decisions with confidence

Australian LNG
State of the Nation

RISC Conversation Series

25 August 2015

Presented by Martin Wilkes

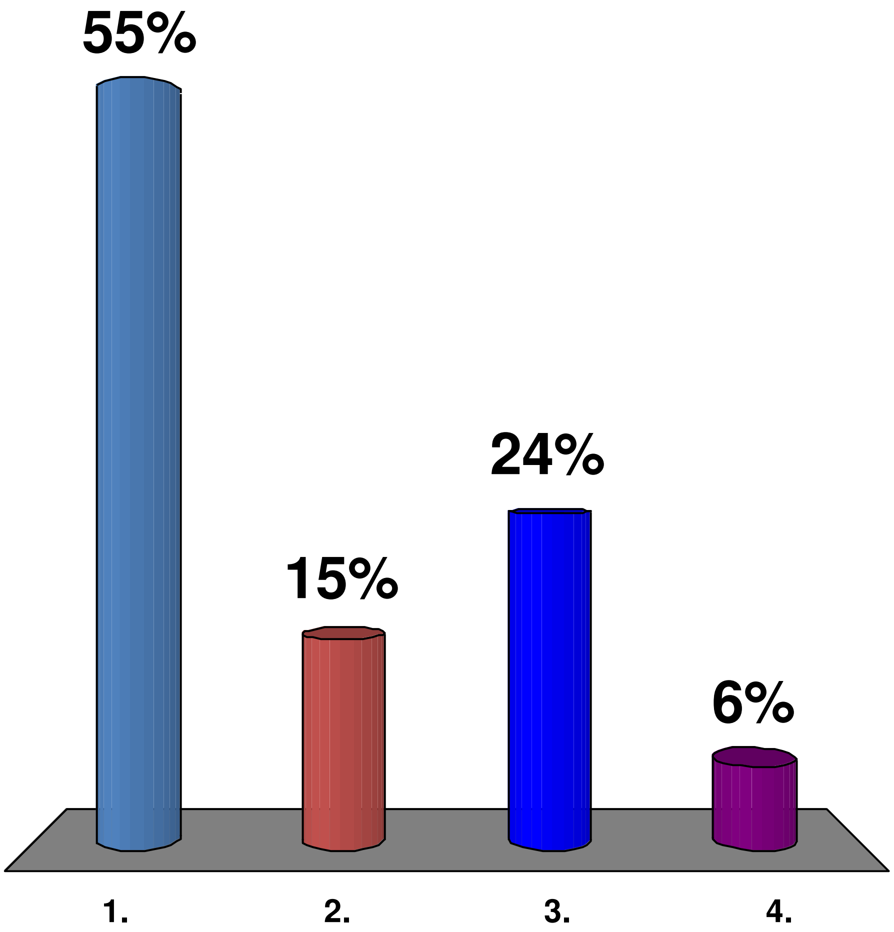
Declaration

- The statements and opinions attributable to the presenter and Resource Investment Strategy Consultants (“RISC”) in this presentation are given in good faith and in the belief that such statements are neither false nor misleading.
- In preparing this presentation the author and RISC has considered and relied solely upon information in the public domain. This information has been considered in the light of RISC’s knowledge and experience of the upstream oil and gas industry and, in some instances, our perspectives differ from many of our highly valued clients.
- In some cases the views of the author differ from other colleagues in RISC
- RISC has no pecuniary interest or professional fees receivable for the preparation of this presentation, or any other interest that could reasonably be regarded as affecting our ability to give an unbiased view.
-

Let's get to know each other

Who are you?

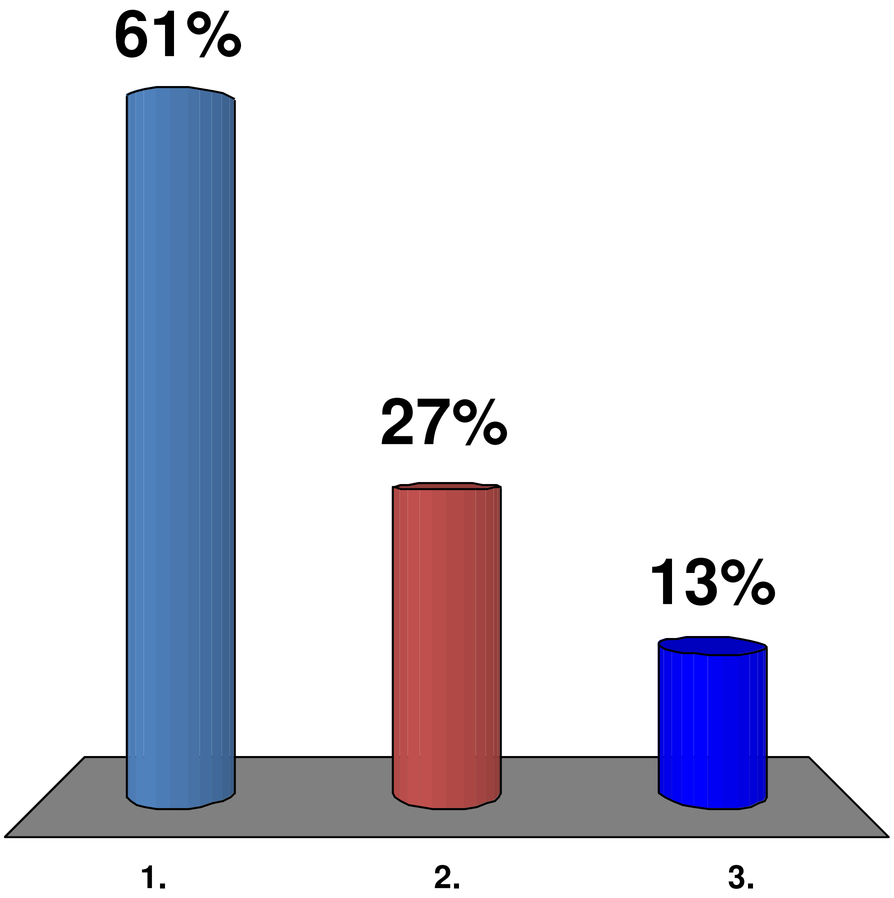
1. A student or associated with the University
2. Someone not associated with the oil and gas industry
3. Someone already working in the oil and gas industry
4. Someone associated with RISC



Let's get to know each other

What is your impression of the oil and gas industry in general?

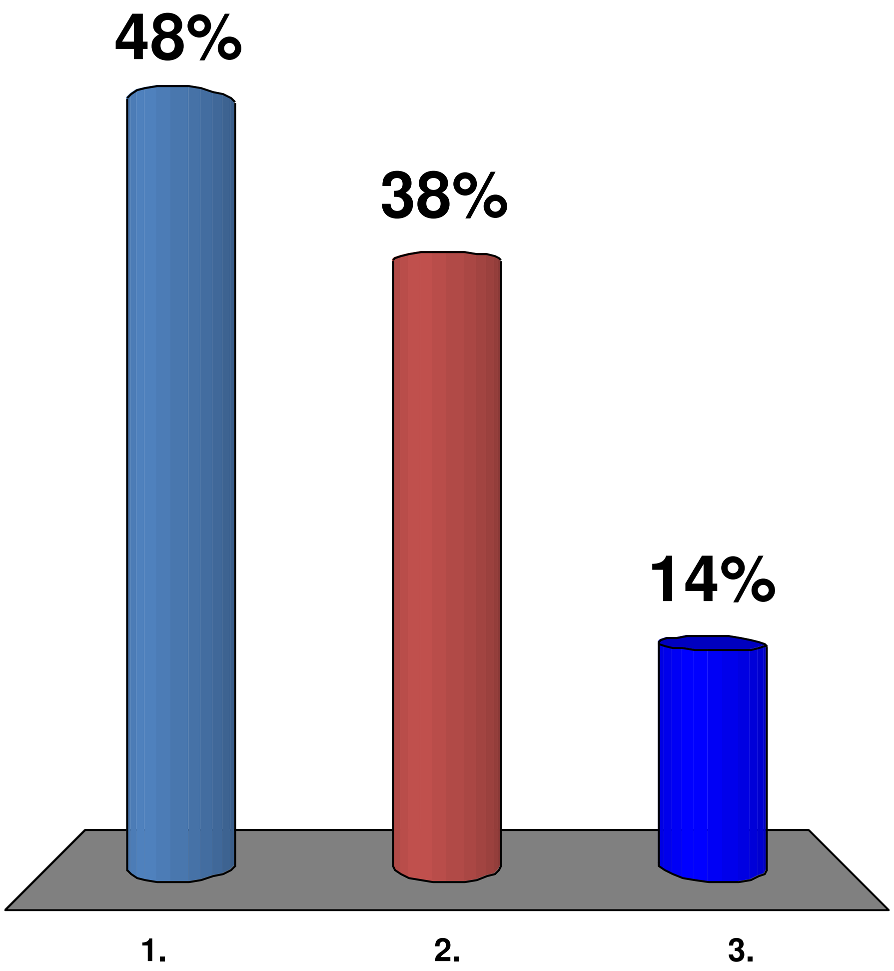
1. Favourable
2. Neutral
3. Unfavourable



Let’s get to know each other

What is your impression of the oil and gas industry in Western Australia, compared to your previous answer?

