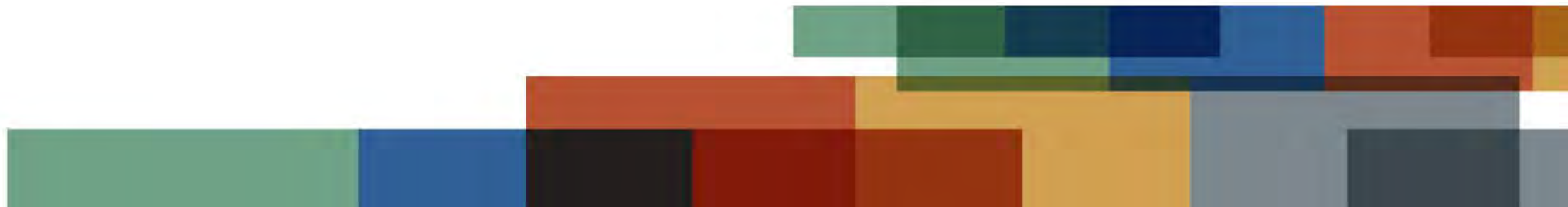




decisions with confidence

FLNG – Still a Nice Niche?

Martin Wilkes



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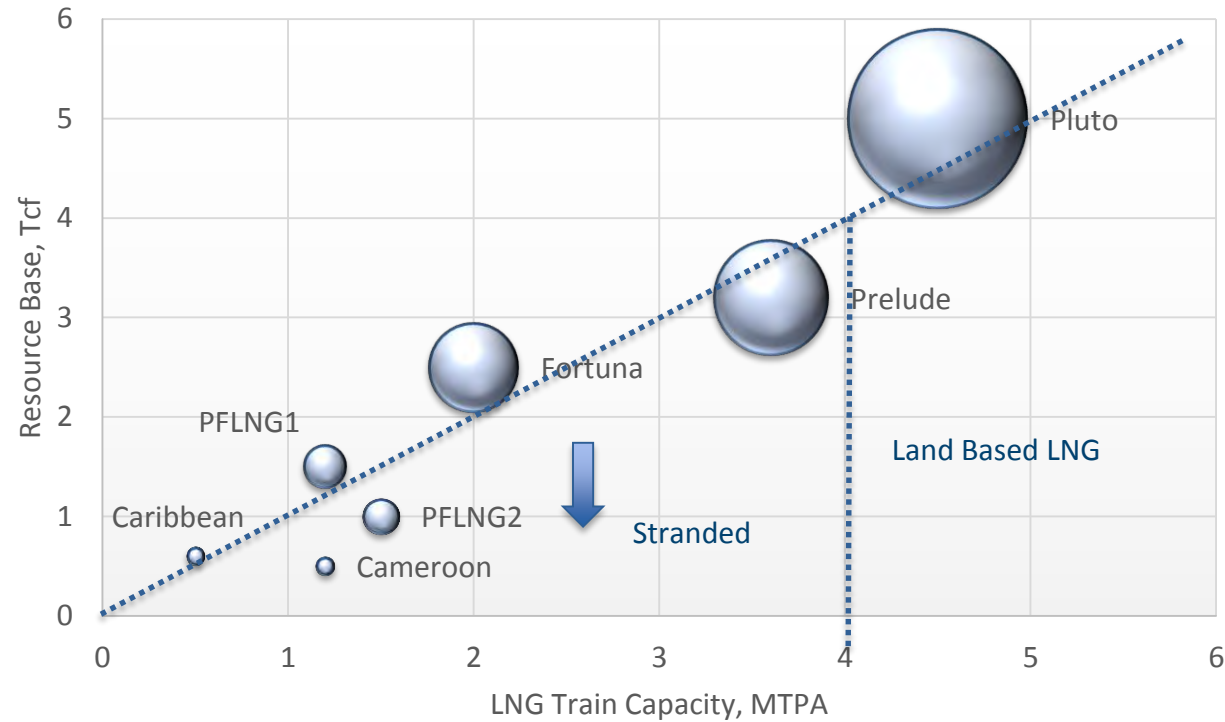
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- A brief recap of what was said 2 years ago
 - The space for FLNG in the development arena
- LNG Market dynamics, what's changed and how changes have and will impact the development of FLNG
- Opportunities and challenges for Australian producers
- A possible future for FLNG

Floating LNG offers options to fill a space created by land based projects' focus on economies of scale

