

Unlocking and Developing the Domestic Gas Market in PNG: Opportunities and Proposals



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Houpu Group—a Leading Gas Utilization and hydrogen Player in the world



Natural Gas Liquefaction Plant Constructed by Houpu in Guizhou



Houpu LNG/CNG gas facilities exported to more than 10 countries

- Houpu Clean Energy Co., Ltd., flagship company of Group, was set up in 2005 and listed on Shenzhen stock exchange
- Built, operated and maintained around **7000 natural gas stations**, around 60% of the market share in China;
- Experience of building about **60 Mini Natural Gas Liquefaction Plants**
- Built the **largest hydrogen refueling station in the world**, and is the sole provider for the hydrogen utilization facilities for the Paris Olympic 2024.
- CNG/LNG/LPG facilities exported to more than **15 countries** including Malaysia, Thailand, German, UK, France etc.
- Houpu has **more than 530 patents and 1100 staff**.

Typical Gas Facilities Built by Houpu



LNG Facility Built by Houpu in Nigeria



Unmanned LNG Refueling Station Build by Houpu in UK



CNG Facility Built by Houpu in Malaysia



Beijing Hydrogen station built by Houpu
The largest one in the world.

Upstream Business--Houpu Group



Houpu Group signing Cooperation Certificate with Kumul Petroleum and TWL witnessed by Hon. PM James Marape



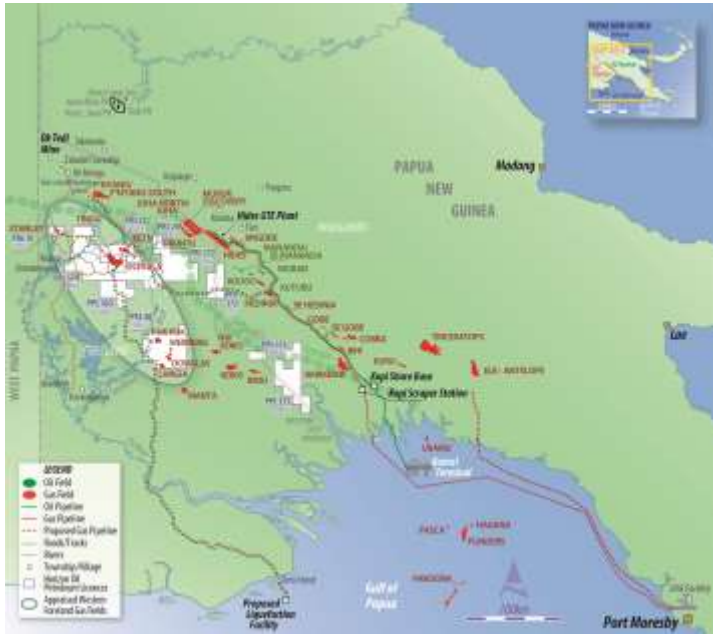
Drilling Operation of HBS in Alberta



Well production test of HBS in Alberta

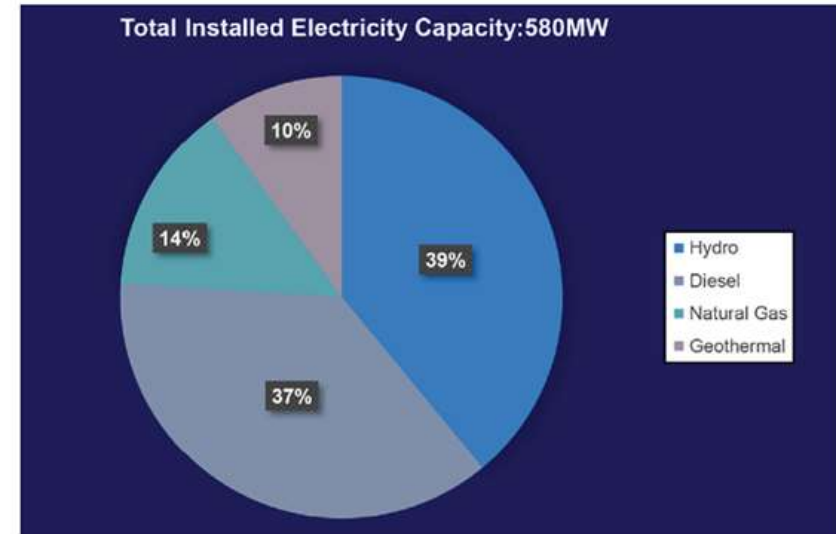
- Houpu BrightSpot(HBS) is the oil and gas upstream arm for Houpu Group
- HBS set up Calgary Office with investment in Canadian upstream, and is registered operator for producing oil and gas assets.
- The group has experience of investment and operating Yongfeng block in western China with estimated OGIP of 1TCF.
- HBS set up partnership with KPHL and TWL for developing gas fields in Western Province by integrated upstream and natural gas utilization project Western Energy Project(WEP) with products of **LNG, LPG, condensate and dry gas.**

