



# Can FLNG open up new or niche markets?

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## Introduction

To answer the question:

**Can FLNG open up new and niche markets?**

We are going to look at the following:

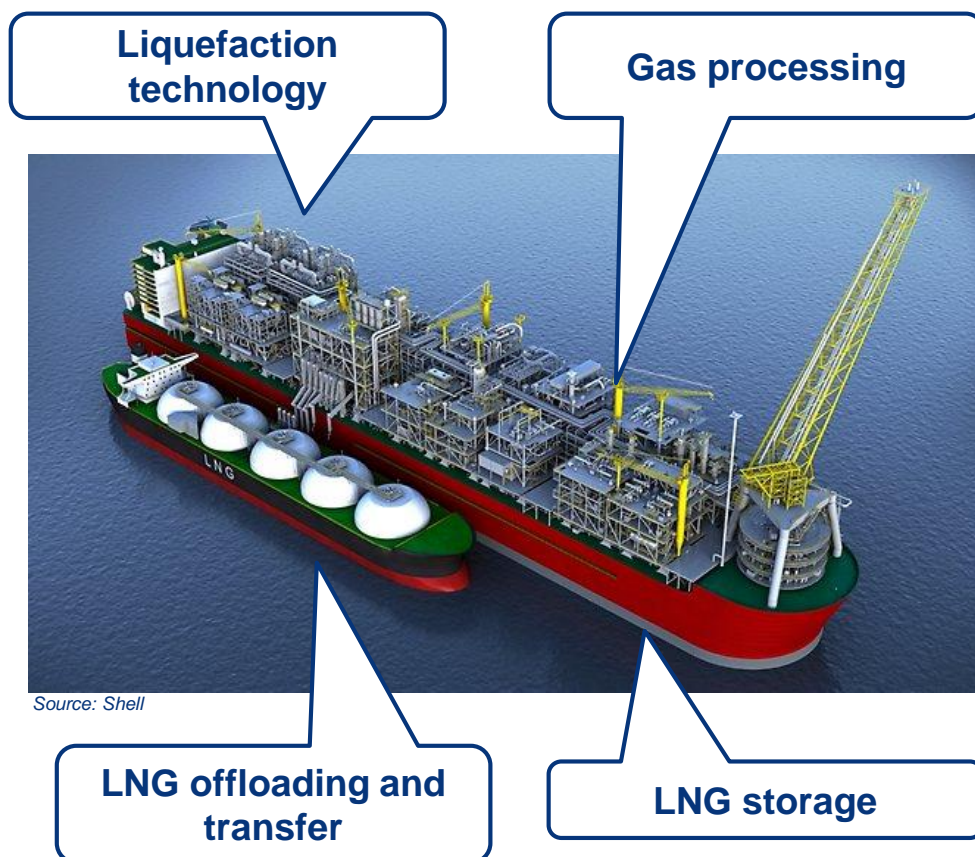
- FLNG Challenges
- FLNG Concepts
- FLNG Applications
- FLNG Success Factors



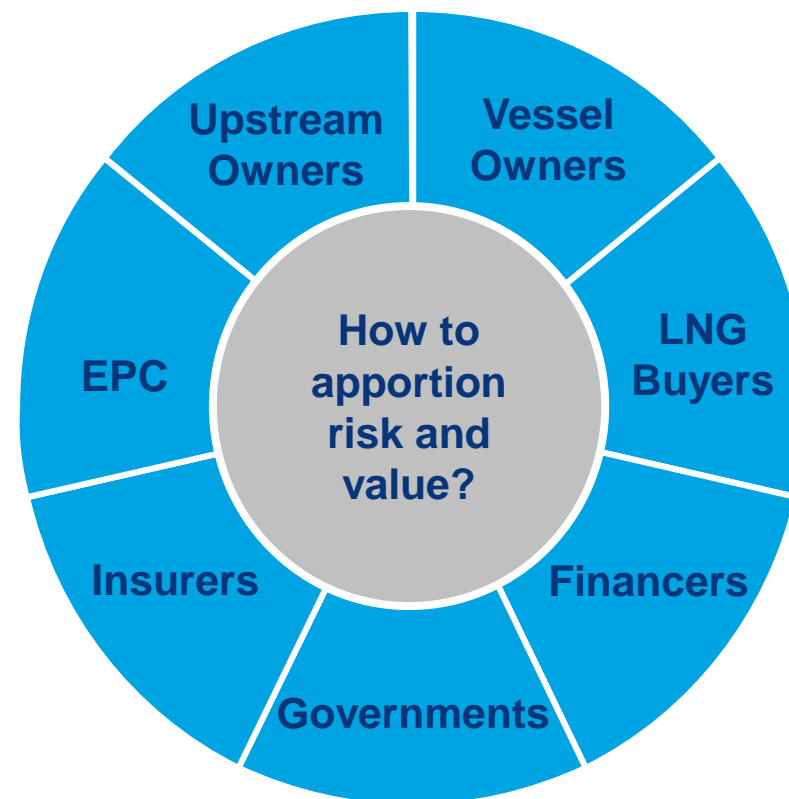
# The FLNG challenge: Limited deck space & marine conditions – uncertainty on cost, utilisation and reliability

