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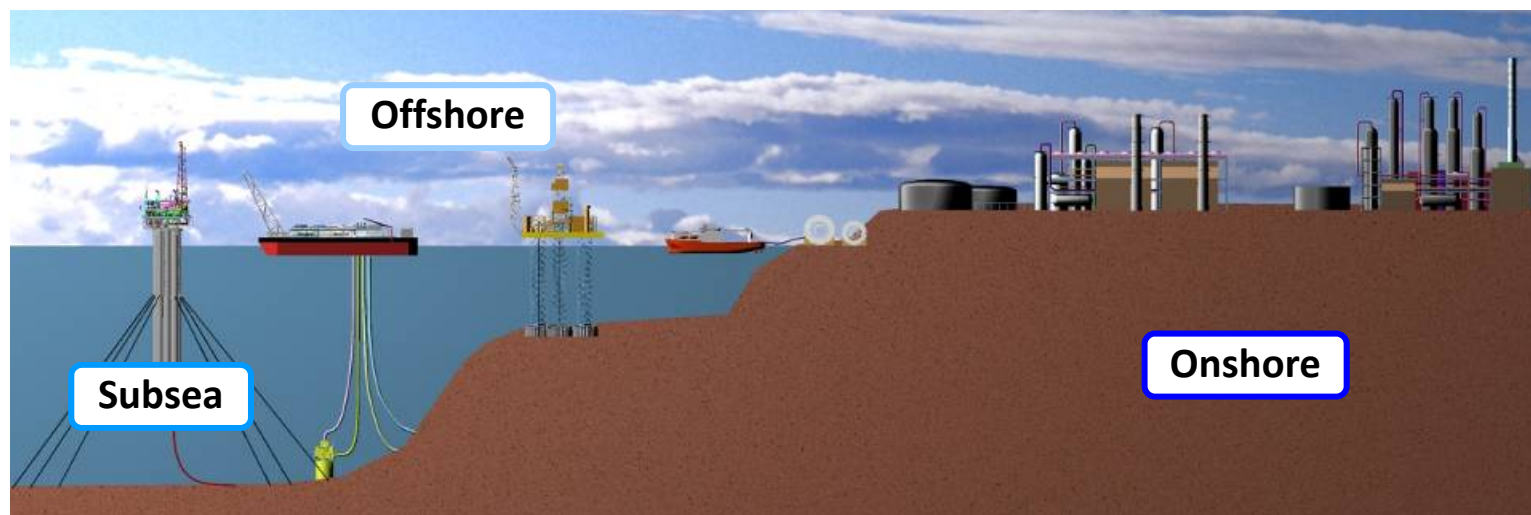


Floating Liquefied Natural Gas From Concept to Reality

Jean-Marc Letournel – VP Offshore Unit, Technip
Paris, October 2011

Technip Today

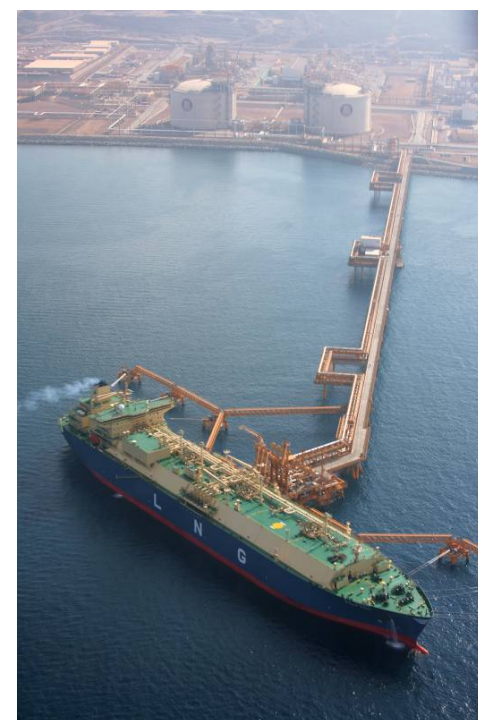
- Worldwide leader in engineering, project management and technologies, serving the oil & gas industry for more than 50 years
- A workforce of 25,000 in 48 countries
- Industrial assets on all continents, a fleet of 18 vessels
- 2010 revenue: € 6 082 million
- 2010 net income: € 417 million



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Technip – a major LNG contractor