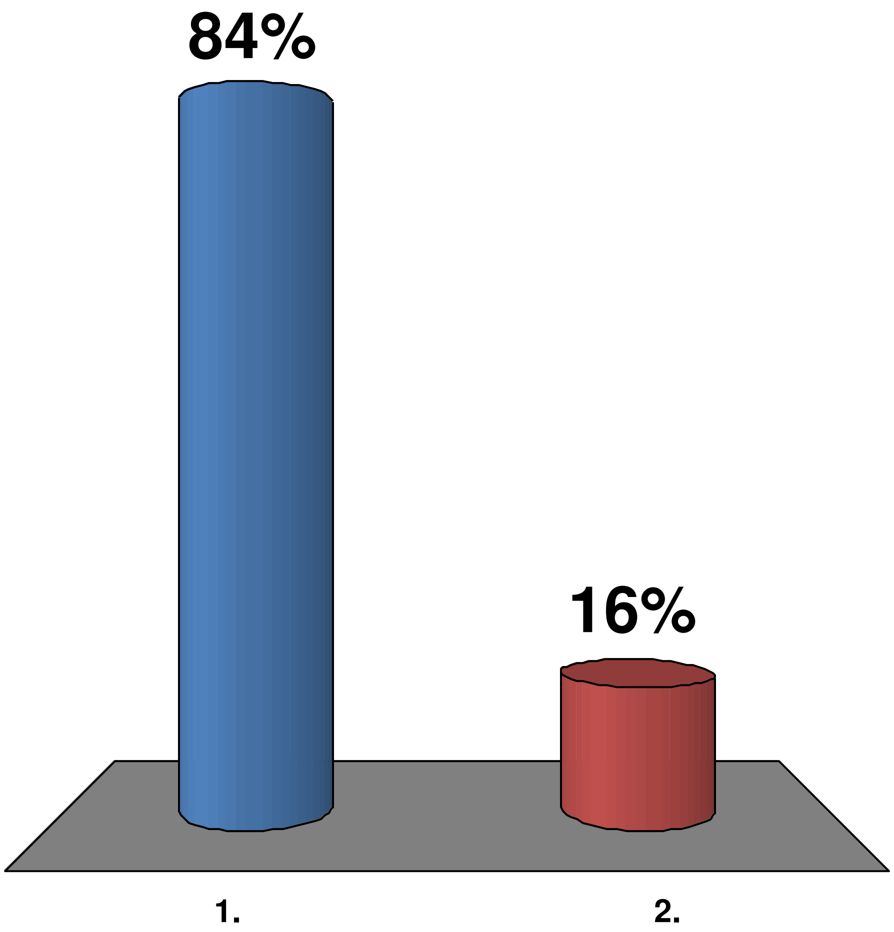
1. Better
2. The same
3. Worse



Let's get to know each other

If you are a student or someone not associated with the oil and gas industry, are you thinking of, or would you consider, working in our industry?

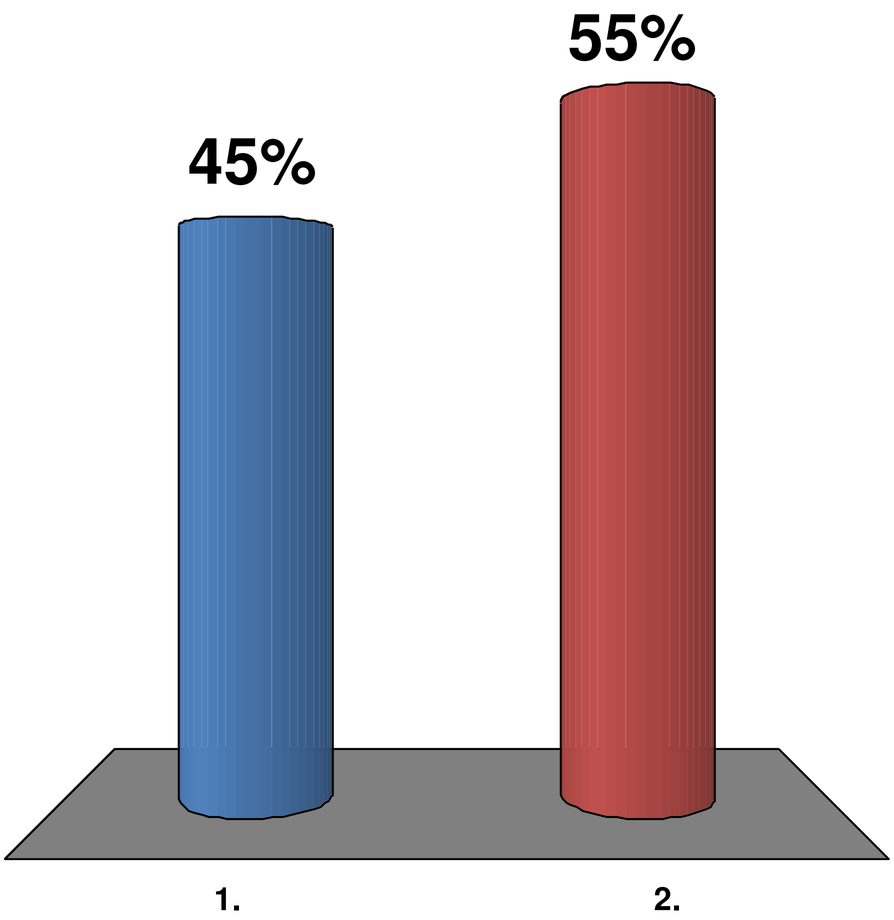
1. Yes
2. No



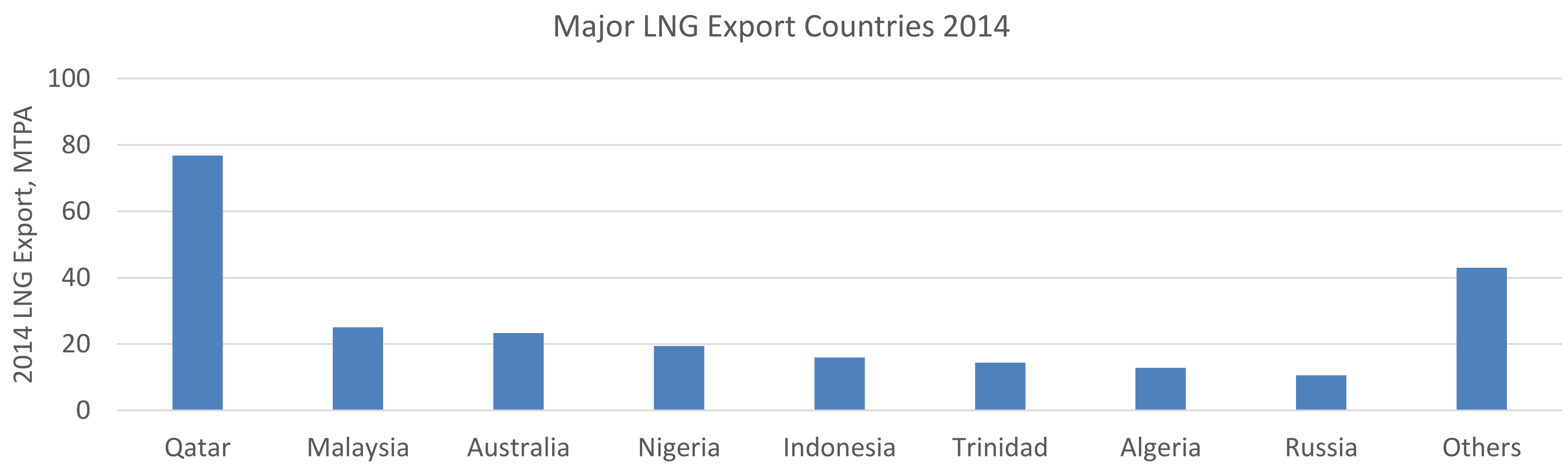
Let's get to know each other

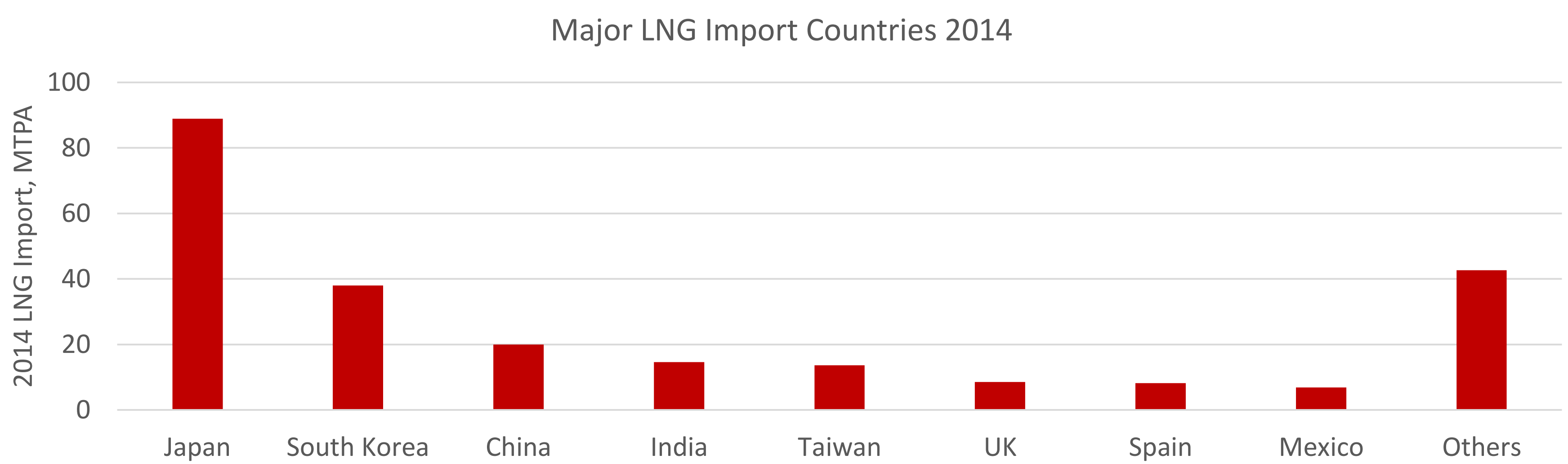
If you are a student or someone not associated with the oil and gas industry, have you heard of RISC before today?

