

# **Update on OIL AND GAS SECURITY** ***(PAPUA NEW GUINEA)***

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➤ ***Brief background on PNG's oil & gas sector.***

Papua New Guinea's (PNG) oil and gas sector is a key component of its economy, representing a significant portion of its export revenues. The PNG has substantial reserves of both oil and natural gas, with exploration and production largely concentrated in its highlands and offshore regions.

➤ ***Importance of energy security for PNG***

Energy security is a critical issue for Papua New Guinea (PNG) for several reasons, as it directly impacts the country's economic stability, development, and overall well-being. Energy security refers to the reliable and affordable availability of energy sources to meet the country's needs, both in terms of production and consumption.

➤ ***Key objectives of the presentation***

- ***Historical Production, Imports & Exports (2019-2023)***
- ***PNGs Oil & Gas Infrastructure Capacity***
- ***Natural Gas in PNGs Energy Mix***
- ***Trade Dependencies (Imports & Exports)***
- ***Key challenges & Risks to Energy Security***
- ***Future Outlook & Strategic Initiatives***
- ***Conclusion***

# HISTROCIAL PRODUCTION, IMPORTS & EXPORTS (2019-2023)

## **Crude Oil and Condensate Production Trends**

Papua New Guinea's crude oil production has shown fluctuations from 2019 to 2023. In 2019, the country produced approximately 56,075 barrels per day (b/d). By 2020, production levels were impacted by global events such as the COVID-19 pandemic, which led to a decrease in demand and operational challenges. However, specific production figures for subsequent years are not detailed in the available sources.

## **Imports and Exports Overview**

### ***Exports***

Papua New Guinea's primary exports include petroleum gas, gold, copper ore, palm oil, and nickel mattes. The export value of petroleum gas was approximately \$5.59 billion in 2023. The main export partners included China (\$3.55 billion), Japan (\$3.19 billion), Australia (\$2.07 billion), Chinese Taipei (\$999 million), and India (\$483 million).

### ***Imports***

The top imports for Papua New Guinea included refined petroleum (\$865 million), rice (\$159 million), delivery trucks (\$154 million), excavation machinery (\$124 million), and motor vehicles parts and accessories (\$113 million). The primary sources of imports were Australia (\$1.44 billion), China (\$1.29 billion), Singapore (\$787 million), Malaysia (\$493 million), and Japan (\$215 million).

### ***Summary of Trends (2019-2023)***

Crude Oil Production: Approximately 56,075 b/d in 2019; further data for subsequent years is not specified.

Exports: Dominated by petroleum gas with significant values reported in 2023.

Imports: Primarily focused on refined petroleum and machinery.

In conclusion, while specific annual production figures from 2020 to 2023 are not available in the sources provided, it is clear that Papua New Guinea remains a notable player in the oil export market with significant trade relationships primarily focused on Asia-Pacific nations.

# Finished Petroleum Products

- Domestic refining vs. imports (gasoline, diesel, jet fuel, etc.)

Papua New Guinea (PNG) has no domestic refining capacity for gasoline, diesel, or jet fuel and relies entirely on imports for these refined petroleum products.

Jet fuel consumption in PNG was approximately 3.22 thousand barrels per day in 2023, reflecting a growing demand despite the absence of local production.

The country has historically fluctuated in jet fuel consumption, with figures ranging from 1 thousand barrels per day in 2014 to a peak of 4.25 thousand barrels per day in 2020.

PNG's complete dependence on imported fuels poses challenges related to supply stability and pricing dynamics, especially during global market disruptions.

Future projections indicate that unless new refining capacities are developed locally, PNG will continue to face challenges due to its reliance on imported fuels as energy demands rise.

- Major suppliers

Napa Napa Refinery: Operated by InterOil Corporation, it is PNG's first oil refinery with a capacity of 32,500 barrels per day, producing various finished petroleum products for the domestic market.

TWL Fuels: Established in 2021, TWL Fuels partners with Puma Energy to supply fuels for commercial and domestic customers in PNG.



