

17th INTERNATIONAL CONFERENCE & EXHIBITION ON LIQUEFIED NATURAL GAS (LNG 17)



LNG as Marine Fuel

By: Frederick Adamchak &

Amokeye Adede

Poten & Partners, Inc.

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International Organizers



Host Association



LNG already has 6% of marine fuel market

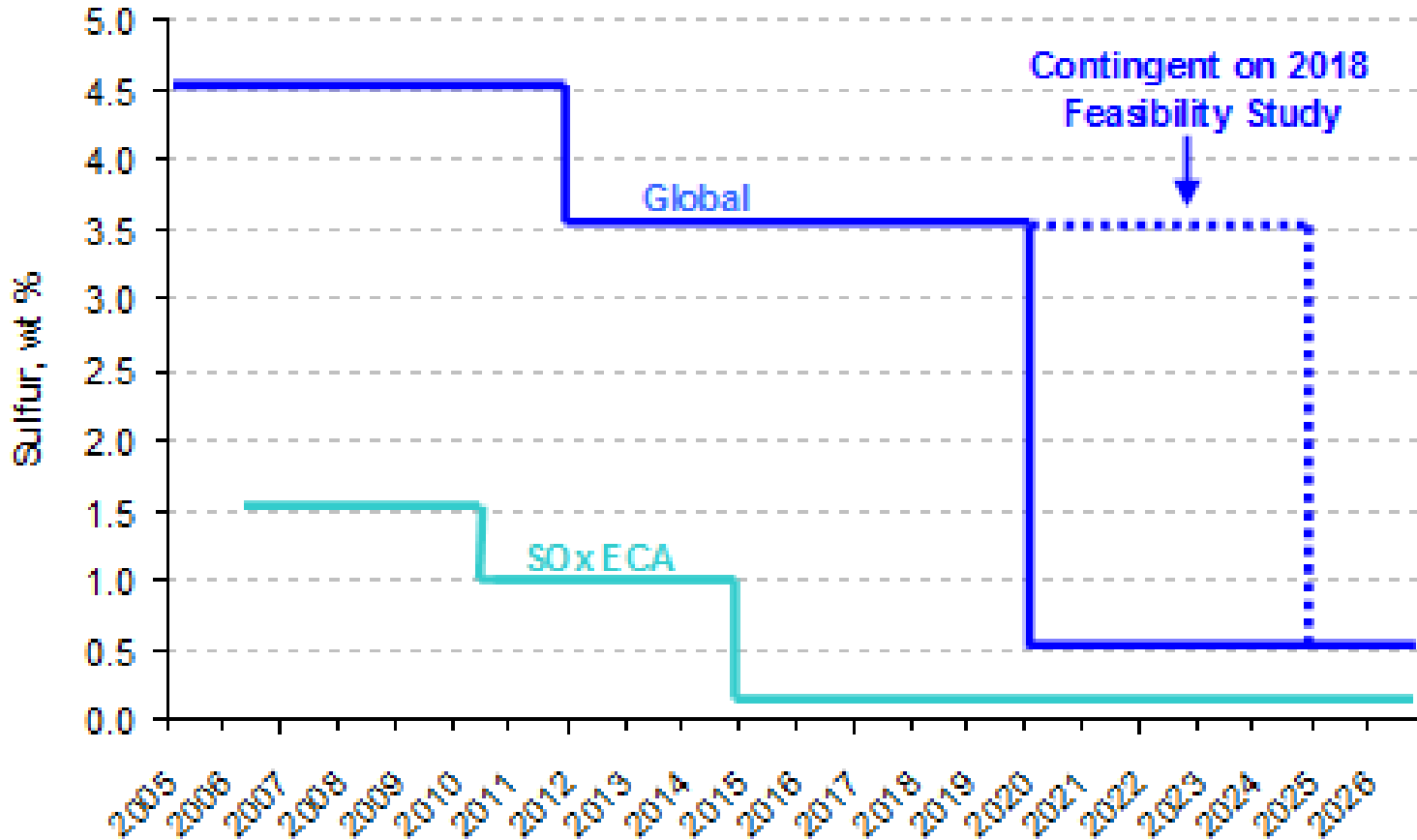


> 300 LNG ships use **12 MMt/yr LNG**
Bunker market potential
(180 MMt IFO + 55 MMt MGO) = **185MMt/yr LNG**

Objectives

- Examine drivers
- Alternatives to meet MARPOL Annex VI
- Availability and cost of LNG as marine fuel
- Potential LNG demand
- Alignment on issues
- LNG Marine fuel business model




