

HYDROCARBON AND NON-HYDROCARBON GASES OF PAPUA NEW GUINEA

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Petroleum exploration has a long history in Papua New Guinea (PNG), with the first well drilled in 1912 (Rickwood, 1990). More recently investment by international operators in petroleum exploration in PNG has markedly increased. While liquid hydrocarbons have been the main target (e.g. Kutubu discovered in 1986 and Gobe discovered in 1991), there has also been a number of gas or gas/condensate discoveries made (e.g. Juha Field discovered in 1981-84 (Valenti, 1993); Hides Field discovered in 1987 (Grainge et al, 1990); P'nyang Field discovered in 1990 (Valenti, 1993). Recently exploration has focussed on nearfield appraisal (e.g. NW Moran, Bilip) and the Papuan Foreland (e.g. Kimu 1, Koko 1). Well results continue to indicate that gas plays a major part in the Petroleum Systems in PNG. Compositional/isotopic data suggest these gases have a variety of origins (Figure 1).

Commercial hydrocarbon discoveries in the Papuan Basin are almost entirely hosted in thrust faulted anticlines in the PNG Foldbelt which are produced from shoreface to estuarine sandstone reservoirs (Toro to Iagifu Sandstones – e.g. Kutubu, Hides). The PNG Foreland sees a few smaller gas discoveries (Kimu, Elevala) also in sandstones. Several undeveloped gas fields lie in the Gulf of Papua which are hosted in carbonate build-ups (Darai / Mendi Limestone), e.g. Uramu, Pasca. The Eastern Papuan Basin also indicates the presence of a gas system (e.g. Bwata, Kuru).

As a result of the shallow reservoir depths (discoveries and shows range in depth from 313m to 4200m, with an average of about 2610m) for both oil and gas, some biodegradation is evident; however, this is not as widespread as expected due to the late charge that many of the structures have experienced. There are abundant oil and gas seeps at the surface, especially within the foldbelt.

By comparing molecular and isotopic information of the gases in the region with oils in the area, it is hoped that we can define possible source information and secondary effects that have affected discovered gases.

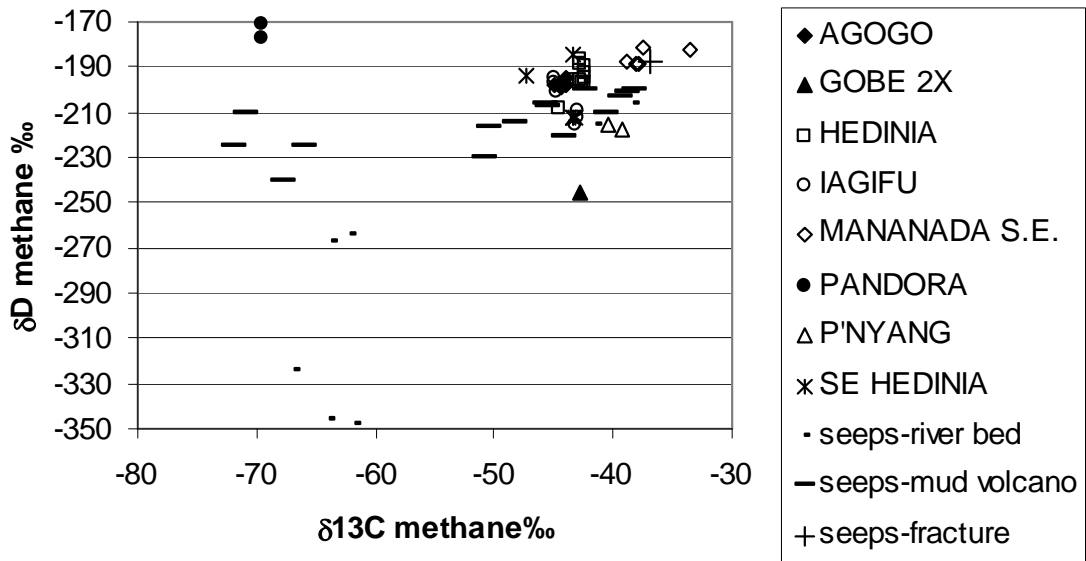


Figure 1. Example of the distribution of isotopes of carbon and hydrogen in methane discoveries and seeps in PNG taken from various literature sources.

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