



PAPUA NEW GUINEA



JICA ENERGY POLICY TRAINING Country Report



By

Kinjohn Lui

National Energy Authority (NEA)

Papua New Guinea

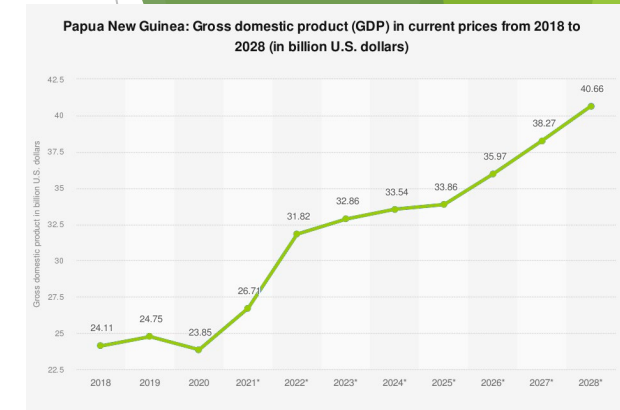
Country Profile

- ❑ PNG is located North of Australia and shares a land boundary with Indonesia
- ❑ PNG's total area is **462,840** square kilometers
 - ❑ land: 452,860 sq km
 - ❑ water: 9,980 sq km
- ❑ PNG consists of both the mainland and some **600** offshore islands, PNG has more than **850+** Indigenous languages and 3 common Languages
- ❑ Climate:
 - ❑ tropical; northwest monsoon (December to March), southeast monsoon (May to October); slight seasonal temperature variation
- ❑ Terrain:
 - ❑ mostly mountains with coastal lowlands and rolling foothills
- ❑ Government Type
 - ❑ Parliamentary Democracy
- ❑ Independence : 1975 (from the Australia-administered UN trusteeship)
- ❑ Capital City: Port Moresby
 - ❑ Industrial & Business Hub