- We built the first ever LNG Plant, 45 years ago...
- We have been active ever since
- Our projects equate to 57 Mtpa of additional LNG capacity brought on-stream in the last 5 years
- The six Qatar mega trains, Yemen LNG, Shell FLNG confirm our position in the first tier of EPC contractors in LNG



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Technip – a major subsea contractor

► Services



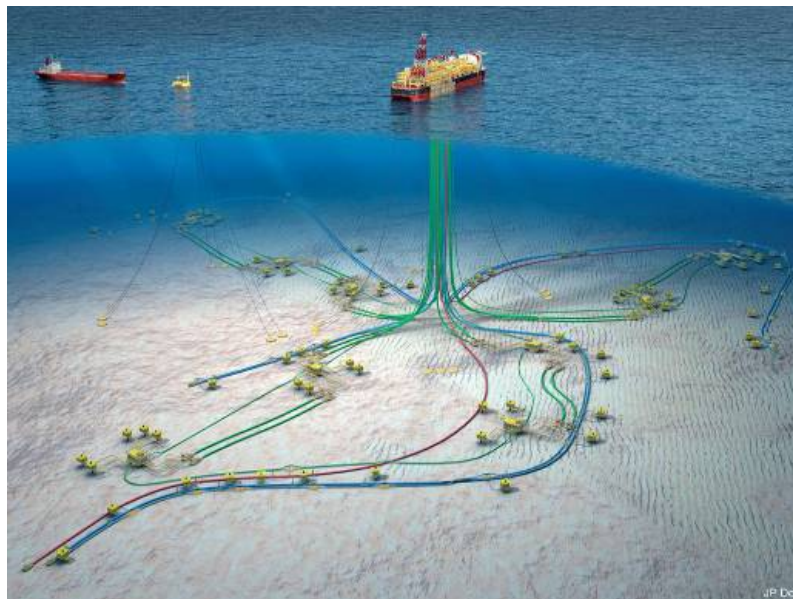
Deep water installation
& construction



Flexible/rigid pipelaying



Inspection,
Repair & Maintenance



- Vertical integration
- In-house technologies
- Worldwide leadership
- First class assets

► Products



Flexible pipe
(in house manufacturing)



Rigid pipelines



Umbilicals
(in-house manufacturing)

