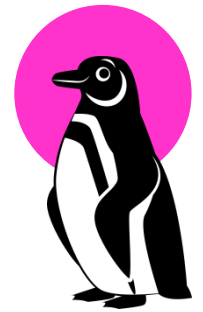


# Implications of FLNG

## Is the future floating?

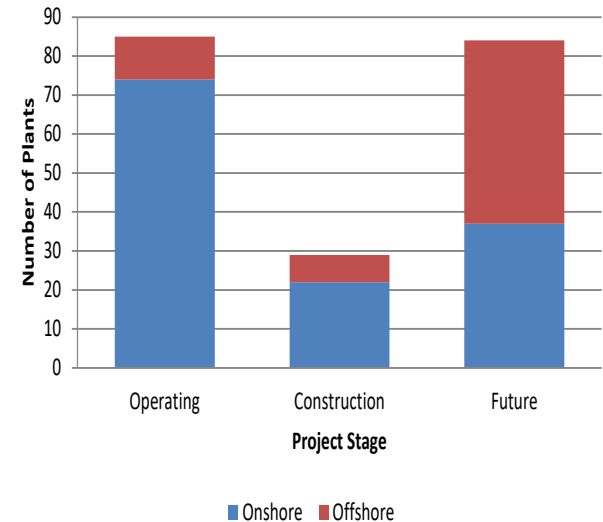


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# The success of FSRUs

- Most new import terminals are floating
- Why?
  - Speed to market improved (2-3 years vs 4-5)
  - Creditworthiness – less gold plated clients
  - Access to finance – leasing options
  - Uncertainty – do customers know what they want?
  - Standardised product – relocatable at end of charter
  - Charter periods reducing – secondary market embryonic
- FSRUs 10 years from first charter to market dominance



# Demand is changing

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- Who is buying?
  - China and India – both more price sensitive than traditional buyers
  - Developing markets primarily in SE Asia and Africa
- Uncertainty in volumes and timescales
- FSRUs are great (more buyers) for LNG but also bad (apparent flexibility)
  - If you don't know what you want because it's a new market why buy long term when spot is available?
- **FLNG is floating why shouldn't it behave like an FSRU!**

# Liquefaction is not importation

- Much more capital intensive
- Customisation is required
  - all fields are different – size, composition, pressures, water depths
- Locations are much more remote and vulnerable
  - No hiding in ports beside most FSRUs
- Disconnection unlikely except in extremis or at end of life
  - Tugs required
  - Lengthy process
- Regulatory issues on recovery and longevity
  - Regulator - How long can a reservoir produce?
  - Owner - How long can a reservoir economically produce?



*FLNG vs FSRU*



*No competition on complexity!*

# Implications for (F)LNG

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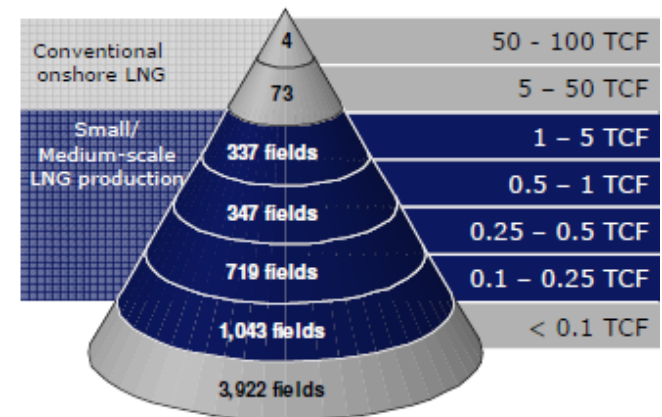
Uncertain buyers = No/few FIDs

- Bank capitalisation concerns (banking crisis) needing more certainty
- Long term project economics to base financing on increasingly challenged by FSRUs
- Need large buyers
  - intermediary role between producers and markets
- Portfolio suppliers and major traders – but how much can they buy?
- Market liquidity has increased too much and not enough



# Problems onshore

- Economies of scale required
  - Single train plants no longer possible as economies of scale are absent
  - Sites are challenging and/or very remote
- Issues:
- Who is going to buy all the LNG from multiple trains?
- Where are all the large gas fields?
  - Mozambique, Tortue..... – the list is short
- **Industry needs FLNG!**



Source: Infield

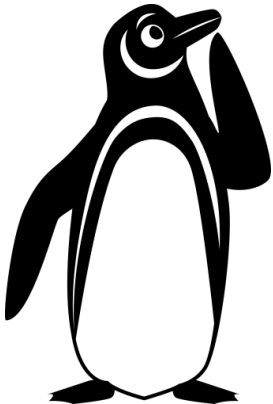
# Beware beauty contests

- “To win my project must be better than your project!”
- Seen as a capex (cost) based beauty contest - Lowest \$/tpa wins
- How far can cost reduction go?
  - Corporate governance wants more and more kit
  - IT developments provide hope of savings
- Track record, terms and conditions and charisma also play a part
  - certainty of costs and schedule are important
  - This will be a long term contract (relationship)



# Moving to FLNG

- FLNG is fundamentally less good than onshore liquefaction BUT it is more economic and provides more opportunities
- Fundamental issues
  - Space limited on FLNG
  - Movement of vessel
- Stranded gas monetisation of smaller fields further from infrastructure in more hostile conditions becoming much more important - only FLNG can make these economic
- Yard built FLNG standardises costs and quality but business embryonic so contingencies are high
- FLNG is relocatable but difficult for FPSOs - FLNG not likely to be different





# Is FLNG working?

- Many rumours – few facts
- Too early to tell
- Big beasts should perform
  - PFLNG1 ?
  - Prelude commissioning
- What about others?
  - Cameroon?



# Prelude or GoLNG?

- What is the future model for the industry?
- Industry wants Prelude but can probably only afford GoLNG
- Can we learn from FPSO experience?
  - Purpose built, IOC/NOC owned FPSOs are complex and expensive
  - Simple, oil tanker conversion, leased FPSOs often preferred



# Squaring a circle

- Shipyards build “standard” ships well and at low costs
- There is a premium for “upstream” projects
  - Risk is in the topsides – it changes and may affect the hull design



- Need to build standard FLNGs - ship yard model
  - “Design one build many” (Prelude)
  - Flex LNG model – liquefaction is standard, change the front end to suit
  - Standard FLNG (GoLNG) means some capital is not utilised
- Can impacts of temperature and wave climate – be standardised?
- How much additional equipment is allowed for gas processing?
- Customisation appears inevitable
- How much can you change before “standard” falls apart?
- Will standard FLNGs work economically in enough scenarios?

# Conclusions



- Is the future floating – probably
- But we are not ready yet
- Is 10 years (FSRUs) enough?
- Probably

- We want an “Amazon” LNG model?
- Delivery of what I want when I want
- We like the cost competition that Amazon brings
- This means someone else takes all the risk and most of it is not priced in



- Remember Christmas – even Amazon has limitations!



# Thank you for your attention

David Haynes  
Penguin Energy Consultants Ltd

*Phone +44 7707 501860*

*Email [penguinenergyconsultants@gmail.com](mailto:penguinenergyconsultants@gmail.com)*