- Potential to reduce minimum economic field size
- Access stranded resources



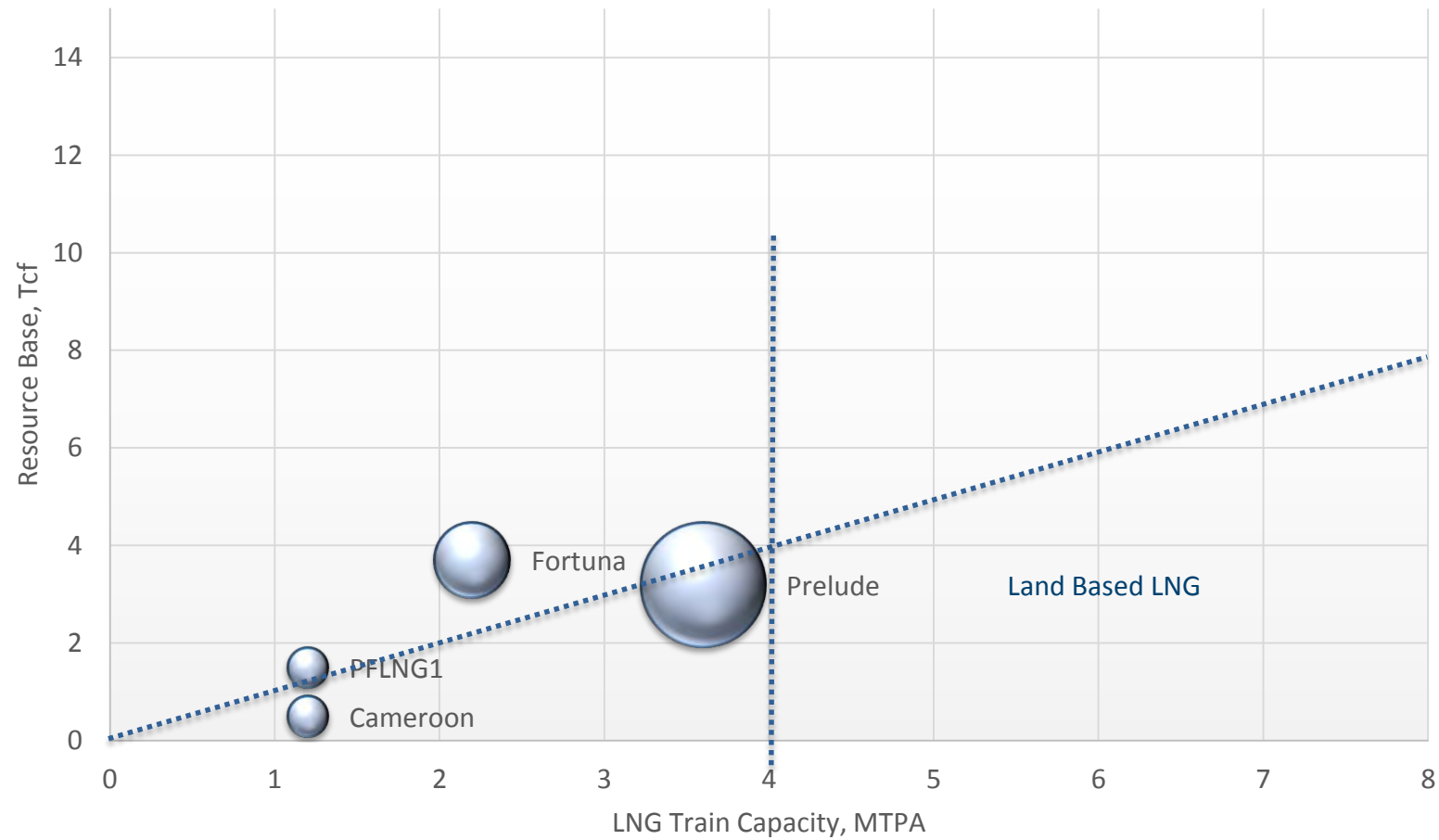
Different approaches being taken

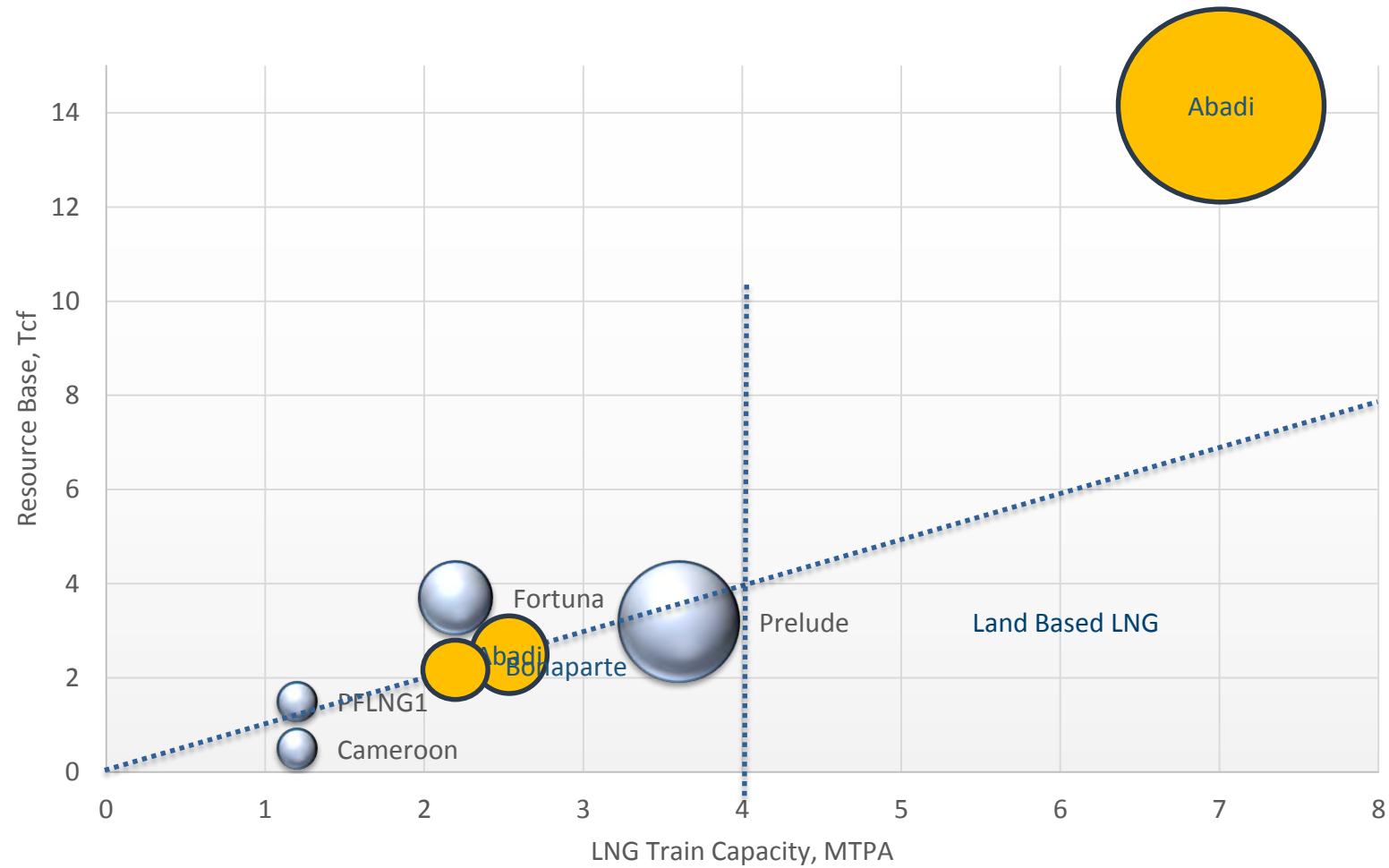


Project	Proponent / Operator	Capacity MTPA	Technology / Design Features	Anticipated Start-up
Caribbean (F)LNG	Pacific Rubiales/ Exmar	0.5	Black & Veatch Prico™, SMR. Tethered barge with separate storage. Feed gas from onshore	2015/16
PFLNG1 (Kanowit)	Petronas	1.2	Air Products AP-N™ Nitrogen expansion. Permanent turret mooring.	2015/16 2017
Prelude FLNG	Shell	3.6	Shell C3MR, Steam systems, Permanent turret mooring, LPG and condensate export	2016 2018
PFLNG2 (Rotan)	Petronas	1.5	Air Products AP-N™ Nitrogen expansion, Permanent turret mooring.	2018 2020?
Cameroon FLNG*	Perenco / Golar	1	Black & Veatch Prico™, SMR. Converted Moss Carrier "Hilli".	2017/18
Fortuna FLNG* EG Block R	Ophir / Golar	2.2	Black & Veatch Prico™, SMR. Converted Moss Carrier "Gimi".	2019 2020

