

Galway Group

Advancing Energy Decisions



Bermuda Energy Summit 2016

LNG For Island Markets

Galway's Representative LNG Projects

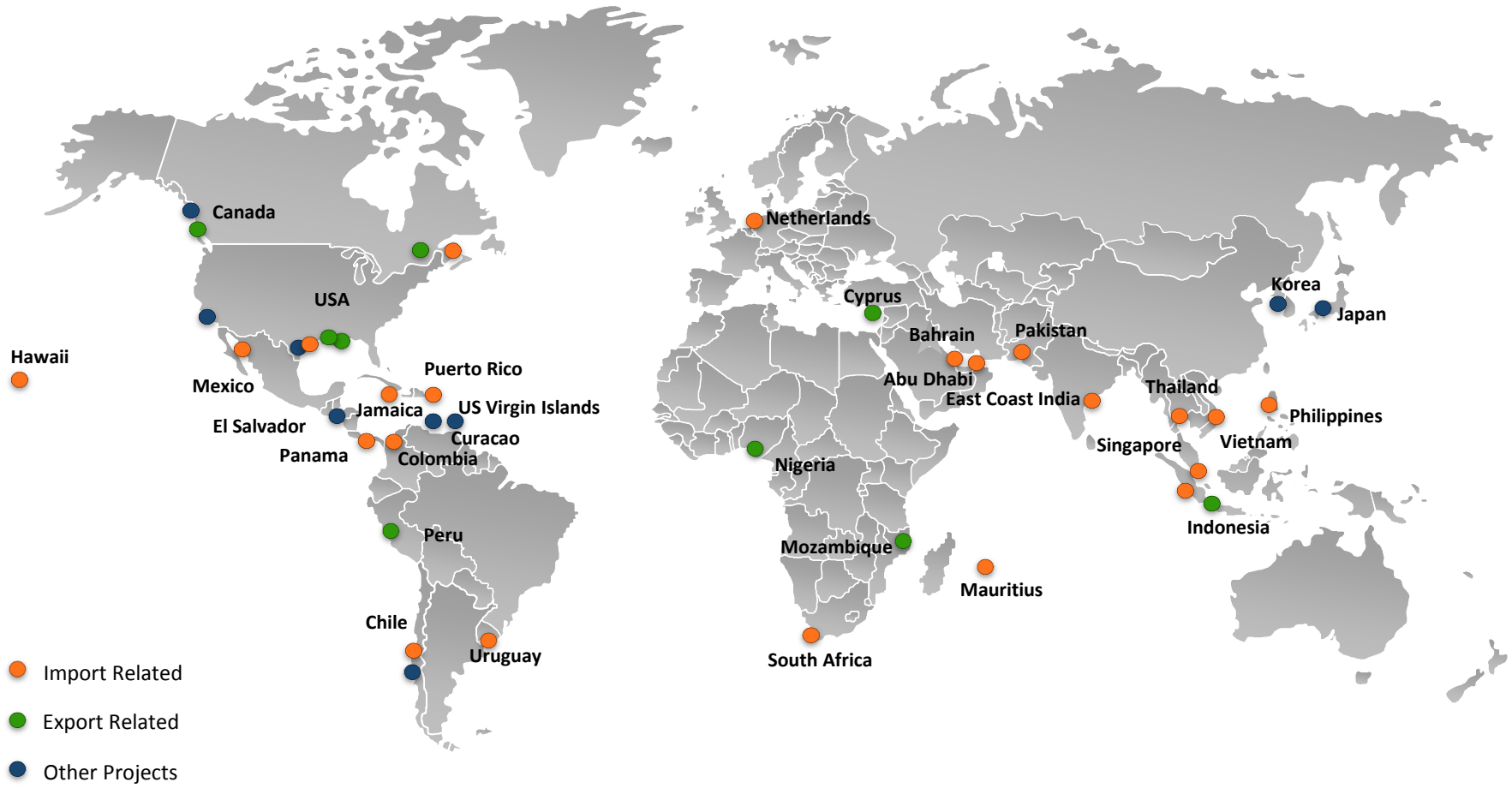
Opportunity Definition

Concept Framing

Deal Development

Financing

