

JICA ENERGY POLICY (B) TRAINING PROGRAM:

PAPUA NEW GUINEA COUNTRY REPORT.

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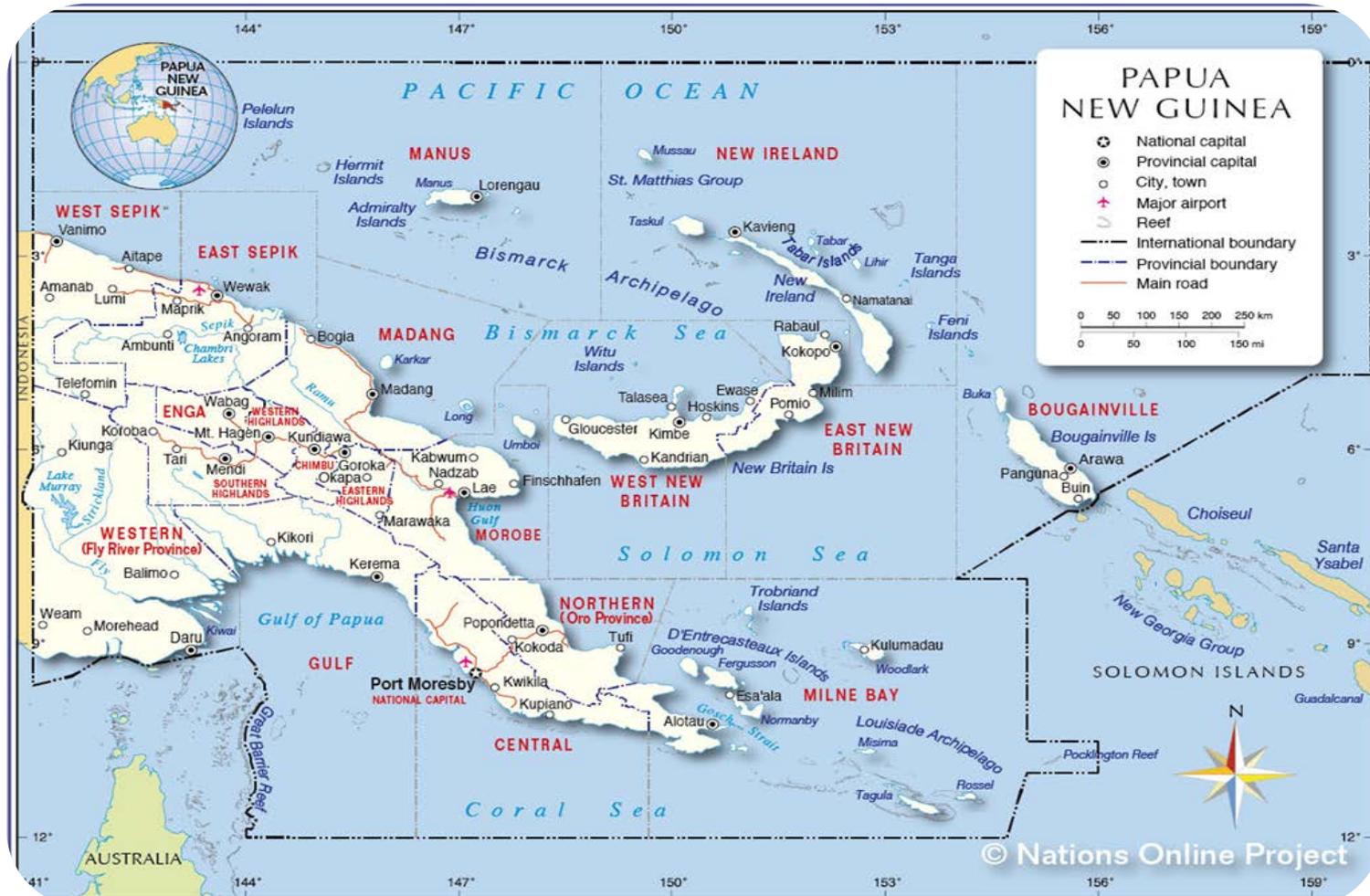
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- 4.0 Major Difficulties and Bottlenecks
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1.0 General Information



1.1 Geography

- PNG is a small island nation that has over 850 different languages and cultures with an estimated population of over 7 million people.
- The total land area of its mainland and 600 smaller islands is approximately 463, 000 square kilometres which is rich in biodiversity and hosts one of the top ten largest rainforests in the world behind Congo and South America.
- It is the largest Pacific nation that shares its land mass to Indonesia which is located to the west. Papua New Guineans are categorised as Melanesians in the Pacific region.

