



HÖEGH LNG

**Höegh LNG**

**“The Floating LNG  
Company”**

***Executing a FLNG Project***

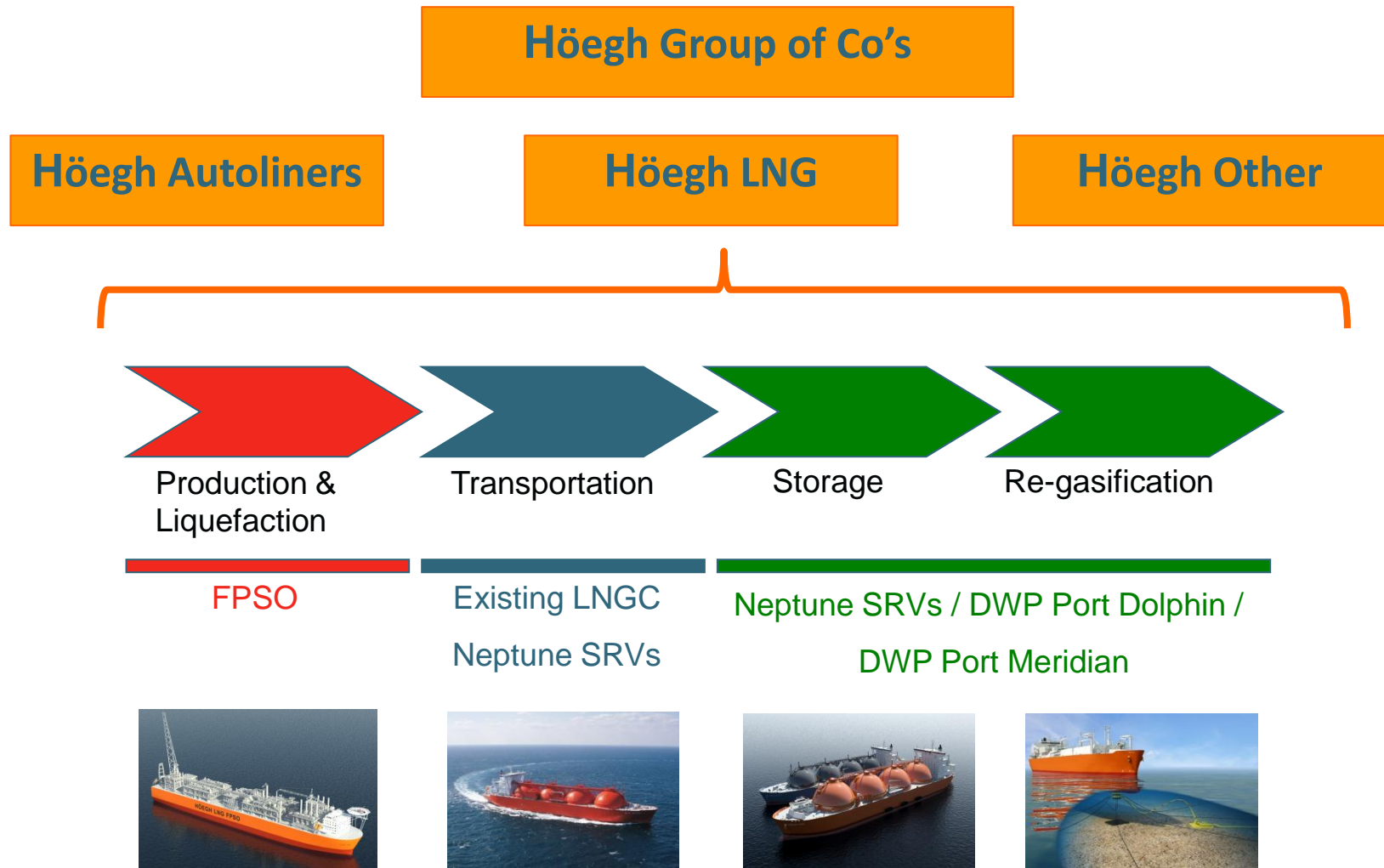
***A Service Providers Perspective***

**Society for Underwater Technology  
Perth 8<sup>th</sup> June 2011**



HÖEGH LNG

# Hoegh LNG – Background



# Höegh LNG

## A Service Provider in the full LNG value chain

Offering the value chain

### Production



### Transport



### Re-gas & Market Access



H LNG in brief

- ✓ Höegh LNG is privately owned by the Höegh family and part of large cluster of shipping and investment companies
  - ✓ The Höegh group of companies have since 1927 operated more than 360 ships
  - ✓ Höegh LNG is the world leading floating LNG operator - Unrivalled operation experience since 1973, developing an unmatched safety culture over the last 40 years
  - ✓ Höegh LNG is one of the five largest independent LNG ship operators
- ✓ Höegh LNG owns and operates total seven vessels including, two LNG re-gasification vessels. These are the most advanced LNG re-gas vessels in operation today
  - ✓ Höegh LNG is a pioneer in developing new and advanced floating LNG solutions
  - ✓ Complete LNG FPSO development covering design, construction and operation