1. Yes
2. No



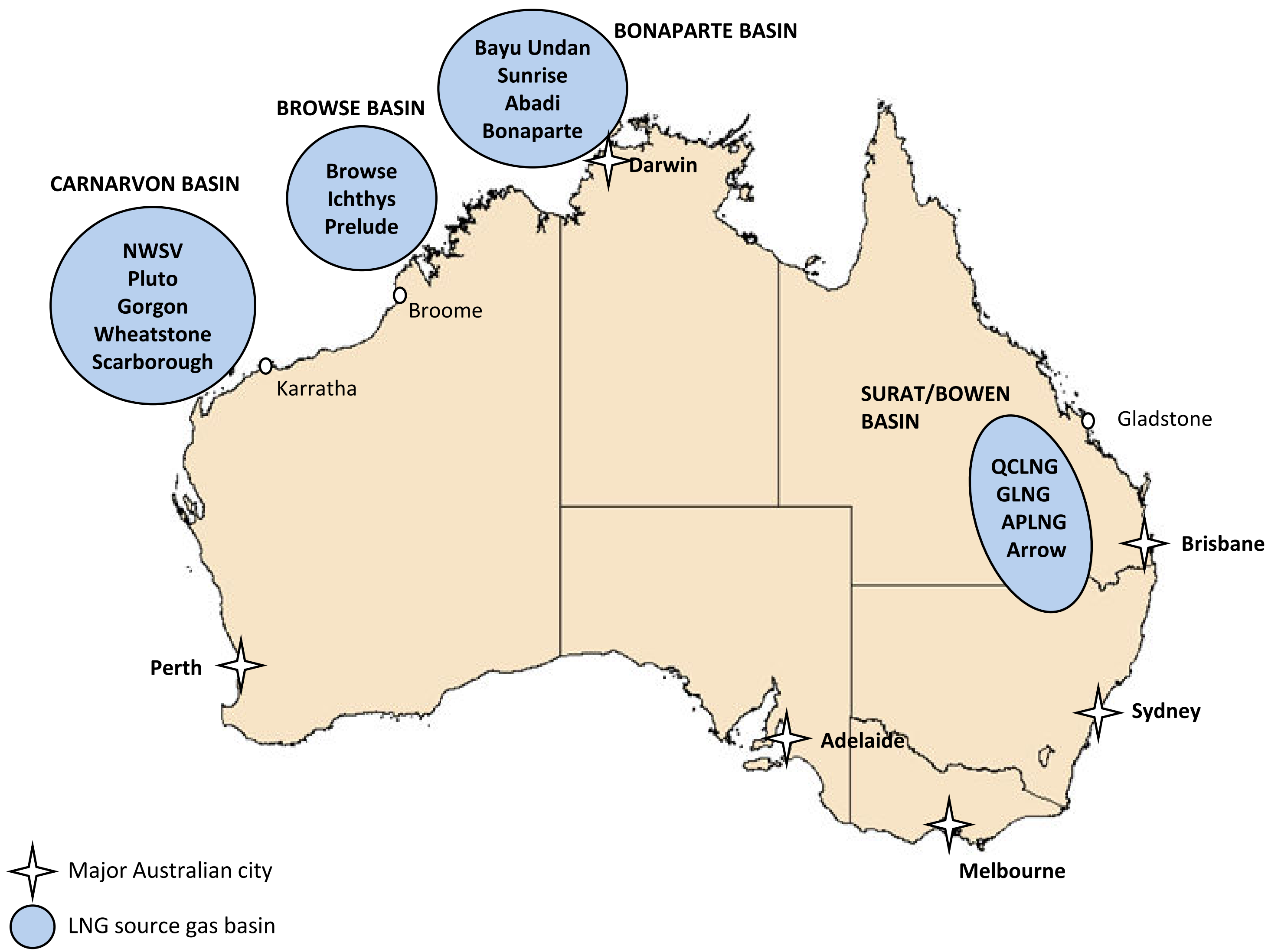
Liquefied Natural Gas





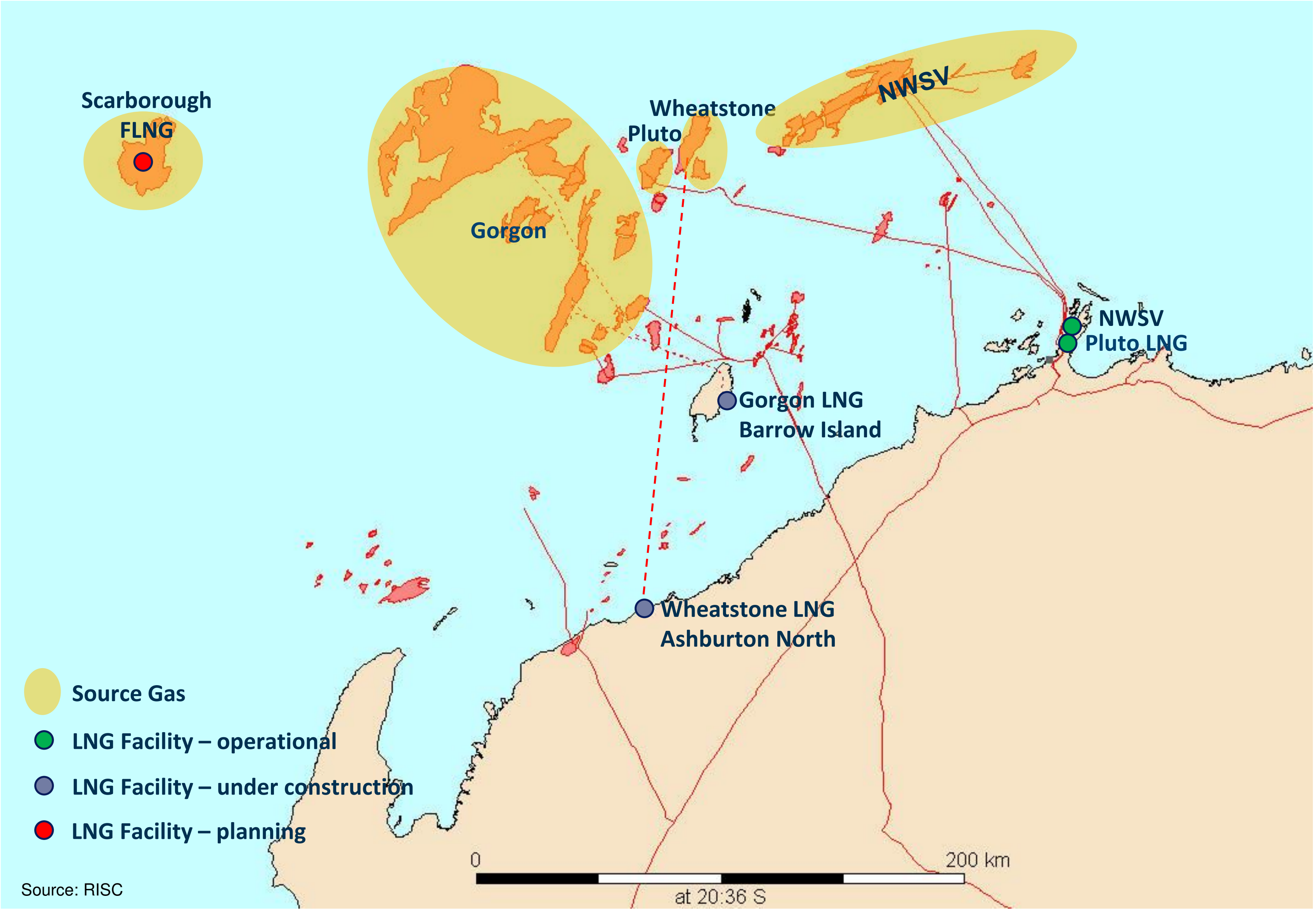
An Australian LNG Tour

Australia's LNG areas



Source: Department of Mines and Petroleum, RISC research and analysis

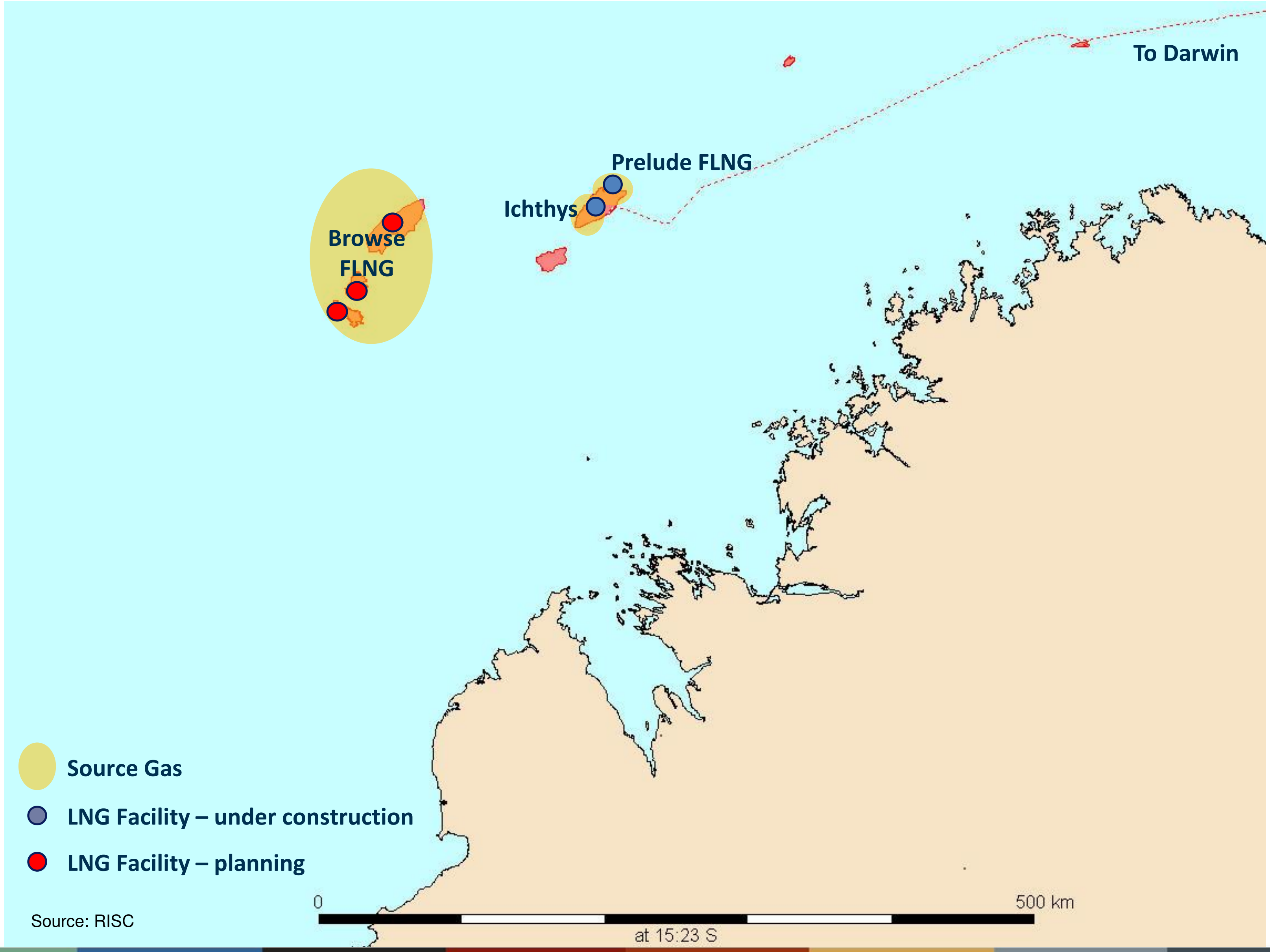
Carnarvon Basin LNG



History of Australian LNG

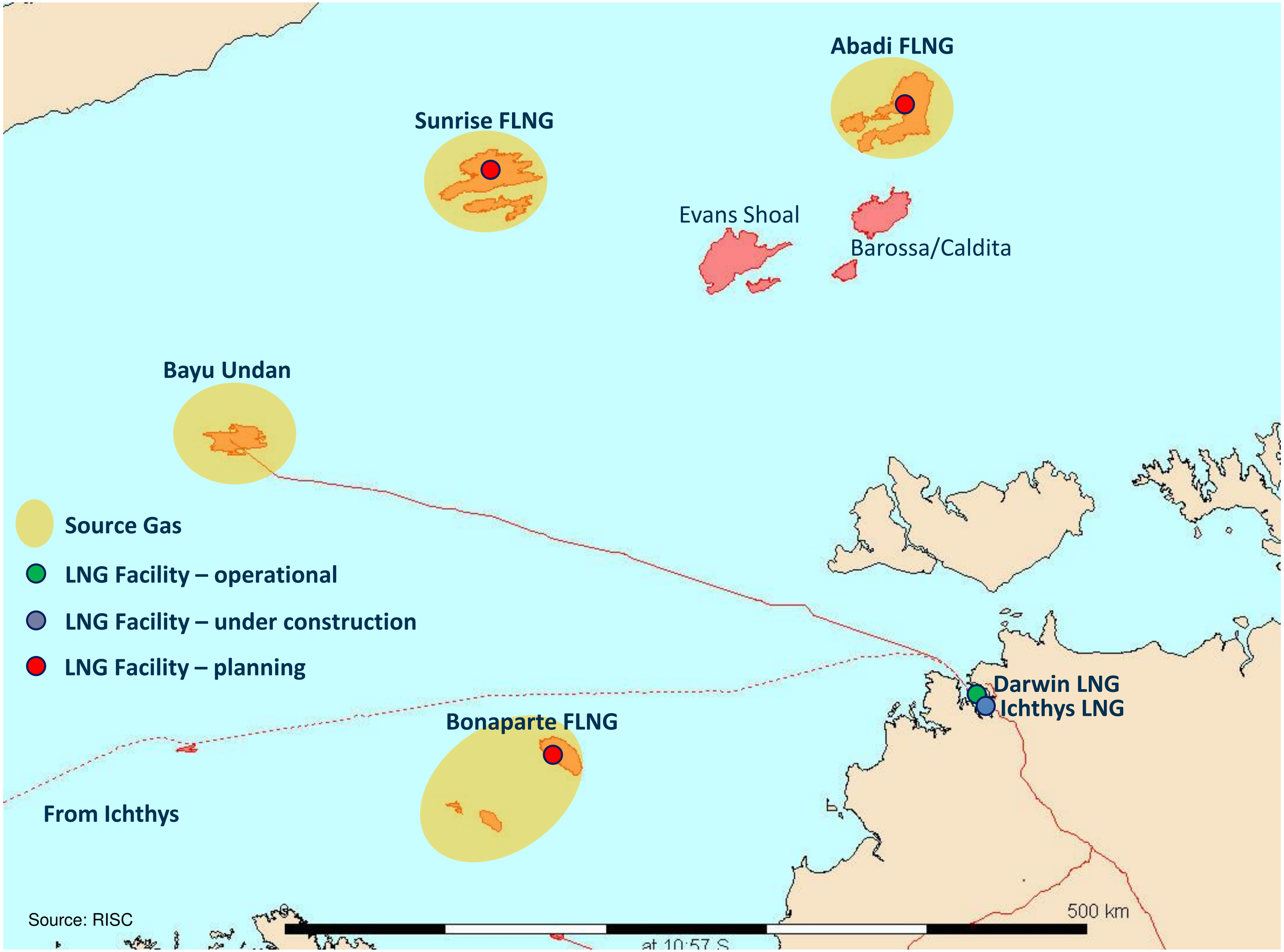
1963	• Woodside awarded >370,000km^2 of NWS acreage
1971-72	• North Rankin and Torosa (Browse Basin) discovered; Goodwyn discovered
1980-81	• WA State Government agrees to underwrite domestic gas with take or pay contract and building DBNGP; Gorgon discovered
1984-85	• Domestic Gas supply starts form North Rankin A; NWSV signs agreements to supply LNG to Japan
1989	• LNG Shipments begin to Japan
1995-96	• Goodwyn A platform starts up; Perseus field discovered next to North Rankin
2002-04	• NWSV agrees LNG contracts with China
2004	• NWSV Train 4 start up: Darwin LNG Start up
2007-08	• Pluto FID; NWSV Train 5 start up
2009	• Gorgon FID;
2010-11	• QCLNG; GLNG; Prelude: APLNG; Wheatstone; Ichthys FIDs
