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Cambodia's Hydrocarbon Prospectivity - An Insight from Block A

Katherine Y.J. Kho[1], Dr John M. Jacques[1,2]

[1]*KrisEnergy Ltd*

[2]*JMJ Petroleum Pte Ltd*

katherine.kho@krisenergy.com

The Gulf of Thailand remains one of the most attractive areas for hydrocarbon exploration and production in Southeast Asia, and constitutes the southern offshore extension of a N-S trending Cenozoic intracontinental rift system that extends over 800 km. The eastern part of this offshore rift system is dominated by ?Eocene–Oligocene syn-rift basins (2–5 km) that underwent rapid Miocene–Recent post-rift subsidence (4–8 km). Although unsubstantiated by significant well data, it is generally regarded that the syn-rift half-grabens that characterise these basins are largely filled with continental sediments, including important lacustrine deposits for hydrocarbon generation, particularly, oil. Coeval with the initiation of post-rift subsidence (latest Oligocene–earliest Miocene), these oil-prone lacustrine sediments were covered by coal-rich, fluvial-deltaic to paralic clastic sediments derived axially from the north (Western Highlands), east and west (e.g., Peninsular Thailand), and local intrarift highs, supported by apatite fission track data and provenance studies. This largely fluvial-dominated setting has provided the principal hydrocarbon-bearing reservoirs we see today, with intra-formational fluvial shales from paleosols forming the main top seals, and fault sealing accomplished by sand-shale juxtaposition and gouge smear.

One of these intracontinental eastern Gulf of Thailand basins, the Khmer Trough, is the subject of this paper; with Block A, operated by KrisEnergy, providing an invaluable insight into the untapped hydrocarbon potential of offshore Cambodia. The Block itself is close to several large producing oil and gas fields in the Central and Northern Pattani basins and contains the Apsara oil field - Cambodia's only confirmed discovery.

Recent technical work completed by KrisEnergy, and by previous operators, demonstrates the significant exploration and producing potential of Block A, and the Khmer Trough as a whole. Prospective trends in Block A have been identified with 3D seismic interpretation and exploratory drilling. These plays are situated within 3-way dip structural closures of north-south trending fault blocks, with multiple stacked reservoirs throughout the Oligo-Miocene section. There is also substantial potential for other fault bounded complexes and stratigraphic traps.

This paper has been designed to: (1) provide an overview of the geotectonic setting and history of the Khmer Trough; (2) the basin's essential play elements, including analogies from nearby genetically-related basins; (3) emphasise some of the key exploration highlights of Block A with regards to its hydrocarbon prospectivity; and (4) present some of the key technical work undertaken by KrisEnergy for the first phase of Apsara oil development in Cambodia Block A.

SPEAKER BIOGRAPHY

Katherine Kho received her BEng in Materials Science Engineering from the Nanyang Technological University of Singapore in 2009, and a MSc in Petroleum Geophysics from Imperial College, London in 2010.

Since graduating from Imperial, Katherine initially worked in global seismic processing and interpretation in London with Petroleum Geo-Services (PGS) from 2009-2011 and Schlumberger from 2011-2014. Since 2014 Katherine has been working as a geophysical interpreter for KrisEnergy Ltd., based in Singapore, largely working on a variety of projects within the Gulf of Thailand and the Bay of Bengal. Katherine was a recipient of the Karen Reed Memorial Award, a PESGB scholarship and the BP Book Prize in 2010, and is a member of the AAPG and PESGB; she is also a serving councillor for the Southeast Asian Petroleum Exploration Society (SEAPEX).