

## What are the key business development risks and mitigation strategies in a FLNG project?

- What are the key challenges ?
- What are some of the risk mitigation strategies ?
- What are some of the tools ?

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- 25+ years with Shell, ENI, Saipem, Centrica, Blue Power, Hoegh LNG, and Gas Strategies
- Advised clients on energy projects located in West, East & North Africa, South America, USA, Caribbean, Europe, Caspian, Indonesia and Australia.
- Strategy formulation, market entry plans, supply procurement, commercial negotiations
- Upstream and midstream gas/LNG/FLNG business development and commercialisation
- Gas supply planning, infrastructure development, domestic and export gas market studies
- Project contracts, sales & purchase agreements, price reviews, and dispute resolution
- Advice and implementation support focused on long term sustainable value creation
- Independent project assurance reviews and commercial due diligence
- Provision of bespoke energy training

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## Challenging and risky business environment



- Gas supply [rate, quality, flexibility]
- Resource holder [PSC, taxation, DMO]
- FLNG solution [availability, performance, maintenance]
- Environment [MetOcean, marine facilities, LNG offloading]
- Development costs [capex, opex]
- LNG commercialisation [SPA]
- Funding [equity, financing]
- Profitability [value chain, sustainability]

# Not all FLNG projects have the same risks...



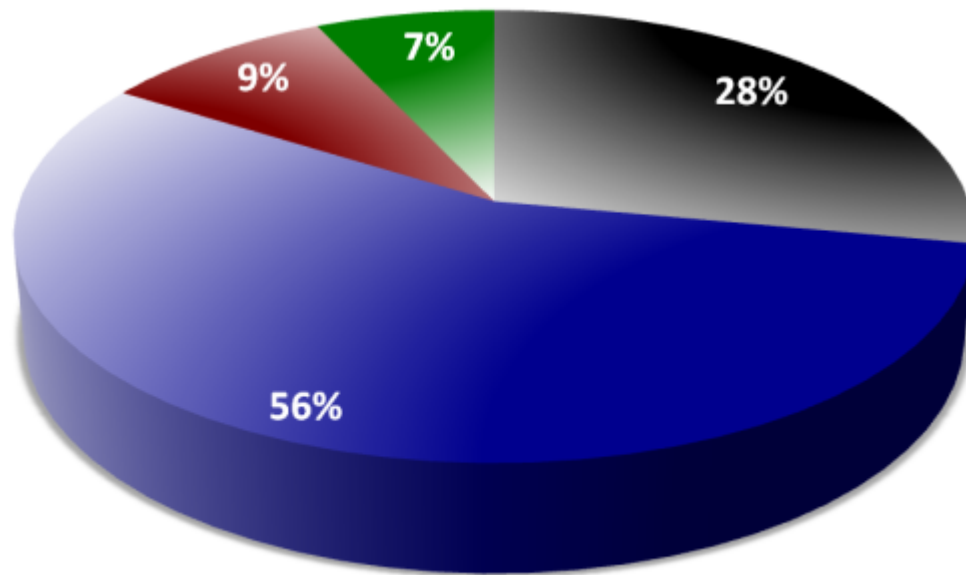
	On-shore LNG	FLNG	sFLNG
Min Size Economic Feasibility	~5 - 10 Mtpa	~2-4 Mtpa	~0.5-2.0 Mtpa
Reserve Requirement (20 years)	5 - 10 Tcf	~2 - 4 Tcf	~0.5 - 2 Tcf
Gas Supply	Upstream Portfolio (AG & NAG)	Single or Multi-field	Single
Gas Transmission System	Multi-Field System	Direct from Field(s)	Onshore or Offshore
On-Shore Facilities	Liquids, Utilities, Living, Roads, etc.	All in FPSO and/or Platform	All in Barge and/or Platform
Storage & Jetty	~2 LNG Tanks & Expensive Jetty	LNG FPSO	Barge and/or LNG Tanker
Loading / Unloading Operations	Channel Traffic, Tugs, Port Fees	Side by Side, Tandem, Flex. Hoses	Side by Side, Tandem, Flex. Hoses
Liquefaction Tech Providers	APC, CoP, Shell, Linde, Axens	APC, Shell, B&V PRICO, Linde	SMRs, Nitrogen Expander
Sponsors & Business Model	Multi-Party JV, Vertically Integrated	Multi-Party JV, New Models	Single JV, New Models
Liquefaction Service Fee	Unlikely. EPC Plant. JV Ops Control	FPSO Provider Charter & Operation	Operated/Leased or Buyer Financed
Project Permitting	Large Site, Safety Contours, NIMBY	Normal FPSO	Barge
Start-up after FID	~40 - 60 months	~48 months	~36 months
Typical \$/tonne	~ \$1,200 - \$1,800	~\$1,500	~\$700 - \$1,000

