Basin Evolution and Hydrocarbon Potential of Majalengka-Bumiayu Transpression Basin, Java Island, Indonesia

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A structural zone striking NW-SE from Majalengka to Bumiayu is characterised by fold belt of Neogene sediments. The zone is located between two majors lineament striking NE-SW; i.e. Cimandiri and N70E fault zones. Both zones indicate left lateral movement and place Majalengka-Bumiayu folded zone within transpression zone.

Stratigraphic information is limited both for the Neogene and the Paleogene sections. Neogene stratigraphic nomenclature is complicated due to inconsistency in applying stratigraphic code. However, it can be generalised that the stratigraphy is composed of rocks ranging in age from Oligo-Miocene to Pleistocene.

The rock characteristics reflect basin evolved within progressive deformation zone, starting from deep marine depositional setting with distal turbidite system in the lower part, upward through shallower deposits with coarser turbidites, and to coarse clastics of fluvial-shallow marine deposits as eroded from the basin's edge in the Plio-Pleistocene time. Regional structural analysis indicates the basin developed in strike-slip transpression zone.

Source rocks, reservoir, and seal are present in the basin. Structural trap related to thrust-belt system and diapiric were observed. Potential stratigraphic trap related to channel in the turbidite system exist theoretically. Petroleum system in this area clearly works. This conclusion is supported by at least twelve oil seepages, ten suspected gas seepages and one discovery well. The well encountered oil bearing formation in the turbiditic sandstones of Early to Middle Miocene. Based on the analyses, a petroleum system events chart is constructed and exploration strategy is proposed to reduce risk.