





# Papua New Guinea

Despite the fact that Papua New Guinea is well-blessed with rich natural resources, its economy has struggled as the exploitation of these is hampered by unfavourable terrain and the high cost of infrastructure development. Approximately 85 percent of the local population depend on agriculture for their livelihood. Mineral deposits account for around two-thirds of its exports.

The government of Prime Minister Michael Somare is currently in power and will be the first government in line to fully serve its five-year term. Somare's government has brought stability to the national budget through expenditure control.

Challenges facing Somare's government include curbing inflation, improving investor confidence, privatising government assets, and balancing relations with Australia, its former colonial ruler.

According to 2005 estimates, the growth in real GDP was earmarked at 2.9 percent. The ever-improving economy is primarily driven by the projected growth in the mineral sector, and the agricultural/ forestry/ fisheries sectors. This is expected to influence the other sectors of the economy. The commencement of production from the Moran Petroleum Development License (PDL5) and higher production from the Gobe oil field will contribute to higher exports of crude oil in 2003.

## Industry Overview

Papua New Guinea's electricity production is

1.496 billion kWh as of 2001 while its consumption is 1.391 billion kWh. Around 80 percent of the electricity is generated by hydropower stations. PNG Power handles 19 power systems with the major hydroelectric schemes being Port Moresby, Ramu and Gazelle Peninsula.

The petroleum and energy sector plays an important role in the economy and accounts for a considerable slice of the GDP. The development of the large natural gas resources plays a pivotal role in the government's economic development and growth strategy. One of its goals is to efficiently manage the development of the gas sector, and to promote the participation of local communities in the various projects. It also continues to explore the channels available to utilise the country's sizeable gas resources through both exports and domestic usage.

With the completion of strategic pipelines and facilities, the development of new oil and gas resources would be easily facilitated. These facilities include the Hides Gas Plant, Kutubu Oil Facility, Gobe/SE Gobe Facility, Kumul Marine Terminal and the Napa Napa Oil Refinery. Oil fields also have adequate access which most heavy equipment can utilise.

The Kutubu, Gobe and Morano oil fields are some of the natural resources available in the country. Their development has provided considerable economic benefits in terms of employment, investment, contribution to the balance of trade, and taxation and royalty revenues. However, with the decline in oil production, owners of

## PROFILE

Capital Area	Port Moresby	Installed Capacity	539MW
Population	462,840 km	Population Electrified	12%
GDP	5.42 million	Main Voltages (kV)	220, 110, 66
Currency	US\$11.99 billion	Natural Resources	natural gas, coal, hydropower
	kina (PGK)		

prospecting and development licenses need to discover and develop additional oil reserves. It is therefore imperative that a new course of action is taken if the petroleum sector is to continue to make a substantial contribution to the economy and to the livelihood of the population.

The government and MNCs like ExxonMobil and ChevronTexaco recognise that the commercialisation of major gas reserves in the PNG Fold Belt offer the best opportunity to realise sustainable hydrocarbon resource development in the long run. The ultimate proposed configuration for developing the reserves is the PNG Gas Project - a project that utilises hydrocarbon resources to produce a number of products for sale on the international markets (crude oil, condensate and Liquefied Petroleum Gas) and gas for sale in Australia.

The project consists of a number of phases, with the initial stage being the development of the existing oil producing fields, and selling gas in Australia at rates of up to 100 PJ/a (400 MMscfd). As gas demand in Australia increases, additional oil and gas fields will be utilised, most significantly the large Hides gas field. The system will be capable of being expanded to produce up to 250 PJ/a (600 MMscfd) of gas sales.

Landowner issues still remain a major challenge to the operation of gas and oil projects in the country. The government has been addressing the issue through the provision of central grants to fund development projects in the resources development areas, and even to allow for greater participation of the landowners in the development of oil and gas projects.

### Privatisation

State-owned businesses in the country are often mismanaged, corrupt and are often criticised by the elites of the country. As such, they are continuously unprofitable, and are more of a burden to the government.

The government has decided to offload them off via a privatisation programme. At least seven of these businesses have been identified and are being prepared for privatisation, including the PNG Electricity Commission (Elcom).

Elcom was privatized during 2002 to become PNG Power Ltd. The privatization of the

company will allow a strengthening of corporate performance prior to future consideration for privatisation.

### PNG Gas Project

Oil exports have significantly contributed to the country's economic growth over the past decade. However, these reserves are projected to be depleted by the end of this decade. While its gas resources are significant, domestic demand is insufficient to justify developing gas resources, on top of that the country lacks the infrastructure necessary to export gas to foreign markets.

The Asian Development Bank (ADB) will provide a US\$700,000 technical assistance grant to help the country optimise the participation of state entities, such as national and provincial governments, in a US\$3 billion PNG Gas Project to export natural gas to Queensland, Australia. The main financiers of the project are ExxonMobil (leading the Project), ChevronTexaco, Oil Search, MRDC (representing landowner interests), and Japan PNG Petroleum. The project provides an opportunity to improve the development prospects of the country.

The project involves the construction of a 3,000km export pipeline system from the gas fields in the highlands of PNG, along with a marine-based processing platform and loading facilities in the Gulf of Papua, which will supply overseas markets as far south as Brisbane, Australia.

