



LNG: OPPORTUNITIES AND CHALLENGES FOR LATIN AMERICA

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OUTLINE

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- LNG Pricing: Past Evolution and Future Trends
- Opportunities and Challenges for Latin America

INTRODUCTION

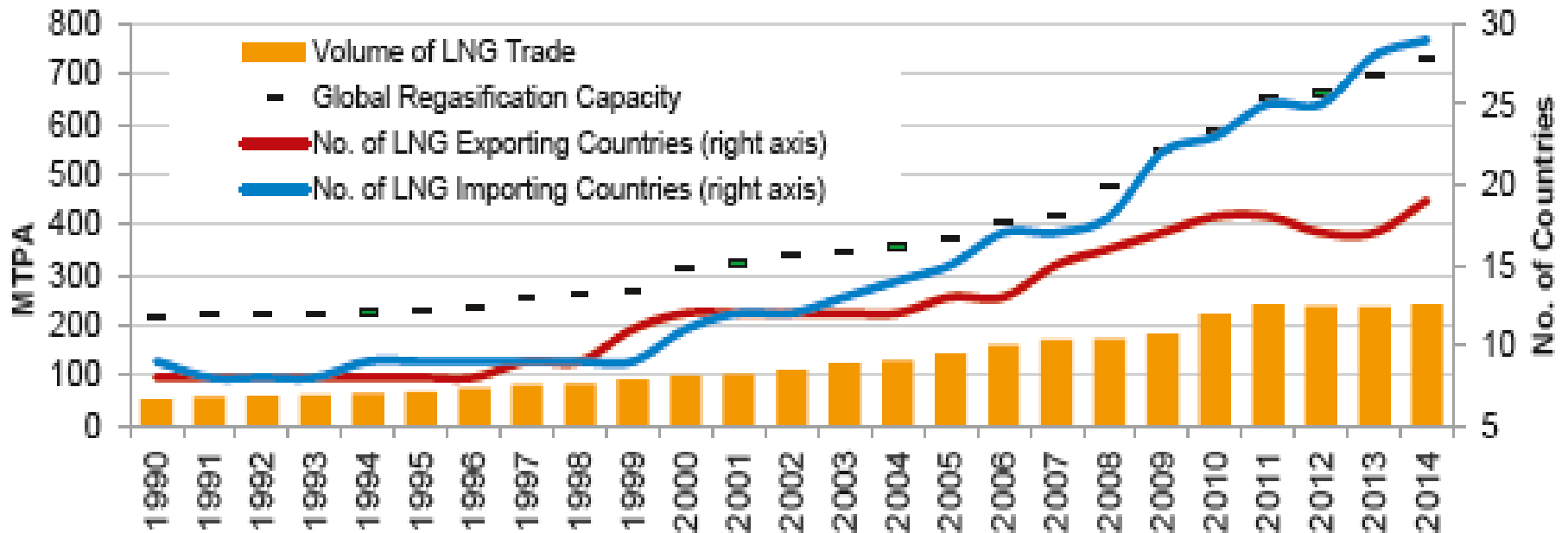
- Rapid LNG market growth in the last 10 years, driven by higher oil prices and gas security of supply issues
- Global LNG market
 - Excess of supply and tendency of lower prices in the mid-term
 - In the long term, LNG costs will define price level and LNG competitiveness
- Opportunities for Latin America
 - LNG tends to become more affordable for importing countries
 - Less focus on security of supply issues facilitates regional trade negotiations
- Challenges for Latin America
 - Lower LNG prices tend to affect regional gas prices
 - Lower gas prices are a challenge for increasing upstream investments in the region

