



Celebrating 25 years

Key trends in the global LNG industry

September 2019

decisions with confidence

Who we are

- RISC is a truly independent advisory firm. We provide impartial advice to a broad range of clients in the oil and gas industry, enabling them to make their business decisions with confidence.
- We work in partnership with our clients to support their interests in the oil and gas industry, offering a broad and innovative perspective on oil and gas projects around the world.
 - We have many years of practical experience and provide a bespoke service.
 - We provide insightful views on technical, commercial and strategic issues
 - We help our clients understand the uncertainties and risks associated with the oil and gas industry.

decisions with confidence



What we do...RISC Group Expertise:



Independent Opinion

- CPRs; ITSRs etc..
- Reserves / Resources audits and certification
- Expert Witness
- Asset/Portfolio valuations

Due Diligence

- Support for acquisition, debt/equity raising etc..
- Asset/Portfolio valuations

Peer Assistance and Review

- Modelling
- Feasibility and Concept Selection studies
- Pre/Post FEED/FID, and execution reviews

Technical Advice

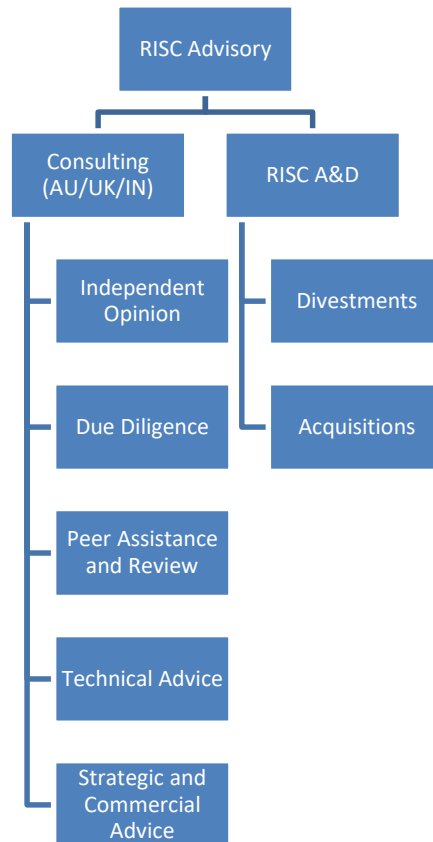
- Basin/Exploration studies and evaluation
- Field Development Plans

Strategic and Commercial Advice

- Portfolio assessment
- Gas market evaluation
- Workshop facilitation

Divestments and Acquisitions

- Sales and purchase processes



What we do...in the last 5 years:



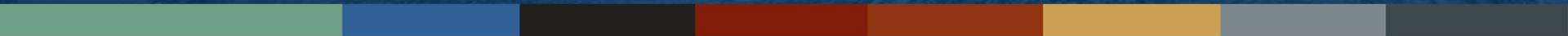
- We have advised on transactions totalling over \$20 Billion
- We have provided independent advice
 - To over 500 clients
 - on over 1500 oil and gas fields
 - With a total value in excess of \$100 Billion
- Including:
 - Over 120 due diligence exercises on assets and portfolios
 - More than 110 Independent Technical Specialist and Expert assignments
 - More than 100 Resources and Reserves reviews and audits
 - Over 140 Technical and Commercial Consulting assignments
- We have covered LNG projects totalling more than 100MTPA or over 35% of the world's current total LNG production.



Who we work with



A quick global overview



The Global LNG Market has changed, liquidity is *still* increasing:



LNG development traditionally supported by long term contracts

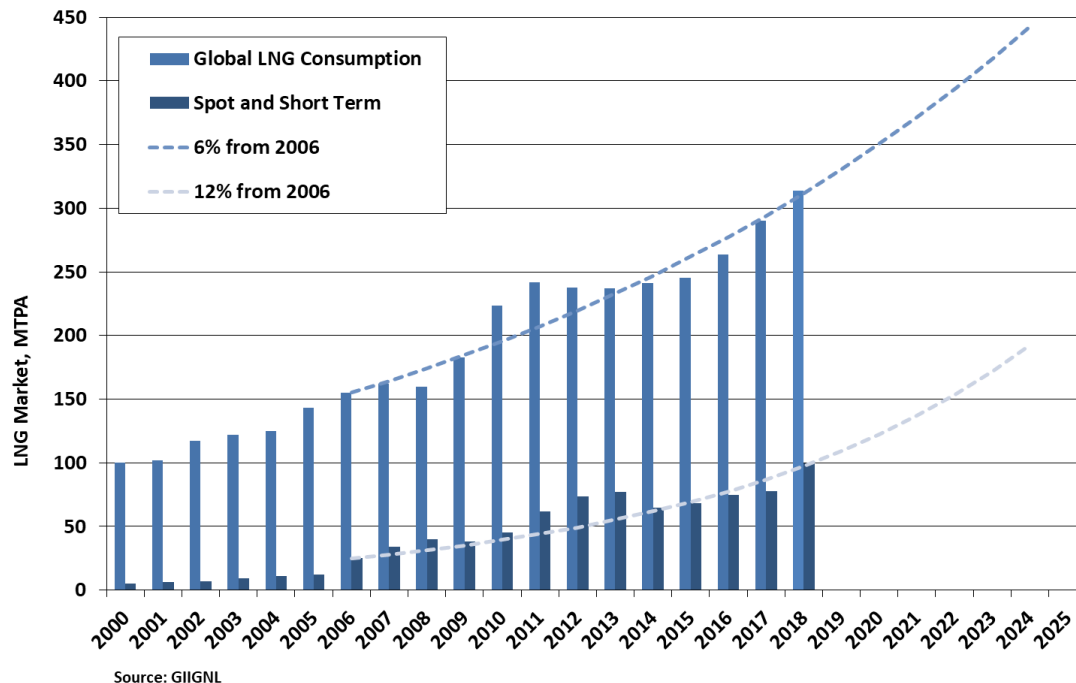
- Small resources unable to commit to long term contracts

Strong growth in LNG market

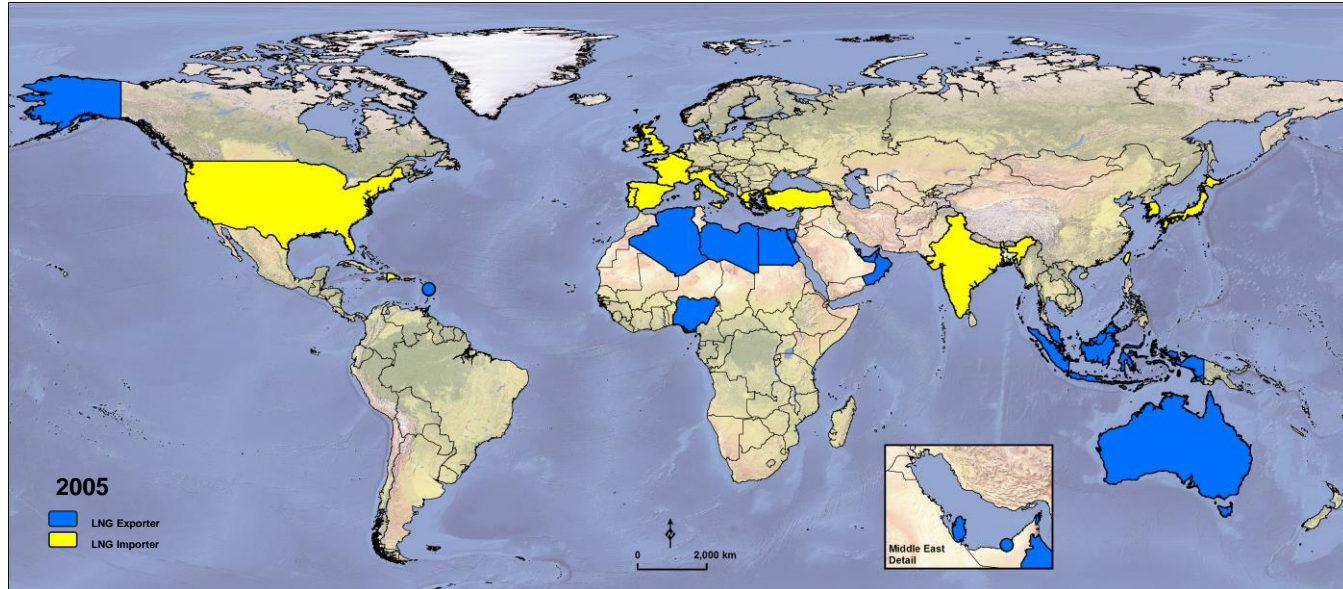
- Significant increase in short term trade

Development of short term market means:

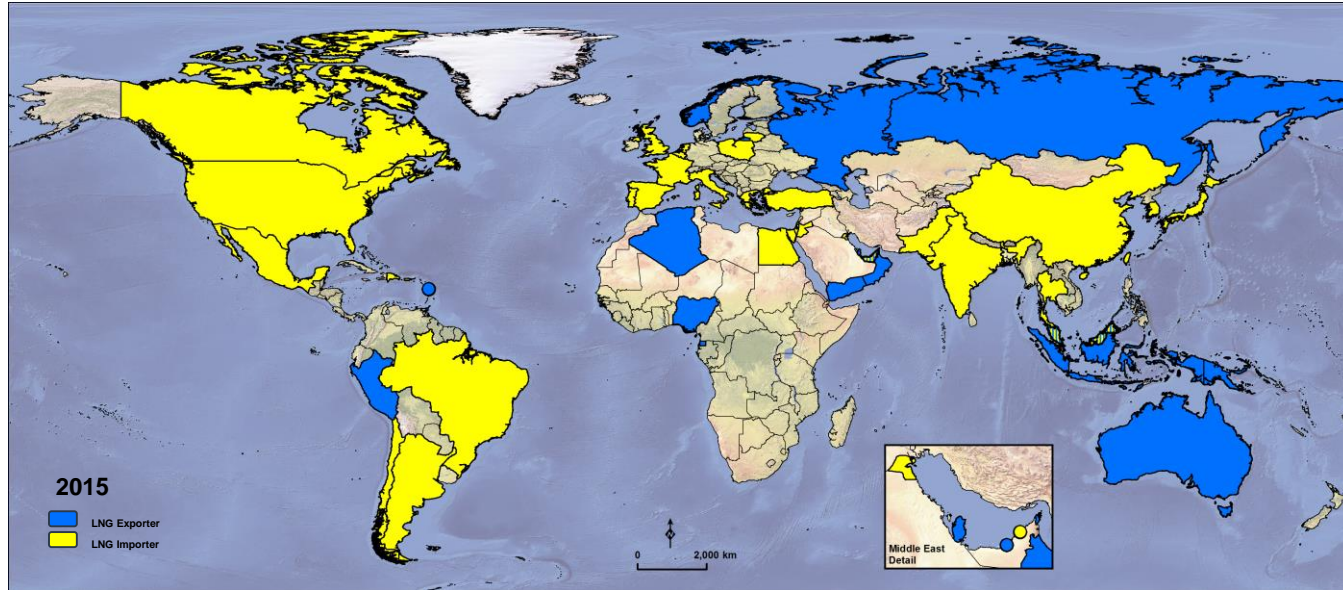
- Buyers less reliant on long term contracts
- Security of Supply through diversification
- Increased diversity and more liquidity
- Increased confidence in sales
- More confidence in smaller developments for Sellers



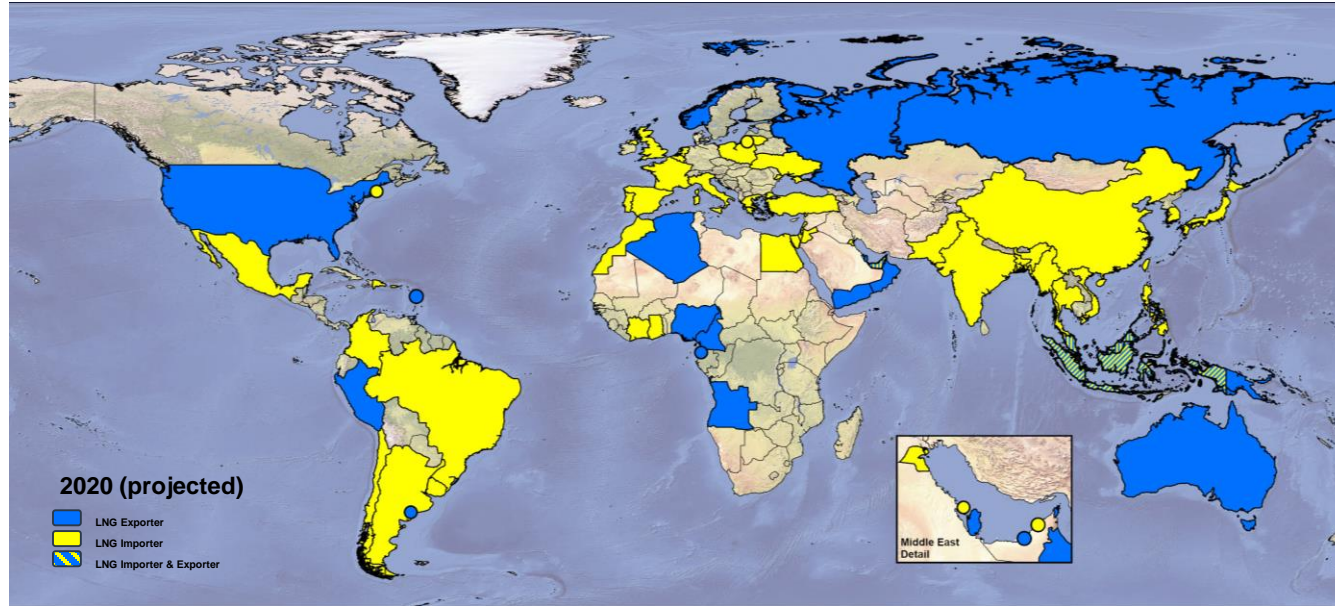
Changes in export and import countries....

