decisions with confidence

Trends in Global LNG

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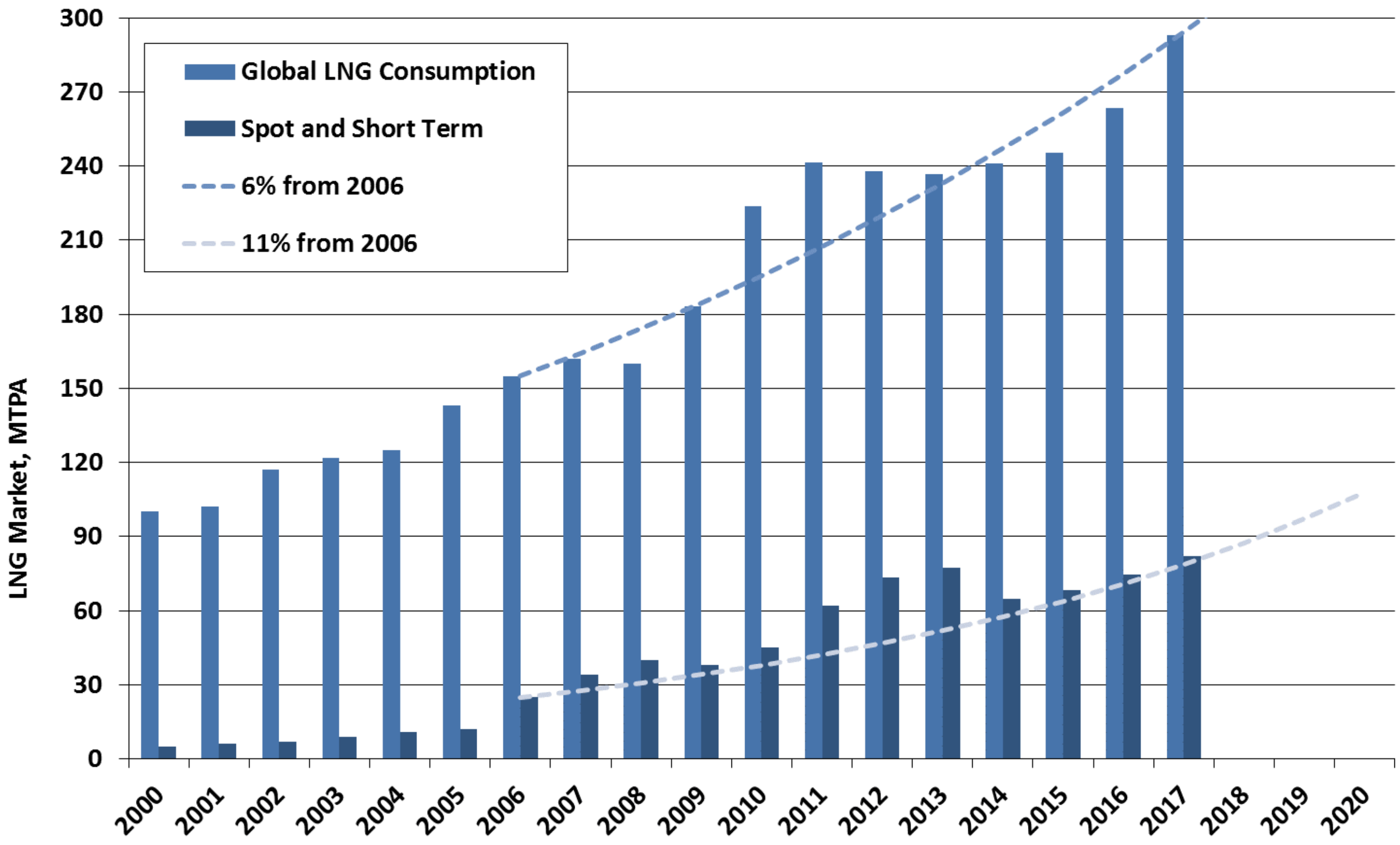
Content

A quick global overview

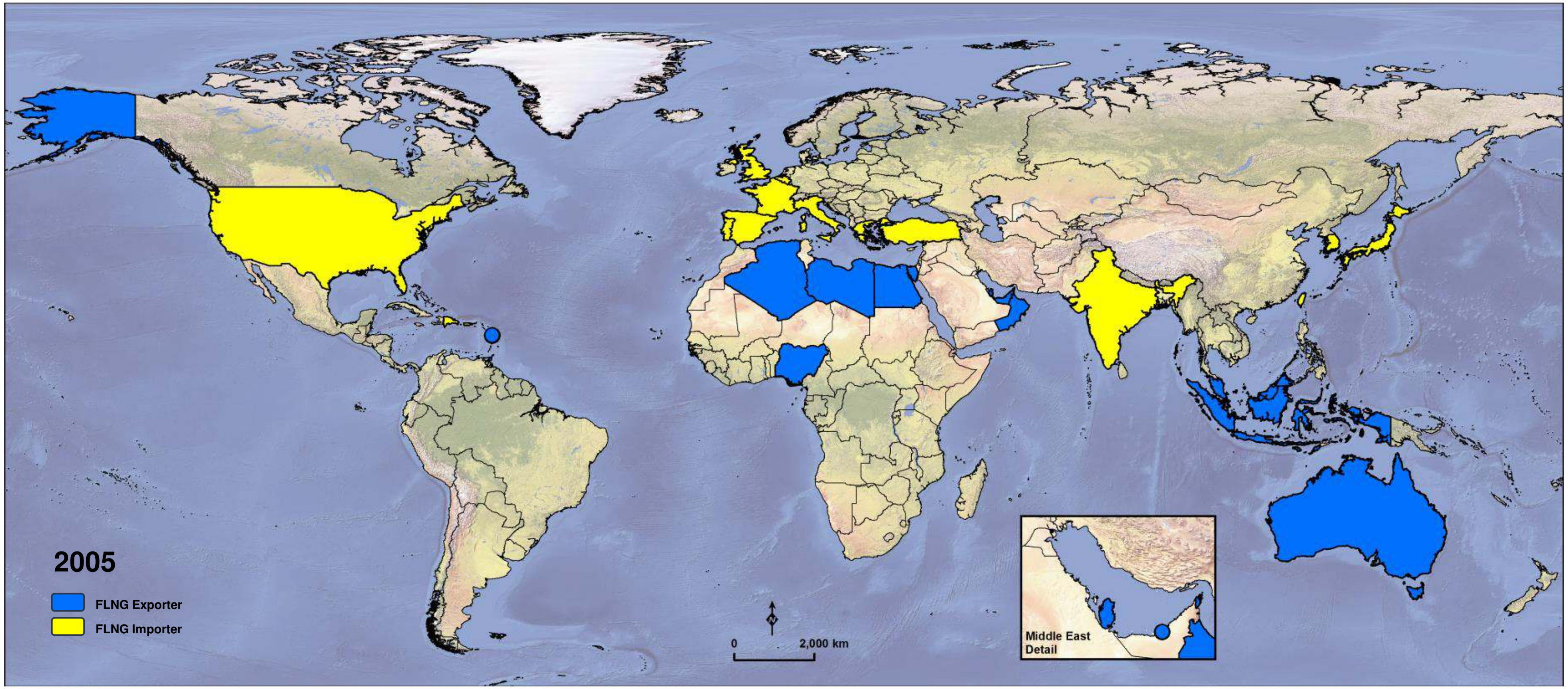
The Global LNG Market has changed, liquidity is increasing:

