



## Energy Co2 : Energy Profiles

### Coal Energy Profile: Black Power

**Coal is the world's number one source of electricity. Unfortunately, it is also the number one energy source of carbon dioxide emissions. Experts say coal will remain an important global energy source – with or without its reputation as world's dirtiest fossil fuel.**



#### Picture Gallery (click on the image to start)

Coal is the most polluting of all fossil fuels, but provides a quarter of world energy needs (Photo: Reuters)

It is now a Cold War cliché to say that life behind the Iron Curtain was grey and depressing. Many who lived in the Eastern Bloc recall queues, indifferent service, and domineering governments. A nearly forgotten source of bleakness were the coal power plants which polluted air with soot and turned fresh-fallen snow into a dismal grey.

Almost twenty years later, central and eastern European countries still rely on coal, but power plants have improved and heating in houses comes partially from oil and gas resources. One problem, however, remains: Coal power plants still emit tons of carbon dioxide, more than any other source of electricity generation.

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#### Worldwide Importance

Despite its reputation as the dirtiest fossil fuel, coal will remain an important energy resource for some time to come. The International Energy Agency predicts that coal will increase its share of global energy demand from its current 25 percent to 28 percent by 2030, making it second only to oil on the list of most important energy sources. Much of this demand will come from China, which has fuelled its impressive economic growth almost entirely with coal. Around 82 percent of China's electricity comes from coal-fired power plants, a new one of which gets added to the Chinese power grid every 7-10 days.

China is not the only country dependent on coal. About half of all electricity generated in the United States and Germany is coal-based.

Demand for coal has grown at an average rate of five percent over the last five years. With coal prices likely to remain well below those of gas and oil, the use of coal for electricity generation will continue to grow.

### Global Resources

Coal is the world's most abundant fossil fuel. Global reserves stand at around 909 billion tons, according to the OECD World Energy Outlook 2006. At the current level of production, this would last for another 164 years. About half of all reserves are located in the three biggest consumer countries – China, the United States, and India. Russia, Australia, and South Africa together hold another 30 percent of proven coal reserves.



### Drowning in coal?

A road sign submerged in a pile of coal near the southeastern city of Ufa some 1350 km (839 miles) from Moscow (Photo: Reuters)

Since coal reserves are found mostly in the biggest consuming countries, coal is regarded as a more secure energy source than imported oil. And while the Organization of Petroleum Exporting Countries (OPEC) has enough leverage to set oil prices, no comparative organization exists in the coal market.

### Energy Output

Coal is still used for cooking, heating, and other industrial uses. However, 75 percent is burnt to generate electricity. Coal fires heat boilers to produce steam, which propels turbines and generators to create electricity. The efficiency of a modern power plant is currently about 35 percent; that means two thirds of the coal energy is wasted. There are, however, different forms of coal. Lignite or brown coal, for example, has less energy density than black coal.

Engineers are developing "clean coal" technology - processes like washing, gasifying, and burning coal at higher temperatures – aimed at improving efficiency at 45 percent and more and reducing emissions, not only carbon dioxide, but also sulfur dioxide, nitrogen oxide, and toxic particles.

### Environmental Impact

Some environmental organizations claim that even with technological breakthroughs, coal can never be as "clean" as other forms of energy generation, like solar or wind. Coal power plants remain a primary cause of human-induced climate change. Older plants also emit sulfur oxide and other pollutants linked to health problems and negative environmental impacts, like acid rain. Coal mining, especially open-pit mining for lignite, destroys large areas of land. Such mines also lower the groundwater level considerably.

With numerous mine disasters in recent years, coal mining remains a dangerous occupation. The newspaper China Daily even called it "China's most dangerous job". In 2006 alone, over 4,700 coal miners died in mining accidents in China . Workers also often suffer from pneumoconiosis, a lung disease caused by prolonged inhalation of dust.

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