# Chapter 2

# Indonesia's LNG Policy

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# Chapter 2
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## 1. Outlook of Natural Gas in Indonesia's Energy Mix

Natural gas plays an important role in meeting Indonesia's energy demand. Under Presidential Regulation No. 22/2017 concerning the National Energy General Plan, energy supply will come from various energy sources mix with the following shares:

1) New low-carbon energy sources and renewables – at least 23% in 2025 and 31% in 2050
2) Oil – less than 25% in 2025 and less than 20% in 2050
3) Coal – at least 30% in 2025 and 25% in 2050
4) Gas – at least 22% in 2025 and 24% in 2050

The report of the Asia Pacific Energy Research Centre (APERC) on APEC Energy Supply–Demand Outlook 2019 (APERC, 2019) projected the growth of Indonesia's gas demand for meeting domestic and export commitment from 58.8 Mtoe in 2020 to 60.9 Mtoe in 2040 (Table 2.1). Gas demand in electricity will continuously dominate, accounting for 30% in 2020 and growing to 40% of total gas demand. Industry accounts for the second-largest gas consumer. Indonesia will maintain export gas. However, the volume will decrease significantly to 44 Mtoe in 2035. In 2040, Indonesia is projected to import natural gas to meet domestic demand.

**Table 2.1: Indonesia Gas Demand Outlook (Mtoe)**

| | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|
| **Total gas demand (Mtoe)** | 58.8 | 54.3 | 55.8 | 59.7 | 60.9 |
| Electricity | 18.0 | 17.1 | 19.1 | 24.8 | 33.1 |
| Energy Industry (Owned Used) | 3.4 | 3.8 | 4.2 | 4.6 | 4.9 |
| Transport | 0.1 | 0.3 | 0.7 | 1.1 | 1.6 |
| Building | 1.2 | 1.6 | 2.1 | 2.8 | 3.4 |
| Non energy use | 3.4 | 3.8 | 4.2 | 4.6 | 4.9 |
| Industry | 11.8 | 13.8 | 15.8 | 17.5 | 19.0 |
| Exports | 20.9 | 13.7 | 9.6 | 4.4 | -6.0 |

Mtoe = million tonnes of oil equivalent.
Source: APERC (2019).

Government Regulation No. 79/2014 on the National Energy Policy directed the role of natural gas in Indonesia's energy supply (Government of Indonesia, 2014). Projected demand for natural gas until 2050, per the National Energy Policy, will grow from 1.84 TCF (trillion cubic feet) in 2015 to 3.29 TCF in 2025 and to 9.21 TCF in 2050 (Table 2.2). The average

growth of natural gas demand from 2015 to 2020 is 6% per year; 2020–2025, 7% per year; 2025–2030, 5% per year; 2030–2040, 5% per year; and 2040–2050, 3% per year. The demand for natural gas will increase significantly from 2015 to 2025 (6%–7% per year). During that period, the government will optimise the use of gas for domestic use both as fuel and industrial raw material to create higher added value and as a transition to the use of cleaner technologies, such as new energy and renewables.

**Table 2.2: Projected Gas Demand of Indonesia**

| Year | 2015 | 2020 | 2025 | 2030 | 2040 | 2050 |
|---|---|---|---|---|---|---|
| Gas Demand | | | | | | |
| Share (%) | 22 | 22 | 22 | 23 | 24 | 24 |
| Volume (Mtoe) | 47 | 64 | 84 | 110 | 178 | 235 |
| Volume (TCF) | 1.84 | 2.51 | 3.29 | 4.31 | 6.98 | 9.21 |
| AAGR (%) | | 6 | 7 | 5 | 5 | 3 |

AAGR = average annual growth rate, TCF = trillion cubic feet.
Source: Government of Indonesia (2014).

## 2. LNG Role in Indonesia's Energy Supply

Indonesia is a pioneer in the LNG industry. The country started the LNG industry in the early 70s. The construction of LNG Plant Arun train 1/2/3 and LNG Plant Bontang train A/B started in 1974, each with a capacity of 1.7 MTPA (million tonnes per annum). The first LNG was shipped to Japan from LNG Badak in 1977, followed by LNG Arun in 1978. The available market in East Asia encouraged Indonesia to rapidly expand the LNG plant capacity. LNG Arun doubled to six trains with a total capacity of 12.5 MTPA. Bontang was expanded to eight trains, processing 22.5 MTPA at its peak production. Indonesia built two more LNG plants: LNG Donggi Senoro with a capacity of 2 MTPA and Tangguh LNG plant, with 7 MTPA. Donggi Senoro LNG delivered its first LNG in 2015 and Tangguh in 2009. Indonesia is currently developing two more LNG plants, Tangguh Train III and Masela.

