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A Brief Analysis of Geologic CO₂ Storage Potential in South Korea

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A Brief Analysis of Geologic CO₂ Storage Potential in South Korea
JJ Dooley, Joint Global Change Research Institute
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Question: Does South Korea have much geologic CO₂ storage potential?

Answer:

- There is relatively little published literature that directly and rigorously attempts to quantify the geologic storage potential in and around South Korea.
- The literature that does exist suggests that CO₂ storage potential in South Korea is potentially small and of lower quality / more expensive to utilize as the majority of the storage potential lies in offshore deep saline reservoirs.
- Even nations that do not have substantial CO₂ storage resources can benefit from CCS technologies through the purchase of lower-cost emissions credits made possible by CCS use in other nations.
- Countries such as Korea will likely see their future use of fossil-energy technologies – and therefore the mix of energy technologies they can use – more constrained under future greenhouse gas policies than if they had more onshore geologic CO₂ storage capacity than they are currently thought to possess.

Supporting Material

In a recently released report from the Australian CO₂CRC that was carried out for APEC, the authors note that “The Republic of Korea and Chinese Taipei both have high emissions (10² MtCO₂/y) and low storage prospectivity (i.e., low storage potential). Both have limited sedimentary basins within their boundaries, and consequently little options for saline reservoir, hydrocarbon field or coal bed storage.”

Citation: Ian Newlands, et. al. “Assessing the CO₂ Storage Prospectivity of Developing Economies in APEC – Applying methodologies developed in GEODISC to Selected Sedimentary Basins in the Eastern Asian Region.” Presented at The Eighth International Conference on Greenhouse Gas Control Technologies. June 2006.

<https://events.adm.ntnu.no/ei/viewpdf.esp?id=24&file=d%3A%5CAmlink%5CEVENTWIN%5Cdocs%5Cpdf%5C950Final00313%2Epdf>

The Newlands GHGT8 paper is a summary of a longer report prepared for APEC by CO₂CRC and released in June of 2005. Page 56 of this longer technical report provides a qualitative description of the candidate storage formations in and around South Korea. The report does not provide a quantitative estimate of potential storage capacity, but does reaffirm the principal conclusion of the quote above that South Korea’s geologic CO₂ storage potential is probably quite small and of relatively low quality. This more detailed technical report can be found at:

http://www.co2crc.com.au/PUBFILES/STOR0405/APEC/APEC_Phase1_FinalReport.pdf

As a part of the Battelle-led Global Energy Technology Strategy Project, in 2004, we carried out a detailed survey of the literature on geologic storage potentials for various regions of the world. While we found no published literature that spoke directly to South Korea's geologic storage potential, the literature that was available allowed us to draw the following conclusions:

- There is relatively small CO₂ storage capacity potential within South Korean coal seams.
- There is effectively no CO₂ storage capacity in South Korean depleted oil and gas fields
- CO₂ storage potential in on-shore deep saline formations is very limited.
- We estimated that there could be a total of 0.4GtCO₂ storage capacity in offshore deep saline aquifers for Korea but that these would be relatively more expensive to utilize.

Citation: JJ Dooley and SJ Friedman. "A Regionally Disaggregated Global Accounting of CO₂ Storage Capacity: Data and Assumptions." Joint Global Change Research Institute, Battelle Pacific Northwest Division. PNWD-3431. May 2004. College Park, MD.

The more recent work from the Australian CO₂CRC appears to agree that to the extent there is geologic CO₂ storage potential in Korea it likely lies in offshore deep saline formations.