Coal accounts for 41% of the world’s electricity generation. It is the key fuel for generating electricity on almost all continents, with almost all developed and developing countries relying on coal for the stable and secure supply of electricity. Over the last ten years, most new coal-fired power plants were built in China.

This provided almost all the energy needed to fuel China’s extraordinary economic growth and, in turn, brought numerous benefits to the Chinese people and the countries enriched by Chinese exports.

Source: IEA World Energy Outlook 2011
Average coal-fired generation efficiencies

![Bar chart showing average efficiency of coal-fired power plants around the world, with China having the lowest efficiency at 28% and the OECD at 36%. Source: IEA Clean Coal Centre 2010]

Average efficiency of coal-fired power plants around the world is around 34%, which is well below the state-of-the-art rate of 45%. This means that substantial CO₂ savings can be made by renovating old plants or replacing them with more efficient ones. In fact, increasing the efficiency of coal-fired power plants by 1% reduces CO₂ emissions by between 2 – 3%.

Upgrading the world’s older (>30 years old) and smaller (<250 MW) coal power plants with newer, larger coal plants would reduce global greenhouse gas emissions by 5.5% - which is more than the intended effect of all the measures included in the Kyoto Protocol on Climate Change.

Contribution of different power sector technologies to reductions in CO₂ emissions

![Pie chart showing various contributions of different power sector technologies to CO₂ emissions reductions. Source: IEA Energy Technology Perspectives 2010]

The IEA estimates that advanced coal technologies, including Supercritical (SC), Ultra Supercritical (USC) and (IGCC) plants, could deliver 7% of the necessary CO₂ emissions cuts in the power sector through to 2050. This is just as much as the estimated contribution of solar photovoltaics (PV) and slightly less than the potential contribution of wind turbines. Carbon Capture and Storage (CCS) could deliver almost one third of the entire mitigation effort needed in the power sector.
Electricity mix in 2009 by region

- **41%**
  - Coal accounts for 41% of the world's electricity generation

- **31%**
  - CCS is expected to represent 31% of all the necessary CO2 emissions reductions in the power sector through to 2050

Coal in Electricity Generation

Source: IEA Electricity Information 2011, European Commission EU Energy in Figures 2010
An affordable and reliable source of electricity

Comparison of electricity generation costs across international studies (US$/MWh)

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<tbody>
<tr>
<td>Coal</td>
<td>28-75</td>
<td>56</td>
<td>52-71</td>
<td>64</td>
<td>82</td>
<td>62</td>
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<td>Gas</td>
<td>44-69</td>
<td>58</td>
<td>65-78</td>
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<td>78</td>
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<tr>
<td>Nuclear</td>
<td>33-74</td>
<td>73</td>
<td>65-110</td>
<td>73</td>
<td>90</td>
<td>84</td>
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<td>Biomass</td>
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<td>104-253</td>
<td>80</td>
<td>180</td>
<td>n/a</td>
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<tr>
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<td>69-262</td>
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<td>45-240</td>
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<td>n/a</td>
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<tr>
<td>Wind</td>
<td>50-156</td>
<td>n/a</td>
<td>97-181</td>
<td>91</td>
<td>146-162</td>
<td>n/a</td>
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<tr>
<td>Solar PV</td>
<td>226-2031</td>
<td>n/a</td>
<td>674-1140</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>


Source: IEA Projected Costs of Generating Electricity, 2010

Existing coal-fired power plants generate electricity at a very competitive cost in comparison to other fuels and technologies. Compared to many other energy sources which are heavily subsidised, subsidies for coal extraction are almost non-existent.

Fossil fuel subsidies by type (billion US$)

Estimates of relative subsidies to energy sources (US$/MWh)

Coal-fired plants have a much higher availability, or average load factor, than many other alternatives which are exposed to weather variations. Typically, coal-fired power plants provide base-load 24/7 electricity supply – as opposed to the more specific peak-load supply provided by more expensive and intermittent technologies.

**Average load factors for various energy technologies and fuels**

![Graph showing average load factors for various energy technologies and fuels](image)

*Source: European Commission 2008*

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**An essential element of the low-carbon transition**

Replacing old coal-fired power plants by more efficient ones substantially reduces CO₂ emissions associated with coal combustion. With Carbon Capture and Storage technology CO₂ emissions from coal power plants can be reduced to very low levels.

**CO₂ reduction potential of coal-fired power plants by increased efficiency**

![Graph showing CO₂ reduction potential](image)

*Source: VGB PowerTech, 2010*
The World Coal Association is a non-profit, non-governmental association

Membership is open to coal enterprises and stakeholders from anywhere in the world. The WCA has more than 40 members spread across the globe. Our membership includes many of the world’s largest coal producers and includes mining equipment manufacturers, national coal industry associations and coal research bodies. Member companies are represented at Chief Executive level. The WCA is the only international body working on behalf of the coal industry worldwide.

Objectives

The coal industry, including both internationally traded and domestic coal, needs to present a united front to the challenges it faces this decade and beyond. The orthodoxy that views coal only as a CO₂ emitter – without regard to its role in economic and social development, essential to electricity generation and steel manufacture – may be at a turning point. However, the industry needs to cooperate to ensure that this turning point occurs. For that reason, the WCA has adopted a forward looking strategy that aims to position:

• coal as a strategic resource that is widely recognised as essential for a modern quality of life, a key contributor to sustainable development, and an essential element in enhanced energy security; and
• the coal industry as a progressive industry that is recognised as committed to technological innovation and improved environmental outcomes within the context of a balanced and responsible energy mix.

The strategy can only be achieved with the commitment of leading coal producers and stakeholders.

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