

# World Energy Assessment

United Nations Development Programme  
United Nations Department of  
Economic and Social Affairs  
World Energy Council

# energy

and the challenge of sustainability





# overview

## Energy and the challenge of sustainability

## INTRODUCTION

The World Energy Assessment provides analytical background and scientific information for decision-makers at all levels. It describes energy's fundamental relationship to sustainable development and analyses how energy can serve as an instrument to reach that goal. This overview synthesises the key findings of the report, which is divided into four parts.

Part 1 (chapters 1–4) begins with an introduction to energy, especially its relationship to economic development. It then considers the linkages between the present energy system and major global challenges, including poverty alleviation, health, environmental protection, energy security, and the improvement of women's lives. The chapters find that although energy is critical to economic growth and human development, affordable commercial energy is beyond the reach of one-third of humanity, and many countries and individuals are vulnerable to disruptions in energy supply. Further, energy production and use have negative impacts at the local, regional, and global levels that threaten human health and the long-term ecological balance.

Part 2 (chapters 5–8) examines the energy resources and technological options available to meet the challenges identified in part 1. It concludes that physical resources are plentiful enough to supply the world's energy needs through the 21st century and beyond, but that their use may be constrained by environmental and other concerns. Options to address these concerns—through greater energy efficiency, renewables, and next-generation technologies—are then analysed. The analysis indicates that the technical and economic potential of energy efficiency measures are under-realised, and that a larger contribution of renewables to world energy consumption is already economically viable. Over the longer term, a variety of new renewable and advanced energy technologies may be able to provide substantial amounts of energy safely, at affordable costs and with near-zero emissions.

Part 3 (chapters 9–10) synthesises and integrates the material presented in the earlier chapters by considering whether sustainable futures—which simultaneously address the issues raised in part 1 using the options identified in part 2—are possible. As a way of answering that question, chapter 9 examines three scenarios to explore how the future might unfold using different policy approaches and technical developments. The analysis shows that a reference scenario based on current trends does not meet several criteria of sustainability. Two other scenarios, particularly one that is ecologically driven, are able to incorporate more characteristics of sustainable development. Chapter 10 examines the challenge of bringing affordable energy to rural areas of developing countries. It presents approaches to widening access to liquid and gaseous fuels for cooking and heating and to electricity for meeting basic needs and stimulating income-generating activities.

Part 4 (chapters 11–12) analyses policy issues and options that could shift current unsustainable practices in the direction of sustainable development (as called for by every major United Nations conference of the 1990s), using energy as an instrument to reach that goal. Creating energy systems that support sustainable development will require policies that take advantage of the market to promote higher energy efficiency, increased use of renewables, and the development and diffusion of cleaner, next-generation energy. Given proper signals, the market could deliver much of what is needed. But because market forces alone are unlikely to meet the energy needs of poor people, or to adequately protect the environment, sustainable development demands frameworks (including consistent policy measures and transparent regulatory regimes) to address these issues. ■