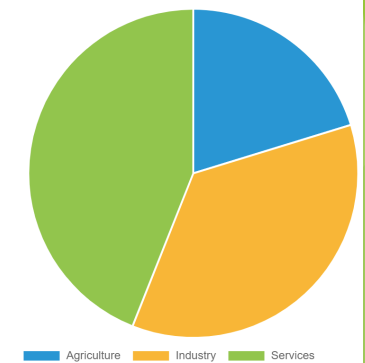


Key Economic Indicators

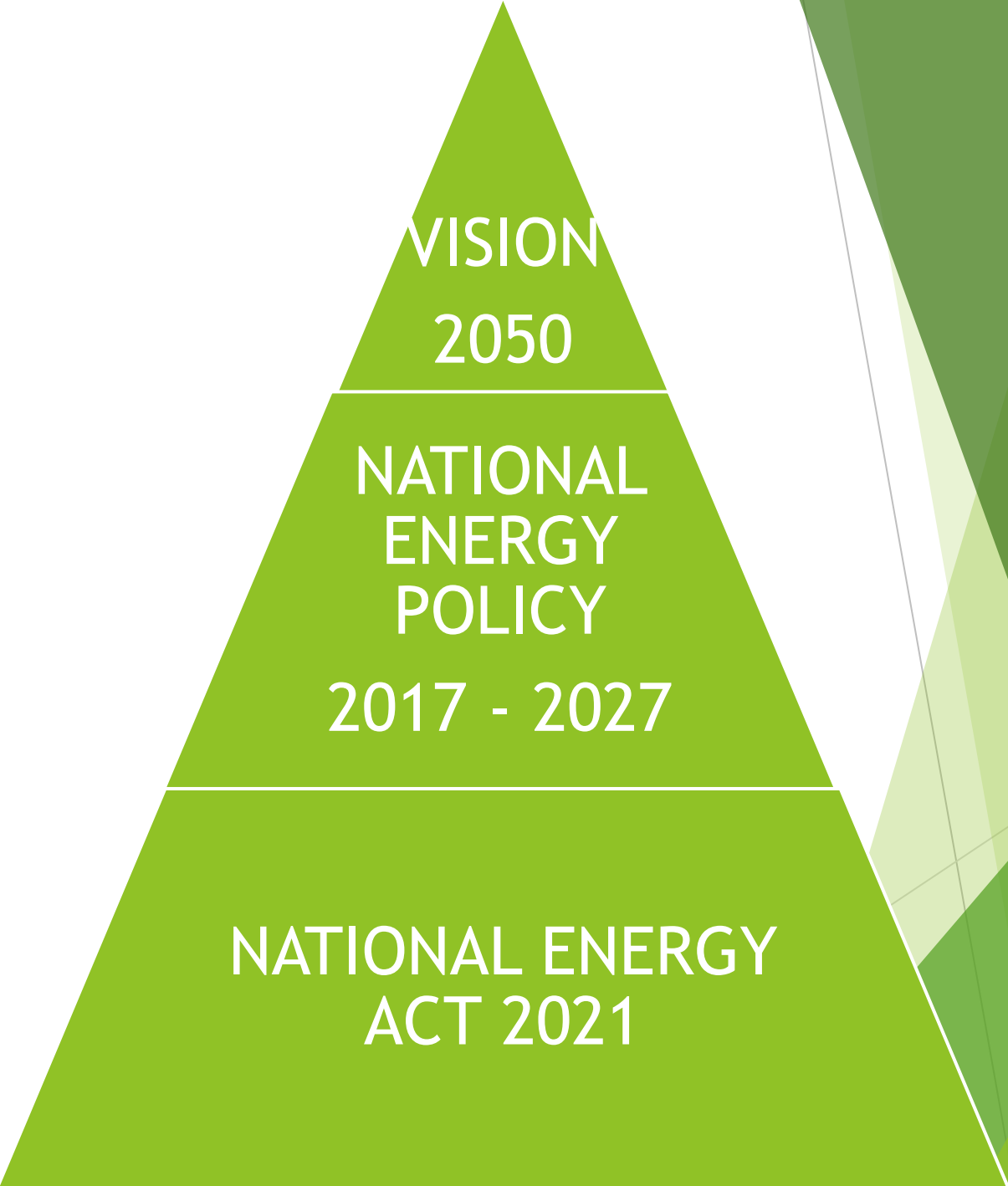
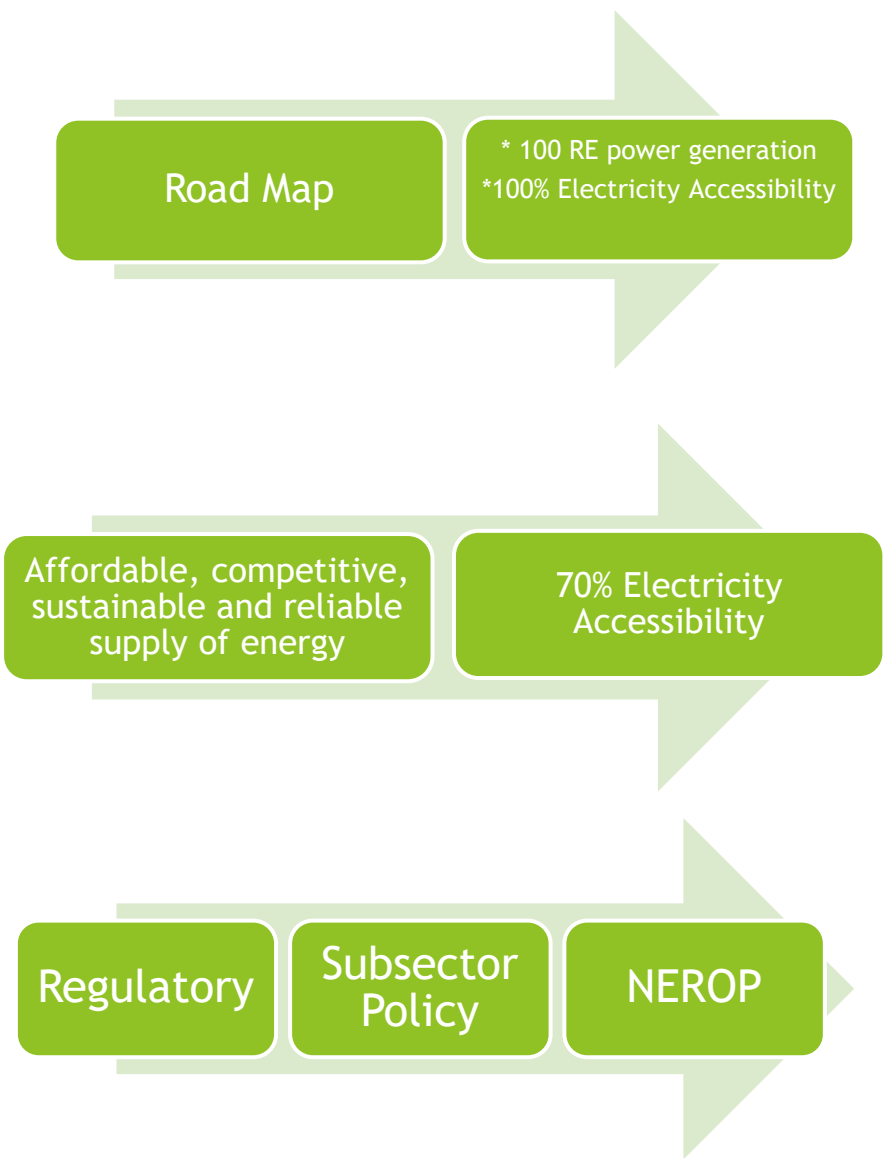
Total population	10.1 Million (2022)	
Population Growth (annual %)	1.97 (2022)	
GDP	USD\$ 31.82 Billion (2022)	
GDP per capita	USD\$ 3,477.16 (2023)	
GDP Growth (annual %)	4.5 (2022)	
No. households	Almost 2 million	
Natural Resources	gold, copper, silver, natural gas, timber, oil, fisheries	
Energy Reserve	Oil (billion barrels)	0.16
	Gas (trillion cubic feet)	5.16