LNG: International Market Overview

INTERNATIONAL LNG MARKET OVERVIEW

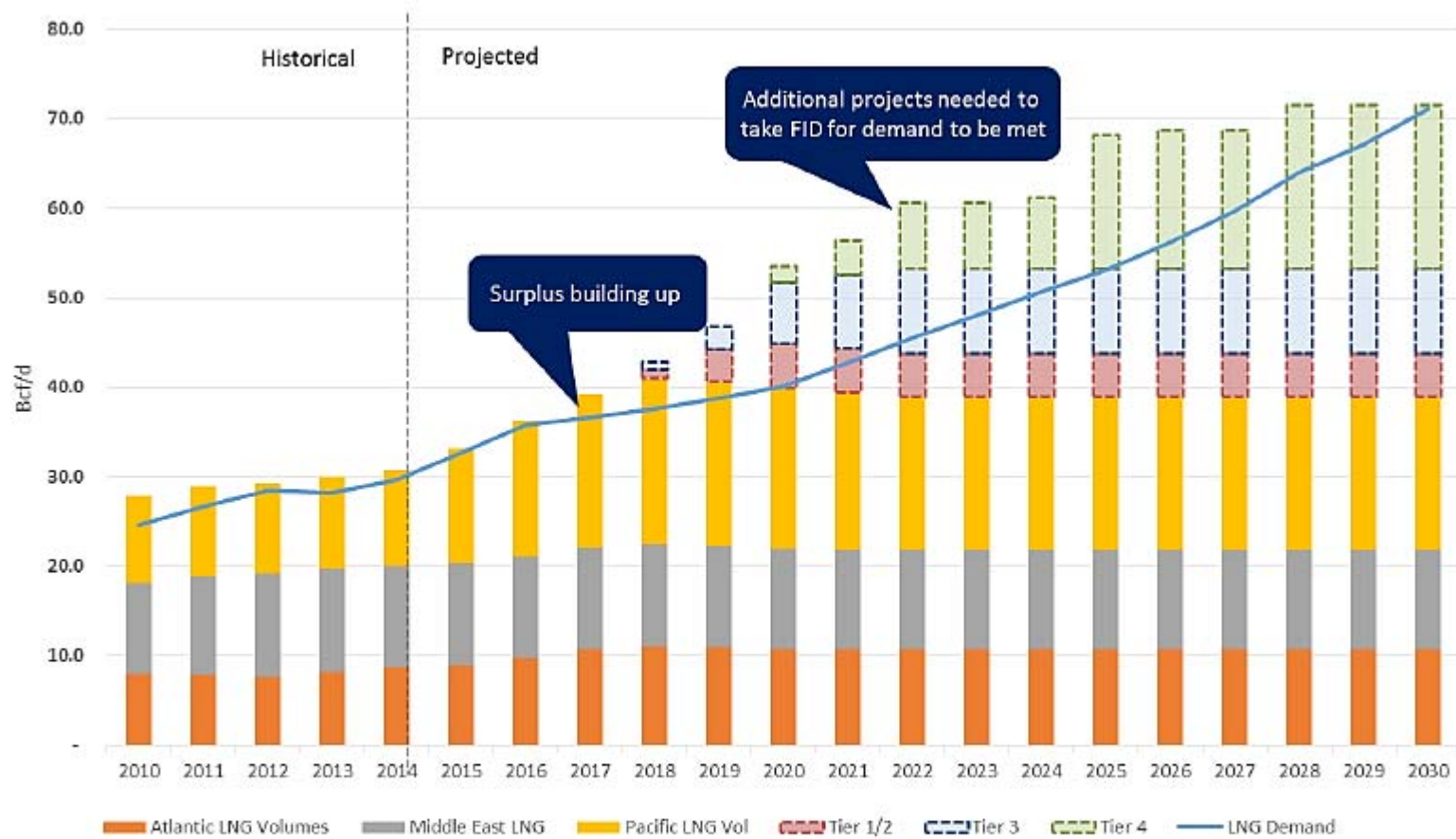
- The LNG market is growing at a fast pace: 7% per year since 2000

Evolution of LNG consumption and number of participants in the market



Source: IGU World LNG Report 2015

LNG SURPLUS AND WEAK PRICES AHEAD



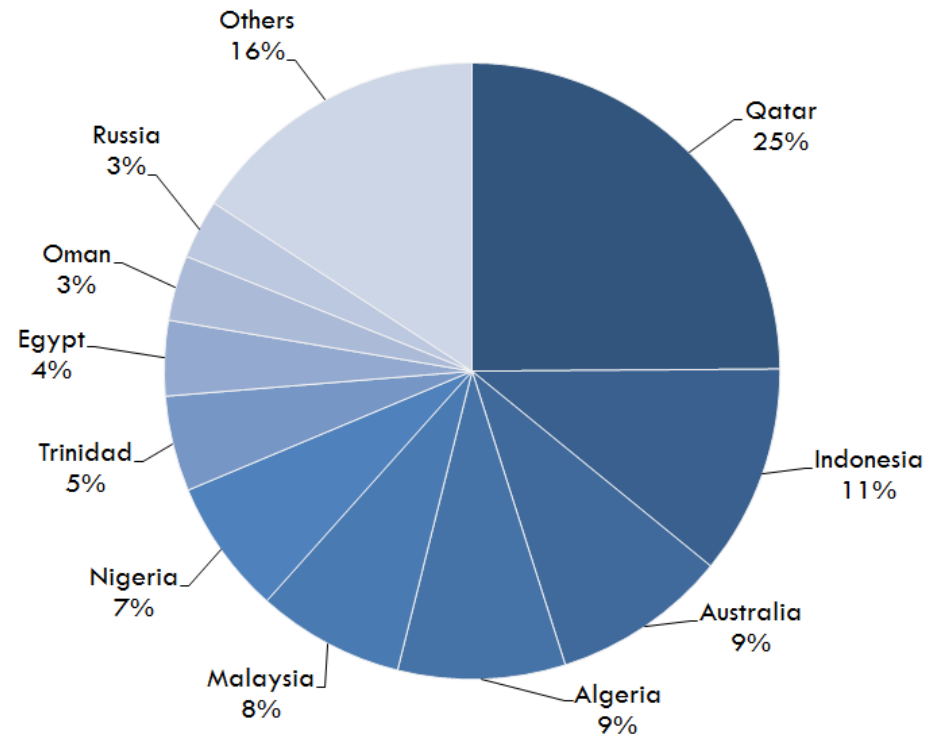
Tier 1: Project is expected to take Final Investment Decision in 6 months.
 Tier 2: Project is expected to take Final Investment Decision in 12 months.
 Tier 3: Proposed project, low probability.
 Tier 4: Speculative project.