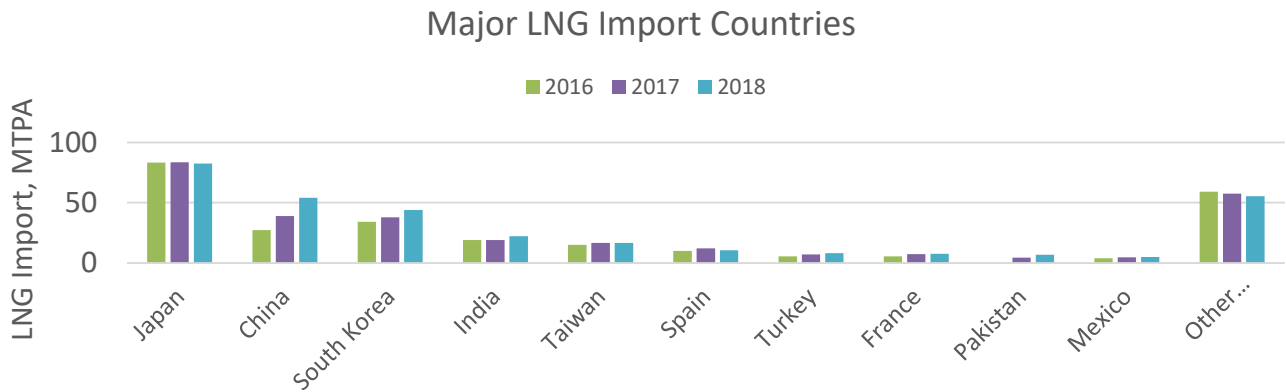
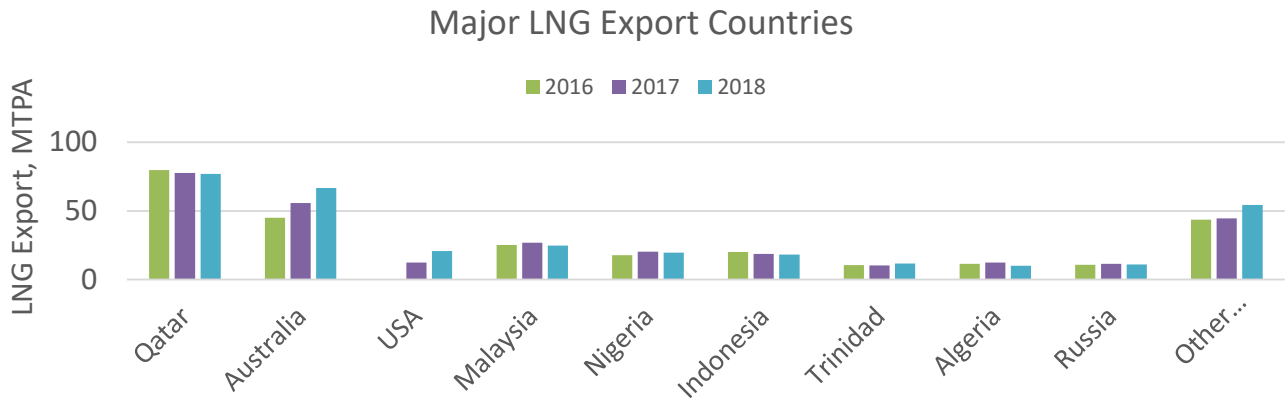


Changes in export and import countries....



Changes in export and import countries....





Rapid rise in supply

- In last 4 years over 100MTPA of capacity has been added, mainly in Australia and USA
- Between now and ~2022 a further 40+MTPA of capacity will be brought into production, mainly in the USA
- Beyond this timeframe projects under consideration total well over 200 MTPA, USA, Canada, Russia, East Africa

Rapid diversification of LNG imports both geographic and market segment

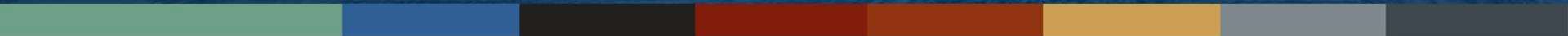
- Growth in importing countries - Asia, South America and Middle East
- FSRU's now the "entry level", which significantly reduces both cost and time to begin imports
 - Smaller scale regional distribution gaining momentum both in Europe and Asia
 - Transportation gaining momentum...but timing is unclear