1.2 Independence

- PNG was a protectorate of the British Empire called British New Guinea in 1888 and was then placed under the authority of the Commonwealth of Australia in 1902.
- PNG became self-governing on December 1973 and then went on to gain its independence on September 16th 1975.
- The first Prime Minister was Sir Michael Somare who still is an active Member of Parliament today.

1.3 Constitution

- PNG is a constitutional monarch where the Head of State is Queen Elizabeth II represented by the country's governor general.
- The government has three tiers; the national, provincial and local-level which represents the legislative branch of the government. The judicial branch consists of the supreme, national and village courts.
- The executive arm of the government is the National Executive Council (NEC) or cabinet which is recommended by the prime minister and appointed by the governor general.

1.4 Customary Law

- Traditional and customary law is still prevalent. , the land tenure system is deeply reflected by the traditional customary laws
- Over 90 per cent of land is customary land communally owned by a community or group of individuals. Because of this fact, the land tenure system is not fixed; there is always a constant rearrangement of power, authority and even boundaries of land within a customary group or between its neighbours.
- Land can be subject to ownership and user right disputes. The issue of landownership of customary land is one of the leading issues prevalent in the Petroleum and Energy Industry.

1.5 Economy

- While PNG's economic growth has been strong over the past decade, the benefits of this growth have not been equitably distributed.
- A lack of quality infrastructure, insecurity, weak governance, low education levels and poor health services constrain service delivery and economic development.
- More than 2 million people—or an estimated 40 per cent of PNG's population—live in poverty. Life expectancy is only 62 years. Over half of all pregnant women give birth without the help of trained health workers. One in five children are not enrolled in school. (*dfat.gov.au*)

2.0 Current Energy Policies and Measures.

Currently there are numerous Energy Policies used by various government institutions in Papua New Guinea. These are a list of the majority of them:

- Vision 2050 (2010-2015)
- Long Term Development Strategy (2010-2030) – finally recognizes and captures energy as a government policy for development.
- Petroleum Policy (and Regulation) – DPE Petroleum Division
- Draft Electricity Industry Policy
- National Energy Policy
- Rural Electrification Policy
- Draft Geothermal Energy Resources Policy
- Policy on Renewable Energies
- Gas Commercialization Policy
- Landowner Management Policy
- Electricity Industry Policy (Dec 2011) – 70% access by 2030

2.1 Medium Term Development Strategy

- The country's *Medium Term Development Strategy (MTDS) 2005–2010* recognizes energy and power as critical ingredients for development and poverty reduction. The strategy invites the government to assist the disadvantaged to “lift themselves out of poverty by improving basic services, such as water and electricity.” The MTDS places high priority for government spending on non-revenue-generating infrastructure, such as roads and education, without making any financing provisions for electrification, the private sector having been expected to invest in the necessary power infrastructure requirements for development. Unfortunately, progress has been slow, and this has not yet occurred.

2.2 Medium Term Development Plan

- On October 2010, the Papua New Guinea Government announced its Medium Term Development Plan (MTDP) 2011–2015.
- The MTDP 2011–2015 will focus on increasing access to electricity for all households in the country. New investment from the private sector in solar technology is also expected. Comprehensive analysis is required into the cost effectiveness of various alternative sources of power.

2.3 Department of Petroleum and Energy

- The ***Energy Division*** is responsible for energy policies and plans, data collection and analysis, and advice to the government on energy sector issues. In practice, it concentrates on electric power, although PNG Power, the national electricity utility, undertakes the majority power sector planning. The DPE itself reports that extremely limited resources have seriously hampered data collection and analysis.
- The ***Petroleum Division*** of the DPE is responsible for oil and natural gas exploration and development.

- Over the past years, three policy drafts, including Draft Energy Policy, Draft Electricity Industry Policy (EIP) and Draft Rural Electrification Policy, have been circulated within the ED-DPE and discussed with the Government and concerned stakeholders.
- PNG endorsed their National Electric Industry Policy in December 2011, and the Energy Department is the custodian of Energy Technical Regulation, which includes energy efficiency and conservation.

3.0 Energy Demand and Supply Statistics



3.1 Oil and Gas

- Papua New Guinea's proven hydrocarbon reserves consist primarily of natural gas (14 tcf of probable gas reserves), followed by oil (0.660 billion barrels) and gas condensates (0.262 billion barrels). The inclusion of inferred, mean-risk reserves would increase oil reserves by an additional 1 billion barrels, and natural gas by more than 283 bcm (PNG CMP, 2012).
- Oil development started in 1991 with crude oil production at the Kutubu fields. Production at the Kutubu fields peaked in 1993, but has been declining. The fields are projected to be depleted by 2026 (DNPM, 2010a).

