



SMALL SCALE LNG DISTRIBUTION UTILIZING ARUN LNG TERMINAL

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Introduction

The development of small-scale LNG value chains and infrastructure is a game changer that will effectively meet the fast growing demand for clean energy globally.

Utilizing Arun LNG Terminal for Break Bulk Services offers practical solutions to supply LNG via small scale carriers to local Indonesian consumers as well as neighbouring Bay of Bengal countries such as East Coast of India, Bangladesh, Myanmar and Sri Lanka.

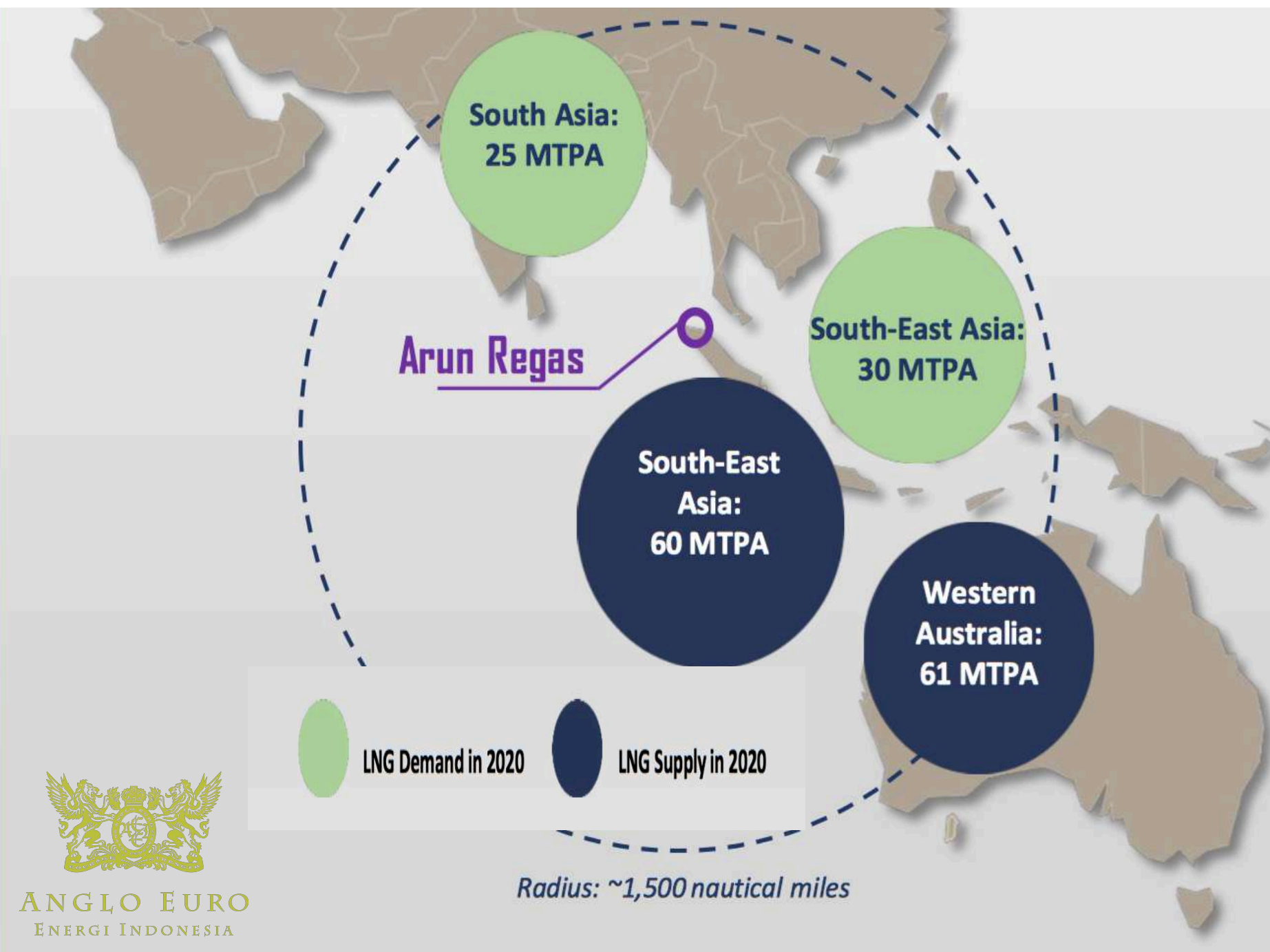
Break bulk services allows for supply to high demand centers for electricity with port draught restrictions and allows for small scale LNG distribution which conventional size vessels cannot meet.