FLNG offers the same change in "entry level" potential for upstream projects

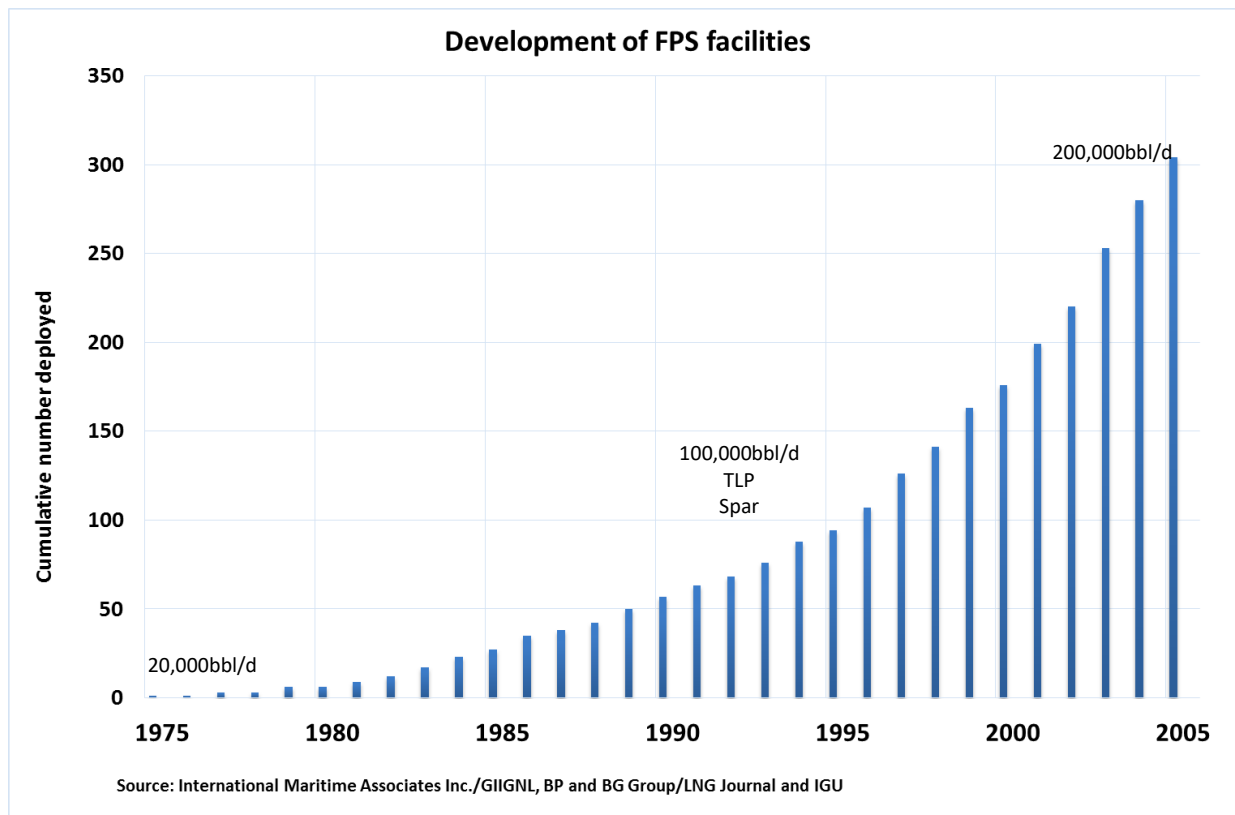
The rise of renewable energy creates both opportunity and risk

- Gas is the natural companion to renewables because of its ability to react quickly in line with variable renewable changes.
- Gas experiencing a "Green-Cheap Squeeze"
 - Not as green as renewables
 - Not as cheap as coal
- Large scale electricity storage is a potential game-changer in the power generation arena, but appears to be some way off.

