

Part I

Climate Change – our approach

Part I of the Review considers the nature of the scientific evidence for climate change, and the nature of the economic analysis required by the structure of the problem which follows from the science.

The first half of the Review examines the evidence on the economic impacts of climate change itself, and explores the economics of stabilising greenhouse gas concentrations in the atmosphere. The second half of the Review considers the complex policy challenges involved in managing the transition to a low-carbon economy and in ensuring that societies can adapt to the consequences of climate change that can no longer be avoided.

The Review takes an international perspective. Climate change is global in its causes and consequences, and the response requires international collective action. Working together is essential to respond to the scale of the challenge. An effective, efficient and equitable collective response to climate change will require deeper international co-operation in areas including the creation of price signals and markets for carbon, scientific research, infrastructure investment, and economic development.

Climate change presents a unique challenge for economics: it is the greatest example of market failure we have ever seen. The economic analysis must be global, deal with long time horizons, have the economics of risk and uncertainty at its core, and examine the possibility of major, non-marginal change. Analysing climate change requires ideas and techniques from most of the important areas of economics, including many recent advances.

Part I is structured as follows:

- **Chapter 1** examines the latest scientific evidence on climate change. The basic physics and chemistry of the scientific understanding begins in the 19th century when Fourier, Tyndall and Arrhenius laid the foundations. But we must also draw on the very latest science which allows a much more explicit analysis of risk than was possible five years ago.
- **Chapter 2** considers how economic theory can help us analyse the relationship between climate change and the divergent paths for growth and development that will result from 'business as usual' approaches and from strong action to reduce emissions. We look at the range of theories required and explain some of the technical foundations necessary for the economics that the scientific analysis dictates.
- **The technical annex to Chapter 2** addresses the complex issues involved in the comparison of alternative paths and their implications for individuals in different places and generations. Building on Chapter 2, we explore the ethical issues concerning the aggregation of the welfare of individuals across time, place and uncertain outcomes. This annex also provides a technical explanation of the approach to discounting used throughout the Review, and in particular in our own analysis of the costs of climate-change impacts.