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Abstract

Biogenic methane from offshore Myanmar is dominant source of hydrocarbon supplying energy demand in the country. Zawtika Field in Gulf of Moattama and Shwe Field in Bay of Bengal are the two largest biogenic gas accumulations. They share similar gas composition that indicative of biogenic in origin and yet the two accumulations are distinctively different in overall geological setting. Findings from detail analysis illustrate their unique control and hence guiding the future exploration opportunity.

Plio-Pleistocene sequence in Moattama Basin is well-recognized by thick prograding stacking of Ayeyarwady delta clastics into a tectonically active Moattama Basin. Conventional cores from key reservoirs indicate lower coastal plain to shallow marine environments which large scale monocline seismic reflectors locating the transitional areas. Well penetrations also provide geo-thermal condition that theoretically impact biogenic generation potential as well as Bio-Chemical condition that directly impacting bacterial who is the main player for this unique play. Similar approach were also applied to Bengal-Rakhine Basin with much less data, anyhow some degree of analysis can be made accordingly.

“Five Influence Factors” are the results from the analysis. 1) Structural Domain Analysis reveals a genetic control of tectonically related trends and trap formation. 2) Depositional Condition which correspond to distinct sediment fills of continuous Ayeyarwady and Sittang Rivers since Pliocene into Moattama Basin. Sedimentation rate in high potential area is more than 750-1000 m/ma with nicely stacking reservoir/seal pair of prograding sequence. 3) Thermal Condition is striking to be low in the high biogenic generation potential areas. 4) Bio-Chemical Condition which is a combination of chemical condition that favor the living and abundance of key players, the bacteria. 5) Condition of Bio-Methane Generation, it's been well accepted that the bio-methane generation requires multiple stages of bacteria activities. Each stage require specific chemical condition that can be proof by chemical condition from retrieve reservoir fluid samples. The five factors describe key ingredient/condition in shallow water condition, especially at Zawtika Field. On the other hand, the discovery from Bengal-Rakhine Basin reveal alternative bio-methane generation/accumulation control. Sedimentation rate can be much less in deep-water environment (500 m/ma). Bengal-Rakhine was impacted from subduction of India-Eurasia tectonic which creating fold/thrust belt favoring the Plio-Pleistocene biogenic generation while the Moattama Basin is majorly controlled by strike-slip motion of Sagaing Fault.

Key for future exploration of biogenic HC along offshore Myanmar is to understand the control of these unique accumulations. Offshore Myanmar is an exceptional case where illustration of two environments of deposition is available in order to study their individual significant to biogenic play. The understanding of two conditions enable to future exploration to be performed with considerate and care with the hope to find the next discovery in offshore Myanmar.