MARPOL Annex VI Sulfur rules should drive to LNG, but are creating uncertainty



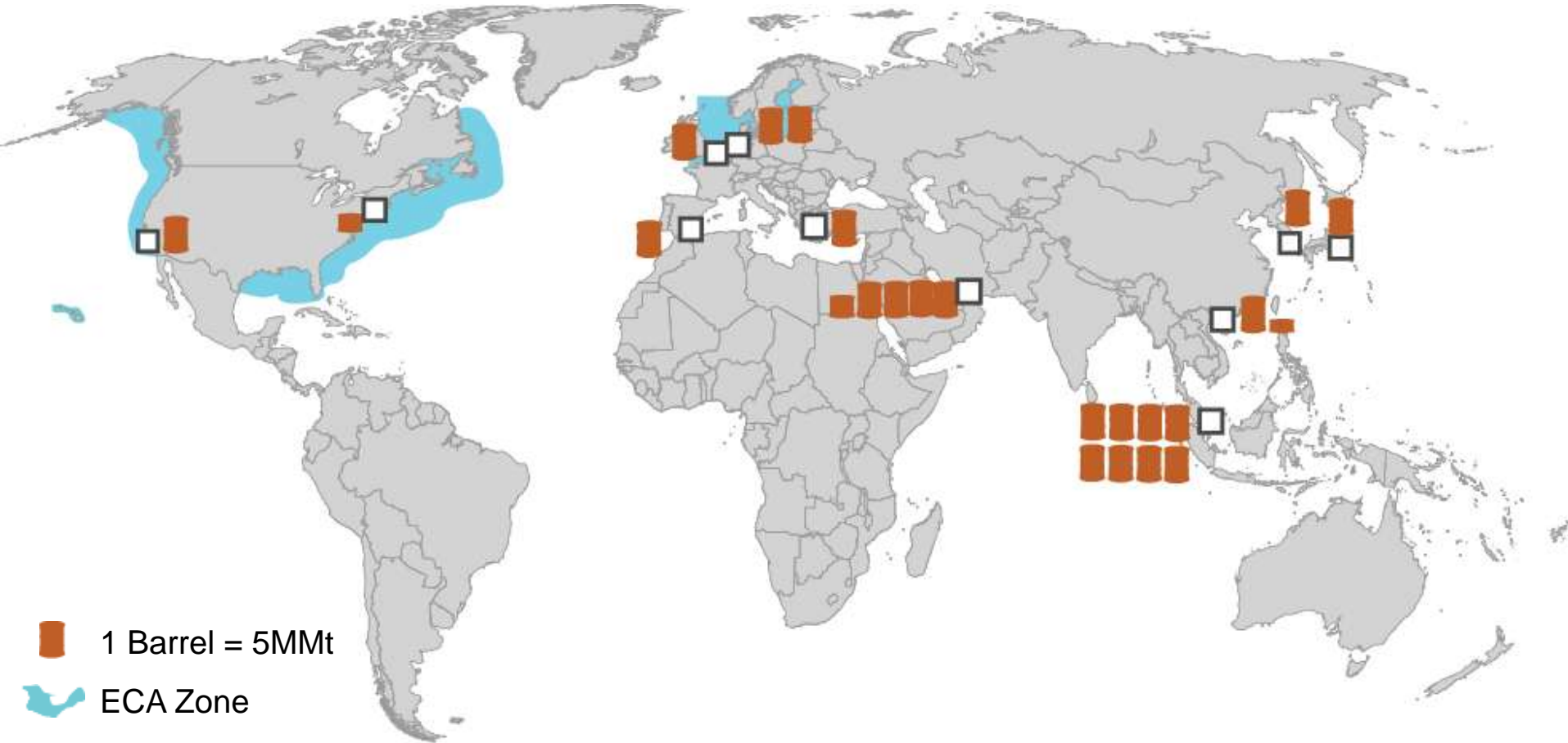
ECAs only in Europe and North America

For the ship owner LNG has to be cheaper than low sulfur diesel and scrubbers

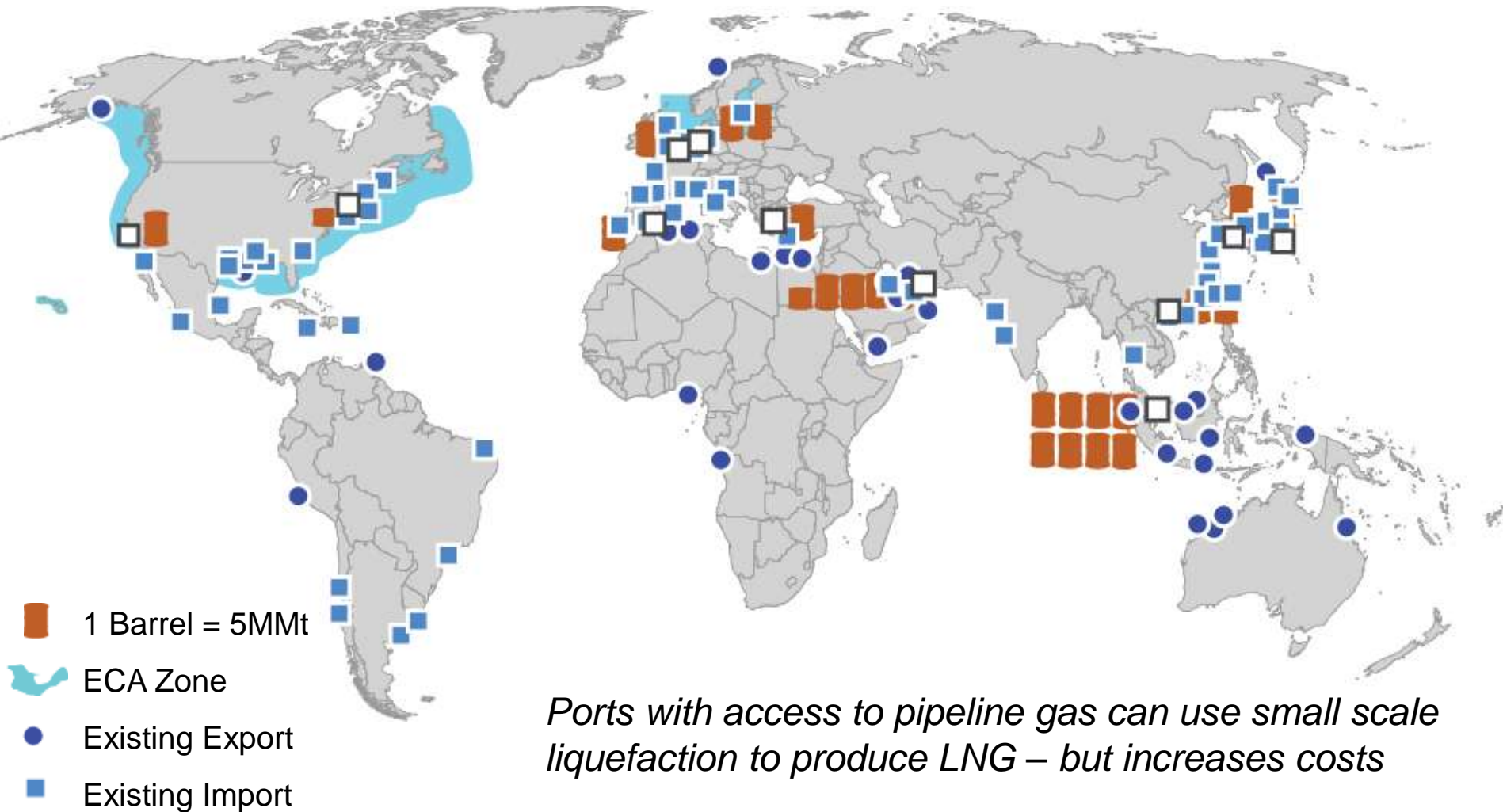
	MDO MGO	IFO + scrubbers	LNG
Fuel Price	Major hindrance	No issue	Slight hindrance
Availability	Slight hindrance	No issue	Slight hindrance
