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## **Petroleum systems of East Africa; insights from exploration activity in Tanzania and Kenya**

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BG Group has undertaken Exploration activity in the offshore basins of both Tanzania and Kenya. To date, BG Group and its partners have discovered ~16 TCF total gross resource of dry gas in offshore Tanzania blocks 1 and 4. Other discoveries along the East African margin have also been overwhelmingly dominated by gas, which at first pass is at odds with published interpretations of an oil-prone source for the area. In addition, in 2014 BG Group drilled the Sunbird-1 exploration well in block L10a in Kenya. The well was a play-opener, targeting a Miocene carbonate prospect in the deep axis of the Tembo Trough (a sub-basin of the Lamu Basin). The well discovered both gas and oil at the crest of the primary target. This talk discusses the petroleum systems across the offshore basins of Kenya and Tanzania.

The sunbird-1 well penetrated a late Aquitanian – Serravallian isolated carbonate buildup (ICB), just inboard from a steep-margined, land-attached carbonate platform. It encountered gas and oil (23.3 m and 4.4 m net pay; 29.6 m and 14.0 m gross, respectively). The presence of the biomarker Oleanane in the oil suggests a post-Barremian age, deltaic source rock. Gases are dry, and are from two thermogenic sources: (1) oil-associated, type II; and (2) coal-derived, type III. Sources for the oil and gas are considered to be Palaeocene-Eocene in age. Both oil and gas show evidence of biodegradation.

In Tanzania the dominant source rock is interpreted to lie in the Lower-Mid Jurassic (syn-rift to early post-rift) section, although erosional remnants of underlying Permo-Triassic Karoo basins may contribute locally, as may plant material-rich Palaeocene-Eocene sections where sufficiently mature. The Jurassic source-prone section is uplifted and exposed in places onshore, notably in the Mandawa Basin, however as yet unpenetrated offshore of Tanzania. The gases in BG's Tanzania discoveries indicate a highly mature source with potential marine affinities, tentatively typed to oil extracted from Lower Jurassic shales in the Mandawa Basin.

