PAPUA NEW GUINEA PRESENTS POWER ENERGY & SOURCES.

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PAPUA NEW GUINEA IN BRIEF.

Background:

The eastern half of the island of New Guinea - second largest in the world - was divided between Germany (north) and the UK (south) in 1885. The latter area was transferred to Australia in 1902, which occupied the northern portion during World War I and continued to administer the combined areas until independence in 1975. A nine-year secessionist revolt on the island of Bougainville ended in 1997 after claiming some 20,000 lives.

Geography Papua New Guinea

- Location:
- Oceania, group of islands including the eastern half of the island of New Guinea between the Coral Sea and the South Pacific Ocean, east of Indonesia

Geographic coordinates: 6 00 S, 147 00 E

- Area: *total:* 462,840 sq km
  land: 452,860 sq km
  water: 9,980 sq km
- Area - comparative: slightly larger than California

Elevation extremes:
lowest point: Pacific Ocean 0 m
highest point: Mount Wilhelm 4,509 m

Natural resources:
gold, copper, silver, natural gas, timber, oil, fisheries

Natural hazards:
active volcanism; situated along the Pacific "Ring of Fire"; the country is subject to frequent and sometimes severe earthquakes; mud slides; tsunamis

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Environment - current issues:
rain forest subject to deforestation as a result of growing commercial demand for tropical timber; pollution from mining projects; severe drought

People **Papua New Guinea**

Population: 6 million

Ethnic groups:

Melanesian, Papuan, Negrito, Micronesian, Polynesian

Religions:

Roman Catholic 22%, Lutheran 16%, Presbyterian/Methodist/London Missionary Society 8%, Anglican 5%, Evangelical Alliance 4%, Seventh-Day Adventist 1%, other Protestant 10%, indigenous beliefs 34%

Languages:

Melanesian Pidgin serves as English spoken; Motu spoken in Papua region

note: 715 indigenous languages - many unrelated

Government Papua New Guinea

Government type: constitutional monarchy with parliamentary democracy

Capital: Port Moresby

Administrative divisions:
20 provinces; Bougainville, Central, Chimbu, Eastern Highlands, East New Britain, East Sepik, Enga, Gulf, Madang, Manus, Milne Bay, Morobe, National Capital, New Ireland, Northern, Sandaun, Southern Highlands, Western, Western Highlands, West New Britain

Independence:
16 September 1975 (from the Australian-administered UN trusteeship)

National holiday: Independence Day, 16 September (1975)

Constitution:
16 September 1975

Legal system:
based on English common law


A
Kairiru Is.
Mushu Is.

Flag description:

divided diagonally from upper hoist-side corner; the upper triangle is red with a soaring yellow bird of paradise centered; the lower triangle is black with white, five-pointed stars of the Southern Cross constellation centered.

Economy - overview:

Papua New Guinea is richly endowed with natural resources, but exploitation has been hampered by rugged terrain and the high cost of developing infrastructure. Agriculture provides a subsistence livelihood for 85% of the population. Mineral deposits, including oil, copper, and gold, account for 72% of export earning.

GDP (purchasing power parity):
$11.99 billion (2004 est.)
GDP - real growth rate:
0.9% (2004 est.)
GDP - per capita:
purchasing power parity - $2,200

Electricity - consumption:
1.561 billion kWh

Exports - commodities:
oil, gold, copper ore, logs, palm oil, coffee, cocoa, crayfish, prawns
Exports - partners:
Australia 28%, Japan 5.8%, Germany 4.7%, China 4.6%

POWER SECTOR PERFORMANCE PROBLEM & OPPORTUNITIES.

In Papua New Guinea (PNG), less than 10% of the population has access to electricity. Where power is available (generally in the main urban centers), the supply is often unreliable.

This lack of access to affordable, reliable power limits economic growth in urban areas, constrains growth in smaller urban centers, and contributes problems in rural areas. Two separate power grids are located in the Port Moresby, and Lae–Madang–Highlands areas (Ramu grid). Some smaller grids service smaller urban centers. Because of the unreliability of the power supply, urban areas have considerable self-generation and backup generation capacity, which is expensive and inefficient. Large industrial users, particularly mining sites, also operate off-grid self-generation.

