Will there be enough LNG?

IGU: 2nd PGC-E

Marketing & Communication

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TOTAL

Today’s Menu

Will there be LNG for every buyer?

- **Buyers’ Reasons to be worried**
- **New LNG demand coming from everywhere**

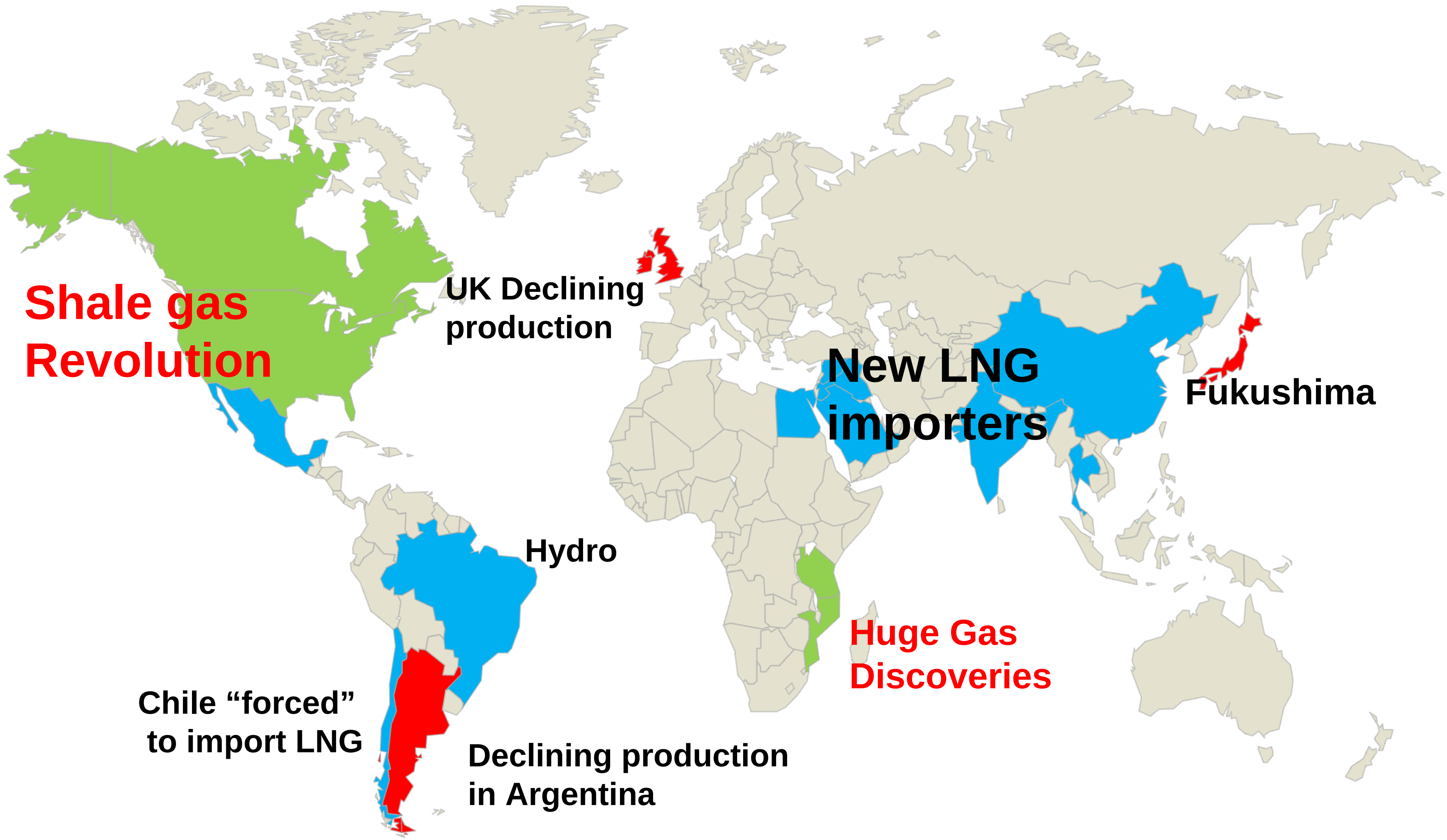
New LNG: the race to gas markets

- Austral Asia…………...Targeting Asia
- Middle-East…………...The Wild Card!
- Southern Atlantic……..For South America?
- Northern Atlantic……..The Arctic Race

And the winners are…..

- It is a Buyers tough choice!

Recent Natural Gas markets “imbalances”

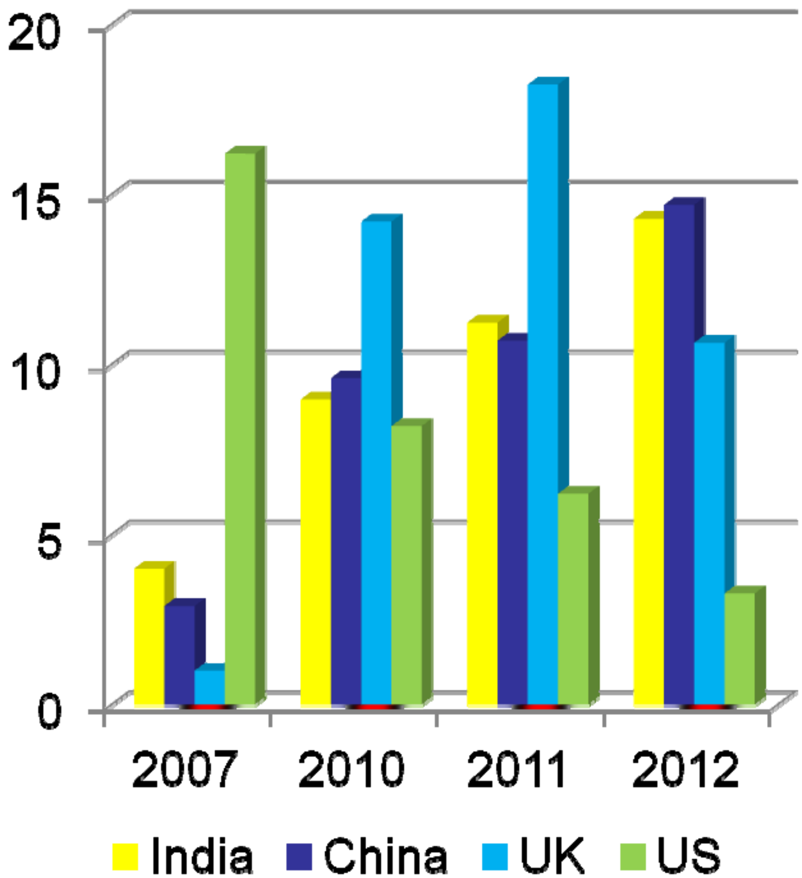


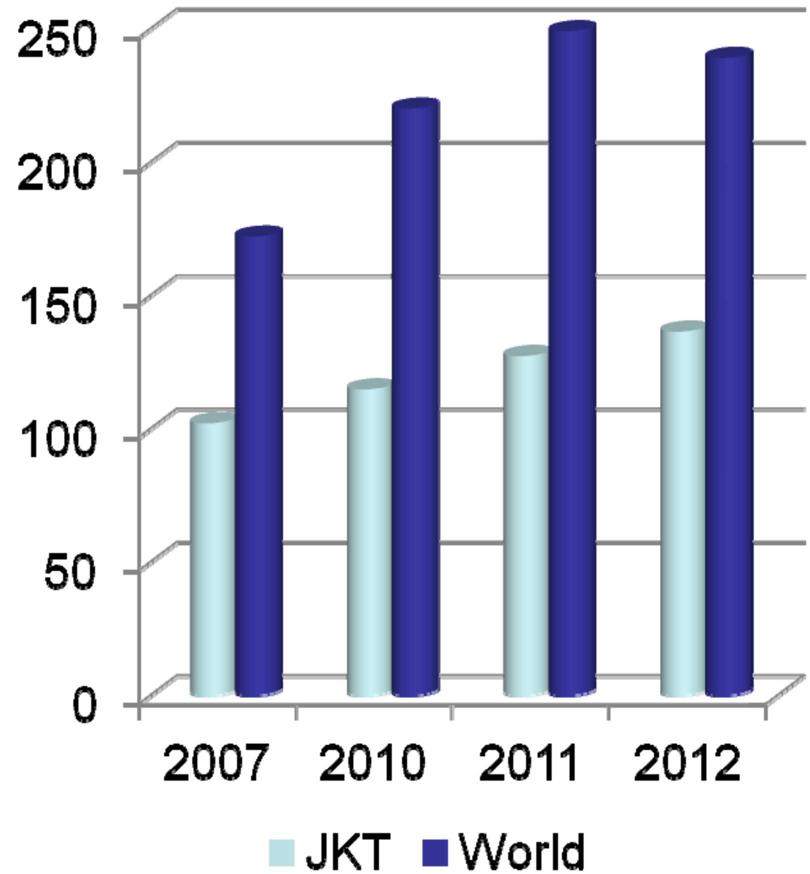
Reasons for Buyers to be worried

- Fukushima aftermath: Japan nuclear policy
  - Need for an extra 15-20% (from 2010 imports)
- India, China and UK: strong appetite for LNG
  - New LNG re-gas terminals & productions decline
- New “thirsty” LNG buyers almost everywhere
  - Malaysia, Indonesia, Thailand, etc….
  - **Argentina, Brazil, Chile**, the Caribbean islands
  - **Middle-East countries (FSRU’s development)**
- Many current problems on supply’s side
  - From Yemen, Egypt, Norway, Nigeria and Angola