Natural gas has supplied domestic energy demand, fuelled power plants, and used in the industry and commercial sectors as well. However, due to geographical conditions, Indonesia, being an archipelagic country, faces several challenges in transporting gas to consumers. Most gas fields in Indonesia are located in less-developed areas, far from consumers. To transport natural gas from the gas field to consumers, Indonesia has developed natural gas infrastructure consisting of transmission and distribution lines. The current natural gas infrastructure comprises 5,254 km transmission lines; 6,183 km distribution lines; and 3,438 km city gas pipelines. In 2020, 13 companies were active in transmitting natural gas and 30 companies are involved in distribution. However, only PT Pertamina Gas and Perusahaan Gas Negara (PGN) (State Gas Company) then merged as Pertamina's Sub-holding that plays a major role in both transmission and distribution.

Domestic use of LNG in Indonesia started when the government decided to allocate LNG to overcome the gas supply shortage in West Java in 2010. PT Nusantara Regas, a joint

Pertamina and PGN subsidiary, constructed the Floating Storage Regasification Unit (FSRU) with a storage capacity of 3 MTPA and regasification capacity of 500 million standard cubic feet per day (MMSCFD), and stationed in Jakarta Bay. The LNG ship Aquarius, with a capacity of 125 CBM, has been delivering LNG from the Badak and Tangguh LNG plants since 2012, and from Donggi LNG plant since 2016. The main LNG consumers are power plants owned by the Perusahaan Listrik Negara (PLN) (State Electricity Company): Muara Karang, Tanjung Priok, and Muara Tawar.

The government issued a licence for the construction of the second FSRU in Medan in 2012. However, since the government converted the Arun LNG plant to an LNG receiving, storage, and regasification terminal, the FSRU operated by PGN relocated to Lampung and started its operation in 2014. FSRU Lampung measures 294 metres in length and 46 metres wide. It stores LNG 170,000 CBM and regasifies 240 MMSCFD of LNG.

Due to declining gas resources, after having exported 4,269 cargoes of LNG since 1978, the government closed the Arun LNG plant in May 2014. The government decided to convert the plant into a storage and regasification terminal to supply industry in Aceh and North Sumatra in 2015. The total regasification facility operated by PT Perta Arun Gas is 450 MMSCFD. The facility supplies LNG to PLN with 105 MMSCFD for the fuelling power plants in Arun and Belawan. Gas to Belawan is transported through 350 km with a 24-inch diameter pipeline which could deliver 250 MMSCFD gas. LNG supply for the Arun Storage and Regasification Facility is generated from Bontang, Donggi, and Tangguh. In 2019, Perta Arun Gas expanded its Arun facility as a hub for international LNG trade by renting its LNG storage capacity to the international LNG trader.

Currently, Indonesia is waiting for the commissioning of the fifth LNG storage and regasification facility in Teluk Lamong, East Java. At the initial stage of operation, the facility will use offshore storage and regasification unit capable to handle regasification at 180 MMSCFD. At the final stage, the facility will use a land-based fixed LNG tank with a capacity of 50,000 CBM, constructed in a 2.5-hectare land; it is expected to be ready by 2023. The regasification facility is expected to be expanded to provide a maximum of 600 MMSCFD regasification capacity in the future. The facility is equipped with a small-scale LNG filling terminal to fill an ISO tank of 20 feet by 40 feet, which will be transported to consumers in East Java Region.

Indonesia has transported LNG using truck-mounted ISO tank 12 feet to supply the power plant at Semberah located 70 km from the Badak LNG plant. LNG is transported from Bontang via ISO tanks and stored at six 105 CBM LNG tanks. LNG is regasified at 7.9 MMSFD to fuel a 2 x 20 MW gas power plant. Twenty ISO tank trucks are dedicated to transport LNG.

To meet domestic energy demand, LNG is also used for transportation and commercial fuel. Pertamina conducted a trial test of LNG used to fuel trucks in Balikpapan in 2014. Some LNG-fuelled trucks were being used by mining companies in East Kalimantan recently. In addition, LNG transported in ISO tanks has supplied industries in North Sumatra, East Kalimantan, South Sulawesi, and South-east Sulawesi. Private companies will supply LNG to hotels in West Java, Bali, and other regions.