Source: Galway Group (Presentation Rio Gas Forum 2015)

SUPPLY OVERVIEW

- Currently, there are 38 liquefaction plants in 21 countries
- Middle East accounts for 34% of world liquefaction capacity
- Qatar only accounts for 25%
- The Pacific Basin accounts for 32% (mainly Indonesia, Australia and Malaysia)

Liquefaction capacity per country - 2014 (%)



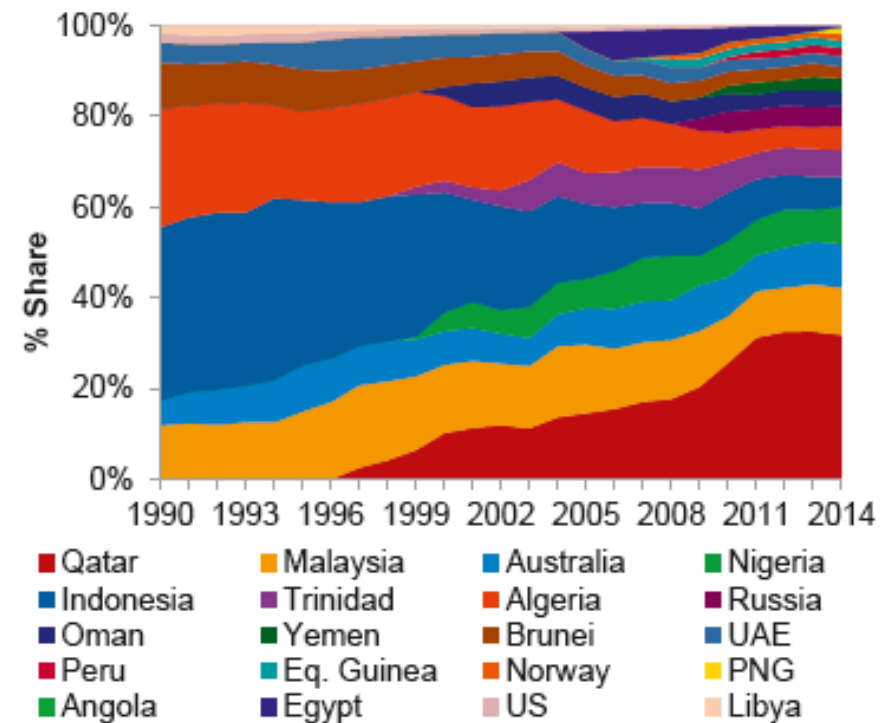
Source: Own Elaboration based on IGU 2015

SUPPLY OVERVIEW

Qatar:

- Largest exporter and *swing supplier* between Atlantic Basin and Pacific Basin
- Strong market power and ability to arbitrate between Europe and Asia

Share of GNL Exports 1990-2014 (%)