- In 2005, Papua New Guinea's first oil refinery started production, sourcing crude oil from both local oil fields and imports. In 2008, 5.8 million barrels of crude oil were processed (DNPM, 2010a). The capacity of the existing refinery, with expansion, could reach 9 million barrels by 2035.
- PNG LNG Project will produce 9tcf of gas over 30 years with a capacity of 6.9 million tonnes per year.
- PNG is a net energy exporter and does not import energy products.

3.2 Geothermal Energy

- The Geothermal Energy Association estimates PNG's geothermal potential at 21.92 terawatt-hours; the association also categorizes the country as an economy that could, in theory, meet all its electricity needs well into the future from geothermal sources alone. Installed geothermal capacity in 2010 was 56 MW.
(<http://aperc.ieej.or.jp/>) APEC Energy Demand and Supply Outlook – 5th Edition

3.3 Hydropower

- PNG has significant hydroelectric potential. Its land area includes nine large hydrological drainage divisions (basins). The largest river basins are the Serpik (with catchment area of 78,000 sq km), Fly (61,000 sq km), Purari (33,670 sq km), and Markham (12,000 sq km). There are other catchments of less than 5,000 sq km, in areas that are very steep.
- The gross theoretical hydropower potential for PNG is 175 TWh per year. There is little economic potential for the expansion of large hydro, due to the lack of substantive demand near supply sources. However, greater potential exists for developing smaller hydro schemes. (<http://aperc.ieej.or.jp/>) APEC Energy Demand and Supply Outlook – 5th Edition

3.4 Wind Energy

- There have been no systematic estimates of wind energy potential since the 1970s, when the best potentials were assessed in portions of Central, Western, Milne Bay and New Ireland provinces, and the Port Moresby area.
- A pilot wind energy project is being installed in the Duke of York islands, jointly funded by the Papua New Guinean and Chinese governments.
(<http://aperc.ieej.or.jp/>) APEC Energy Demand and Supply Outlook – 5th Edition

3.5 Solar Energy

- Solar energy is among the largest potential sources in PNG. Average insolation in much of the country is 400–800 W/m², with 4.5 to 8 sunshine hours a day. Of 23 locations assessed, Port Moresby has the largest resource, with 2,478 sunshine hours per year. The lowest is Tambul, Western Highlands, with 1,292 hours.
- As of 2008, no electricity-producing installations were present in the country, although a solar home systems project for schools is in place, with help from the Sustainable Energy Financing Project from the World Bank/GEF.

[\(http://aperc.ieej.or.jp/\)](http://aperc.ieej.or.jp/) APEC Energy Demand and Supply Outlook – 5th Edition

3.6 Biomass

- Although two thirds of PNG are covered with forest, much of it is inaccessible or unsuited for energy use. 58% of land is subject to strong or severe erosion, and 18% is permanently inundated or regularly flooded. The main practical biomass energy potential is in areas such as logging and agricultural production, using either the crop output or residues. Log exports are roughly 2 million m³ per year, but very little is processed locally, leaving only small amounts of biomass for energy production.

(<http://aperc.ieej.or.jp/>) APEC Energy Demand and Supply Outlook – 5th Edition

3. 7 Summary

- Papua New Guinea will become a major LNG exporter with the start-up of LNG export projects after 2014.
- Papua New Guinea's total primary energy supply is projected to increase from 2.2 Mtoe in 2010 to 6.7 Mtoe in 2035; fuel gas for LNG liquefaction accounts for a significant portion of this increase.
- Papua New Guinea may shift from a net oil exporter to a net oil importer after 2020 unless new reserves of oil are found.
- Papua New Guinea has a significant hydroelectric and geothermal potential. The government plans to either build or upgrade 800 MW of hydro electricity and over 500 MW of geothermal generating capacity within the next 10–15 years to provide a reliable and affordable electricity supply