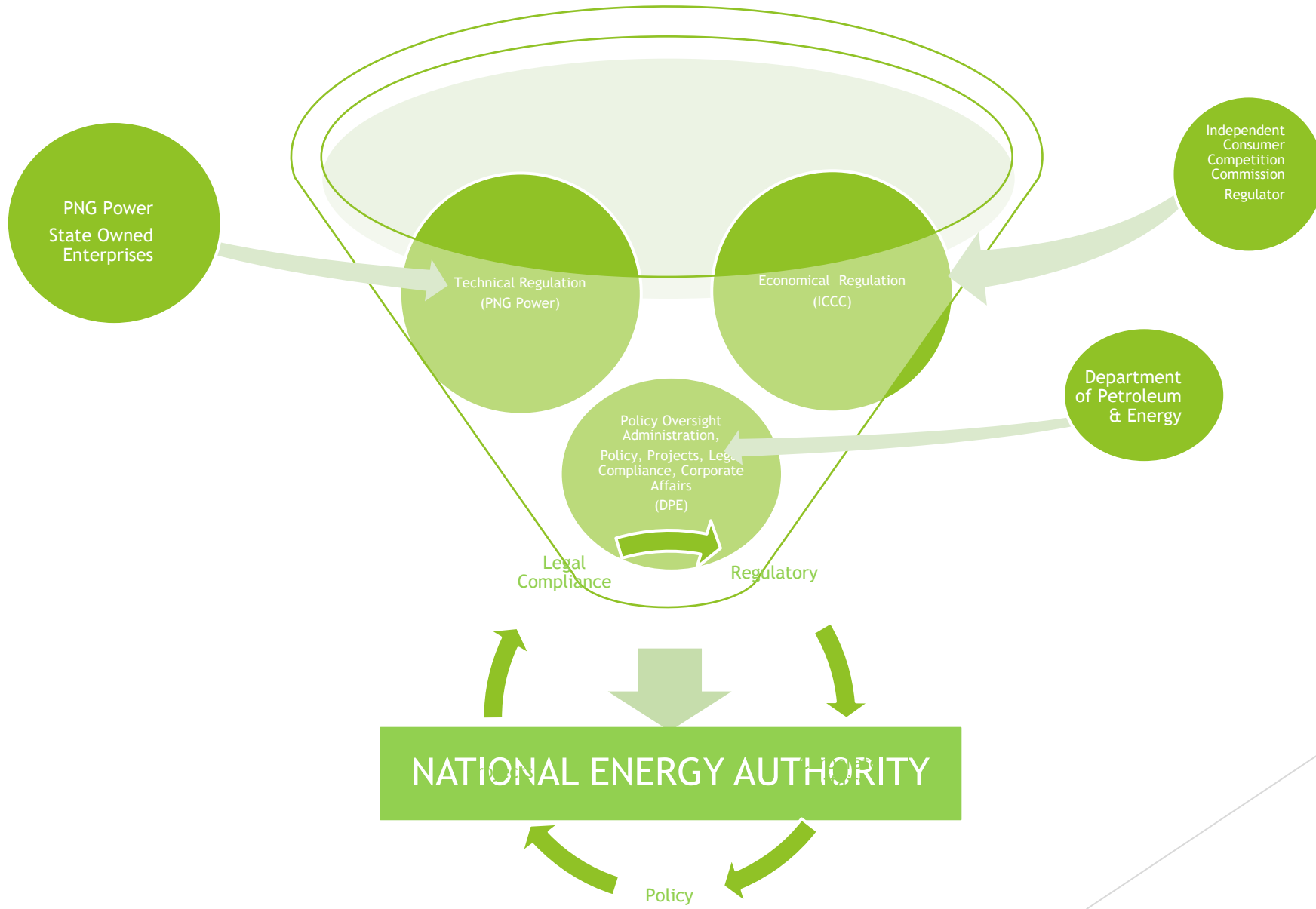
Agriculture, Industry, and Services (% of GDP)