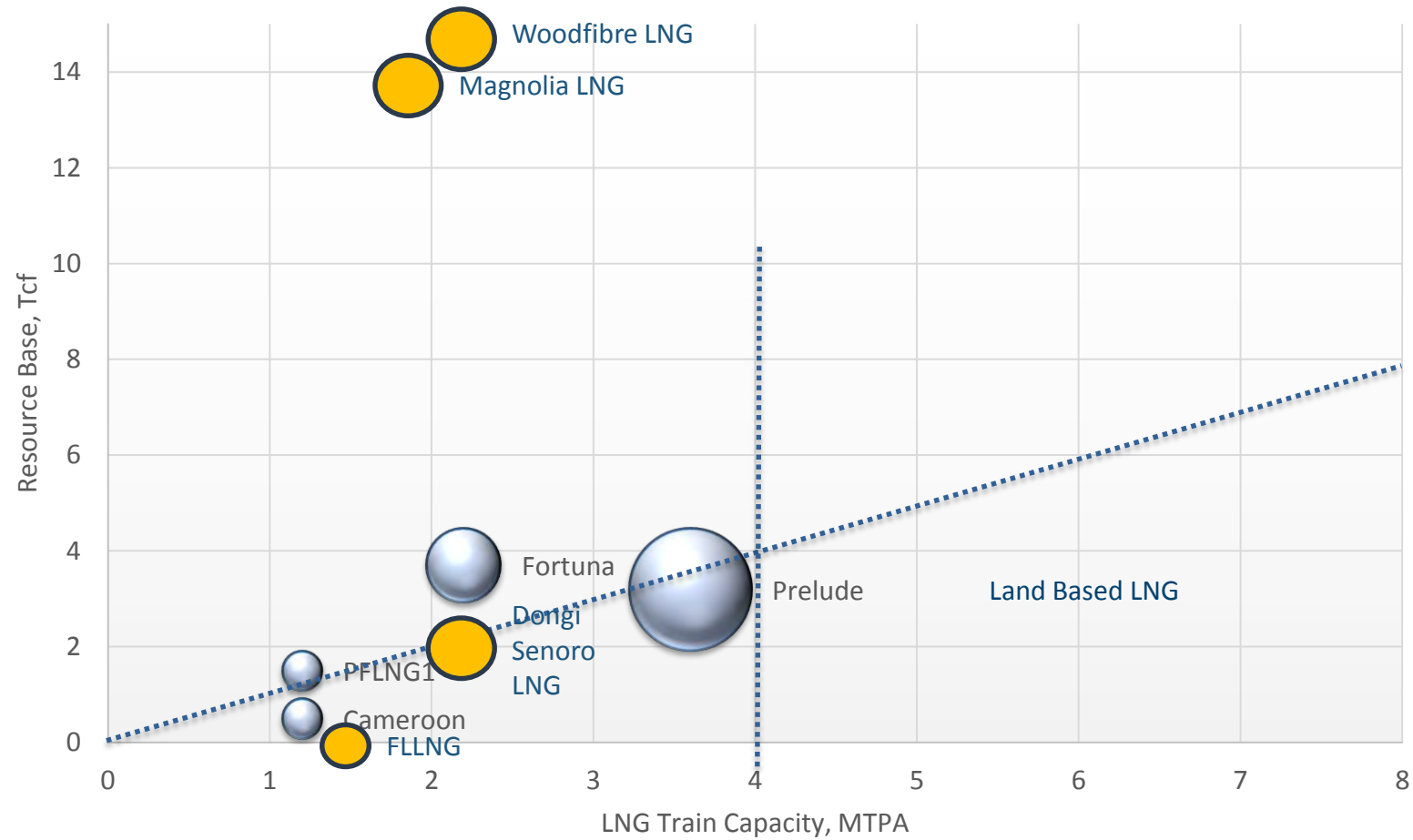
*FLNG Vessel conversion has been sanctioned, project has not

