



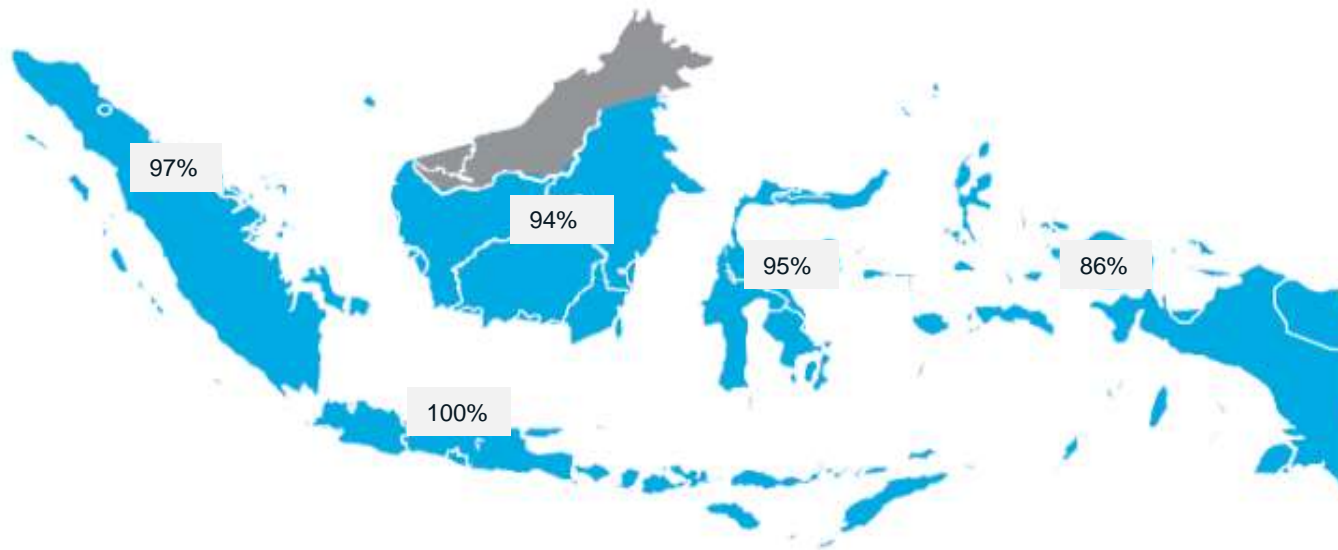
Distributed Power Generation Solutions Maxpower Experience

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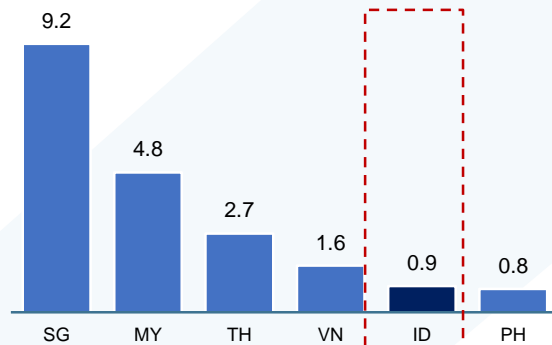


Indonesia Fact Sheet

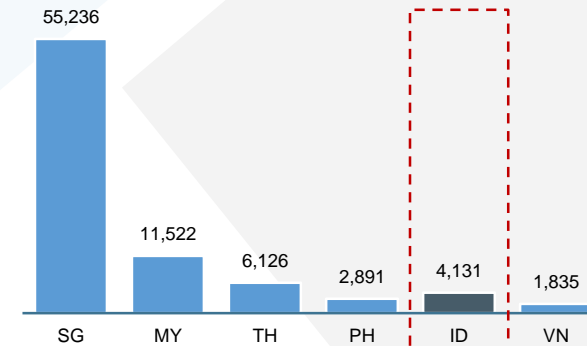
Electrification ratio 2018: 98.3%



Per capita electricity consumption benchmarking (MWh)



Per capita income benchmarking (US\$)



Concept of distributed power generation

What is Distributed Power Generation?

- Distributed Power Generation is a method of generating electricity **at or very near** to the load demand / end users to meet specific customer needs.
- Relatively small generating units and can be interconnected with the main grid or isolated from the grid.

