

## Comparative Study of the Mature Basin of the Bohai Bay and New Frontier Basins of the Mongolian Plateau, China

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The subduction of the Pacific plate under the Eurasian continent created two groups of rift basins in eastern China. The Mongolian Plateau basins, which include the Hailaer, Tamtsag, East Gobi, and Erlian basins, are in one group developed by regional extension behind the active plate margin in the Mesozoic. These basins were filled with Jurassic-Cretaceous lacustrine-fluvial sediments 3.5-4.0 km thick.

The Bohai Bay basin, part of the group of Cenozoic rift basins, was created in the Tertiary by doming and rifting caused by subduction near the active plate margin. There is over 6.0 km of lacustrine-fluvial sedimentary fill in the basin. The Bohai and the Mongolian Plateau basins share many structural and sedimentary characteristics that are typical for intraplate rift systems. Both are characterized by rapid subsidence, numerous half-grabens, active faulting, widespread volcanic intrusion, and tripartite fluvial-lacustrine facies throughout rifting.

The Bohai Bay basin has proved to be a giant petroleum province. It has reserves of an estimated 20 billion barrels in place. The Bohai basin is a good analog for the Mongolian basins in terms of tectonic

evolution, sedimentary history, and hydrocarbon habitat. Buried hills, tilted fault blocks, and draped anticlines are the major structural plays. Black lacustrine shales with an average TOC of 1.8%-3.4% are the major source rocks and are thermally mature. Delta-front, subaqueous fan, deep lake turbidite, channel, and fluvial sandstones with porosity of 17%-25% are the principal reservoir rocks. Fractured volcanoclastics and karsted carbonates are the major buried-hill reservoirs.

Commercial hydrocarbon flows have been discovered in the fluvial-lacustrine succession of the Aershan structural zone in the Erlian basin, the Lower Cretaceous sandstone of the Sotamo-19 well in the Tamtsag basin, and Beierhu-Huhehu depressions in the Hailaer basin. High hydrocarbon potential probably exists in the unexplored sub-basins of the Mongolian Plateau. The geology and exploration models in the Bohai Bay basin will enhance understanding of these frontier basins.

### BIOGRAPHICAL SKETCH

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Mr. Wu has consulted to international oil and gas companies and to the Chinese petroleum industry. He was in charge of the data package preparation for the first bidding round of China onshore blocks in 1984. He has exploration and production experiences in both onshore and offshore Chinese basins, the southeast Asian lacustrine basins, and the North Sea basins. He is currently focused on the study of petroleum systems of lacustrine rift basin and the tectonic controls of hydrocarbon generation and migration. He has published numerous papers, and abstracts in both Chinese and English.