Developing small-scale LNG infrastructure for gas to power projects allows for investments in other vital sectors and priority projects hence contributing significantly to economic growth. Existing coal and diesel power plants can be converted to LNG to meet emissions control regulations and climate change agenda.

Small scale LNG distribution will also bring direct and widespread socio-economic benefits to remote, coastal, island and inland river communities giving impetus for balanced growth and wealth distribution. This will result in multiplier effects on domestic and national economies.

Every sector of the economy will benefit from cheap, clean energy from utilizing LNG and the advent of technological advance in floating storage solutions such as FSRUs and FSUs will change the method and delivery of LNG more directly to end consumers.





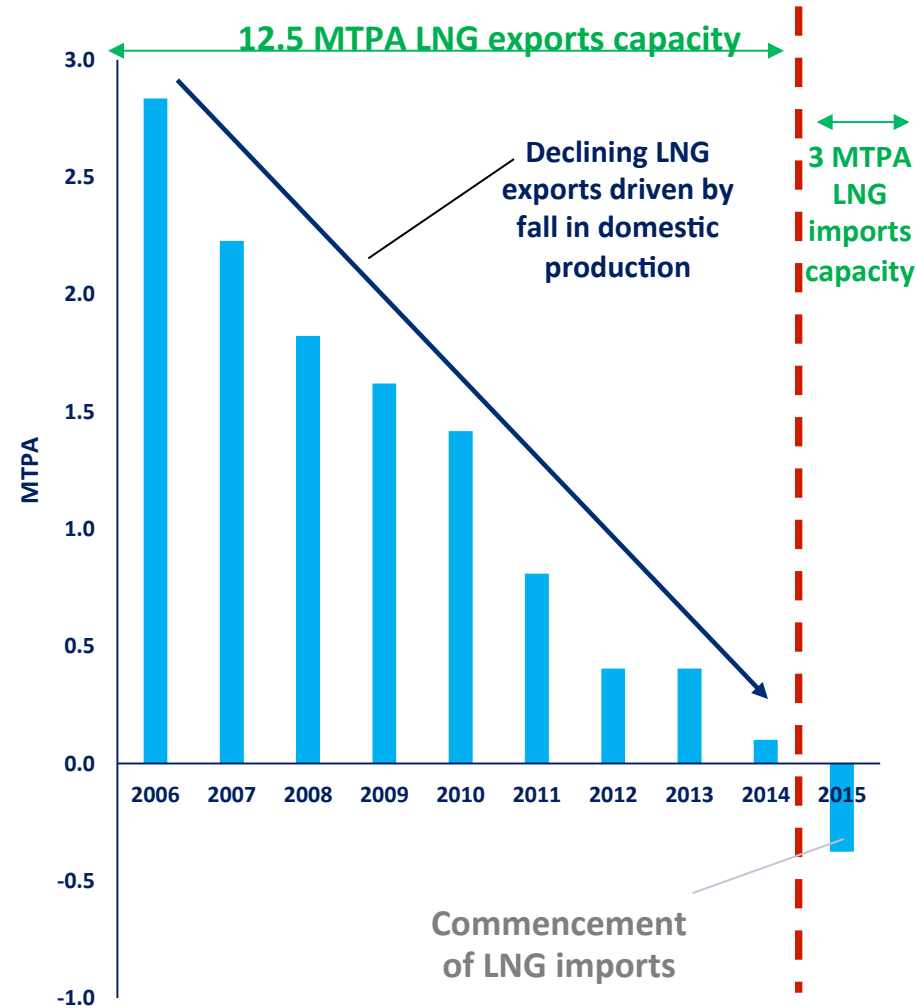
The contribution of Arun to the local North Aceh economy has been declining...

- The 12.5 MTPA Arun liquefaction terminal ceased exports in 2014 and was converted into a 3 MTPA LNG importing facility beginning 2015
- Gross Regional Domestic Product (GRDP) for North Aceh has declined from IDR* 7.68 trillion in 2006 to IDR 4.32 trillion in 2012, led by fall in LNG exports from Arun

➤ Arun LNG liquefaction project was estimated to deliver ~53% of the North Aceh GRDP in 2006

- Whilst LNG imports have commenced beginning 2015, the regas terminal is still under utilized.

