

Strategies for Financing Large-scale Carbon Capture and Storage Power Plants in China

EPRG Working Paper 1410

Cambridge Working Paper in Economics 1430

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Abstract Building on previous stakeholder consultations from 2006 to 2010, we conduct a financial analysis for a generic CCS power plant in China. In comparison with conventional thermal generation technologies, a coal-fired power plant with CCS requires either a 70% higher on-grid electricity tariff or carbon price support of approximately US\$50/tonne CO₂ in the absence of any other incentive mechanisms or financing strategies. Given the difficulties of relying on any one single measure to finance a large-scale CCS power plant in China, we explore a combination of possible financing mechanisms. Potential measures available for increasing the return on the CCS investment include: enhanced oil recovery (EOR), a premium electricity tariff, and operational investment flexibility (e.g. solvent storage, upgradability). A simulation found that combining several financing options could not only provide private investors with a 12% to 18% return on equity (ROE), but also significantly reduce the required on-grid tariff to a level that is very close to the tariff level of existing coal-fired power plants and much lower than the tariffs for natural gas combined cycle and nuclear power plants. Therefore, we suggest that a combination of existing financing measures could trigger private investment in a large-scale CCS power plant in China.

Keywords Carbon capture and storage, Coal-fired power plant, Electricity, Finance, China

JEL Classification Q4, Q42, O3, O13, P48

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Publication July 2014
Financial Support DECC (NZEC); FCO and Global CCS Institute (Guangdong CCS Readiness project). For H.L: William & Flora Hewlett Foundation and BP Group