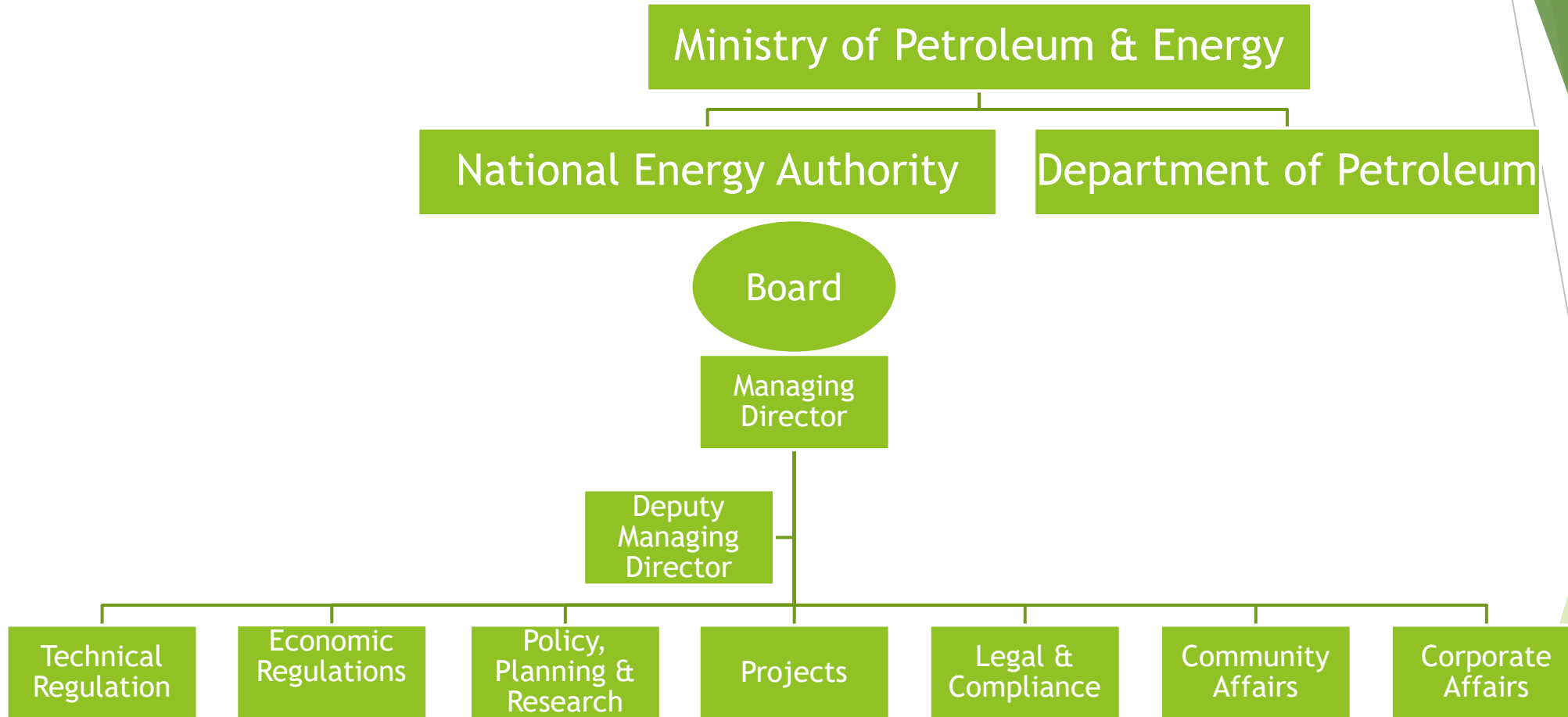
Policy & Plan



Institutional Reform



Organizational Structure

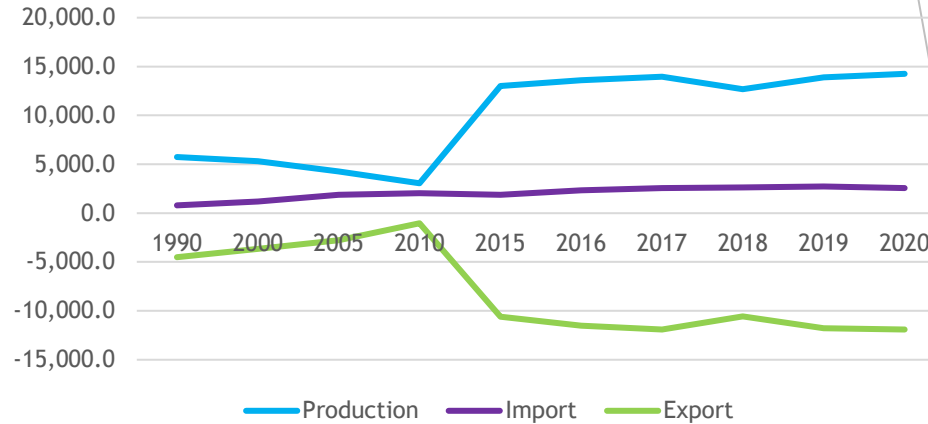


- Main regulator for the energy sector in the country.
- Enforcement of the Energy Authority Act 2021
- Regulatory, policy oversight and energy project implementation roles in the country.

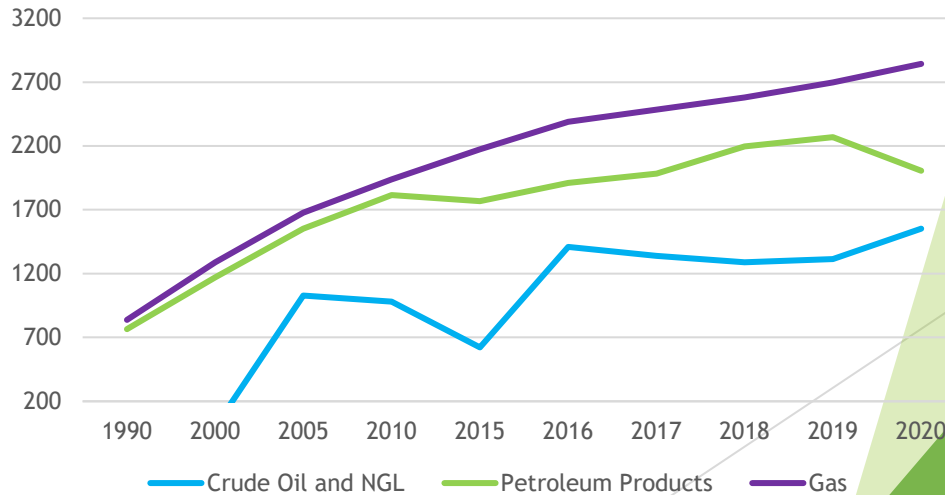
Energy Demand and Supply

- Main Sources of Energy, Oil, gas, petroleum products, Hydro, Solar, Biomass, Geothermal
- PNG has significant underutilized indigenous energy sources such as hydro power, natural gas, geothermal, and solar-based power systems
- National Energy Authority is the mandated Authority now to address energy data gap

Primary Energy Supply By Sector (KToe)



Energy Supply By Source (KToe)

