

CO₂ Storage Capacity Assessment of Deep Saline Aquifers in Malaysia

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Abstract : The increasing amount of greenhouse gasses in the atmosphere recently has become one of the discussed topics in relation with world's concern on climate change. Developing countries' emissions (such as Malaysia) are now seen to surpass developed country's emissions due to rapid economic development growth in recent decades. This paper presents the potential storage sites suitability and storage capacity assessment for CO₂ sequestration in sedimentary basins of Malaysia. This study is the first of its kind that made an identification of potential storage sites and assessment of CO₂ storage capacity within the deep saline aquifers in the country. The CO₂ storage capacity in saline formation assessment was conducted based on the method for quick assessment of CO₂ storage capacity in closed, and semi-closed saline formations modified to suit the geology setting of Malaysia. Then, an integrated approach that involved geographic information systems (GIS) analysis and field data assessment was adopted to provide the potential storage sites and its capacity for CO₂ sequestration. This study concentrated on the assessment of major sedimentary basins in Malaysia both onshore and offshore where potential geological formations which CO₂ could be stored exist below 800 meters and where suitable sealing formations are present. Based on regional study and amount of data available, there are 14 sedimentary basins all around Malaysia that has been identified as potential CO₂ storage. Meanwhile, from the screening and ranking exercises, it is obvious that Malay Basin, Central Luconia Province, West Baram Delta and Balingian Province are respectively ranked as the top four in the ranking system for CO₂ storage. 27% of sedimentary basins in Malaysia were evaluated as high potential area for CO₂ storage. This study should provide a basis for further work to reduce the uncertainty in these estimates and also provide support to policy makers on future planning of carbon capture and sequestration (CCS) projects in Malaysia.

Keywords : CO₂ storage, deep saline aquifer, GIS, sedimentary basin

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