Ship modification	No issue	No issue	Major hindrance
Infrastructure	No issue	Major hindrance	Major hindrance
NOx	Slight hindrance	Major hindrance	No issue
Ship regulation	No issue	No issue	Slight hindrance

-  Major hindrance
-  Slight hindrance
-  No issue

Largest bunker ports: located on busy shipping routes



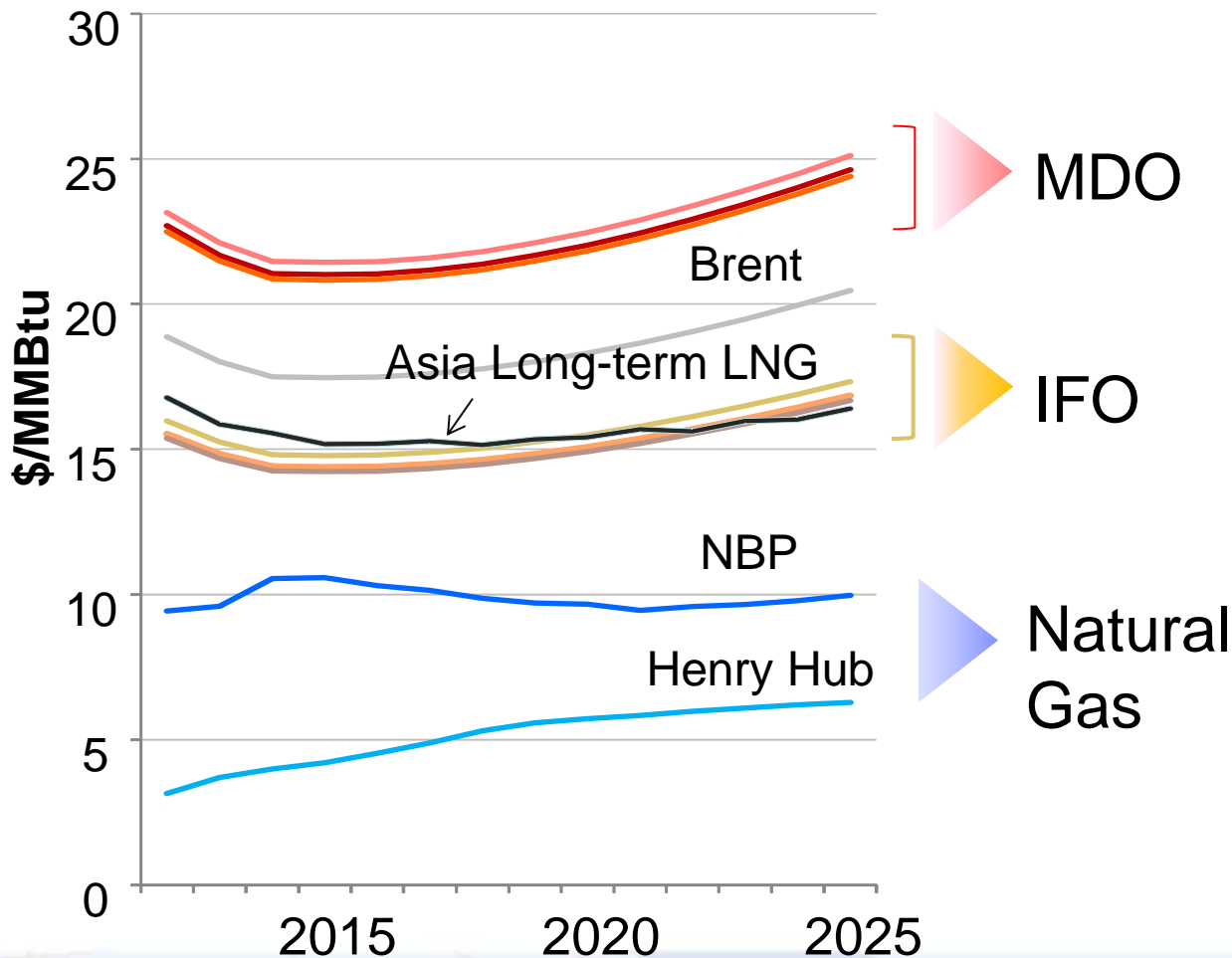
..but limited overlap of LNG facilities and bunker ports