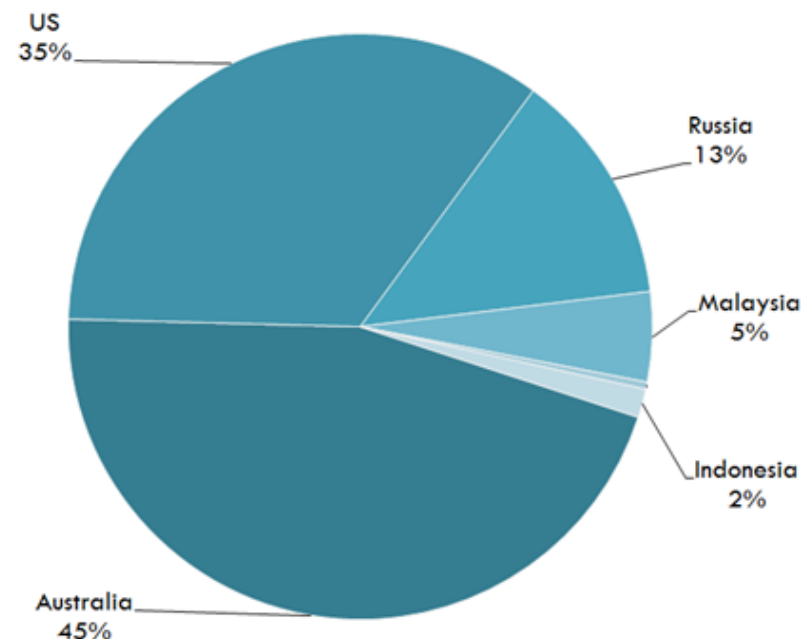


Source: IGU (2015).

LNG CAPACITY EXPANSION: PROSPECTS

- 74 new liquefaction projects at various stages of progress in US, Canada e Australia
- In 2014, four projects (27.6 MTPA or 102 MMm³/d) reached final investment decision and are under construction
 - 3 in the US: Cameron LNG, Cove Point e Freeport LNG
 - 1 in Malaysia: Petronas FLNG 2
- 15 projects are in construction and will add 127 MTPA (473 MMm³/d) capacity between 2015 e 2019

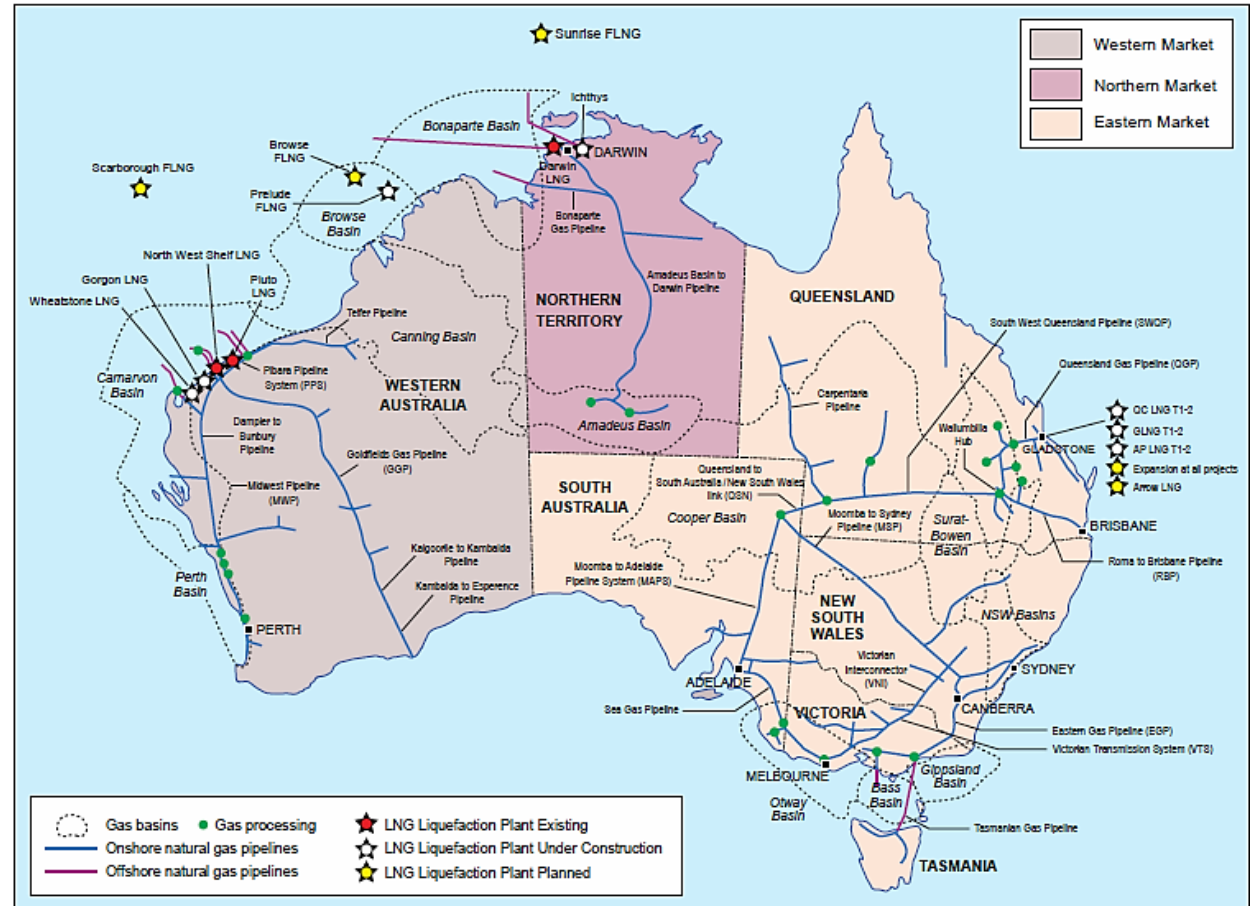
Countries with Liquefaction plants in construction - 2015 (%)