➤ Arun has a capacity to import 3 MTPA but the existing demand from domestic industries is only in the range of 1.5 MTPA

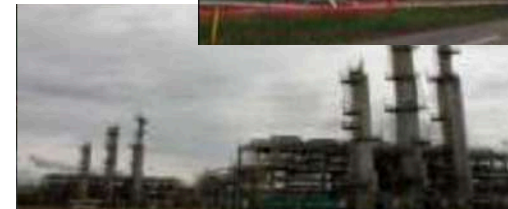


Arun Facilities

Lhoseumawe, Arun



Arun terminal facilities comprise of 5 LNG storage tanks with total capacity of 636,000m³ and 2 LNG Jetties @ 80,000 DWT, LPG extraction facility, LPG storage tanks with total capacity 302,000m³ and LPG Jetty 65,000 DWT and 4 condensate tanks with total capacity of 2.12 million barrel per day.



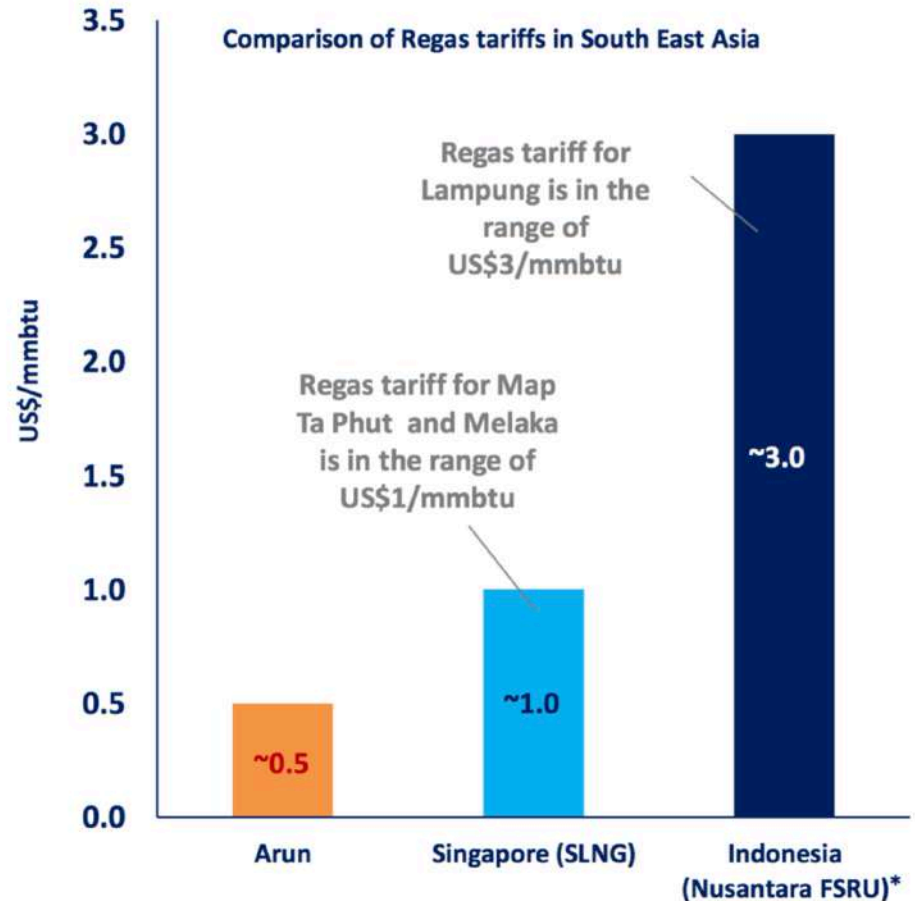
Source from Pertamina



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Arun's cost competitiveness can provide the terminal an Edge over peers in the region.