Gas sales for 30 years are under consideration, but it is expected that additional developments and discoveries of natural gas resources in PNG will potentially extend the life of the project past this period.

The PNG Gas Project proposes to commercialize gas reserves lying in whole or in part within the existing fields of the Kutubu, Gobe and Moran Petroleum Development Projects, as well as the Hides Gas Development. It may also include additional discovered but undeveloped fields, such as SE Mananda, Juha and Angore, and other prospecting areas.

The project will progress through a number of phases, and developments will proceed with the integration of new reserves and changing sales gas demand. The initial development will include blowing down the reservoirs of the oil fields at



Kutubu and Gobe Main. In the second phase, the Hides gas field will be developed and will be transported via the Central Processing Facility at Kutubu. In the latter stages of the project, gas blown down from the Agogo and Moran fields will contribute to gas sales.

The government has an option to take up 22.5 percent equity in the Hides gas field and therefore will become a participant in the project when the option is exercised. There is a possibility that some, or all of the State's equity, could be sold on commercial terms to other investors, especially if these investors could provide funding to assist the participation of the State and other PNG entities in this very important resource project.

The ability of PNG consumers to utilise natural gas from the gas fields of the Papuan Fold Belt is currently limited by the small size of the domestic market, and the absence of natural gas

reticulation infrastructure.

This may change in the future if the PNG gas project's reliable and long-term supply of natural gas leads to other downstream developments in PNG, such as petrochemicals, Liquefied Natural Gas (LNG), and electricity generation. Projects such as these could co-exist with the continued export of natural gas by pipeline to Australia, but there is no such project under active consideration at this time.

The target market identified in the project's development is Queensland, which produces relatively small quantities of natural gas, but has a high demand potential. Net energy use in Queensland has risen over the last 20 years, averaging an annual growth rate of 3.9 percent, which is significantly higher than the Australian national average of 2.5 percent. This is a reflection of Queensland's high rates of economic and



Photo: Bloomberg

population growth.

The project is expected to sell up to approximately 200 petajoules (PJ) of gas annually to the Australian market after the initial sale build-up period. Total gas sales projected to be 5,500 PJ but there to be potential to increase this with greater penetration of the Australian energy market.

The total capital costs of the PNG gas project is estimated to cost approximately US\$2.7 billion. Total operating costs over the project lifespan have been estimated at US\$2.9 billion.

The ADB grant is designed, in part, to help identify feasible mechanisms to increase the transparency of the project revenue flow. This is to ensure that part of the project revenue will benefit the society at large and contribute to poverty reduction. The total cost of the technical assistance is estimated at US\$875,000. The government will finance the balance.

### LPG

PNG enjoys a geographical advantage with its position in the world LPG market. It is closer to major South East Asian consumers than LPG production facilities in the Middle East, and is adjacent to the growing premium market areas in eastern Asia. Most of these markets are expanding their LPG import handling and distribution systems. LPG produced in PNG should be able to capture markets such as the east coast of Australia, Japan and China, as it will have a freight price advantage over other potential supplies from the Middle East and the rest of the world.

The PNG Gas Project is anticipated to produce approximately 600,000 tonnes of fractionated specification propane and butane (typically in a 2 : 1 ratio of C3 : C4) annually. The amount produced is proportional to the sales gas flows and dependent upon which reservoirs are producing (as there is substantial variety in LPG content of the rich gas from each field). Current Asian demand is about 30 million tonnes per year, and hence the PNG Gas Project has the potential to be a significant contributor to regional production.

While markets for LPG within PNG are presently small, they offer significant growth and development opportunities. Locally produced LPG will provide a more competitively priced source

of secure, clean fuel for residential, commercial and industrial sectors. Substantial reductions in the cost of LPG for local consumption should be achievable, and would do much to encourage demand for LPG within the country, and to promote economic activity based on LPG usage.

A key requirement for the local market will be the establishment of sufficient "critical mass" to reduce unit distribution costs. New large industrial consumers will need to enter the market so that economies of scale can be realised, and improvements to storage and delivery infrastructure can be made. Even with acknowledged limitations in the current distribution system, it is considered that up to one-third of the PNG population could potentially use LPG, if encouraged to do so through lower prices, better availability, better awareness and education on the safe use of LPG.

### Geothermal Power

A geothermal power plant may be constructed in the country by the PNOC Energy Development Corporation (PNOC-EDC), part of the state-owned Philippine National Oil Company (PNOC).

At the request of PNG's Lihir Management Co (LMC), the company will submit a proposal to build and operate geothermal power plants. PNOC-EDC has worked in PNG since 1999, recently completing its 23rd well on Lihir Island. PNOC-EDC has three contracts with LMC worth US\$12.9 million.

In 2003, LMC installed a 6MW geothermal power station, which is expected to save the company about US\$2 million a year. In addition, LMC's board has approved the installation of a 30MW geothermal power plant, due to be commissioned early in 2005.

According to an article by Joseph Onglo Espi, geothermal power generation should be examined as an alternative method of generating electricity in PNG, especially in the New Guinea Islands region where geothermal features are evident. Studies should be undertaken to decide whether or not construction of geothermal plants is economically viable, following the example of the plant built on Lihir Island. PNG Power, as sole power provider, should include geothermal plants in their future plans and policies.