

Hydrocarbon Exploration Activities in the Eastern Mediterranean Basins: Challenges and Opportunities

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The Nile Delta offshore basin comprises a world-class hydrocarbon province between the deep and long existing Levant Basin to the east and the Herodotus abyssal plain to the west. The variety of tectonic styles and depositional patterns in the eastern Mediterranean basins provide favorable trapping conditions for hydrocarbon generations and accumulations. The shallow gas discoveries in the Pliocene sands and the high-grade oils in the Oligo-Miocene and Mesozoic reservoirs indicate the presence of multiple source rocks and an appropriate conditions for hydrocarbon accumulations in both biogenic and thermogenic petroleum systems. These systems were active in the whole Mesozoic and Cenozoic sedimentary sequences of Levantine, Nile Delta and Herodotus basins.

Trap filling in the Nile Delta and even the western part of Levant basin can be considered as a dynamic process to maintain constant pressure magnitude and subsequently constant hydrocarbon columns. Leakage of natural gas from traps in the Tertiary rocks resulted in gas chimneys mostly related to the deep-seated faults in the Nile Delta. Sealing rocks are generally sufficient to hold significant hydrocarbon column, except where structural collapses occurs at crests. Hence, fault re-activation can be generally ruled-out as an additional reason for hydrocarbon entrapment failures in the Nile Delta and Levant basins. Meanwhile, the majority of such unsuccessful exploration wells show evidences of residual or paleo-hydrocarbon columns.