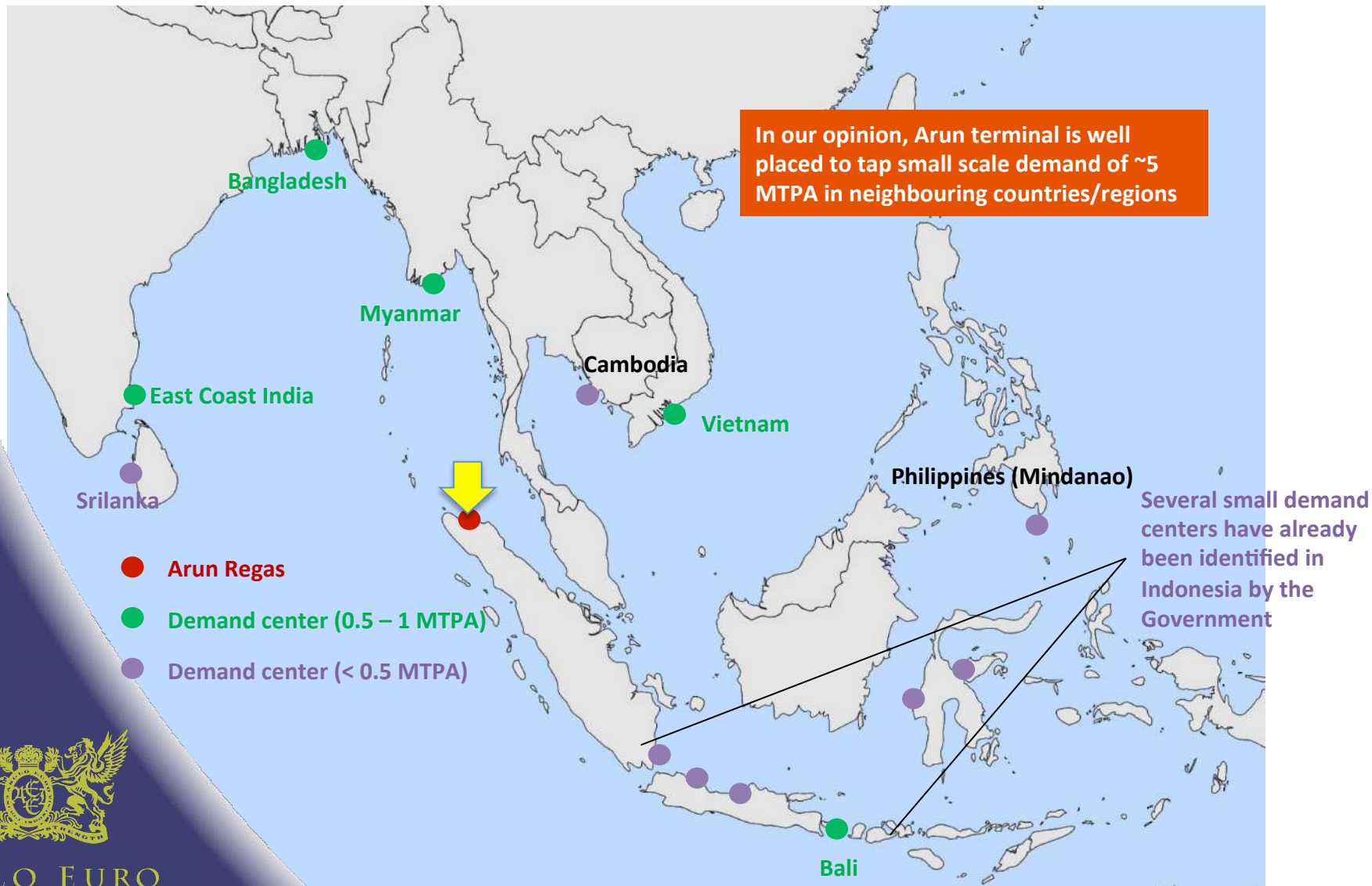
- Arun is a depreciated asset, giving it a competitive advantage over regas terminals in South East Asia which were all recently built
- Arun is a land based terminal and better placed to provide ancillary services (e.g. break bulk, bunkering) vis-à-vis floating regas solutions
 - Nusantara in West Java, Lampung in South Sumatra and Melaka in Malaysia are floating solutions and will not be able to provide ancillary services



* FSRU -- Floating Storage and Regasification Unit; Lower utilization rate is the primary reason for higher tariff at Nusantara FSRU



There are several demand centres around Arun which can be targeted for break bulk services



THE ROLES OF PT ANGLO EURO ENERGI INDONESIA

ANGLO EURO ENERGI IS:

- A LNG HUB DEVELOPER,
- RESPONSIBLE FOR LNG SUPPLY FROM MAJOR PRODUCERS,
- IN-CHARGE OF STORAGE, BREAK-BULK SERVICES, LNG TRANSPORTATION & DISTRIBUTION, AND
- TO SECURE OFFTAKE AGREEMENTS WITH END USERS.

