

# **Petroleum System of the Middle East**

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More than 500 commercially significant oil and gas fields have been discovered in the Middle East since the beginning of the 20<sup>th</sup> century. The published recoverable petroleum reserves at the end of 1998 were estimated 677 BBL and 1726 tcf, which represents almost 65.2% and 33.7% of the world's oil and gas reserves respectively. Most of the fields has more than one pay zone producing from shallow water carbonates and clastics with pay zones ranging in age from Infracambrian to Oligo-Miocene. The most prolific oil-producing zones are: The fracture and reefal carbonates of the Asmari and its equivalent formation (Oligo-Miocene) of SW Iran and Northern Iraq; the shallow water carbonates of the Arab Formation (Upper Jurassic) and the Thamama Group (Lower Cretaceous) of Eastern Arabia; the rudist and associated facies in the Shuaiba, Mishrif, Simsima (Aptian, Cenomanian and Maastrichtian) in the southern Arabian Gulf; the shallow water clastics of the Zubair (Barremian) and Burgan/Nahr Umr (Albian) in Kuwait, S. Iraq and NE Offshore Saudi Arabia; the shallow shelf limestones and dolomitic limestones of the Khuff/Kangan Formation (Permian) in the Arabian Gulf; the carbonate and clastic sediments of the Huqf Group (Infracambrian Early Cambrian) in Oman and the clastics of the Permian Unayzah/Hausi Formation in Arabia.

The most prolific source rocks are: the shales of the Kazhdumi Formation (Albian) in SW Iran; the laminated argillaceous limestones Hanifa Formation (Kimmeridgian) or its equivalent Sargelu Formation in the Arabian Gulf; the argillaceous bituminous limestones Shilaif/Khatiyah Formation (Albian-Early Cenomanian) in the Arabian Gulf; the Upper Cretaceous marly limestones in Northern Iraq, the Silurian shales in Arabia and Iran and the Infracambrian carbonates in Oman. The major sealing rocks are the anhydrite of the Hith Formation (Tithonian); the shales of the Nahr Umr (Albian); the shales of the Laffan Formation (Coniacian) and the anhydrite of the Gachsaran (Miocene). The structure forming mechanisms that have operated in various parts of the Middle East include several types such as salt-cored structure, and/or halokinesis movements; deep seated basement faulting; compressional folding, and transtensional/ transpressional structures. The depositional pattern of the sedimentary rocks through geologic time resulting from the interplay of many factors such as sea-level changes, climatic variations, epeirogenic movements and rejuvenation of relief. These factors have a direct influence on the regional distribution and occurrences of hydrocarbons in the region.