

Australian LNG in a European Context

What is the potential for Australian LNG import into the EU

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An Australian Overview

The Americans are coming

Comparison of costs and Pricing

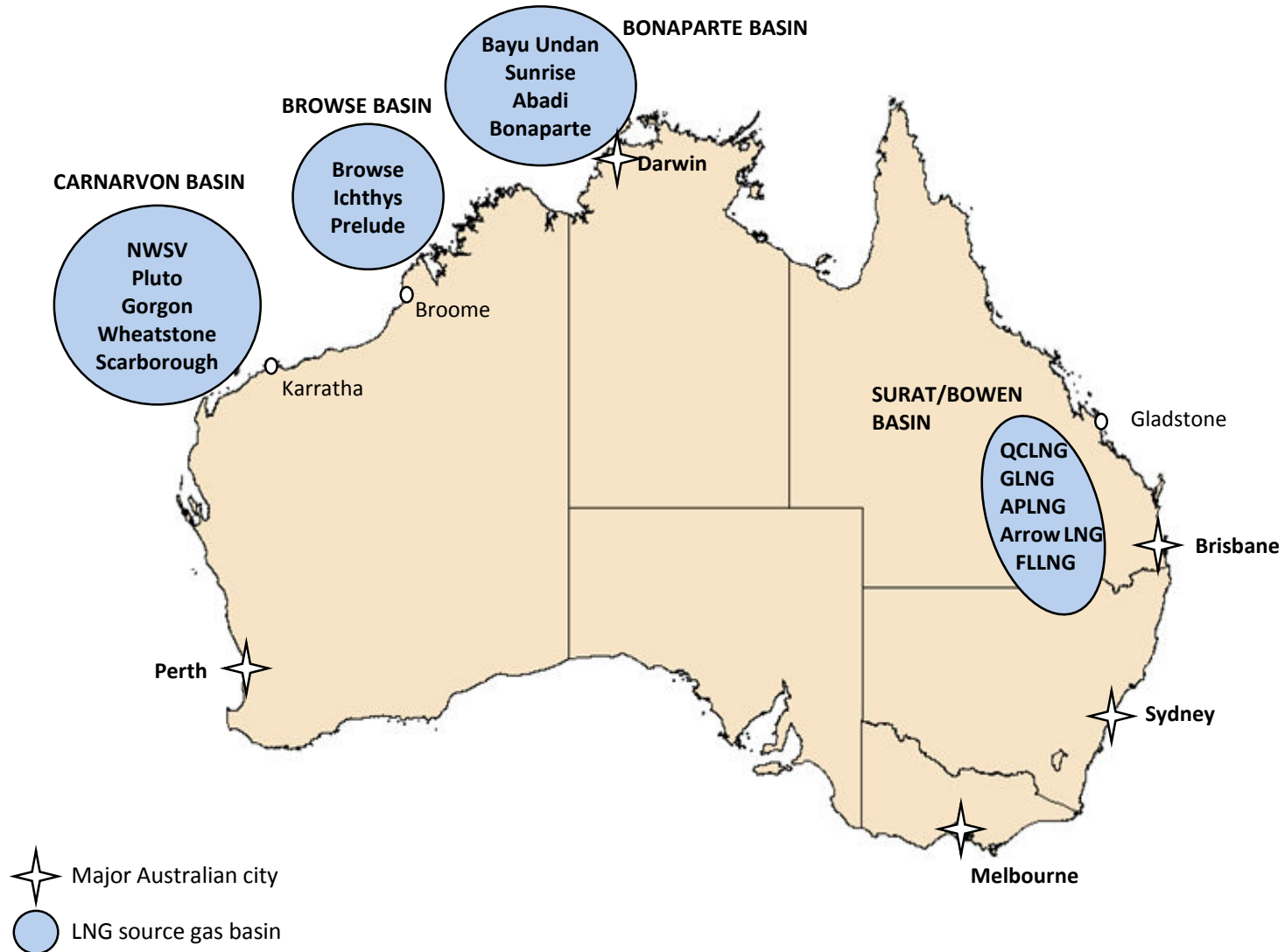
Thoughts and Issues

- What does this mean for the potential of Australian LNG to Europe

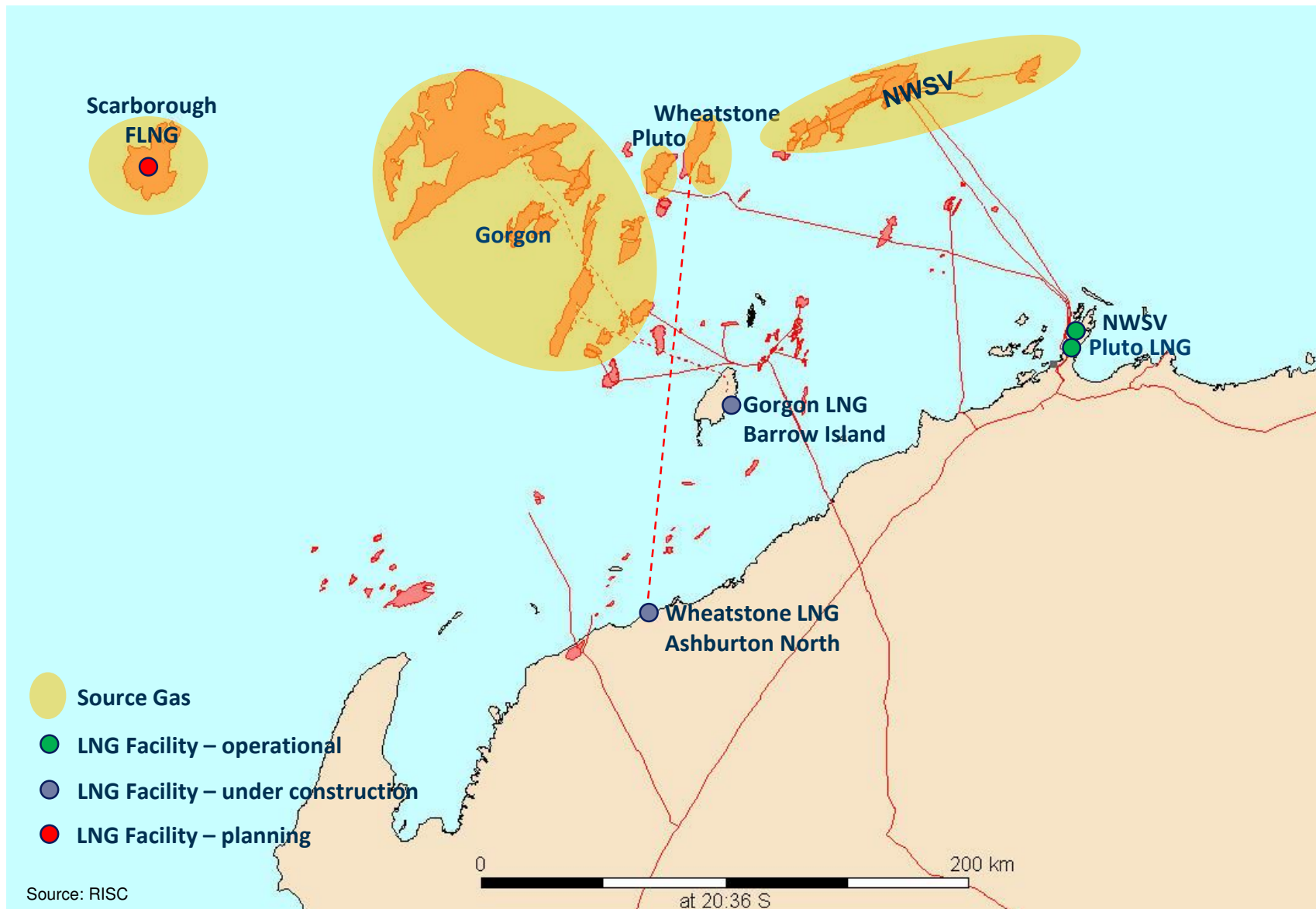
An Australian LNG Tour



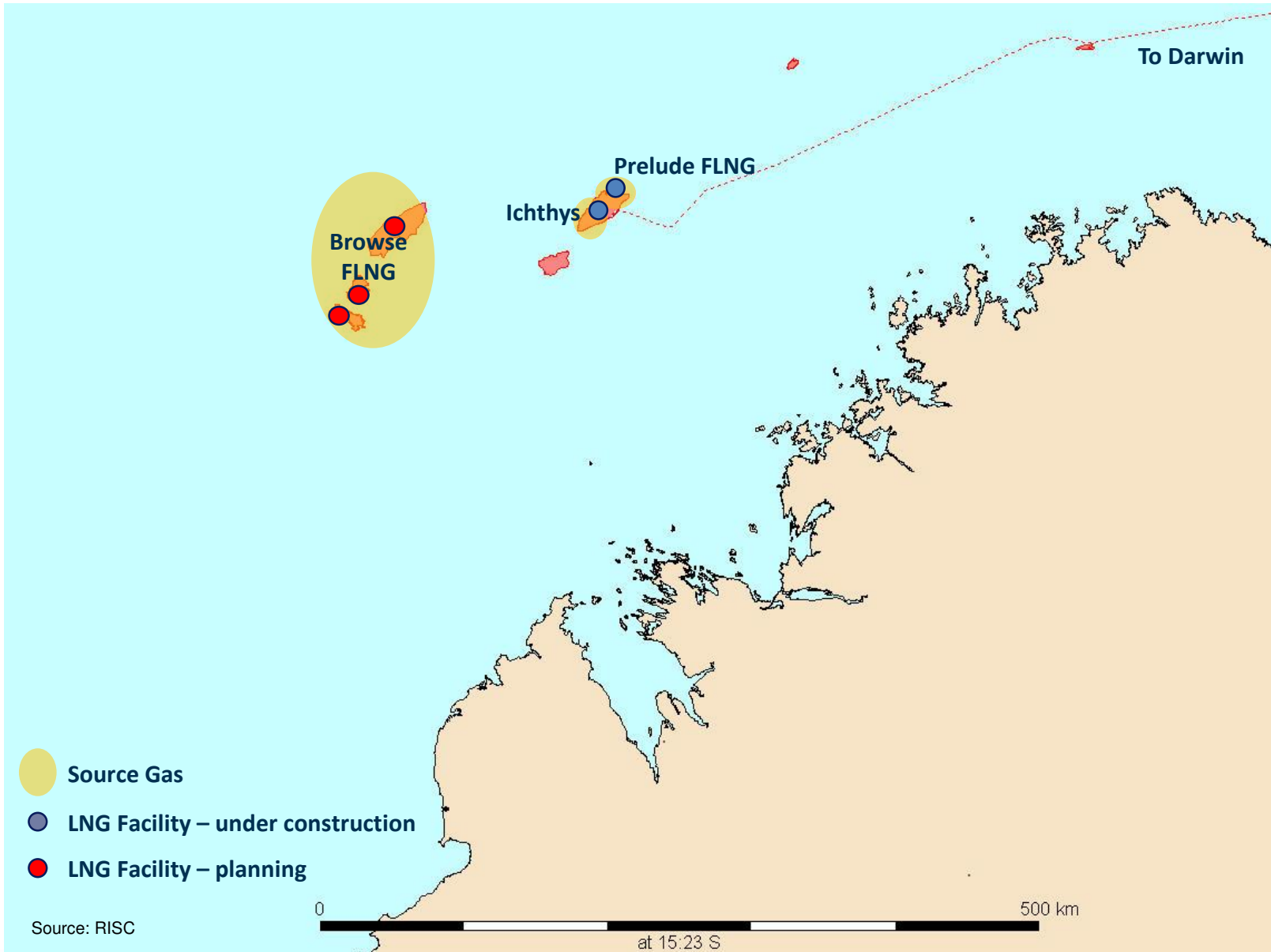
Australia's LNG areas



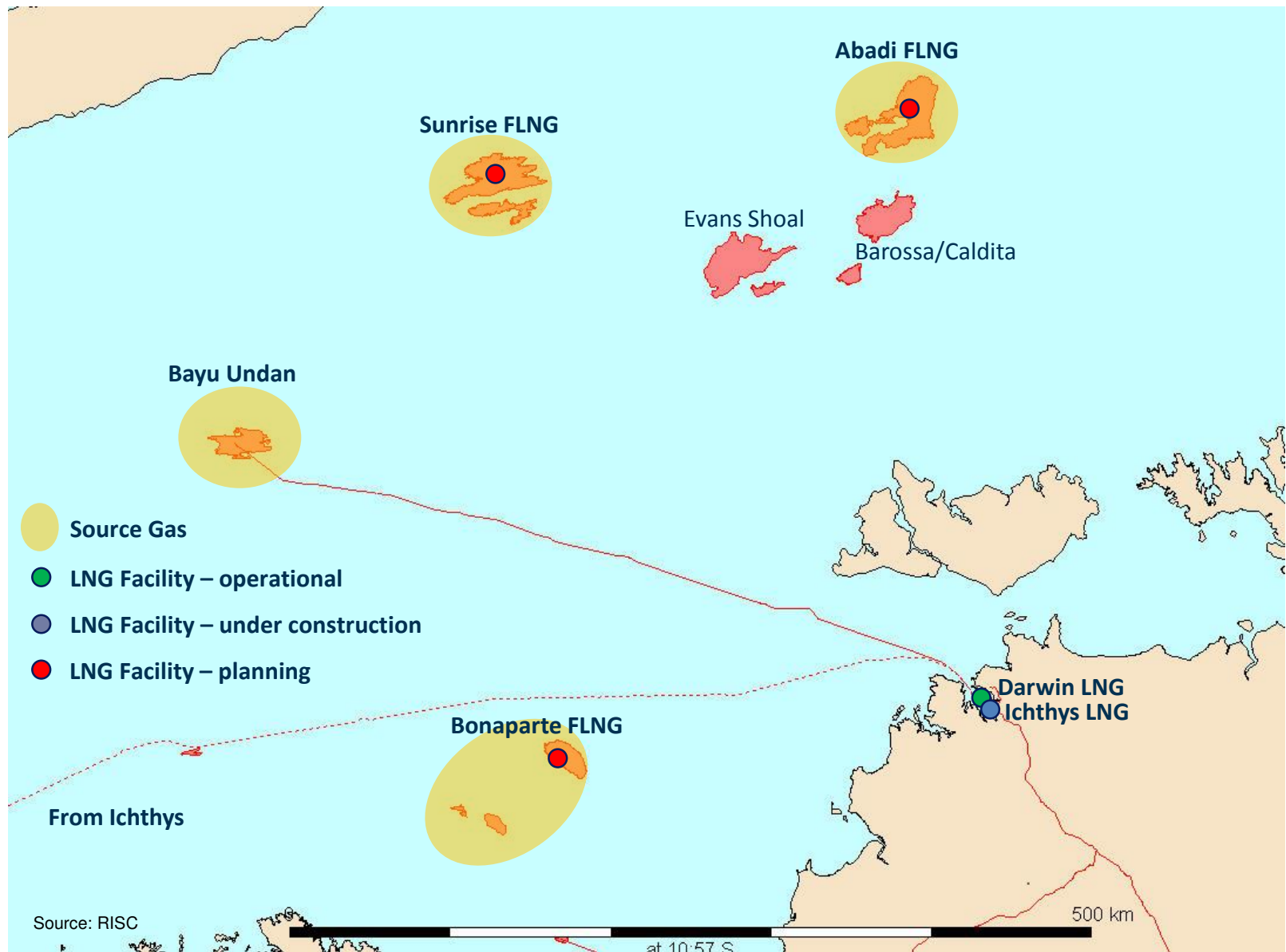
Carnarvon Basin LNG



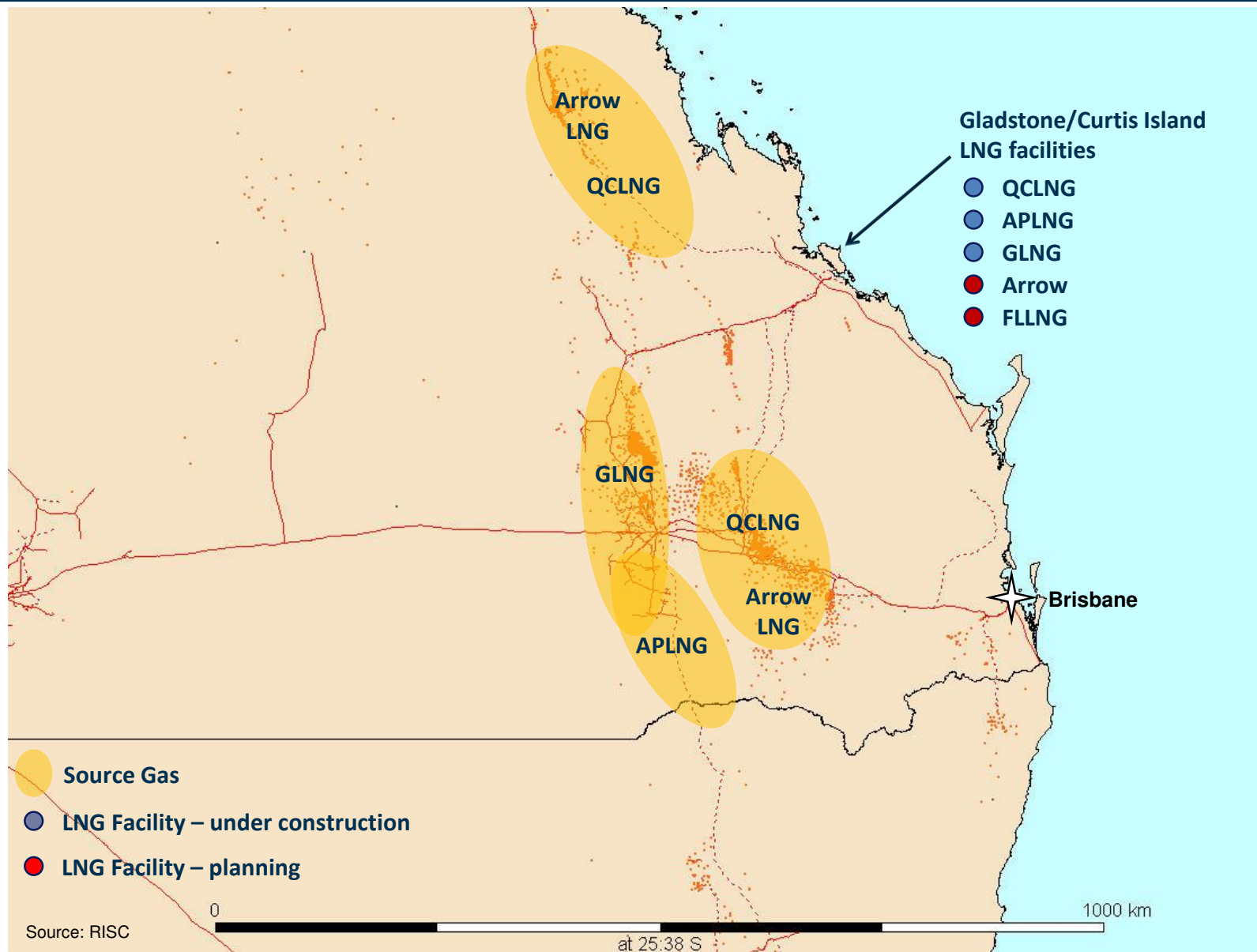
Browse Basin LNG



Bonaparte Basin LNG



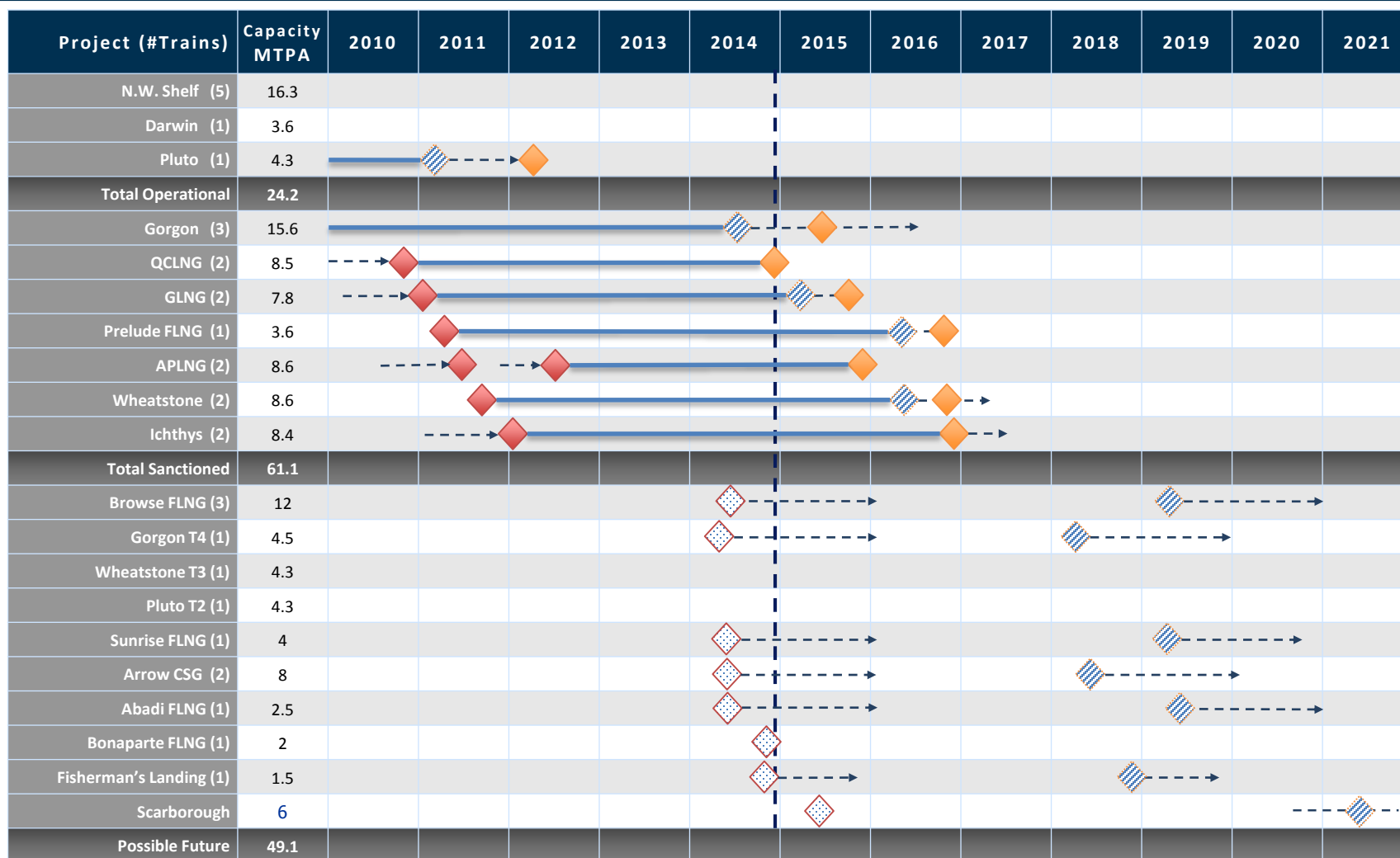
Surat/Bowen Basin CSG-LNG



