

A Mathematical Model for Deterministic Optimization of Carbon Capture and Storage Infrastructure Network in China

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In this study, a deterministic optimization approach of Carbon Capture and Storage (CCS) infrastructure network which meets the situation in China will be introduced. A mathematical model is presented to determine the adequate technology, location and amount of CO₂ which should be captured, transported and sequestered, while achieving the objective of minimizing the total cost. The CCS model focuses on design and operation of a deterministic, steady-state network for constant CO₂ emission. The model is formulated as a mixed-integer linear programming (MILP) problem. An example of a China case is presented to illustrate the applicability of the proposed model. The case study is conducted in order to elucidate the potential for CCS technologies to be deployed in a part of China, considering the region's large and increasing industrial CO₂ emission with effective and secure CO₂ storage method, and to present a minimized costs for CO₂ transport and storage.