2012	• NWSV 3500th Cargo; Pluto Start up
2015	• QCLNG Start up

Browse Basin LNG



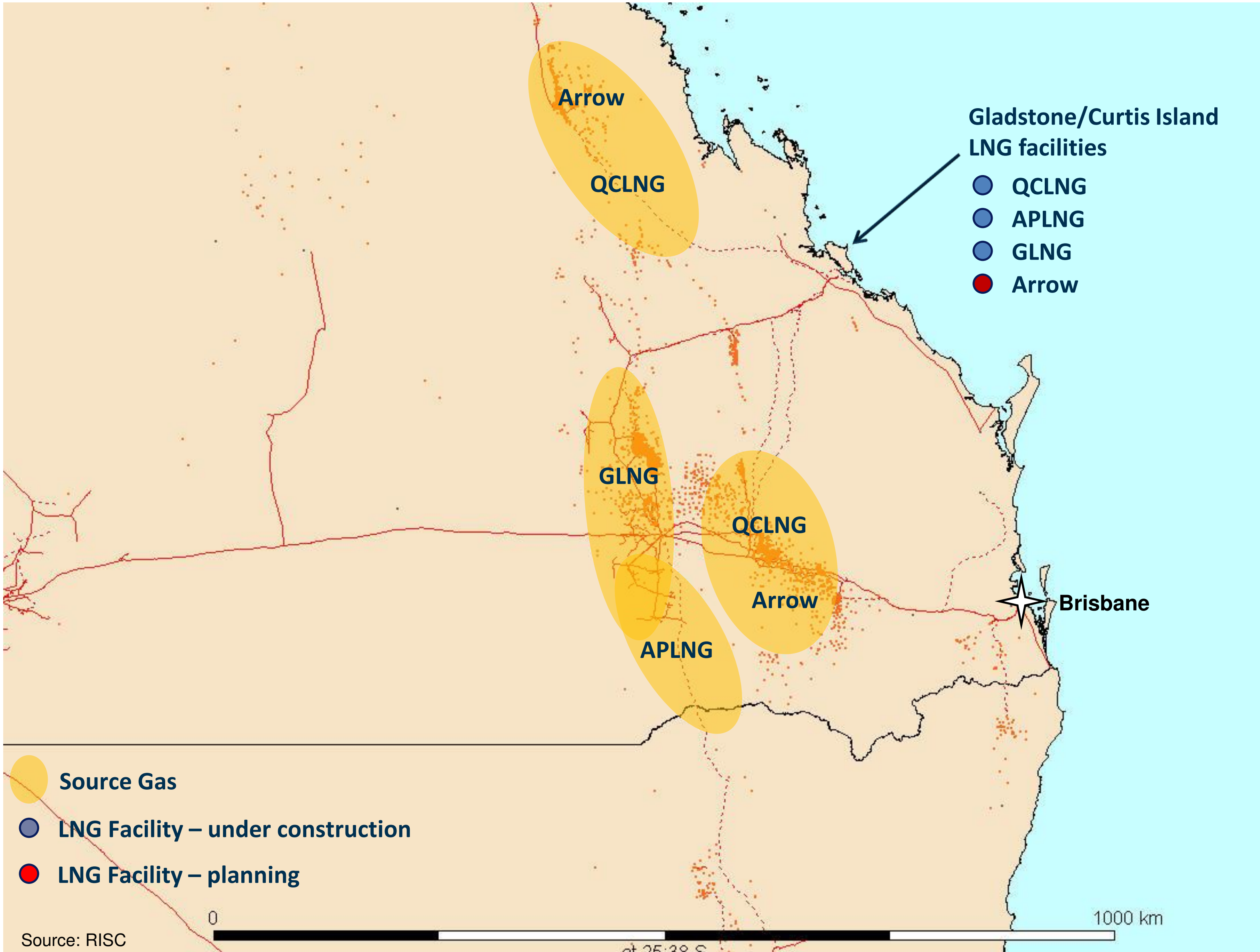
Source: RISC

Bonaparte Basin LNG



Source: RISC

Surat/Bowen Basin CSG-LNG



Source: RISC

Current and proposed CSG-LNG facilities at Gladstone

Australia's LNG projects overview

Project (#Trains)	Capacity MTPA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
N.W. Shelf (5)	16.3												
Darwin (1)	3.6												
Pluto (1)	4.3												
Total Operational	**24.2**												
Gorgon (3)	15.6												
QCLNG (2)	8.5												
GLNG (2)	7.8												
Prelude FLNG (1)	3.6												
APLNG (2)	8.6												
Wheatstone (2)	8.6												
Ichthys (2)	8.4												
Total Sanctioned	**61.1**												
Browse FLNG (3)	12												
Gorgon T4 (1)	4.5												
Wheatstone T3 (1)	4.3												
Pluto T2 (1)	4.3												
Sunrise (F)LNG (1)	4												
Arrow CSG (2)	8												
Abadi FLNG (1)	2.5												
Bonaparte FLNG (1)	2												
Fisherman's Landing (1)	1.5												
Scarborough	6												
Possible Future	**49.1**												