Fleet and Customers



GDF SUEZ



GDF SUEZ

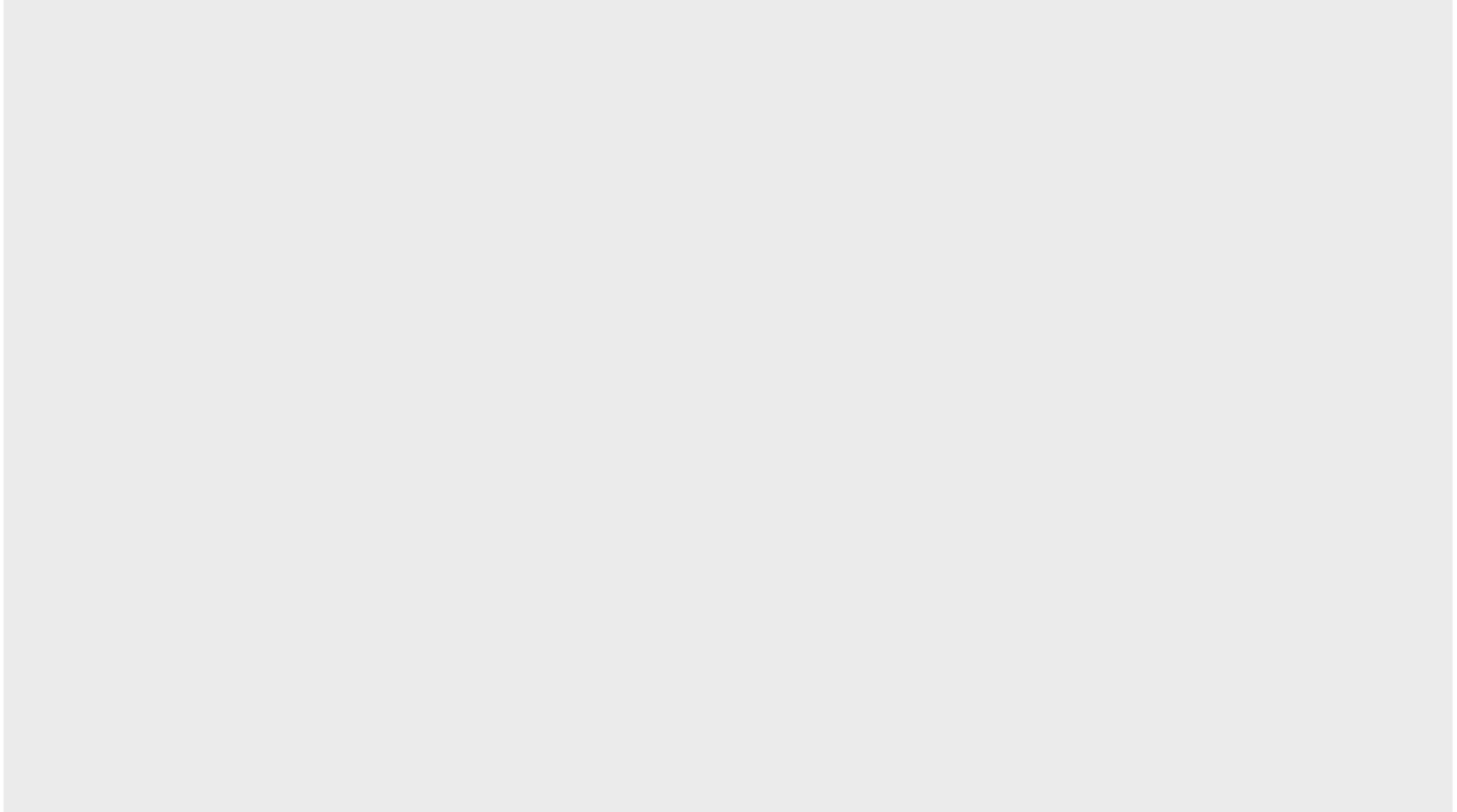


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