China and Europe join forces on ‘clean coal’

A joint initiative between China and Europe has paved the way for the development of efficient and low-carbon energy systems using coal.

The researchers believe that international collaboration – and in particular an initiative called cooperation action with China (under the COACH project) – will speed up the development of polygeneration plants. These plants produce other coal-based fuels at the same time as generating electric power. Another key focus of the programme is the incorporation of carbon capture and storage (CCS) technologies to reduce greenhouse gas (GHG) emissions.

Global energy demand is increasing year on year, and although renewable energy is a key goal for all developed countries, there is still no renewable source that can adequately replace fossil fuels.

In China, which relies very heavily on coal as its primary energy source, the need for cleaner power generation is urgent. In 2004, China accounted for more than 17 per cent of global CO₂ emissions arising from the use of fossil fuels and was the second largest emitter in the world after the US. By 2007, China’s emissions had increased and were estimated to be equal to the US’s, each responsible for around 25 per cent of global CO₂ emissions. While continuing to grow economically, China will have to accept increasingly strict global emissions reduction targets.

COACH was developed to ‘prepare the ground’ for advanced clean coal technologies in China, with two key goals: decarbonising fossil fuels, especially through the capture and storage of CO₂ and the polygeneration of coal–derived fuels.

Through the programme, European experience helps meet the challenges of implementing the new technologies needed for carbon capture and for polygeneration. For example, coal-based polygeneration systems, especially in the electric power sector, have to be adapted to specific infrastructures, which can vary greatly. In these systems, as well as producing electricity, coal-based power plants are also used to produce liquid and gaseous fuels. By products such as steam and waste heat can also be captured and used for industrial and domestic energy services.

The different drivers and research priorities in China and Europe make cooperation mutually beneficial. For example, a major obstacle for the deployment of CCS technology is cost; these technologies are not yet commercially competitive. Europe already funds research in this area, and findings from these projects could usefully inform developments in China as well as Europe, especially research into the handling and storage of the captured CO₂. The European Commission plans to support as many as 12 European CCS demonstration plants which should go on stream between 2012 and 2020.

Equally, China’s reliance on its abundant coal resources means that it has ploughed funding into establishing effective coal gasification systems. China has already established ambitious targets for its gasification technologies, but there has been ‘political lingering’ that has slowed the implementation of clean coal technologies. By directing research into handling CO₂, and making CCS commercially acceptable Europe and China can support each other in the rapid development of more sustainable energy schemes.

1. COACH (COperation Action within CCS CHina-EU) is supported by the European Commission under the Sixth Framework Programme. See: www.co2-coach.com
2. For example: CACHET (www.cachetco2.eu) and DYNAMIS (www.dynamis-hypogen.com)


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