Asset Operations

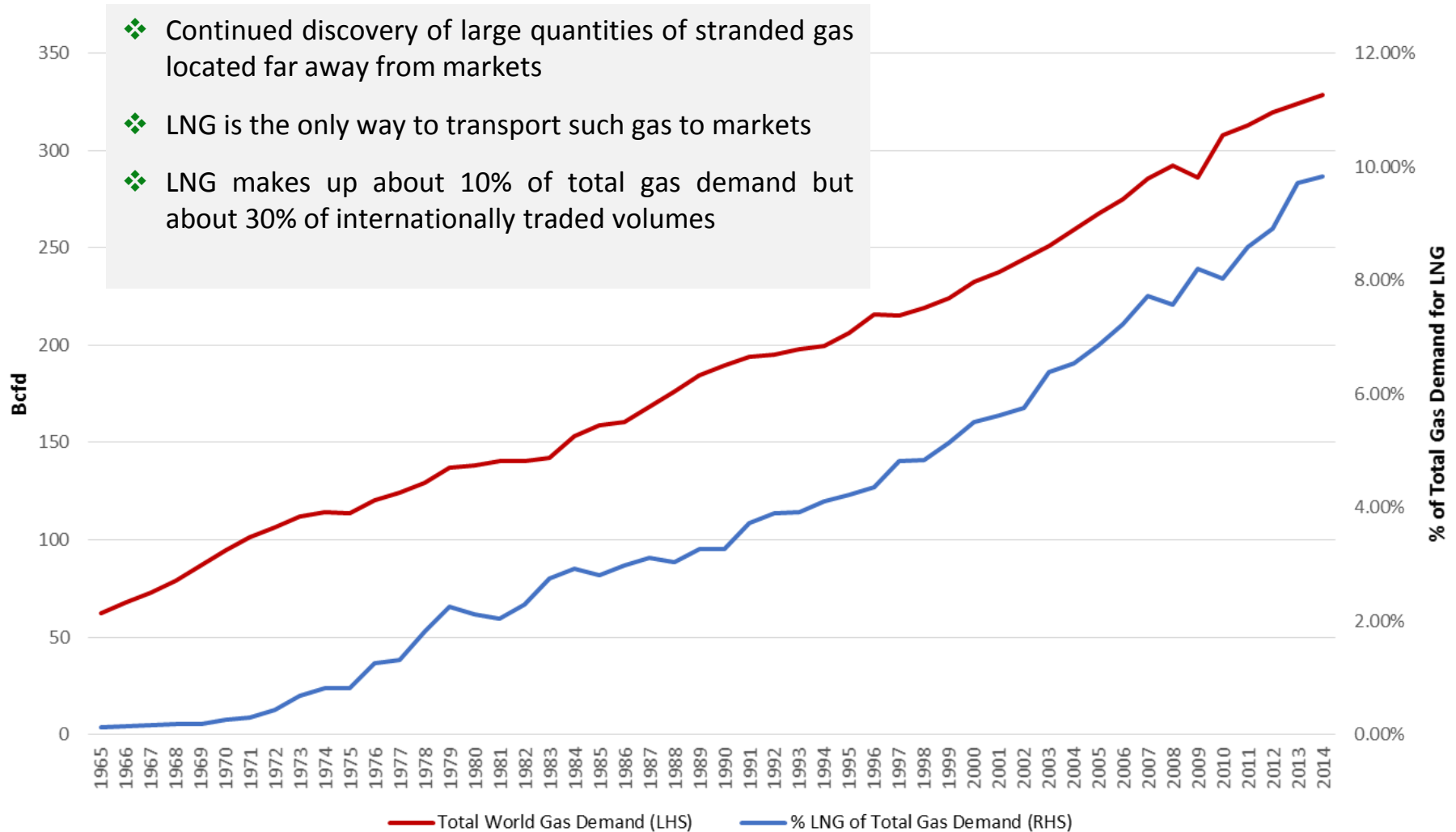


Industry Leaders in LNG Project Development/Commercial Advisory

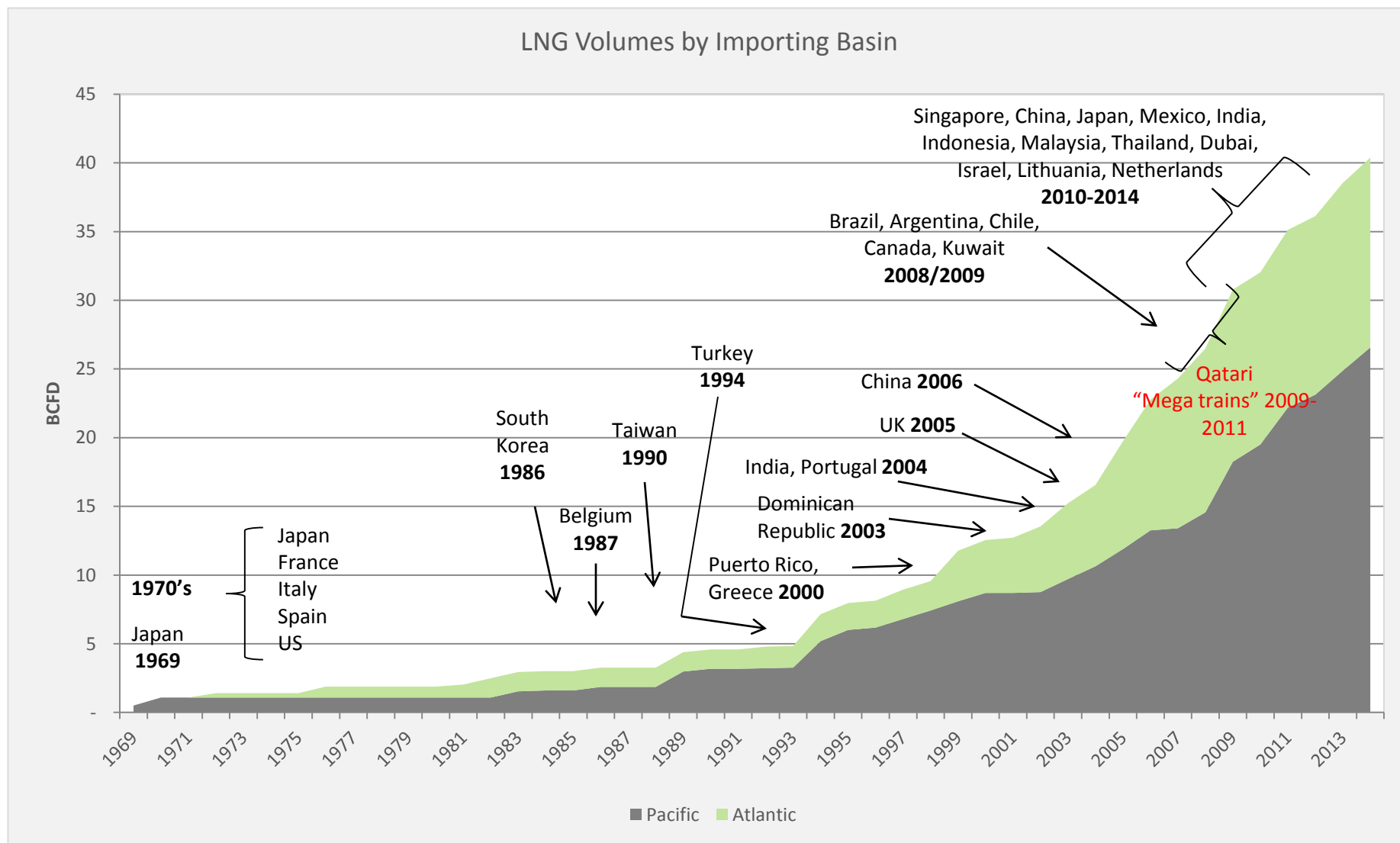
World LNG Market Outlook

- ❖ Gas is the Fastest Growing Energy Market Worldwide
- ❖ LNG is Increasing its Share of the Worldwide Gas Market
- ❖ LNG Market is Becoming more Liquid and More Like a Commodity
- ❖ LNG Market Currently is Buyers Market because of increased supplies and general commodity market conditions