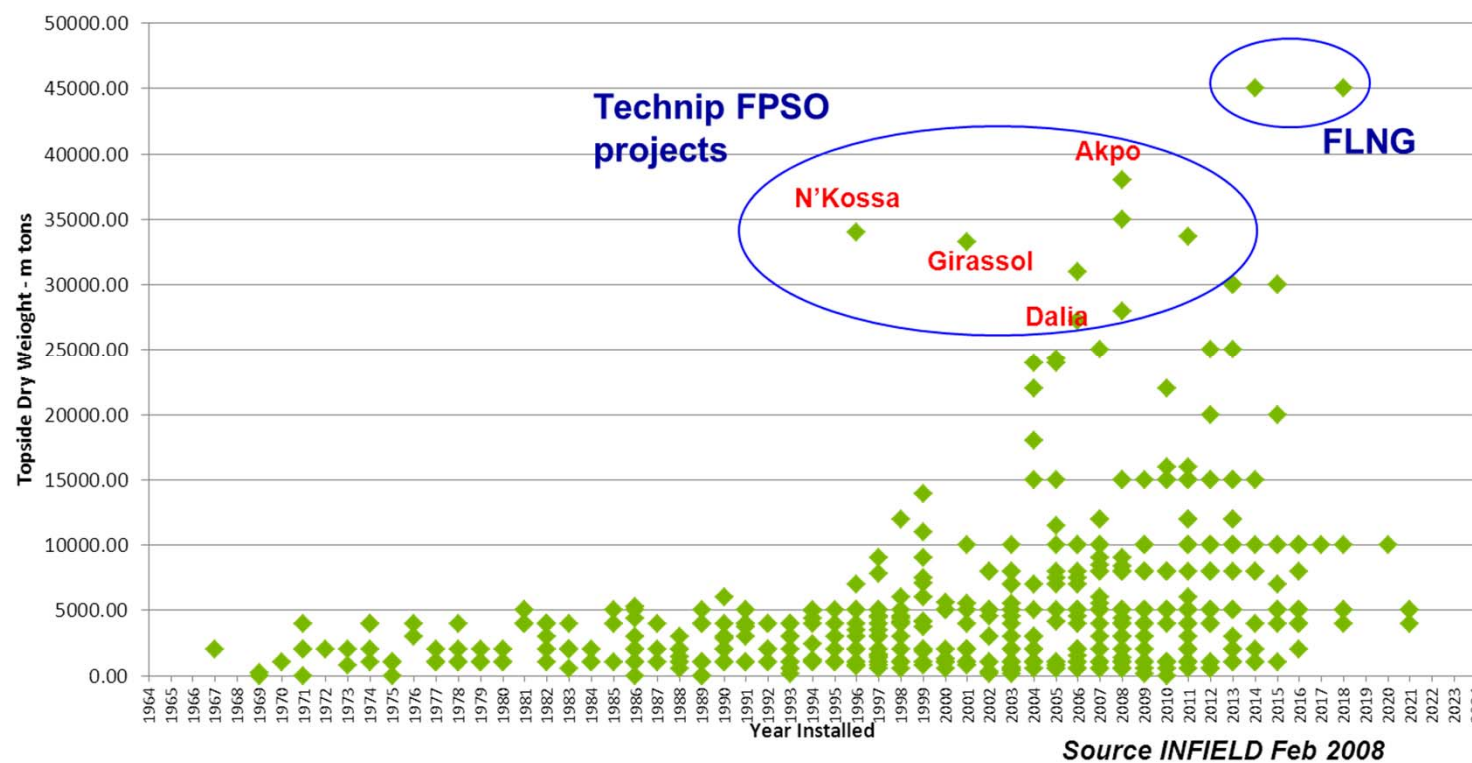


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Technip – a major FPSO contractor

FPSO's Installed or Planned



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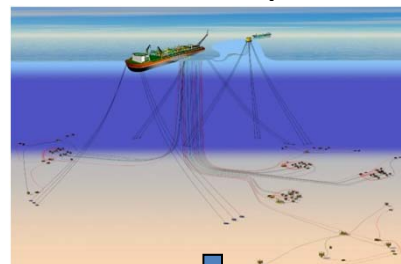
Floating Liquefied Natural Gas From Concept to Reality

FLNG is built on industrial experience.....

Natural gas liquefaction



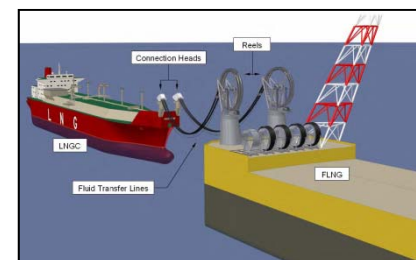
Subsea field development



Large floating oil production platforms



..and innovation in open sea LNG transfer



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FLNG: New opportunities for oil and gas producers

- Floating LNG reaching maturity
- Open sea transfer of LNG solved (e.g. Technip ALLS)
- Industry experience with large FPSO's
- Processing on moving platforms is understood
- Industrial momentum with many FLNG projects at FEED stage



Opportunity Stand-alone gas reserves

- No immediate delivery infrastructure or local market
- Insufficient reserves to support onshore LNG
- Difficulty in landing gas onshore

Opportunity Associated gas disposal

- Enable oil field developments
- Monetize gas rather than re-injection or flaring



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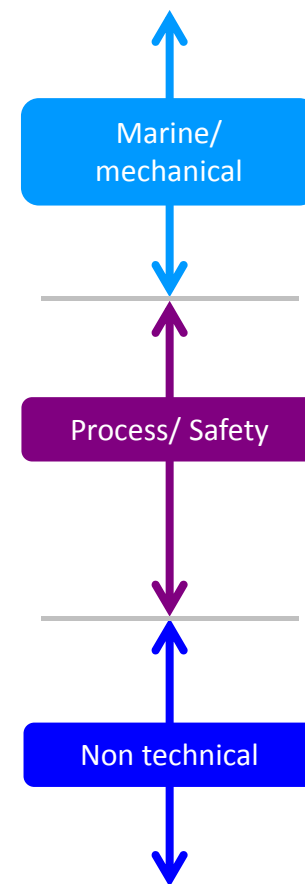


FLNG – The challenges

- LNG tank sloshing over 25 years without dry docking
- Offloading LNG between two vessels in the open sea
- Importing large quantities of HP feed gas through a swivel
- Equipment and piping loads due to motion

