

THE RISE OF SMALL-SCALE LNG/FLNG PROJECTS

AN ALTERNATIVE APPROACH TO SUSTAIN GLOBAL GAS SUPPLY

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Opportunities for new players in LNG market

- Opportunities to enter the LNG market for both new project sponsors and buyers are now bigger than ever due to strong LNG demand, numerous small stranded gas fields, and advanced proven technology
- Poten & Partners have worked with various project sponsors, potential buyers, and EPC contractors of small-scale LNG projects around the world
- We have gained thorough understanding of the business, and have provided solutions for clients to overcome project challenges and mitigate risks



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Numerous small-scale LNG projects have been proposed

Potential small scale LNG development (< 3MMt/y)



Source: Poten & Partners

- Both for floating (FLNG) and onshore projects

NOTE: We will define a project less than 3 million tons per year (MMt/y) of LNG production as a small-scale project, and only focus on small-scale projects for supplying international markets

Two key drivers for small-scale LNG proliferation

Key Drivers

Small stranded gas resources

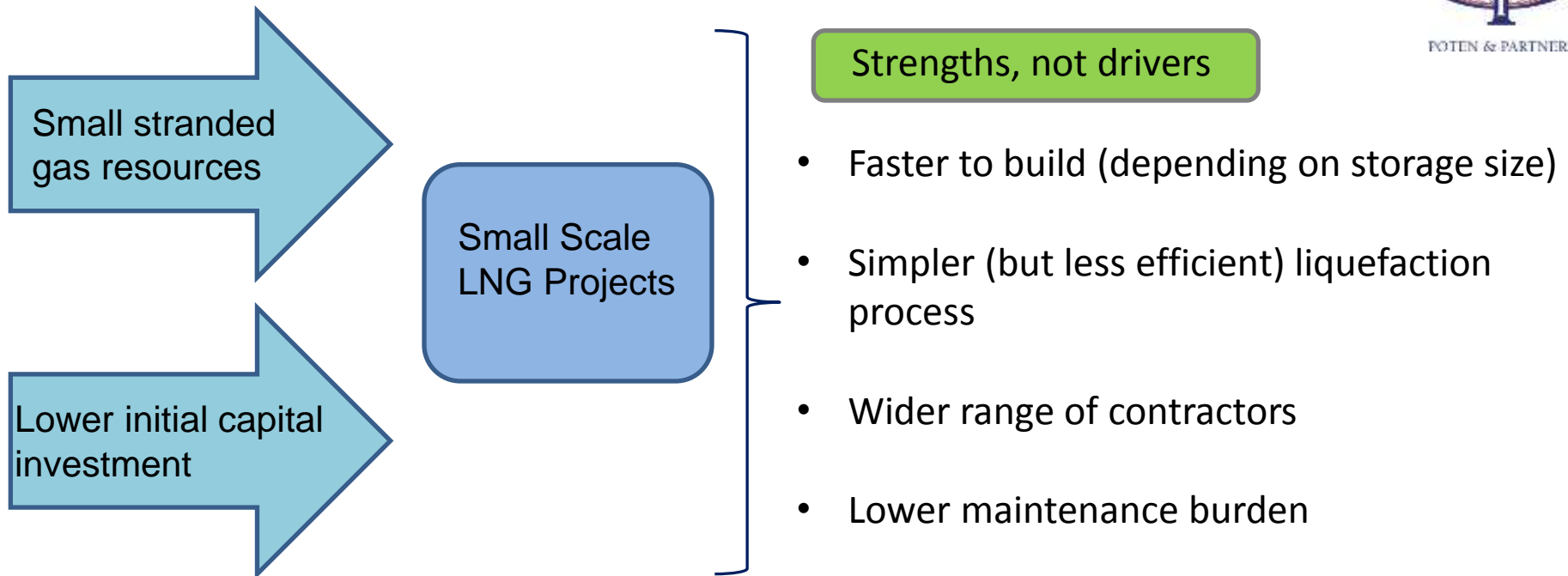
Lower initial capital investment

Size of LNG project

Small-Scale LNG Projects

- These two key factors allow participation from a wider (i.e., less well-heeled) group of owners, buyers, and engineering resources

