Chapter 5

Outlook of LNG Production

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Chapter 5
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1. LNG Development in Indonesia

Indonesia has been producing LNG since 1977, starting from the Badak LNG plant and followed by the Arun LNG plant in 1978. During its peak operation, LNG Arun consisted of six trains with a total capacity of 12.85 MTPA. The Bontang LNG plant consisted of eight trains with a total capacity 22.5 MTPA. Two more LNG plants were put on stream afterwards. These were LNG Tangguh, with a capacity of 7.6 MTPA on stream in 2009, and LNG Donggi Senoro, with a capacity 2 MTPA on stream in 2014. However, due to declining gas resources, the production of LNG Arun ceased in 2014. The current total capacity of an LNG plant in Indonesia is 31.4 MTPA. The declining gas reserves in East Kalimantan led to the closure of four trains in the Badak LNG plant. In 2019, the total LNG production of Indonesia was 16.4 MTPA: 6.4 MT from the Badak LNG plant, 7.8 MT from the Tangguh LNG plant, and 2.2 MT from the Donggi Senoro LNG plant.

Although LNG production declined from 19.1 MT in 2015 to 16.4 MT in 2019 due to declining production in LNG Badak, the projected Indonesian LNG production will rebound after train 3 LNG Tangguh is completed in 2022. This will expand the plant capacity by 3.8 MTPA, totalling 11.4 MTPA. The projected Masela LNG plant will add about 9 MTPA in capacity in 2028.

In addition to large-scale LNG plants, Indonesia started developing small-scale LNG plants to monetise stranded small gas fields. Gas technology development, either in transporting or processing technology, provides an opportunity to utilise stranded small gas resources. A national downstream company, PT Kayan LNG Nusantara, will develop a small LNG plant in Tana Tidung, North Kalimantan. The plant will process 22 MMSCFD gas from Simenggaris field operated by PT Pertamina Hulu Energi Simenggaris and PT Medco E&P Simenggaris. . This project will start in December 2021.

Three more companies had secured the licence to build small-scale LNG plants. These are (i) PT Paraamartha LNG which will build an LNG plant in Sidoarjo with a capacity of 170 tonnes/day, (ii) PT Sumber Aneka Gas which will build an LNG plant in Tuban with a feed gas of 15 MMSCFD, and (iii) PT Natgas, which will build an LNG plant in Batam with a capacity of 50 tonnes/ day. LNG production will be mainly generated by the Bontang, Tangguh, Donggi, Masela plants, and several small-scale LNG plants that are expected to be on stream by 2030.

1.1. Badak LNG Plant

The Badak LNG Plant, located in Bontang East Kalimantan, was built to process gas from Muara Badak field operated by Huffco, a Pertamina production-sharing contractor, and sell it as LNG to buyers in Japan. The first train, train A, started its production in July 1977 and shipped the first LNG to Japan in August 1977. The Badak LNG plant expanded to eight trains with a total capacity 22.5 MTPA. For almost 4 decades of the operation, LNG Badak had

already shipped more than 59,000 cargoes. However, due to declining gas sources, only four trains of LNG Badak were recently in operation.

According to the Indonesian *Natural Gas Balance* issued by the MEMR (2018), the Badak LNG plant will continue producing LNG until 2030 and beyond. The raw materials are expected to be supplied by Mahakam Gas fields operated by Pertamina Hulu Mahakam and Muara Bakau field operated by ENI. Additional supply is expected from IDD Ganal field operated by Chevron, which will be on stream in 2025 at the rate of 205 MMSCFD and will be increased up to 844 MMSCFD by 2027. However, after reaching its peak production in 2027, gas supply will decline in 2028 from 844 to 769 MMSCFD in 2029, and 709 MMSCFD in 2030.

Natural gas from ENI East Sepinggan (Marakes) is going to be on stream in 2021 at 147 MMSCFD and will reach its peak production at 371 MMSCFD in 2023. The amount of production will naturally decline but it will keep producing gas up to 2029. The outlook of Badak LNG production and allocation is indicated in Figure 5.1.

Figure 5.1: Outlook LNG Badak Production and Allocation

Source: MEMR (2018).

The production of Badak LNG plant in 2020 will reach 6,047 kilotonnes. All production is shipped to domestic and Japanese buyers. However, the slowing down of economic activities due to the Covid-19 pandemic, which started in December 2019, has led to the curtailment of production. Demand is expected to rebound in 2021 as the pandemic could be handled globally and economic activity would go back to normal. Badak LNG production will be limited by the availability of gas. Under the Indonesian *Natural Gas Balance*, Badak LNG production will reach 4,553 kilotons in 2021. As the new gas resources go on stream, production will increase to 7,221 kilotons in 2025 and decline afterwards to 2,424 kilotons in 2030.