Exmar sanctioned a 2nd barge in December 2014 – project unknown



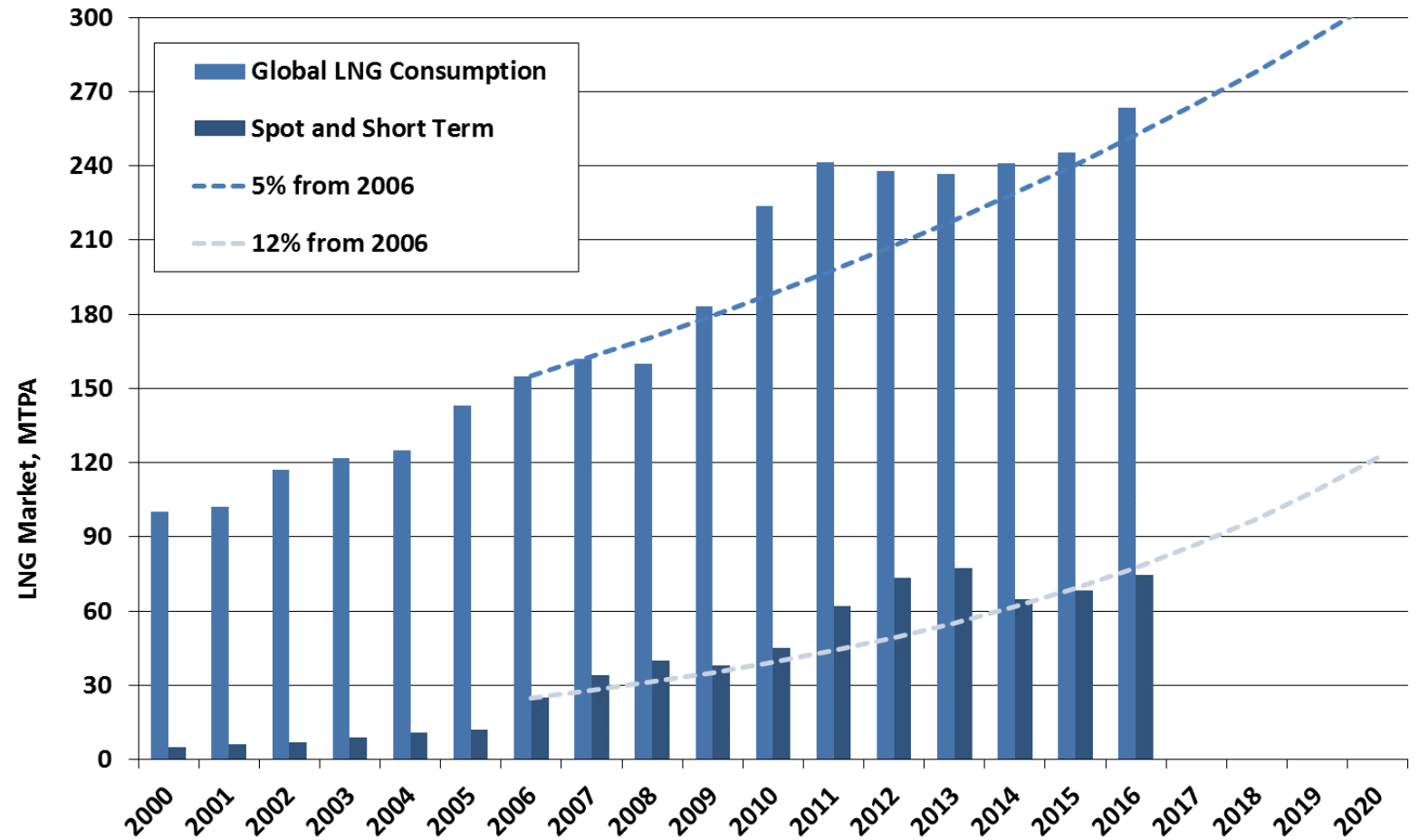


LNG project changes – the rise of mid-scale developments

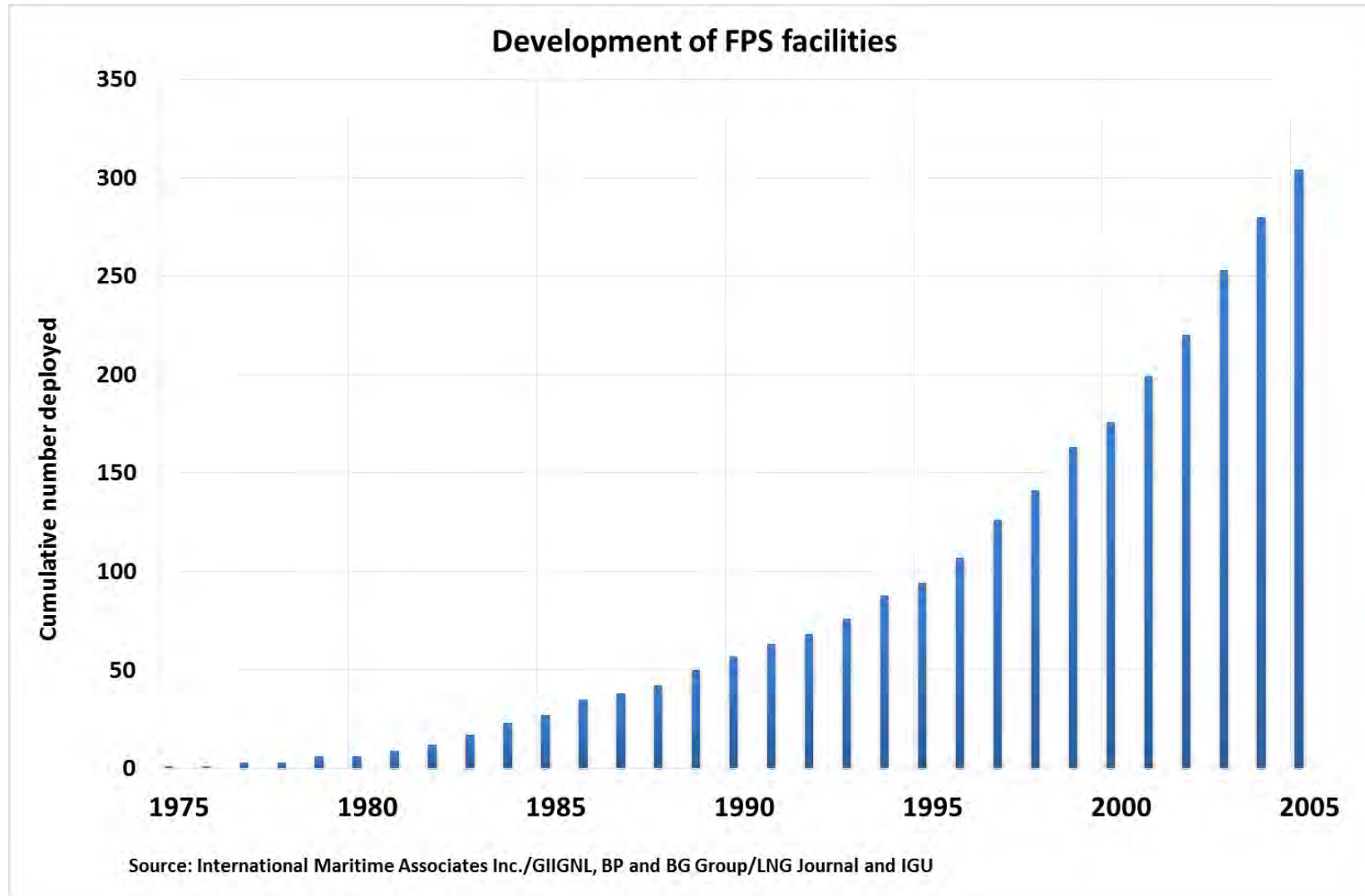


2 years ago: indications of significant changes in the LNG Market...

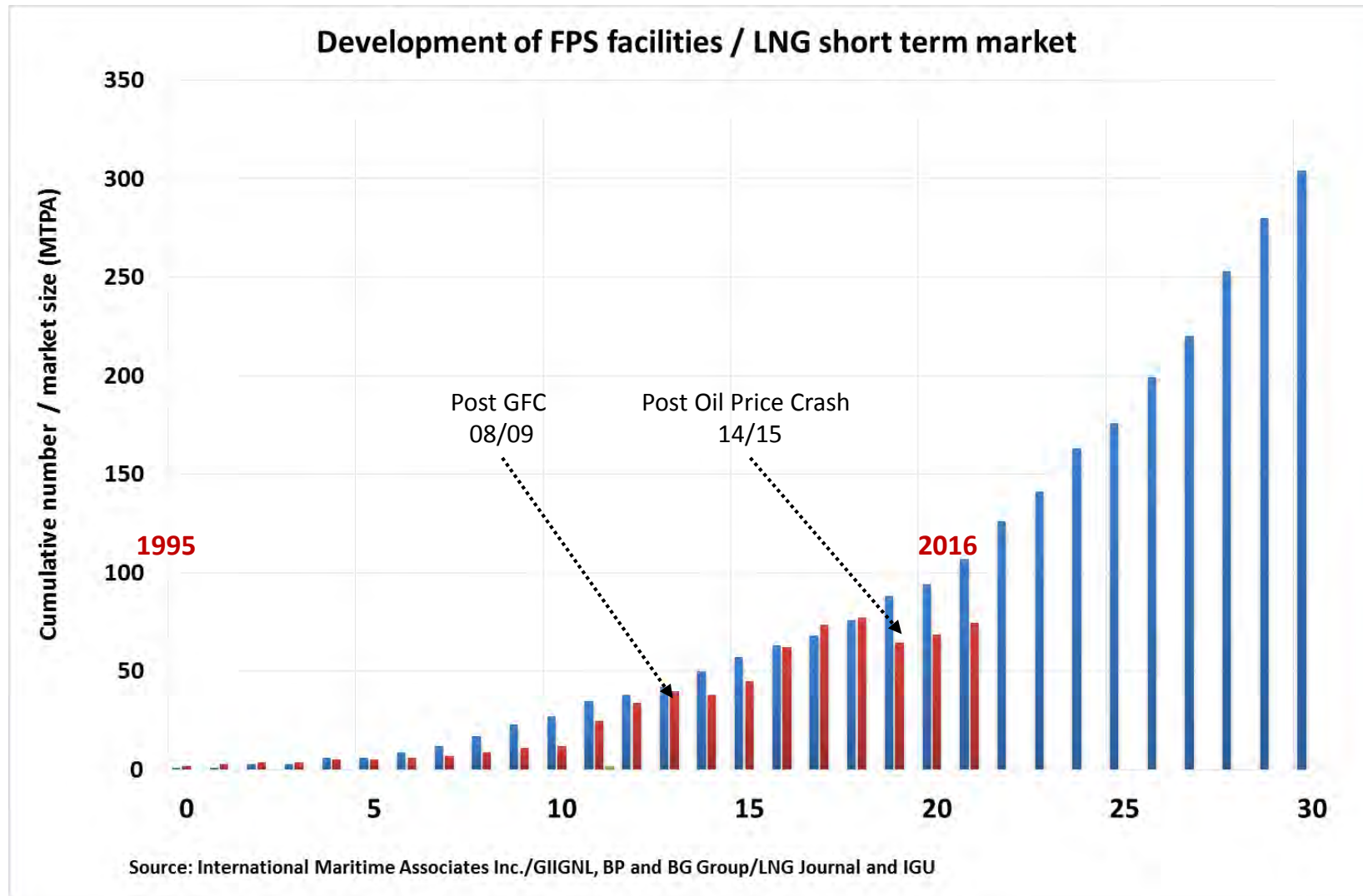
- LNG development traditionally supported by long term contracts
 - Small resources unable to commit to long term contracts
- Strong growth in LNG market
 - Significant increase in short term trade
- Development of short term market means
 - Buyers less reliant on long term contracts
 - Security of Supply through diversification
 - Increased diversity and more liquidity
 - Increased confidence in sales



