

# 1 Coal Meeting Global Challenges

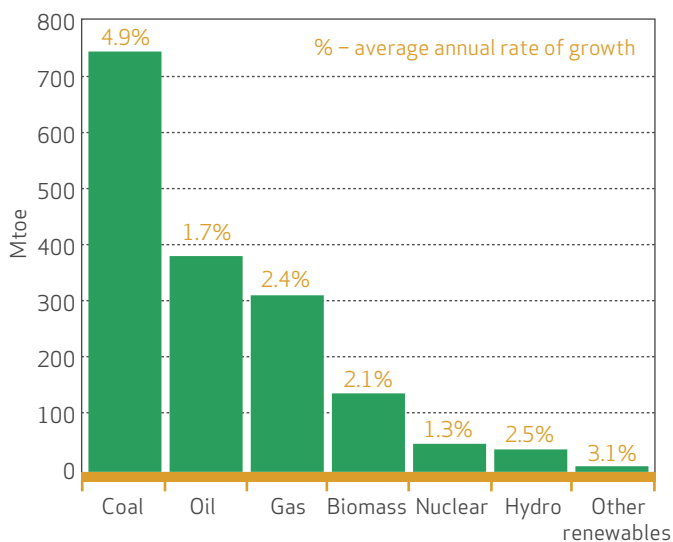
Coal is an essential energy resource and raw material for industrial production and electricity generation, has a vital role in long-term sustainable development and can be used in a manner consistent with climate change goals. The World Coal Institute (WCI) calls on countries to work with industry and support this vision for coal as a key resource able to meet the challenges of the coming decades based on consideration of the following:

#### KEY POINTS

- >> Coal plays a central role in supporting global economic development, alleviating poverty and is an essential resource to meeting the world's energy needs
- >> World primary energy demand will continue to rise, driven primarily by increased energy needs in developing countries
- >> Coal reserves are abundant and widely distributed providing unparalleled access to secure energy
- >> The world is committed to the use of coal for the foreseeable future; therefore, efforts to address climate change cost-effectively need to include carbon capture and storage
- >> A range of technologies to reduce emissions from coal are available now ensuring that coal use is compatible with efforts to reduce CO<sub>2</sub> emissions
- >> Reducing emissions from coal is additional and complementary to the deployment of other low carbon and energy efficient technologies
- >> Successfully addressing emissions from coal can be a driver for reductions in other sectors

## Coal Meeting Global Challenges

**Figure 1. Incremental World Energy Demand 2000–2006**



Source: IEA "World Energy Outlook" (2008)

- >> Since 2000 coal use has risen an average of 4.9% per annum; a faster rate than any other fuel
- >> Coal currently supplies 26% of primary energy demand and 40% of electricity generation worldwide
- >> Increased energy demand is driven by the needs of developing countries, fuelling economic growth and increased standards of living

**Coal plays a central role in supporting global economic development, alleviating poverty and is an essential resource to meeting the world's energy needs**

Coal currently supplies 26% of primary energy demand and 40% of electricity generation worldwide<sup>1</sup>. Affordable, secure and reliable electricity supply enables economic development which is a prerequisite for poverty alleviation. Currently 1.6 billion people (25% of the world's population) do not have access to electricity or the benefits that accompany electrification, with similar numbers only having access to intermittent electricity supplies. Economic development is absolutely vital to the global achievement of the objectives of the United Nations Universal Declaration of Human Rights.

**World primary energy demand will continue to rise, driven primarily by increased energy needs in developing countries**

In recent years, coal use has risen at 4.9% per annum; a faster rate than any other fuel<sup>2</sup> (Figure 1). Latest projections forecast energy growth to rise by 45% between 2006 and 2030. Almost 90% of this increased energy demand is driven by the needs of developing countries, fuelling economic growth and increased standards of living. Coal use is forecast to rise by over 60% from 2006 to 2030, with developing countries responsible for 97% of this increase, primarily to meet increased electrification rates<sup>3</sup>.