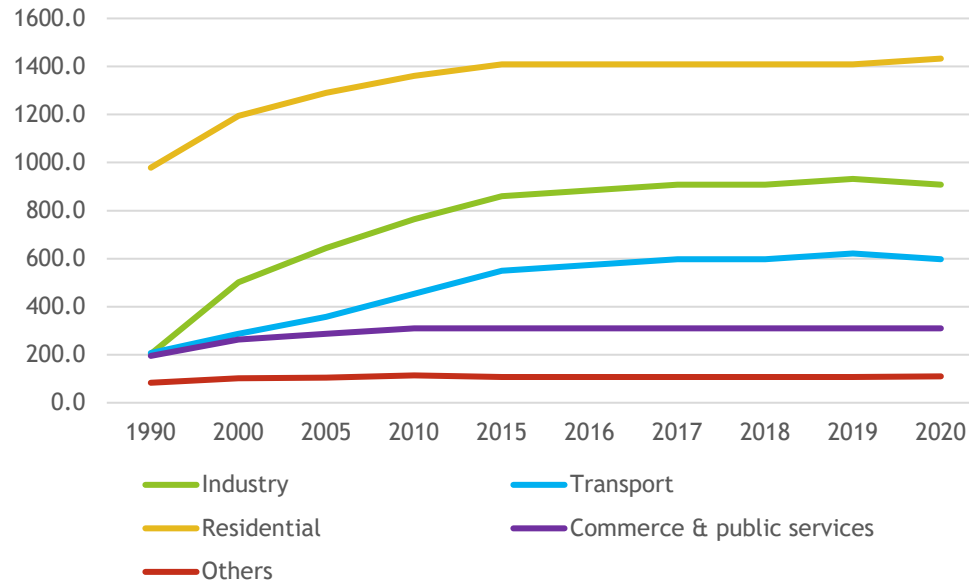


Source: APEC Energy Statistics 2020

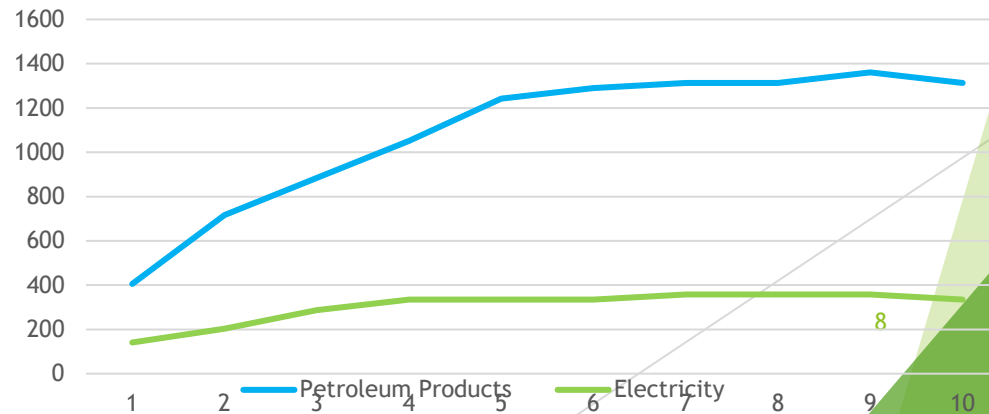
Cont..

- Most of PNG's population (60%) lacks access to electricity.
- Buildings sector use traditional biomass for much of its energy requirements.
- Traditional biomass makes up a half of current energy use and will continue to be used if electricity is unavailable.
- The increase in Industry and transport is due to the increase in economic activity in the last 10 – 15 years

Energy Consumption by Sector (Ktoe)



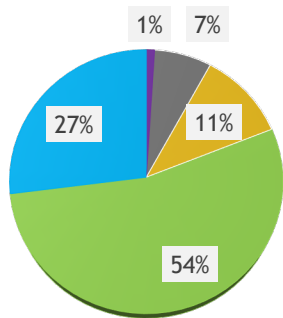
Energy Consumption by Energy Source (Ktoe)



Cont

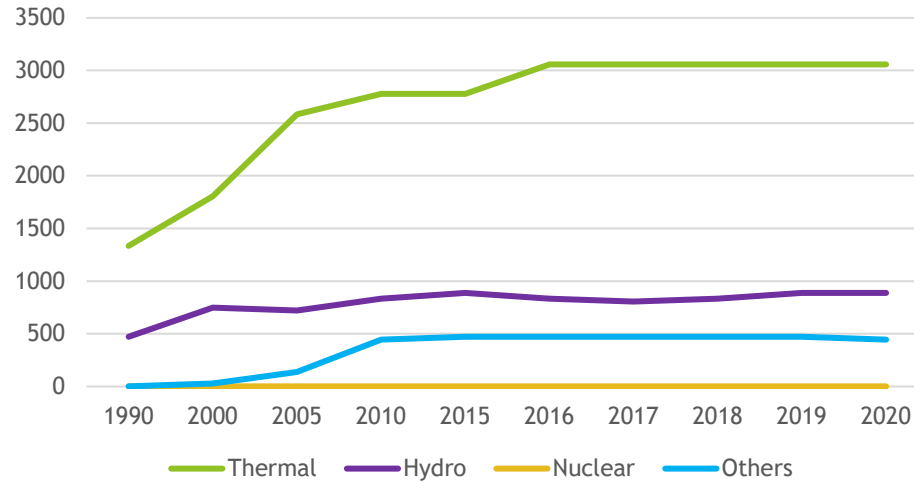
PNG's current generation capacity is dominated by oil generators and hydroelectric dams. However, its endowment of natural gas and potential for solar, geothermal and wind deployment provides the opportunity to diversify its capacity structure over the next few decades.