In June 2020, the government, through an MEMR decree, established a task force on energy utilisation and energy security whose task is to increase LNG consumption in the industry, household, and transport sectors, especially the shipping industry. The task force was mandated to secure the construction of LNG terminals in West and Central Java. Following the decree, Pertamina started trying out the Anchor Handling and Tug Supply ship to support offshore oil and gas in East Kalimantan. To enable LNG consumption, the ship was converted to diesel dual fuel with fuel combination LNG: high-speed diesel is 60:40. LNG was supplied to the ship via ISO tanks. The commercial use of LNG to fuel ships will start in August 2021. The government is also seriously considering the use of LNG for rail transport.

### 3. Small-Scale LNG Terminal

The Government of Indonesia issued the National Gas Policy Road Map 2014–2030 in 2014. This policy proposed that small-scale LNG infrastructures supply gas to the small islands in East Indonesia. Indonesia started its first mini LNG terminal at Benoa Bali in April 2016. The LNG terminal operated by Pelindo Energi Logistik intended to supply gas to a 250-MW power plant in Pesanggrahan, Bali at 40 MMSCFD rates. The LNG facility consists of two main infrastructures, namely, the floating regasification unit (FRU) and the floating storage unit (FSU). FSU Hysy and FRU were both rented and moored alongside the Pelindo wharf at Benoa Bay. LNG from Badak was stored at the FSU, sent to the FRU located next to the FSRU for regasification, then piped to the PLN power plant in Pesanggrahan. The total investment reported was US$500 million. In addition to supplying the power plant in Pesanggrahan, the terminal also aimed to supply cooling water to Ngurah Rai Airport, located 6 km from the terminal site.

After almost 3 years of operations, Pelindo Energi Logistik decommissioned the FSU and FRU unit and installed a new FSRU, namely, Karunia Dewata in December 2018. The FSRU is equipped with four independent C-type LNG tanks, each with a capacity of 6,500 CBM or 26,000 CBM in total. The FSRU regasifies LNG at 50 MMSCFD and sends the gas to Pesanggrahan power plants.

### 4. Regulatory Framework

Gas distribution in Indonesia is regulated by the following: (i) Law No. 22/2001 regarding oil and gas law and its derivatives, (ii) Government Regulation No. 36/2004 concerning the Oil and Gas Downstream Business, and (iii) MEMR Regulation No. 4/2018 regarding the Downstream Gas Business to Accommodate LNG as a Mode of Transport of Gas for the Domestic Market and Prohibit Multilevel Gas Trading, which replaced the previous MEMR Regulation No. 19/2009 concerning the Natural Gas Business through Pipelines. Indonesia's gas regulatory framework promotes unbundling business models, whereby upstream companies are prohibited from taking part in the downstream business, and vice versa.

Article 8 no. 3 of Law No. 22/2001 provides that transport business activities of natural gas connected through pipelines shall be regulated so that their utilisation is open for all. The law