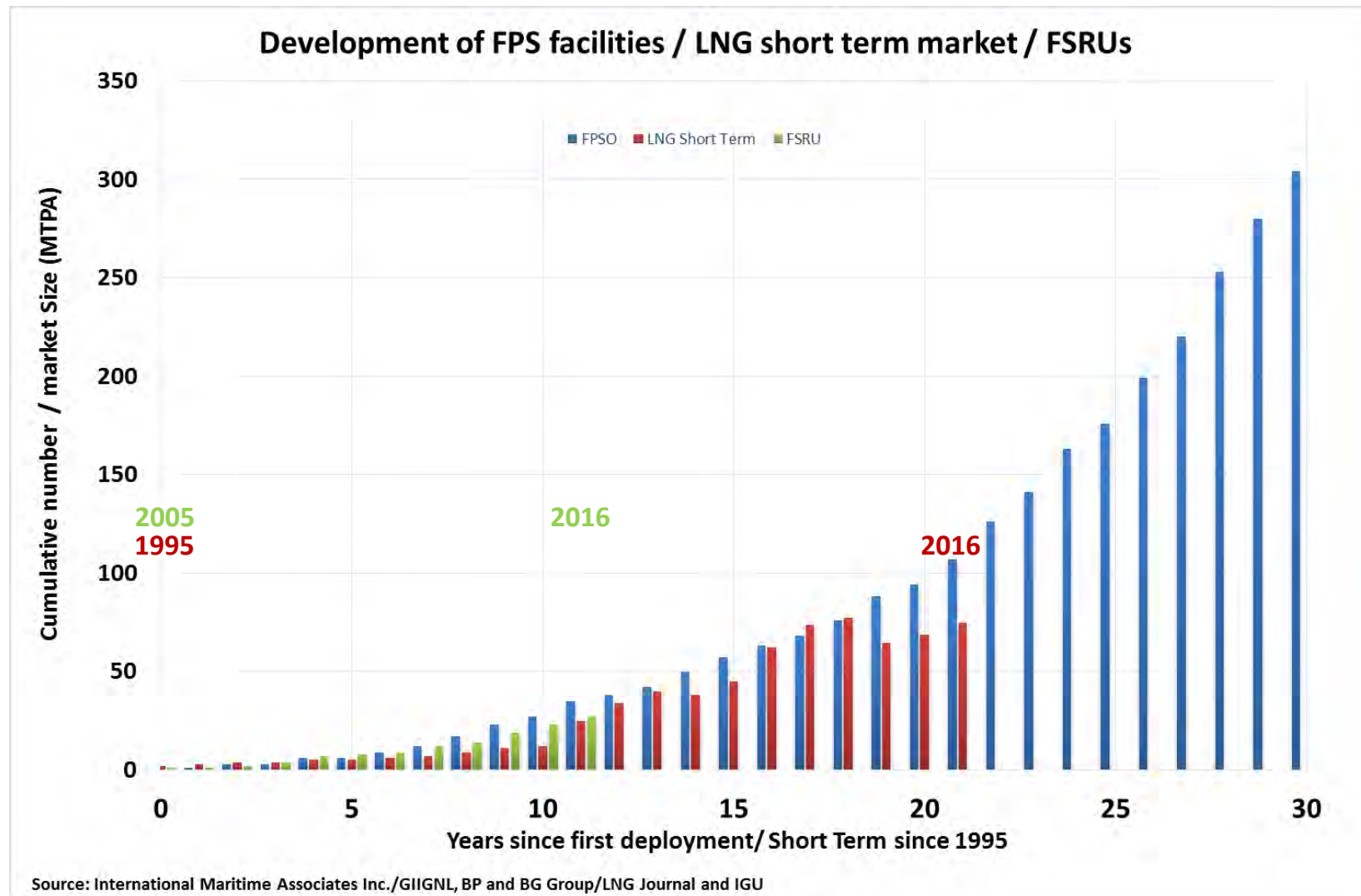
Sources: GIIGNL, BP and Shell



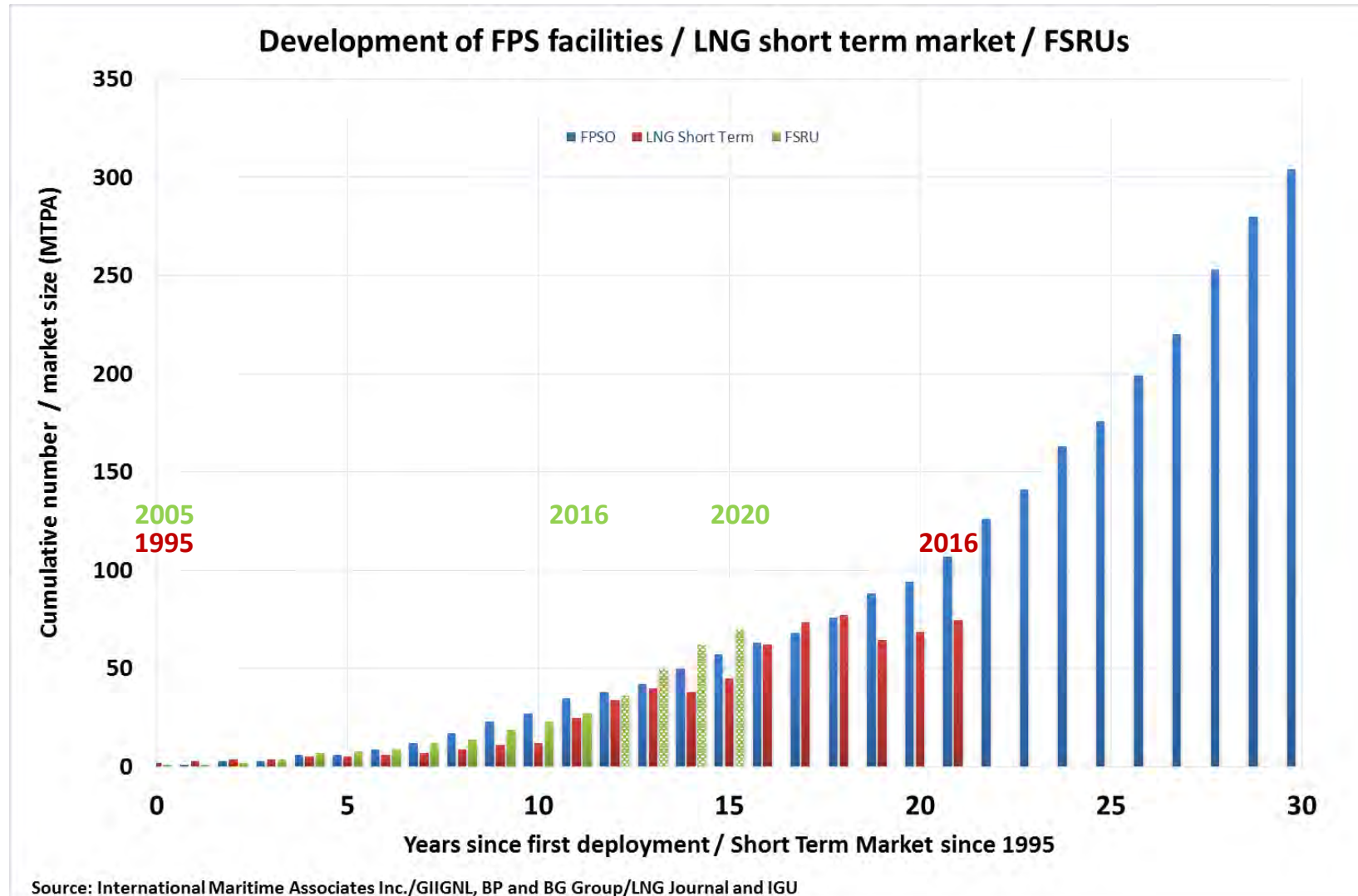
The LNG short/spot market has followed a similar development trend



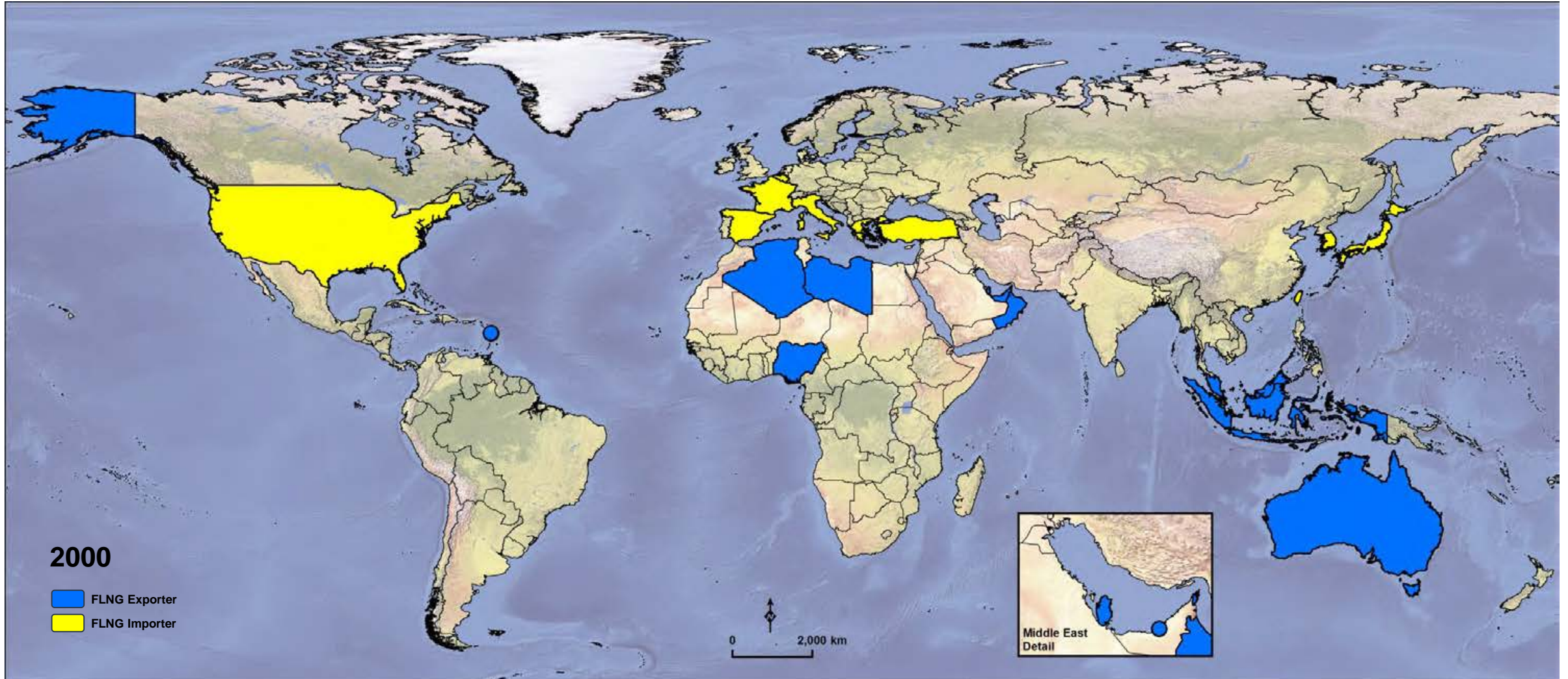
FSRU's also appear to be following the same development path



