Miocene Exploration Deepwater Lebanon

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ABSTRACT

For the first time, acreage offshore Lebanon is available to License for hydrocarbon exploration. This Basin is unique as despite never being licensed previously, it already has ca 70% coverage with 3D seismic. This creates an unprecedented stage for pre-bid de-risking and a platform for accelerated exploration for the near future.

Since the discovery of the Tamar Field in 2009, industry attention has been drawn to the Eastern Mediterranean by the ca. 30TCF of Early Miocene dry gas discoveries that have subsequently been made in the Southern Levant basin. This area is often considered to be characterised as a mostly explored biogenic gas basin, with reservoirs derived from the Arabian plate to the South East, and structures provided by simple inverted Syrian Arc anticlines.

Yet offshore Lebanon, just 70 km to the north remains unexplored, despite displaying even more exciting and favourable play elements. Based on regional 2D and 3D seismic and well studies, we show that in the South-West Offshore Lebanon, Nile Delta derived Early Miocene sands are thicker than in Southern Levant, and there is a strong case for a working thermogenic hydrocarbon system.

De-risking of the Early Miocene play fairway in the Levant Basin has recently taken a huge step forward in recent months by integrating models for reservoir and hydrocarbon charge with the clarity of structural imaging of 3D seismic datasets. These 3D data are yielding a new understanding of both basin and trap formation, identifying very significant north-south mid-basin structural arch, that has been cross cut by linear East-west piano key faults. This yields a prolific number of simple one-way fault and three-way dip closed structures, often with 400m relief, within a mid-basin ‘super-closure’.

The chance of success of these structures is highly dependent, setting up playmaker opportunities where early trap formation is matched to source rock maturity and expulsion significantly reducing both risk and uncertainty in resource estimation throughout the play. 3D allows reservoir architecture in the Early Miocene to be resolved, and additionally, a new play – the Late Miocene clastic sequence poorly developed to the south is interpreted to represent a new and exciting shallow sub-salt target offshore Lebanon.

Proximal to the discoveries to the south, on trend with reservoir transport models and clear thickened seismic clastic facies, abundant large structures within a mid-basin super-closure, and coincidence with mature thermogenic source, illustrates that the south western Offshore Lebanon area is very favourable indeed for low risk exploration.