Ports with access to pipeline gas can use small scale liquefaction to produce LNG – but increases costs

Price difference between gas price and fuel oil is a driver in North America and western Europe

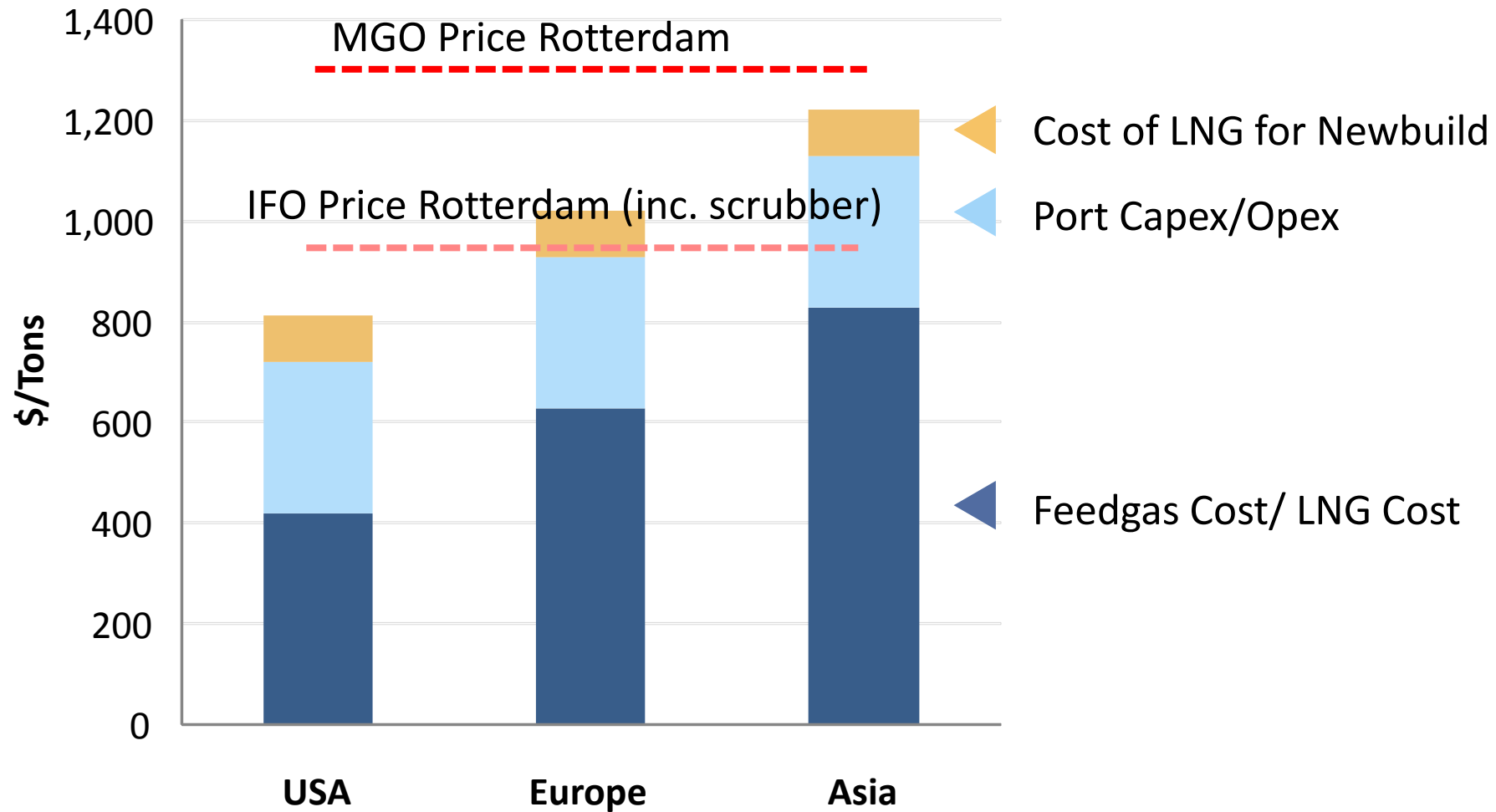
Fuel Oil vs. Natural Gas Prices Projection