Each solution has its own requirements and benefits...  
Distinct risk profile... and mitigation strategy

Not all FLNG components have the same risks...

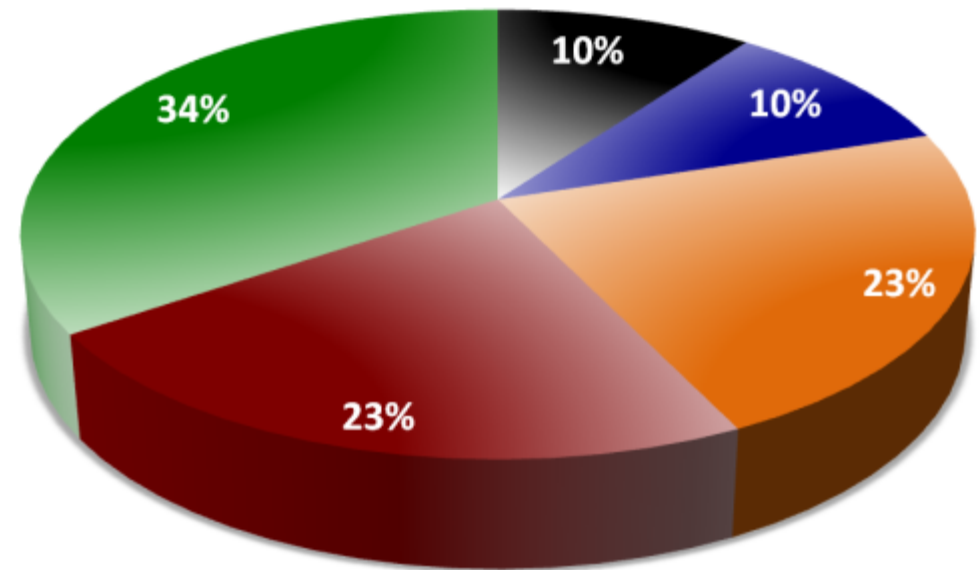


### FLNG Indicative Cost Breakdown



■ Hull ■ Topsides ■ Other ■ Integration

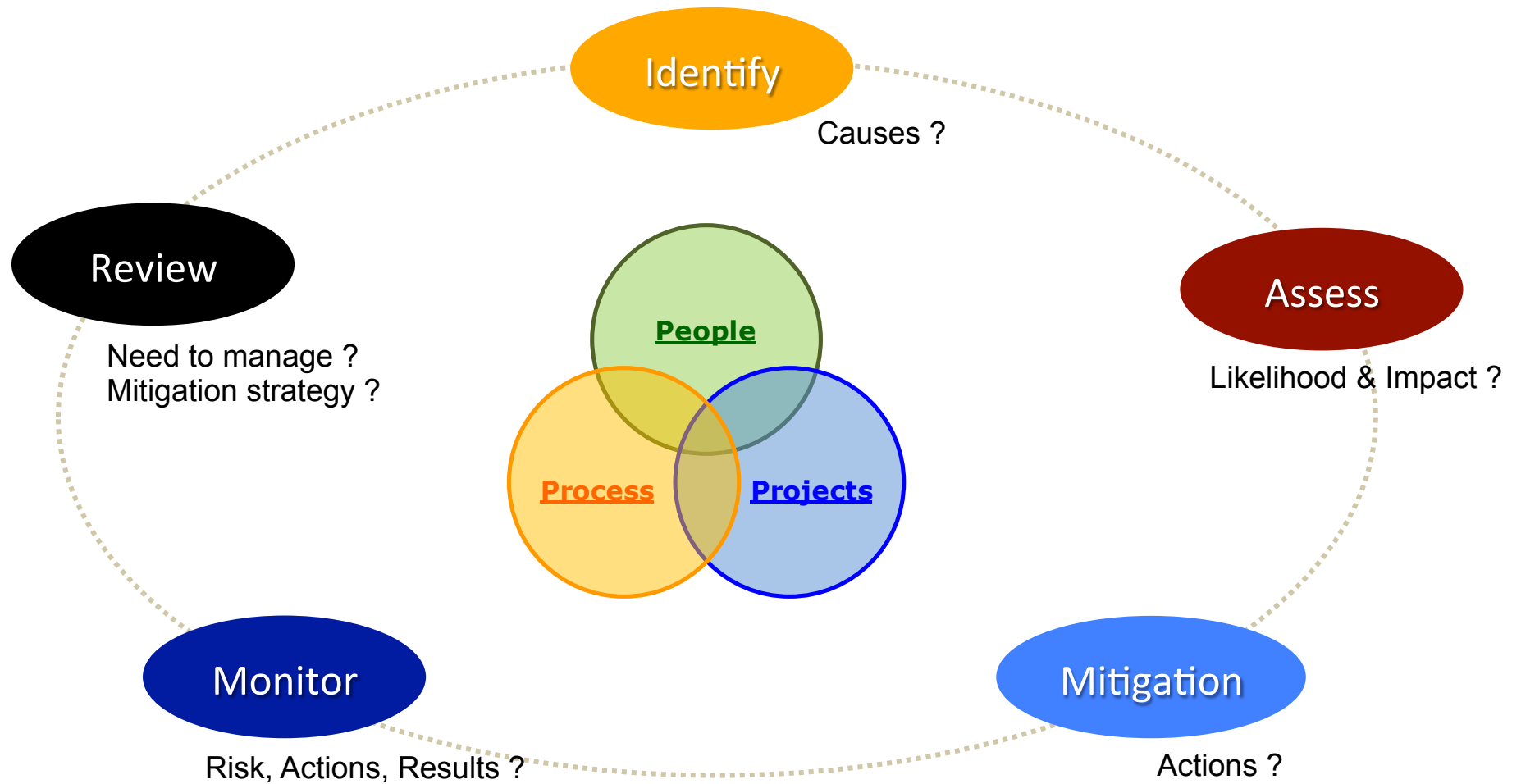
### FLNG Topside Indicative Cost Breakdown



■ Contingencies ■ Other ■ Power Generation ■ Pre-Treatment ■ Liquefaction

**Focus your risk mitigation strategy on value creation...  
or prevention of value erosion...**

# Energy Projects Risk Management Process



# Risk Prioritization, Mitigation Strategies & Tools



<b>Likelihood</b>	5 Certain	Low	Moderate	High	Extreme	Extreme
	4 Likely	Low	Moderate	High	High	Extreme
	3 Possible	Low	Moderate	Moderate	High	High
	2 Unlikely	Low	Low	Moderate	Moderate	Moderate
	1 Rare	Low	Low	Low	Low	Low
		1 Insignificant	2 Minor	3 Significant	4 Major	5 Catastrophic
		<b>Significance</b>				

## Risk Mitigation Strategies

- Avoidance
- Acceptance
- Transfer
- Control

## Risk Mitigation Tools

- Partnering
- Business Model
- Contracts

Source: ISO 31000 (2009)



# What is needed from the parties ?



## Resource Holder

- Industrial policy
- Clear regulation
- Stability of terms

## Technology Providers

- Reliability
- Commercially proven
- Performance guarantees

## Project Sponsors

- Quality front-end plan
- Resourceful business development
- Operational competence

## Finance Partners

- Transaction cost reduction
- “Fit for purpose” solutions
- Smaller, but many deals

**P R O F I T**  
**I**  
**L O S S**  
**K**

# Risk taking and management... to achieve success



***"A good player... plays where the ball is,  
and a great player... plays where the ball is going to be."***

Source: adapted from Wayne Gretzky

- Have you hugged your FLNG project sponsor today ?
- Unique FLNG solutions... distinct risk management profiles...
- Focus on value creation.... and prevention of value erosion...
- Pragmatic and continuous risk management process
- Key tools... Partnering, Business Model, Contracts
- All partners along the value chain have a key contribution to make
- To win, goals need to be scored... requiring the risk in kicking the ball
- *Doing the right innovative things = competitive advantage*

Thank You !

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