

# **A Combinatorial Optimization Model for Selection of Technological Alternatives on a Life-Cycle Basis: Application to Power Generation with Carbon Sequestration**

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## Abstract

Choice of technological alternatives in a life cycle system is modeled as an integer programming problem. The resulting model is an extension of the formalized matrix-based computational LCA described in the work of Heijungs and Suh (2002). A case study on the minimization of greenhouse gas emissions from coal-fired generation of electricity with carbon dioxide capture and storage (CCS) is used to illustrate the modeling approach. The resulting integer program is solved using swarm intelligence methods to determine the optimal solution.