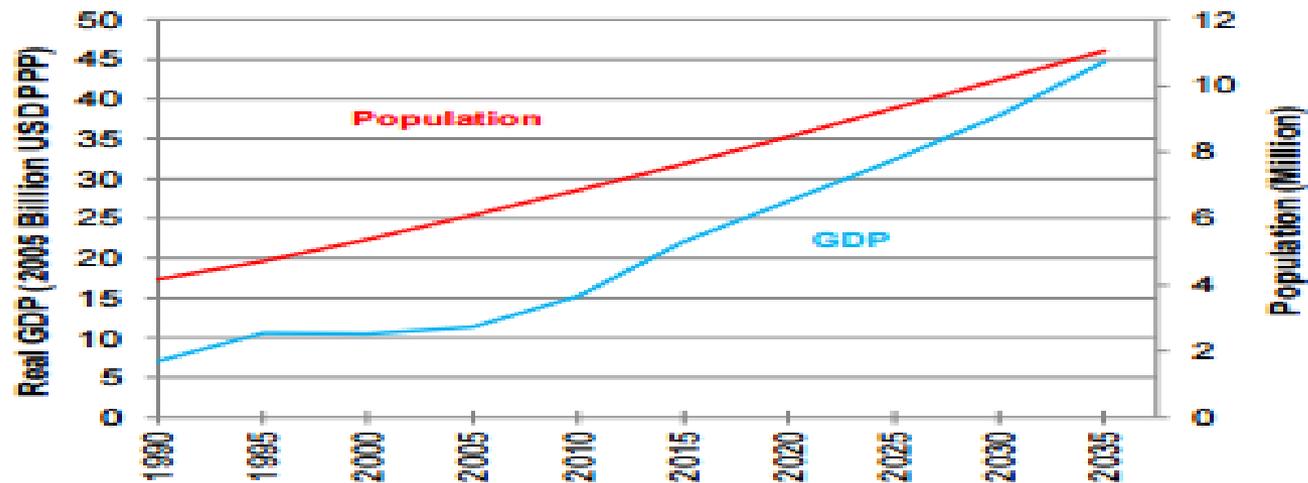
Generation Resource 2010-2030

Table 1: Planned New Generation Capacity to meet Future Electricity Demand

Generation Resource (MW)	2010	2015	2020	2025	2030
Hydropower	215	430	580	750	1020
Renewable (non-hydro)	55	90	160	280	500
Natural Gas	70	130	280	390	390
Diesel	160	100	60	40	30
Coal	0	30	30	30	30
Total Capacity	500	780	1,110	1,490	1,970

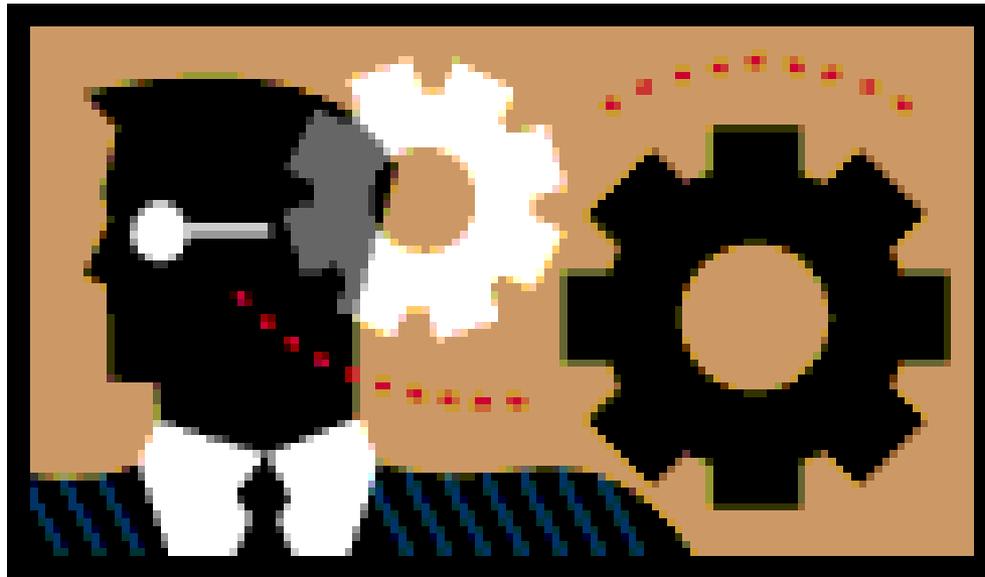
Source: Government of Papua New Guinea, Department of National Planning and Monitoring. 2010. *Papua New Guinea Development Strategic Plan, 2010–2030*. Port Moresby.

GDP and Population 1990-2035



Sources: USDA ERS (2012) and APERC Analysis (2012)

4.0 Major Difficulties and Bottlenecks faced in formulating Energy Policies



4.1 List of Challenges

- Lack of clear implementation plan to realize goals of strategy documents.
- Lack of funds
- Institutional Capacity and lack of Training
- Uniform retail tariff is not cost reflective of PNG's current economic situation
- Stakeholder attitude eg. compensation demands, vandalism
- Management Support
- Disarray in sector policy management / duplication of roles, functions and responsibilities.
- Lack of comprehensive data

5.0 Conclusion

- The JICA Energy Policy (B) Training Program will help in formulating much needed Policy requirements to cater for the growing Energy Industry in PNG.

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Any Questions?