Recent trends in LNG (Mton)

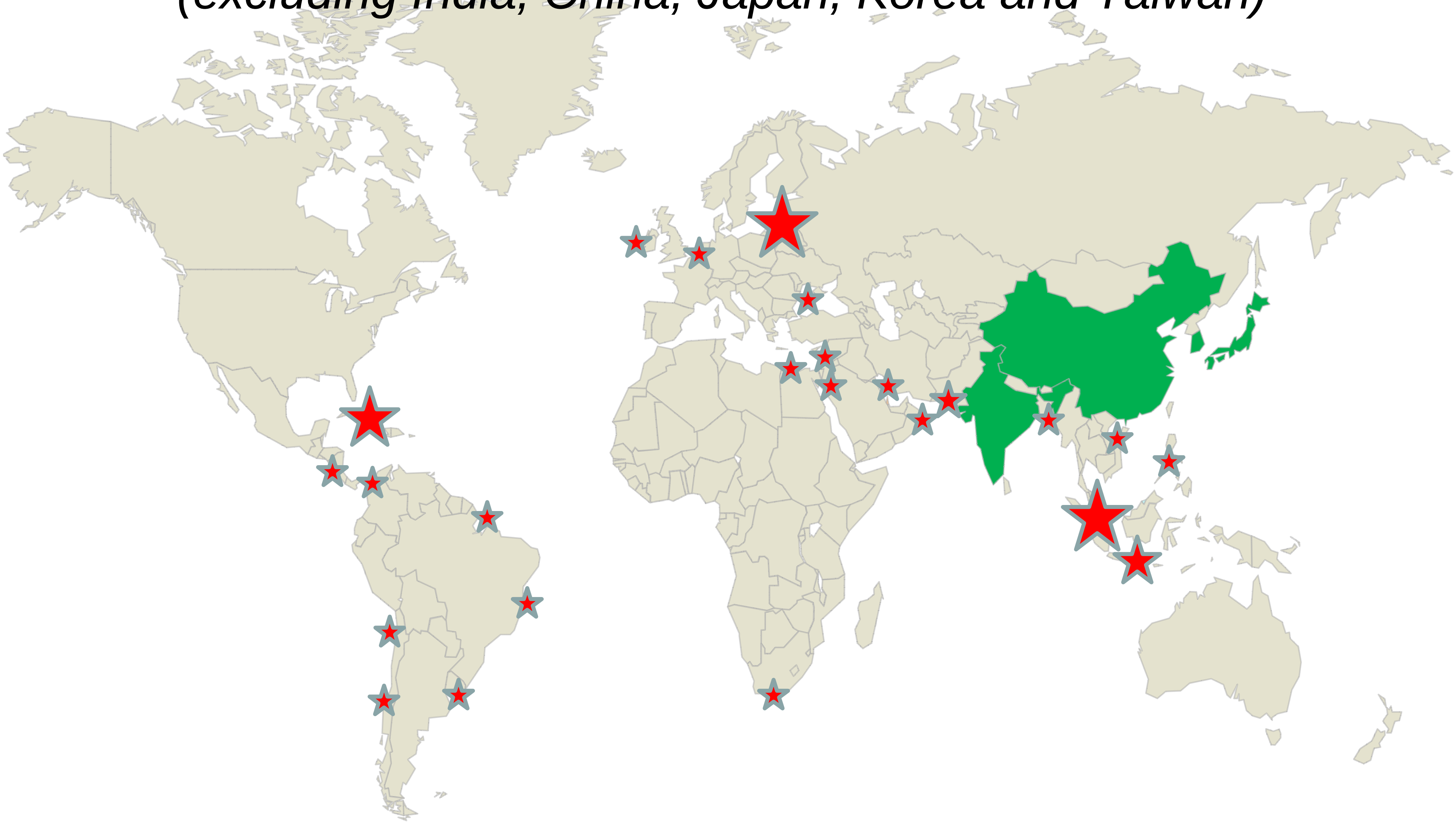
Before and after “Fukushima”





Serious Candidates for LNG imports: new re-gas terminals

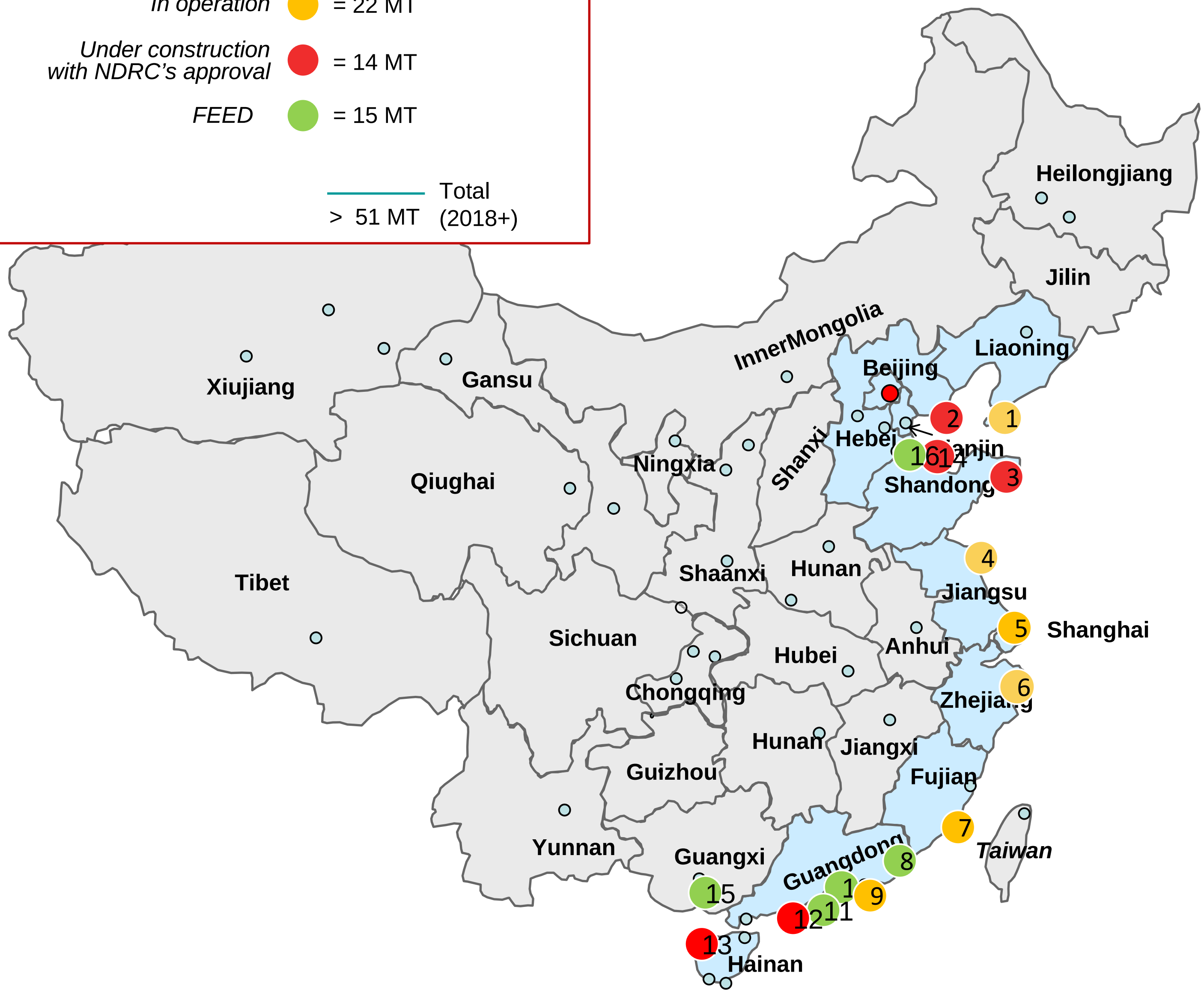
(excluding India, China, Japan, Korea and Taiwan)



Malaysia, Indonesia, Vietnam, Philipines, Bahrain, Pakistan, Bangladesh, Egypt, Jordan, UAE, Columbia, Israel, Baltic countries, South Africa, Uruguay new imports