Not including:

- PNGLNG (PNG 6.6MTPA – FID December 2009 start-up May 2014)
- DSLNG (Indonesia 2MTPA - FID January 2011 for end 2014 start, now 2015)

FID | Planned FID | Anticipated First Production | Planned First Production

The USA is coming…

US LNG projects overview

Project (#Trains)	Capacity MTPA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Sabine Pass LNG T1-2 (2)	9												
Sabine Pass LNG T3-4 (2)	9												
Cameron LNG (3)	12												
Cove Point LNG (1)	5.25												
Freeport LNG (2)	8												
Corpus Christi LNG (2)	9												
Sabine Pass LNG T5 (1)	4.5												
Total Sanctioned	**56.75**												
Freeport LNG (1)	4												
Corpus Christi LNG (1)	4.5												
Lake Charles LNG (3)	15												
Jordan Cove LNG (4)	6												
Oregon LNG (2)	9												
Magnolia LNG (2)	4												
Total awaiting approvals not Sanctioned	**42.5**												
Gulf Coast LNG (2)	10												
Golden Pass (3)	15												
Others	100+												
Possible Future	**200+**												

FID
Expected First Production
Planned FID
Proposed First Production

What the News has been saying

What have they been comparing?

AUS Gorgon

USA Sabine Pass LNG

Is this a fair comparison?

Gorgon

- 3 Trains
- Greenfield Island location
  - 2km Jetty into the Sea
  - Breakwater
  - MoF
- Class A Nature Reserve
- >10% CO_2
- Carbon Capture and Storage
- Upstream subsea development
- Some Liquid HC Content (Condensate)
- Domestic Gas Plant

Sabine Pass

- 2 Trains
- Existing Import Terminal
  - Jetty and offloading facilities
  - LNG Storage Tanks
  - Connection to gas grid
- Industrial area with good access
- <1% CO_2
- No upstream content
- No Liquids

We now have other projects to compare

QCLNG

- Greenfield location
- Small Jetty into sheltered water
- Island location
- Near industrial area (but no road access)
- 2 Trains
- 2 Storage Tanks
- No liquids

Corpus Christi

- Greenfield locations
- Small Jetty into sheltered water
- River location
- Industrial area with good road access
- 2 Trains
- 2 Storage Tanks
- No Liquids
- No upstream content

Is this a fair comparison?

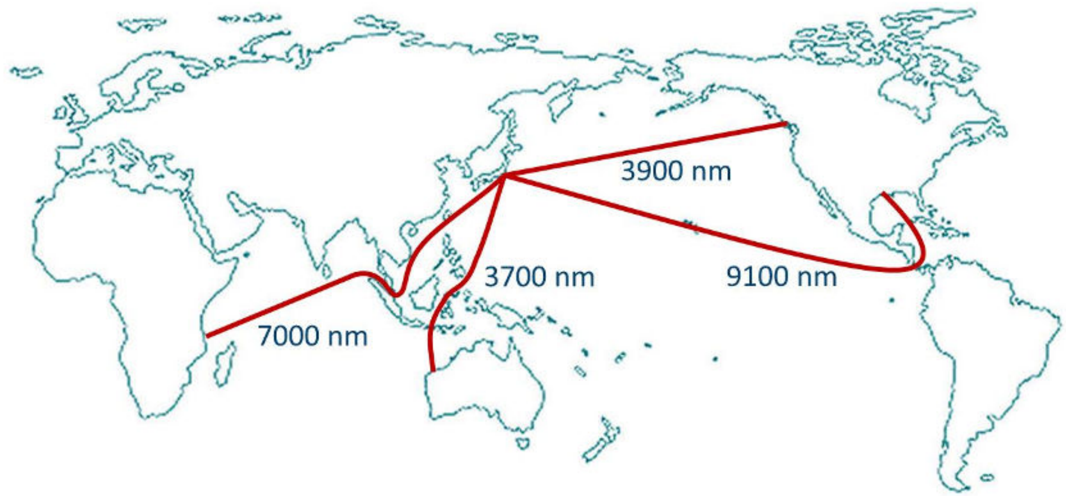
QCLNG

- ~A$19 bln Total
- ~A$11-12 bln Downstream (in a period of ~parity)
- ~50 months from sanction to first LNG
- Most significant delays pre-sanction

Corpus Christi

- No upstream content
- US$11.5 bln
- Planned 42 months execution
- Significant approval delays pre-sanction

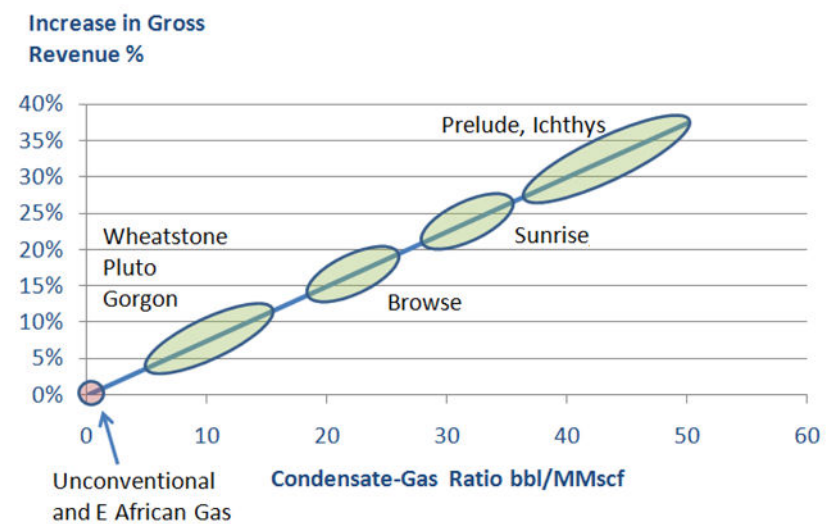
Cost of Supply – Key Issues



Distance impacts Shipping Costs

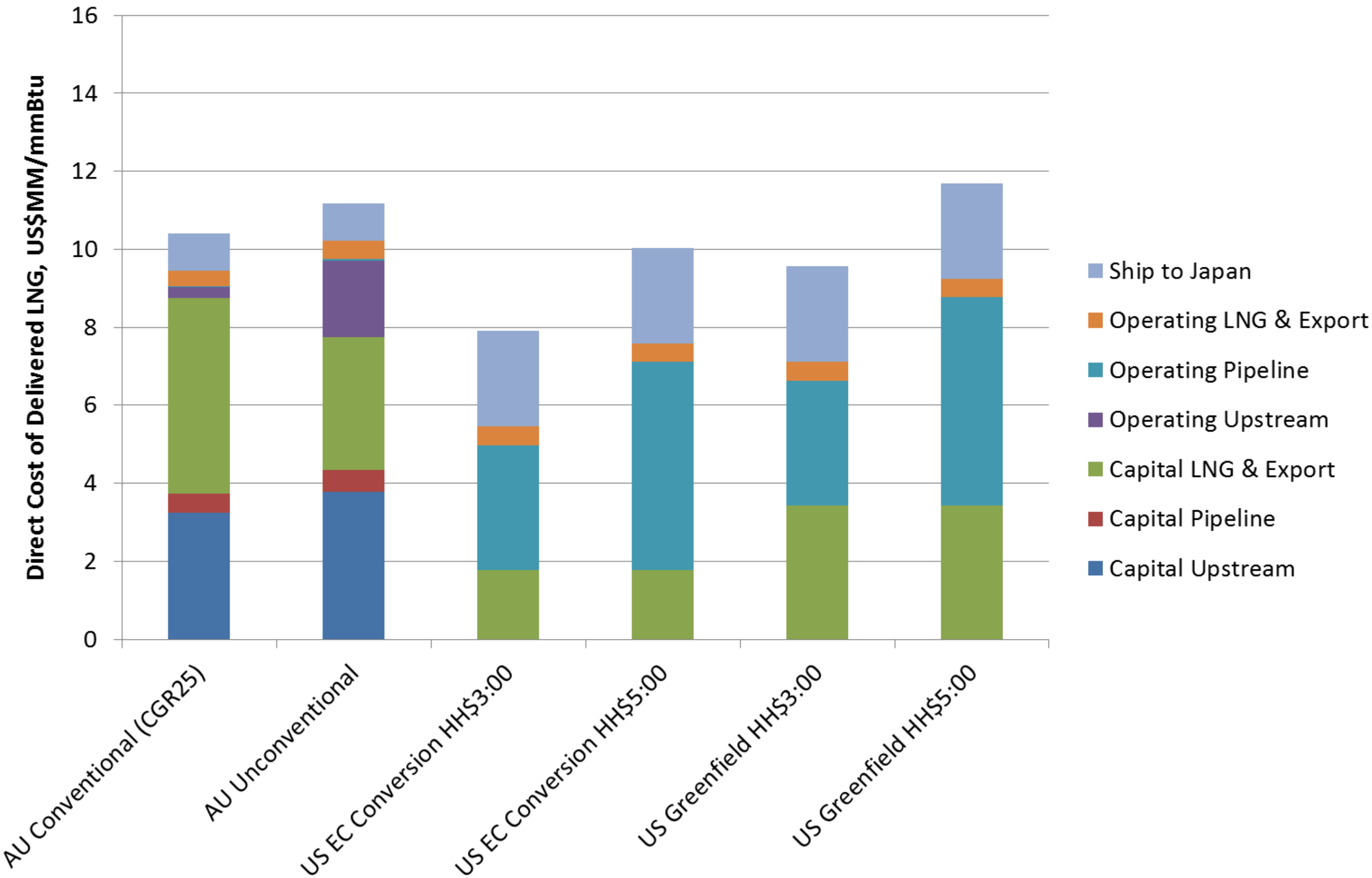
Cost from US Gulf coast is significantly higher than Australia

