Petroleum Systems of the Pattani and North Malay Basins, Gulf of Thailand

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The Pattani and North Malay Basins located in the northern Gulf of Thailand are one of the major gas and oil provinces in Southeast Asia. The basins have estimated recoverable reserves of >25 TCF of gas and 1.3 billion barrels of oil and condensate.

Structural histories of the basins are closely related to the collision between the Indian and Eurasian plate since Eocene time. The Sunda Land, which covers much of Southeast Asia, is thought to be part of an "extrusion tectonic", resulting from the northerly movement of the Indian plate into the Eurasian. Generally, the basins are characterized as major north-south trending extensional basins with no evidence of inversion structure. Accommodation of extension has created multiple en-echelon graben systems controlled by basement block faulting. Continuous normal faulting throughout the Tertiary has created a multitude of fault related structural and stratigraphic traps filled with significant gas, condensate and oil accumulations in both graben trends and isolated horsts.

The basins involve two operating petroleum systems: a "shallow" (Miocene source-Miocene reservoir) system relating to most gas condensate, and a "deep" (Oligocene source-Miocene reservoir) system relating to oil accumulations in the basins. The "shallow" petroleum system was sourced from Lower/Middle Miocene fluvio-deltaic coals and carbonaceous shales (gas condensate-prone). The "deep" petroleum system involved the Oligocene syn-rift lacustrine algal sources (oil-prone). The Lower to Middle Miocene fluivial and deltaic sandstones are primariy target reservoirs in the basins.