

# CHINA

Although the first phase of the Kyoto Protocol exempts China from reducing its own CO<sub>2</sub> output, China, as the first or second largest CO<sub>2</sub> emission country, is facing growing international political pressure. As a responsible big country, China will almost certainly have to respond to climate change in the future. China is entering unexpected fast development period of the industrialization, urbanization and motorization, in which large-scale new infrastructures will be built.

This provides great opportunity to plan for longer-term CO<sub>2</sub> mitigation—the infrastructures built today have a long life time and are not easy to upgrade the technologies involved, and decisions made now will have a major impact on energy utilization mode and CO<sub>2</sub> mitigation technology option in coming years. Carbon Capture and Storage (CCS), as an option in the portfolio of mitigation actions to combat climate change, is expected to have far-reaching implications for China.

## CCS projects in China

There are only two ongoing CCS projects in China:

- ❖ **GreenGen:** GreenGen is a joint venture representing China's largest electric utilities and coal companies. China Huaneng Group is managing partner. It is China's centerpiece initiative to advance near-zero emissions coal-fueled generation with CCS. The project includes multiple phases between 2006 and 2020 for additional generation and capture. The total investment is about RMB 7 billion. The first phase of GreenGen will build a 250 MW IGCC plant. The later phase will have a 2□400 MW IGCC with CCS.
- ❖ **PCC Demo Project:** The project is China's first Post Combustion Capture (PCC) demonstration project. As one part of APP, the project is based on the agreement between the Australian government research organization CSIRO and China's Thermal Power Research Institute (TPRI). TPRI is responsible for the installing, commissioning and operating of the PCC pilot plant at the Huaneng Beijing Thermal Power Plant, with all of its equipments domestically made. The project was put into operation on July 17, 2008, with a capability of recovering more than 85 percent of CO<sub>2</sub> from flue gases and can thus trap 3,000 ton of the gas annually.

In addition, China is engaged in a number of international CCS projects and programs.

- ❖ **The CSLF** (Carbon Sequestration Leadership Forum) is an international climate change initiative that is focused on development of improved cost-effective technologies for the separation and capture of CO<sub>2</sub> for its transport and long-term safe storage. China was one of the initial members of CSLF, and the Chinese Ministry of Science and Technology (MOST) is engaging in the forum on behalf of China.
- ❖ **FutureGen** is a public-private partnership to build a first-of-its-kind coal-fueled, near-zero emissions power plant. In 2005, the China Huaneng Group—China's largest coal-fueled power generator—joined FutureGen Alliance. The investment from Huaneng in FutureGen accounts for two percent of the total investment. However, Huaneng is in a position to share the technology and achievements of FutureGen as a shareholder.
- ❖ **COACH** (Cooperation Action with CCS China-EU) is a Sino-EU research project aimed at creating a strong and durable cooperation between China and Europe. Responding to the fast growing energy demand of China, COACH will prepare the ground for new energy technology options that employ CCS—including the use of CO<sub>2</sub>-EOR (Enhanced Oil Recovery) or CO<sub>2</sub>-ECBM (Enhanced Coal Bed Methane Recovery).
- ❖ **NZEC** (Near Zero Emissions Coal) is a joint venture initiative between the UK and China. It is designed to help build capacity for CCS in China. It is hoped NZEC will lead to a demonstration project starting up between 2010 and 2015. COACH and NZEC are part of the EU-China Partnership on Climate Change. Chinese partners in both include Administrative Centre for China's Agenda 21 (ACCA21), Tsinghua University, Zhejiang University and GreenGen.
- ❖ **APP** The Asia-Pacific Partnership on Clean Development and Climate (APP) is a voluntary partnership among seven major Asia-Pacific countries—Australia, Canada, China, India, Japan, Korea, and the United States—that have joined together to address increased energy needs and the associated issues of air pollution, energy security, and climate change. The partners intend to accelerate the development and deployment of cleaner, more efficient technologies to meet national pollution reduction, energy security and climate change concerns in ways that promote economic development and reduce poverty.
- ❖ **GeoCapacity**, co-funded by the EU within FP6, will provide the storage capacity data required for the Europe wide adoption of CCS. It will also build a framework for international cooperation, especially with other CSLF countries (notably China, India and Russia), focusing on technology transfer facilitating the countries to undertake similar studies, as these countries perhaps face an even greater challenge to reduce CO<sub>2</sub> emissions due to their rapidly growing energy demands. MOST has joined the GeoCapacity initiative as a full project partner. Under the supervision of MOST, Tsinghua University and Chinese Academy of Sciences participated into the GeoCapacity research project.