- LNG development traditionally supported by long term contracts
  - Small resources unable to commit to long term contracts.
- Strong growth in LNG market
  - Significant increase in short term trade.
- Development of short term market means:
  - Buyers less reliant on long term contracts
  - Security of Supply through diversification
  - Increased diversity and more liquidity
  - Increased confidence in sales
  - More confidence in smaller developments.



Sources: GIIGNL, BP and Shell

Changes in export and import countries….



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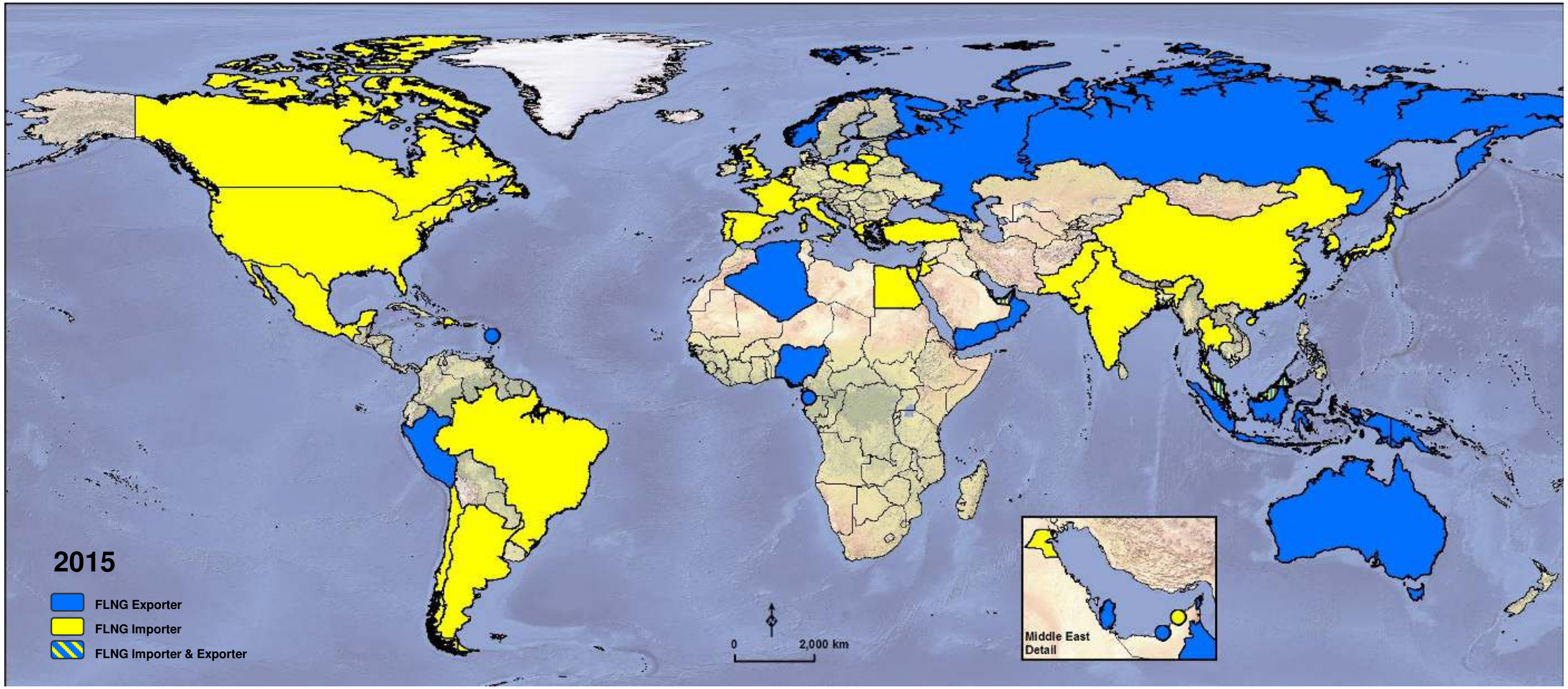
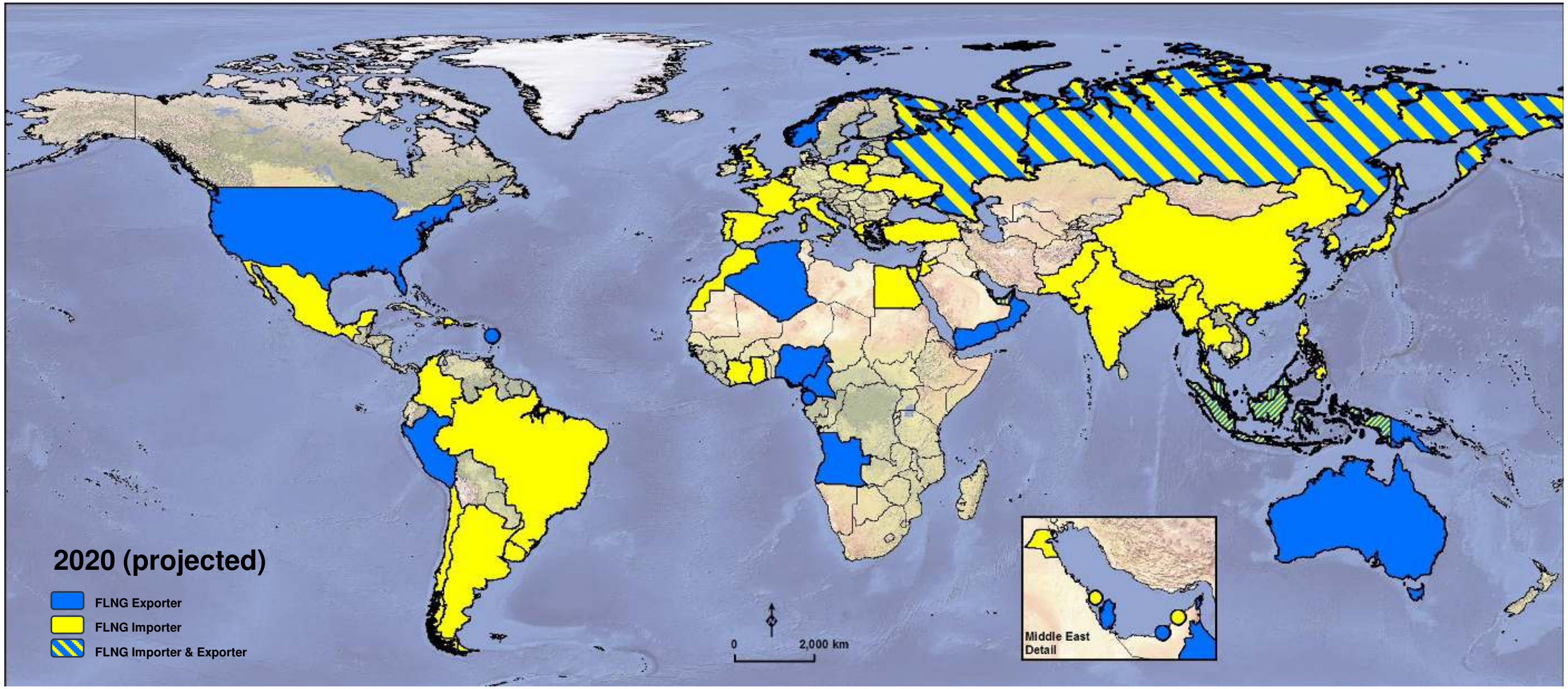
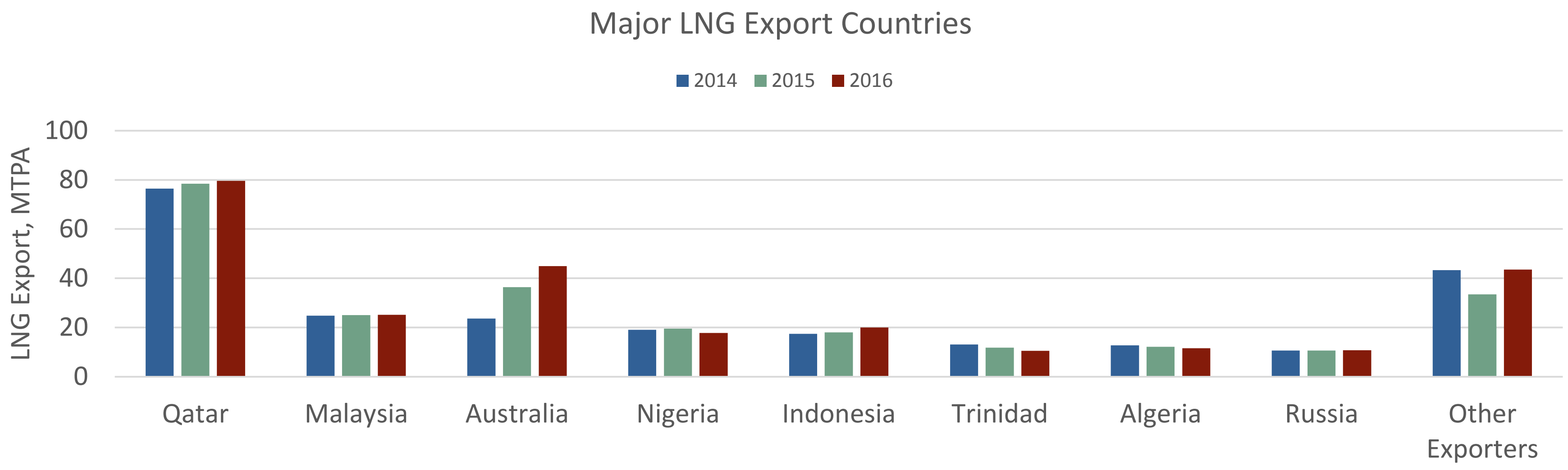
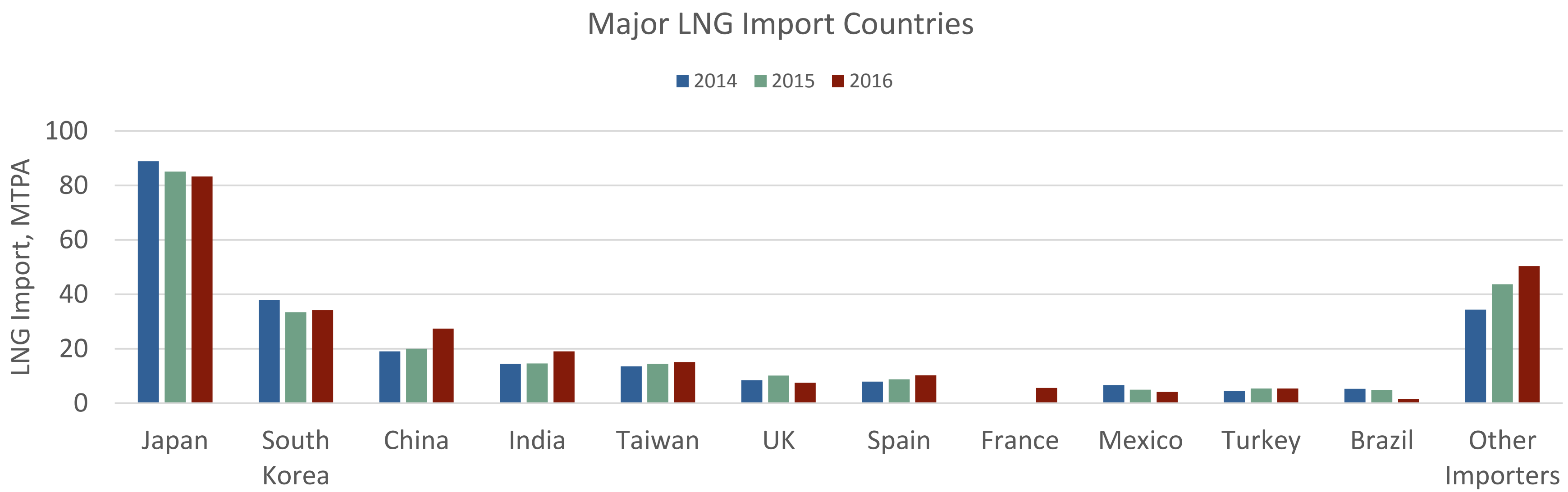


Changes in export and import countries….