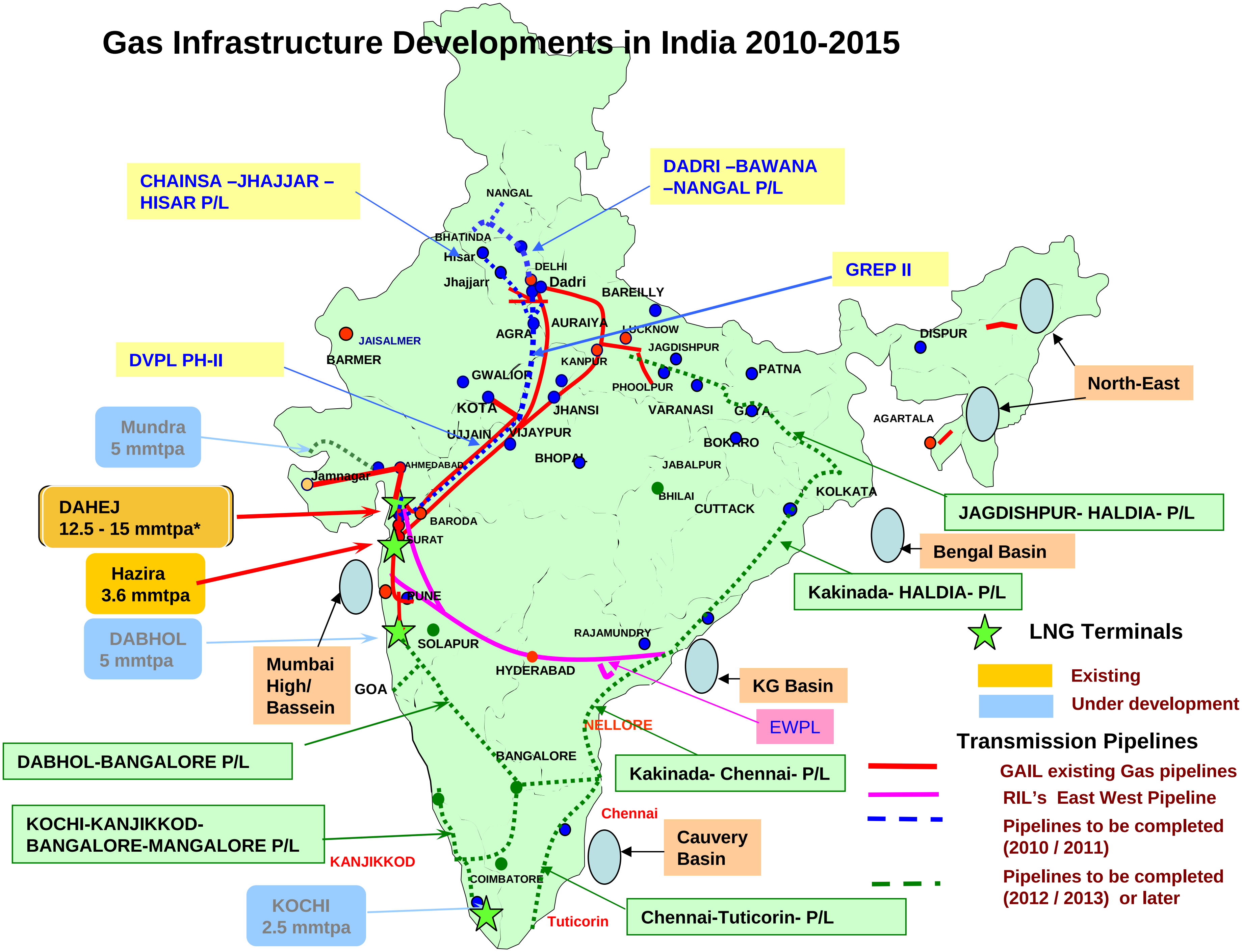
China: LNG receiving Terminal Projects

	Capacity
In operation (yellow)	= 22 MT
Under construction with NDRC's approval (red)	= 14 MT
FEED (green)	= 15 MT
> 51 MT	Total (2018+)

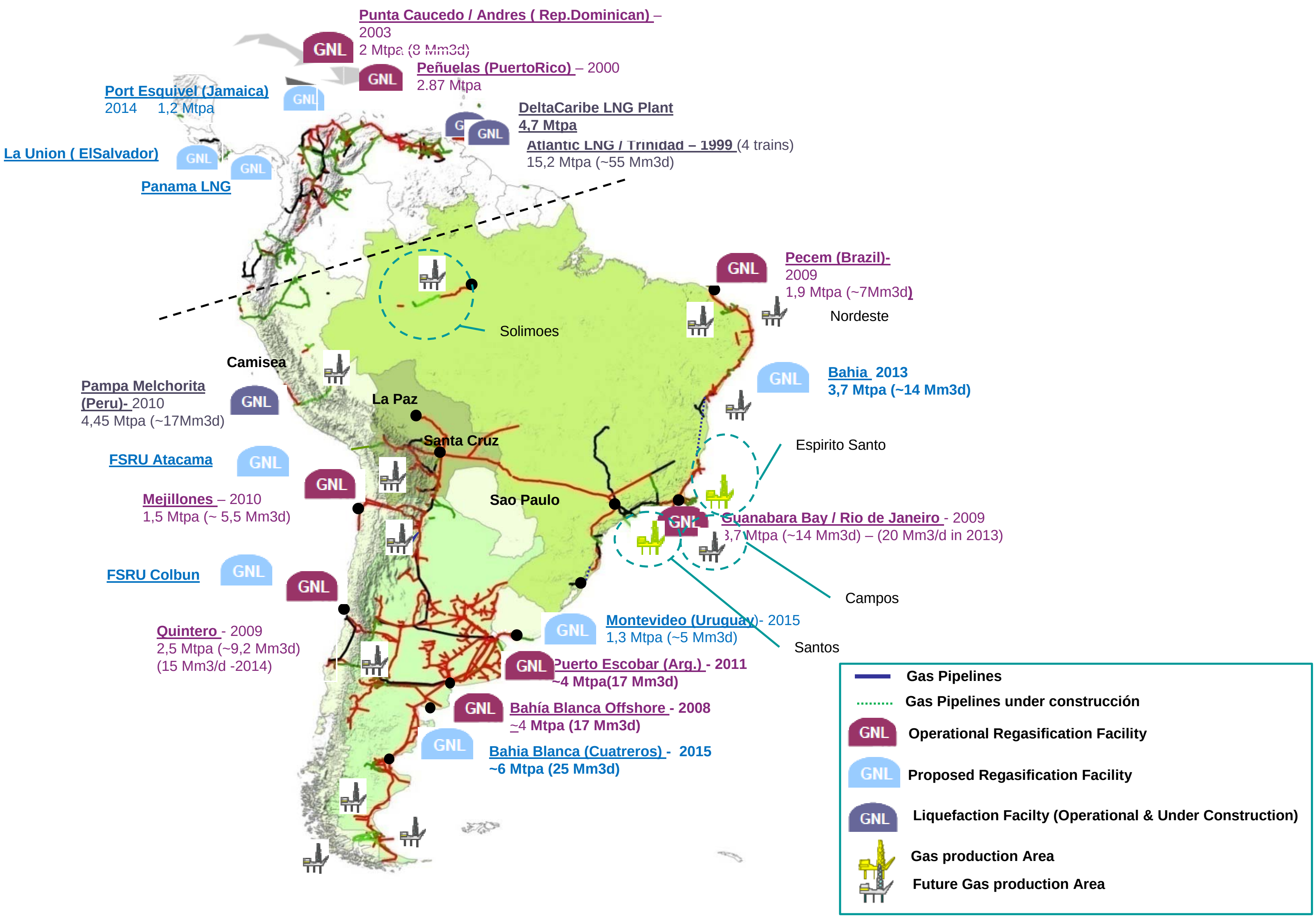


	Location Main owner
1	Dalian PetroChina
2	Caofeidian PetroChina
3	Qingdao Sinopec
4	Rudong PetroChina
5	Shanghai CNOOC
6	Zhejiang Ningbo CNOOC
7	Fujian CNOOC
8	Jieyang CNOOC
9	Guangdong Dapeng CNOOC
10	Shenzhen CNOOC
11	Guangdong PetroChina
12	Zhuhai CNOOC
13	Yangpu CNOOC
14	Tianjin FSRU CNOOC
15	Beihai Sinopec
16	Tianjin Sinopec