Source: Poten & Partners

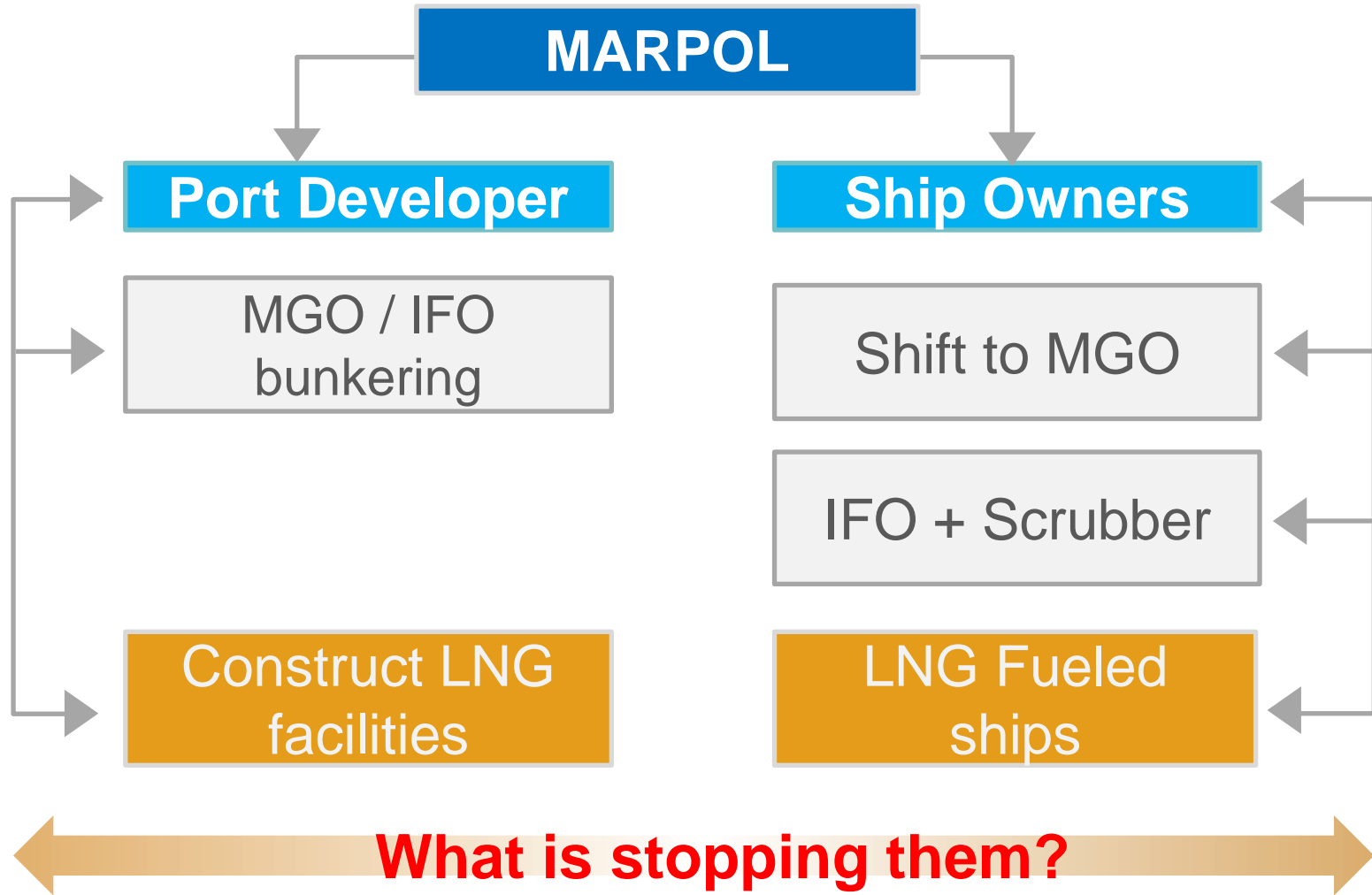
*Economic driver
more powerful when
Sulfur rules imposed*