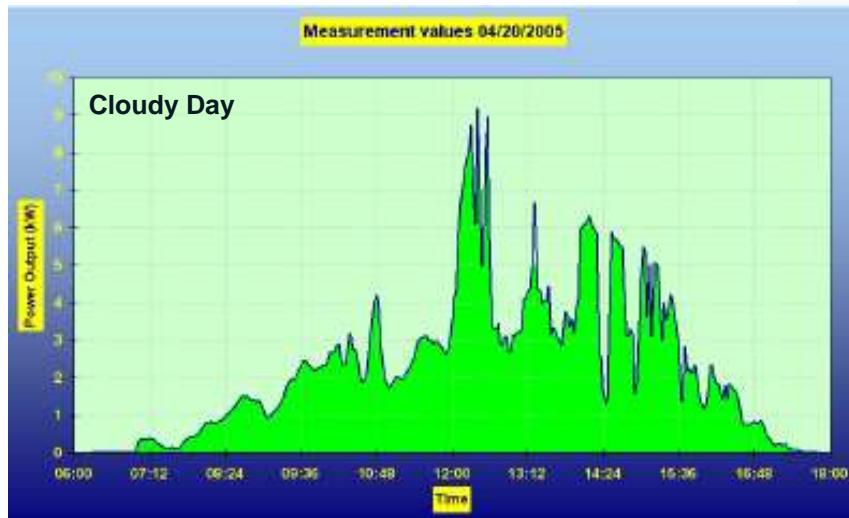
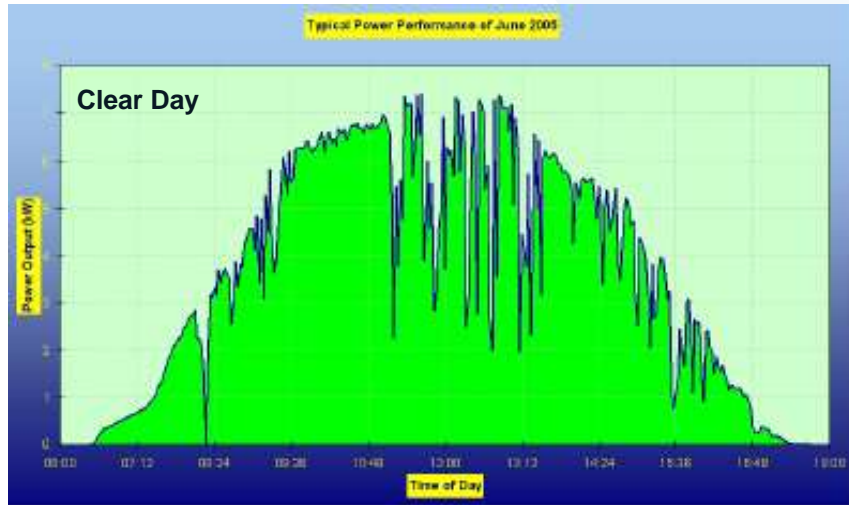
Why Distributed Power Generation?

- Indonesia is an archipelago country; Energy provision needs to be tailored to fit with the different profile (demand, infrastructure) on each area.
- Except in Java and Sumatera, energy infrastructures are not well established. Distributed power generation can be used to balance the supply demand gap in respect to geographical condition.

