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The potential sites and capacity of CO_2 geo-sequestration off western Taiwan

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IPCC has considered the method of CCS (Carbon dioxide Capture and Storage) a very good approach to reduce the global CO_2 quantity. Among all, the geological storage is thought to be the most efficient way. One way of CO_2 geo-sequestration is to inject CO_2 into a sedimentary layer at $\sim$1000m deep where a saline formation exists. With or without a geological structure of trap, in such a depth the CO_2 will be captured or dissolved. In Taiwan, most of CO_2 come from the industries or power plants situated in the coastal area of western Taiwan. A suitable CO_2 storage site could be close to the shore area. We have investigated the geological conditions for CO_2 storage along western coastal zone of Taiwan. The offshore area of western Taiwan is geologically a foreland basin, linked to the loading from the Taiwan mountain belt in the east. The plate bending of the Eurasian plate along the Taiwan Strait forms a basin receiving about 8 km thick sediments from Taiwan orogen since ca. 5 Ma. Considering the CO_2 supercritical condition beneath ca. 800 m deep, we found a suitable cap rock of Chingshui Shale beneath about 1000 m deep. Beneath the Chingshui Shale, the sandy layers of Kueichulin formation and Nanchuang formation contain porosity between 10% to 30% and are considered as excellent reservoir for CO_2 storage. We estimate that overall the capacity of CO_2 storage in the saline formations off western Taiwan could reach several tens of billion tons. However, if only we consider appropriate locations and the saline formations with suitable cap rock of Chingshui Shale, the capacity could be about 10 billion tons off western Taiwan.