

Optimization of the Flexible operation for post-combustion capture plant

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When the post-combustion capture plant is running in flexible mode, the electricity output is increased and the plant management can sell the large amount of electricity at higher prices. Hence the operating profit can be increased along with reduced CO₂ emissions under this scenario as the reboiler energy penalty has been reduced when the capture plant is running in flexible mode. In this study two flexible operation modes i.e., bypassing a part of the flue gas or partial CO₂ removal have been used to minimize the capture cost which includes the capture energy cost and the emission penalty as carbon tax. Equilibrium based model for monoethanolamine (MEA) based absorption process has been implemented in gPROMS. It has been found that the partial CO₂ capture mode of flexible operation was more economical than bypassing flue gas in response to daily electricity price change.