Hybrid power concept for distributed power generation

Gas engine + Solar PV

Solar Power Profile

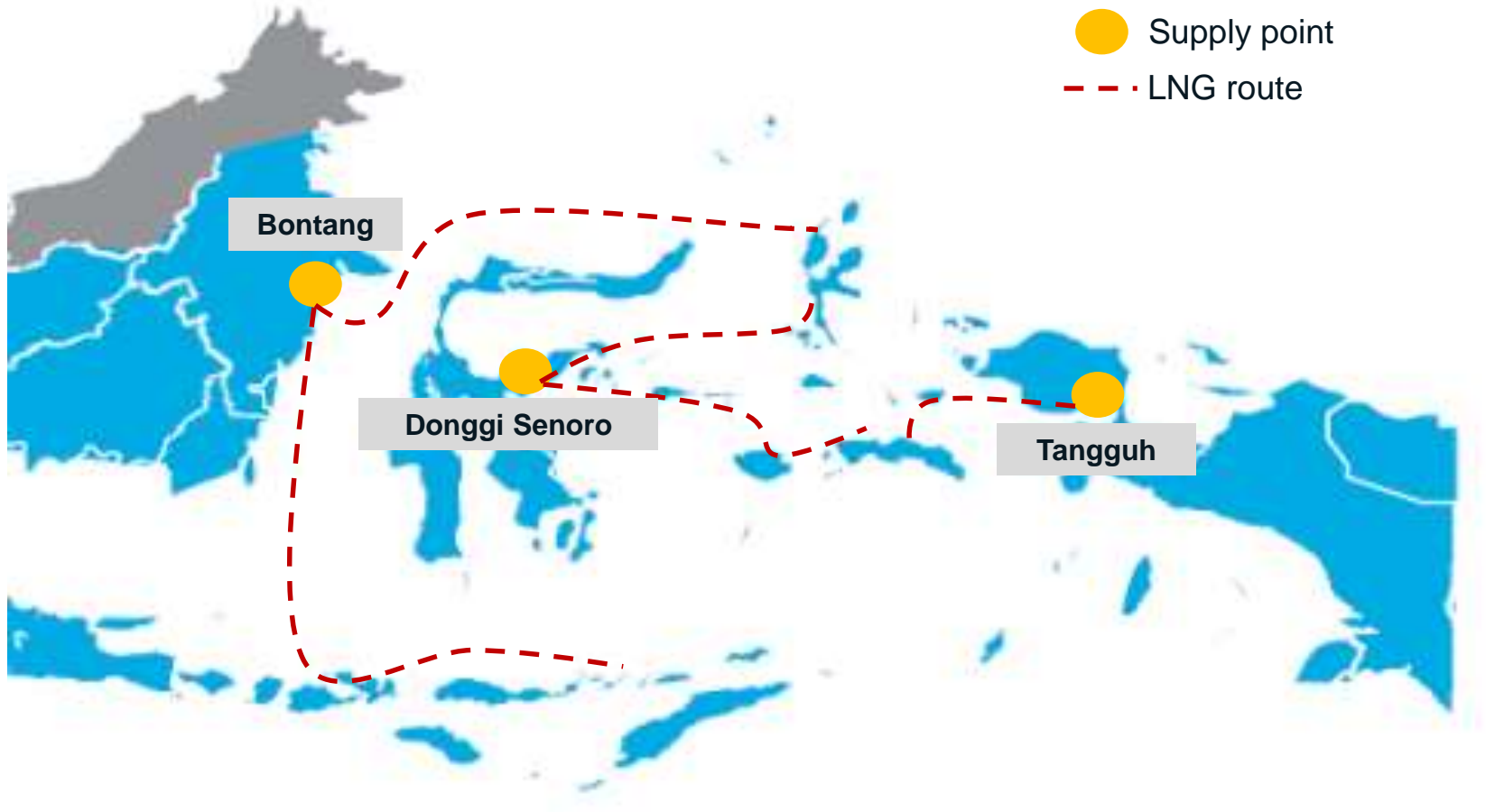


- Irradiation rate average Indonesia 4.8 kWh/m²/day
- Fluctuation on sun irradiation in Indonesia resulted in intermittent power supply.
- Combination with gas engines may become a solution to stabilize the power output.
- Suitable for eastern part of Indonesia. Gas supply will be by small scale LNG. Virtual pipeline concept.