Electricity Generation Capacity 779 MW (2016)

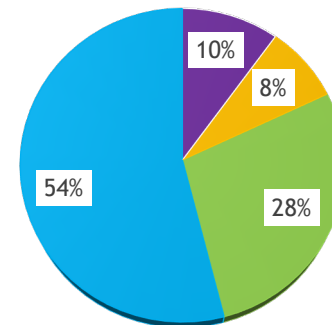


■ Biomass ■ Geothermal ■ Natural Gas ■ Hydro ■ Diesel, Fuel & oil

Energy Generation by Energy Sources (GWh)



Energy Mix, 3.6 TWh (2013)



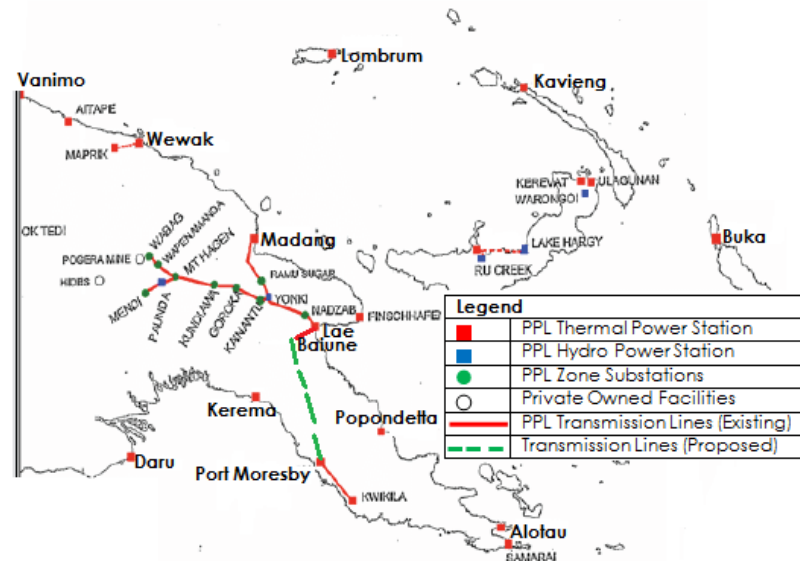
■ Geothermal & Biomass ■ Natural Gas ■ Hydro ■ Diesel, Fuel & oil

ELECTRICITY CAPACITY

PNG has about 797 megawatts (MW) of installed generation capacity, including hydropower 54%, diesel 27%, gas-fired 11%, geothermal 7% and Biomass 1%.

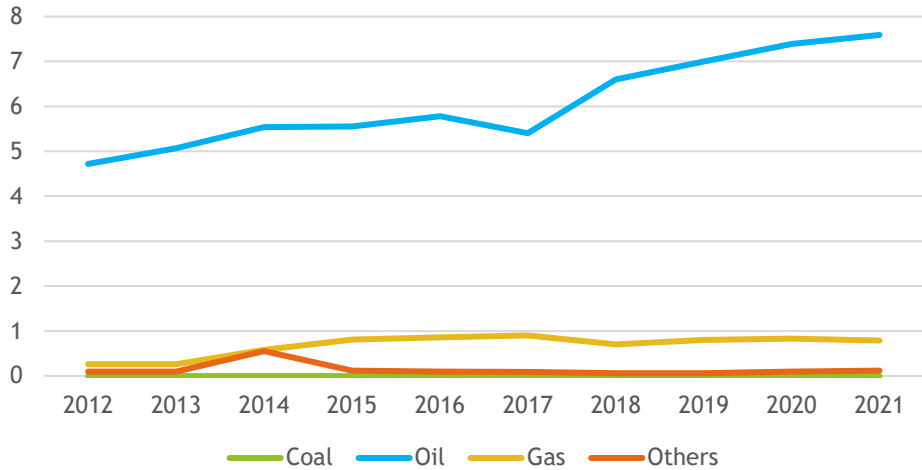
PNG Power Limited (PPL), the national state-owned corporatized power utility, manages installed generation capacity of about 300 MW, including the two main grids and 26 other smaller urban centers through 19 independent power systems.

The remaining capacity of about 280 MW comprises (i) self-generation systems owned and operated by industrial facilities, including mining companies; and (ii) private sector generators supplying the main grids or rural communities

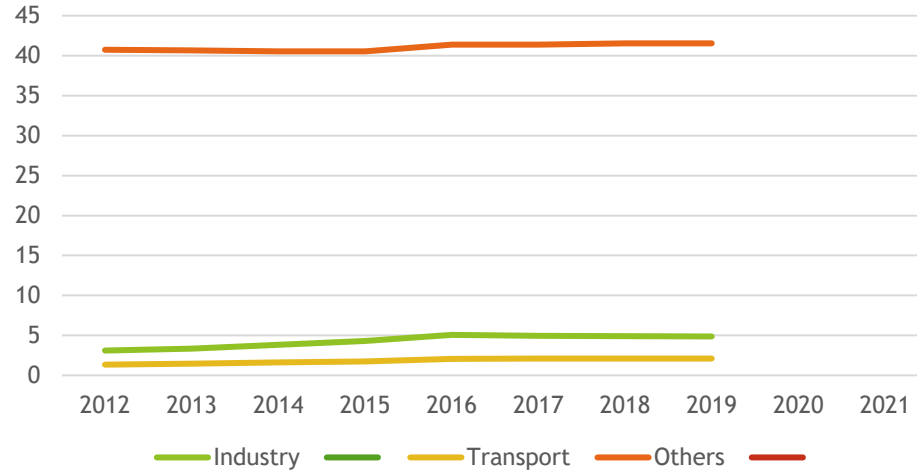


CO2 Emission

CO2 Emission by Energy Sources (Mt CO2)