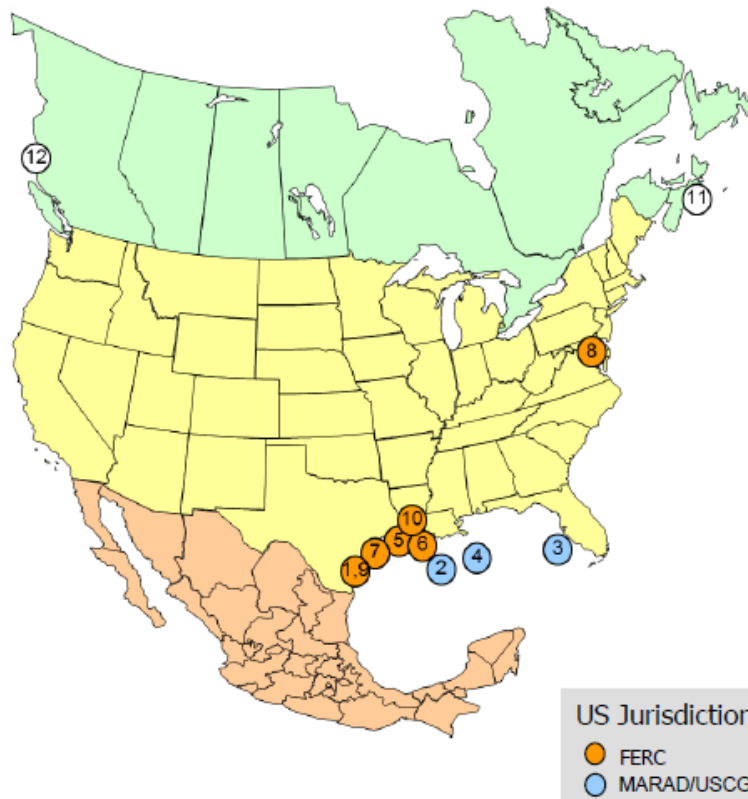
Source: Own Elaboration based on IGU (2015)

AUSTRALIA WILL BECOME THE LARGEST LNG EXPORTER

- 7 projects under construction, adding 58 MTPA (215 MMm³/d) of capacity
- Several other projects have been abandoned due to cost issues



LNG PROJECTS APPROVED BY FERC (2015)



Import Terminal

APPROVED - UNDER CONSTRUCTION

U.S. - FERC

1. **Corpus Christi, TX:** 0.4 Bcf/d (Cheniere – Corpus Christi LNG) (CP12-507)

APPROVED - NOT UNDER CONSTRUCTION

U.S. - MARAD/Coast Guard

2. **Gulf of Mexico:** 1.0 Bcf/d (Main Pass McMoRan Exp.)
3. **Offshore Florida:** 1.2 Bcf/d (Hoëgh LNG - Port Dolphin Energy)
4. **Gulf of Mexico:** 1.4 Bcf/d (TORP Technology-Bienville LNG)

Export Terminal

APPROVED - UNDER CONSTRUCTION

U.S. - FERC

5. **Sabine, LA:** 2.76 Bcf/d (Cheniere/Sabine Pass LNG) (CP11-72 & CP14-12)
6. **Hackberry, LA:** 1.7 Bcf/d (Sempra – Cameron LNG) (CP13-25)
7. **Freeport, TX:** 1.8 Bcf/d (Freeport LNG Dev/Freeport LNG Expansion/FLNG Liquefaction) (CP12-509)
8. **Cove Point, MD:** 0.82 Bcf/d (Dominion – Cove Point LNG) (CP13-113)
9. **Corpus Christi, TX:** 2.14 Bcf/d (Cheniere - Corpus Christi LNG) (CP12-507)

APPROVED – NOT UNDER CONSTRUCTION

U.S. - FERC

10. **Sabine Pass, LA:** 1.40 Bcf/d (Sabine Pass Liquefaction) (CP13-552)