Current and proposed CSG-LNG facilities at Gladstone



Australia's LNG projects overview – what's next?



Not including:

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



Planned FID



Anticipated First Production



Planned First Production

Why are Australian projects considered expensive?



There has been a lot of discussion about Australia being a high cost environment, and high labour costs, but are these the real reasons?

- Gorgon and Wheatstone are claiming ~50% local content
 - Of this 50%, approximately 50% can be attributed to labour costs
 - 20% rise in Australian labour costs = 5% rise in project costs
- Gorgon is reporting a 45% cost increase, and that's likely to increase
- QCLNG is about to be completed on time (on budget?)

If not labour costs and/or productivity then what ?

- A union (International Transport Workers' Federation) commissioned report early in 2014 claimed that “poor management, poor planning, logistics and red tape” were to blame.
 - RISC is quoted in this report and supports many of the issues raised

Decisions made very early on in the project that have massive impact on the project later

- Gorgon chose to locate on an A class reserve, on an Island, and to reinject CO2 in 2001, 8 years prior to project sanction.
 - “Clearly we underestimated the challenges (of working on Barrow Island)” Chevron to WA Inquiry into FLNG September 2013.

Pluto

- High N2
- Single Train project, pre-investment in infrastructure for 2nd Train

Gorgon (3 Trains)

- Island base, Class A nature reserve
- Long subsea tieback (2nd only to Snohvit)
- High CO2, CO2 capture and sequestration

Queensland - QCLNG, GLNG & APLNG (2 Trains)

- World first CSG to LNG projects
- Onshore fields, growing social and environmental issues/pressure
- Shared location with other LNG projects in construction, but little collaboration
- QCLNG Train 1 about to start up on time (on budget?)

Prelude (1 Train FLNG)

- World first FLNG
- High CO2

Wheatstone (2 Trains)

- High N2
- Large Dredging requirements

Ichthys (2 Trains)

- High CO2
- Longest subsea pipeline in southern hemisphere (through military training area)

Are others immune?