THROUGH BREAK BULK SERVICES UTILIZING ARUN'S FACILITIES IN INDONESIA, ANGLO EURO ENERGI IS WELL POSITIONED TO ADD VALUE TO THE LNG SUPPLY CHAIN TO MEET THE REQUIREMENTS OF SMALL DEMAND CENTERS IN NEIGHBOURING COUNTRIES SURROUNDING BAY OF BENGAL AND SOUTH EAST ASIAN COUNTRIES.



Arun terminal can target to become a Regional LNG Hub by Introducing break bulk and LNG bunkering services

Spare storage capacity and location advantage make an ideal business case for Arun to develop into a Regional LNG Hub

1. Value Proposition

- Arun has a regas capacity of 3 MTPA against demand of 1.5 MTPA. Additionally, the terminal can be expanded to 12 MTPA given the existing storage tanks
- Spare storage capacity provides opportunity for ancillary services that can help to develop the terminal into a "Regional LNG Hub"

2. Unique Selling Proposition

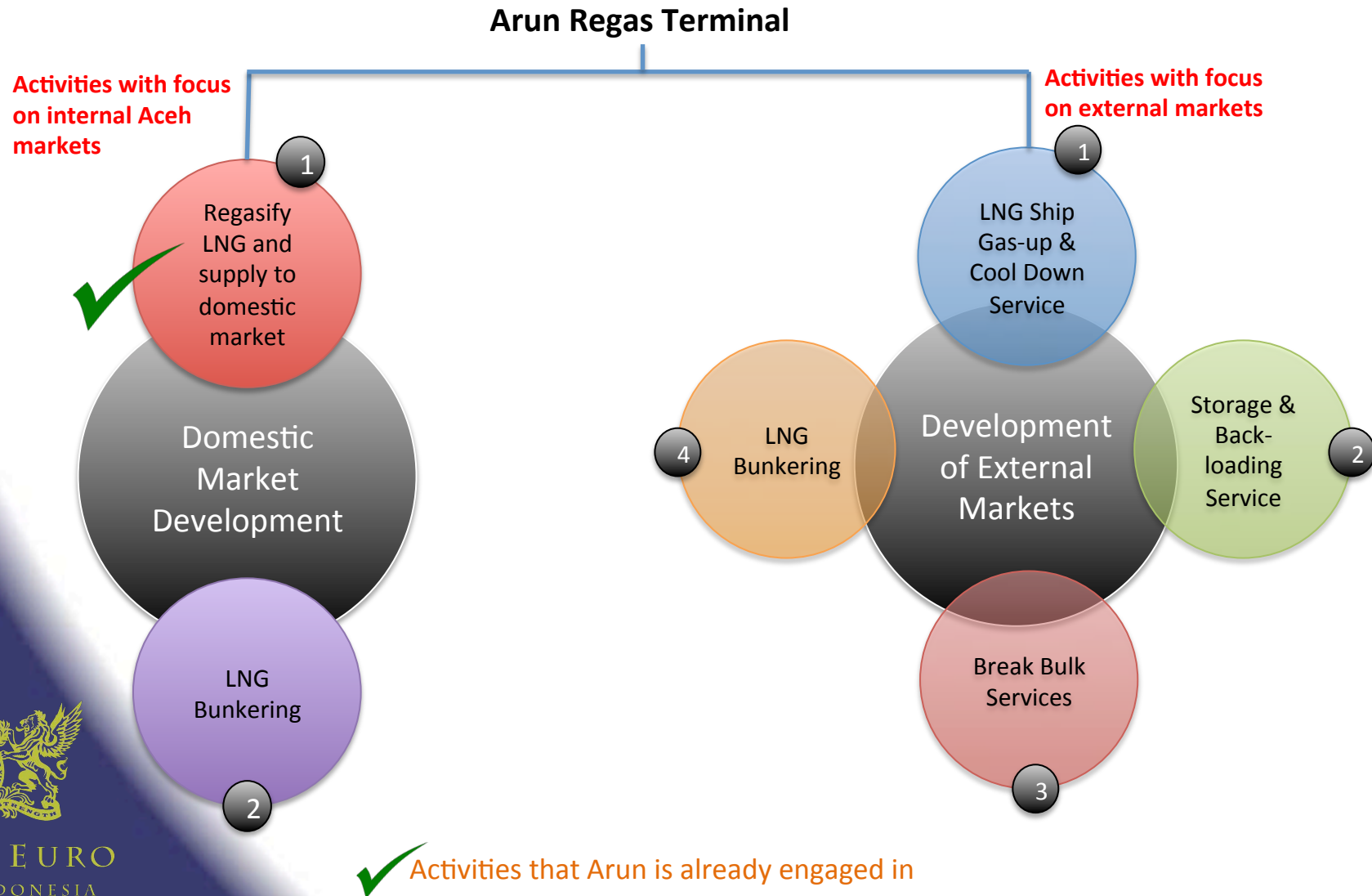
- Arun is located enroute the shipping journey from Middle East & Atlantic basin to South East Asia and North Asian countries
- There are a number of small demand centers around the terminal, which cannot import LNG economically through conventional LNG importing mechanisms