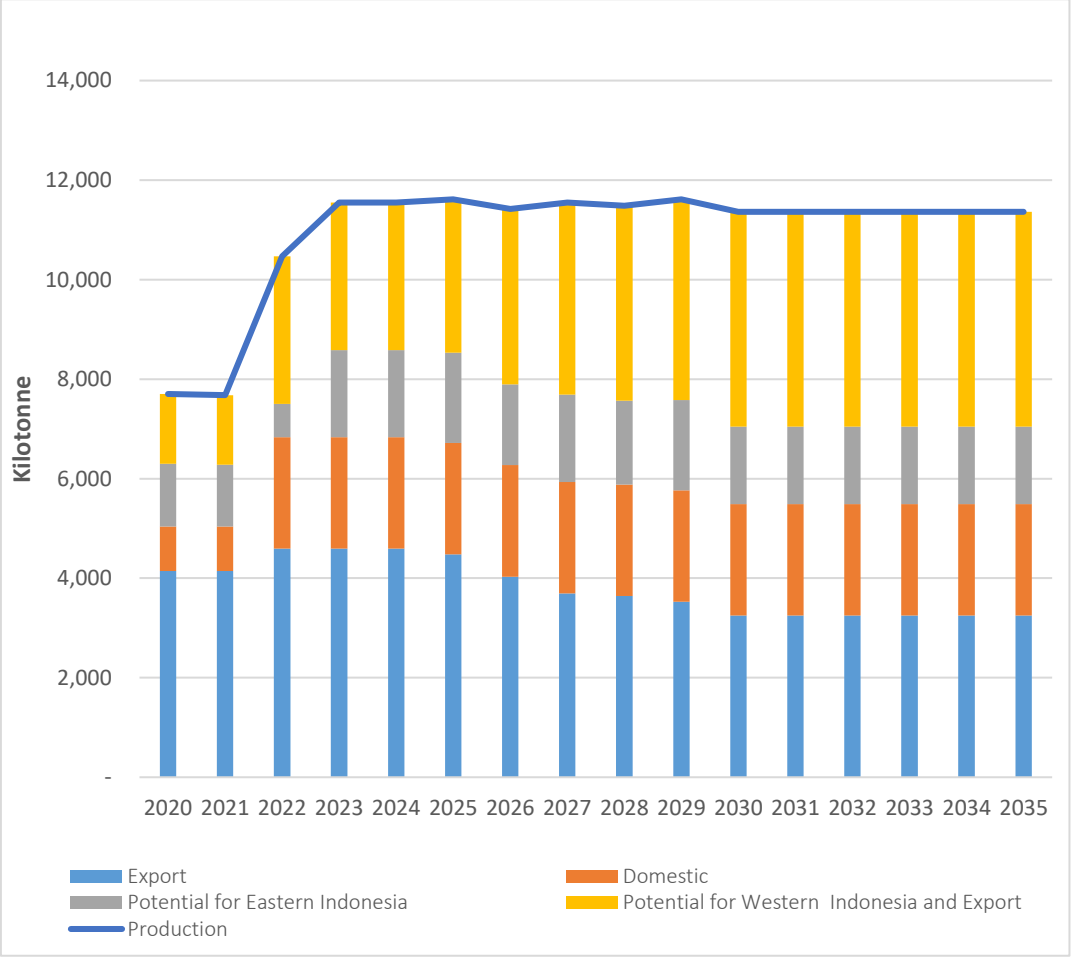
Badak LNG production is allocated for both export and domestic markets. Contracted exports at 780–902 kilotons/year will end in 2025. However, contracted sales for domestic buyers at 1,934 kilotons/year have been signed up to 2023. Although the continuation of sales contracts with domestic buyers beyond 2023 and overseas buyers beyond 2025 have not been secured yet, most likely the domestic buyers in Arun, Medan, Lampung, and West Java

will need LNG supply from Bontang. In addition, LNG Badak will continuously seek the export market, especially in East Asia, since the LNG market in East Asia offers the best price. Only 792 kilotons and 265 kilotons of LNG from Badak will be available to meet the LNG demand of Eastern Indonesia in 2025 and 2030, respectively.

1.2. Tangguh LNG Plant

The Tangguh LNG plant, located in Bintuni Bay West Papua, was developed by BP Indonesia[3] and its partners to monetise natural gas found around Bintuni Bay such as Berau, Wiriagar, and Muturi. The first two train LNG plants with a total capacity 7.8 MTPA was constructed in 2005 and completed in 2009. The third train with a 3.8 MTPA capacity is still being constructed and expected to be completed at the end of 2021. Figure 5.2 shows the outlook of LNG Tangguh production.