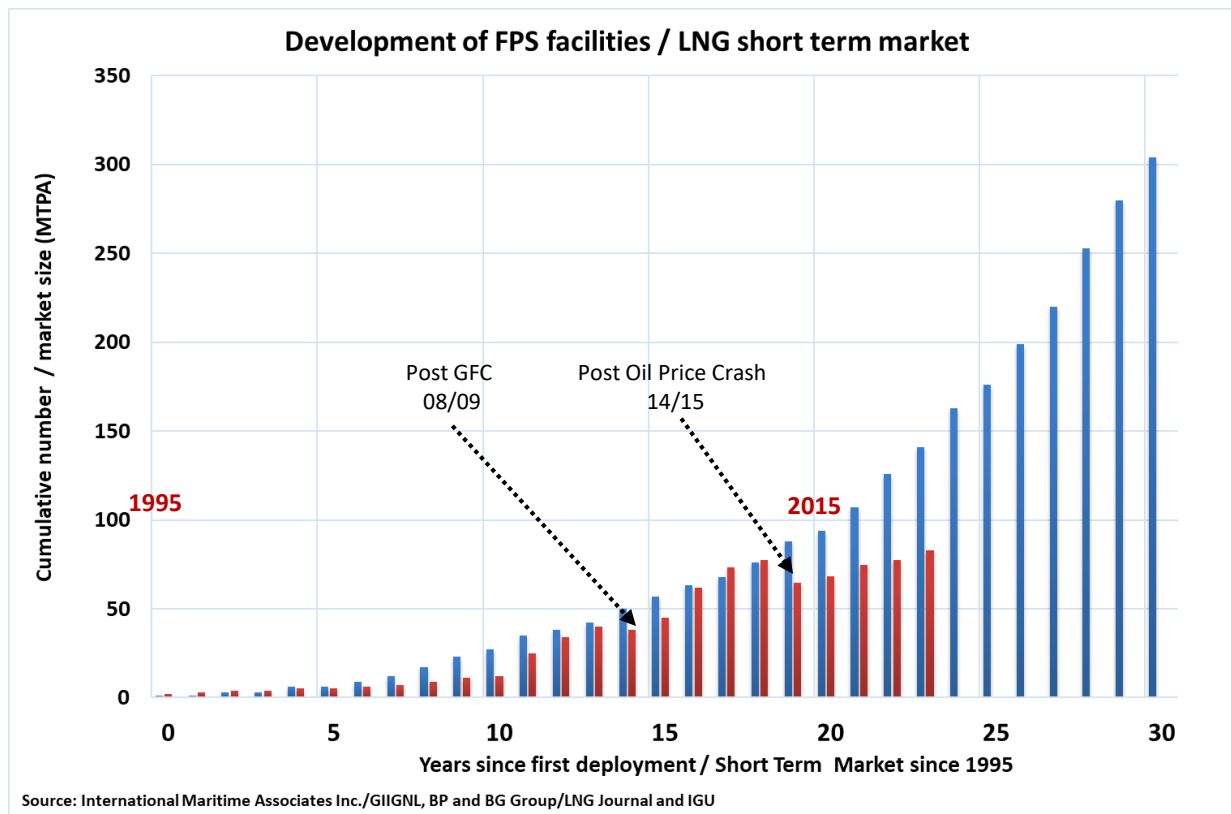
Impact of floating facilities



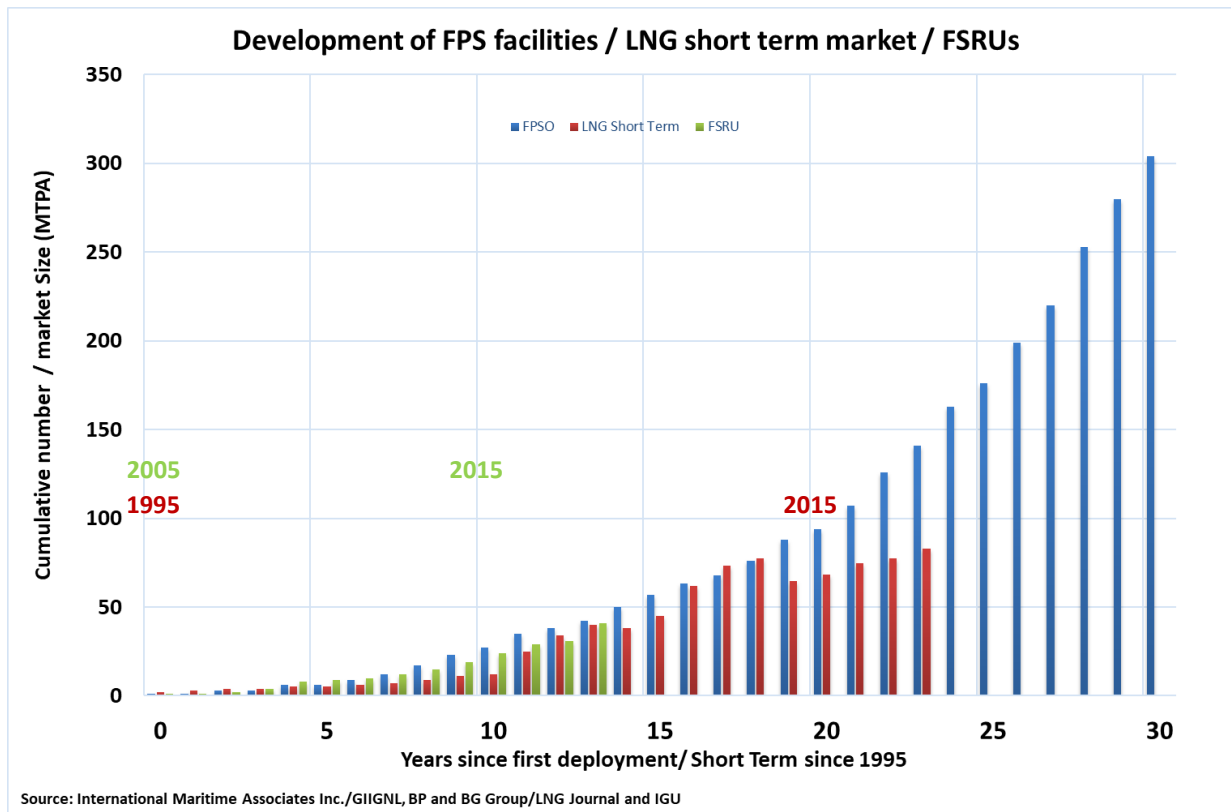
Historical Development of FPS facilities (Oil FPSO's)