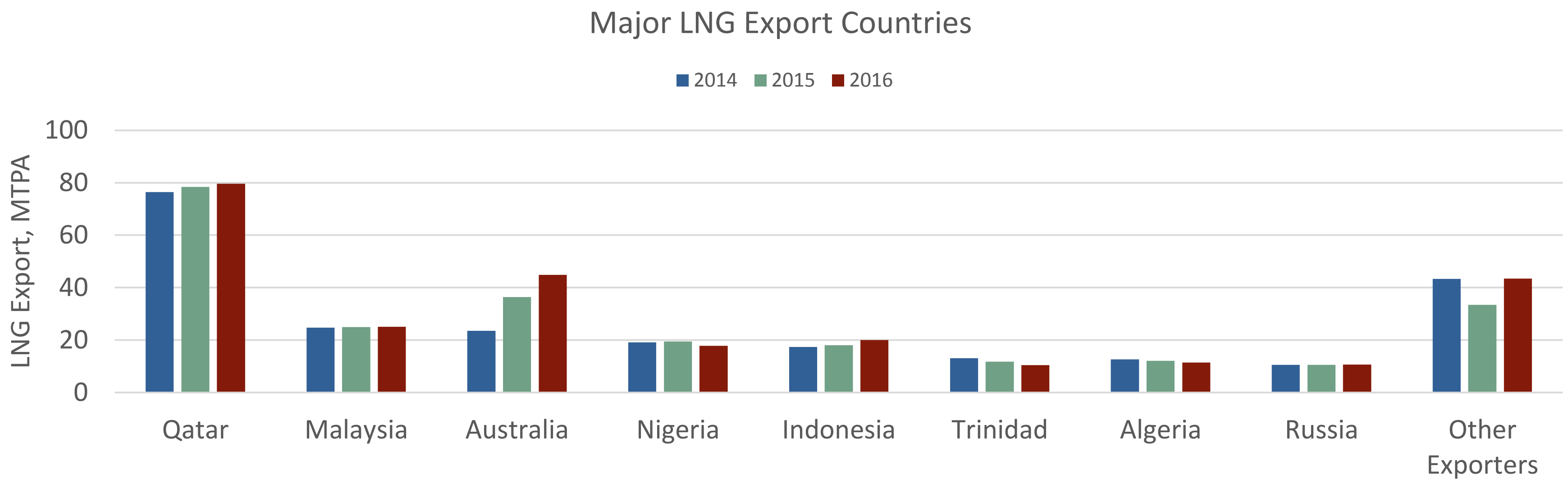


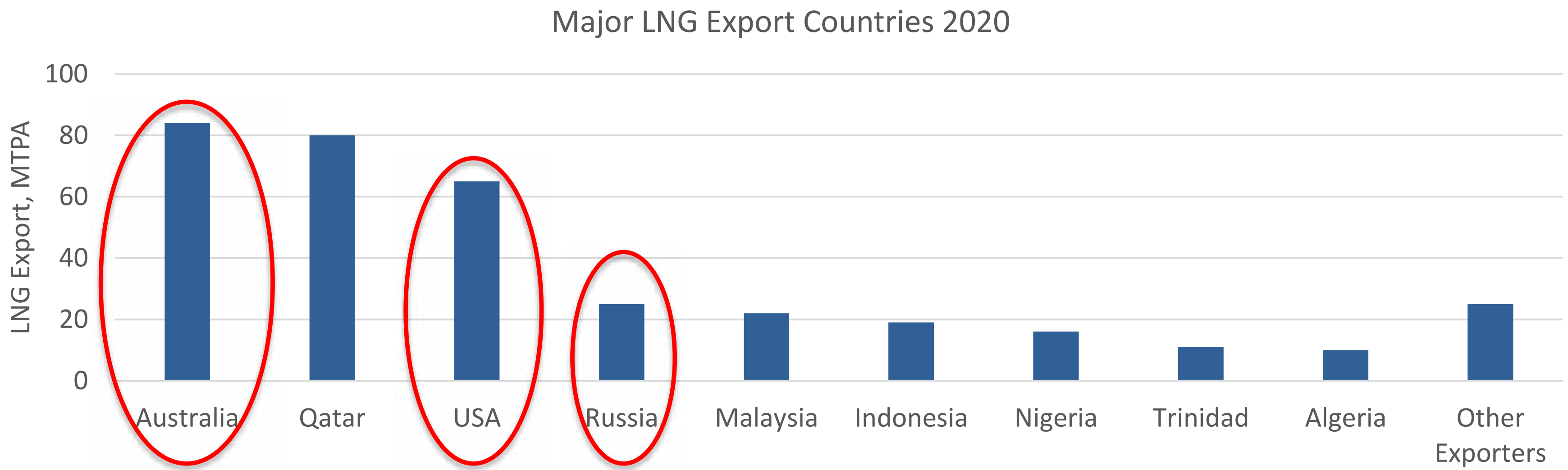
Current Exporters and Importers



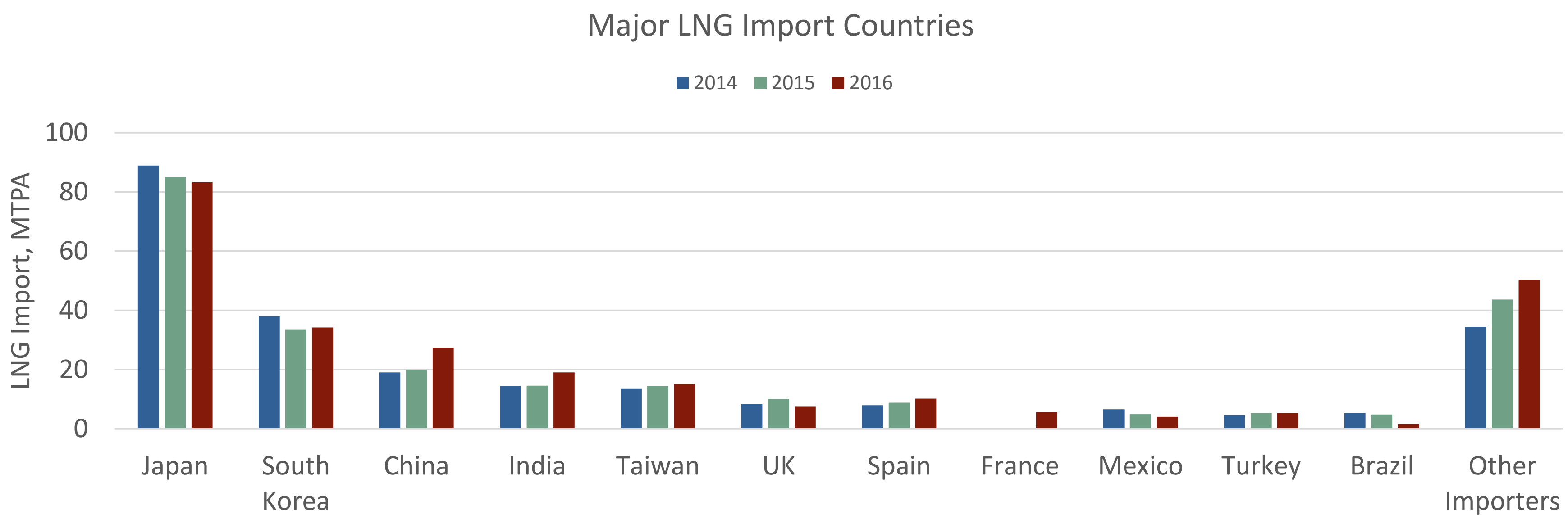


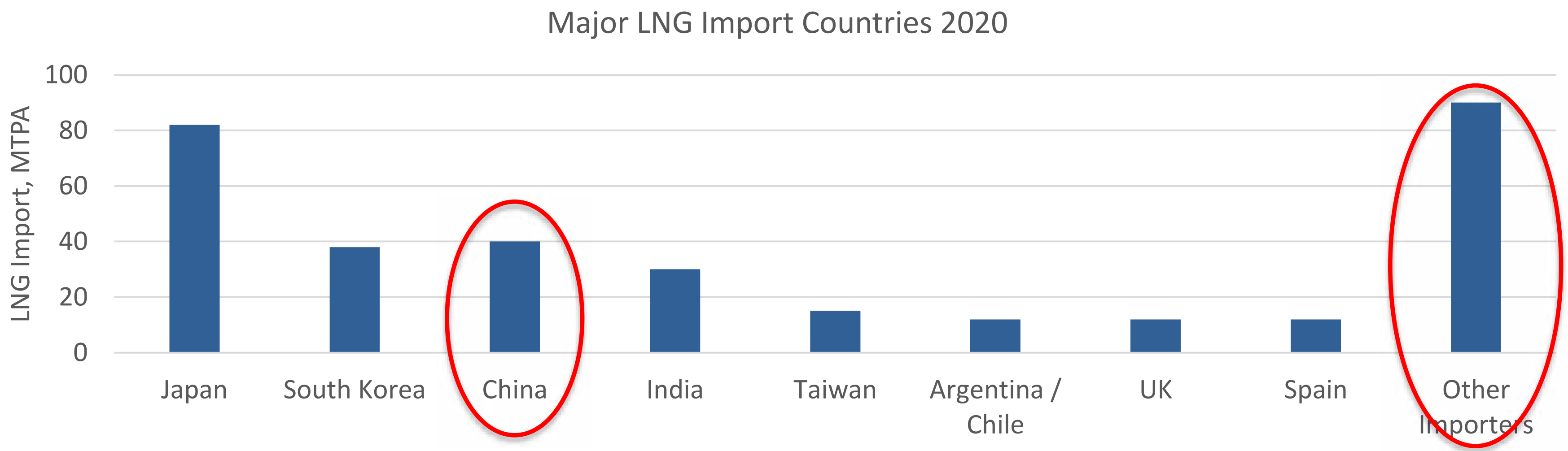
Significant new export in next 4 years





Increasing diversification of imports





Mid and Long Term

Between now and ~2020 a further 85+MTPA of capacity will be brought into production, mainly in the USA

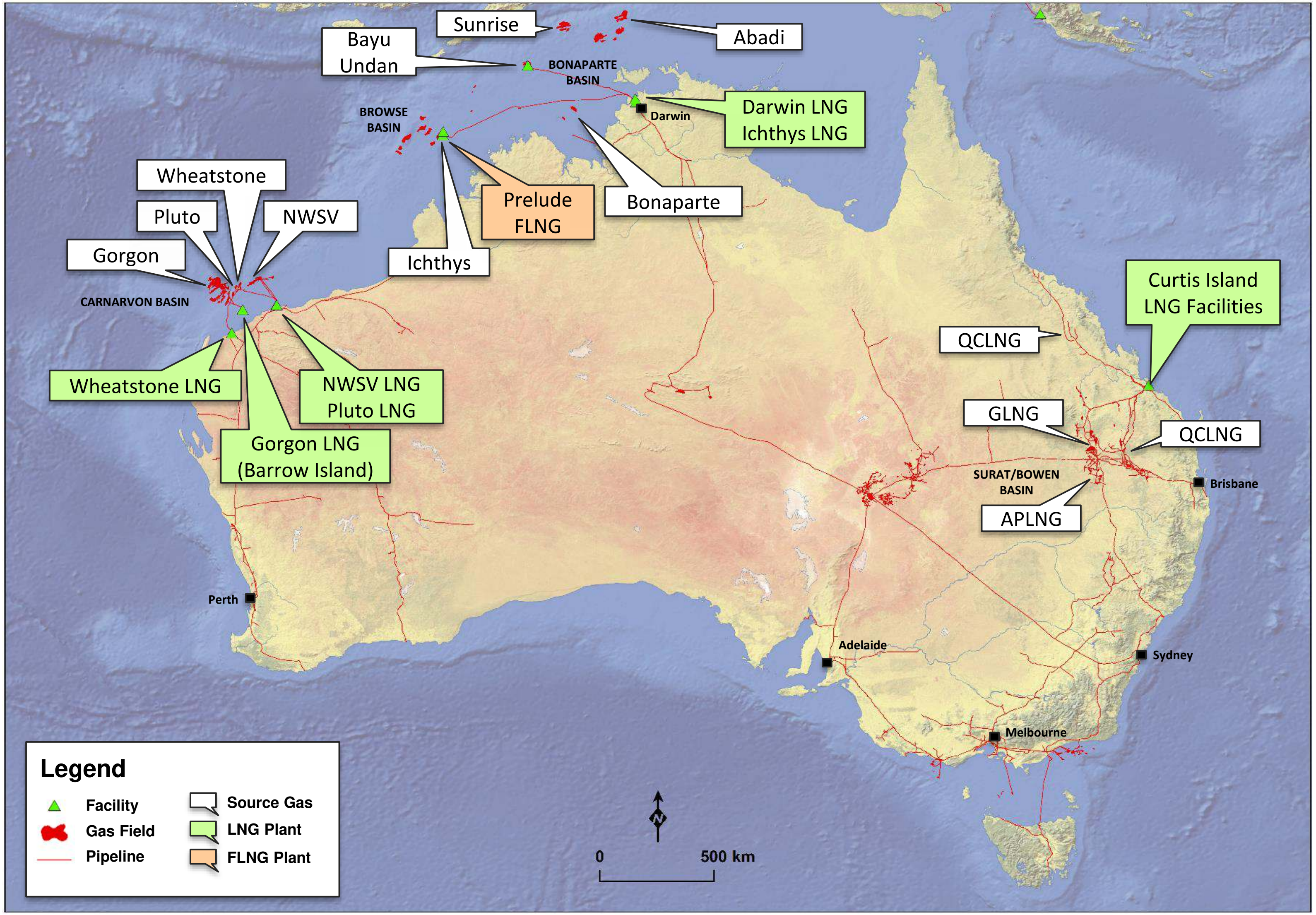
- A significant amount of this, but not all, is already contracted.
- Remainder of uncontracted LNG will create an overhang in supply into the early 2020's.
- Rapid diversification of LNG imports both geographic and market segment will see this rebalance.
  - Growth in importing countries - Asia, South America and Middle East
  - FSRU's now the "entry level", which significantly reduces both cost and time to begin imports
  - Smaller scale regional distribution gaining momentum both in Europe and Asia
  - Transportation gaining momentum
  - …but timing is unclear.
- FLNG offers the same change in "entry level" potential for upstream projects.

