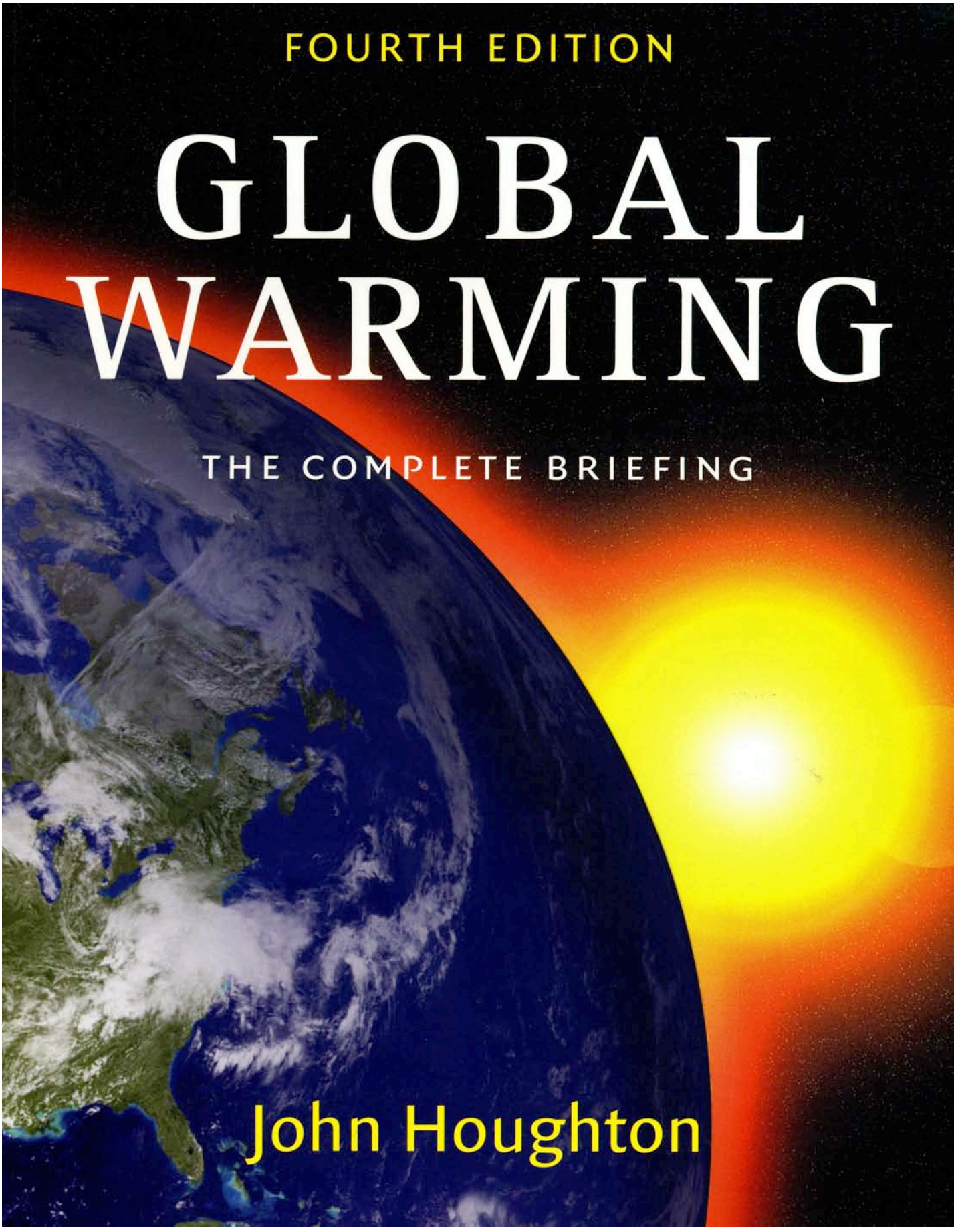
FOURTH EDITION

GLOBAL WARMING

THE COMPLETE BRIEFING



John Houghton

Realising the Climate Convention Objective

Having recommended a choice of stabilisation level, a large question remains: how can the nations of the world work together to realise it in practice?

It is instructive first to look at annual emissions of greenhouse gases expressed as CO_2e and per capita. Averaged over the world in 2004 they were about 6.5 t CO_2e (~1.8 t C) per capita but they varied very much from country to country (Figure 10.4). For developed countries, including transitional economy countries, in 2000 they averaged 16 t CO_2e (ranging downwards from about 25 t for the USA) while for developing countries they averaged about 4 t. Looking ahead to the years 2050 and 2100, even if the world population rises to only 9 billion, under the profile of carbon dioxide emissions leading to stabilisation at concentrations of 450 ppm (Figure 10.3) the per capita annual emissions averaged over the world would be between 1 and 2 t CO_2e for 2050 and less than 0.4 t CO_2e for 2100[33] – much less than the current value of about 6.5 t.

The Objective of the Climate Convention is largely concerned with factors associated with the requirement for sustainable development. In Chapter 9, four principles were enunciated that should be at the basis of negotiations concerned with future emissions reductions to mitigate climate change. One of these was the Principle of Sustainable Development. The others were the Precautionary Principle, the Polluter-Pays Principle and the Principle of Equity. This last principle includes *intergenerational* equity, or weighing the needs of the present generation against those of future generations, and *international* equity, or weighing the balance of need between industrial and developed nations and the developing world. Striking this latter balance is going to be particularly difficult because of the great disparity in current carbon dioxide emissions between the world's richest nations and the poorest nations (Figure 10.4), the continuing demand for fossil fuel use in the developed world and the understandable desire of the poorer nations to escape from poverty through development and industrialisation. This last is particularly recognised in the Framework Convention on Climate Change (see box on pages 291–2) where the growing energy needs of developing nations as they achieve industrial development are clearly stated. In Chapter 8 on page 253, this current international inequity was presented as a challenging moral imperative to the developed world.

