

Optimal deployment of the CO₂ transportation pipelines for the CCS network in Korea

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Carbon capture and storage(CCS) has been receiving much spotlight in accordance with the greenhouse gas reduction efforts, and research on commercialization of the technology is ongoing all over the world. Considerable amount of research has been done on carbon capture, but to commercialize the whole technology, research on designing the CO₂ transportation chain has to be conducted. Korea has recently confirmed the plan of reducing 37% of the GHG emissions in 2030, and the CCS technology is expected to take care of 10% of the planned amount of CO₂ reduction. Post-combustion capture of CO₂ has been successful in power plants such as Boryeong, but research on CCS network planning is almost non-existent. In this study, a CCS network was modeled and optimized regarding the geographical conditions of Korea and the reduction objective. Considering the coal fired and LNG C/C power plants as capture sources and Uleung basin as the reservoir, the optimal pipeline deployment throughout Korea was planned by mixed-integer linear programming. With addition of some realistic factors such as government policies, this research is expected to give an idea of the future CCS network within Korea.