

Techno-economic evaluations of pressure swing adsorption (PSA) and amine based CO₂ capture systems for an ironmaking or steelmaking process

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Reducing Carbon dioxide (CO₂) is essential to mitigate global warming. To that end, a promising option is to use carbon capture and storage (CCS) which controls CO₂ from flue gas produced by fossil fuel sources, especially power plants.

In the last decade, many studies and commercial applications of CCS technologies have been proposed to assess post-combustion CO₂ capture using amine-based absorption systems for fossil fuel power plants. However, there are few studies about reducing CO₂ from flue gas produced by an ironmaking or steelmaking process.

This study presents details of the performance and cost models developed for possible CCS options at the ironmaking or steelmaking process. Especially, the new ironmaking process is assessed in our study using the models for pressure swing adsorption (PSA) and amine based CO₂ capture systems. For the CCS options with the lowest cost, the best one is determined, and compared with four different cases how to handle the heat contents of the remaining flue gas after CO₂ separation.