

The Tectonostratigraphic History and Petroleum Potential of the Levantine Basin

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The Levantine Basin is both a proven & frontier basin. There has been limited exploration; most on the modern continental shelf and less in the deeper part of the basin. Numerous hydrocarbon shows and noncommercial oil and gas discoveries occur in various aged siliciclastic and carbonate rocks. Hydrocarbon shows and other DHI's including flat spots/bright spots identified in an extensive 2D seismic survey and seeps visible in satellite data indicate hydrocarbon potential throughout the basin. The DHI's together with tectonostratigraphic history interpretations and 2D basin and petroleum systems models of the basin suggest the burial and thermal history support petroleum generation and accumulation with the recent giant gas discovery (~5TCF) ~60 miles offshore in deeper water confirming the petroleum potential. Several potential petroleum plays have been identified with industry quality 2D seismic data; exploration targets are structural and stratigraphic traps. Interpretations and 2D models developed for the basin can be used to lower exploration risk.

The Levantine Basin's tectonostratigraphic history records a position along the southern Tethyan margin with many similarities between the Levantine Basin and elsewhere along the African-Arabian plate. Tectonics followed the general progression associated with the opening and closing of the Tethys: rift-extension, passive margin, and compression. The stratal package is up to 15 km thick and consists of mixed siliciclastic-carbonate-evaporite facies; depositional settings ranged from fluvio-deltaic to deep marine. Candidate source rocks are argillaceous carbonates and shales. Reservoir rocks include siliciclastic and carbonate. Seal rocks are siliciclastic, carbonate, and evaporite. The 2D models show that maturity of source rocks varies according to age and burial, while the older source rocks have completely matured, there was only partial maturation of younger source rocks. Petroleum generation was sufficient for ample charge into potential reservoirs. Moreover, timing of source rock maturity, charge, and trap formation are conducive preservation and accumulation of petroleum.