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Undiscovered Conventional Petroleum Resources of the Paleozoic and Jurassic Total Petroleum Systems, Greater Ghawar Uplift Province, Eastern Arabian Peninsula and Gulf Region

Two prolific total petroleum systems (TPS), a Central Arabia Qusaiba-Paleozoic TPS and a Jurassic age Arabian Sub-Basin Tuwaiq/Hanifa-Arab TPS, encompass the Greater Ghawar Uplift Province (USGS Province 2021) of the eastern Arabian Peninsula and Arabian-Persian Gulf. Thick, organic-rich, thermally mature source rocks, high porosity reservoir rocks, and highly effective seal rocks in both TPS are of great areal extent. The combination of these extensive and exceptional elements, and the formation of large structural closures prior to, or coincident with, peak hydrocarbon generation and migration, produced some of the world's largest oil and gas fields.

Two assessment units (AU) are recognized in the Central Arabia Qusaiba-Paleozoic TPS that are related to type of structural trap and presence of underlying Infracambrian salt: (1) an onshore Central Arch Horst-Block Anticlinal Oil and Gas AU, and (2) a mostly offshore North Gulf Salt Basin Structural Gas AU. Mean total volume of undiscovered conventional resource for the Central Arabia Qusaiba-Paleozoic TPS is estimated at about 108 billion barrels of oil equivalent (BBOE) [19 BBO; 383 trillion feet of gas (TCFG); 25 billion barrels of natural gas liquids (BBNGL)].

Two assessment units are also recognized in the Arabian Sub-Basin Tuwaiq/Hanifa-Arab TPS that are similarly related to structural trap style and presence of underlying Infracambrian salt: 1) an onshore Horst-Block Anticlinal Oil AU, and 2) a mostly offshore Salt-Involved Structural Oil AU. Mean total volume of undiscovered conventional resource for the Arabian Sub-Basin Tuwaiq/Hanifa-Arab TPS is estimated at about 49 BBOE (42 BBO; 34 TCFG; 1.4 BBNGL).