Natural Gas Utilization in PNG is in Very Early Stage



Source: Arran

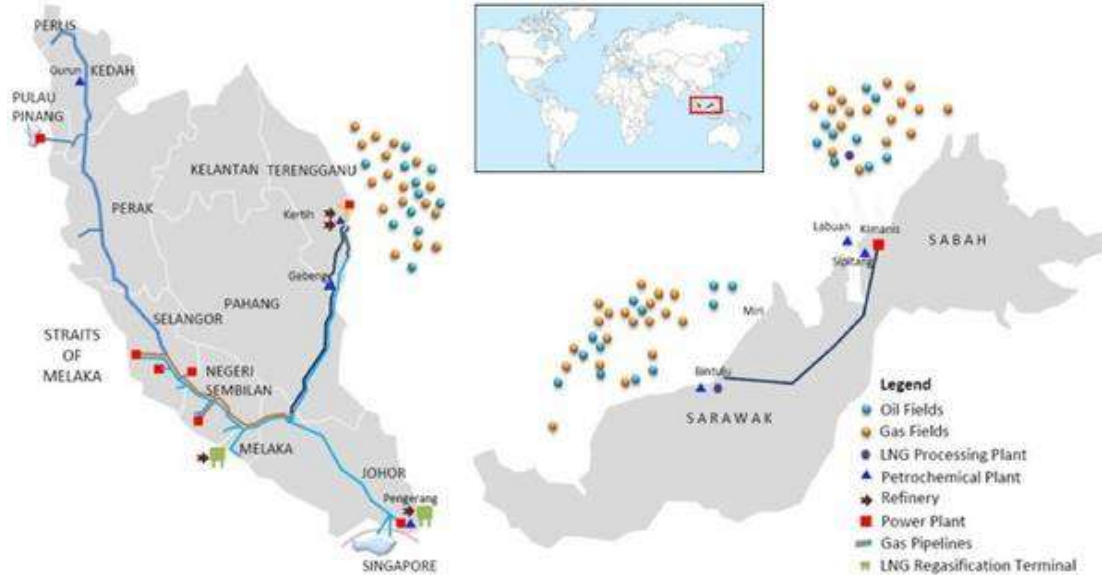
Figure 7. PNGs Total Installed Capacity



Source: PNG Power Limited

- PNG is a gas rich country exporting LNG to world market for more than 10 years.
- Domestic natural gas market is only for limited natural gas power and is less developed yet.
- 37% of installed electricity capacity in PNG is taking diesel as fuel according to data of PNG Power.
- No city gas distribution network established and there are no reported commercial natural gas utilization in transportation and chemical industry.

Natural Gas Marke of Malaysia and Outlook for PNG



Malaysia

- Population(2023): 34 million (Source: World Bank)
- Gas Consumption(2023): 430 MMSCF/day
- Per Capita gas consumption(2023): 12 SCF/day
- Gas Utilization: mining, power generation, chemical, city gas etc.

