ENERGY COUNTRY REVIEW

Papau New Guinea

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Papua New Guinea ("PNG") is located in the south-western Pacific towards the eastern end of the Indonesian archipelago. PNG is rich in natural resources including oil and natural gas. Development of PNG's oil and gas resources has been slow due to the rugged terrain and the high cost of developing infrastructure. Existing infrastructure is concentrated around major projects and urban areas. Existing oil refineries have the capacity to produce 32,500 barrels of product per day. A consortium led by ExxonMobil has begun the commercialization of PNG's estimated 22.5 trillion cubic feet of natural gas reserves through the construction of a liquefied natural gas production facility scheduled for completion in 2014.

Oil began to be produced in Papua New Guinea in 1992 after heli-borne rigs were used to explore in the remote jungle ridges. Fields clustered in the Kutubu complex remain the only oil and gas producers. Apart from brief increases in output in the late 1990s production had been in permanent decline up to 2002 when output stabilised.

It is forecast that new a LNG gas development, firstly tapping gas fields in the Papuan Fold Belt, after a pipeline project to Australia was abandoned, will lead to considerable growth in gas production. The processing plant will also be tied into offshore discoveries in the Gulf of Papua. Associated liquids production from these fields should lead to small increases in oil output allowing the oil production plateau to be maintained.

PNG has five sedimentary basins: Papuan, North New Guinea, Cape Vogel, New Ireland and Bougainville. The first three basins have been regarded by the petroleum industry as highly prospective for oil and gas. The Papuan Basin has had production since commercial discoveries were made in 1986. Even though there are numerous oil and gas seeps and shows in the North New Guinea and Cape Vogel basins, there is yet to be any major oil or gas field discoveries. Very little exploration has been made in the other two basins, which are New Ireland and the Bougainville basins. Along with the North New Guinea and Cape Vogel Basins, the New Ireland and the Bougainville basins are considered the frontier areas of exploration.

Source: Eaglewood Energy, Energyfiles.com

Geology

The PNG oil and gas fields are held within fold belts and it is the abundance of structures in the fold belts which is the major difference to other petroleum provinces. More importantly the petroleum system(s) which feed these structures is world class.

The Papuan Mesozoic geology is part of the Tethyan petroleum system which has strong sedimentary (source, seal and reservoir rocks) similarities to the NW Shelf of Australia. Each region has

significant oil and gas reserves and importantly each region holds individual fields which are very large in size. In the Papuan Basin there is the; Kutubu and Gobe oil fields and the Hides gas fields. In the younger Cenozoic East Papuan Basin there is the Elk/Antelope gas field.

The Papuan Basin has proven plays in the Jurassic-Cretaceous folded clastic reservoirs, and drape and fault block plays in the less folded foreland. The East Papuan Basin proven plays are the folded Miocene carbonates, either reefal or deep water. The fold belts generally are extremely rugged and for a long time the oil and gas in the highlands was stranded. In 1986 the Kutubu oil discoveries were made, between 1991 and 1992 the 265 km pipeline was built and production commenced June 1992. Oil production at Kutubu peaked at 130,000 bopd. The Hides gas field was discovered in 1987 and small scale gas production as feed stock for electricity generation commenced in 1991. The PNG-LNG 700 km pipe line began in 2010 and production commenced in April 2014, reported to be 100 million cubic feet a day from a proven reserve base of 7.1 Trillion cubic feet. The East Papuan Basin saw success with the drilling of the Antelope gas field in 2007. Reserves are in the order of 6.5 Trillion cubic feet with deliverability as high as 705 million cubic feet from Antelope 2 reefal carbonate reservoir. There is currently a feasibility study on how to commercialize this with an LNG export facility.

The same types of folded anticlinal traps exist with PPL579, but without the remoteness or the rough topography of the highlands. The current foreland setting has the traps buried and below sea level and the PPL is only 150 km from Port Moresby. Most of PPL579 is accessible by road or by boat.

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