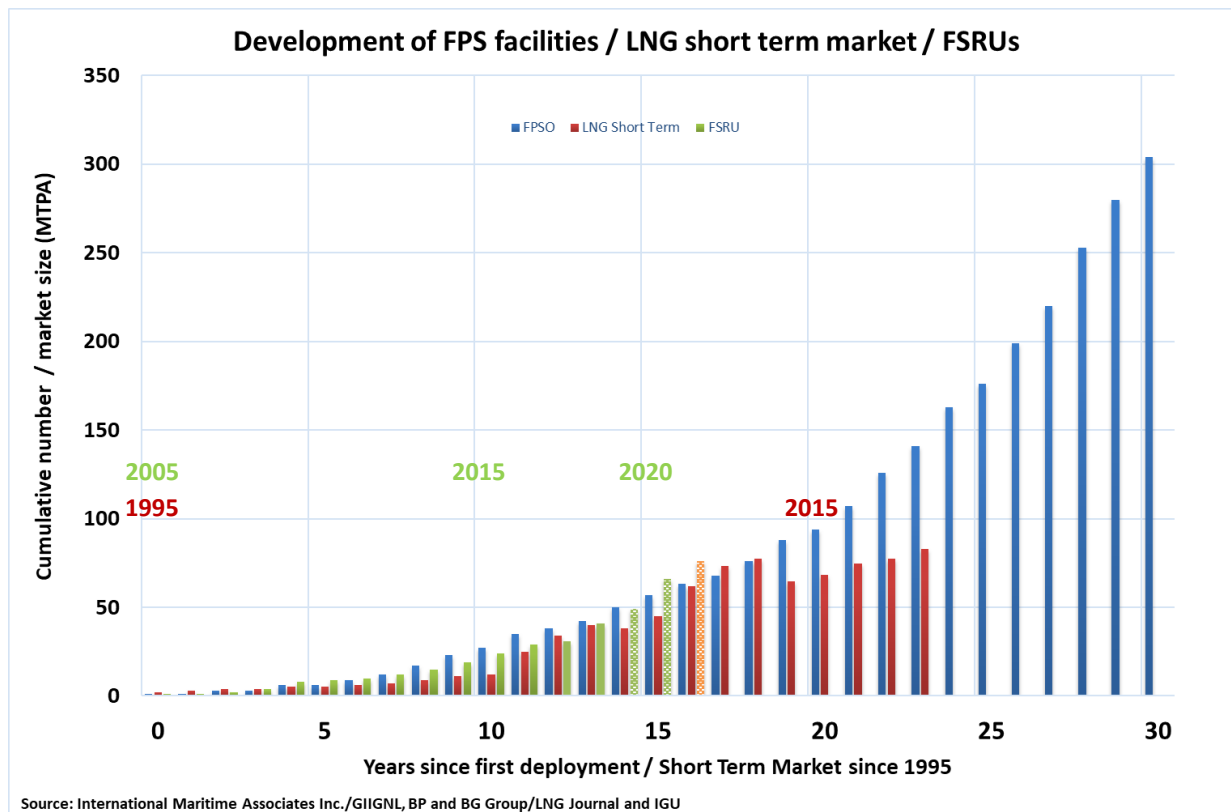
The LNG short/spot market has followed a similar development trend



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



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



Why FSRU's?



Scale

- Entry enabled at smaller scale

Cost

- Capital cost significantly lower
 - Minimal onshore infrastructure
 - Potential to lease