LNG competitive in the North America

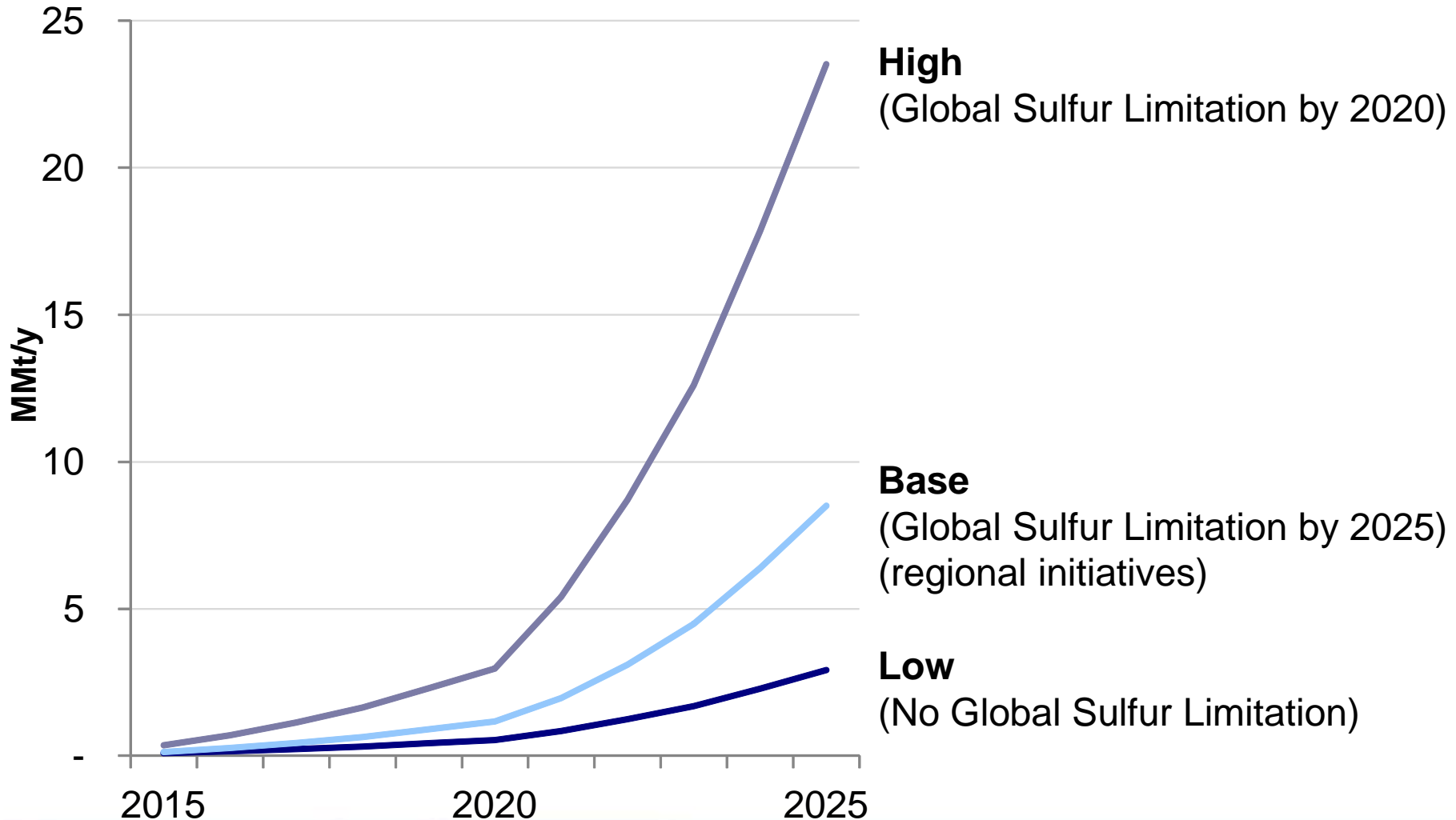


“Chicken-and-Egg Problem”