Many of the issues that impacted Australian Projects are visible in other regions. History suggest that very few LNG projects achieve initial suggested timelines:

East African (Mozambique) Projects - “Expected first LNG Sales in 2018”

- Still developing Petroleum regulatory regime
- Gov’t requirement for local benefits
- Lack of infrastructure
- Potential for domestic obligations

Canada – “Producing by end 2013”

- Approvals
- Costs for remote developments, lack of infrastructure
- “Projects require robust pricing”

USA

- Approvals (non-FTA and FERC/environmental)
- 3-4 projects sanctioned, 6 anticipating sanction in next 6 months
- Louisiana experiencing a period of “unprecedented investment”,
 - one of the lowest unemployment rates in the world,
 - significant and growing transient workforce
- Panama Canal expansion delays and capacity limitations to Asia

The Americans are coming



Sabine Pass – 18MTPA (Cheniere)

Construction underway at Sabine Pass (June 2014)

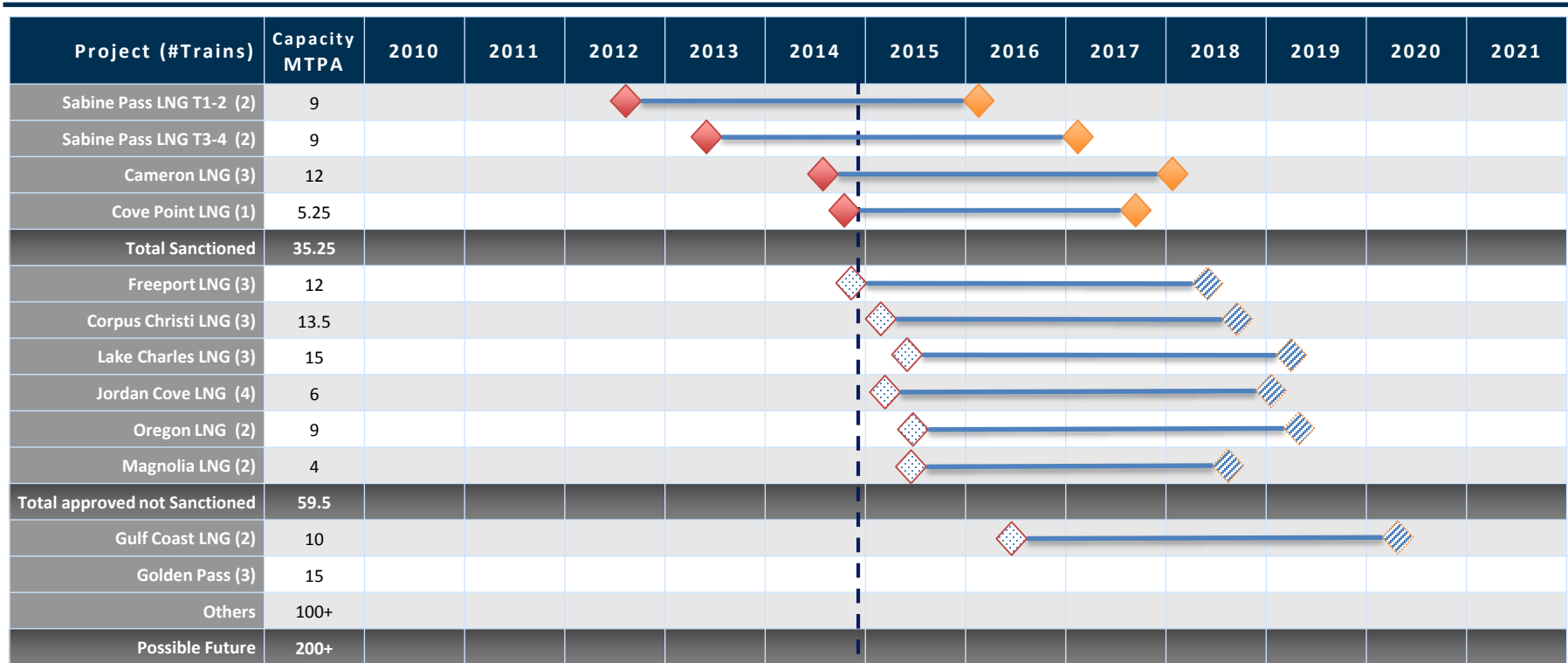


Freeport Timeline



Key Milestone Activities	Status / Anticipated Date
Application to DOE for Long-Term Authorization to Export LNG	Completed
Execution of FEED Agreement with EPC Contract Terms	Completed
Liquefaction Tolling Agreements (Train 1) with Osaka Gas and Chubu Electric	Completed
Filing of formal NGA Section 3 Application to FERC	Completed
Liquefaction Tolling Agreement (Train 2) with BP Energy Company	Completed
DOE's Authorization to Export the Equivalent of 511 Bcf/year of LNG to non-FTA Countries	Completed May 2013
Liquefaction Tolling Agreements (Train 3) with Toshiba Corporation and SK EKS	Completed September 2013
DOE's Authorization to Export the Equivalent of an Additional 146 Bcf/year of LNG to non-FTA countries	Completed November 2013
EPC Contract Finalized	Completed December 2013
Issuance by FERC of Draft Environmental Impact Statement	Completed March 2014
Issuance by FERC of Final Environmental Impact Statement	Completed June 2014
FERC's Issuance of Authorization to Construct and Operate	Completed July 2014
FID/Financial Close	4Q 2014
Commencement of Construction	4Q 2014
Liquefaction Train 1 In-Service Date	2018
Liquefaction Train 2 In-Service Date	2019
Liquefaction Train 3 In-Service Date	2019