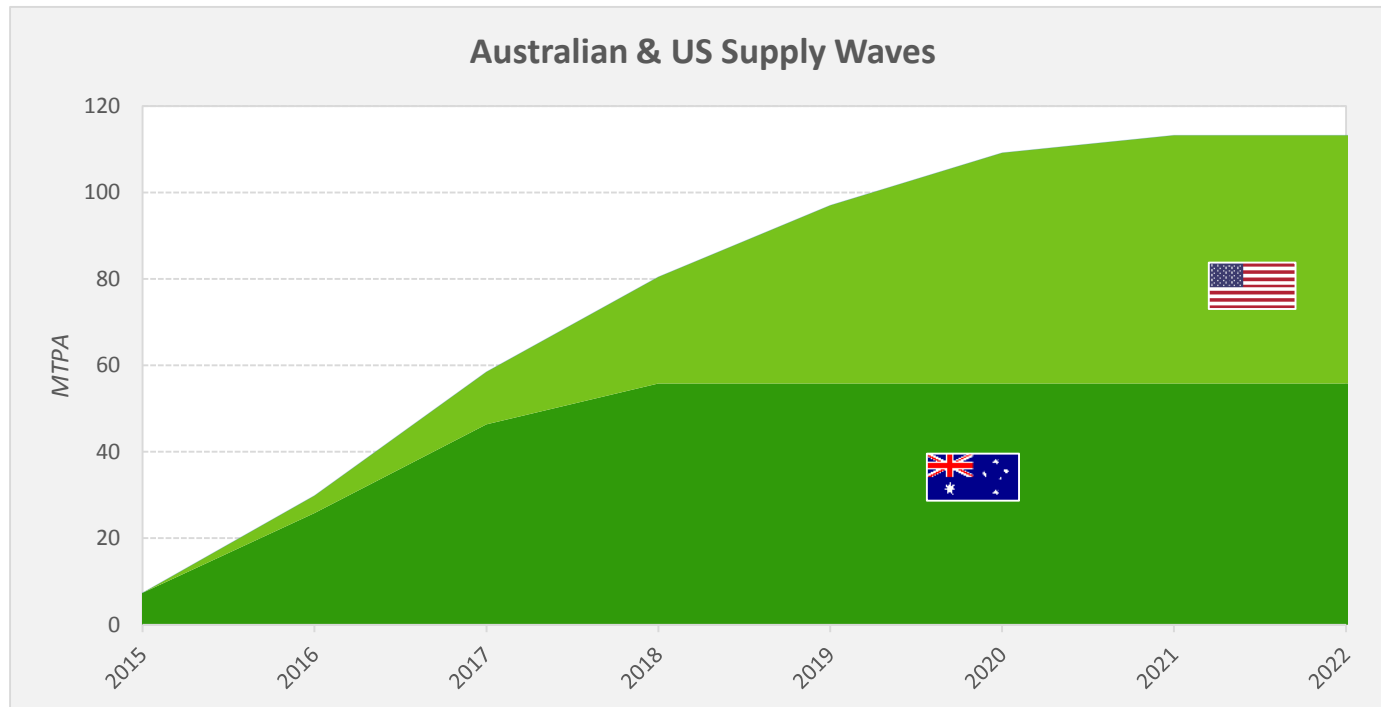
LNG's Share of Global Gas Continues to Grow