3. Market Potential

- Market potential for break bulk and LNG bunkering services estimated at ~5 MTPA and ~1 MTPA respectively
- Additional services (e.g. LNG Ship Gas-up and Cool Down, Storage and Back-loading and LNG Trucking) are possible but market potential appears limited



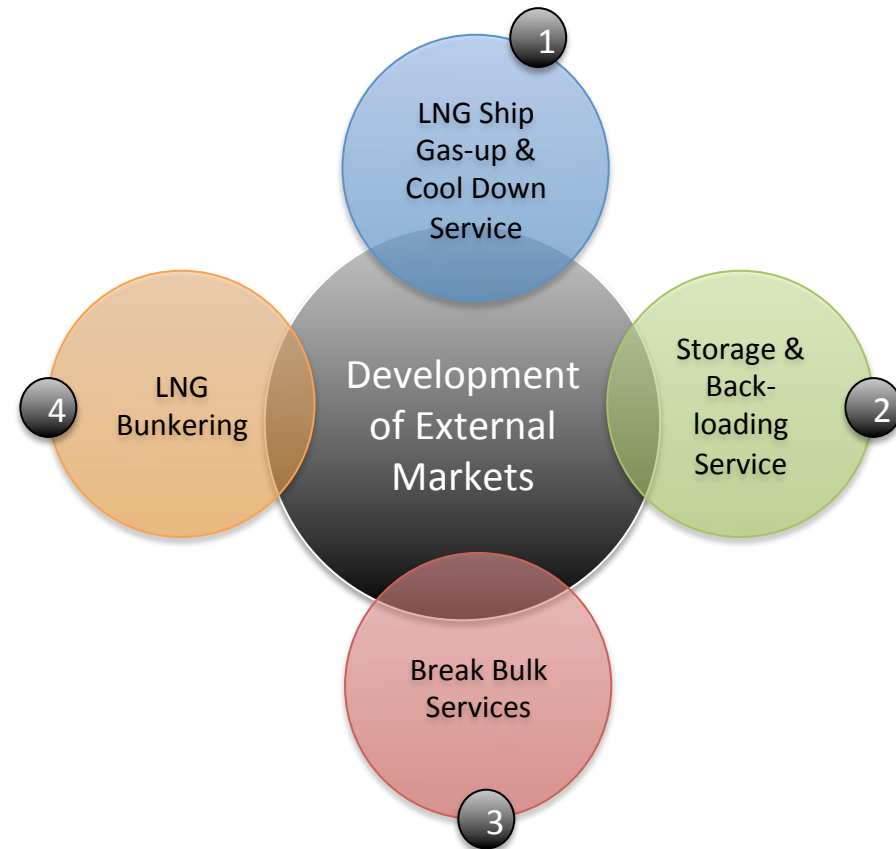
Ancillary services focusing on external markets can help to increase terminal utilization