With the concept in its infancy, finding ways to spread cost, delivery and schedule risk between project participants is key

## Technical challenges



## Commercial challenges







# Two distinct FLNG concepts are evolving with different strategic drivers and sponsors

1. Small-scale, barge mounted & vessel conversions for near shore/benign sea conditions
2. Open sea, new-build FLNG vessels

## 1. Near-shore/Benign Sea Condition projects

1-2+ mmtpa conversions & barges

LNG shipping companies & small upstream players



## 2. Open-sea projects

1- 8 mmtpa, new-builds

Highly capitalised, integrated companies



HÖEGH LNG



EXMAR  
LNG

Golar LNG



PERENCO



ophir  
energy plc

ONE LNG



PETRONAS





# The nine most advanced projects differ significantly in scale, scope and cost....

Onstream/Under construction    
 Pre-FID    
 Open sea /Deepwater    
 Benign sea condition / Near-shore

## Tortue FLNG:

**Capacity:** 2.3-2.5 mmtpa  
**Vessel Provider/EPC:** Black and Veatch & Keppel  
**Vessel Capex\*:** Not confirmed



## Fortuna FLNG:

**Capacity:** 2.2 mmtpa  
**Vessel Provider/EPC:** Black and Veatch & Keppel  
**Vessel Capex\*:** US\$1.5 billion



## PETRONAS FLNG 1

**Capacity:** 1.14 mmtpa  
**Vessel Provider/EPC:** Technip/DSME  
**Vessel Capex\*:** US\$2.7 billion



## PETRONAS FLNG 2

**Capacity:** 1.43 mmtpa  
**Vessel Provider/EPC:** JGC/Samsung  
**Vessel Capex\*:** US\$3.2 billion



## Delfin FLNG

**Capacity:** 3 mmtpa  
**Vessel Provider/EPC:** Black and Veatch & Keppel  
**Vessel Capex\*:** Not confirmed



## Etinde FLNG (Cameroon)

**Capacity:** 1 mmtpa  
**Vessel Provider/EPC:** JGC, SBM, CSSC  
**Vessel Capex\*:** Not confirmed



## Cameroon GoFLNG

**Capacity:** 2.2 mmtpa  
**Vessel Provider/EPC:** Black and Veatch & Keppel  
**Vessel Capex\*:** 1.2 billion



## Coral FLNG

**Capacity:** 3.4 mmtpa  
**Vessel Provider/EPC:** Samsung/JGC/Technip  
**Vessel Capex\*:** US\$5 billion



## Prelude

**Capacity:** 3.6 mmtpa  
**Vessel Provider/EPC:** Samsung/Technip  
**Vessel Capex\*:** US\$11.7 billion





.....and the drivers for pursuing FLNG at these projects have varied significantly. This reflects its numerous applications

	Proof of concept	Access to multiple resources	Smaller fields unlocked	Removes the need for pipelines to shore	Earlier cash-flow	More manageable cost risk profile
Open-sea projects	Prelude	✓		✓	✓	
	Petronas FLNG 1 & 2	✓	✓	✓		
	Coral			✓	✓	
Near-shore projects	Cameroon GoFLNG		✓	✓		
	Fortuna		✓	✓	✓	
	Tortue				✓	✓



# FLNG is changing upstream industry investment strategies in other ways too



## Exploration

Decisions on which prospects to drill will be affected



## Associated Gas

With environmental sensitivity rising FLNG can capture associated gas which might previously have been flared.





# What other factors have made FLNG projects successful?



**The right partners:**  
**Access to finance  
and reliable  
offtakers**



**Supportive Governments:**  
**Favourable regulatory  
policies to encourage  
project development**



**Innovative commercial  
structures:**  
**Risk spread across  
project participants**





## Conclusion – can FLNG open up new and niche markets?

Yes,

- There are multiple instances and applications for FLNG as a gas monetisation solution. As projects are completed, they are proving the concept, and this gives new FLNG projects momentum
- FLNG is increasingly being used by developers as a way of managing location, cost and schedule risks, which is particularly attractive in remote markets
- Permits and approval procedures can be lighter because FLNG typically has a smaller environmental footprint

*But...*



**Supportive market  
environment is critical  
for project success**

**In some locations and  
for some resources,  
onshore solutions will  
remain optimal**



# Disclaimer

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# Giles Farrer

Director, LNG and Global Gas Research

## Biography

**Giles directs Wood Mackenzie's LNG and global gas research, maintaining client relationships across the world. Having led the development of our LNG Corporate offering, Giles now manages Wood Mackenzie's LNG Service and Tool products, drawing on his nine years of experience in gas & LNG.**

His particular expertise lies in LNG supply and costs, LNG contracting and pricing, FLNG, competitor benchmarking and market analysis.

Prior to joining the LNG team in 2008, Giles worked in Wood Mackenzie's upstream group covering the Middle East and South Asia. He previously worked for Evaluate Energy in London.

Giles holds a BA in History & Politics including a final year paper on African Petroleum Economies, from the University of Exeter.

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