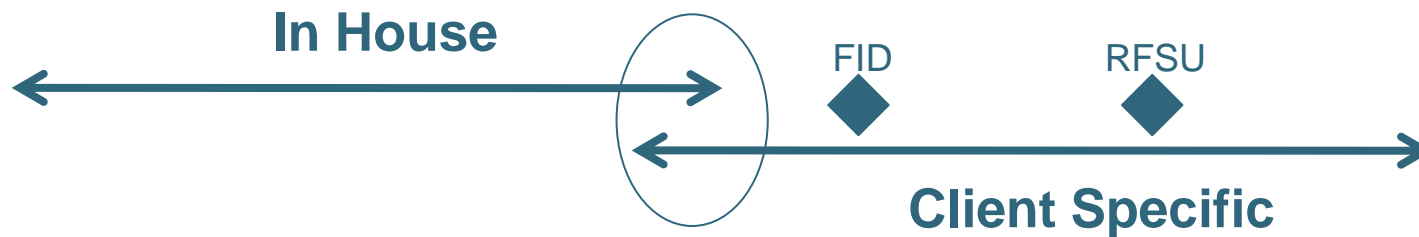
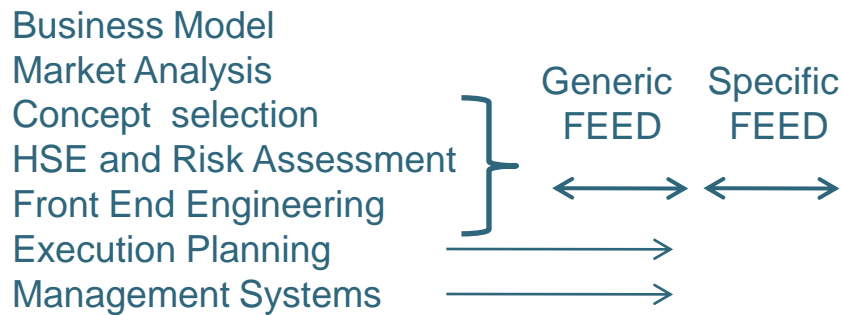


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# Hoegh FPSO, SRV, FSRU's - Video