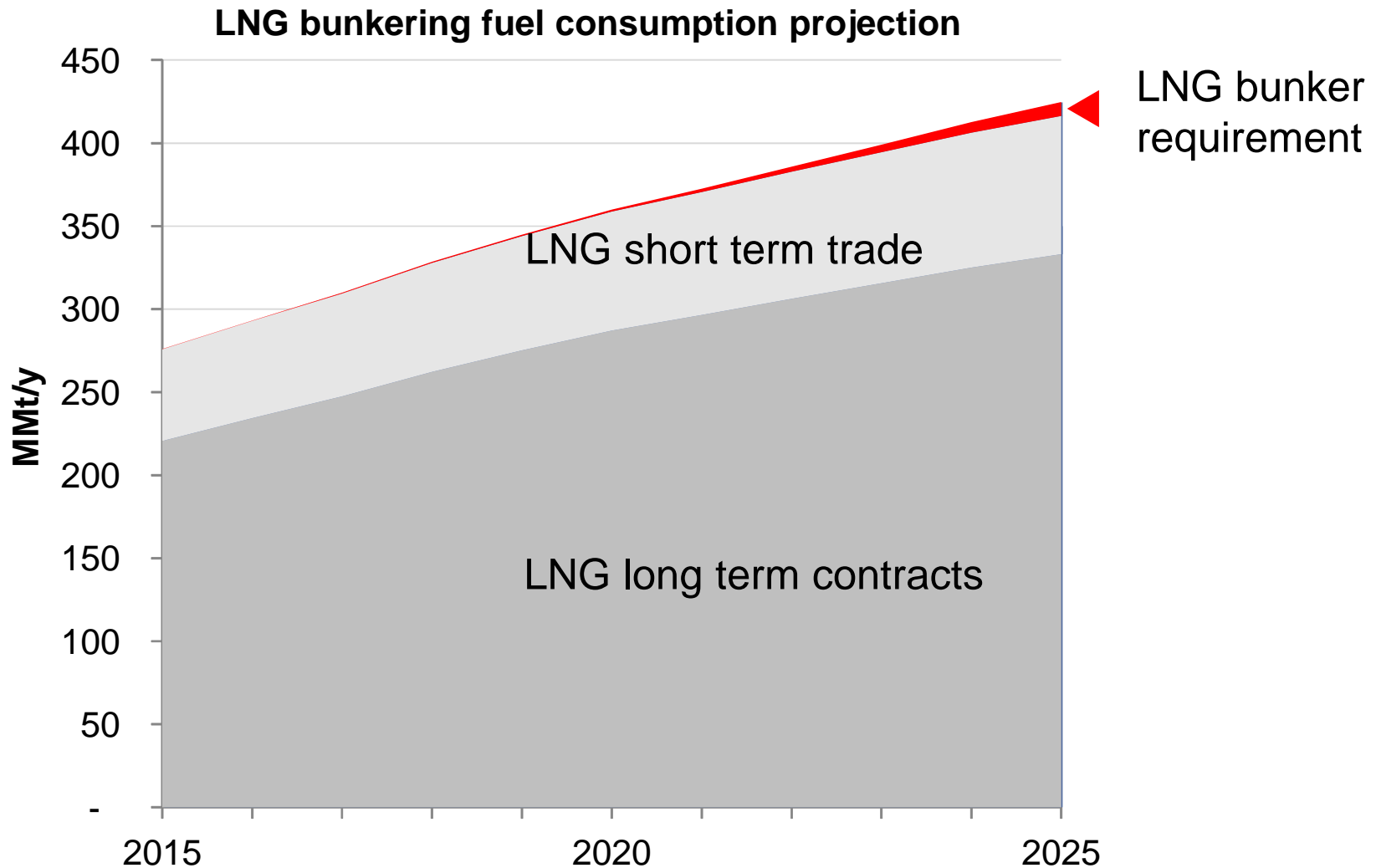
Ship owners and ports need to invest



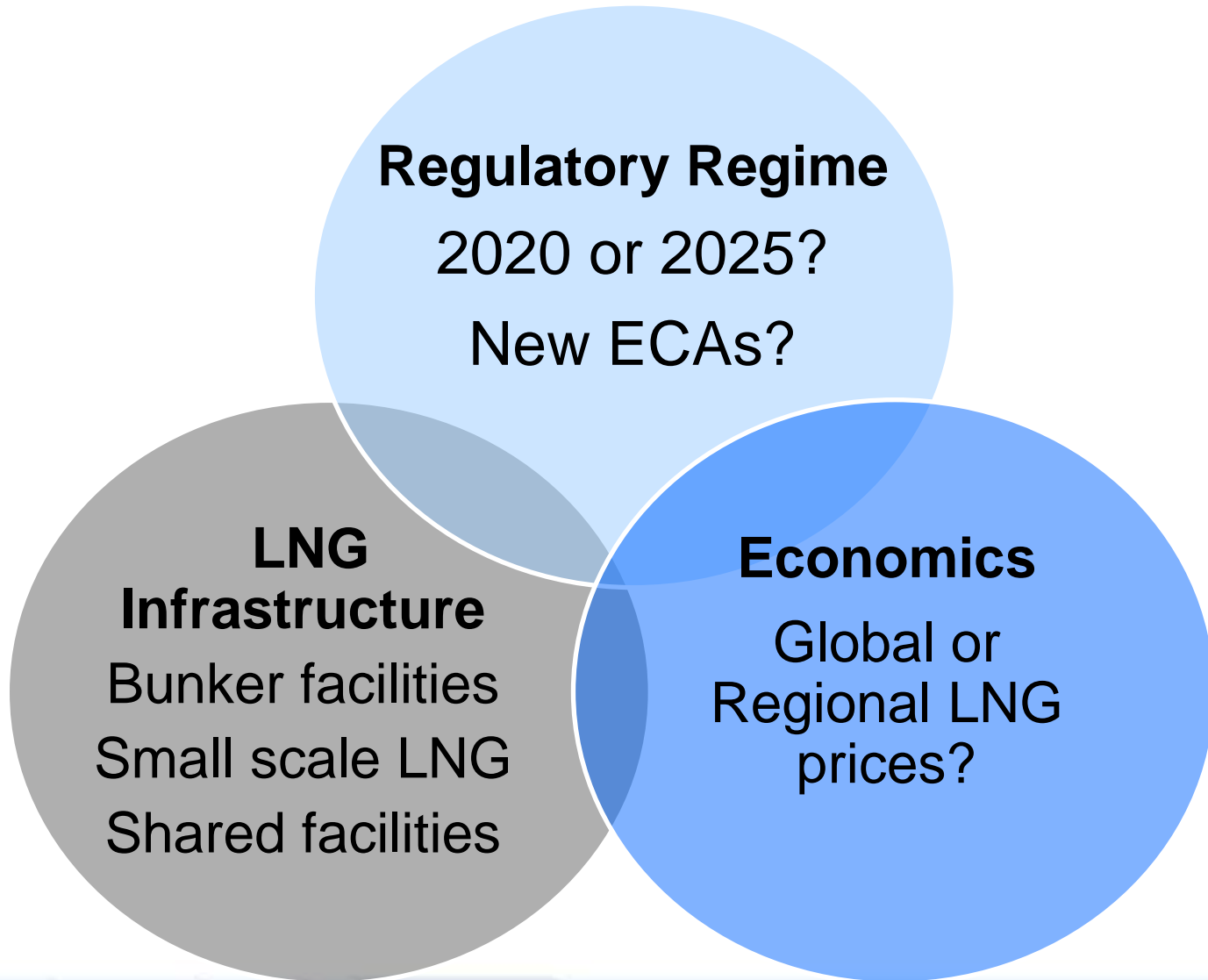
Projected LNG fuel demand impacted by Annex VI implementation