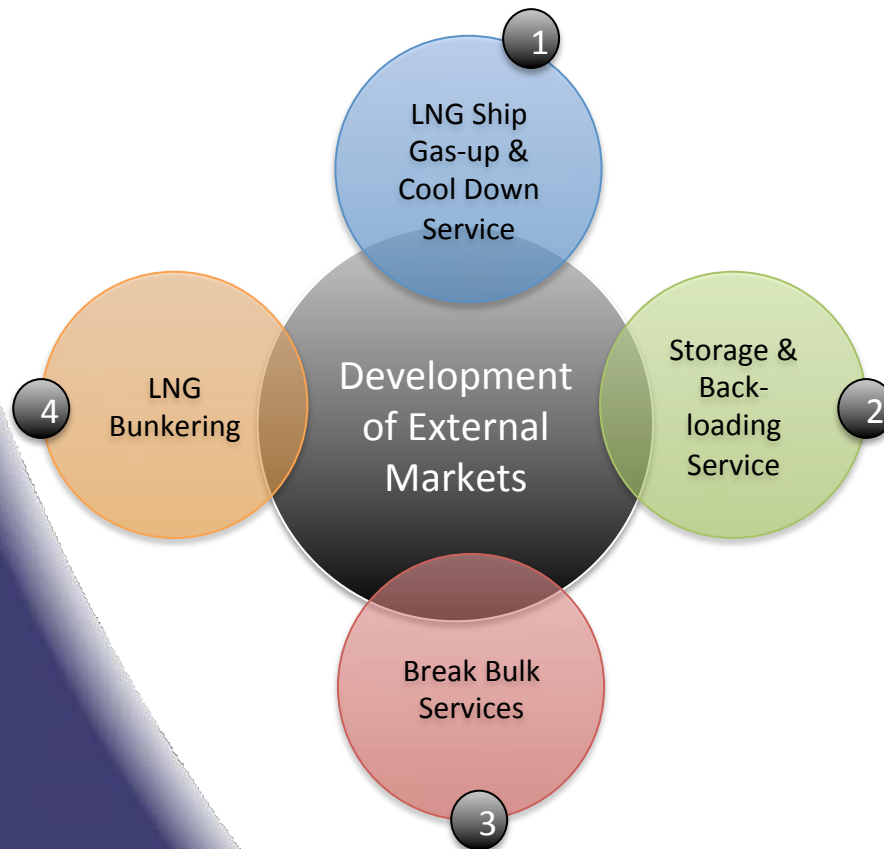
Break bulk service

❖ Opportunity Definition

- A “break-bulk” service would also involve storage and back-loading as already discussed, with the difference that the supplier of “large” cargoes (say 138 – 265,000m³) into Arun regas terminal would then systematically back-load “smaller” cargoes (say 10,000m³ – 90,000m³) for distribution to smaller LNG import terminals (incl. FSRUs) in neighbouring countries/regions. This would enable the supplier to ship LNG long-distance economically in large LNG tankers to Arun and then the volumes can be distributed “locally” in smaller LNG ships.