# Hoegh LNG – Approach to FLNG

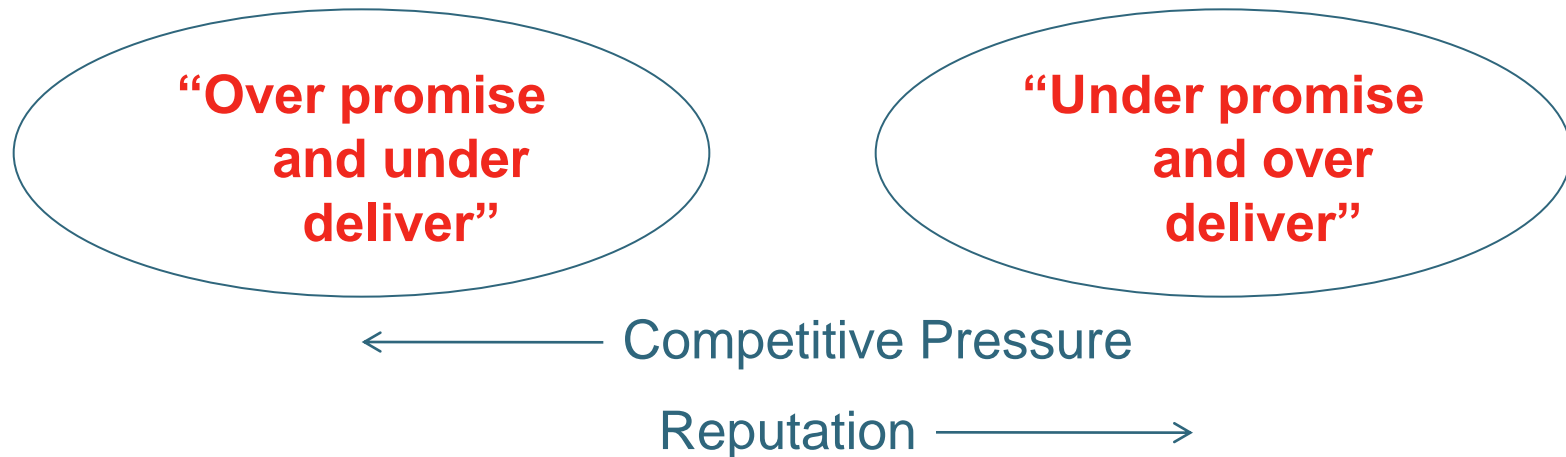


Client Fit Evaluation  
Service Contract Development

# Setting Expectations for Commercial FLNG

## The Challenge

**Setting Realistic and Achievable Expectations is not easy where there is no track record**



**Comprehensive Due Diligence** is required to determine whether the eventual delivery as promised by the salesman is likely to materialise.

# Benchmarks



Source – Woodside Energy Ltd.

- The facilities are totally different
- Business Cases involve different considerations
- Treat 'Benchmarks' with great caution
- Its largely academic

# Hoeghs 'Front End' position

- Full scope definition based on Generic FEED
- Specific concept refinement
- Numerous optimisation studies
- Comprehensive HSE, operations and maintenance considerations **incorporated into design**
- Comprehensive cost estimates based on quotations and up to date market data
- Extensive design, construction and commissioning schedule analysis
- Documented design challenge, technology qualification, independent review and risk analysis
- Owners Team in place with established Management Systems and Processes