Gas Demand in Both Pacific & Atlantic Has Driven Rapid Growth of LNG Trade



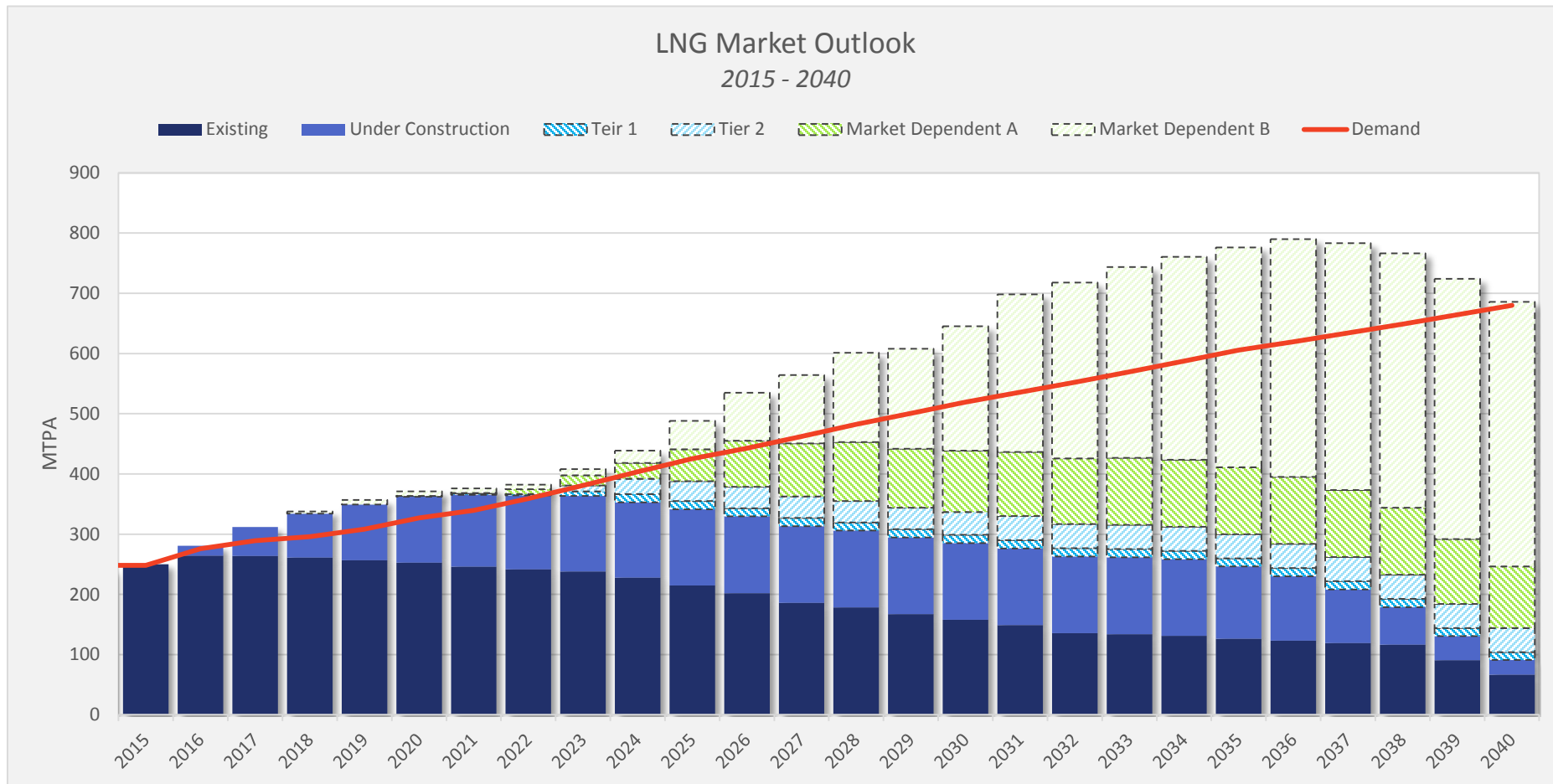
To the end of the decade, the LNG market faces an oversupply with two “supply waves” --Australia and US



Source: Galway Group database

- ❖ In 2015, GLNG and QCLNG were brought online – increasing existing supply in the region by around **14 MTPA**
 - Another ~ **41 MTPA** of supply is expected to come out of Australia by 2018, after construction concludes at APLNG, Gorgon, Ichthys, Prelude, and Wheatstone
- ❖ By 2020, the United States is expected to have around **58 MTPA** of export capacity from projects currently under construction
 - Sabine Pass T1-T4, Cameron T1-T3, Freeport T1-T3, Corpus Christi T1-T2 and Cove Point

Presenting an Interesting Change in LNG Demand Supply Dynamics Over the Next Decade



- **Tier 1** – Projects that are under advanced development, including most technical and permitting work completed; FID is likely within the next 6 -12 months; Some or all of the necessary offtake agreements have been finalized;
- **Tier 2** – Project is under active development, e.g., FEED in progress, active discussions for offtake with potential buyers, permitting processes sufficiently progressed; FID could happen, but not within the next one year;
- **Market Dependent A** – Speculative projects that are being actively developed which could materialize should there be market demand in the long term.
- **Market Dependent B** – Proposed projects not being actively developed, but could materialize should there be market demand in the long term.

Source: Galway Analytics

Island LNG to Power Examples

1

Bali
Indonesia

2

Central
Indonesia

3

Jamaica

4

Virgin
Islands

5

Hawaii



Project Details:

- Power Plant – 200 MW
- FSRU (Barge)
- FSU (Ship Temporary) – 30,000 cm
- FSU (Barge Permanent) – 26,000

2. Central Indonesia

Proposed

PLN's Central Region Definition for Gas Supply



New Distributed Power Generation Plan Map



Project Details:

- Total Number of Power Plants – 32
- Aggregate Power Plant Capacity – 2,400 MW
- Total LNG Demand -- .8 to 1.7 MMtpa
- Regasification Capacity – 100-230 MMcfd