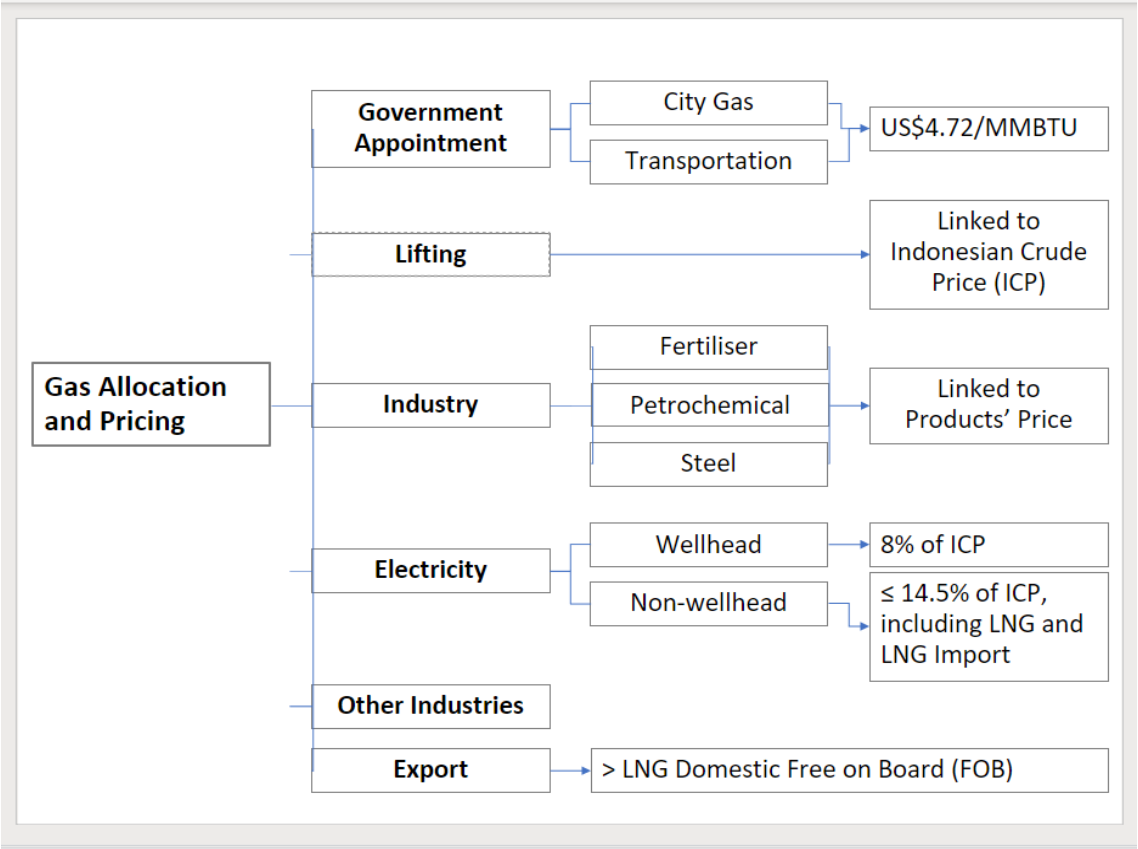
allowed the private sector to build and operate gas pipelines. The natural gas business framework in Indonesia adopts retail competition. However, the majority of pipelines built before the enactment of Law No. 22 of 2001 were project-specific point-to-point pipeline, their capacity was not prepared to transport a large volume of gas, have various specifications, and were challenging for interconnection. Only part of the transmission lines are open for third-party access, whilst most distribution companies still operate in monopoly. Geographical conditions also mismatch with infrastructure, gas resources, and consumers in some circumstances, encouraging gas sellers or traders or consumers to build their pipelines. As a result, the implementation of the open access policy and competition is yet to be effective.

Currently, 38 companies have entered the market and are involved in the downstream gas business. However, only 10 firms that entered the gas market own the infrastructure – they built pipelines to distribute gas – whereas Pertagas and PGN are the dominant players. The rest of the companies only act as pure traders. These pure trader companies have added more layers in gas transactions, leading to cost inefficiency.

The MEMR issued Minister Regulation No. 6/2016 concerning the provisions and procedures for determining the allocation, utilisation, and price of natural gas. Under this regulation, the government encourages gas trading between producers and direct consumers and abolished pure trader companies to reduce the gas price for consumers. Besides, the regulation also encourages optimisation and utilisation of gas as a driver of economic growth.

In 2016, the government introduced economic stimuli to enhance economic growth. One is a policy to maximise gas for national development and is provided to certain industries. Under this policy, companies in which gas is 40%–50% part of their cost structure are to receive gas supply with a special price of US$6.00/MMBTU (million British thermal unit). The industries listed to receive incentives are oleochemical, fertiliser, petrochemical, steel, ceramic, glass, and gloves. To meet the gas price target, the government subsidised gas from shared revenue generated by the upstream gas fields. In addition, the government also adjusted toll fees, considered an appropriate normal return on investment in midstream business. Gas pricing mechanism for those industries, which were subsidised, is regulated by MEMR Regulation No. 40/2016 on gas pricing for certain industries. Under this regulation, gas prices for fertiliser and petrochemical are linked to the price of urea and ammonia. For the steel industry, gas prices are linked to hot rolled coil. The scheme of regulation is elaborated in Figure 2.1.

**Figure 2.1: Gas Allocation and Pricing Policy**




Source: MEMR Regulation No. 40/2016 and MEMR Regulation No. 8/2020.

MEMR Regulation No. 40/2016 concerning gas pricing for certain industries was amended by MEMR No. 8/2020 (MEMR, 2020a) which sets the maximum gas price of listed industries at US$6.0/MMBTU at plant gate. The details of pricing for industries were set by the Ministry of Energy and Mineral Resources (MEMR) Decree 89 K/10/MEM/2020 regarding Consumers and Price of Natural Gas for Industry. Prices are adjusted such that these would not economically jeopardise the upstream companies. The government provides subsidy from its share in the related gas fields. Government assigned Pertamina to supply gas to industries through Decree 90 K/10/MEM/2020 regarding Appointment of PT Pertamina (Persero) to Deliver Gas to Industrial Consumers.