# PNG FLNG, Papua New Guinea



HÖEGH LNG



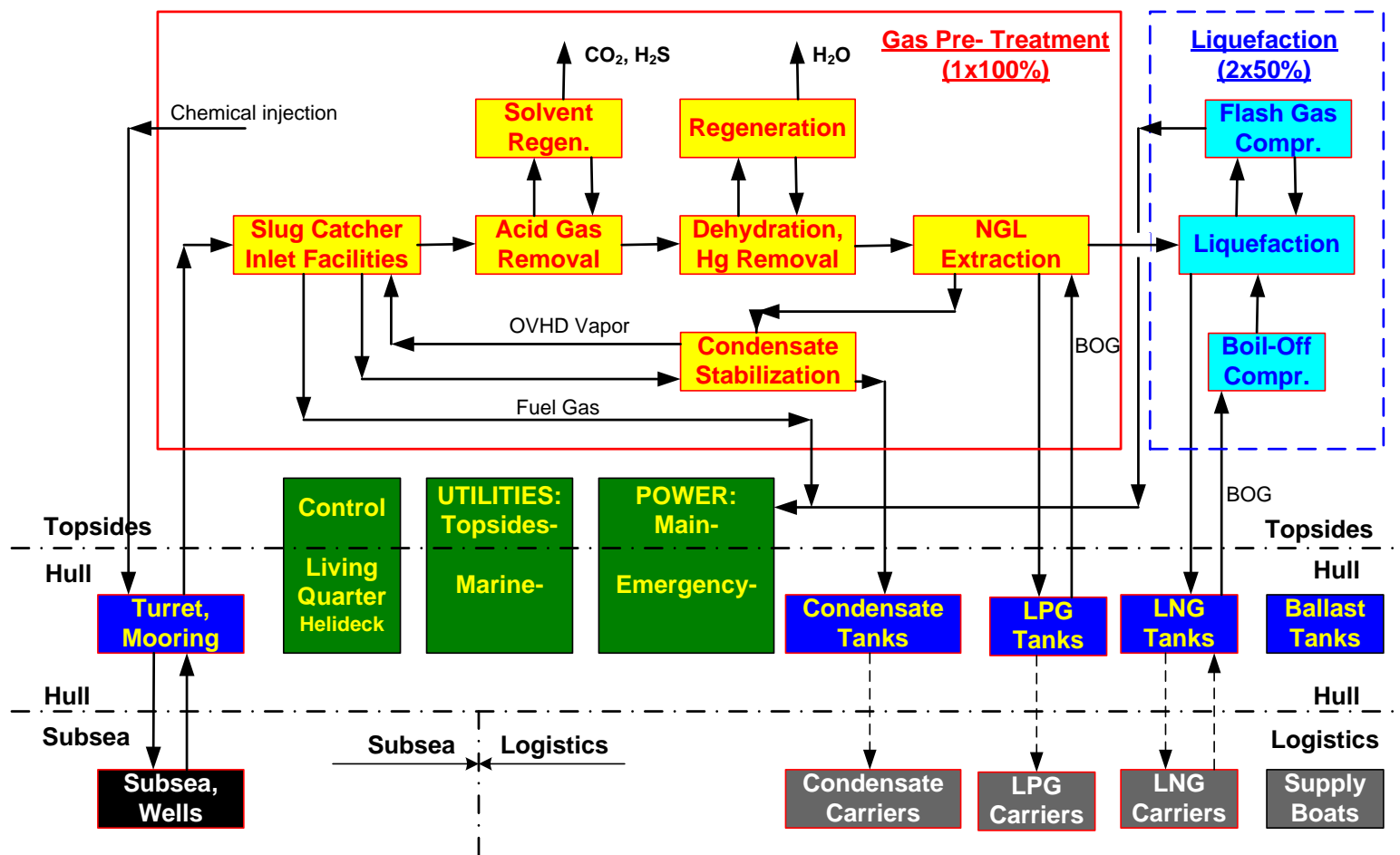
Petromin



- LNG capacity: 3 MTPA
- No. of LNG FPSOs: 1
- FID: 2012
- First LNG: 2015-16

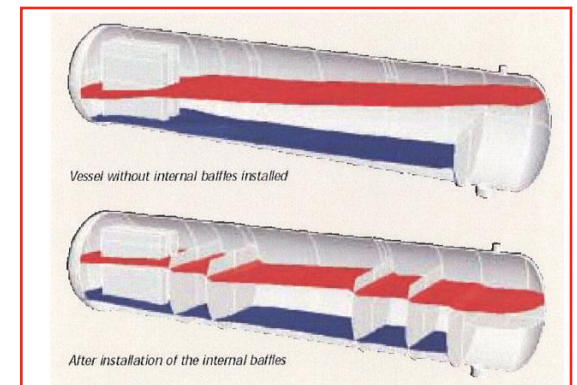


# Høegh LNG FPSO LNG FPSO Development



# Facility Design and the offshore environment

- Conventional onshore technologies and practices may not be suited to FLNG
- FLNG must cater for;
  - Marine Environment
  - Variable inlet conditions and ship motions
  - Changes in composition
  - Safety in layout and minimum hydrocarbon inventory
  - Maintenance without long shutdown periods
  - Logistic challenges
- Alternative technologies may be less efficient, but offer better uptime, less intervention and improved safety