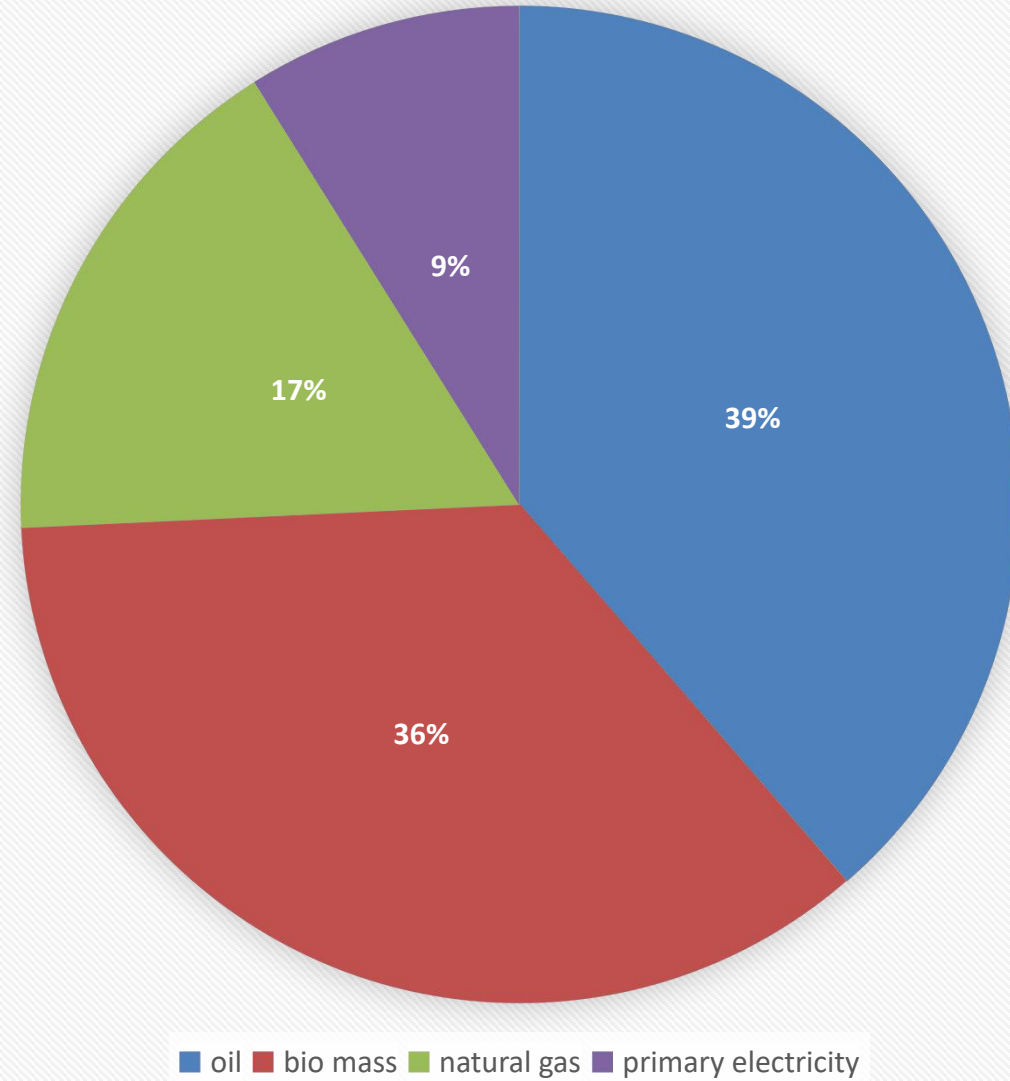
# PNG's Oil & Gas Capacity

- **Exploration and Production Facilities**
- **Oil Fields**
- PNG has several oil fields primarily located in the Highlands region. Key fields include:
- **Kutubu Oil Field:** One of the largest oil fields in PNG, with production capacity reaching around 30,000 barrels per day (bpd).
- **Gobe Oil Field:** Another significant field contributing to PNG's oil output.
- **Natural Gas Fields**
- The country is rich in natural gas reserves, with major fields including:
- **Hela Gas Project:** This project includes the Hides gas field and is part of the PNG LNG project.
- **Elk-Antelope Gas Field:** Located in the Gulf Province, this field is expected to play a vital role in future LNG developments.
- **Processing Facilities**
- **Refineries**
- **Napa Napa Refinery:** Operated by InterOil Corporation, this refinery has a capacity of 32,500 bpd and processes crude oil into various finished petroleum products such as gasoline, diesel, and jet fuel.
- **Liquefied Natural Gas (LNG)**
- **PNG LNG Project:** This major project includes a liquefaction plant located near Port Moresby with a capacity of approximately 6.9 million tonnes per annum (mtpa). It processes natural gas from the Hela region for export.
- **Transportation Infrastructure**
- **Pipelines**
- **Oil Pipelines:** The Kutubu to Gobe pipeline transports crude oil from production sites to the Napa Napa Refinery.
- **Gas Pipelines:** The PNG LNG project includes an extensive pipeline network that transports natural gas from the Highlands to the liquefaction plant.
- **Ports**
- **Port Moresby:** The primary port for exporting LNG and other petroleum products.
- **Kumul Marine Terminal:** A dedicated facility for loading LNG onto ships.
- **Storage Facilities**
- PNG has various storage facilities for both crude oil and finished products:
- **Tank Farms at Napa Napa:** These facilities store refined products before distribution.
- **Strategic Reserves:** The government maintains strategic reserves to ensure energy security during supply disruptions.

