CO₂ Capture Using Green Microalga *Chlorella Vulgaris* in Thermal Power Plant: Systematic approach and Economic analysis

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Recent studies have been highlighted microalgae as a promising solution to reduce CO2 emitting, because of their great capacity to fix and ability to convert CO_2 to biomass. To commercialize this technology effectively, systematic approach is essential. In this context, the main goal of this research is the systematic approach on CO_2 capture using growth model of microalgae *Chlorella vulgaris* in photobioreactor. The growth model has two states and eight parameters, and takes into account of light intensity expressed by Monod structure with limitation effect given by Contois dynamics. From D-optimality criterion, the optimal input design is obtained to decide the system input profile. Then, sensitivity analysis is used to determine which parameters have negligible influence on the biomass productivity. Finally, pilot scale CO2 capture system combined with flue gas pretreatment process is assumed to determine whether this technology is economically feasible or not.