

Hydrocarbon Potential of West Africa's Final Frontier: The Namibe Basin

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Abstract

The Namibe Basin is a true frontier in the South Atlantic, covering an area of over 100,000 sq. km offshore Angola and Namibia. The Angolan offshore has been penetrated by only the ODP site 1080 wells which drilled a maximum of 52 metres of stratigraphy, and just two exploration wells have been drilled to date in the Namibian sector. Kunene-1 (2008) targeted Albian carbonates in a four-way dip closure and Tapir South (2012) pursued Cretaceous clastics draping a rotated fault block ridge, neither of which found commercial hydrocarbons.

Since these wells were drilled regionally extensive broadband 3D seismic data have been acquired in both countries, enabling hydrocarbon potential to be evaluated in a holistic manner. The seismic, interpreted in conjunction with potential fields data, demonstrates a wide range of potential targets that could transform this frontier region into a prolific hydrocarbon province.

The Namibe Basin is very different from its conjugate in Brazil, the Santos Basin, where multi-billion barrel pre- salt oil discoveries are producing at outstanding flow rates. Compared to other South Atlantic basins, Namibe contains significantly less salt, though potential in the pre-salt is observed in the north of the basin where structures are identified both at the immediate base salt surface and detached from this event in the deeper syn- rift section.

Recent successful frontier exploration along the Atlantic Margins has focused on post-rift deepwater clastic reservoirs situated close to underlying mature Upper Cretaceous marine source rocks, providing simple hydrocarbon migration pathways. In the Namibe Basin comparable candidate play elements have been interpreted in similar geological situations. Extensive marine source facies have been mapped that are closely coupled with stacked overlying clastic fairways, providing significant running room in the basin.