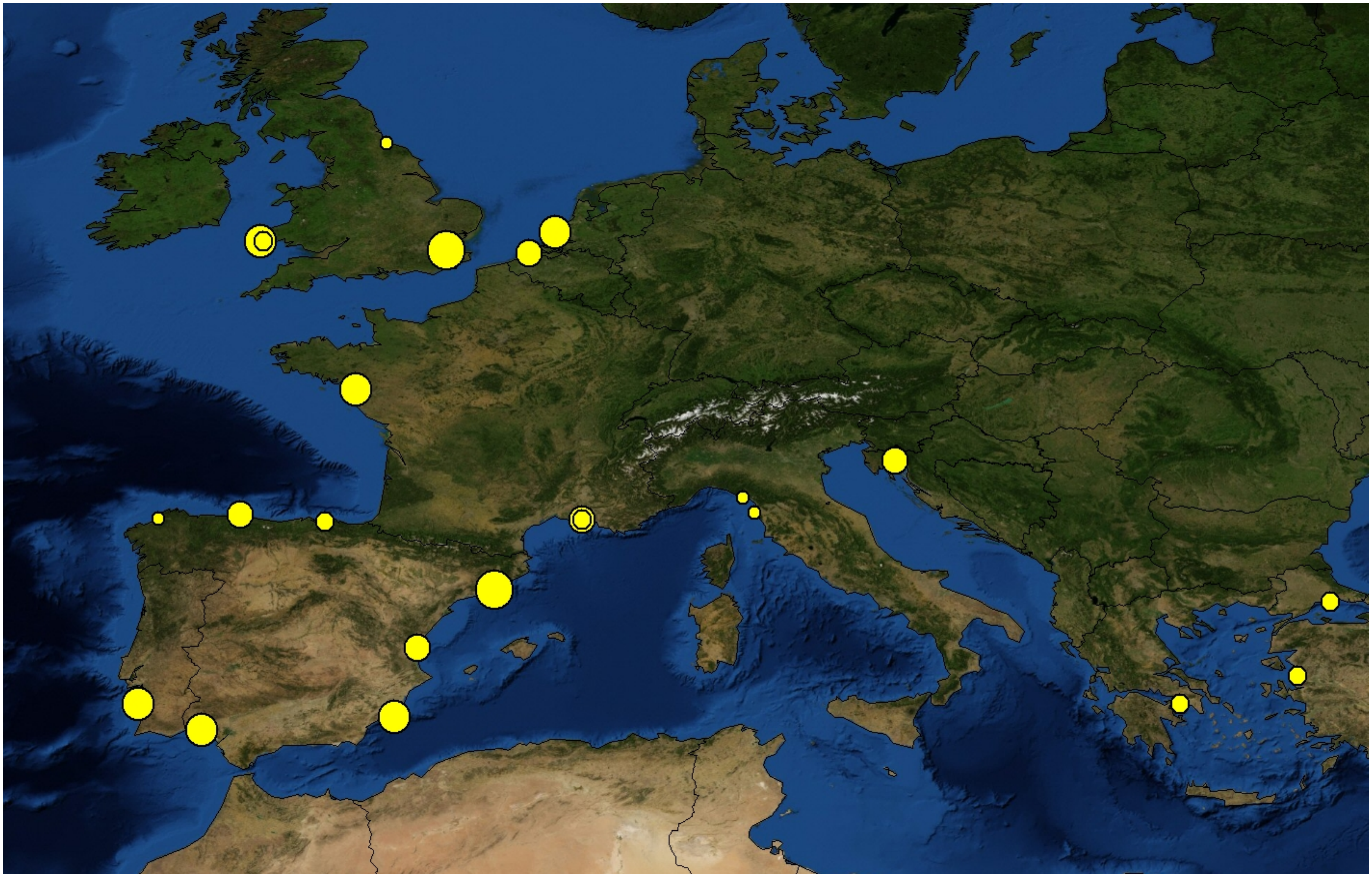
Gas Infrastructure Developments in India 2010-2015



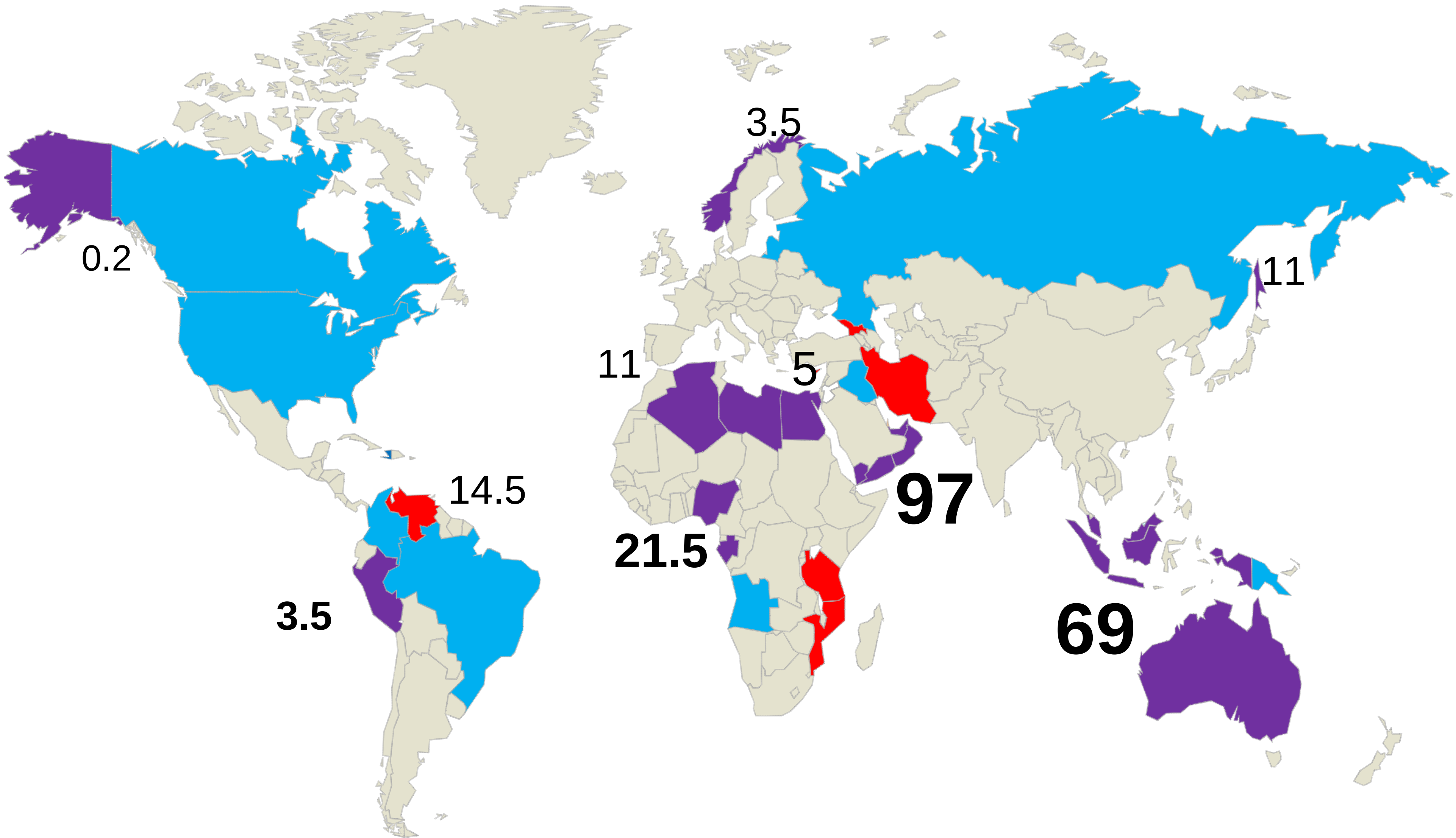
South America LNG terminals (current & projects)



Europe LNG terminals as of 2012



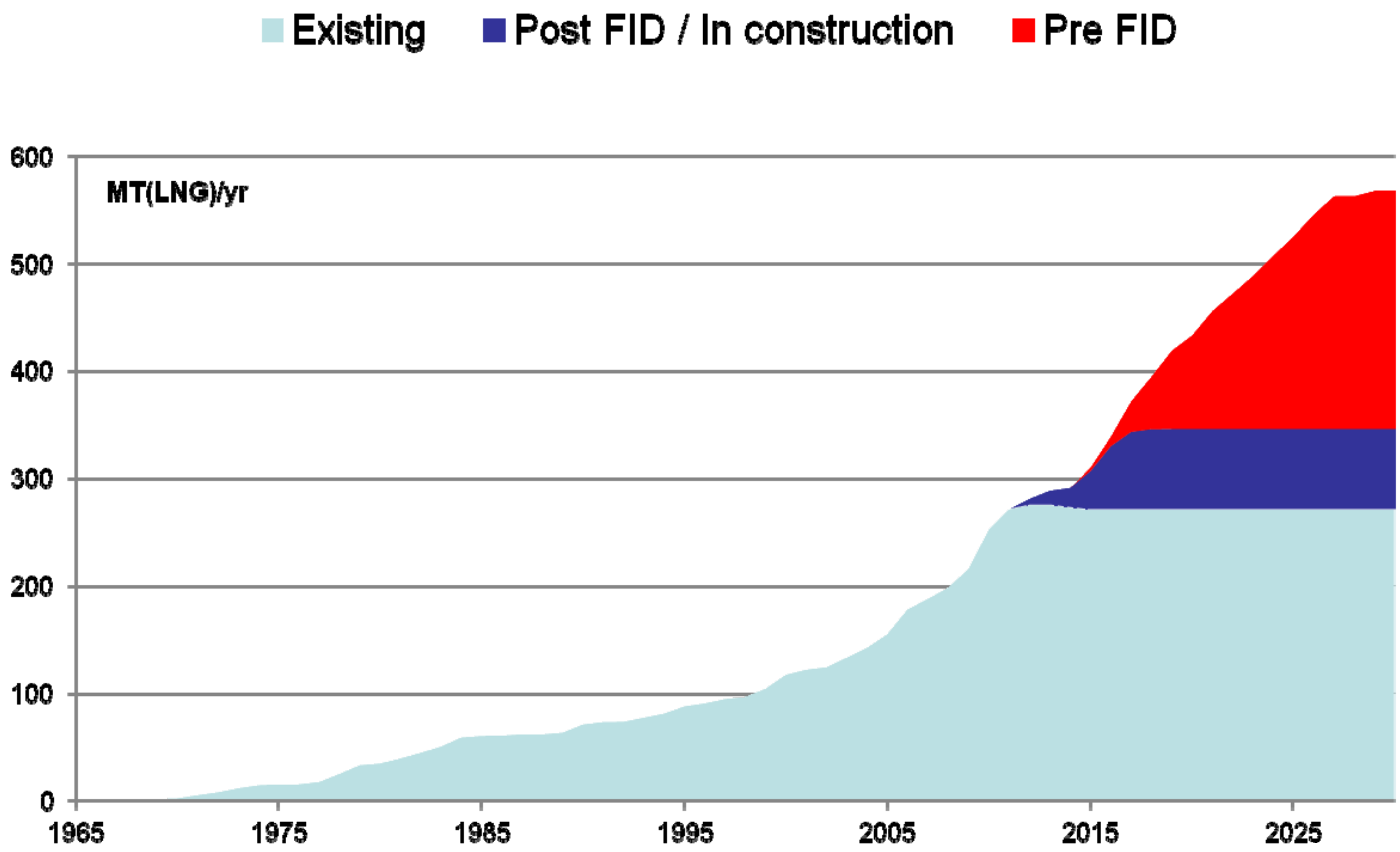
Current and future sources of worldwide LNG (+candidates)



