February 2004
PF 04-01

# Profiles

## Sustainable development in the production and use of coal

'Sustainable development is high on the agenda of international policy makers'

'Coal provides a crucial and enduring element in a modern, balanced energy portfolio'

'The key task is to accelerate the deployment of advanced, efficient CCTs'

Heightened awareness of the global pressures of population, poverty and environmental degradation has placed sustainable development high on the agenda of international policy makers. In its simplest form, sustainable development requires social and economic development to be undertaken in such a way that adverse impacts on natural resources, society and the environment are minimised. The overriding theme of the World Summit on Sustainable Development (WSSD), held in Johannesburg in September 2002, was to promote action to address some of the most pressing concerns of poverty and the environment. Commitments were made to increase access to clean water and proper sanitation, to increase access to energy services, to improve health conditions and agriculture, particularly in drylands, and to better protect the world's biodiversity and ecosystems.

The concept of sustainable development has grown out of concern about a number of global trends. One is the growing imbalance in development between different countries. Poverty reduction is a major challenge, that will become more pressing as the world's population grows. The President of the World Business Council on Sustainable Development (WBCSD) notes that 'sustainability cannot be achieved in a world where nearly 3 billion people are struggling to survive on less than $2 per day. By 2025, the world will be home to two billion more people, most of these born in developing countries'. Another concern is the high and increasing consumption of non-renewable resources, which means that such resources will no longer be available for future generations. Finally, there is concern about the impacts of development on the environment, particularly in the most developed countries, and on cultures. Unintended consequences of development, such as the threat of climate change, loss of ecosystem integrity and biological diversity have become the focus of increasing concern.

Whilst priorities differ between countries, with developed countries in general focusing more on environmental issues whilst developing countries' priority is poverty relief, there is general agreement that sustainability needs to encompass all three aspects of economic, social and environmental development. The simplest, and most widely accepted definition of sustainable development was provided by the World Commission on Environment and Development (WCED) in 1987: *'. . . development that meets the needs of the present without compromising the ability of future generations to meet their own needs . . .'*

The concept of sustainable development formed the cornerstone of the UN Conference on Environment Development in 1992, known as the Rio Earth Summit, and is integral to Agenda 21, the blueprint for change adopted at Rio along with the Framework Convention on Climate Change and the Convention on Biological Diversity. The importance of working towards sustainable development is recognised in the preamble to the 1994 Marrakech Agreement establishing the World Trade Organisation and is explicitly referred to in the European Union's 1992 Maastricht Treaty.

The Mining, Minerals and Sustainable Development (MMSD) Project breaks down the definition of sustainability into four conditions. These are: to fulfil material and other needs for a better quality of life for people of this generation; as equitably as possible; while respecting ecosystem limits; and building the basis on which future generations can meet their own needs.

Based on these conditions, the MMSD project defines the challenge of sustainability for natural resource-based industries as contributing to human welfare and well-being today without reducing the potential for future generations to do the same.

### Implications for coal

All fossil fuels, including coal, are finite resources. Some environmentalists consider that the use of non- renewable resources is inherently undesirable, either because they will ultimately run out or because of the adverse impacts of extraction and use. However, the WSSD recognised the importance of access to reliable and affordable energy services to sustainable development and that fossil fuels such as coal play a key role in energy provision. Fossil fuels provide the basis for meeting around 80% of the world's energy needs and nearly 65% of electricity generation, with coal contributing 24% and 39% respectively. Figure 1 shows the breakdown of total world primary energy consumption in 2000 by fuel type and Figure 2 shows

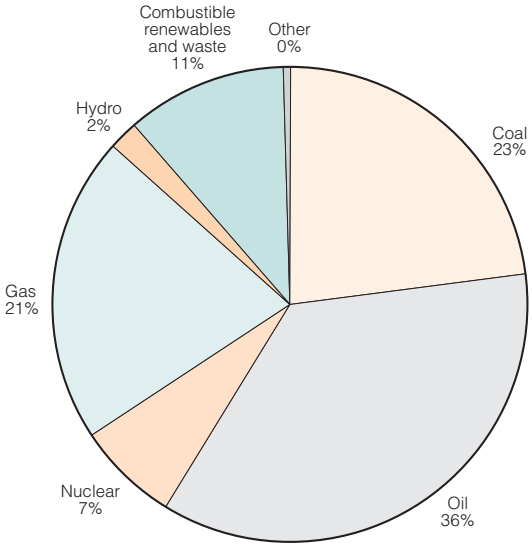


*Figure 1 Total world primary energy consumption in 2000 by fuel type*

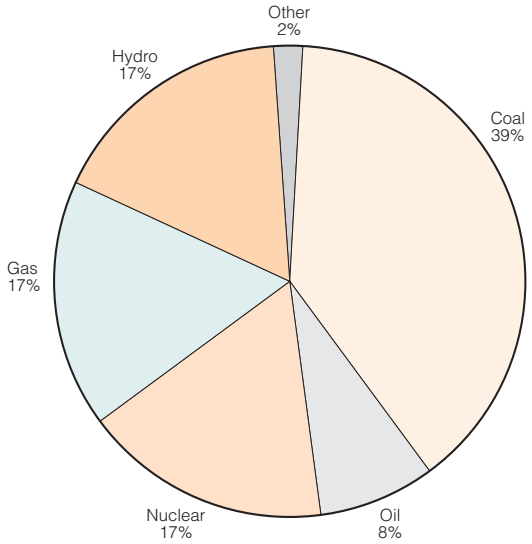


*Figure 2 Total world electricity generation in 2000 by fuel type*

total world electricity generation by fuel type. The International Energy Agency (IEA) forecasts that, under its reference case, 90% of additional demand for energy through to 2030 will be met through fossil fuels.

Coal is by far the most abundant fossil fuel, with global reserves four to six times that of other fossil fuels. Known reserves of coal total nearly 1 trillion tonnes which, at current extraction rates, have a lifetime of over 250 years. There are significant coal deposits in over 50 countries spanning most continents. Coal therefore provides a crucial and enduring element in a modern, balanced energy portfolio, providing a bridge to the future as an important low cost and secure energy solution to sustainable development challenges. These challenges include providing energy services to the over two billion people in the world without access to modern electricity. The key task is to accelerate the deployment and further development of innovative, advanced, efficient, cleaner coal technologies whilst continuing to meet the energy needs of society and minimising environmental impacts.

Each issue of *Profiles* is based on a detailed study undertaken by IEA Coal Research, the full report of which is available separately. This particular issue of *Profiles* is based on the report:

**Sustainable development in the production and use of coal**
Jan Vernon
CCC/79, ISBN 92-9029-394-2, 37 pp, January 2004, £255*/£85†/£42.50‡

* non-member countries
† member countries
‡ educational establishments within member countries

IEA Clean Coal Centre is a collaborative project of member countries of the International Energy Agency (IEA) to provide information about and analysis of coal technology, supply and use. The service is governed by representatives from Austria, Canada, Italy, Japan, the Netherlands, Sweden, the United Kingdom, the USA and the European Commission.

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