

## Characterization of carbon storage systems in central Taiwan and its offshore area

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Geological carbon storage is widely used to mitigate CO<sub>2</sub> emissions in the atmosphere. Up to 8 km thick Cenozoic sandstone/shale interbeds in central Taiwan and offshore areas provide multiple carbon storage systems. In this study, we characterize four storage systems, including the spatial distribution of lithologies, formation thicknesses, depths, permeability and porosity of reservoirs, using data from 22 boreholes. Three sites, Taichung Power Plant (TPP), Changhua Coastal Industrial Park (CCIP), and Mailiao Area (MA), are selected for detailed site characterization. The caprock/reservoir pairs are divided into four storage systems from top to bottom: (1) R1 system, the Lower Cholan Formation (Fm), (2) R2 system: Chinshui Shale (Sh), Kueichulin Fm, Nanchuang Fm, and Kuanyinshan Sandstone (Ss), (3) R3 system: Talu Sh, Peiliao Fm and Shihti Fm, (4) R4 system: Piling Sh, Mushan Fm and Wuchishan Fm. There are spatial depth variations in the aforementioned four systems and lateral changes in lithofacies for both the caprocks and reservoirs, leading to suitable carbon storage systems that vary by site. At the TPP site, the systems from R1 to R3 are suitable for carbon storage. At the CCIP site, the systems from R1 to R3 with part of R4 are suitable for carbon storage. At the MA site, the systems of R1, R3 and R4 are suitable for carbon storage. Our results indicate that central Taiwan and offshore areas are ideal for the geological sequestration of carbon dioxide, and their capacity for hosting CO<sub>2</sub> requires further investigation.

Keywords: Geological carbon storage, caprock, reservoir, porosity, permeability, central Taiwan