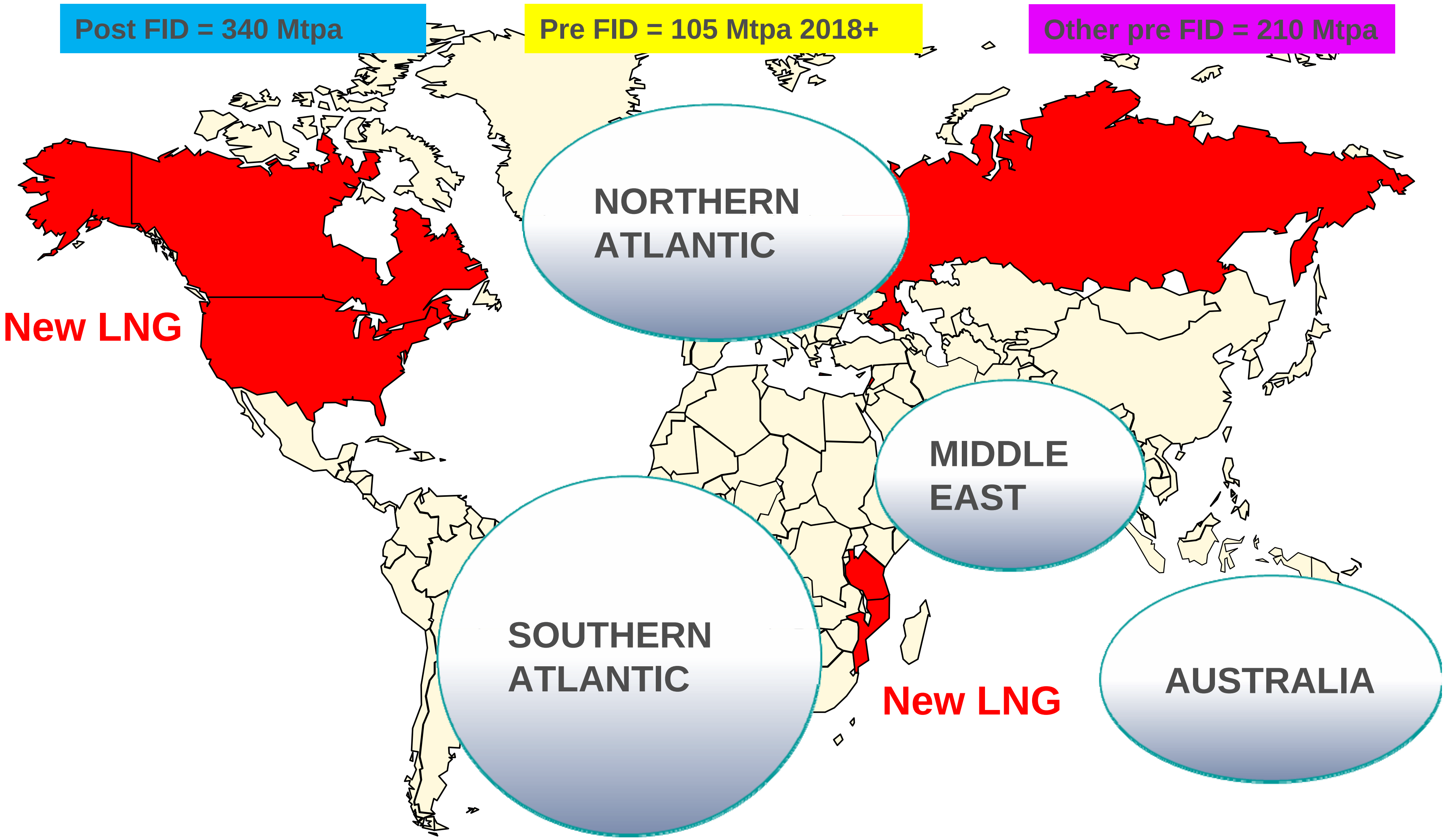
Source: Poten&Partners

239 Mt exported in 2012

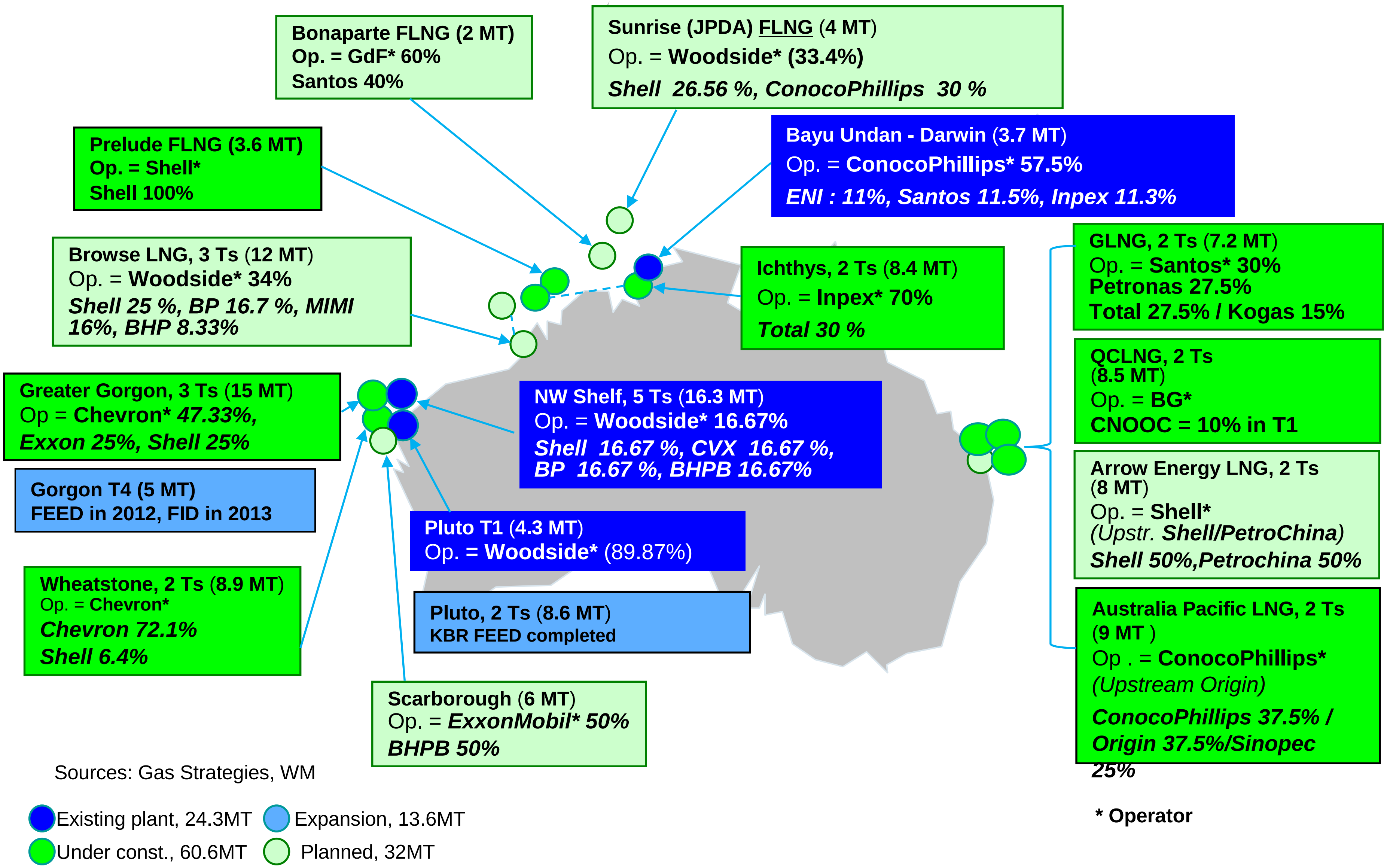
Worldwide LNG Productions (TOTAL view)