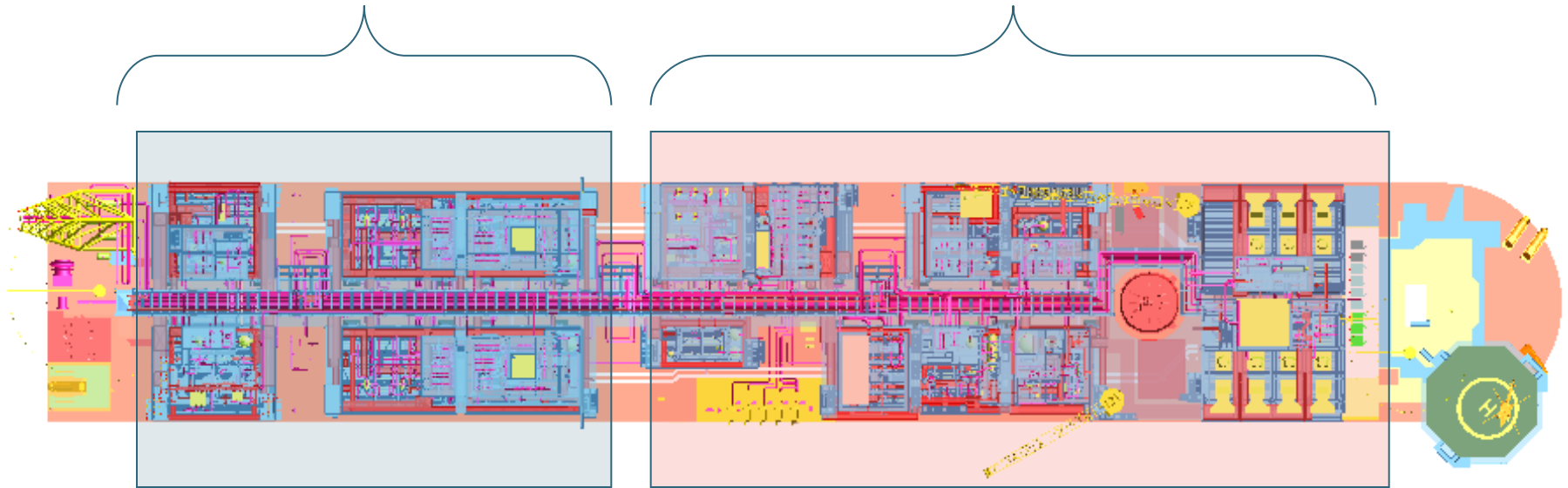


# Facility Design and the offshore environment

## Niche vs MR system comparison

Studied:  
NGL and Liquefaction  
Niche vs DMR/SMR

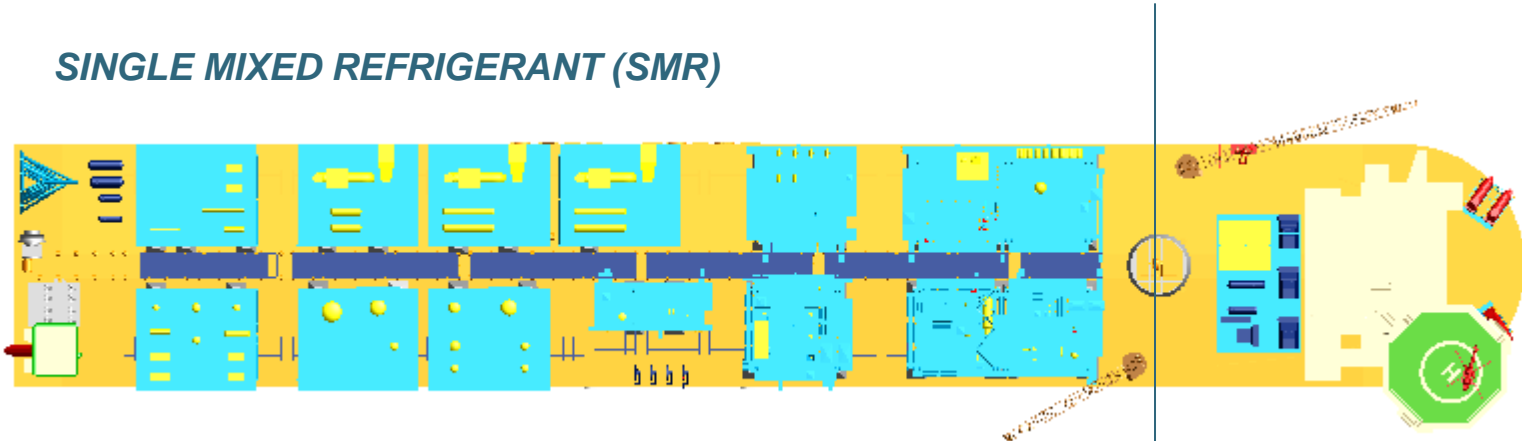
Not included in study:  
Inlet, pre- treatment; equipment sizes held constant