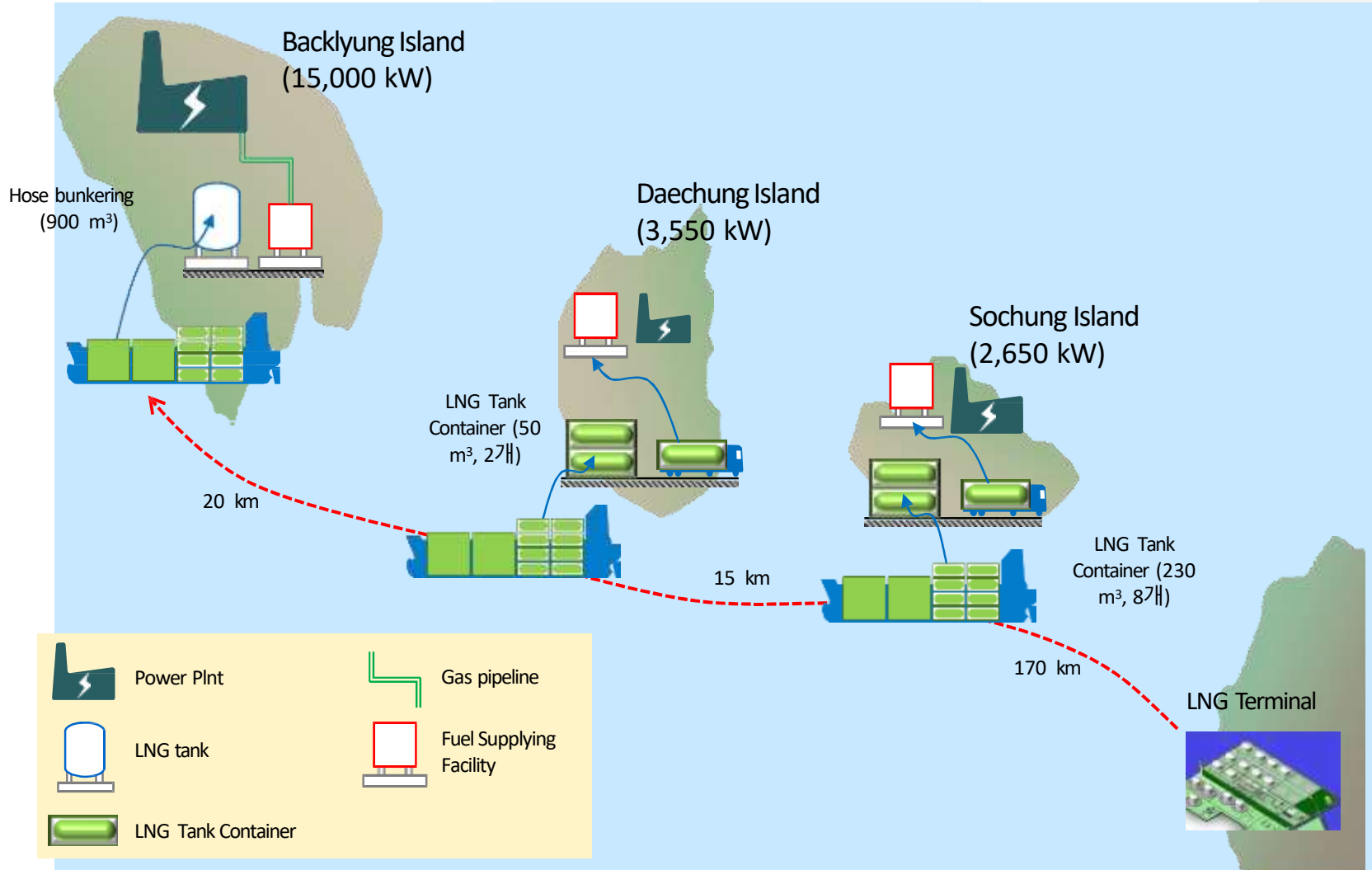
Virtual pipeline concept for Eastern part of Indonesia, Bring energy to customer

Concept



Power plant size: 10 MW – 50 MW each
Estimated Potential capacity: 500 MW – 600 MW

Reference of small scale LNG– truck container LNG distribution



Loading



Shipping



Unloading

Small & Medium scale LNG storage options



Mini LNG Terminal

- 2,000 M³ – 30,000 M³ storage tank
- Shell and Tube/Ambient Air Vaporizer
- 30 MW – 400 MW



Satellite Station

- Up to 1,000 M³ storage tank
- Shell and Tube/Ambient Air Vaporizer
- 5 MW – 30 MW



Mobile / Modular Regas System

- Up to 64 M³ storage tank
- Ambient Air Vaporizer
- Up to 5 MW

Mode of transportation for small scale LNG

IMO Container for LNG



- IMO Container is a standardized and reusable tank used for the safe, efficient, and secure storage of liquefied gases
- Standard freight container with standard dimensions suitable and certified for transportation by all modes: Sea, Rail, and Road. Available in 20ft and 40 ft size.