<sup>1</sup> OECD/IEA "World Energy Outlook" (2008)

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

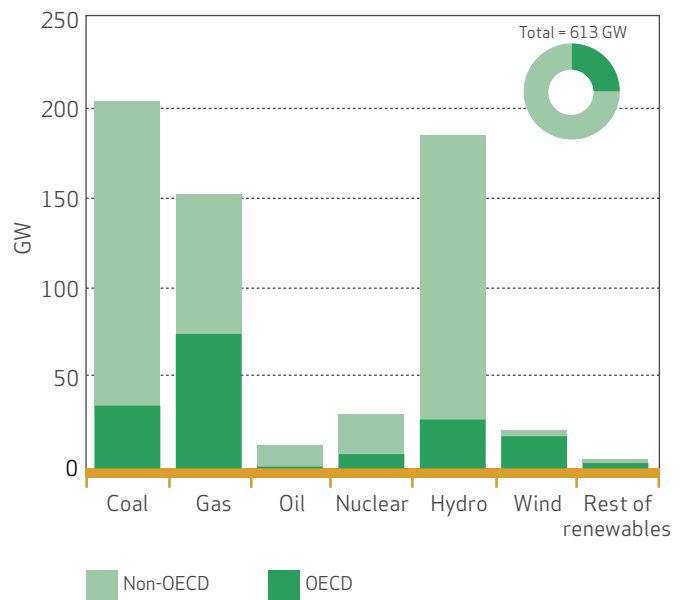
**Coal reserves are abundant and widely distributed providing unparalleled access to secure energy**

Widespread availability, coupled with an efficient international coal market, provides a level of energy security not matched by any other fuel. Global reserves of coal are vast, relative to the other fossil fuels, and more than adequate to meet the world's increasing energy needs. For many countries – particularly those with large indigenous reserves – this will mean continuing to use coal for power generation for decades to come (Figure 2).

**The world is committed to the use of coal for the foreseeable future; therefore, efforts to address climate change cost-effectively need to include carbon capture and storage**

Capturing the CO<sub>2</sub> emitted by the use of coal and other fossil fuels, and injecting it for storage in deep geological formations, is the only currently available technological solution that will enable deep cuts in greenhouse gas emissions while simultaneously maintaining the energy infrastructure needed for growth. The Intergovernmental Panel on Climate Change (IPCC) concluded that CCS can contribute between 15 – 55 % of the cumulative emission reduction effort to 2100, providing it with a central role within the portfolio of low-carbon technologies needed to address climate change<sup>4</sup>. Attempting to stabilise emissions without coal and CCS is estimated to be 71% more expensive; equivalent to US\$1.28 trillion annually in 2050<sup>5</sup>.

**Figure 2. Power Generation Capacity Under Construction Worldwide**



Source: IEA "World Energy Outlook" (2008)

<sup>4</sup> IPCC "Special Report on Carbon Dioxide Capture and Geological Storage" (2005)

<sup>5</sup> IEA "Energy Technology Perspectives" (2008)

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### **A range of technologies to reduce emissions from coal are available now ensuring that coal use is compatible with efforts to reduce CO<sub>2</sub> emissions**

Reducing emissions requires improvements to the efficiency with which coal is used and the deployment of carbon capture and geological storage. Incremental improvements in the supply-side technologies that produce energy make an important contribution to slowing the rate of growth in greenhouse gas emissions, particularly for developing countries experiencing surging demands for energy. A 1% increase in power plant efficiencies will typically result in a 2 – 3 % drop in CO<sub>2</sub> emissions.

The widespread deployment of CCS across all regions with substantial fossil fuel use is required to deliver the emission cuts necessary. CCS utilises a range of technologies that enables CO<sub>2</sub> to be captured from a variety of sources. For example, post-combustion and oxy-fuel capture technologies can be fitted to both existing and new power plants, pre-combustion capture is suitable for new power plant constructions and existing industrial capture technologies can be used at natural gas processing plants, refineries and coal gasification plants.

### **Reducing emissions from coal is additional and complementary to the deployment of other low-carbon and energy efficient technologies**

All emission reduction technologies must be made available and deployed at a scale and rate never seen before. Addressing the challenge of climate change, while meeting countries' development goals and affordable energy needs, will require access to the full range of energy efficient and low-carbon technologies. Decisions on the technologies deployed within specific countries will be subject to national considerations of prevailing economic conditions, energy resource endowments and government policy.

### **Successfully addressing emissions from coal can be a driver for reductions in other sectors**

Stabilising atmospheric concentrations of CO<sub>2</sub> requires all sectors to make significant reductions in their emissions. Finding a solution to emissions from coal not only plays an important role in decarbonising the electricity sector but can deliver emissions reductions in energy end-use sectors including transportation, buildings and industry where opportunities exist to replace fossil fuels with decarbonised electricity (see WCI Climate Policy Paper 5). Mitigating CO<sub>2</sub> emissions from the power sector is an essential component of any cost effective response to climate change as costs are typically less than the cost of emission reductions from end-use sectors.