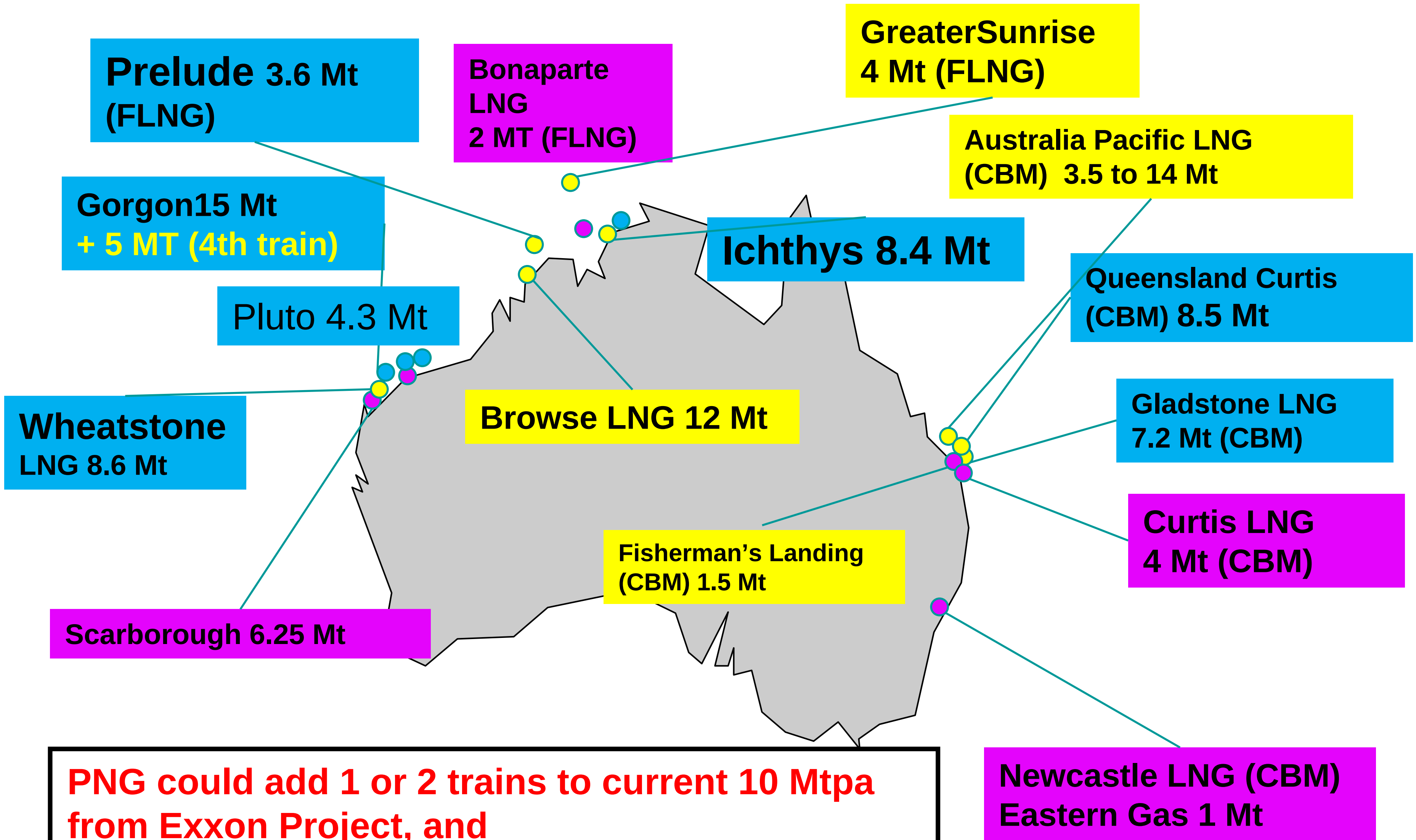
New Potential LNG: + 100 Mtpa post 2018



Overview of Australian LNG Projects



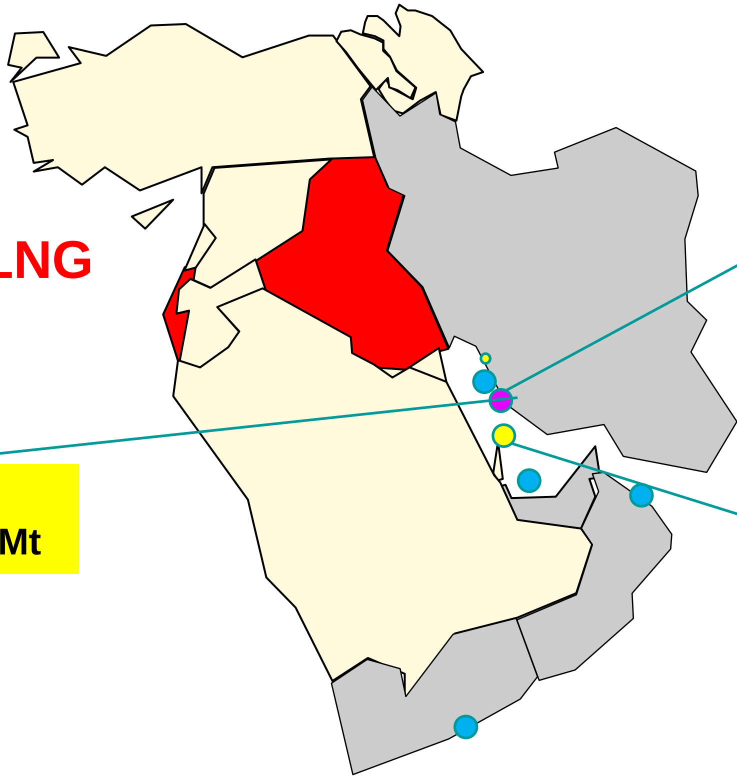
Australian LNG estimate: 100 Mtpa in 2020



PNG could add 1 or 2 trains to current 10 Mtpa from Exxon Project, and
Don't discard Indonesia LNG future too!