Other advantages of small-scale can help optimize after main decision is taken

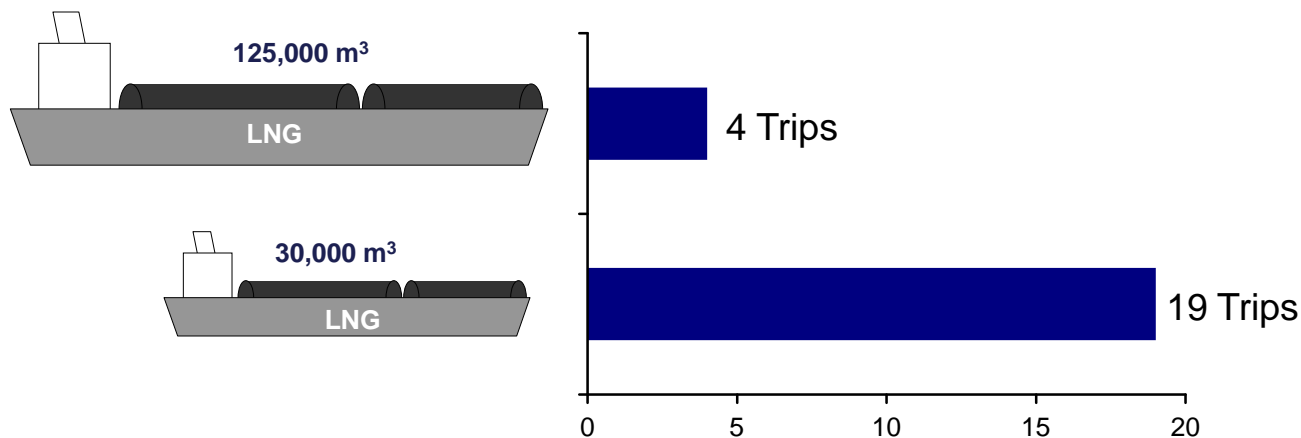


- These strengths of small scale LNG projects enable project sponsors to improve project economics across the value chain

Challenges of small-scale marine based LNG projects need to be managed

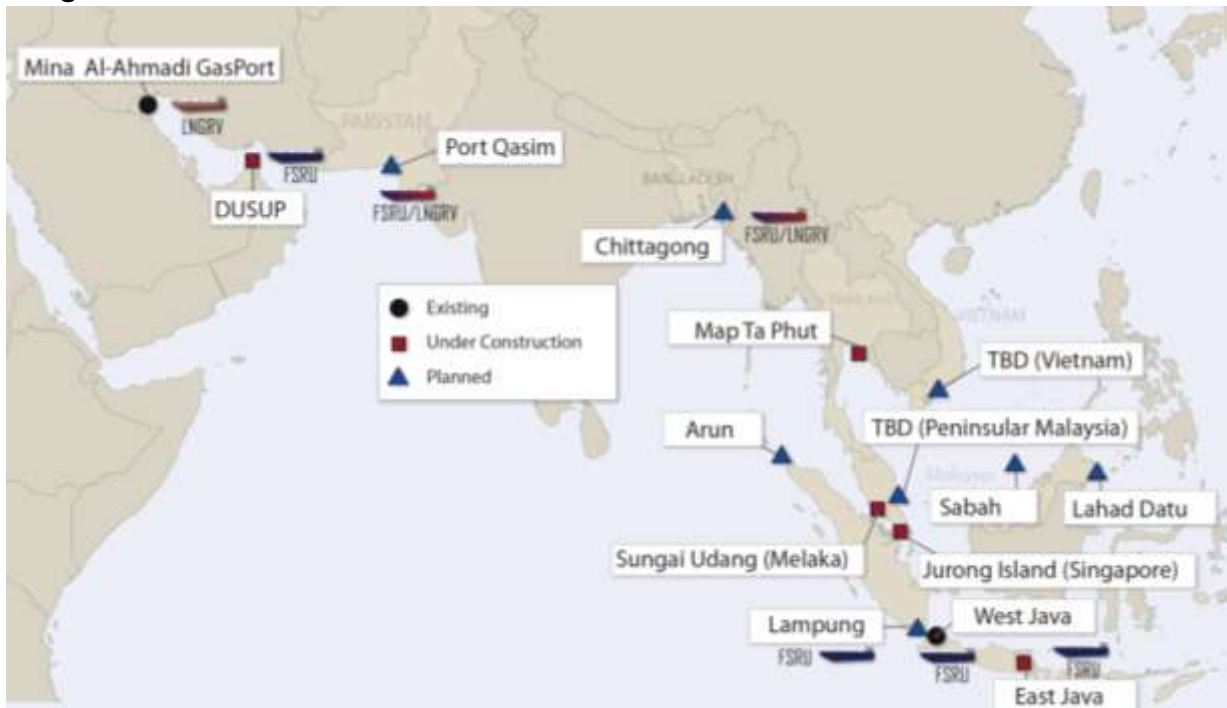
- Shipping of LNG from a small plant
 - Smaller ships could limit distance, hence limiting some market entrance
 - Small-scale projects could be limited to small ships since the storage and loading facility costs increase with ship size, not production rate
- Logistical issues
 - More trips required per voyage for smaller vessels
 - Inefficiency of port usage – small and larger vessels tend to take as much port time even though the loading is much faster
 - Potential port compatibility issues

