



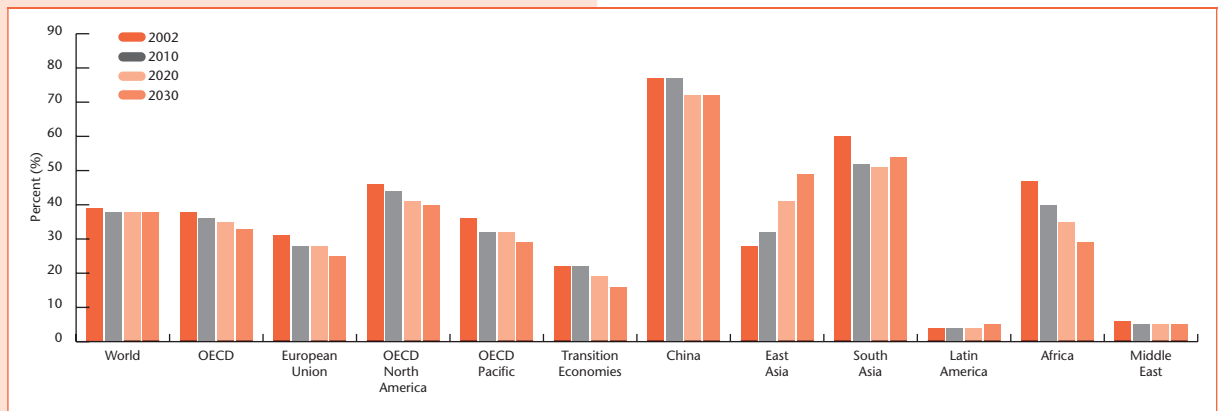
# Facts and Trends

## COAL

### CONTEXT

- Coal is the most abundant fossil fuel; it is widely distributed, and there are over 200 years of economically recoverable reserves at current extraction rates, an important contribution to energy security.
- Most coal is used within the country of extraction. A small, growing percentage (currently 12%) is traded between regions. Transport costs exhibit regional differences but are significant; thus trade is limited to high-quality coals.
- More electricity is generated from coal than from any other fuel. In 2002, coal was responsible for 39% of world generation.
- Coal is a relatively cheap and abundant fuel and will continue to be used where it has major cost advantages. The International Energy Agency (IEA) projects a coal share of 38% in 2030, and continuing large generation shares within the rapidly growing markets of China (80% of electricity generation) and India (over 60%).
- In certain locations, coal offers the only cost-effective route to electrification.

### Share of electricity generation: Coal



Source: International Energy Agency. *World Energy Outlook 2004*.



## ISSUES

- 95% of the electricity generated from coal is from conventional pulverized coal (PC) plants, with efficiencies typically between 33 and 39%.
- Capital costs are higher than natural gas combined cycle gas turbine (CCGT), but coal is a relatively low-cost fuel. Power generation from new coal plants is often more competitive than new CCGT, especially where coal prices are low.
- The challenge with coal is to reduce its environmental impacts.
- Technologies that reduce the environmental impacts of coal generation exist and are being developed; they have higher operational efficiencies but higher capital costs.
- Coal power generation emitted 70% of power sector CO<sub>2</sub> in 2002.
- Conventional old generation PC plants emit up to twice as much CO<sub>2</sub> per unit of electricity generation as natural gas CCGT.
- Well-maintained coal plants with modern controls can meet environmental regulations for local pollutants (NO<sub>x</sub>, SO<sub>x</sub> and particulates) in the most demanding countries. Poorly-maintained equipment with missing or ineffective emissions controls can cause environmental impacts.

- Most new plants use advanced coal technologies (higher efficiency PC with flue gas desulfurization).

## THE WAY FORWARD

- More advanced clean coal technologies (e.g., integrated gasification combined cycle (IGCC), fluidized bed combustion (FBC)) have been demonstrated. Uptake is currently limited by higher costs, perceived technology risks and lack of clear financial incentives. However, recent announcements of new IGCC plants to be built in the U.S. indicate a growing change in overcoming past obstacles.
- R&D needs to be focused on further increasing efficiencies, reducing emissions of local air pollutants to near zero, developing plants compatible with carbon capture and storage (CCS) and reducing the capital costs of plants.
- CCS technologies must be demonstrated at scale and incorporated as soon as they are commercially available (see also the CCS fact sheets).
- Local air pollution must be minimized using advanced generation and emissions control equipment, where applicable.

