CO_2 Recovery Development Activities at Kansai Electric Power

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Abstract

CO_2 capture and sequestration (CCS) technology is expected to become an effective and important counter measure against global warming. Among several different kinds of CO_2 recovery technology, the authors believe that the chemical absorption method is the most appropriate and practical method to recover CO_2 from boiler flue gases due to several technical and economic advantages. Kansai Electric Power Co., Inc.（KEPCO）has been developing energy efficient chemical absorbents and economical CO_2 capture processes which aim to reduce the cost of CO_2 capture, in collaboration with Mitsubishi Heavy Industries, Ltd.（MHI）since 1991. As a result, an improved absorbent, KS-1® and enhanced processes have been tested and developed at the Nanko pilot plant in Osaka, Japan. These technologies have subsequently being commercialized and have been applied at 9 commercial CO_2 capture plants in the chemical and fertilizer industries throughout the world.

For further CO_2 capture related cost reduction,, we have designed new and innovative absorbents, and have evaluated these during several test campaigns. One of these absorbents has demonstrated superior performance compared with KS-1®. The thermal energy for CO_2 recovery has been further reduced to about 2.7MJ/kg-CO_2, and we intend to proceed with further evaluation.

Additionally we have continued the optimization of the CO_2 capture plant operating conditions, resulting in further improvements of energy consumption to about 2.5 MJ/kg-CO_2. We are also continuing pilot tests for this new process for development and application in future commercial CO_2 capture plant design. We are continuing this important work by diligently providing economic and technically robust CO_2 capture solutions for the power generation sector as an effective counter measure against global warming.