into short, digestible, sections. Liberal use is made of Figures and Tables, and many of the points are illustrated using current and historical examples from different countries around the world. Its great merit is that it aids the reader in coming to

an informed opinion by clearly explaining the relevant scientific, economic and political concepts and arguments.

Metz lists the changes in climate over the past century and a half, and briefly explains why scientists think they are related to human activities. Predictions by climate models of how the climate will change in future are presented, for example increases in global average temperature and sea level are expected. Key areas impacted will be water supply, food supply, natural environment, health and infrastructure, and the built environment.

The scale of the problem is highlighted in stark terms: climate models predict that to achieve stabilization of global average temperature at roughly 3 degC above present levels, global emissions should start declining by 2030 and should be 5–30% below 2000 levels by 2050. Given that emissions are expected to increase by 40–110% by 2030 if no action is taken, the challenge is truly awesome.

Various economic sectors are covered. Taking one example, the book examines CO₂ emissions due to energy generation, listing energy supply options (fossil fuel, nuclear, wind, solar, biofuels) and their potential roles in reducing emissions. The context of course is that world demand for power will increase significantly in future. The bottom line is that it is feasible to reduce emissions and stabilize CO₂ levels at a level sufficient to limit the global temperature rise to about 2 degC but it will require radical changes to how we generate energy - entailing for example widespread use of carbon capture and storage, whereby CO₂ from burning fossil fuels is stored in geological formations deep underground. How this can be achieved is spelt out by description of various policy instruments such as carbon taxes, trading of emissions allowances and subsidies for renewable energy.

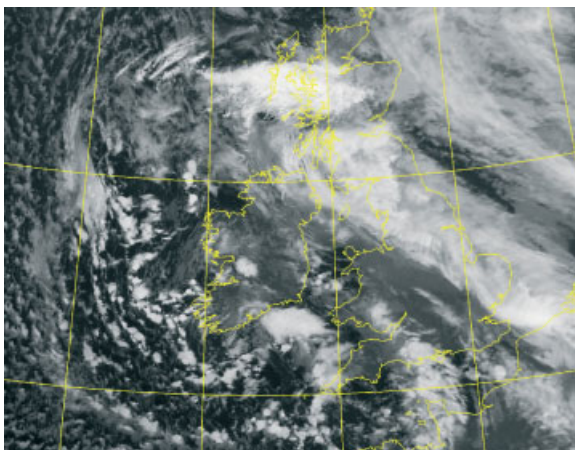
Metz enters the murky world of economics to examine the potential costs of controlling climate change compared with the costs of doing nothing. Costs are difficult to estimate: uncertainty is enormous because of the assumptions required. However this is the key question because economics is the real driver of policy. What will be the cost of deep cuts to emissions and adaption to climate change impacts? What is the cost of inaction? Reducing emissions has side benefits such as improvements to the environment and to human health which are difficult to assess in financial terms. Do we include the risk of low probability but potentially devastating events such as changes in the ocean circulation or melting of ice caps? Metz concludes that the costs of abatement are comparable to conservative estimates of costs caused by uncontrolled climate change.

The book's mantra is that the potential exists to make deep cuts in emissions, to stabilize greenhouse gas concentrations levels without wrecking the global economy or putting essential human development at risk, although politically difficult decisions must be made and enforced in a global context.

Finally, Metz suggests what the next international climate change agreement should look like (the book was written before the Copenhagen summit). In light of the outcome of Copenhagen the book comes across as overly optimistic about what can be achieved politically on climate change, but this doesn't detract from its usefulness. It is a manual on how to stabilize global atmospheric greenhouse gas concentrations. Science and economics tell us it can be done if that is what we want.

Bablu Sinha

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A deepening depression left eastern Canada early on 6 November 2010 and arrived over Cornwall on the evening of the 8th, when its central pressure was about 962mbar (its lowest en route was about 958mbar). It filled up over northern France 24 hours later. The British weather during its passage was noted more for its variety than its severity. Heavy rain, snow, coastal thunder, strong winds and fog were all reported.

The infrared satellite image for 1919 UTC on 8 November was kindly provided by Neil Lonie at the University of Dundee. It shows the frontal cloud from Norfolk to western Scotland, aggregated shower cloud further to the northeast and deep convection near the centre of the depression.

On 11 November, pressure fell near to 950mbar in the Hebrides.