

The Geological Evolution of the East China Sea Basins — Implications on Petroleum Exploration Prospectivity

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ABSTRACT

The East China Sea is one of four marginal seas of China, encompassing an area of 750,000 km². Situated at a convergent plate boundary it exemplifies the structural characteristics of a trench-arc-basin system.

The area contains two major sedimentary basins, the Shelf basin and the Okinawa Trough basin. The former evolved during shearing of the continental margin and the latter as a result of backarc rifting associated with subduction of the Philippine plate.

The Shelf basin is tectonically subdivided into the Taixi, Taibei, Zhedong and Fujiang basins. Four structurally distinct periods characterize basin evolution: (1) Late Cretaceous to Eocene rifting; (2) Oligocene to middle Miocene post rift; (3) late Miocene compression; (4) Pliocene to recent regional subsidence.

In the Taibei basin and adjacent Jilong Subbasin, the most prominent arc closures consist of tensional structures formed during rifting. Synrift sequences contain the primary source rock facies.

The post-rift period was distinguished by uplift of the Taibei basin and isostatic subsidence in the Zhedong basin. In the Taixi basin continued tectonism was manifested by basement detached listric faults and associated rollover anticlines.

Late Miocene compression produced easterly dipping backarc thrust faults and associated asymmetrical folds in the Xihu subbasin (Zhedong basin). These structural culminations being the target of 15 wells.

The Okinawa Trough basin, evolved during the late Miocene or early Pliocene. It comprises the North basin, which is now in an active stage and the South basin now in a sea floor spreading stage.