

Donor country Canada			
Project/programme title Reduction of Emissions from Coal-Based Power Generation			
Purpose An international partnership between Canada and China was established to reduce emissions from coal-fired utility boilers. A well-tested CFD modeling tool was used to identify the improvement strategies for 11 selected units ranging from 200 to 600 MWe, to realize the reduction of coal consumption, NOx and CO2 emissions and the increase of availability. The study results could potentially be extended to 23% of the units in China to achieve significant GHG reduction prior to implementing advanced clean coal technologies like IGCC and oxy-coal combustion with CO2 capture.			
Recipient country China	Sector Energy - Power Generation	Total funding \$2,000,000 (CIDA)	Years in operation 2003 to 2006
Description The project was a multi-year, bilateral project between CanmetENERGY and the Chinese power generation sector to investigate the extent of improvement that can be made to existing (and not ready to be retired) coal fired boiler units to upgrade existing coal-based power generation units both in Canada and abroad. The novel development of this project was the use of CFD (computational fluid dynamics) via the creation of a user-friendly modeling tool for coal-fired utility boiler, named "CoalFire". Through a graphical user interface, a user can input the physical dimensions of the unit, specify the burner geometry, select the coal type and submit the air and fuel flow rates. Then the software with built-in "artificial intelligence" will automatically generate the computational grid, initiate and complete the computation, and generate a simulation report in a HTML format ready to be issued to power plant operators for diagnostic or performance improvement purposes. "CoalFire" was jointly developed by CanmetENERGY and ANSYS Canada, based on commercial CFD code ANSYS CFX-TASCflow and the experience of CanmetENERGY in coal-fired boiler modeling.			
Indicate factors that led to project's success Long established relationships between key CanmetENERGY staff and the Thermal Power Research Institute (Xi'an, China) the North China Electric Power University (Boading, China) and Northeastern Electric Power Research Institute (Shenyang, China)			
Technology transferred A user friendly CFD tool for analysis of coal-fired utility boilers to reduce diagnostic time and costs, optimize power generation while reducing GHG, NOx and other emissions. This tool is a key component in a dedicated program to develop clean coal technologies for near zero emissions through an international partnership focusing on improving the performance and reducing the emissions from a representative sample of the current Chinese coal-fired boiler fleet, with the intent to have more replications completed by the Chinese partners.			
Impact on greenhouse gas emissions/sinks			