Condensate production can generate significant additional value for some projects

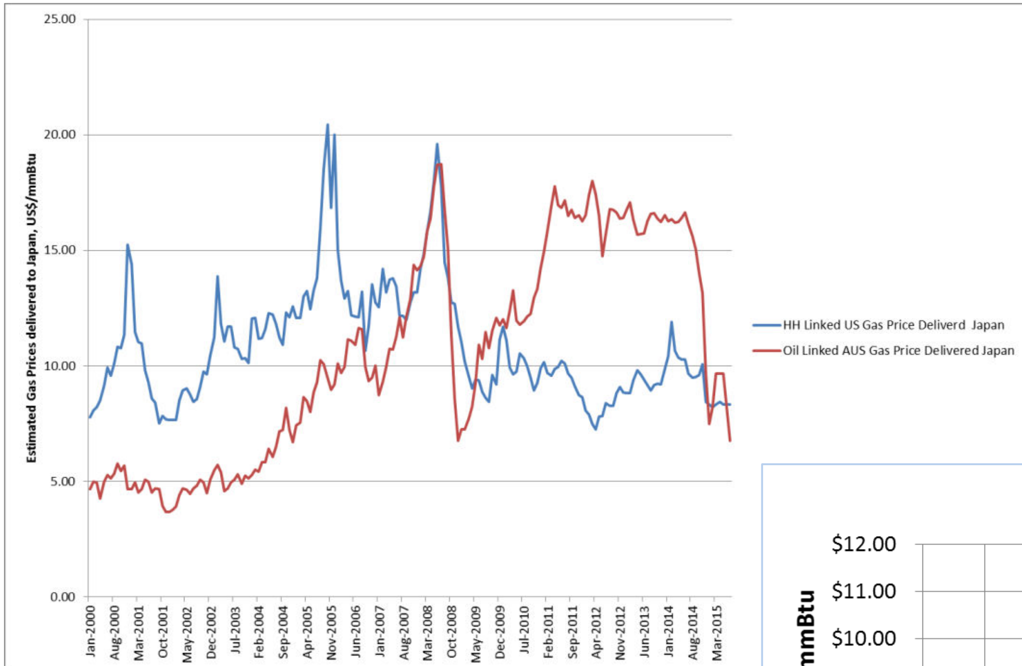


Assumes LNG sold at energy value parity to condensate

Cost of Supply comparison to N. Asia

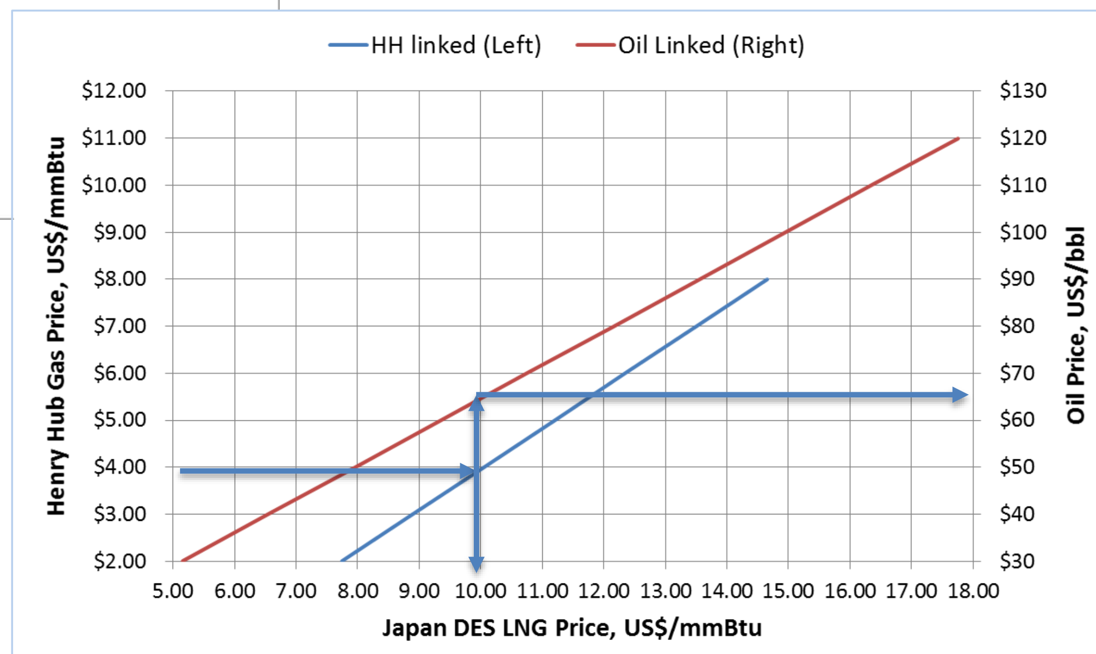


Pricing Mechanisms – how different are they?

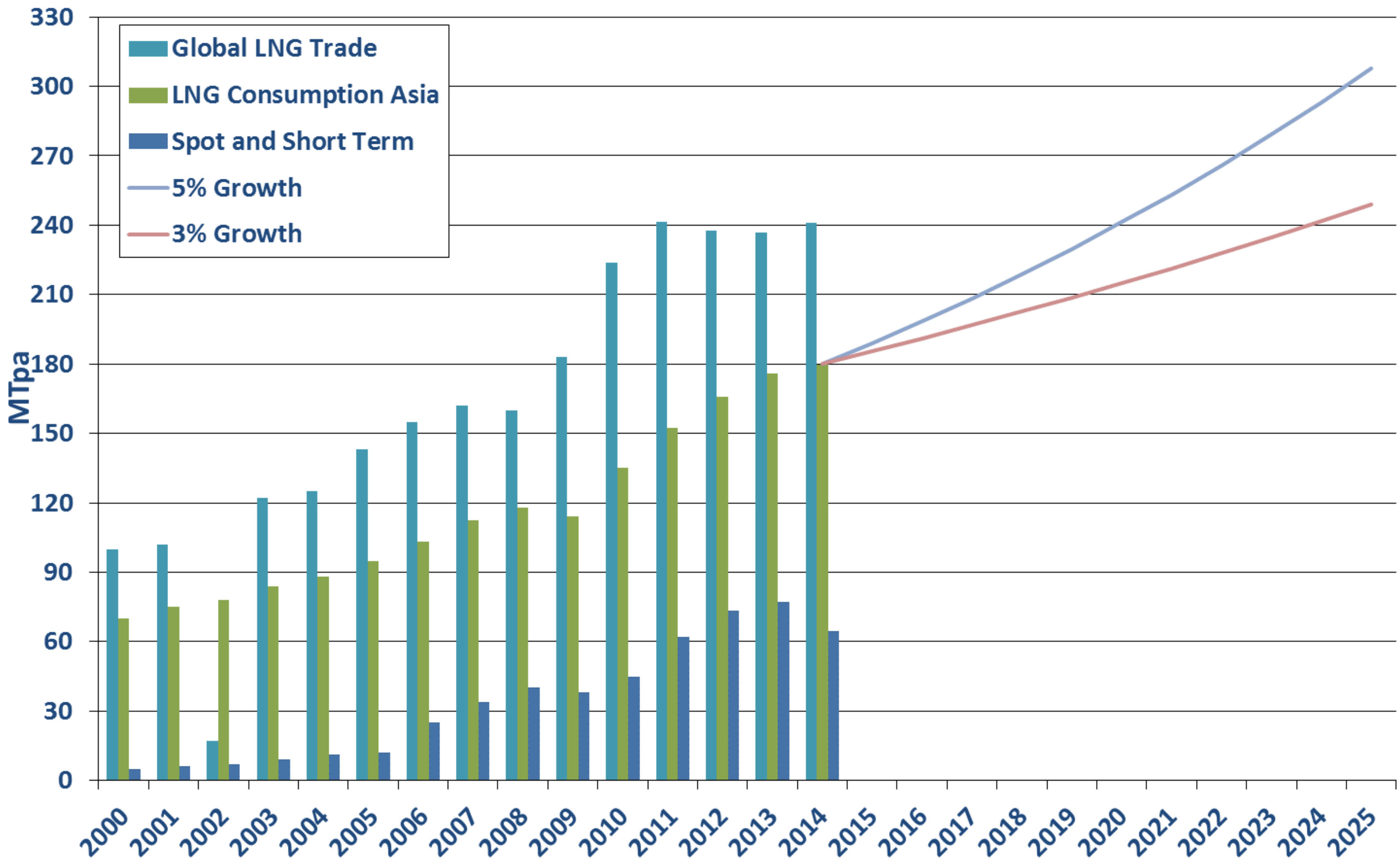


Applying recent pricing mechanisms to historical data shows that for most of the past Decade HH indexing would have been more expensive (to Japan) than oil indexing

HH at $4/mmBtu results in a gas price of ~$10.00/mmBtu in Japan, which is roughly equivalent to an oil price of ~$65/bbl