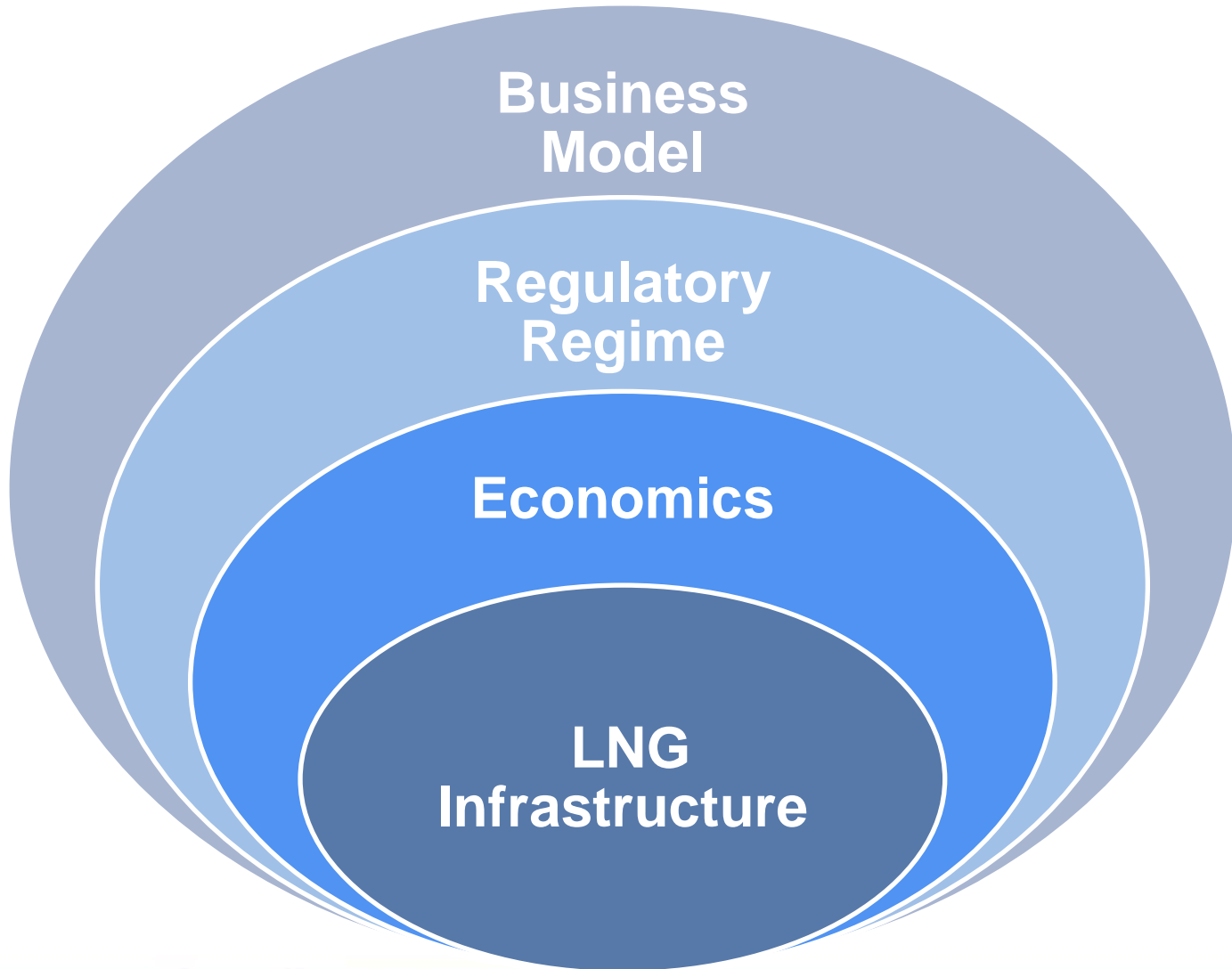
LNG supply can meet marine fuel demand



Alignment on issues will increase LNG demand



What business model will make LNG a viable marine fuel?

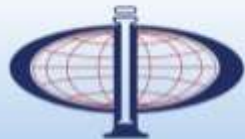


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LNG & NATURAL GAS CONSULTING CONTACTS:

AMERICAS

Contact: Jim Briggs
Email: jbriggs@poten.com
Tel: +1 212 230 2000

EUROPE, MIDDLE EAST, AFRICA

Contact: Graham Hartnell
Email: ghartnell@poten.com
Tel: +44 207 493 7272

ASIA PACIFIC

Contact: Steve Thompson
Email: sthompson@poten.com
Tel: +61 8 6468 7942