- Marination of gas processing facilities
 - Compact designs
 - Designing for motion
- Feed gas - Sulphur free; high methane content preferred
- Safety – escalation, cryogenic spill management

- Local content
- Synergy with domestic gas schemes (except for LPG)
- Logistics/Accommodation
- Insurance – storms, piracy
- Expansion capacity



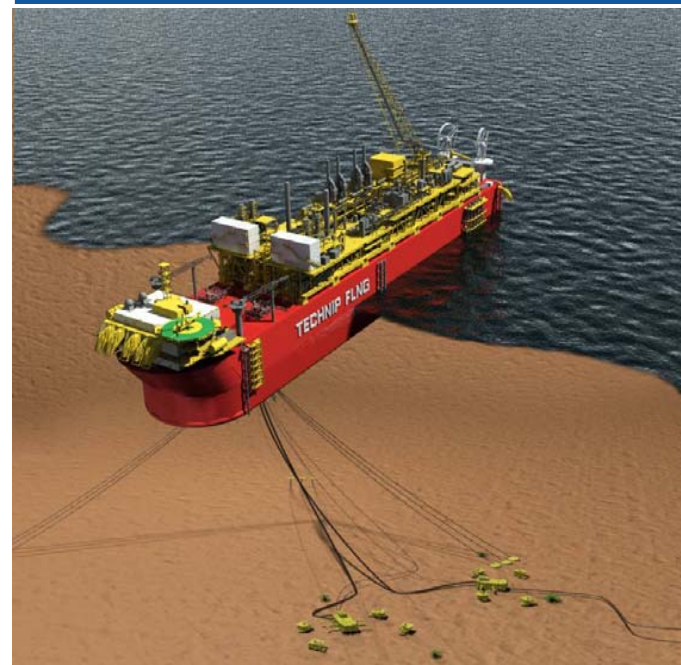
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FLNG Market Trend

- Opens up offshore gas resources once considered too remote to tap
- A significant number of small scale FLNG projects have been proposed:
 - IOC's
 - NOC's
 - Utilities companies
 - Shipping companies
- **FLNG Projects need the support of large integrated players**
 - project management and technology
 - portfolios of LNG supply
 - financial capability to keep projects on balance sheet
- **Many projects in the Conceptual/FEED stage**
- **First FID declared by Shell 20th May, 2011**

Unique Combination of Skills and Technologies



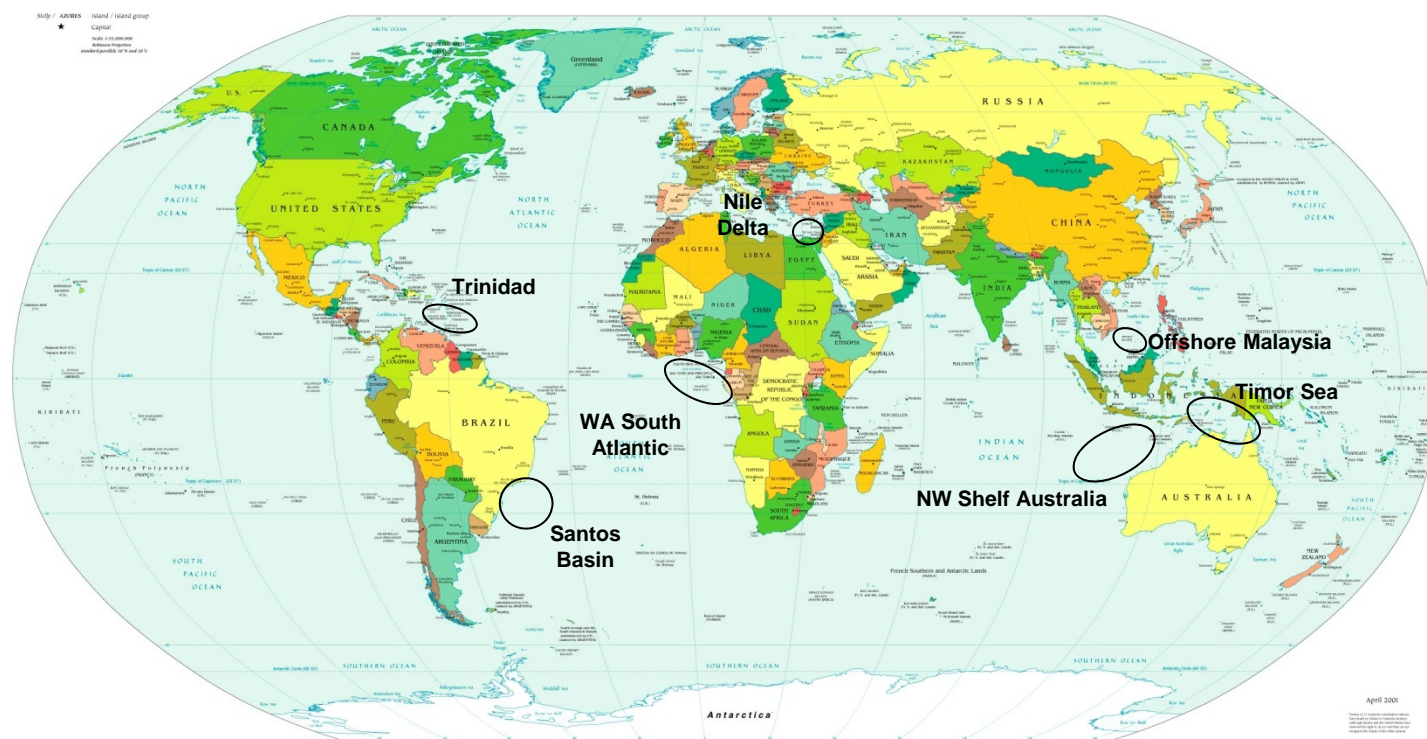
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FLNG Potential projects



