This contribution presents an updated comprehensive review of the petroleum prospects of Lebanon through description of the known hydrocarbon shows as well as their host rock formations and structures. Tectonic and depositional evolutions will be discussed and placed in the larger context of the eastern Mediterranean Levant region. A generalized model for hydrocarbon migration in Lebanon is presented disclosing data about Paleozoic, Mesozoic and Cenozoic prospects.

Since no economical petroleum prospects have been exploited to date in Lebanon, the necessary regional correlations and comparisons with adjacent hydrocarbon producing countries were undertaken in this contribution. This approach helps in explaining the Lebanese data in a regional framework, filling certain gaps and confirming or negating proposed ideas. Major lithological rock units are described and their aspects with respect to hydrocarbon prospects are assessed (source rocks, reservoirs, cap-rocks). The tectono-sedimentary evolution is reviewed together with the major structural configuration (e.g. Syrian Arc deformations and basinal inversions, Dead Sea strike-slip fault and transpression). The role of diagenesis (e.g. dolomitisation, karstification, dissolution) in enhancing reservoir properties is also highlighted and linked to the major structures and tectonic events that are believed to provide traps.

Hence, the present understanding of the petroleum systems in Lebanon proposes two major plays: (1) onshore the Qartaba structure (or similar anticlinal structures) - associated to the Syrian Arc Deformation-, where Triassic (ore pre-Jurassic) prospects are considered to be of major interest; and (2) offshore northern Lebanon where various Cretaceous and Neogene rock formations may be charged by the Upper Cretaceous source rocks and sealed with volcanics, marl/clay, and evaporites. Local reef platform structures of Miocene age, sandstone and turbidites (Cretaceous and Cenozoic) offshore northern Lebanon, especially within the southern Levant Basin, are believed to provide attractive reservoirs. The timing of hydrocarbon migration should be constrained. Potential reservoirs may be isolated by the evaporites, volcanics, clays and marls, as well as the Messinian salts which acts as a heat conductor and may save the underlying source rocks from over-cooking.

This contribution is a general, updated review of the petroleum prospects of Lebanon within its regional framework.