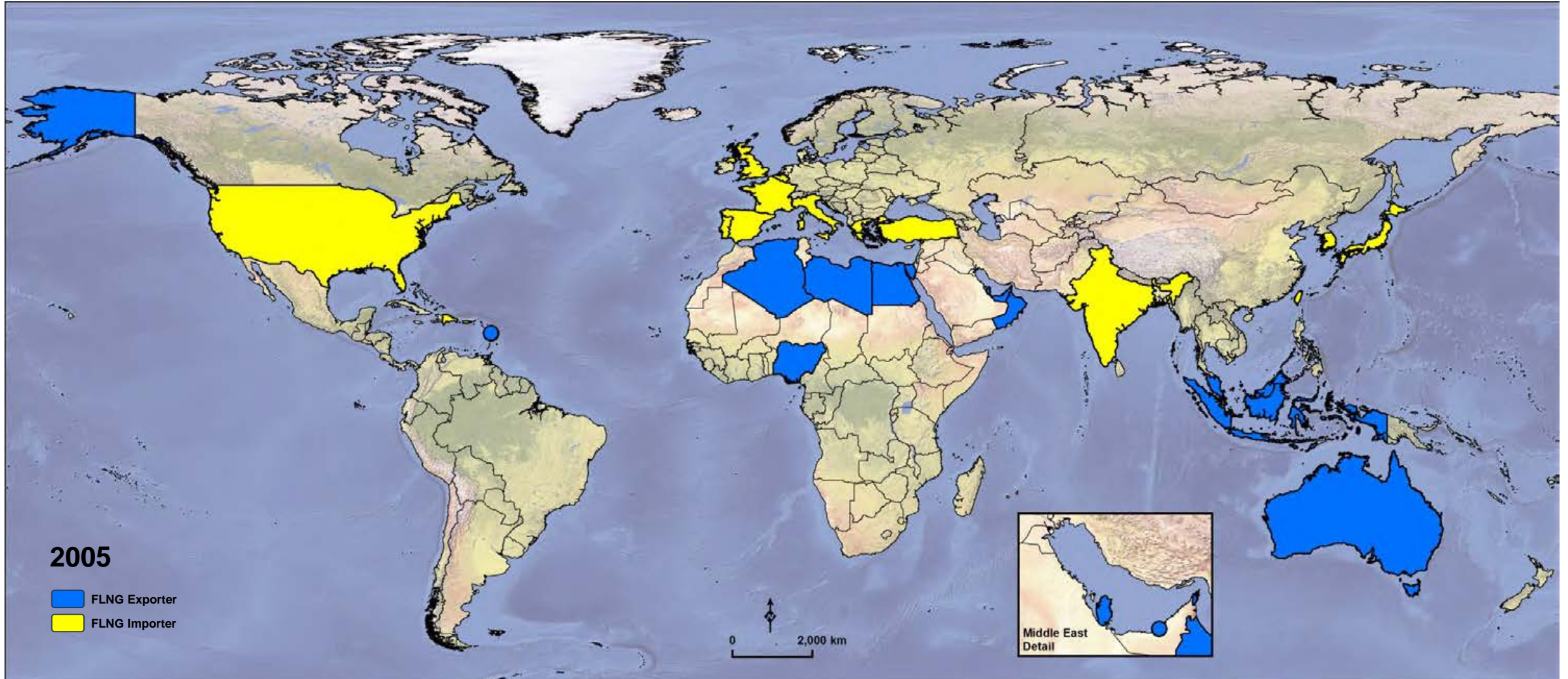
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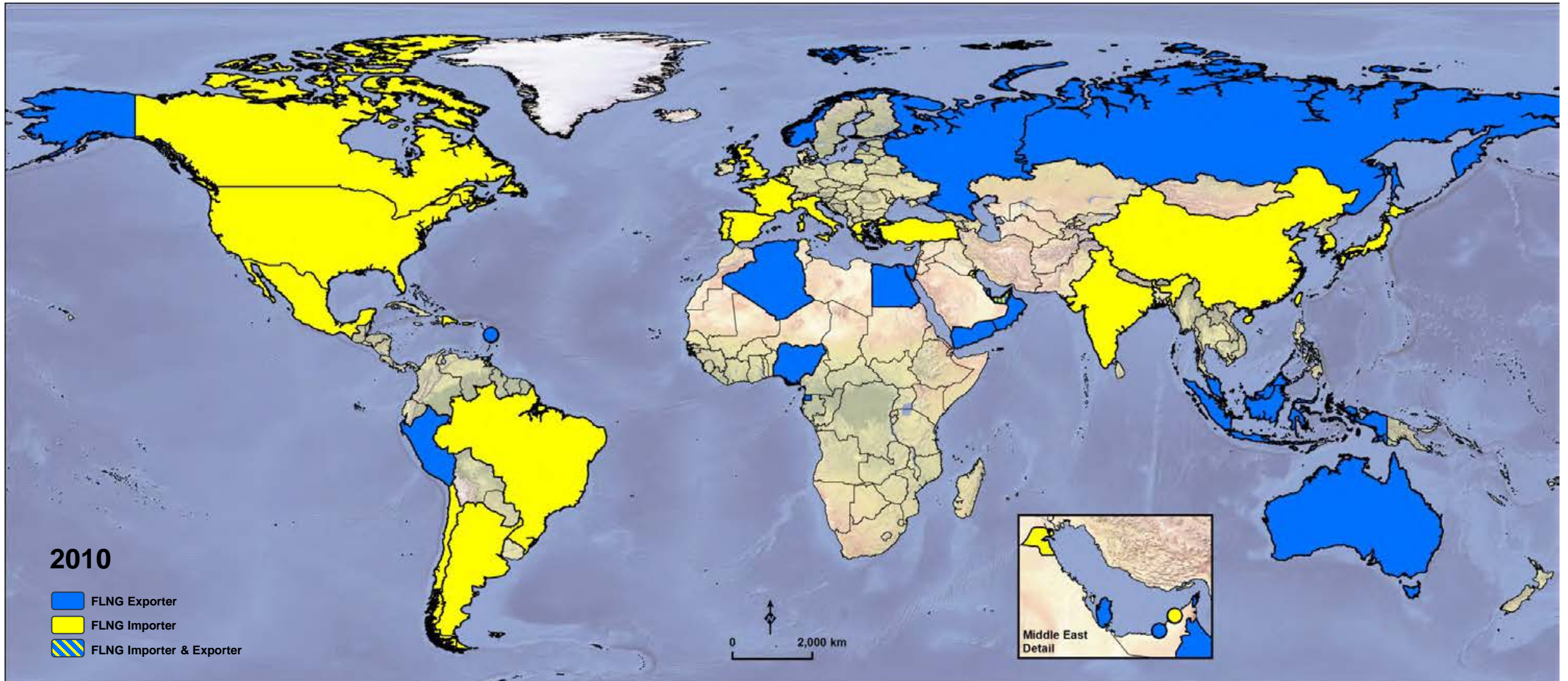


Changes in export and import countries....