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Shell Floating Liquefied Natural Gas

Technip Samsung Consortium Contracts

④ **Master Agreement** 28/07/2009

The design, construction and installation of multiple FLNG facilities over 15 years

② **Generic FLNG – FEED** 28/07/2009

④ **Prelude FLNG – FEED** 08/03/2010

Offshore Western Australia

④ **Prelude FLNG – EPCI** 08/03/2010

Contract under which the FLNG would be built when the project receives the final investment decision (FID announced 20th May 2011)



Generic FEED – finalised

Prelude – start up 2016

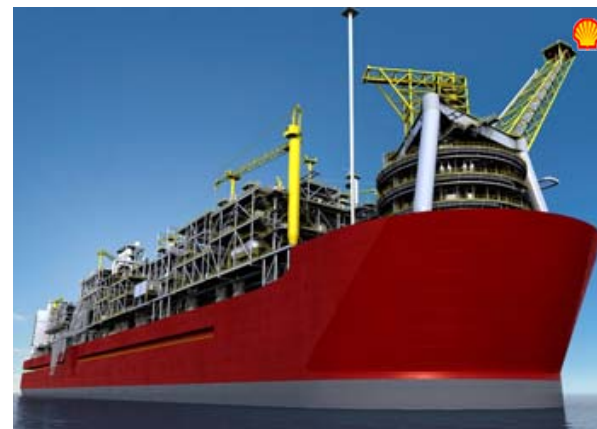
Sunrise – to come

Picture courtesy of Shell

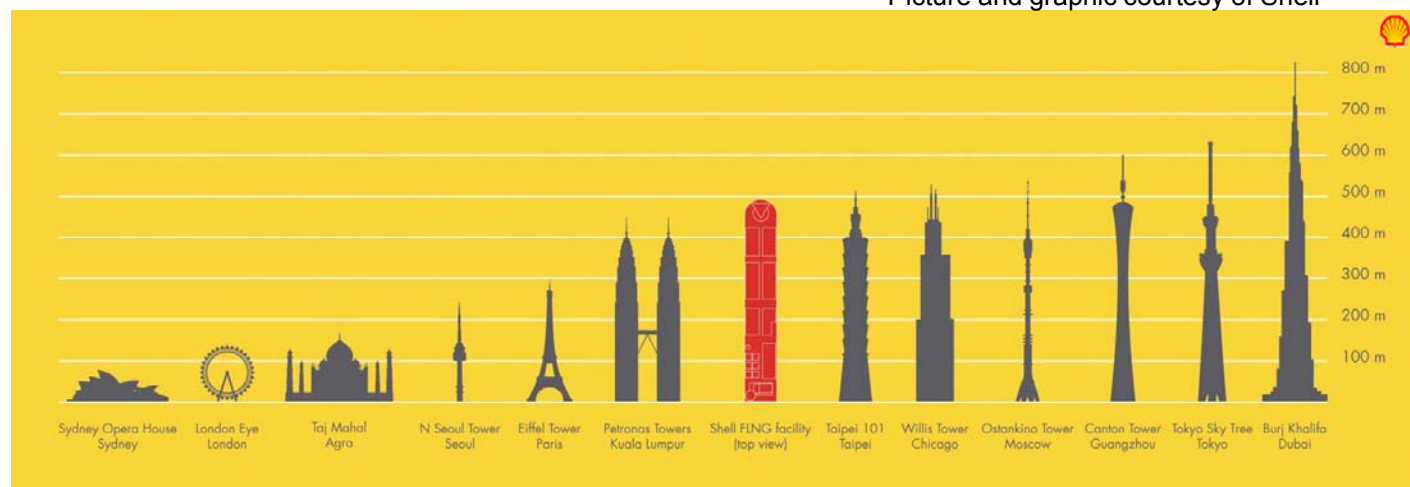
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Shell Prelude