LNG Market



Global LNG Trade
LNG Consumption Asia
Spot and Short Term
5% Growth
3% Growth
MTpa
330
300
270
240
210
180
150
120
90
60
30
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

Issues for Australian LNG

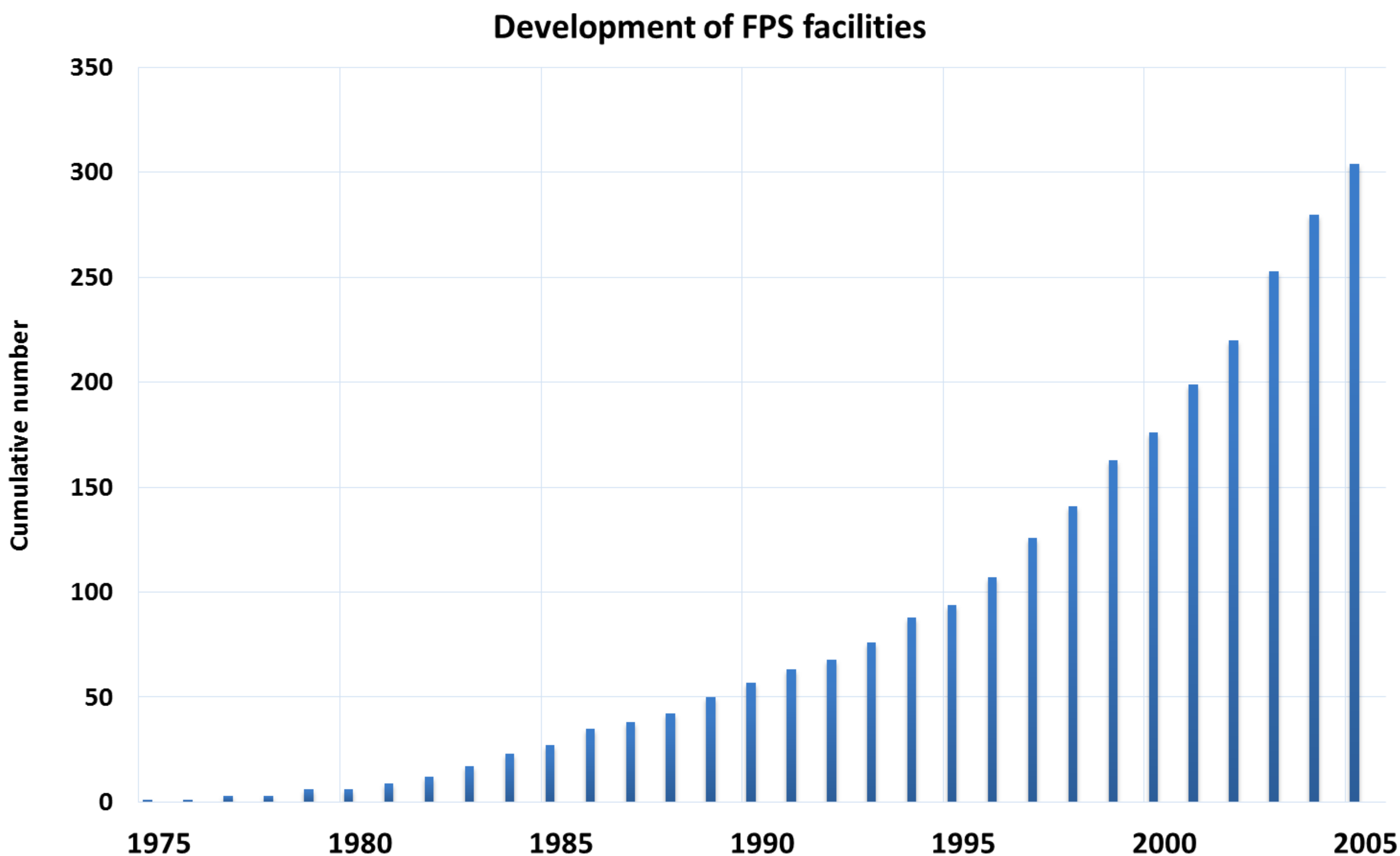
- LNG from Australia is relatively high cost LNG
  - This may not be true for mature projects (e.g. with contracts coming to an end).
- Proximity to Asia is an advantage that mitigates against high initial costs

- By 2018 Australia will be the largest producer of LNG in the world
  - LNG will be the second largest export earner for Australia
- Production from current projects will require continued investment to maintain production

- New large scale greenfield LNG projects are facing increased complexity, but will still need robust pricing
  - Innovation and Ingenuity will be required in the face of continued low oil prices
- Project expansion (brownfield expansion) has significant potential advantage because infrastructure is already there.

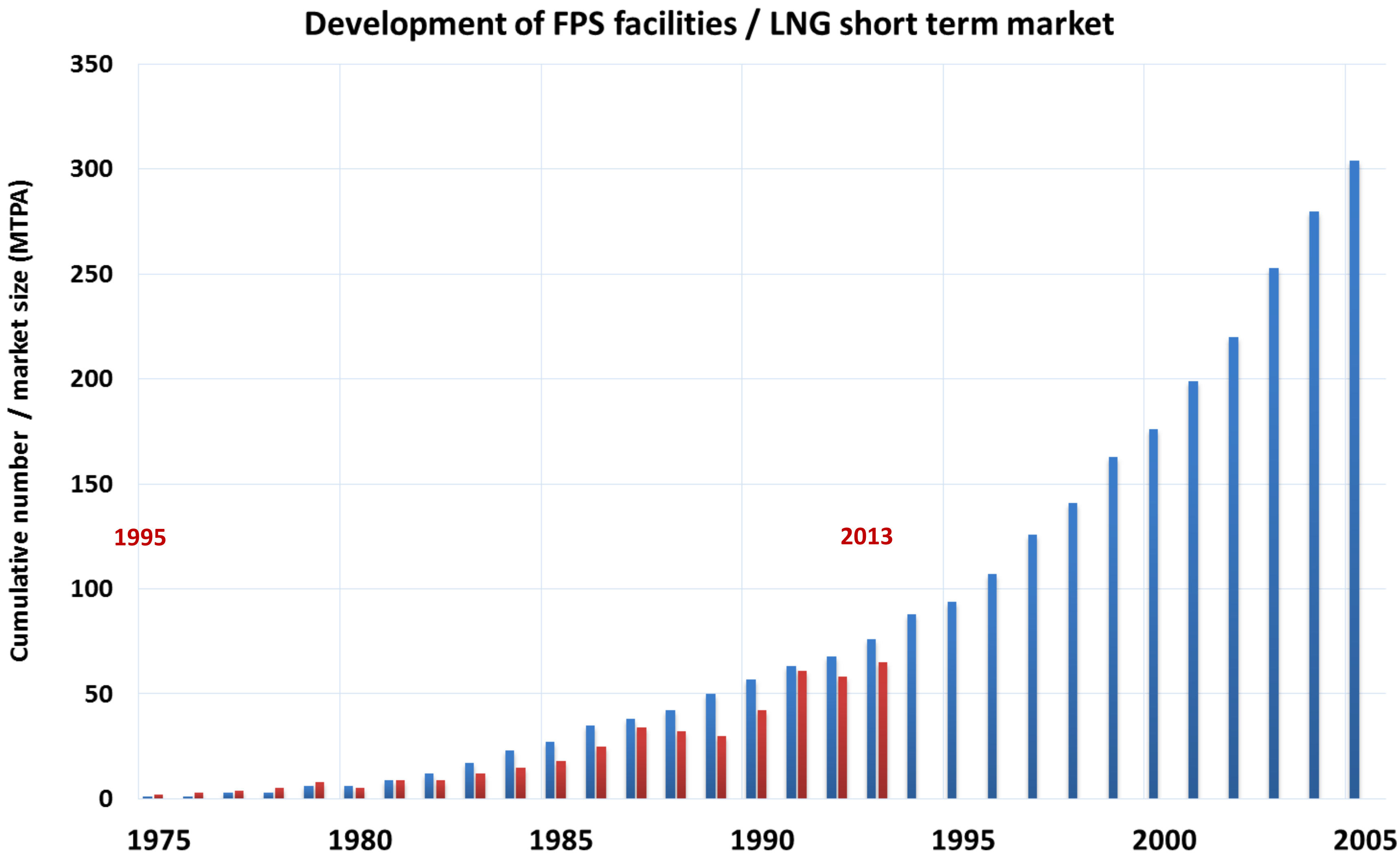
- Each project is unique

What about FLNG?