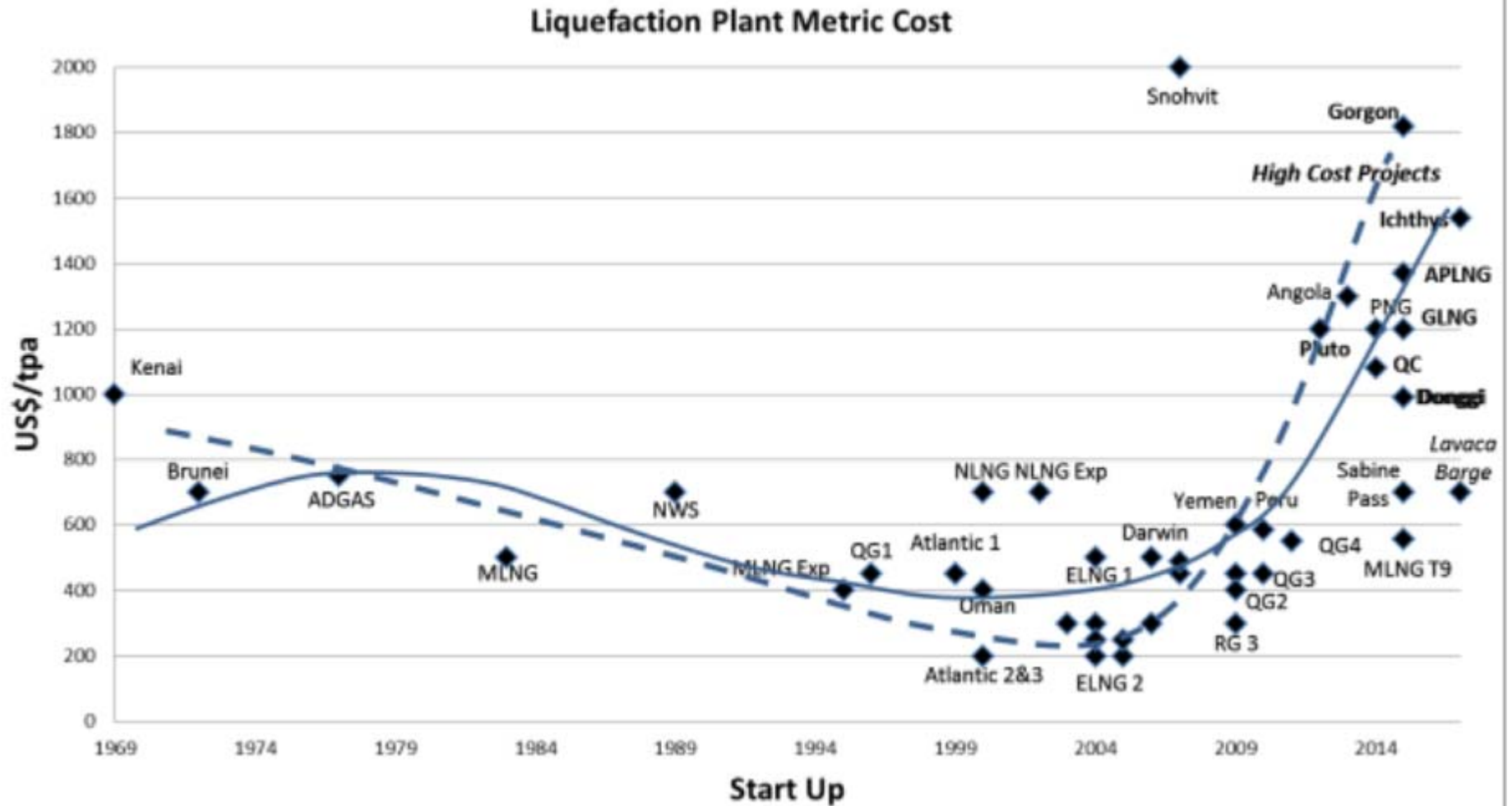
APPROVED – NOT UNDER CONSTRUCTION

Canadian

11. **Port Hawkesbury, NS:** 0.5 Bcf/d (Bear Head LNG)
12. **Kitimat, BC:** 3.23 Bcf/d (LNG Canada)