Number of trips required for 0.24 MMt/y with 3,500 nautical miles distance



Overcome the challenges via the right marketing strategy

Regasification terminals in Asian niche markets



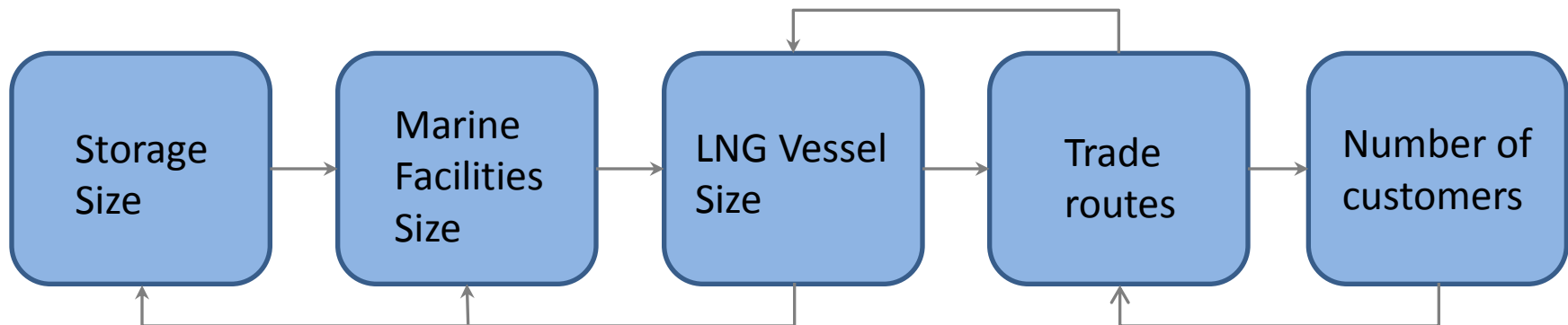
Source: Poten & Partners

- Volume from small-scale LNG projects may be attractive for the new niche Asian LNG importers to lift the whole train, while not over committing into one source of supply
 - But limited possibilities for volume expansion and security of supply may deter buyers from relying on single source of supply
- Seek high valued markets closer to home

The right sizing combination and technology could help

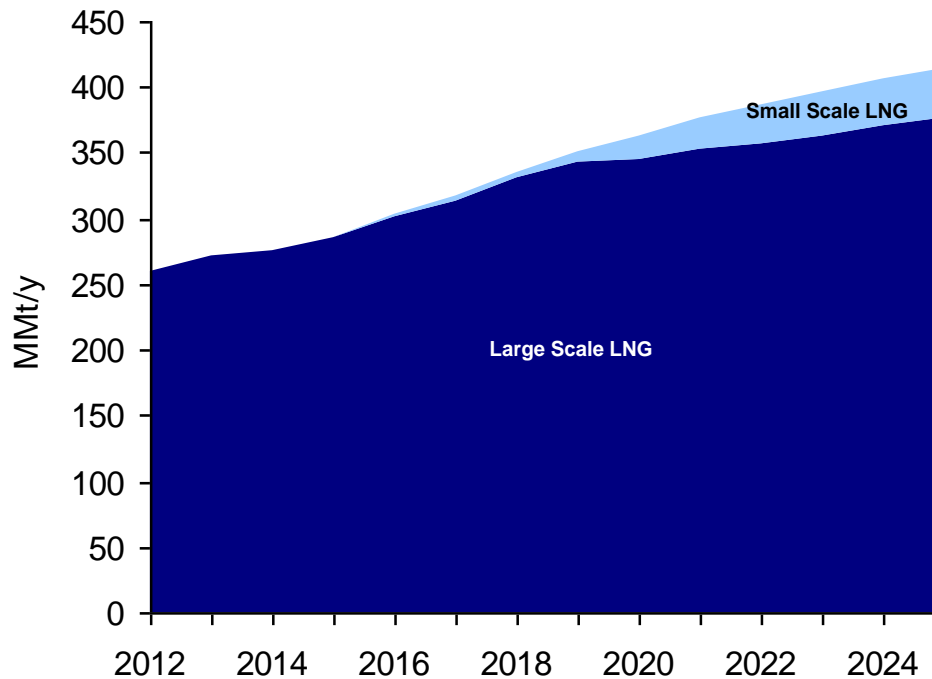
- Optimizing across the LNG value chain via good design strategy on the storage and loading capacity, marine facilities, ship size, and marketing
 - Very complex
- Technology selection
- Employ used ships

Sophisticated analysis required to optimize the size of small scale LNG projects



Small-scale LNG to remain a minority in 2025 LNG supply stack

Forecasted World LNG Supply for International Trade



Source: Poten & Partners

- Small-scale LNG projects will likely to face tough competition from large-scale LNG project development around the world
- The world of LNG project development has evolved, but only to a certain extent