PNG has 582 megawatts (MW) of installed generation capacity: 230 MW hydropower (39.5%), 217 MW diesel (37.3%), 82 MW gas-fired (14.1%), and 53 MW geothermal (9.1%). However, the main Port Moresby grid (140 MW) depends heavily on diesel generation. PNG has significant underutilized indigenous energy sources such as hydropower, natural gas, geothermal, and solar-based systems. PNG Power Limited, the national state-owned corporatized power utility, manages about 300 MW of installed generation capacity, including the two main grids and 26 smaller urban centers through 19 independent power systems. The remaining capacity of about 280 MW comprises (i) self-generation systems owned and operated by industrial facilities, including mining companies; and (ii) private generators supplying the main grids or rural communities.

The power sector is facing some key development issues and challenges, including (i) high up-front infrastructure costs to extend power to off-grid areas (such as rural areas and smaller urban centers); and (ii) the unreliability of power in urban areas, which discourages economic development. The existing power sector infrastructure requires (i) rehabilitation to improve reliability, (ii) extension of grids to service the growing urban populations, and (iii) expansion of disaggregated generation to service the rural populations. The power transmission and distribution system loses about 20% of the energy it handles. Energy losses have continued to increase, primarily because of outdated and poorly maintained transmission and distribution lines, and inadequate substation sizing.

PNG's private power generators include (i) Hanjung Power, which operates a power station (26.4 MW) supplying the Port Moresby grid; (ii) PNG Sustainable Energy, which operates rural grids in Western Province and is expanding operations to other parts of the country; and (iii) mining operations that maintain significant levels of self-generation capacity. In addition, provincial governments have responsibility for maintaining a number of stand-alone rural generation facilities (C-centers), churches provide electricity to some off-grid villages, and the larger mining sites sometimes provide power to adjacent communities. Private participation in the power sector is increasing. As detailed in the draft electricity industry policy (EIP), the government is encouraging more private sector participation.

The low electrification rates for rural areas reflect low income levels and the less developed formal sector. Other contributors include (i) difficult geographical access conditions,
(ii) operational issues related to technical and management capacity,
(iii) investment disincentives related to the single national tariff structure, and
(iv) high up-front costs for power generation in rural areas. Some customers have demonstrated the capacity and willingness to
pay for tariffs significantly higher than the national single rate. However, the extension of power
into rural areas has been slow because of financing hurdles and ongoing operational issues.

2. Government's Sector Strategy

The Electricity Industry Act, 2002 currently governs activities in the power sector. The government recently prepared the draft EIP and the draft rural electrification policy. The draft EIP recognizes the (i) low level of electricity access, (ii) unreliability of electricity supply and subsequent economic impacts, (iii) high costs for the private sector in terms of cost of power as well as unreliability of service, and (iv) difficulties faced by PNG Power Limited because of outstanding receivables and problems raising capital for infrastructure investments. Under the EIP, the electricity industry should be responsive to market signals and the government should intervene only when the market fails. The proposed policy measures include (i) facilitating competition and contestability in the electricity industry, (ii) expanding rural electrification through government assistance, (iii) enhancing technical regulation, (iv) bringing certainty to investors in the sector by developing a clearly defined access regime, and (v) encouraging private participation in the sector. The EIP proposes state financing of an Electricity Trust Fund to promote rural electrification.

The draft rural electrification policy sets out the government's plans to improve electricity access for rural areas. It emphasizes (i) providing reliable, affordable, and sustainable electricity; (ii) promoting greater use of renewable energy technologies; (iii) ensuring efficient and productive end-use of electricity for the development of rural areas; and (iv) developing human and institutional capacity to plan and manage rural electrification. The Energy Division of the Department of Petroleum and Energy recently completed the national power sector development plan, with support from the Asian Development Bank (ADB).2

8. Electrification is important for export-driven economic growth, rural development, and the poverty reduction agenda of the national medium-term development strategy (MTDS).3 An expanded and more efficient electricity system will be an integral element of successful economic development in PNG. However, the MTDS does not prioritize government spending on electrification. The MTDS was predicated on the expectation that the private sector would finance necessary power investments, and that national budget resources could focus on nonrevenue-generating economic and social infrastructure, such as roads, education, and health. However, the market has not responded as expected and the power situation in PNG is dire. While there may be sufficient willingness and capacity to pay for power consumption, investments in power generation, transmission, and distribution capital assets—especially in smaller urban centers (towns), villages, and rural areas—appear to be less attractive. Support would target areas where the power sector is able play a catalytic role in economic development and where capacity to pay for power consumption exists.