## Natural gas and PNG energy mix

Papua New Guinea (PNG) has a diverse energy mix that includes significant contributions from natural gas, alongside other sources such as oil, biomass, and renewables. As of 2022, the total energy consumption in PNG reached approximately 5.2 million tonnes of oil equivalent (Mtoe), with natural gas accounting for about 17% of this mix. The country is also focusing on increasing its renewable energy share to 78% by 2030, which reflects a strategic shift towards cleaner energy sources while still relying on fossil fuels like natural gas for economic growth and energy security.

Energy consumption (PNG)



# Trade dependencies (Imports & Exports)

- Exports
- Papua New Guinea's top exports include:
- Petroleum Gas - The largest export commodity, valued at approximately \$5.59 billion.
- Gold - A significant contributor to export earnings, amounting to about \$1.85 billion.
- Copper Ore - This mineral resource generated around \$904 million in export revenue.
- Palm Oil - Another crucial agricultural product, with exports valued at approximately \$843 million.
- Nickel Mattes - Contributing about \$578 million to PNG's export economy.
- PNG primarily exports these goods to several key markets:
- China: The largest destination for PNG's exports, receiving goods worth about \$3.55 billion.
- Japan: Another major partner, importing approximately \$3.19 billion worth of PNG's products.
- Australia: A close trading partner with imports from PNG valued at around \$2.07 billion.
- Chinese Taipei (Taiwan): Imports from PNG are valued at about \$999 million.
- India: Receives approximately \$483 million in goods from PNG.
- Imports
- On the import side, Papua New Guinea relies heavily on various essential goods:
- Refined Petroleum - The most significant import item, costing around \$865 million.
- Rice - A staple food item imported at a value of approximately \$159 million.
- Delivery Trucks - Valued at about \$154 million, indicating infrastructure development needs.
- Excavation Machinery - Essential for mining and construction sectors, with imports worth around \$124 million.
- Motor Vehicles and Parts - These imports total roughly \$113 million.
- The main sources of these imports include:
- Australia: The largest supplier of imports to PNG, providing goods worth about \$1.44 billion.
- China: Supplies approximately \$1.29 billion in various products to PNG.
- Singapore: Contributes around \$787 million in imports.
- Malaysia: Provides goods valued at about \$493 million.
- Japan: Supplies roughly \$215 million in products.

# Key challenges & Risks to Energy Security

- **1. Infrastructure Limitations**
- **Aging Infrastructure**
- PNG's energy infrastructure is often outdated and insufficient to meet the growing demand for electricity. Many power generation facilities are not maintained properly, leading to inefficiencies and frequent outages.
- **Limited Transmission Networks**
- The transmission network in PNG is underdeveloped, particularly in rural areas where access to electricity is minimal. This lack of infrastructure limits the ability to distribute energy effectively across the country.
- **2. Dependence on Fossil Fuels**
- **Vulnerability to Price Fluctuations**
- PNG relies heavily on fossil fuels, particularly natural gas and diesel, for its energy needs. This dependence makes the country vulnerable to global oil price fluctuations, which can impact economic stability and energy affordability.
- **Environmental Concerns**
- The extraction and use of fossil fuels pose significant environmental risks, including greenhouse gas emissions and potential ecological damage from oil spills or gas leaks. These concerns can lead to public opposition against fossil fuel projects.
- **3. Geopolitical Risks**
- **Regional Instability**
- Geopolitical tensions in the Asia-Pacific region can affect PNG's energy security. Conflicts or instability in neighboring countries may disrupt supply chains or deter foreign investment in energy projects.
- **Foreign Investment Dependency**
- PNG's energy sector relies significantly on foreign investment for exploration and development. Political instability or unfavorable regulatory changes can deter investors, impacting future energy projects.
- **4. Climate Change Impacts**
- **Extreme Weather Events**
- Climate change poses a risk through increased frequency of extreme weather events such as cyclones and flooding, which can damage infrastructure and disrupt energy supply.
- **Transition to Renewable Energy**
- While transitioning to renewable energy sources is essential for long-term sustainability, it presents challenges related to technology adoption, financing, and skill development within the local workforce.
- **5. Regulatory Challenges**
- **Policy Uncertainty**
- Inconsistent government policies regarding energy production and pricing can create uncertainty for investors and hinder long-term planning in the sector.
- **Bureaucratic Hurdles**
- Complex regulatory processes can delay project approvals and increase costs for developers, discouraging investment in new energy initiatives.



## Future Outlook & Strategic Initiatives

- The future outlook for PNG's oil and gas industry is characterized by a strong emphasis on sustainability, local participation through national content policies, significant infrastructure improvements, and major LNG project developments. These strategic initiatives collectively aim to position PNG as a key player in the global energy market while ensuring that its natural resources benefit its citizens.

# Conclusion

- the security status of PNG's oil and gas sector is multifaceted, involving geopolitical considerations, regulatory frameworks, infrastructure resilience, community relations, and environmental sustainability efforts. While challenges exist, strategic initiatives aimed at enhancing stability provide a foundation for future growth in this vital industry.