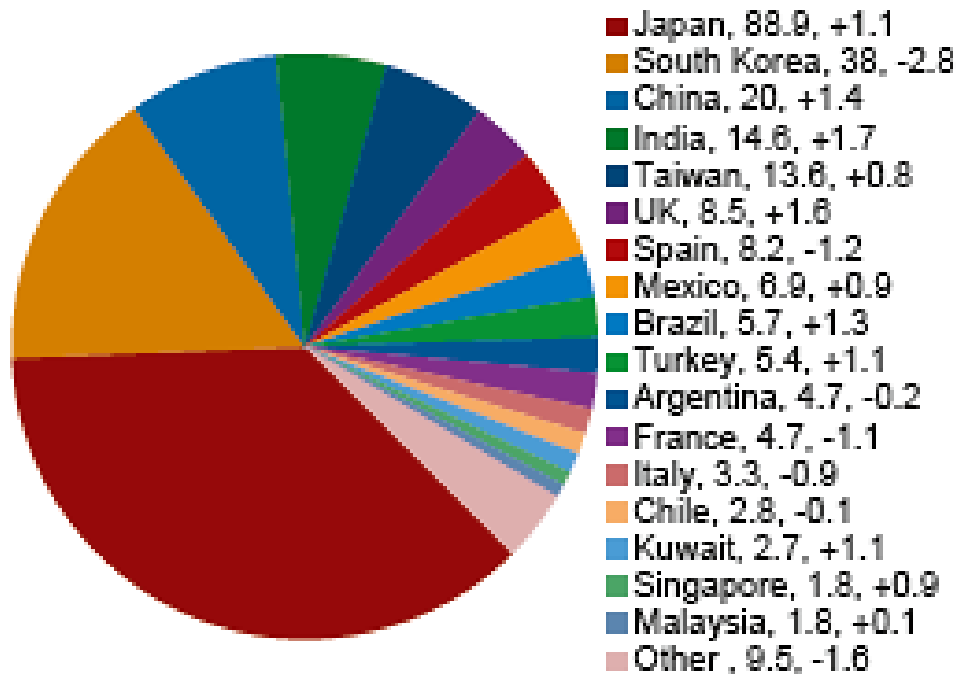
- Currently, there are 33 projects in the USA (320 MTPA or 1.192 MMm³/d)
- 5 projects under construction with 57,5 MTPA (214 MMm³/d) capacity

LNG CAPEX INCREASE IS A CHALLENGE IN THE LONG RUN



LNG DEMAND OVERVIEW

LNG Imports by Country and LNG Imports Increase in 2013 (MTPA)



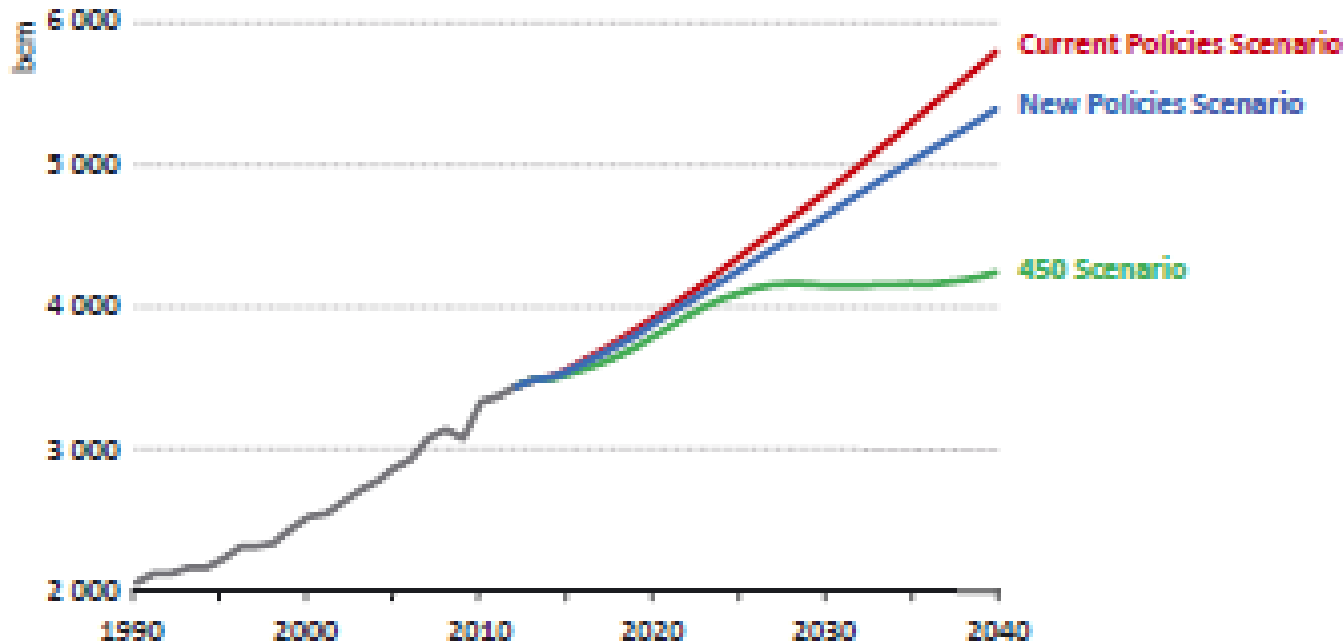
- The Asia-Pacific region accounted for 60% of total LNG demand in 2014
- Japan and Korea are the largest consumers
- Europe is the second largest market

Fonte: IGU (2015).