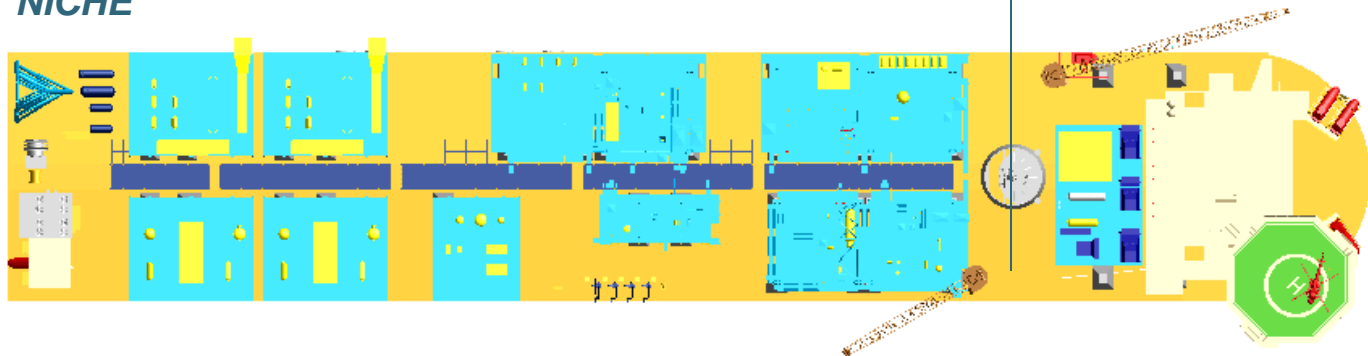
# Facility Design and the offshore environment

