

The Petroleum Endowments of the Total Petroleum Systems in the Middle East and North Africa Tethys

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The Total Petroleum Systems (TPS) of the Middle East and North Africa represent the dominant oil and liquids (first by significant margins) and natural gas endowments (slightly behind the Former Soviet Union) of the world. 58% of global oil reserves (765 BBO of a total of 1326 BBO exclusive of the U.S. as of 1/1/96) and 44% of the world's known petroleum volume occur in this region. Some estimates suggest that two-thirds of the liquid petroleum potential of the world resides in this region which coincides with Region 2 of the USGS 2000 assessment. Twenty eight TPS were studied in the USGS 2000 global petroleum assessment, and three additional TPS have been evaluated since 2000 in this region.

The petroleum endowment is comprised of four elements; i.e. cumulative production, remaining reserves, reserve growth and undiscovered resources. As of 1/1/96 data, this region had nearly three times the liquid endowment of any other region, and was closely comparable to the Former Soviet Union natural gas endowment, both significantly larger for conventional resources than any other region. Reserve growth data from 1997 to 2003 show that this region dominates additions for oil (85 BBO) and natural gas (over 1100 TCF or 183 BBOE) relative to any other region. Discoveries continue to be impressive in the 2000-2008 time frame with average discovery sizes being 840MMBOE, 780MMBOE and 233 MMBOE in Kuwait, Iran and Saudi Arabia (IHS, 2009).

Four mega-TPS dominate the petroleum endowment in this region; i.e. the Infracambrian, Silurian, Jurassic and Cretaceous. All four occur on the Arabian Peninsula with the Jurassic TPS providing over two-thirds of the volume whereas the latter three TPS dominate North Africa particularly Silurian/Devonian and Cretaceous TPS there. Tertiary TPS contribute in both regions as well. Significant unconventional natural gas resources have been identified or produced in the Silurian TPS in both the Arabian Peninsula (Jordan and surrounding nations) and North Africa (Algeria) and represent a very large future potential for this richly endowed region. Significant natural gas discoveries in Egypt and the eastern Mediterranean and oil discoveries in frontier provinces such as the Murzuk Basin only increase the prospectiveness of this prolific region.