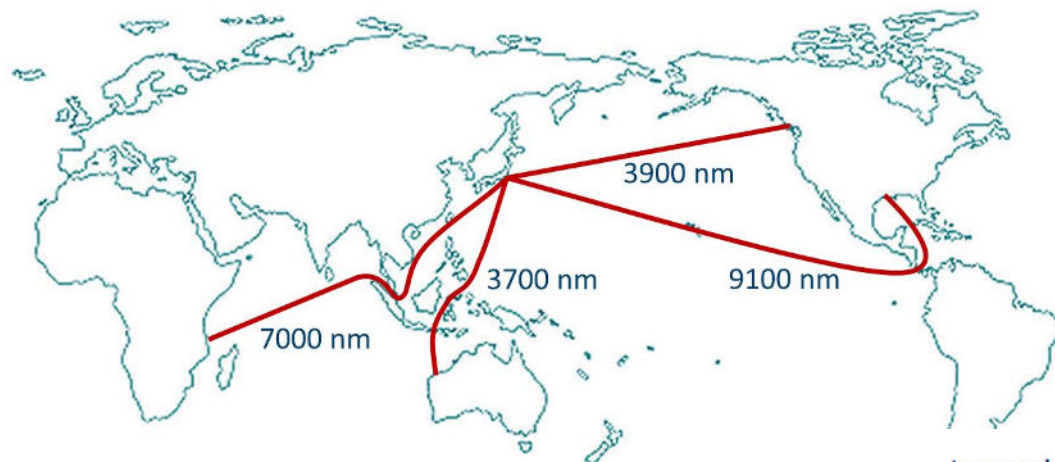
US LNG projects overview



Comparisons of costs and price

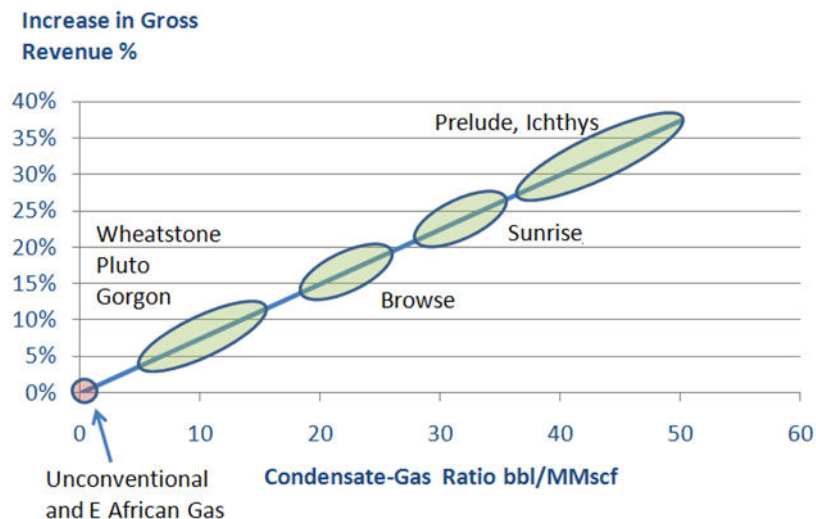


Cost of Supply – Key Overlooked Issues



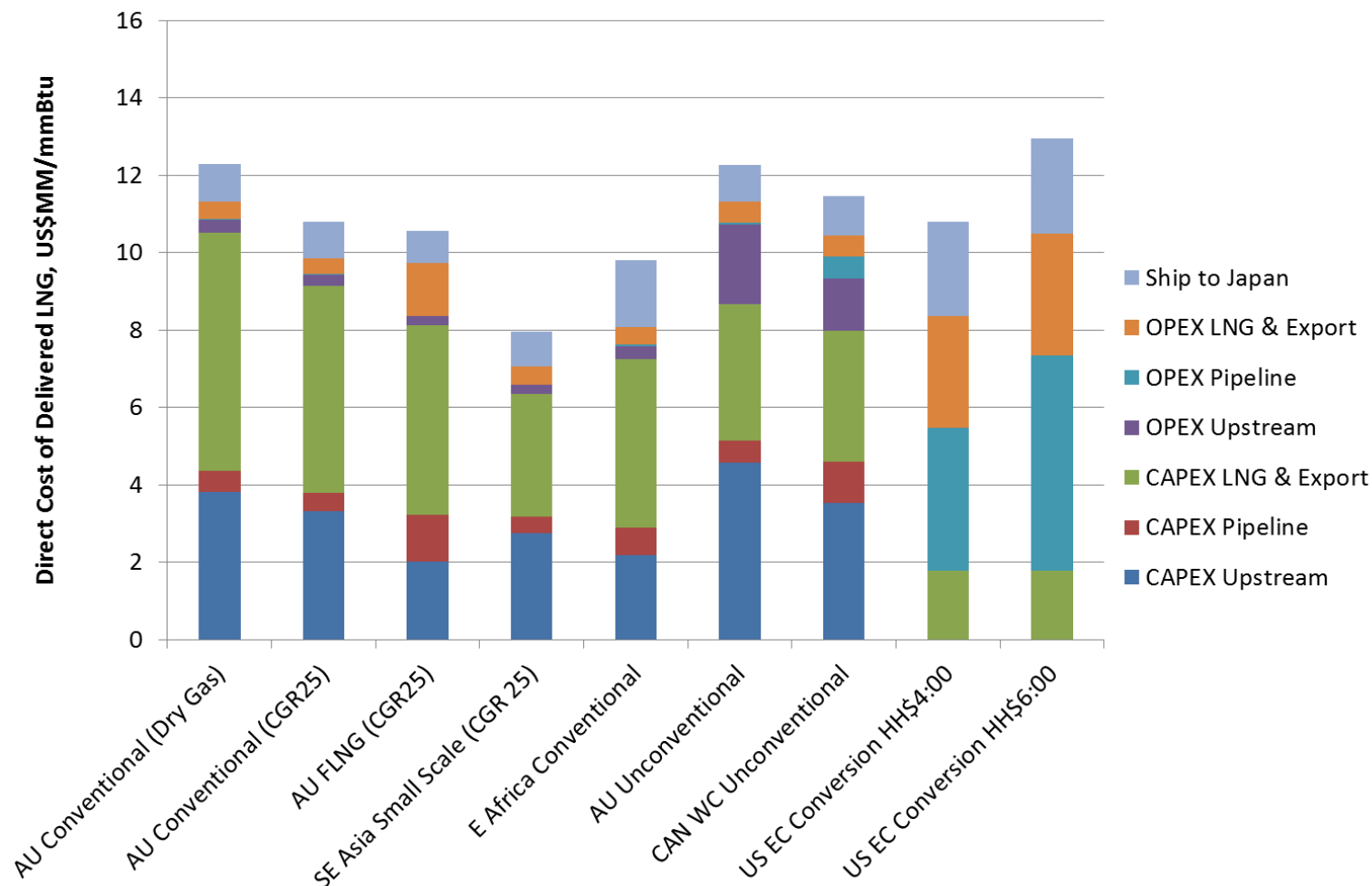
Distance impacts Shipping Costs
Cost from US Gulf coast into Asia is significantly higher than from Australia

Condensate production can generate significant additional value for some projects