CO2 Emission by Sector (Mt CO2)



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Sector										
Industry (Manufacturing and Construction Electricity and Heat)	3.1	3.34	3.83	4.3	5.06	4.94	4.92	4.86		
Transport	1.35	1.45	1.6	1.75	2.06	2.11	2.09	2.09		
Others (land use change and forestry, building, other fuel combustion)	40.74	40.68	40.57	40.57	41.39	41.38	41.55	41.56		
Source										
Coal	0	0	0	0	0	0	0	0	0	0
Oil	4.72	5.07	5.54	5.55	5.78	5.4	6.6	7	7.39	7.59
Gas	0.26	0.26	0.58	0.81	0.86	0.9	0.7	0.8	0.83	0.79
Others	0.1	0.1	0.55	0.12	0.1	0.09	0.06	0.06	0.1	0.12

PNG emitted almost eight million tones of CO2 in 2018. Currently, 40% of PNG's emissions come from electricity generation, 20% from transport, 20% from industry and 10% from own use.

Emission by sector & source

Carbon Project (2023) & Climate Analysis Indicators Tool (CAIT)

Source: Our World in Data based on the Global

CO2 emission and strategizes

PNG's status as a rapidly growing economy makes it an unlikely candidate to peak or decrease CO2 emissions over the outlook period. In both scenarios, fossil fuels remain an important component of the energy system. Fueling a growing population and economy with natural gas and oil results in rising emissions. However, the off-grid projects for 100% coverage by 2050 is expected to increase the generation capacity of renewable energy demand and hence will result in a balance between the emission component

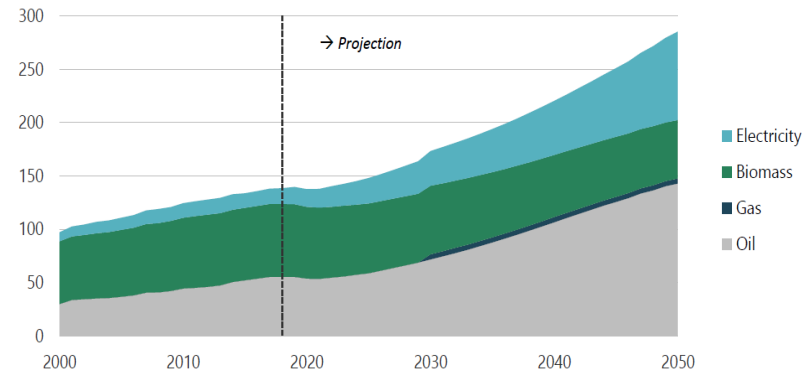
Impact of Covid 19 in 2021

Papua New Guinea's economy was hit hard by the COVID-19 crisis due to weaker demand and less favorable terms of trade. This was an important experience for the country to prepare in terms of resilience to external shocks. Economic growth in the medium term was supported by foreign investment in new resource projects, including the existing LNG and Mineral projects. Potential expansions of the resource sector would also contribute to the impending investment boom.

OUTLOOK: Energy Demand By Source

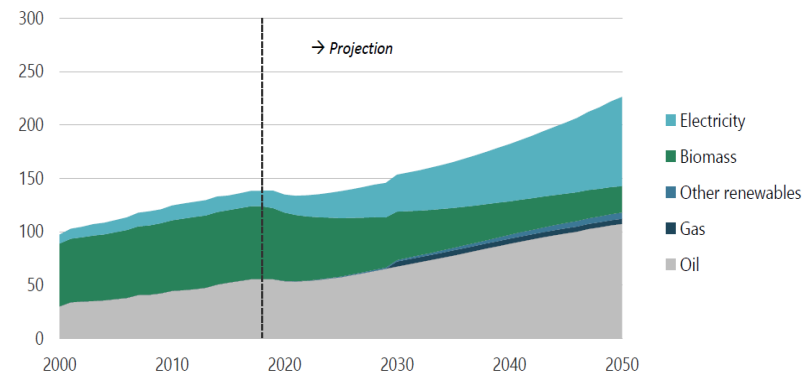
- Demand has been increasing slowly, driven mostly by rising oil use, specifically diesel. However, renewable energy still contributes the largest share of demand, with traditional biomass used in the residential sector accounting for half of the renewables share.
- Oil consumption continues to grow steadily, making up most of the consumption throughout the outlook because of the growth in transport and industry sectors.
- Demand for traditional biomass persist but the growth will be limited by the electrification of end users and use of natural gas for end users by 2030

Figure 13-3. Energy demand in REF, 2000-2050 (PJ).



Sources: EGEDA, APERC analysis. Includes non-energy.

Figure 13-4. Energy demand in CN, 2000-2050 (PJ).

