

Aspects of the Geological Structures and Petroleum Resources of the Malay-Tho Chu Basin, Offshore Vietnam

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The Malay-Tho Chu Basin is located in the Eastern part of the Gulf of Thailand, where a number of oil and gas fields are put on stream. The basin was formed by extension and pull-apart related to movements of the Three Pagodas Fault. The basin is filled with an up to 10 Km thick Cenozoic sedimentary package that can be divided into 5 formations, namely the Kim Long, Ngoc Hien, Dam Doi, Minh Hai and Bien Dong formations. The basin is characterised by two main fault systems: a N-S trending, basement attached fault system in the northern part, whereas strike-slip faults related to Paleogene rifting dominate the southern part. The tectonic development of the basin reflects Pre-Cenozoic processes and can be divided into 2 stages: an Eocene–Oligocene rifting stage and an Early Miocene–Present sagging phase. Oligocene and Lower Miocene shales are regarded as the main source rocks.

The Oligocene, oil prone source rocks originated in lacustrine environments and contain organic matter dominated by algae. The Lower Miocene source rocks were mainly deposited in continental and lacustrine environments and can mostly generate gas. Oligocene–Miocene sandstones and pre-Cenozoic basement rocks are the main reservoirs, and fractured crystalline basements as well as stratigraphic traps are the main targets for oil and gas exploration in the basin. The Malay-Tho Chu Basin is regarded as a prospective, mainly gas-bearing basin possibly with some 450 Mm³ oil equivalent including approximately 150 Mm³ discovered.