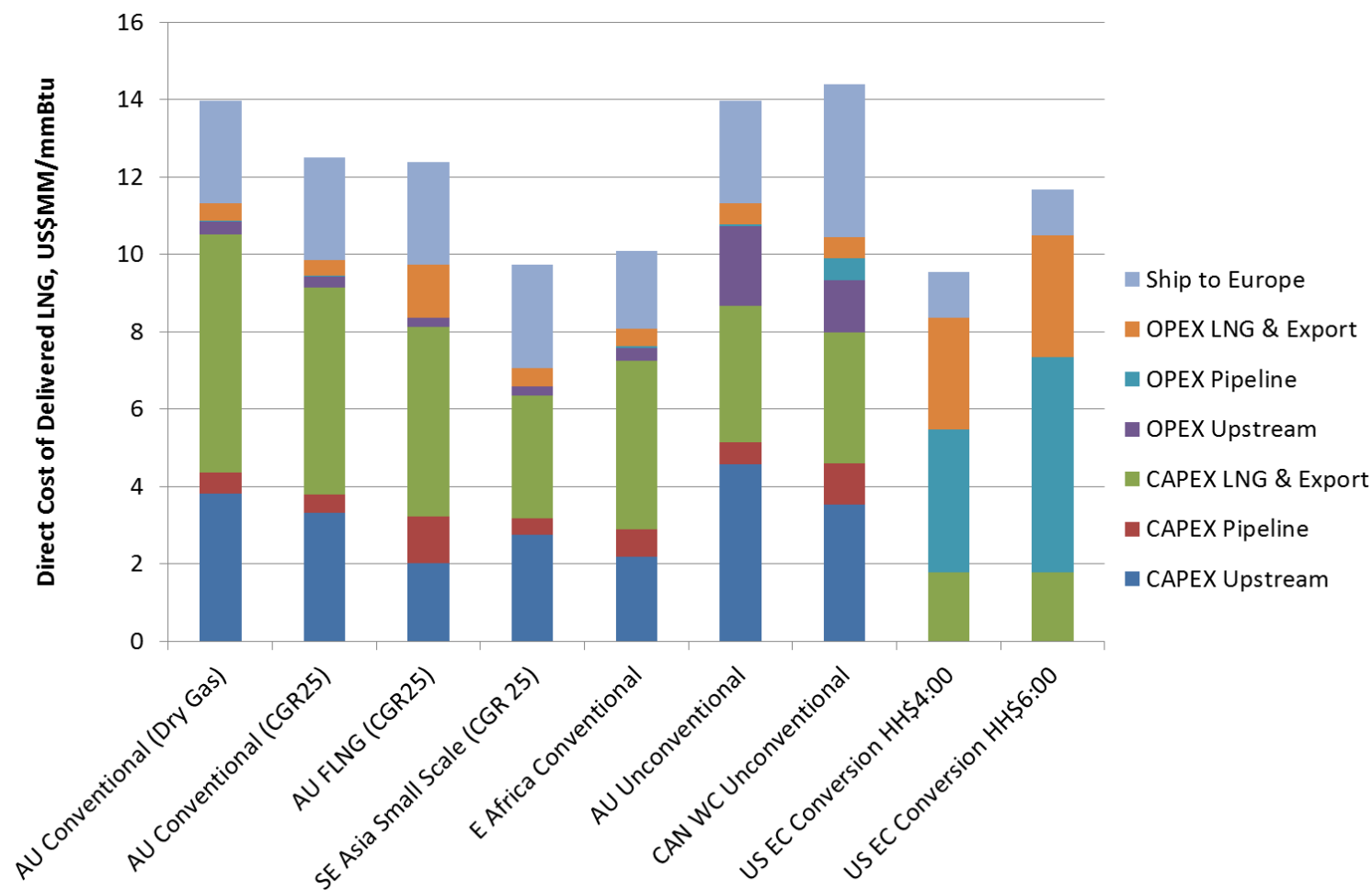


Assumes LNG sold at energy value parity to condensate

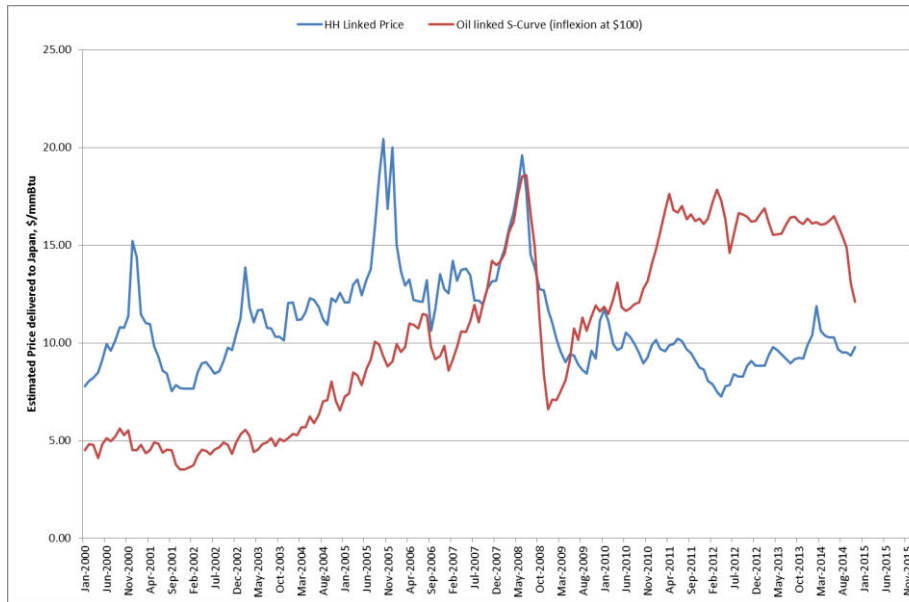
Cost of Supply comparison to N. Asia



Cost of Supply comparison to Europe



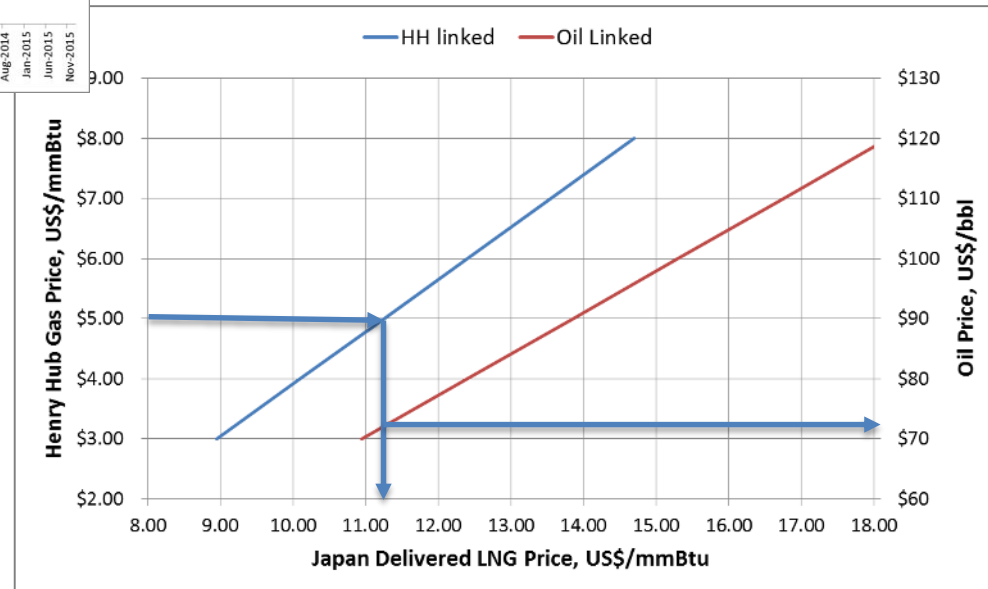
Pricing Mechanisms – how different are they?



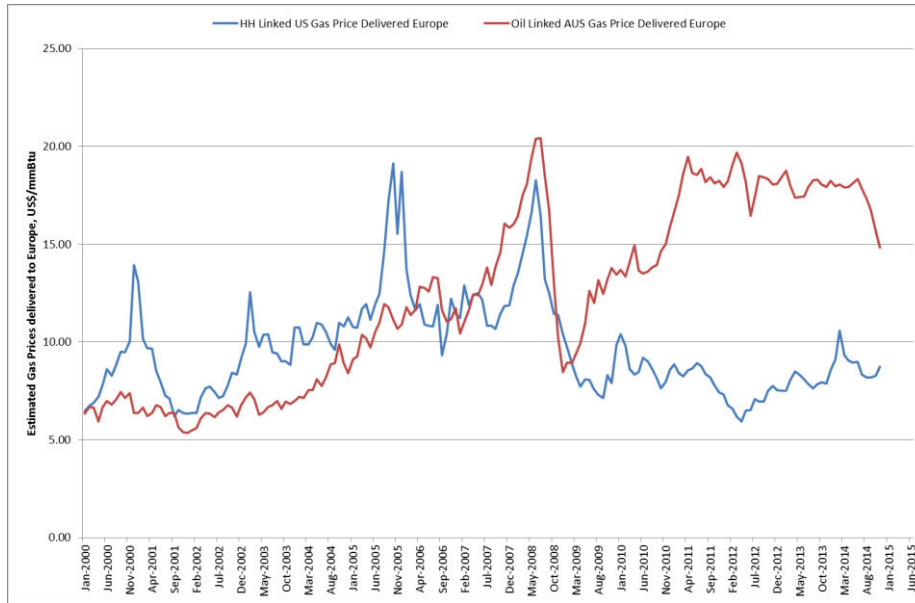
Applying recent pricing mechanisms to historical data shows that for most of the past Decade HH indexing would have been more expensive (to Japan) than oil indexing.

What will happen to HH in low oil price environment? We anticipate upward pressure.

HH at \$5/mmBtu results in a price of ~\$11.25/mmBtu for US gas in Japan, which is roughly equivalent to AUS an oil price of ~\$73/bbl



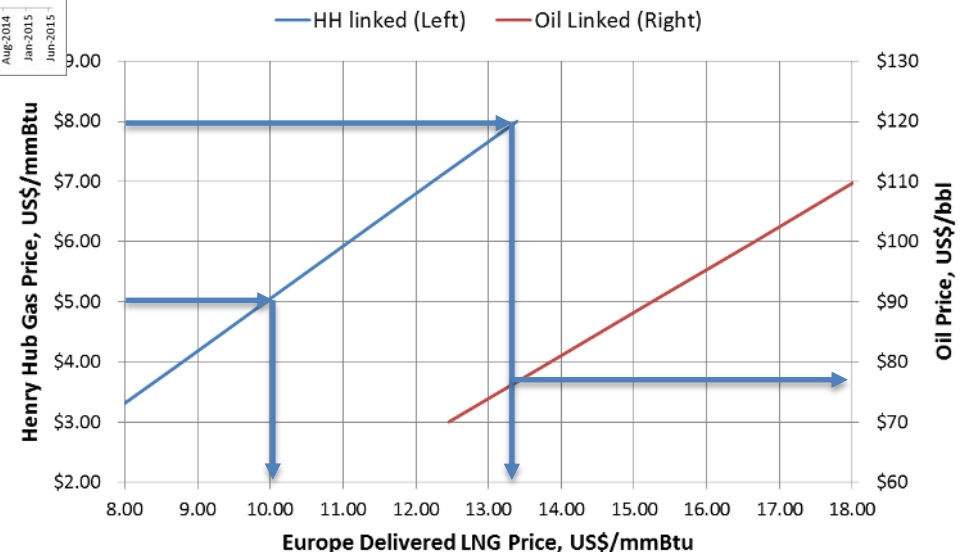
Pricing Mechanisms – look different in Europe



US Gas would generally have been cheaper than oil indexed AUS gas into Europe.

HH at \$5/mmBtu results in a price of ~\$10.00/mmBtu for US gas in Europe. To deliver AUS gas at that price would require oil <<\$60/bbl

HH at \$8/mmBtu results in a price of ~\$13.40/mmBtu for US gas in Europe, which is roughly equivalent to AUS gas at an oil price of ~\$78/bbl



Thoughts, Issues and Conclusions



- LNG from Australia is relatively high cost LNG
 - but is it the real issue?
 - Is current cost base going to remain in the face of the end of construction boom in both mining and LNG
- New greenfield LNG projects in Australia (and E. Africa and Canada) will still need robust pricing
 - Projects unlikely to be sanctioned in the face of a continued low oil price
- Proximity advantages for delivery to Asia are reversed when considering delivery to Europe
- Australian LNG is going to be at the top of the gas cost curve in Europe
 - This may not be true for mature projects (e.g with contracts coming to an end).
- Each project is unique
- A more obvious seller of gas into Europe is the US (East Coast), which will have a lower cost base and lower shipping costs
 - This may free up other cargoes (Australian?) for delivery to Asia



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