PNG

- Population(2024): 10.6 million (Source: World Bank)
- Gas Consumption(2024): 30 MMSCF/day (Source : HBS)
- Per Capita gas consumption(2023): 2.8 SCF/day
- If per capita gas 12scf/day, PNG consumption could be **127 MMSCF/day or 1 Million TONS LNG annually**
- Gas Utilization: mining, power generation, chemical, city gas

Natural Gas Utilization in Transportation Sector of PNG



LNG Refuel facility from Houpu in London



LNG Refuel facility from Houpu for Vessels

- Houpu developed the advance technology and facilities for refuel LNG to trucks and vessels
- Mileage of heavy truck could up to 1,500 Kilometers and more than 20,000 nautical miles for vessels by LNG Fuel, cost saving is about 15%-35% compared with diesel.
- Assuming 200 trucks with daily mileage of 300Km, will consume daily 20 tons of LNG(1MMSCF/day) and cost saving could be millions USD annually.
- Assuming 100 vessels with Dead Weight of 3000 tons sailing in river and coast every day could consume 300 tons/day of LNG (15 MMSCF/day) then the cost saving could be more than 10 million USD , decreasing Nitrogen oxides more than 80%

Natural Gas Utilization for Power Sector of PNG



- About 215MW power generation is by diesel in PNG with diesel price in remote area up to 1USD/litre
- Replace 100MW power generation will need dry gas about 23MMSCF/day or 470 tons/day, cost saving for fuel could be 15 to 30 million USD with potential LNG price discount in PNG

Solution for Transportation LNG to Gas Clients in PNG



Mini LNG Plant



LNG Trailer



LNG ISO Container

- In cooperation with partners of KPHL and TWL, HBS plans to built the first Mini LNG plant in PNG to supply PNG domestic market
- LNG could be transported by LNG Trailers on road and WEP is preparing for this to supply clients in Western Province.
- One trailer could carry 18 tons of LNG.
- LNG could be transported by WEP project to Port Moresby, Lae etc. in ISO Container.
- LNG Refuel station could be set up in Kjunga, Daru, Port Moresby, Lae etc. for potential Vessel fuel LNG.

Digital Computing Provides On Site Market for Nature Gas



NVIDIA's Jensen Huang spoke at COMPUTEX conference

"There's no question we're in a new computing era ... Every single computing era you could do different things that weren't possible before

Crypto and Computing are reshaping global energy markets.

- Around 60% cost of computing center is electricity
- Cryptocurrency Mining: Consumes 13.6-18.3GW electricity globally, about 30% of global computing center consumption
- HPS is working with PNG government and Partners to bring the digital computing market to PNG on site for natural gas power.

“It is not just powering computers—it Brings Gas Market to Well Site.”

Opportunities from Gas Liquid---LPG



- Current LPG consumption in PNG is about 33 tons/day, all imported.
- Per Capita LPG annual consumption in PNG is 1.1Kg/Capita, with Indonesia for 29.6Kg/Capita with world average 38.75kg/Capita
- Stanley development could produce 170 tons of LPG/day which could make PNG a LPG Hub in South Pacific Region.
- PNG domestic product Enjoying NO import duty
- Opportunities could be available for LPG transportation, LPG power generation, residential usage etc.

Opportunities from Gas Liquid---Condensate



- Condensate is natural gas liquid and PNG is rich of condensate
- Important material for petrochemical industry
- Could mix with heavy oil for vessel fuel and environmental friendly
- Could mix with diesel for power Genset
- Stanley could produce around 2100Bbl/day condensate with 41° API and Sulphur Content 0.018%
- Cost saving will be significant as PNG local condensate price is close to Brent, but Diesel and heavy oil price could be 40%-100% higher than Brent

Business Strategy of Houpu Group in PNG



Investment

- Own Cash
- Capital Market
- Strong Partners

Upstream Experience

- International Experience
- Technology Resources
- Partners with Local Expertise

Middle Stream Solutions

- Transportation Solutions
- Small-Medium LNG Facilities

Down Stream Market

- Replacing Diesel Power in PNG
- Condensate/LPG sales
- Computer Centers

➤ Houpu Group hopes to add value in developing PNG natural gas market by integration of investment, technology and operation in the whole industry chain from upstream to downstream.

➤ It could not be achieved without the support from government and close partnership in the whole value chain..

Thanks