Figure 5.2: Outlook Tangguh LNG Production and Allocation



Source: MEMR (2018) and Author's analysis.

[3] https://www.bp.com/id_id/indonesia/home/siapa-kami/tangguh-lng.html.

In 2020, LNG Tangguh is expected to produce 130 cargoes of LNG equal to 7,800 kilotons of LNG. Amongst its production, 88 cargoes equivalent to 5,100 kilotons will be exported, 33 cargoes or 2,100 kilotons will be delivered to domestic consumers, and about 9 cargoes are about to go to the spot market. Train 3 of LNG Tangguh will start its production in 2022 and is expected to reach its maximum capacity in 2023. LNG Tangguh will maintain its peak production at 11.4 MTPA from 2023 to 2028, and the production will decline afterwards. However, there are opportunities to find more gas reserves to maintain peak production beyond 2030. From 2020 to 2025, 60% of Tangguh LNG production will be allocated for export, 35% for the domestic market, and the rest of 5% will be distributed to the spot market as it is not covered by the LNG sales agreement with any buyer yet. From 2025 to 2033, the production of LNG Tangguh will be allocated for the domestic and export markets equally, between 3.6 to 3.9 MTPA. There will be growing uncommitted LNG cargoes from LNG Tangguh of 2,000 kilotons in 2025 to 4,100 kilotons in 2028. Those uncommitted cargoes will most likely go to the domestic gas market in Western and Eastern Indonesia or to export. To supply the demand in Eastern Indonesia, the potential volume available in LNG Tangguh will be 1,750 kilotons in 2023; 1,800 kilotons in 2025, and 1,560 kilotons in 2030.

1.3. Donggi Senoro LNG

The Donggi Senoro LNG (DSLNG) Plant is located in Banggai Regency in the Province of Central Sulawesi and is situated about 45 km south-east of Luwuk, the main town of Banggai Regency. DSLNG was a downstream LNG plant, owned by a company established in 2007, with its shares owned by Pertamina Energy Services Pte Ltd (29%), PT Medco LNG Indonesia (20%), and Mitsubishi Corporation (51%). The DSLNG plant processes gas sent by the Senoro Toili Block at the rate of 250 MMSCFD, the Matindok Block at the rate of 85 MMSCFD, and liquefies it at 2 MTPA LNG. As projected, gas resources from these two fields currently supply DSLNG and will be continuously available up to 2030 or 2035. Basically, LNG produced by the DSLNG plant is exported to Japan (1 MTPA for Jera and 0.3 MTPA for Kyusu Electric), and the Republic of Korea (KOGAS 0.7 MTPA). However, DSLNG also sends LNG to the Arun Regasification Unit and FSRU West Java due to declining export demand, or on cargo swap mechanism with Bontang or Tangguh LNG plant.

1.4. Masela LNG

The Masela LNG plant will liquefy gas from the Abadi Field that was found in 2002 and confirmed by appraisal in 2013 and 2014. The Abadi Field Plan of Development was submitted to the government by Inpex and Shell assuming LNG production will be 9 MTPA, consisting of onshore LNG plant and offshore floating production and storage offloading as workplace for wells operation onshore. The plan of development was approved by the government in 2019. The government of Maluku Province issued the permit for plant construction in Nustual Island of the Tanimbar islands. The expected final investment decision will be made in 2020.

Masela LNG is starting to find buyers. A memorandum of understanding with PLN, Indonesia's state electricity company, was signed in February 2020 where PLN expressed its intention to utilise LNG from Masela to fuel the power plant. Certainly, the Masela LNG plant

needs more buyers to secure the project. Most likely, the government will allocate the LNG from Masela for fulfil domestic and export demand.

There is strong indication that the future LNG market is from the buyers' market. Many LNG projects in Australia, Africa, and the Middle East will deliver LNG to the market, including the Masela LNG plant, which is expected to be on stream in 2027. The projection of Indonesian LNG supply was made with the assumption that expected or planned projects will be successful in delivering the LNG as planned. However, in case of any disruption, Indonesia could benefit from the international market by importing LNG to supply domestic demand, especially for Eastern Indonesia. As in the Arun LNG facility case, the government will most likely convert the Bontang facility into LNG storages for imported LNG before LNG is distributed to consumers.

2. Conclusion

If upstream gas projects will go as planned, Indonesia could provide LNG to the eastern islands to replace oil consumption in power plants and industries in other regions of the country. Success in finding new gas reserves through intensive exploration will prolong the availability of gas and LNG to secure the energy needed by the country. However, some circumstances such as delay in project execution could lead to LNG deficit. In such a case, Indonesia could rely on the international LNG market. The development of medium- and small-scale receiving terminals is imperative in securing the supply.