Source: International Maritime Associates Inc./GIIGNL, BP and BG Group/LNG Journal and IGU

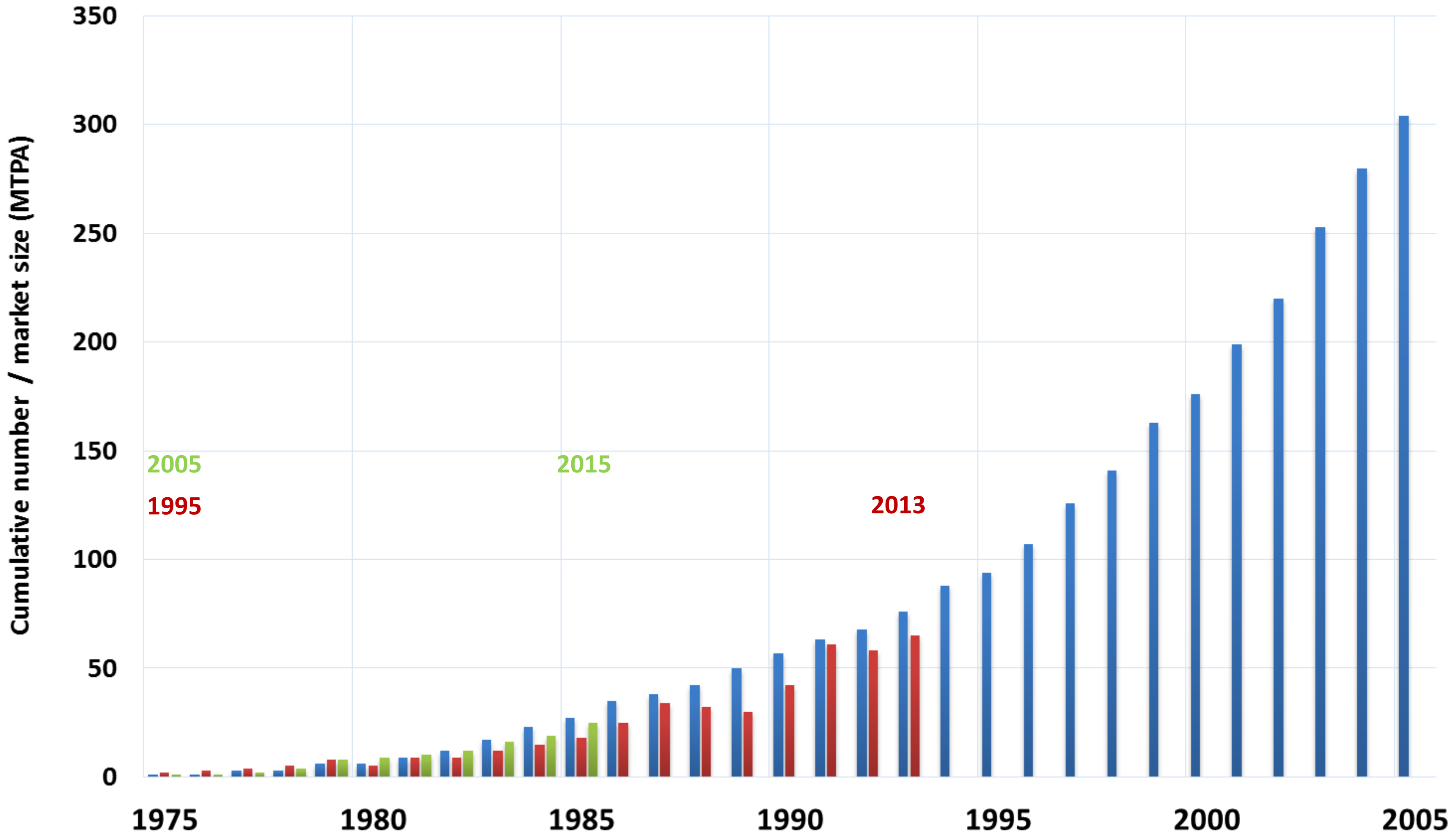
What about FLNG?



Source: International Maritime Associates Inc./GIIGNL, BP and BG Group/LNG Journal and IGU

What about FLNG?

Development of FPS facilities / LNG short term market / FRSUs



Source: International Maritime Associates Inc./GIIGNL, BP and BG Group/LNG Journal and IGU

What does this mean for you?

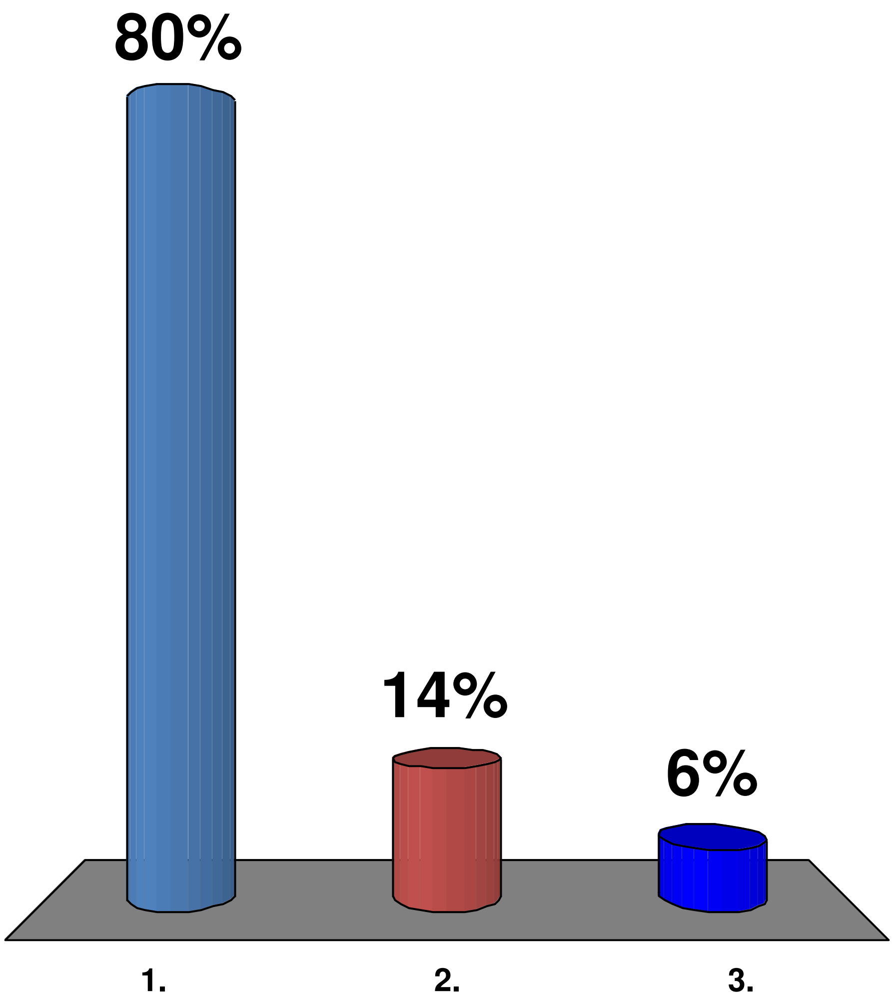
- The Australian LNG industry will be employing people for the next 40+ years
- It will require ingenuity, innovation and new ways of working

You've heard my views….

What does this mean for you?

What is your impression of the oil and gas industry in general?

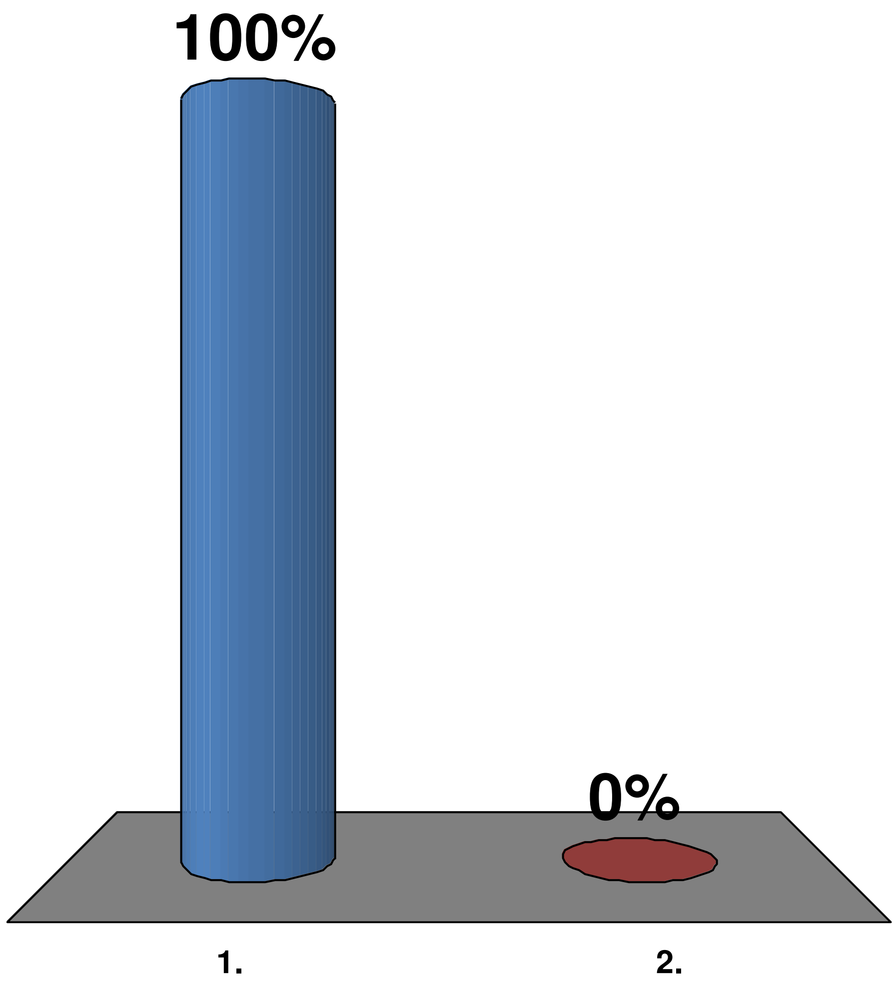
1. Favourable
2. Neutral
3. Unfavourable



What does this mean for you?

If you are a student or someone not associated with the oil and gas industry, are you thinking of, or would you consider, working in our industry?

1. Yes
2. No



Perth

Level 3
1138 Hay Street
WEST PERTH WA 6005
P. +61 8 9420 6660
F. +61 8 9420 6690
E. admin@riscadvisory.com

Brisbane

Level 2
147 Coronation Drive
MILTON QLD 4064
P. +61 7 3025 3369
F. +61 7 3025 3300
E. admin@riscadvisory.com

London

53 Chandos Place
Covent Garden
LONDON WC2N 4HS
P. +44 20 7484 8740
F. +44 20 7812 6677
E. riscuk@riscadvisory.com

Dubai

DIFC, The Gate Building
Level 15, Office 63
Sheikh Zayed Road
DUBAI UAE
P. +971 4 401 9875
F. +61 8 9420 6690
E. admin@riscadvisory.com

Jakarta

Alamanda Tower, 25th Floor
Jl. T.B. Simatupang, Kav. 23-24
JAKARTA 12430
INDONESIA
P. +62 21 2965 7823
F. +62 21 2965 7824
E. admin@riscadvisory.com

www.riscadvisory.com

decisions with confidence