

## CHINESE ADVANCED POWER PLANT CARBON CAPTURE OPTIONS (CAPPCCO)

### OBJECTIVES

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- Develop and define options for integrating carbon dioxide capture plant with advanced Chinese pulverised coal power plants to allow a rapid transition to a high level of CO<sub>2</sub> emission reductions.
- Assess performance of advanced (non-CO<sub>2</sub>) pollutant control technologies on Chinese coals.
- Identify and engage with key stakeholders to ensure that relevant information transfer takes place.

### SUMMARY

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UK climate change mitigation policy has identified rapid cuts in global CO<sub>2</sub> emissions as essential. This means that tackling emissions from existing coal fired power plants in China (and elsewhere) is likely to be a critical part of any global effort to tackle climate change. If carbon capture and storage (CCS) cannot be retrofitted to these plants they represent many decades of future carbon lock-in.

CAPPCCO is centred around the principle of making new power plants carbon capture ready (CCR). If done properly this will allow CCS to be retrofitted without

unnecessary extra effort and cost. Otherwise in some cases CCS retrofit to unprepared plants could be so difficult that replacing the plant entirely would be the only viable option.

#### A Chinese-built post-combustion capture pilot unit at a Huaneng Group power plant near Beijing

This is the type of technology that could be retrofitted to CCR plants in China



CAPPCCO will also transfer UK expertise in coal characterisation to the Chinese market, modifying it where necessary to suit the particular requirements of Chinese coals and boiler technologies. In addition to helping to provide the cleaner flue gases that are essential for capture retrofit, immediate environmental benefits

and efficiency improvements can be achieved through improved low NO<sub>x</sub> combustion system performance and a better understanding of the role of coal properties in carbon burnout. This project is linked to ongoing MOST 863 projects in this area.

The CAPPCCO project aims to:

- Develop a carbon capture characteristics database for existing & planned plants
- Develop and assess capture options for planned new pulverised coal (PC) plants
- Develop and assess capture options for existing PC plants
- Investigate special issues for adding carbon capture to Chinese power plants e.g. water requirements, cooling requirements, coal properties, capture performance under variable Chinese climatic conditions including likely performance of next-generation pollutant control technologies
- Investigate options for financing capture ready and capture retrofit

This project could significantly amplify the value of the UK Government funded NZEC ([www.nzec.info](http://www.nzec.info)) project by opening up more options (CCR power plants sites) where CCS technologies studied in NZEC could be deployed rapidly. The CAPPCCO participants are also involved with the NZEC project and so are able to ensure the maximum positive synergies between these two studies, and the parallel COACH project. One area of particular interest may be the investigation of the role for private finance in CCS implementation in China. The 'capture option' concept

being explored in CAPPCCO could turn out to be one of the ways in which the later, CCS implementation, phases of NZEC are funded.

## **CONTRACTOR**

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## **COLLABORATORS**

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With additional contributions from:  
Harbin Boiler Company Limited,  
Datang International Power  
Generation Co. Ltd., National  
Power Plant Combustion  
Engineering Technology Centre,  
Xi'an Jiaotong University

## **COST**

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The total cost of this project is £335,131 with the Department of Energy & Climate Change (DECC) contributing £264,904.

## **DURATION**

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43 months – December 2007 to July 2011.

For further information about Carbon Abatement Technologies activities please visit <a href="http://www.decc.gov.uk">www.decc.gov.uk</a>
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