Sea

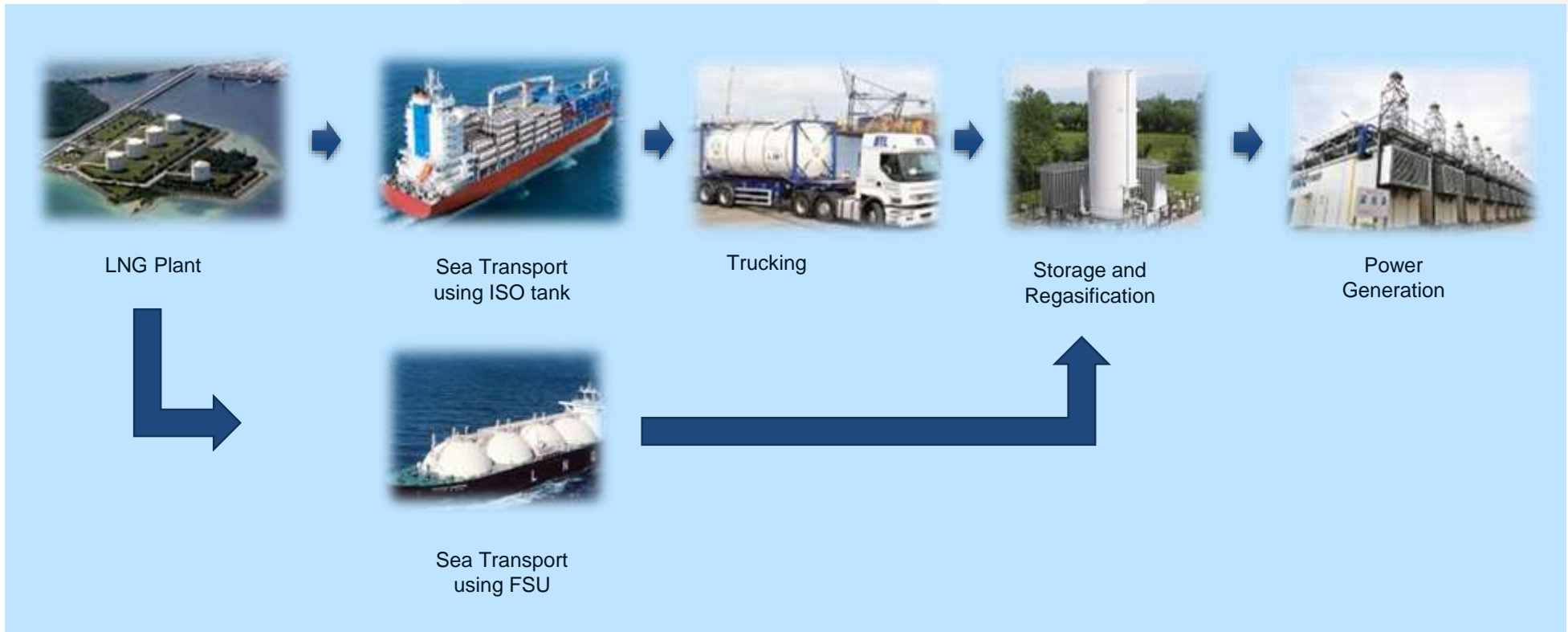


Rail



Road

Maxpower capabilities to provide LNG to power, Bringing total solution



As fuel is the key factor to provide power, small scale LNG tandem with gas engine is the solution needed for fast, scalable, and affordable power.

Benefit and advantages of distributed power generation solutions

#1

**'FAST'
Power**

- Rapid deployment of power solutions for customers with acute power needs

#2

**'MOBILE'
Power**

- Ability to provide solutions to remote areas with significant power needs

#3

**'AFFORDABLE'
Power**

- Delivery of economically attractive gas-fired power for customer cost savings

#4

**'SCALABLE'
Power**

- Increasing capacity in a modular fashion which is cost-efficient

MAXpower Example



Plant Name: Borang

Capacity: 35.6MW

- Commissioned in record 67 days



Plant Name: Tarakan

Capacity: 3.2MW

- Location in remote area of Kalimantan with limited grid connectivity



Plant Name: Sorong

Capacity: 10.9MW

- Replacement of more expensive diesel-fired power facilities



Plant Name: Langgam

Capacity: 16.7MW

- Started in 2012 as a 16.7MW plant
- Subsequent request for incremental capacity to bring total to 33.4MW

Distributed power generation

Scale and Diversity of MAXpower Plants in Operation



289 MW in operation, assets located in Indonesia and Myanmar

Distributed power generation solutions

Maxpower examples



SORONG, PAPUA

Number of engines: 21 units
Installed capacity: 66 MW
Supplying more than 90% electricity in Sorong

