

A Game-theoretic Modeling for Optimization of the Carbon Capture and Storage Infrastructure

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This study proposed a non-cooperative optimal model of the carbon capture and storage (CCS) infrastructure using Game theory. Given a set of available resources to capture, storage, and transport of CO₂, the problem consists of determining the optimal planning of the CCS infrastructure that the decisions of each player in the model are sole driven by its own economic interest. This decentralized planning aims to minimize the cost level for each participants applying game theoretical Nash-type models. The model is formulated as a mixed-integer nonlinear programming (MINLP). In order to reduce the model to linear form, a separable programming approach using logarithmic differentiation is utilized. The case study based on power-plant CO₂ emission in Korea is presented to illustrate the application of the proposed modeling and solution method.