LNG Bunkering

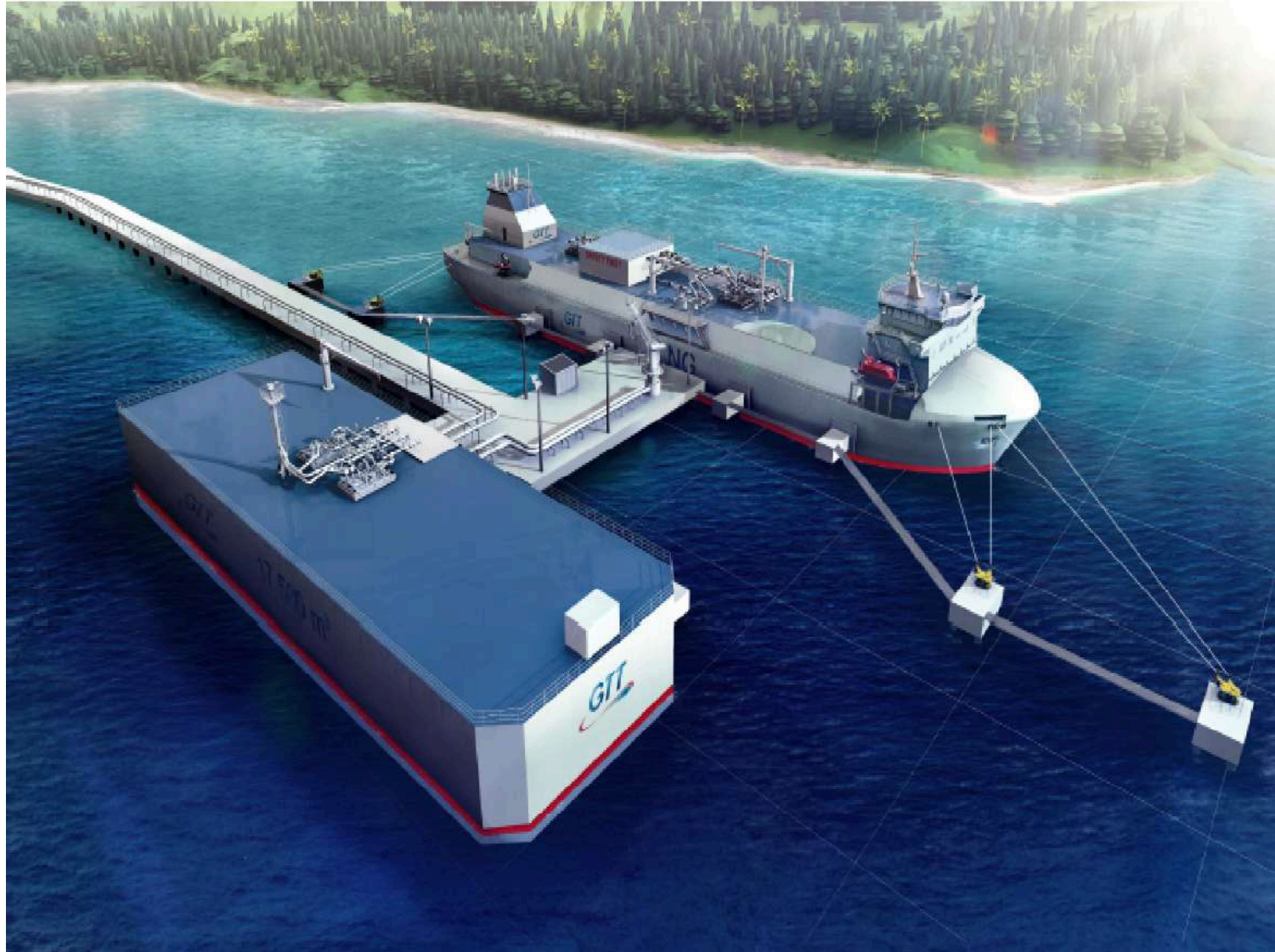


Opportunity Definition

- While nearly all LNG tankers use gas as their main bunker fuel (but excluding most of the Qatar LNG fleet, whose ships have re-liquefaction-on-board), use of LNG as bunker fuel by the rest of the world shipping fleet is just starting to develop and is today small in volume (approx 80 LNG-fuelled vessels in operation or on order)
- International work is commencing on standardising LNG bunkering facilities, loading equipment and procedures - but much remains to be done
 - In Europe: Pollution legislation will soon require ship owners to switch from HFO in some inshore waters to using more expensive MDO, making LNG competitive
 - In America: Emissions controls are also anticipated in the US - and there will soon be significantly cheaper LNG available for bunkers use
 - A small number of ships in Europe and America are already being designed for LNG fuel use e.g. ferries, some river barges or container ships on a fixed shuttle route



Low Draught Floating Solution



FSRU Barge



Large Scale FSRU



Key Takeaways

- Development of Arun into a Regional LNG Hub will lead to optimum usage of the asset and revitalize the local economy and contribute regular revenue to the Provincial and Central Governments.
- Existence of small demand centers around the terminal and location en-route the shipping journey to North Asia make Arun an ideal project for break bulk services and LNG bunkering.
 - We estimate the market potential for break bulk services to be ~5 MTPA.
 - We estimate the market potential for LNG bunkering services to be ~1 MTPA.
- FSRUs, FSUs & Regas, and other Floating Storage Solutions will provide connectivity direct to end consumers and distribute LNG in high demand load centers for gas to power projects.
- LNG Infrastructure projects should be structured to benefit local communities and have spin-off benefits for grassroots projects and social development.



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Thank You

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