Middle-East :The Wild Card

New LNG



Iran
Persian LNG: 16 Mt
Iran LNG: 11 Mt
Golshan / F:10 MT
North LNG: 20 Mt

Iran
Pars LNG : 10 Mt

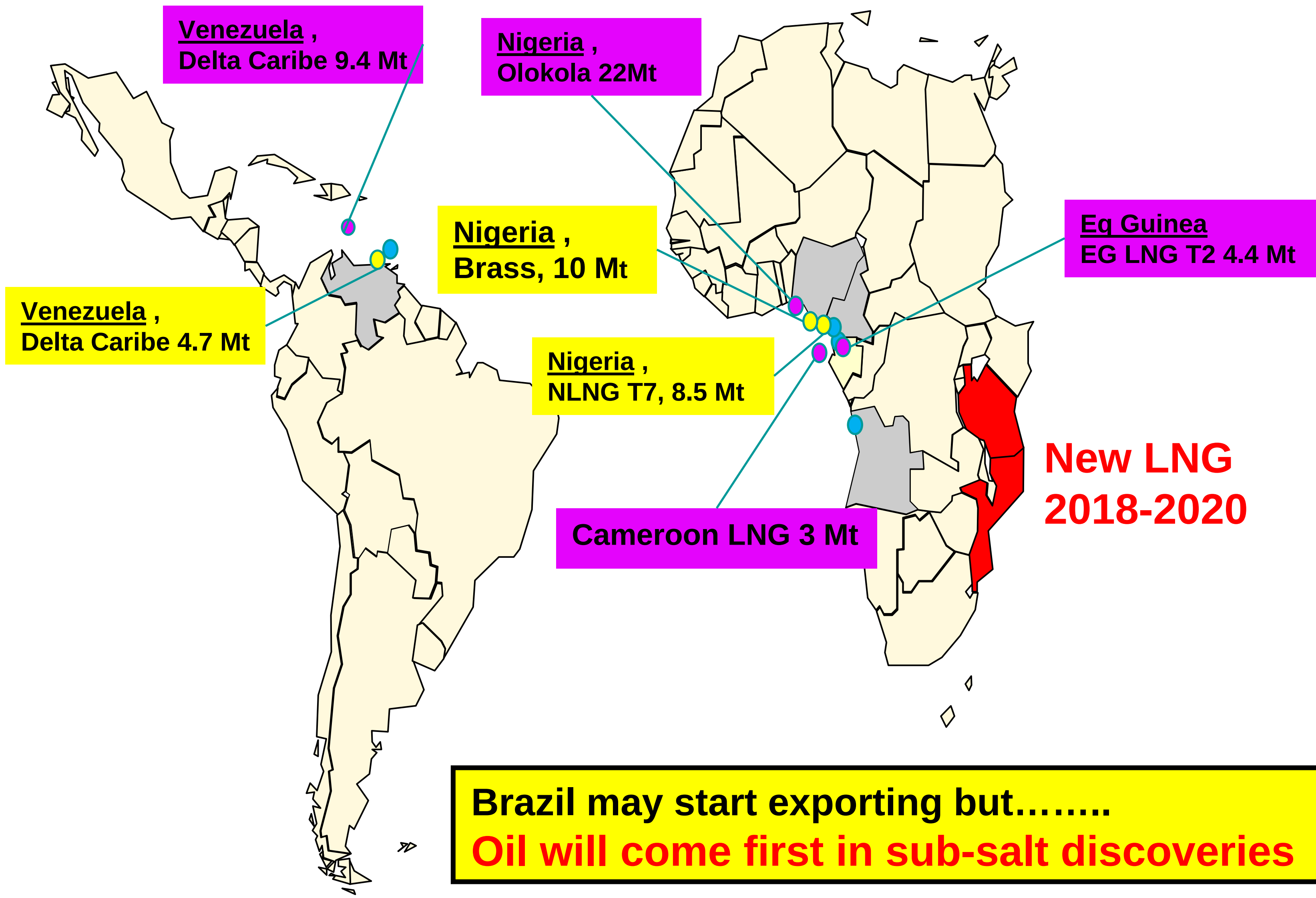
Qatar
De-bottlenecking = +10Mt

+10 Mtpa from Qatar de-bottlenecking if needed

10-20 Mtpa Iran LNG to come one day

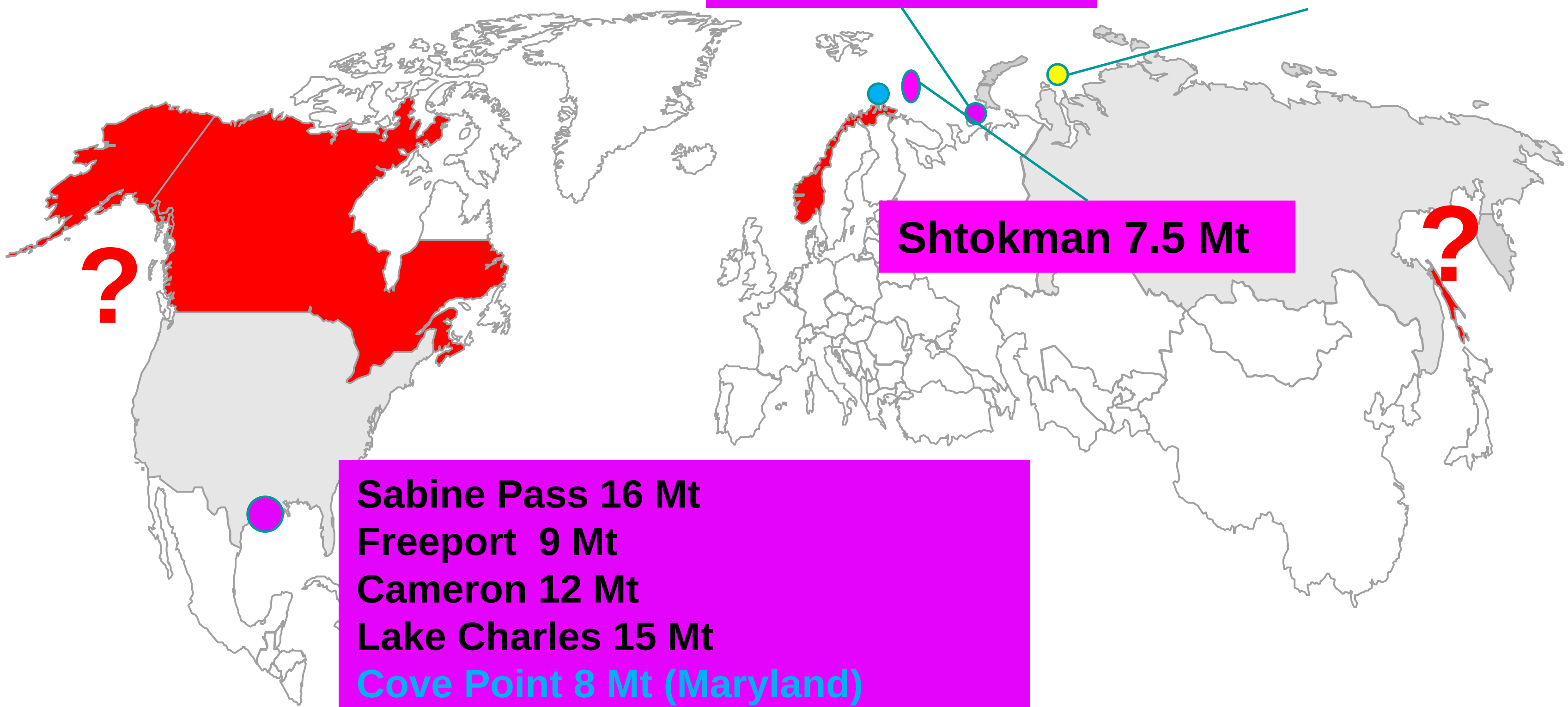
Iraq, Israel & Cyprus may become LNG exporters soon

Southern Atlantic LNG: +23 Mtpa (+39Mtpa)



Brazil may start exporting but……..
Oil will come first in sub-salt discoveries

Northern Atlantic



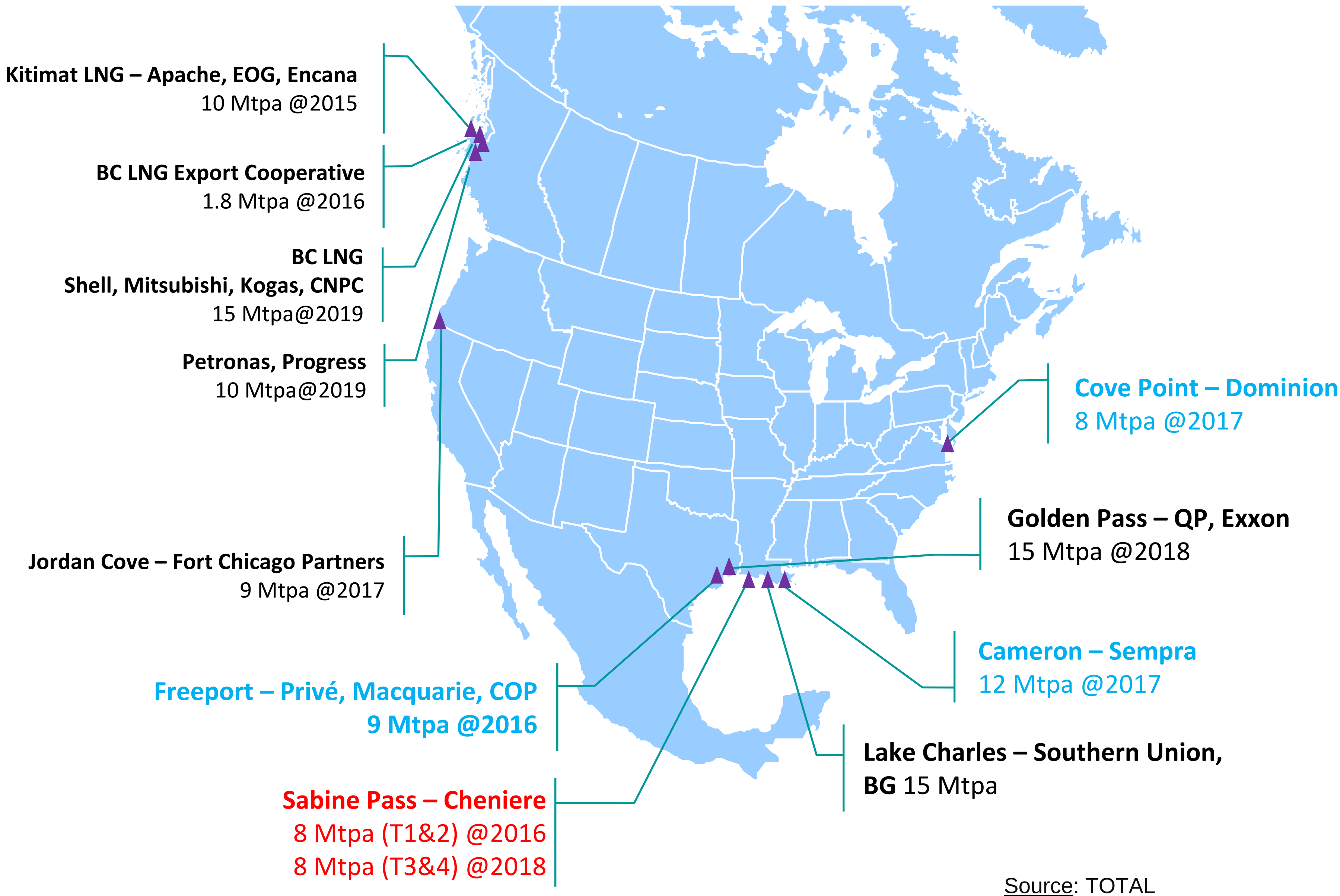
Sabine Pass 16 Mt
Freeport 9 Mt
Cameron 12 Mt
Lake Charles 15 Mt
Cove Point 8 Mt (Maryland)
Golden Pass 15 Mt (Qatar-Exxon)
Excelerate; Pangean LNG, etc..

Which new projects will come first?

(US GoM, Alaska, West-Canada, East/Arctic Russia or Norway?)

And for which Markets & Buyers (EU/Asia)?