3. Jamaica



Under
Construction

1. Bogue (Montego Bay)

- Power Plant – 120 MW
- LNG Shipped via ISO Containers
- ISO Containers offloaded to onshore regas

Proposed

2. Old Harbour

- New Power Plant – 190 MW
- FSU (old ship), permanently moored
- Onshore Regasification

4. US Virgin Islands

Construction

Power Plant Locations

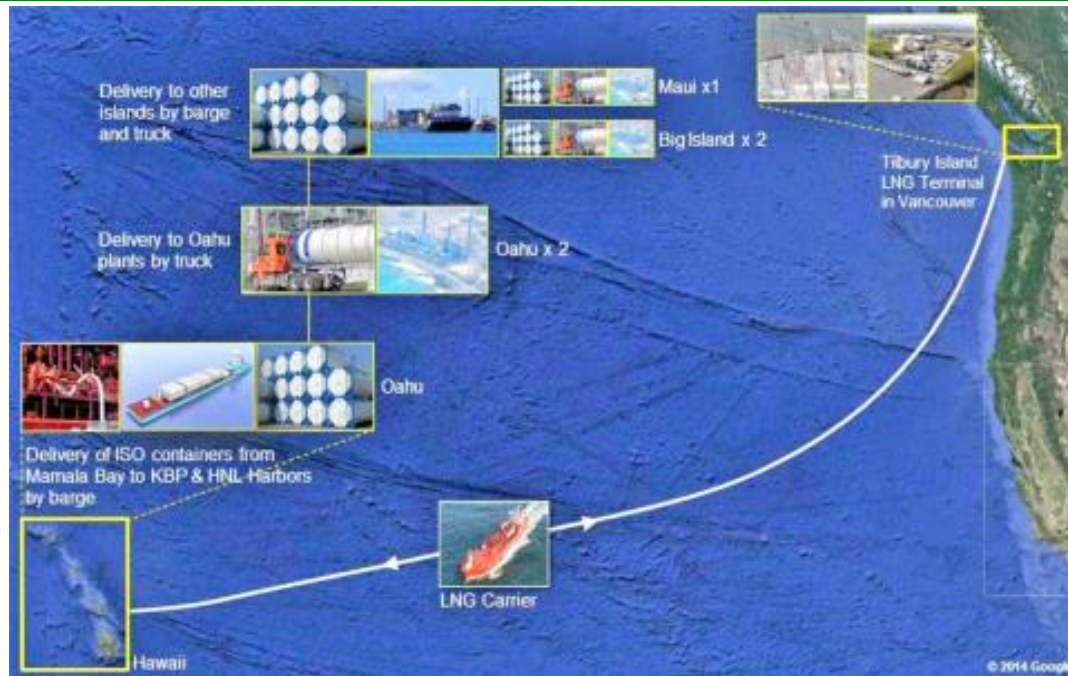


Project Details:

- St Thomas Power Plant – 80 MW (because of lack of land and ocean conditions, LPG chosen)
- Offshore Propane Storage (floating)
- Onshore Regasification
- Power Plant Turbine Repowered

5. Hawaii

Proposed



Project Details:

- Power Plants – Aggregate 1,000 MW (three islands)
- Vancouver LNG Peaking Plant Expansion
- Purpose Built LNG Carriers (draft limitation)
- ISO Containers on Barge – LNG offloaded from ships to barge
- ISO Containers transported via barge, then truck to each power plant

LNG Import Project Development

- ❖ Each LNG Import Project is Bespoke – Particularly for Small Island Service
 - Demand Considerations – size, load factor
 - Water Considerations – protected, tides, waves (height and period)
 - Ship Berthing – Purpose built Dock, Multi-use Dock, Ship Traffic
 - Land Considerations – Availability, Exclusion Zone, other Hazardious Material Nearby
- ❖ Project Development from a User/Government Perspective
 - Important to have Competitive Tension Throughout the Process of Project Negotiations
 - In order to Facilitate a Competitive Process, User/Government must Define What Solution it Wants
 - User/Government must Conduct Sufficient Studies to be able to Provide Bidders with a Concept Design so that they can bid on the basis of a Firm Project Price
 - User/Government needs to Determine what Role it wishes to Play – just a user, a project participant, project investor, etc.
 - User/Government needs to Determine what type of Financing it Desires – Developer with Balance Sheet Financing, Project Financing, etc.