The rise of renewable energy creates both opportunity and risk

- Gas is the natural companion to renewables because of it ability to react quickly in line with variable renewable changes.
- Is Gas experiencing a "Green-Cheap Squeeze"
  - Not as green as renewables
  - Not as cheap as coal.
- Large scale electricity storage is a potential game-changer in the power generation arena, but appears to be some way off.

Australian LNG

Australia's LNG areas



History of Australian LNG

1963	• Woodside awarded >370,000km^2 of NWS acreage
1971/2	• North Rankin and Torosa (Browse Basin) discovered; Goodwyn discovered
1980/1	• WA State Government agrees to underwrite domestic gas with take or pay contract and building DBNGP; Gorgon discovered
1984/5	• Domestic Gas supply starts form North Rankin A; NWSV signs agreements to supply LNG to Japan
1989	• LNG Shipments begin to Japan
1995/6	• Goodwyn A platform starts up; Perseus field discovered next to North Rankin
2002/4	• NWSV agrees LNG contracts with China
2004	• NWSV Train 4 start up: Darwin LNG Start up
2007/8	• 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; GLNG Start up; APLNG Start up
2016	• Gorgon Start up
2017	• Wheatstone Start up

Australia's LNG projects overview

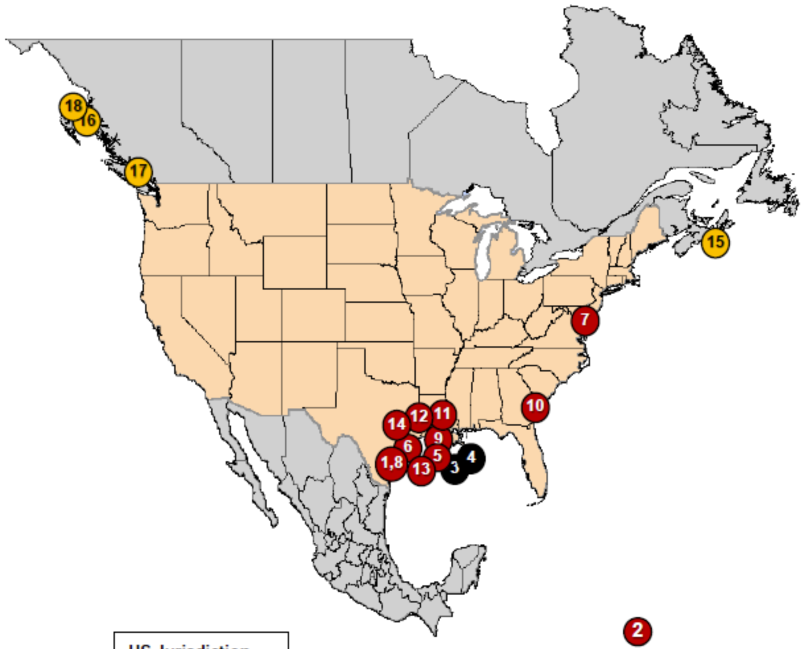
Project (#Trains)	Capacity MTPA	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
N.W. Shelf (5)	16.3												
Darwin (1)	3.6												
Pluto (1)	4.5												
QCLNG (2)	8.5	Nov 2010											
GLNG (2)	7.8	Dec 2010											
APLNG (2)	8.6												
Gorgon (3)	15.6	Sep 2009				1 2	3						
Wheatstone (2)	8.6	Sep 2011											
Total Operational	**73.5**												
Prelude FLNG (1)	3.6	May 2011											
Ichthys (2)	8.4												
Total Sanctioned	**12.0**												
Browse (F)LNG (2/3)	10-12		Studying alternative concepts										
Gorgon T4 (1)	5		Unlikely										
Wheatstone T3 (1)	4.5		Unlikely until after foundation project complete										
Sunrise (F)LNG (1)	~4		Political Issues										
Possible Future	**~25**												

FID — Expected First Production — Planned FID — Proposed First Production

USA LNG

USA LNG Areas

North American LNG Import/Export Terminals
Approved



US Jurisdiction
- FERC
- MARAD/USCG

As of January 24, 2018

Import Terminals

U.S.

APPROVED - UNDER CONSTRUCTION - FERC
1. **Corpus Christi, TX:** 0.4 Bcfd (Cheniere – Corpus Christi LNG) (CP12-507)

APPROVED – NOT UNDER CONSTRUCTION - FERC
2. **Salinas, PR:** 0.6 Bcfd (Aguirre Offshore GasPort, LLC) (CP13-193)

APPROVED - NOT UNDER CONSTRUCTION - MARAD/Coast Guard
3. **Gulf of Mexico:** 1.0 Bcfd (Main Pass McMoRan Exp.)
4. **Gulf of Mexico:** 1.4 Bcfd (TORP Technology-Bienville LNG)

Export Terminals

U.S.