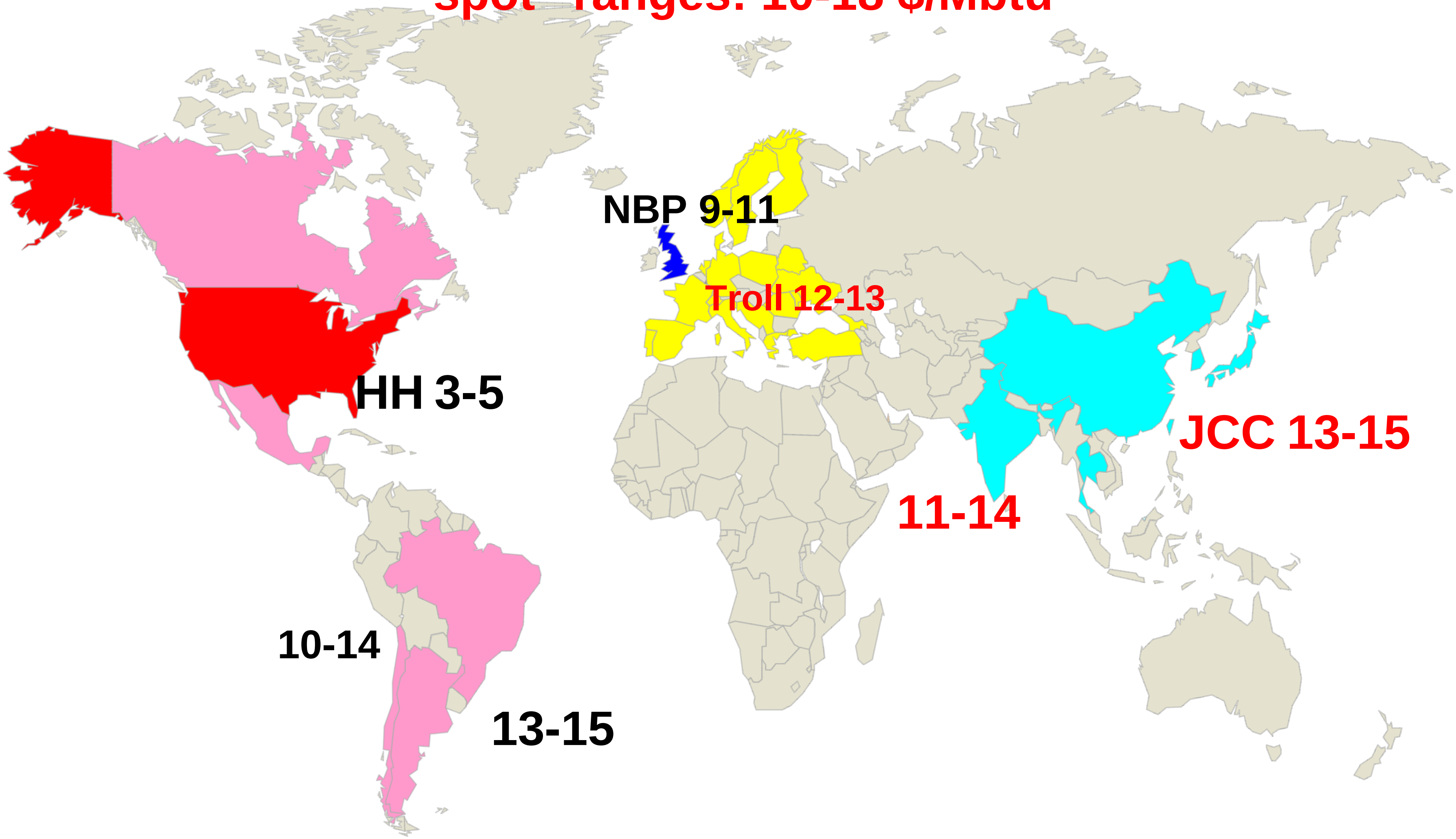
North American LNG Projects (excl. Alaska & «floating » ones)



Source: TOTAL

Mid-Long term LNG price trends ($/Mbtu)

"spot" ranges: 10-18 $/Mbtu



For a 100$/b BRENT

Price signals? What « price signals »?

- Spot deals (Traders'World)- Opportunistic deals
  - Horizon: next Quarter; Quantities: small number of cargoes
  - Origin: Excess production, re-loading, re-direction, buying / reselling
  - Actors: LNG producers, Portfolio Aggregators, Utilities, Banks
  - Pre-requisite: LNG availability, shipping availability, financial trust
  - Trigger: **Destination price allowing a financial reward to seller**

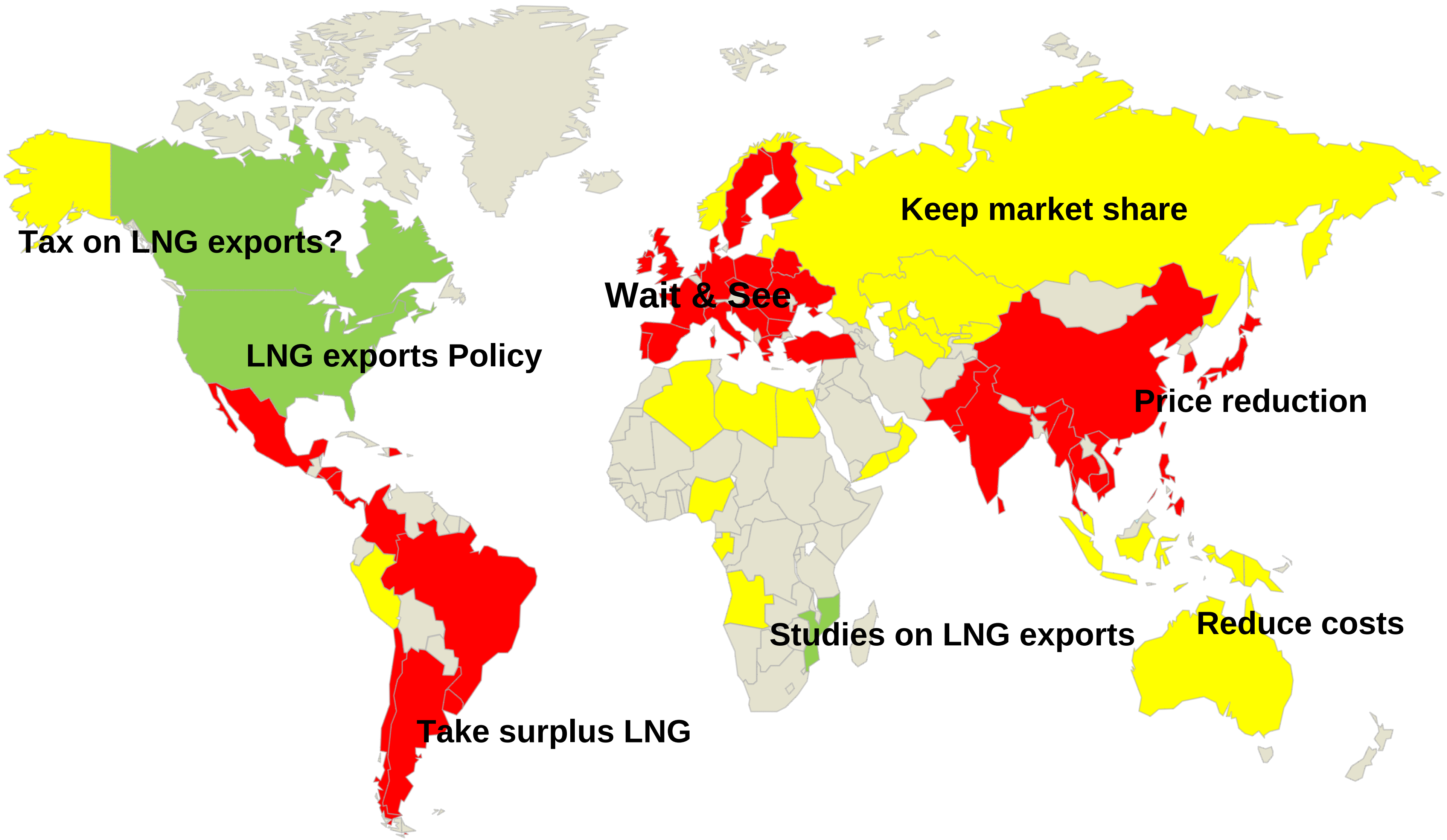
- Mid-Term deals (demand-supply adjustment)
  - Horizon: Next five years (before any new plant development)
  - Limited quantities generally (<1Mtpa)
  - Origin: LNG Portfolios or Excess production from LNG plants
  - Trigger: Consolidate financial flows & **ramp-up for new LT contracts**

- Long-Term deals (fundation or structural adjustment)
  - 15 to 25 years starting at LNG plant start-up **(>5 years from now**)
  - Origin: New LNG train (existing plant) or New Project (grassroot)
  - Actors: Big Utilities and Big Producers (NOC's & IOC's)
  - Trigger**: Price to permit FID** (sustainable revenue flows)

IOC's future LNG plants (on the drawing board)

Each Major IOC has more than one LNG grass-root project to promote

The race for the new LNG supply to Asia, South-America and Europe



Conclusions

- Mid-term 2013-2016
  - Sufficient existing “Flex LNG” to balance the markets
- Long-term (> 2017)
  - **Austral Asia & Russia to supply Asian buyers**
    - Australia to lead the pack (projects under construction)
  - **New LNG plants to be launched by IOC’s**
    - In Northern Atlantic + **Israel/Cyprus** for Europe
    - **In Southern Atlantic for Europe & South America**
    - In the Middle-East, maybe, new quantities for Europe & Asia
  - **US and Canada to enter the race for every market from Europe to Asia and the Americas**!
- Buyers to decide which projects they like best