For power generation, the gas price is regulated under MEMR No. 11/2017 concerning gas for power plant pricing, which was amended by MEMR Regulation No. 45/2017. The latest amendment was by MEMR Regulation No. 10/2020, which sets the maximum price of gas for power generation at US$6.0/MMBTU. The price of wellhead gas and mine mouth power plant gas is 8% Indonesian crude price.

The price of downstream gas (gas transported) through pipeline is determined by MEMR Regulation No. 58/2017 (MEMR, 2017a) regarding the price of natural gas transported through pipelines. The final price of natural gas for consumers is determined by the wellhead

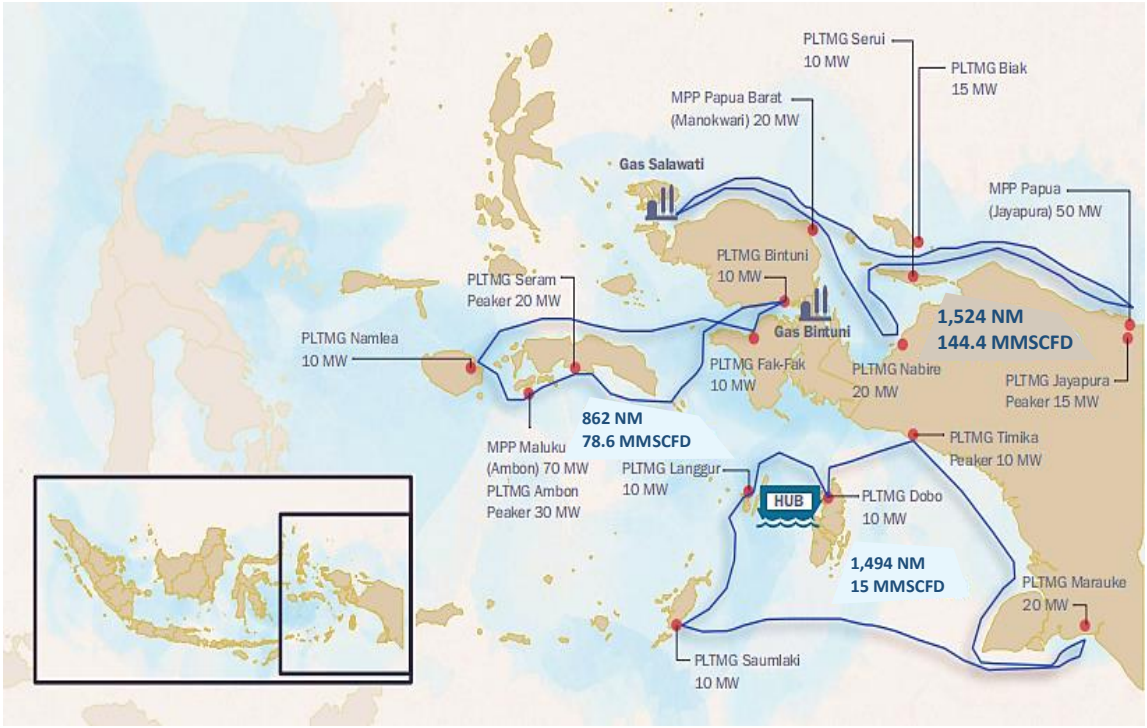
gas price, infrastructure cost, and trading fee. Wellhead gas price is determined by gas fields' economic development and is negotiable. The infrastructure costs include transport and distribution, liquefaction, compression, regasification, and storage. The government sets up a formula for calculating the cost of infrastructures. The internal rate of return (IRR) of infrastructure was set at 11% for developed markets and 12% for underdeveloped markets. For IRR calculation, the government used the assumption that 60% of the capacity of infrastructure was used and the lifetime of the infrastructure at 15 years for new infrastructure. For pipeline/infrastructure that exceed 15 years, the lifetime is calculated based on the designated remaining life of the infrastructure in operation. Trader cost is set at 7% of gas price.

## 5. Future LNG Development Policy

Due to their nature, most power plants in Eastern Indonesia are powered by oil.