- 488 m x 74 m
- 600 000 t displacement with tanks full
- 3.6 Mtpa LNG capacity
- 1.3 Mtpa condensate production
- 0.4 Mtpa LPG production
- Total liquid production 110 000 boe/day



Picture and graphic courtesy of Shell



Shell Prelude - Execution



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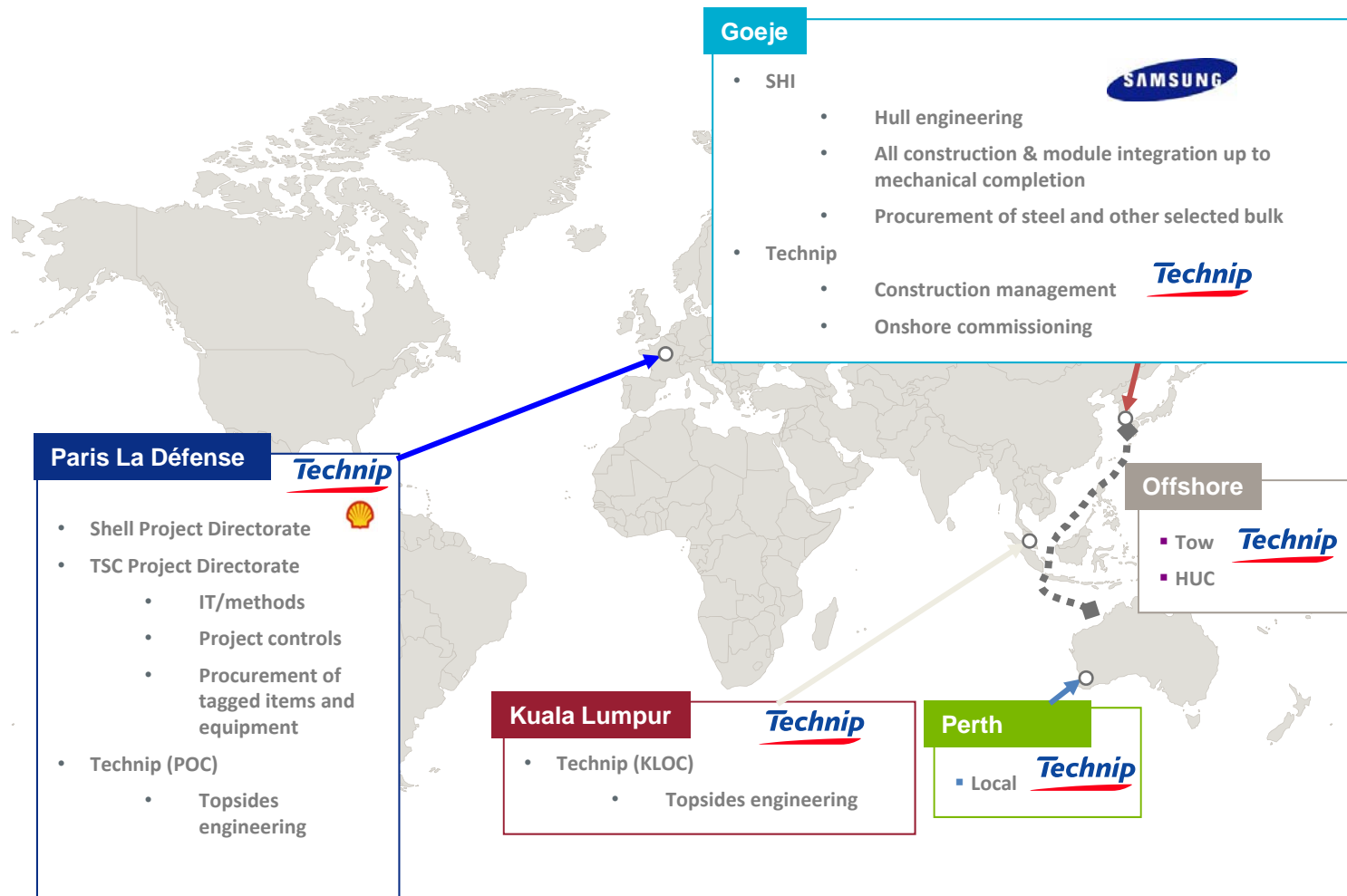
Paris