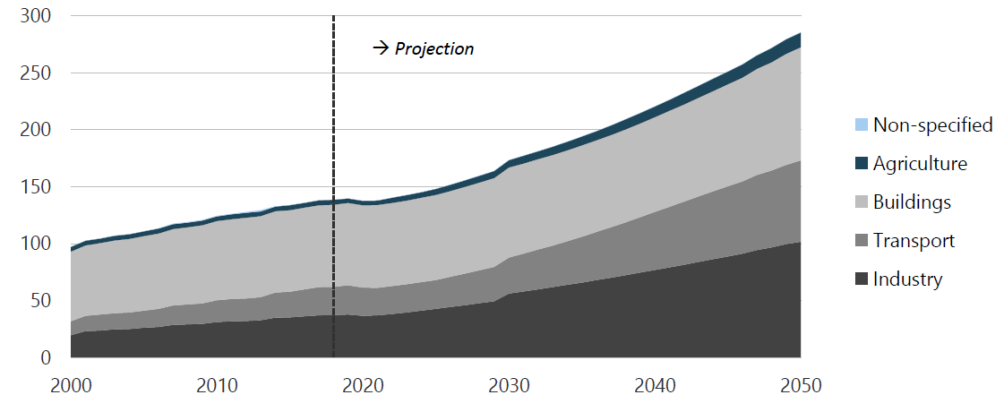


Sources: EGEDA, APERC analysis. Includes non-energy.

OUTLOOK: Energy Demand by Sector

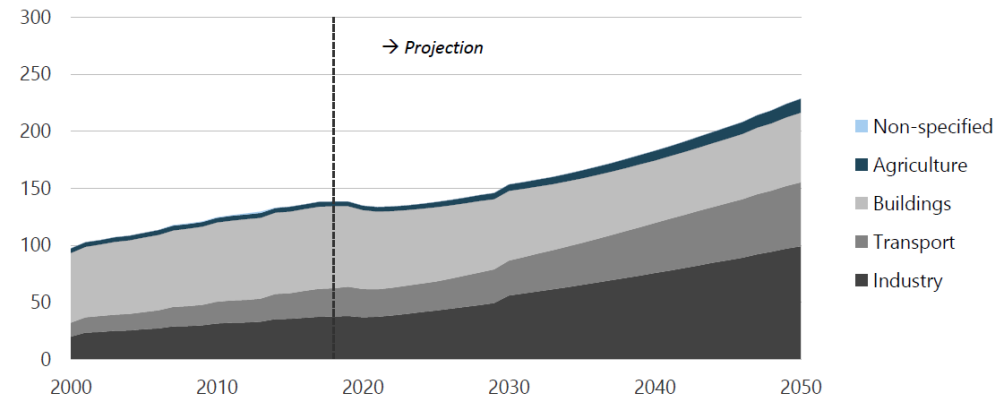
- Transport and industry sectors demand has doubled since 2000 due to economic development
- Building sectors demand increased at slower rate due to inefficient use of combustion traditional use of biomass
- Industry demand is the bigger driver of the energy growth in mining sector and due to the increasing global demand for minerals
- Agricultural energy demand, although relatively low, slowly increases throughout the outlook period in these scenarios
- Building Energy demand will gradually increase due to increase in population and shift from traditional biomass to electricity for end users after the electrification project

Figure 13-5. Energy demand by sector in REF, 2000-2050 (PJ).



Sources: EGEDA, APERC analysis. Includes non-energy.

Figure 13-6. Energy demand by sector in CN, 2000-2050 (PJ).



Sources: EGEDA, APERC analysis. Includes non-energy.

Current Energy Policy Measures

- Vision 2050 – Economic Roadmap
- National Energy Policy 2017
 - Structural reforms in energy sector
 - Competitive economy for investment
 - Sustainable Energy Export
- National Electrification Rollout Plan (NEROP), 70% of Household access to Electricity by 2030 and 100% by 2050
- Sub-sector policies on Solar, Hydro, Geothermal, Wind, Gas Reservation / DMO Policy
- Nationally Determined Contribution (NDC) - 100% renewable capacity by 2050
- National Regulatory Framework for Off – grid electrification
- Undertaking the Mandatory Data Collection to feed the National Energy Data Repository Hub to address energy data gap

Major Challenges & Developments

- Energy Security
- Uncertain policy and regulatory environment
- Dispersed and isolated population. Over 70% of the population do not have access to Electricity
- Insufficient Public and Private Partnership
- Challenging Climate and Environment
- Land access and cost recovery tariffs
- Institutional reform now requires capacity building
- Lack of Accurate Data and Management Capability
- Political to diversify energy and drive major changes

Program Expectation

Subjects of Interest

- Understand the Energy Current Status of Energy Situations in Japan and around the other participating countries
- Understand Relevant Energy Policies for participating countries
- Renewable Energy and Energy Security
- Concepts and methods of energy demand forecasting, energy balance, energy best mix, and policies / plans / business models on Carbon Neutrality
- Approach to Global Issues and energy demand
- Energy Efficient and conservations approaches

Supervisors Expectation

- Have broader understanding of Energy Sector in developed countries to assist when formulating energy polices aligned to global targets
- Sufficient understanding of appropriate approach technologies and tools to facilitate mechanisms to address challenges and issues
- Will be able to understand the flow of energy, analysis and creation of energy tools which can assist in the formulation of policies
- More understanding of Energy Security, Energy Transition and Carbon Neutrality

Q & A

Thank you all

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Vision 2050 <https://png-data.sprep.org/dataset/papua-new-guinea-vision-2050>

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