Schedule

- <12 months from sanction to start up

Environment

- Minimal onshore impact
- Many more possible locations

End of life

- Redeployment
- Minimal decommissioning

Lampung - Indonesia

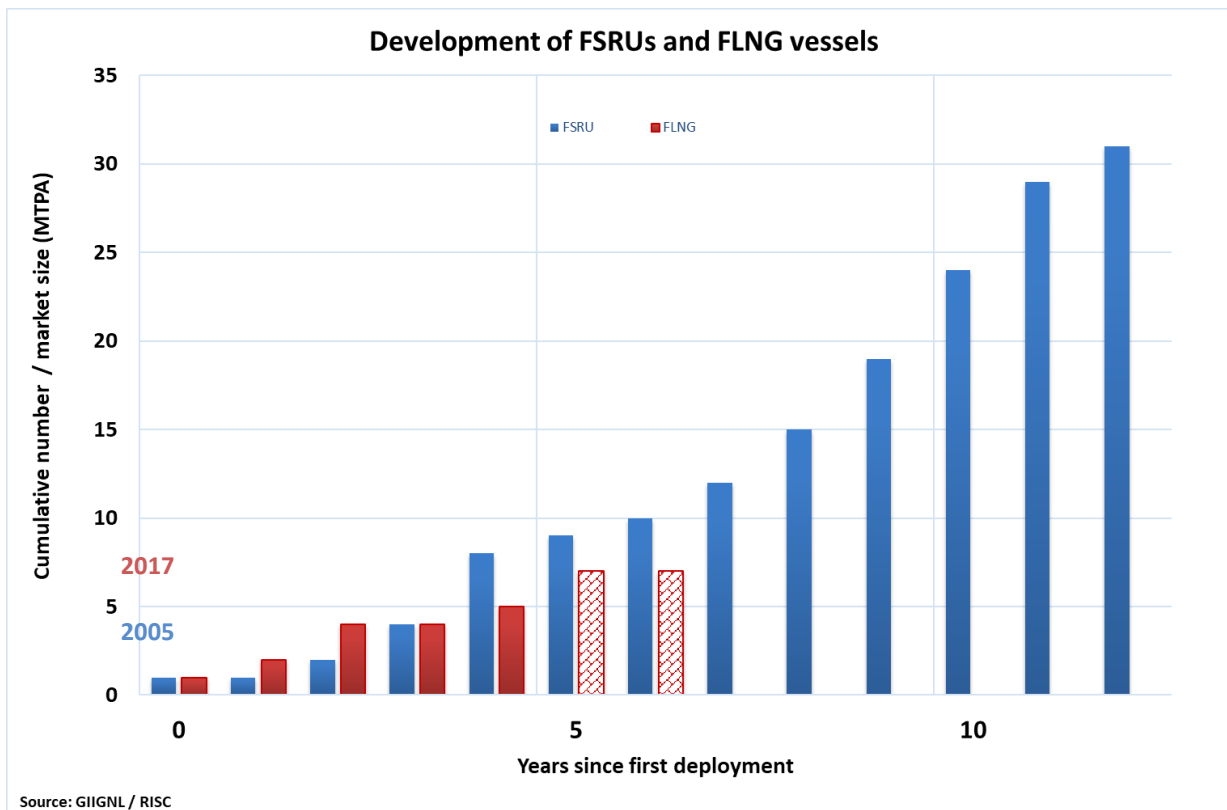


Benoa - Indonesia



Canaport - Canada

FSRU benefits are also applicable to FLNG



Significant (interesting) projects in SE Asia Region



- Abadi LNG – now going to be an onshore development, timing still unclear
- Barossa as backfill to Darwin LNG
- PFLNG2

- Australia
 - 5 proposed LNG import terminals, start up from 2021/22 (port Kembla, AIE, includes gas to power)
- Indonesia
 - PT Jawa Satu Power, Integrated FSRU / Gas power plant (1.7 GW)
 - Construction started end of 2018, completion expected end 2021
- Philippines
 - Native gas production in decline, want to have import facility before Malampaya depleted
 - Batanga onshore terminal to provide gas to existing power stations (up to 5GW)
- Thailand
 - EGAT FSRU proposal on hold(?)

- Thi Vai LNG Terminal in Vietnam
 - Gas for power plant
 - Construction commenced, planned start up end 2022
- Son My LNG
- Bac Lieu LNG
 - Gas to power project (3.2GW) announced this week by LNG Ltd (Magnolia LNG yet to reach FID in Louisiana, US)



www.riscadvisory.com

Perth

Level 2
1138 Hay Street
WEST PERTH WA 6005
P. +61 8 9420 6660
F. +61 8 9420 6690
E. admin@riscadvisory.com

Brisbane

Level 10
239 George Street
BRISBANE QLD 4000
P. +61 7 3025 3397
F. +61 7 3188 5777
E. admin@riscadvisory.com

London

4th floor Rex House
10 Regent Street
LONDON UK SW1Y 4PE
P. +44 203 356 2960
F. +44 203 356 2701
E. admin@riscadvisory.com

Dubai

Suite 503, Shangri La Offices
Sheikh Zayed Road
DUBAI UAE
P. +971 4 401 9875
F. +61 8 9420 6690
E. admin@riscadvisory.com

South East Asia

Jakarta
Indonesia
P. +61 8 9420 6660
F. +61 8 9420 6690
E. admin@riscadvisory.com