Project Finance Requirements

❖ All Project Documents must be fully executed

- Project Agreements
- Shareholder Agreements
- Terminal Use Agreements
- EPC Agreement
- O&M Agreement

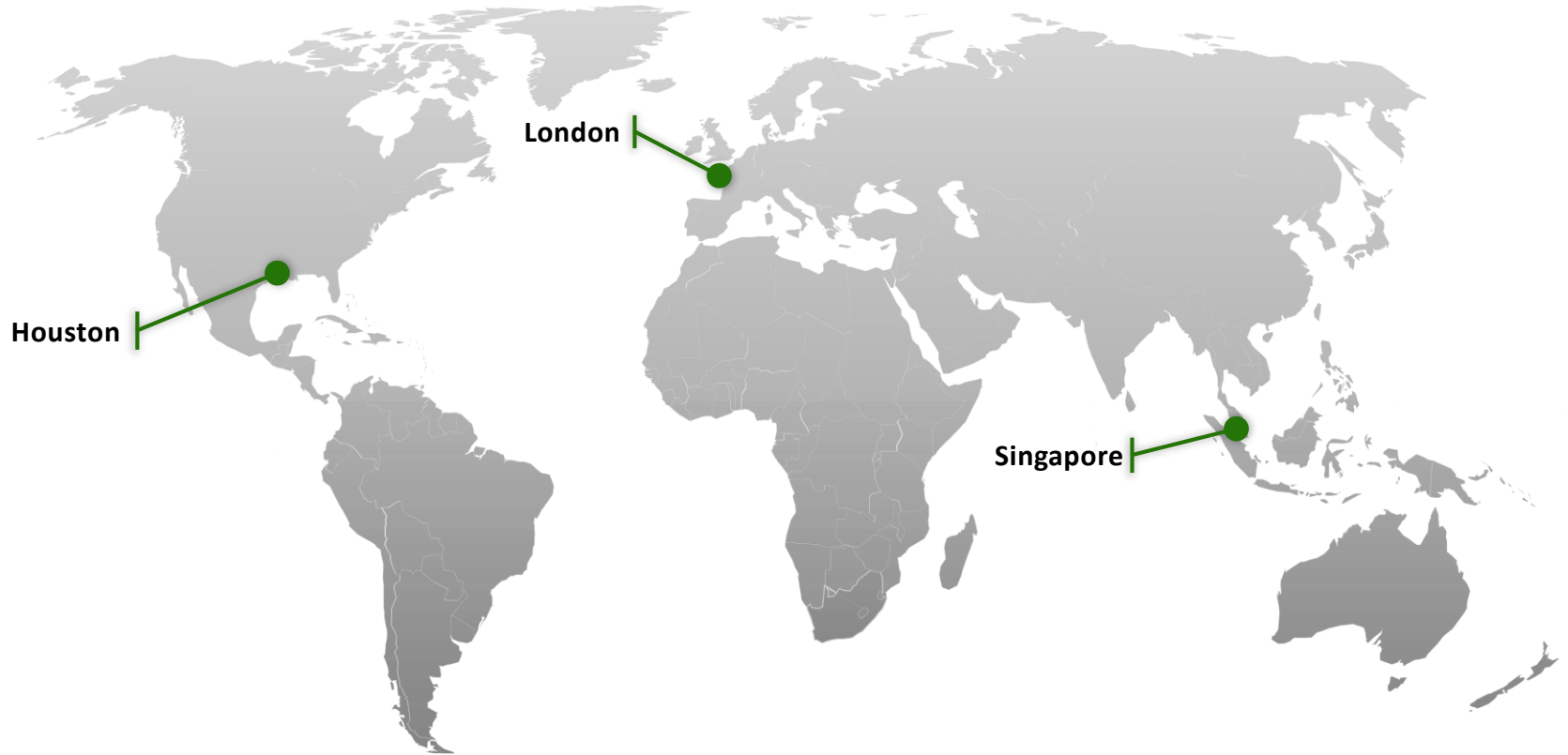
❖ All Permits must be obtained

- Land Use
- Waterway
- Environmental

❖ Financing Considerations

- Credit Support
- Known costs, lenders take no over-run risk
- Lenders protected from force majeure
- Appropriate Insurance Coverage
- Sovereign risks addressed

Thank you!



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