

## **Play Fairways Analysis and Hydrocarbon Potential of the Keta Basin, DeepWater Ghana**

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The Offshore Keta basin, a part of the Gulf of Guinea province which includes the Ivory Coast, Tano, Saltpond, Central Benin basins and the Dahomey embayment has recently been an area of strong interest by the oil industry. Exploration offshore Ghana received a tremendous boost with a number of large discoveries recently made in Cape Three points West and Deep-Water Tano. This basin developed as a transform margin along the Romanche Fracture Zone (RFZ) as Africa separated from South America beginning in the Early Cretaceous.

The Keta basin is regionally located within wrench modified basins initiated during the Late Jurassic rifting of the Atlantic ocean basin. The area has undergone a complex history which can be subdivided into the pre-rift, syn-rift and post-rift stages. The Keta block is located in the drilled onshore and offshore parts and the deepwater part of the Keta basin, offshore Ghana. Water depths range from 0m - 2800m. With respect to proximity to other fields in the Gulf of Guinea province, the Keta basin is situated in the eastern portion of the larger Saltpond basin and is separated from the Ivory Coast Saltpond basin by the Romanche Fracture zone.

To assess the hydrocarbon prospectivity of this basin, this study has focused on interpretation of key stratigraphic sequences, understanding the basin evolution, the identification of key elements and processes for a working petroleum system (source rocks, reservoirs, migration routes, traps, seals), an identification of structural and stratigraphic prospects in this relatively frontier deepwater basin.

This study confirms the presence of a working petroleum system. Basin modeling suggests the presence of several source rocks (Early Cretaceous and Albian). Faults are likely migration pathways which have led to charging of synrift Albian reservoirs, late Cretaceous reservoirs and tertiary reservoirs. Traps are primarily stratigraphic. Extensive seals occur throughout the Cretaceous and include marine shales.

This study illustrates numerous seismic examples from regional reprocessed pre-stack time migrated (PSTM) 2D seismic data, showing the different plays in the area and proposed recommendations for further development of potential prospects. These play types might be similar to identified huge hydrocarbon deposits in Upper Cretaceous deepwater sandstones by Kosmos and Tullow's exploration activity in the west of the country ( West Cape Three points and Deepwater Tano blocks).