3. ADB Sector Experience

10. ADB has previously supported a series of technical assistance (TA) projects in the power sector that looked into gas-based power generation, 4 power system planning, 5 institutional assessment of the PNG Electricity Commission,6 review of electricity tariffs,7 and hydropower planning,8 as well as specific site assessments at Luwini (Divune) hydropower site9 and the Ramu–Port Moresby transmission interconnection.10 ADB also processed loans to (i)develop hydropower sites (Divune, Lake Hargy and Upper Warangoi),11 and (ii) support the reinforcement of the Ramu grid.12 In 2009, ADB completed a TA project with preparation of the national Power Sector Development Plan,13 which will provide strategic assistance to the sector through the preparation of the power demand forecast and least-cost supply development plan.

In response to a government request, ADB has provided project preparatory TA for the development of hydropower resources in secondary urban centers not connected to the main power grids. 14 The TA will prepare the Town Electrification Project. In addition, ADB is implementing two regional TA projects with components being implemented in PNG: (i) Promoting Energy Efficiency in the Pacific, 15 which is assisting PNG Power with grid efficiencies; and (ii) Promoting Renewable Energy in the Pacific,16 which is assisting the Energy Unit, Department of Petroleum and Energy (DPE) in trying out innovative approaches to rural hydropower.

11. PNG’s development partners have traditionally focused on policy support in the power sector and the development of small off-grid power supply projects that reduce poverty directly.
The Pacific Islands Applied Geo-science Commission has provided assistance, including consultation on the draft national electricity industry policy and draft rural electrification policy through the Pacific Islands Energy Policy and Strategic Action Planning. The World Bank, with support from the Global Environment Fund, has been supplying rural teachers in Western
Province with solar lighting kits. It has also launched the regional Sustainable Energy Financing
Project to provide financing to the power sector in Pacific countries, including PNG. In the
previous few years, development partners have shown increased interest in financing larger infrastructure projects. Opportunities also exist to co-finance power infrastructure projects with
development partners.

16. ADB will support the expansion of the power sector in provincial centers by developing least-cost hydropower projects and improving distribution systems. This is expected to improve access to energy in the provinces significantly. ADB will explore options for financing least-cost generation options, primarily through TA for Preparing the Power Sector Development Project,
which will prepare the Town Electrification Project. In addition, the proposed grant project for Improved Power Supply to Poor Communities will increase the social benefits from power sector
expansion activities. ADB will support the expansion of power generation capacity on the two main PNG power grids to meet anticipated demand growth (i) on the Port Moresby grid from
economic development in the capital associated with the proposed liquefied natural gas project,
and (ii) on the Ramu grid from the development of mining sector projects. ADB will build on recent TA for the development of power sector planning capacity17 by providing technical support to the Department of Petroleum and Energy for the implementation of the Electricity Industry Policy.

As requested by the government, TA will also be provided to support sustainable development through the promotion of renewable energy, particularly in off-grid areas, and improved energy efficiency. This will be carried out primarily through the regional TA projects for Promoting Energy Efficiency in the Pacific and Promoting Renewable Energy in the
Pacific, both of which identify PNG as a target country. ADB will continue to explore areas to support private involvement in the power sector. Where possible, ADB will also provide support to increase access to international carbon markets through the development of projects eligible
for the Clean Development Mechanism. ADB will also support capacity development climate change mitigation. Assistance will be provided through the ADB Carbon Market Initiative
Technical Support Facility, backed up by the Asia Pacific Carbon Fund and the Future Carbon
Fund, as required. ADB’s private sector operations will strongly support pioneering clean energy
projects with innovative contractual and financial structures to encourage private participation.

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All Have a top Day.