An example of how an approach to stabilisation for carbon dioxide might be achieved is illustrated in Figure 10.5. It is based on a proposal called 'Contraction and Convergence' that originates with the Global Commons Institute (GCI),[34] a non-governmental organisation based in the UK. The envelope of carbon dioxide emissions is one that leads to stabilisation at about 450 ppm (without climate feedbacks included), although the rest of the proposal does not depend on that actual choice of level. Note that, under this envelope, global fossil fuel emissions rise by about 15% to about 2025; they then fall to less than half the current level by 2100. The figure illustrates the division of emissions between major countries or groups of countries as it has been up to the present. Then

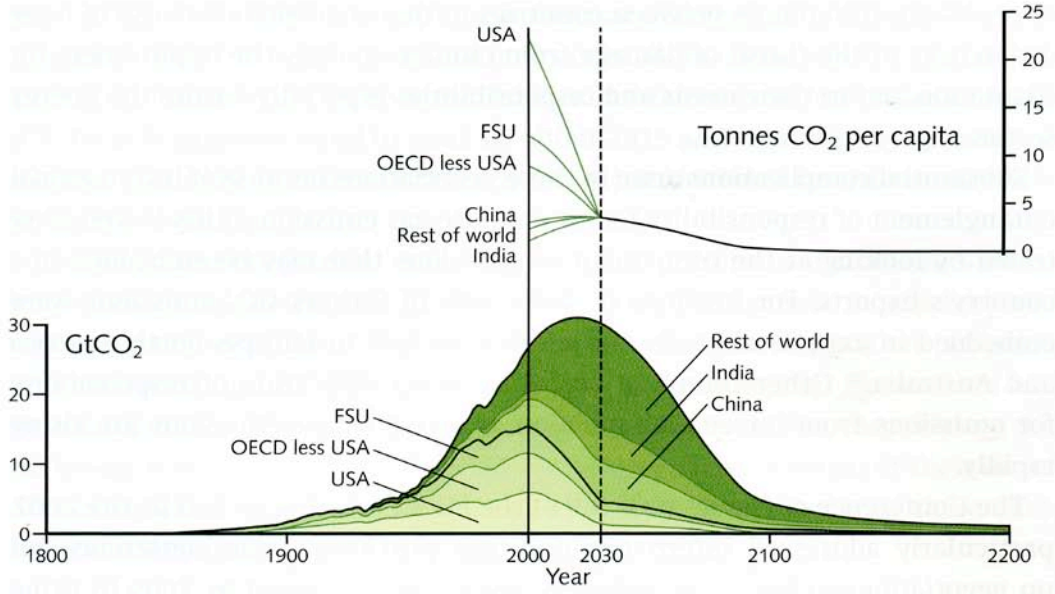


Figure 10.5 The 'Contraction and Convergence' proposal of the Global Commons Institute for achieving stabilisation of carbon dioxide concentration. The envelope of carbon dioxide emissions illustrated is one that leads to stabilisation at 450 ppm (but the effect of climate carbon-cycle feedbacks is not included). For major countries or groups of countries, up to the year 2000, historic emissions are shown. After 2030 allocations of emissions are made on the basis of equal shares per capita on the basis of population projections for that date. From now until 2030, smooth 'convergence' from the present situation to that of equal shares is assumed to occur. In the upper part of the diagram the per capita contributions that apply to different countries or groups of countries are shown. For OECD and FSU see Glossary.

the simplest possible solution is taken to the sharing of emissions between countries and proposes that, from some suitable date (in the figure, 2030 is chosen), emissions are allocated on the basis of equal shares per capita. From now until 2030 the division is allowed to converge from the present situation to that of equal per capita shares. Hence the 'Contraction and Convergence'. The further proposal is that arrangements to trade the carbon dioxide allocations are made.

The 'Contraction and Convergence' proposal addresses all of the four principles mentioned above. In particular, through its equal per capita sharing arrangements it addresses head-on the question of international equity – and the proposed trading arrangements ensure that the greatest 'polluters' pay. The value of the proposal is that it clearly suggests some of the principal ingredients of a long-term solution. However, the discussions taking place at the moment and the other proposals that have been put forward[35] demonstrate that any international agreement is bound to be more elaborate and to differentiate appropriately between countries. In particular it will have to take account, not just

of very large differences between countries in their emissions but also of large differences in the threat of damage from climate change, the requirement for adaptation and in their needs and responsibilities especially within the energy sector.

Substantial complications arise in these negotiations because of international entanglement of responsibility for greenhouse gas emissions. This is well illustrated by looking at the component of emissions that may be embedded in a country's exports. For instance in 2005, 44% of China's CO_2 emissions were embedded in exports of goods and services mainly to Europe, north America and Australia.[35] Other complications arise in the allocation of responsibility for emissions from internation aviation, a sector where emissions are rising rapidly.

The Conference of Parties (COP 13) of the FCCC, meeting in Bali in late 2007, particularly addressed international action post-Kyoto. The conference set up negotiations to begin immediately and to be completed by 2009 to bring about:

> *A shared vision for long-term cooperative action, including a long-term global goal for emission reductions, to achieve the ultimate objective of the Convention, in accordance with the provisions and principles of the Convention, in particular the principle of common but differentiated responsibilities and respective capabilities, and taking into account social and economic conditions and other relevant factors.*

Significant progress was also made at the Bali meeting in addressing the important areas of adaptation, deforestation and technology transfer.