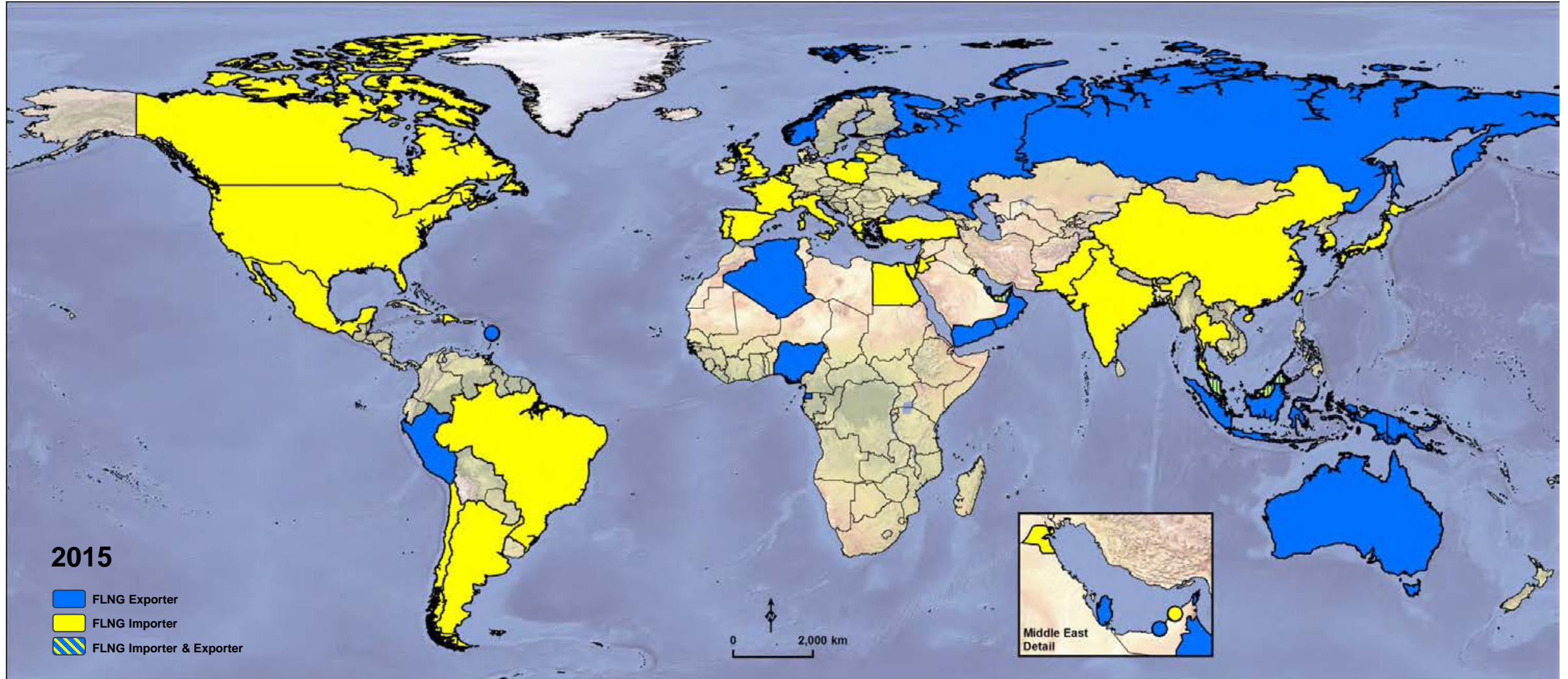


Changes in export and import countries....

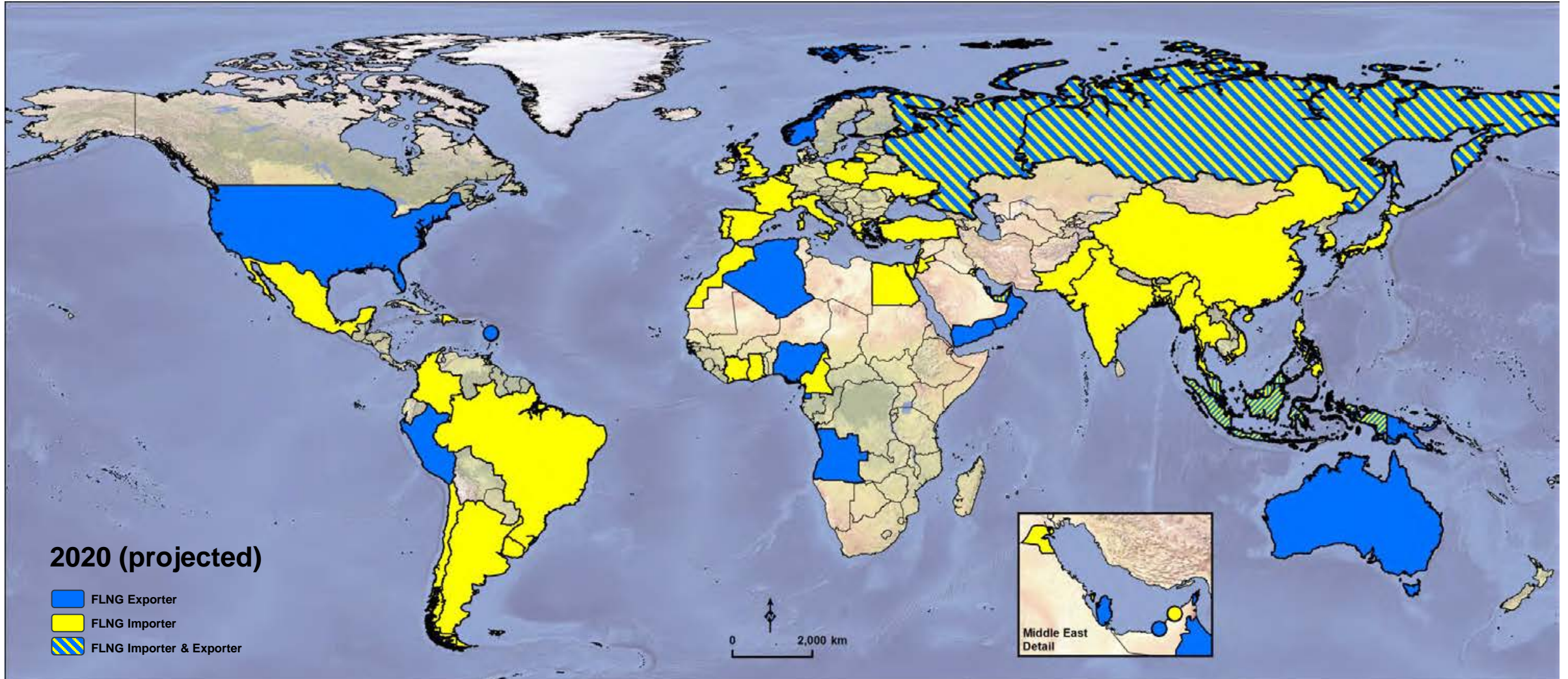




Changes in export and import countries....



Changes in export and import countries....



FLNG becomes “mainstream”

- Competition and cost reduction
- Smaller less expensive facilities
 - Development of smaller resource pools
 - RISC analysis indicates FLNG may be viable for ~0.5Tcf
 - FLNG becomes development of choice

Australian Context

- Australia already has 1 sanctioned FLNG project
- RISC is aware of at least 8 other projects that are or have considered FLNG
 - All of them >2Tcf
- Most new finds will be smaller than those already discovered
 - Ability to develop small fields will be key
 - New players emerging and adopting similar techniques to the FPSO industry
 - Lower development costs and smaller environmental footprint will make FLNG attractive

FLNG poised to become the next generation of the floating industry

- Challenges are not dissimilar to those that the industry has previously overcome
 - Financing, particularly of early projects
 - Involvement of IOC/NOCs
 - World Bank and CEIB providing funding to Caribbean FLNG
 - HongKong Shipping Company financing for GoFLNG conversion
 - Chinese Banks providing funding for the Ophir Fortuna project
 - Long history of innovation and adaptation
 - Clear indication of progress & adaptation of existing knowledge
- Continued strong growth in LNG, and even stronger growth in short term trades indicates the potential for development of smaller resources
- History supports a growth both in development and in technology choices

Will FLNG follow a similar development path