## Niche vs MR system comparison

*SINGLE MIXED REFRIGERANT (SMR)*



*NICHE*



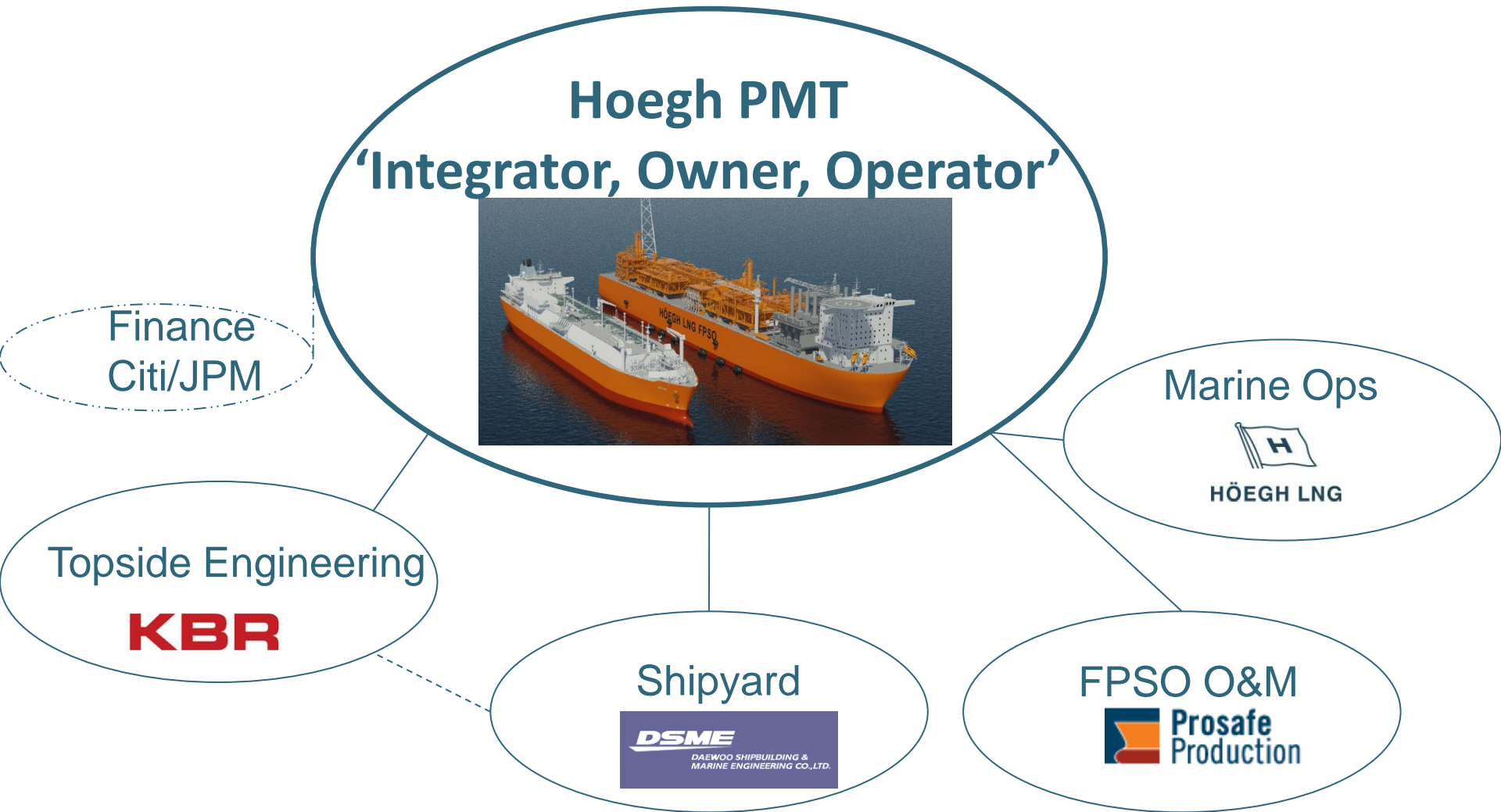
# Facility Design for the offshore environment

## Niche vs DMR system comparison

### Study Results Summary

	Niche	DMR
Design Capacity - MTPA	2.5	2.5
Vessel Length - m	350	395
Topsides Weight	Base	Base + 2205T
Topsides H/C Inventory – m3	85	450
Topsides Cost	Base	Base + \$140m
Facility Availability (RAM)	92%	90%
Shrinkage - % feedgas	11.5%	9.7%

# The Höegh Base Case Approach



# Höegh LNG FPSO A Competent Team

## Our Strengths

- ✓ Structured Approach
- ✓ Complete set of skills
- ✓ World leaders in every segment
- ✓ Unmatched experience
- ✓ Combines Marine LNG experience with FPSO experience
- ✓ Sufficient and adequate engineering capacity and competence within the same company, including reserve capacity.

1. Engineering capacity
2. Liquefaction technology
3. Cryogenics
4. Marine LNG experience
5. Offloading
6. Interfaces
7. Offshore operations
8. Offshore design
9. Process plant integrity
10. EPCIC capabilities
11. Cost & Finance

**Thank you for your attention!**



**KBR**