APPROVED - UNDER CONSTRUCTION - FERC
5. **Hackberry, LA:** 2.1 Bcfd (Sempra–Cameron LNG) (CP13-25)
6. **Freeport, TX:** 2.14 Bcfd (Freeport LNG Dev/Freeport LNG Expansion/FLNG Liquefaction) (CP12-509) (CP15-518)
7. **Cove Point, MD:** 0.82 Bcfd (Dominion–Cove Point LNG) (CP13-113)
8. **Corpus Christi, TX:** 2.14 Bcfd (Cheniere – Corpus Christi LNG) (CP12-507)
9. **Sabine Pass, LA:** 1.40 Bcfd (Sabine Pass Liquefaction) (CP13-552)
10. **Elba Island, GA:** 0.35 Bcfd (Southern LNG Company) (CP14-103) ★

APPROVED – NOT UNDER CONSTRUCTION - FERC
11. **Lake Charles, LA:** 2.2 Bcfd (Southern Union – Lake Charles LNG) (CP14-120)
12. **Lake Charles, LA:** 1.08 Bcfd (Magnolia LNG) (CP14-347)
13. **Hackberry, LA:** 1.41 Bcfd (Sempra - Cameron LNG) (CP15-560)
14. **Sabine Pass, TX:** 2.1 Bcfd (ExxonMobil – Golden Pass) (CP14-517)

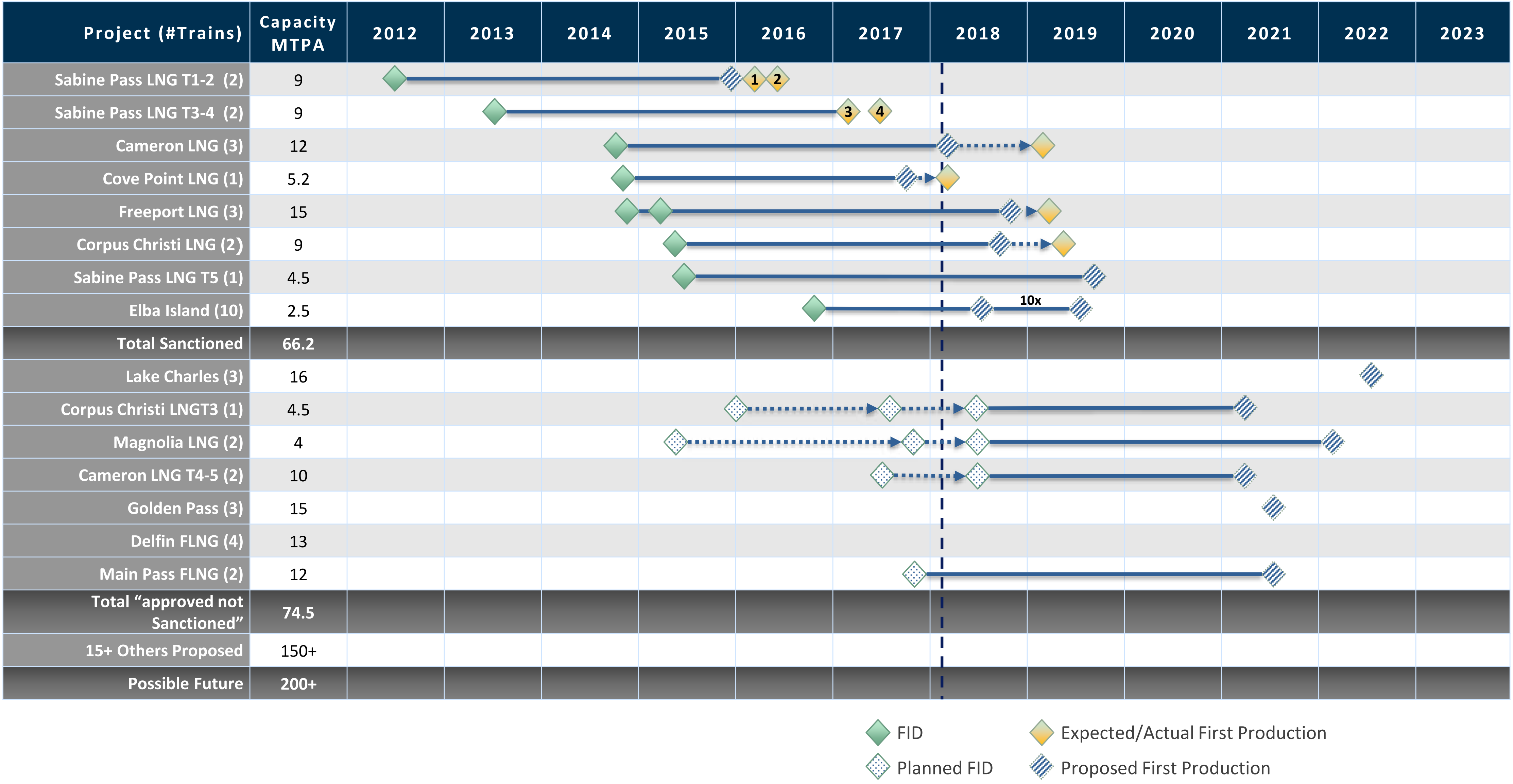
Canada

APPROVED – NOT UNDER CONSTRUCTION
15. **Port Hawkesbury, NS:** 0.5 Bcfd (Bear Head LNG)
16. **Kitimat, BC:** 3.23 Bcfd (LNG Canada)
17. **Squamish, BC:** 0.29 Bcfd (Woodfibre LNG Ltd)
18. **Prince Rupert Island, BC:** 2.74 Bcfd (Pacific Northwest LNG)

★ Trains 5 & 6 with Train 5 under construction

Source: FERC

US LNG projects overview



FLNG and Other Projects

FLNG projects overview

Project (#Trains)	Capacity MTPA	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Kanowit PFLNG1 (1)	1.2												
Prelude FLNG (1)	3.6	May 2011											
Rotan PFLNG2 (1)	1.5												
Kribi FLNG (1)	1.2												
Coral FLNG (1)	3.3												
Total Sanctioned	**2.4**												
Fortuna FLNG (1)	1.2												
Tortue FLNG (2)	4.6												
Total planned not Sanctioned	**10.6**												

FID
Planned FID
Expected/Actual First Production
Proposed First Production

Other Projects

- MLNG T9 started up in 2016, 3.6MTPA
- Yamal LNG – 16.5MTPA, FID end 2013, Started up late 2017
- Tangguh T3 Sanction in July 2016, 3.8MTPA in 2020
- Abadi – 9.5 MTPA, FID 2020, RFSU 2025
- PNGLNG / PAPUA LNG expansion initial announcements
  - 3 new Trains, 8MTPA RFSU 2020's.