Goeje

Prelude FLNG execution

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Petrobras Pre-Salt FLNG FEED

- **Petrobras in Joint Venture with**

- BG
- Repsol
- Galp Energia

- **Technip leader of an association with JGC with Modec as TMS supplier and O&M partner**

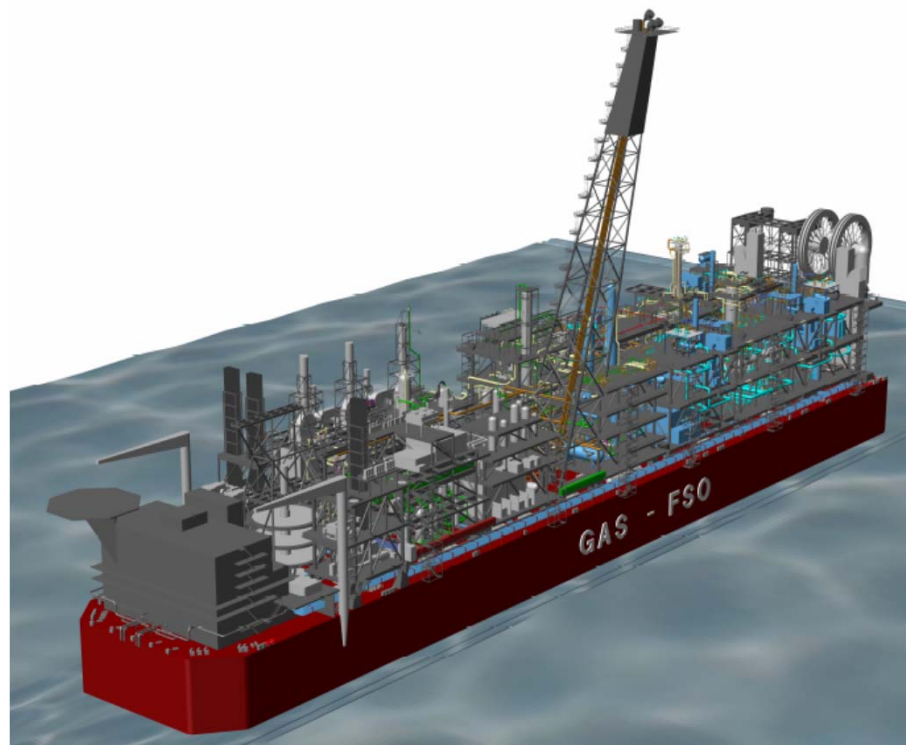
- Paris, France
- Rio de Janeiro, Brazil

- **Associated gas imported from FPSO's**

- LNG: 2.7 MTPA
- LPG: 0.7 MTPA

- **Design competition**

- FEED completed on Dec. 2010
- Proposal for EPCIC / O&M submitted



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Petronas FLNG FEED

- Client : Petronas / Misc
- Technip leader of a consortium with DSME
- FEED to be completed in Q4 2011
- Gas fields located off Sabah (Malaysia)
- Capacity 1 Mtpa LNG



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TOTAL FLNG pre-FEED

- Client : TOTAL
- Technip leader of the topside design
- Pre-FEED completed in Q4 2011
- Capacity 2.5 Mtpa LNG
- Length: 410m +
- N2 cycle



<http://www.total.com/fr/nos-energies/gaz-naturel>



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Paris, October 2011

Thank you



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