However, since LNG technology currently enables the transport of LNG in small volume, the government issued a policy to convert oil into LNG to generate power in the area. The implementing policy crafted in MEMR Decree No. 13 K/13/MEM/2020 (MEMR, 2020e) concerning assignment of the construction of LNG infrastructure in Eastern Indonesia, conversion of fuel oil into LNG to supply electricity, and securing LNG supply. The decree assigned Pertamina to build LNG storage and regasification infrastructures to convert 52 power plants in Eastern Indonesia, with a total LNG demand of 170 billion BTU per day. An early process to implement the policy is taking place.

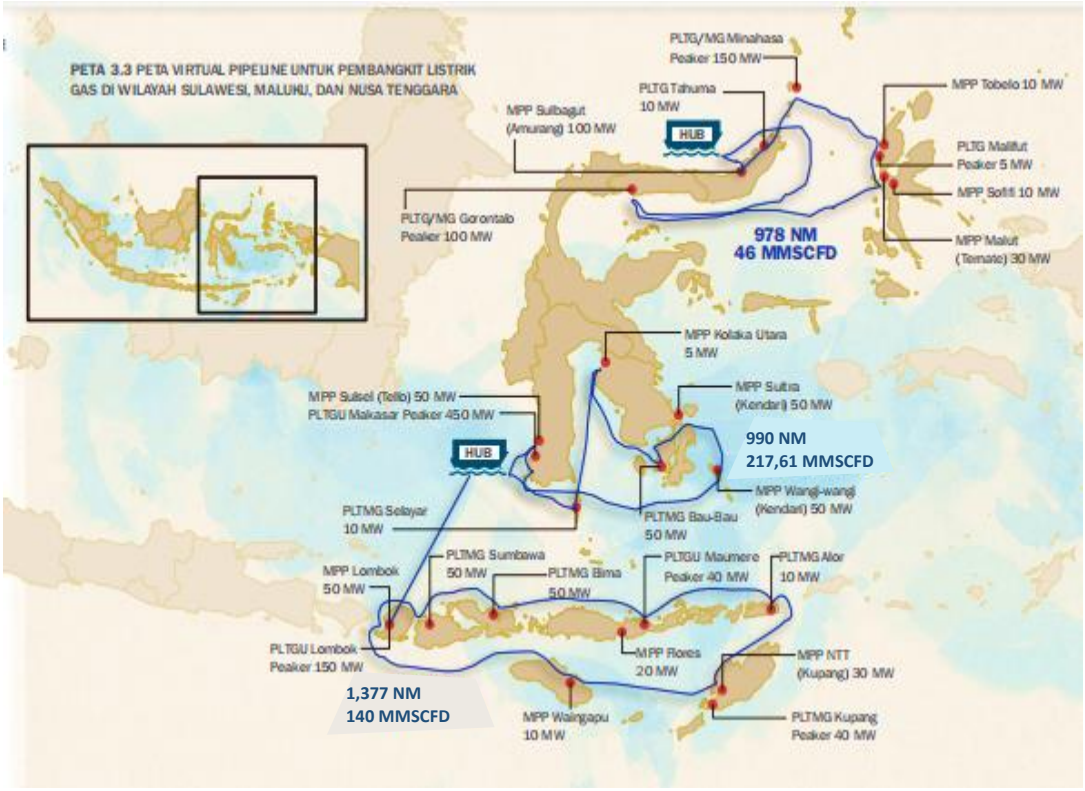
**Figure 2.2: Proposed Natural Gas Plant in Papua and Maluku**




Source: MEMR (2015).

Indonesia will develop a 9 MTPA capacity LNG plant in Masela. The role of LNG to meet domestic energy demand will continuously increase. Indonesia will also be an LNG hub as indicated by the opening of the Arun terminal to store LNG owned by overseas companies. Declining gas in East Kalimantan will reduce the operation of LNG Badak. LNG Badan plant will most likely be converted into an LNG storage and regasification facility either partially or completely if LNG production ceases. It has a similar path to that of the Arun LNG plant.

**Figure 2.3: Proposed Gas Power Plant in Sulawesi, Bali, and Nusa Tenggara**




Source: MEMR (2015).

The utilisation of LNG to meet future energy demand will increase. Per experience in operating the FSRU, the regasification unit will provide a good learning curve in maximising LNG infrastructure development and use to meet Indonesia's energy demand and the national goal of reducing emissions from the energy sector.

## 6. Conclusion

The Government of Indonesia sees that LNG is an important source of energy for fuelling the economy and securing the energy supply of the country. Several policies encourage optimisation of gas supply in the country, such as pricing policy, incentives for infrastructure development, and facilitation of accurate business policies that bring natural gas to consumers.