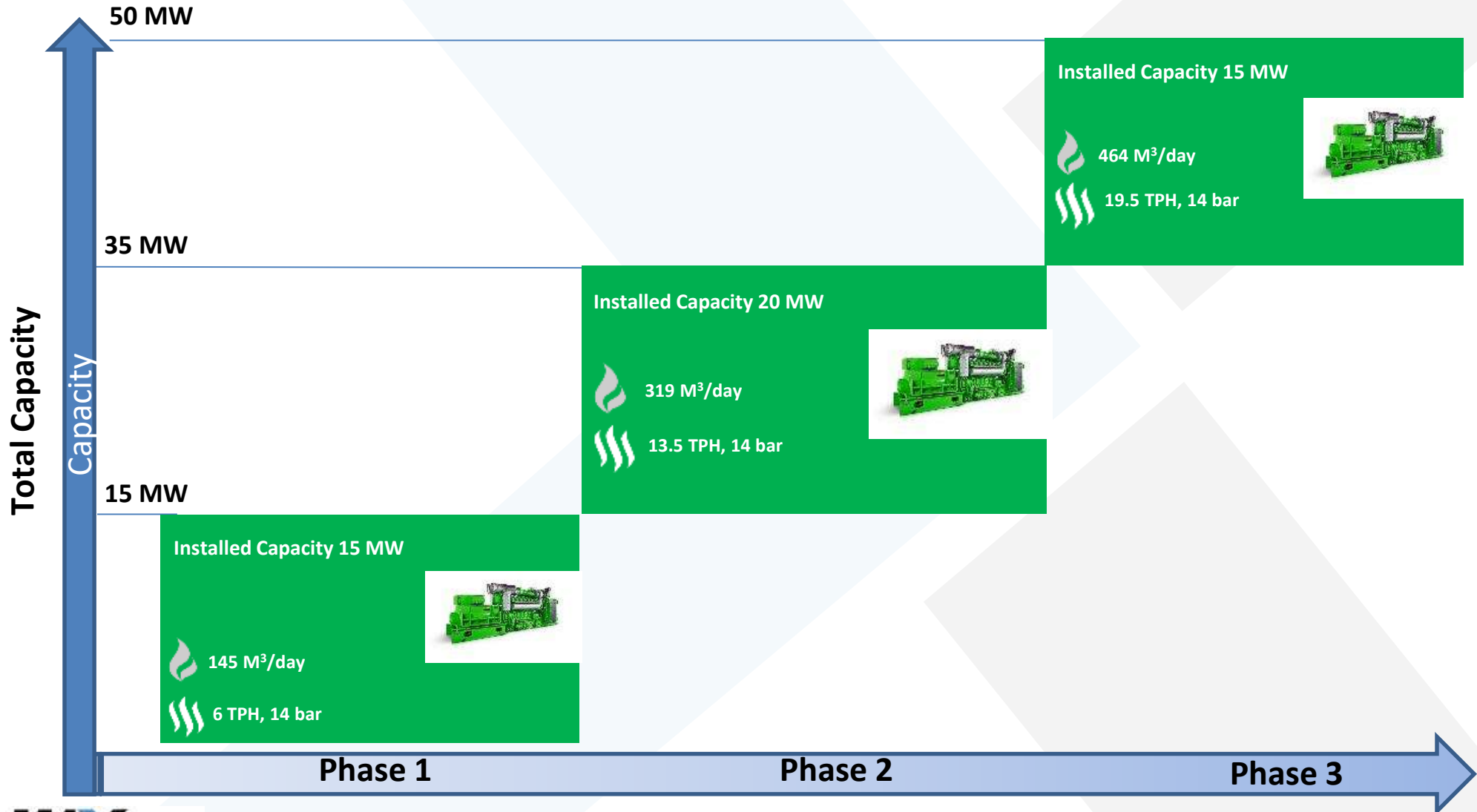


TARAKAN, KALIMANTAN

Number of engines: 8 units
Installed capacity: 27 MW
Supplying more than 40% electricity in Tarakan

Scalable LNG to power development for industrial area

Maxpower example



Conclusion

- Distributed power generation can provide a fast, mobile, and affordable power. Feasible for remote area and industrial area.
- LNG to power is a viable solution, suitable for distributing gas to large, small, or scattered gas power plant. Scalable LNG to power tailored to Indonesia archipelago is needed.
- Hybrid power by combining gas engine – solar PV can be solution for optimum power output and pricing.



Thank You

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