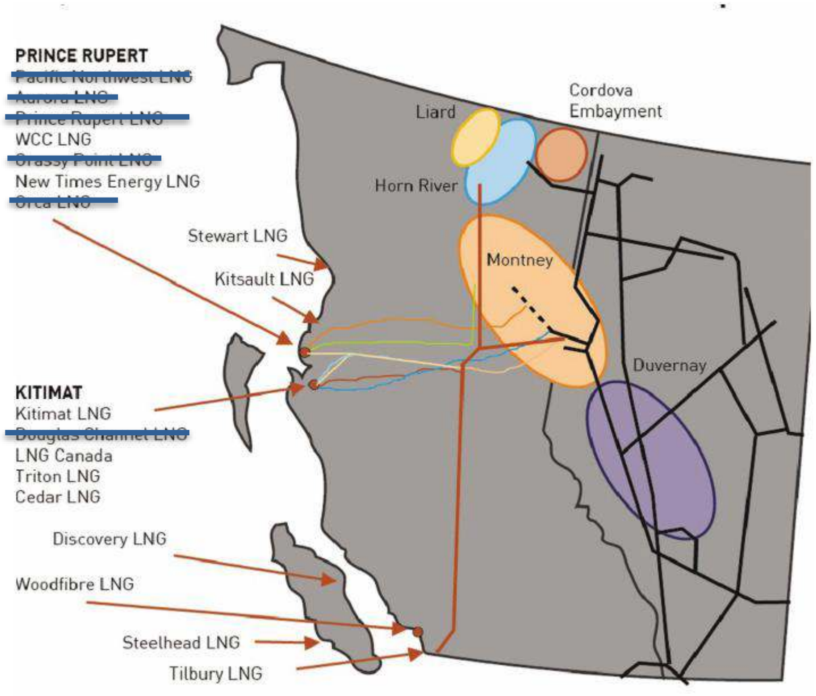
Canada and East Africa

Massive Gas Resources in Canada and East Africa

…BUT…

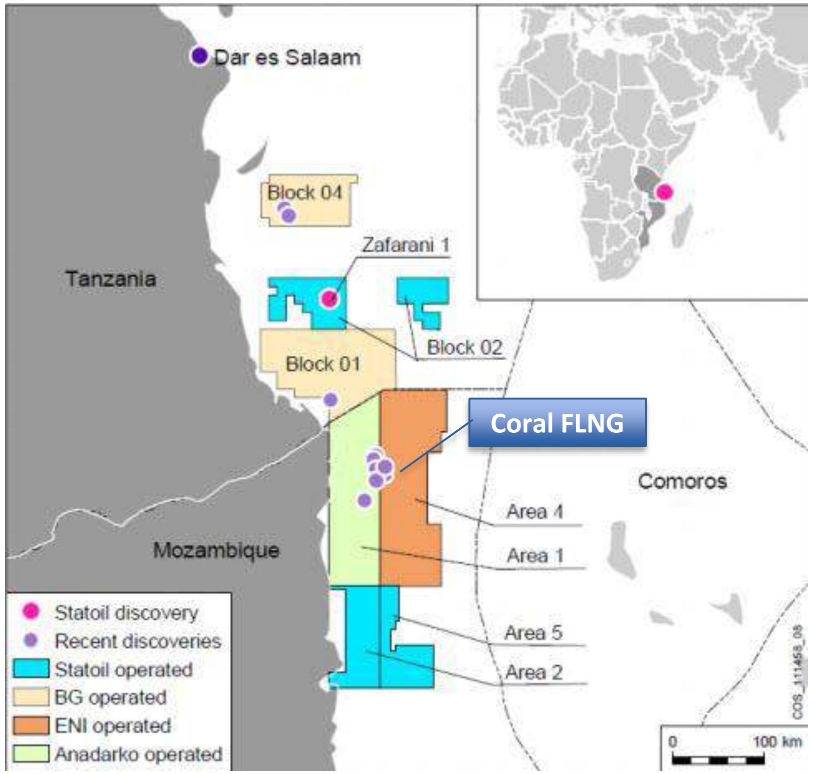
Canada

- West Coast (Pacific)– Multiple possible projects
- Greenfield, remote, high cost, native title, active opposition
  - Similar issues to Australia.



East Africa

- East Coast (Indian Ocean) - >100Tcf
- Lack of petroleum legislation
- Gov't debt crisis
- Greenfield, remote, low skills base.



Canadian Projects – info…

Canadian LNG projects are having delays in getting to FIDs….

- *“Unforeseen global conditions are challenging projects…low global prices will impact timelines”* (BC Gov’t).
- *“global industry challenges, including capital constraints*“ (LNG Canada).
- Woodfibre
  - RGE celebrated FID, but Squamish First Nation approvals not yet received, no date for construction.
- LNG Canada
  - Shell/Petrochina/Mitsubishi/KOGAS, delay to end 2016 in 2015, “Unspecified delay” July 2016.
  - *“want to take FID in 2018”*…August 2017.
- Kitimat
  - Chevron/Woodside - *“activity levels in 2016 will be lower than 2015”* …no firm dates.

…or have been cancelled

- Cancelled in 2017
  - Aurora LNG: Inpex and CNOOC (Nexen) cancelled project in September 2017
  - Pacific NorthWest LNG: Project cancelled July 2017 after gov’t approval Sep 2016 with 190 conditions
  - Prince Rupert LNG: Shell cancelled project in March 2017.
- Cancelled in 2016
  - Douglas Channel LNG, Canaport LNG.

East African Projects

- Mozambique ENI's Coral FLNG project (Area 4):
  - Gov't approvals received Q1 2016
  - FID targeted for end 2016 following contract and trade agreement approvals
  - FID announced June 2017.

- Mozambique onshore LNG:
  - 2014/15 Gov't urging collaboration, Anadarko and ENI "strongly committed to Mozambique LNG"
  - Unitisation agreement across Areas 1 and 4, December 2015 (yet to be ratified)
  - Exxon take 25% stake in Area 4 from ENI, March 2017
  - Anadarko project "signs 2 marine concessions" for 2 train development of Area 1, July 2017
  - Gov't announcement that two separate LNG projects will be built, August 2017.
  - Anadarko announces key terms for ~5MTPA of offtake agreements.
- Tanzania
  - Gov't sanctioned collaboration for onshore project
  - Project proponents working together (BG/Shell, Statoil, E-M, Ophir, Pavilion)
  - LNG site land agreements finalised early 2016
  - Host Gov't Agreement (re)-drafted July 2017, negotiations on contracts and conditions anticipated for 18 months
  - No clear indication of a timeline to FID (Various reports between 2018/20).

Closing thoughts & insights

What happens now?

- Australia will become the number 1 exporter of LNG sometime in 2018/19.
- The vast majority of new LNG capacity up to 2020 will come from USA.

Beyond 2020 the future is less clear

- USA could overtake Australia as #1 exporter in the early 2020's….
- There are a number of large scale LNG opportunities in East Africa and Canada
  - but new greenfield LNG project will still need robust pricing wherever they are.

- FLNG will lower the "barrier to entry"
  - The increasing liquidity of the market will enable shorter term contracts and the development of smaller resource pools
- Brownfield developments will have potential advantages.

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