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Pilot CCS project in Indonesia "Gundih CCS project": Geological and geophysical surveys for site selection and monitoring

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A pilot CCS project in Indonesia will be implemented in Gundih area, Central Java Province. The Gundih area is a gas field, and gas is ready to be produced by Pertamina EP. The CO_2 content within the produced gas is more than 20% in the Gundih field, so that CO_2 injection near the gas production well could be effective way to avoid abundant CO_2 emission. Before implementing CO_2 injection, the reservoir for CO_2 injection must be characterized carefully by conducting subsurface characterization and evaluation, in order to make sure that the reservoir is suitable for CCS. Here we report preliminary results of site surveys for the determination of CO_2 injection site in the Gundih area. Subsurface structures imaged on seismic reflection profiles indicate that the Ngrayong formation is one of the candidates for CO_2 injection. The lithology of the Ngrayong formation is sandstone, and the depth of the formation is $\sim$1 km in the Gundih area. Since we could not find large-scale structural closure (i.e. anticline) for the Ngrayong formation, we need to consider residual trapping. To reveal hydrological properties (e.g., permeability) of the Ngrayong formation, we obtained rock samples from the outcrop of the Ngrayong formation. Using the laboratory-derived hydrological properties and subsurface structures extracted from seismic data (e.g., geometry of the Ngrayong formation), we will apply reservoir simulation in order to determine CO_2 injection site. To design the geophysical monitoring survey (e.g., receiver and source position in time-lapse seismic survey), furthermore, we conduct simulation study for the constructed geological model and estimate elastic and electric responses associated with CO_2 injection.