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Research and Application for Clean Coal Technologies in Taiwan

Heng-Wen Hsu, Ching-Lin Shieh, Wu-Chi Ho

Energy and Environment Research Laboratories, Industrial Technology Research Institute
Chutung, Hsinchu 310, Taiwan, R.O.C.

Abstract

Coal is the main source of energy in Taiwan. In 2005 the consumption of coal exceeded sixty million metric tons. This accounted for 34.2% of the total energy supply generated by coal, and 72.7% was consumed in the process of power generation in Taiwan. Appropriately, the government in Taiwan has invested substantial time and money into researching Clean Coal Technologies (CCT) that provide both high efficiency and low pollution. Since 1988, Energy & Resource Laboratories (ERL)/Industrial Technology Research Institute (ITRI) has received funds from The Energy Commission of Ministry of Economic Affairs (MOEAEC) to research combustion pollution control, e.g. Low NO_x Burner (LBN), Flue Gas Desulfurization (FGD), De-NO_x technologies...etc. ERL was commissioned by MOEAEC to study, introduce, and promote Integrated Gasification Combined Cycle (IGCC) technology, a highly efficient clean coal power generation technology, during 1998~1999. In addition, a strategy was planned for the use of CCT in power generation and energy-intensive industries, a plan supported by MOEAEC since 2000. MOEAEC considered gasification technology for fossil energy to have the most applicable potential; in turn, ERL was commissioned to execute the first four-year project, called "Application Study of Fossil-fuels Gasification Technology", from 2002 to 2005. ERL has constructed completely the first experimental system of pressurized gasifier with a capacity of two metric tons of coal per day in Taiwan and has accomplished testing of gasification characteristics for four kinds of coal and CPC's petroleum coke. In addition, we have established abilities and experiences for gasification system basic design and syngas quality control technology. From 2006 to 2009, Energy and Environment Research Laboratories (EEL) are commissioned to execute the second four-year project, called "Development of Gasification and Clean Coal Technologies" by Bureau of Energy, Ministry of Economic Affairs (MOEABOE). The whole project goals are: establishment of multi-fuel gasification technology with the study of gasification characteristics for coal and petroleum coke; development of syngas clean up, carbon dioxide capture/separation and syngas conversion technologies; demonstrations of combustion and power generation system of syngas from gasifier and to promote the installation of gasification plant in industrial park.