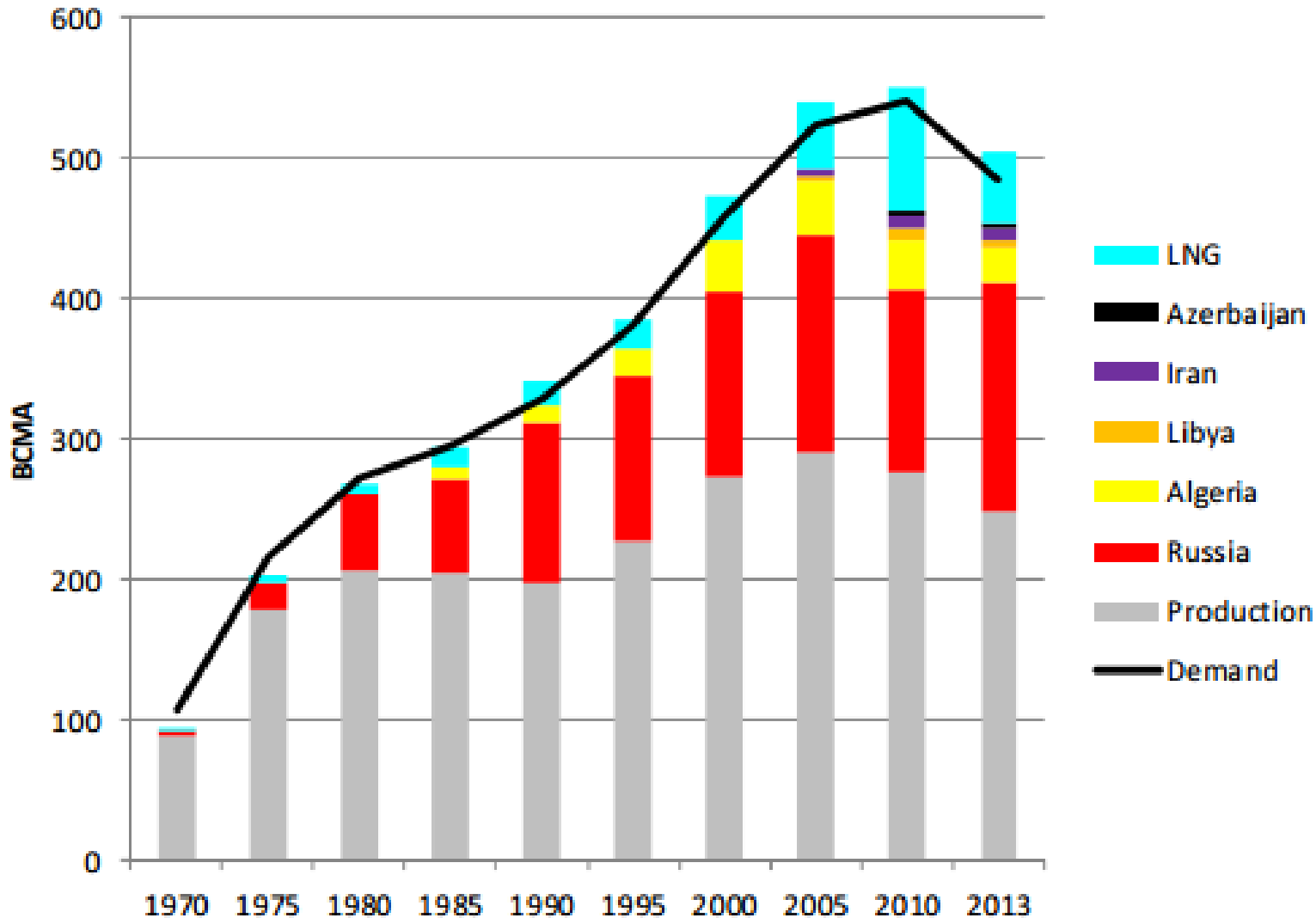
PROSPECTS FOR LNG DEMAND QUITE UNCERTAIN

- Strong competition with coal and renewables in Europe
- Nuclear revival in Japan and lower economic growth in China is a challenge for the Asia-Pacific market

Figure 4.1 ▶ World natural gas demand by scenario

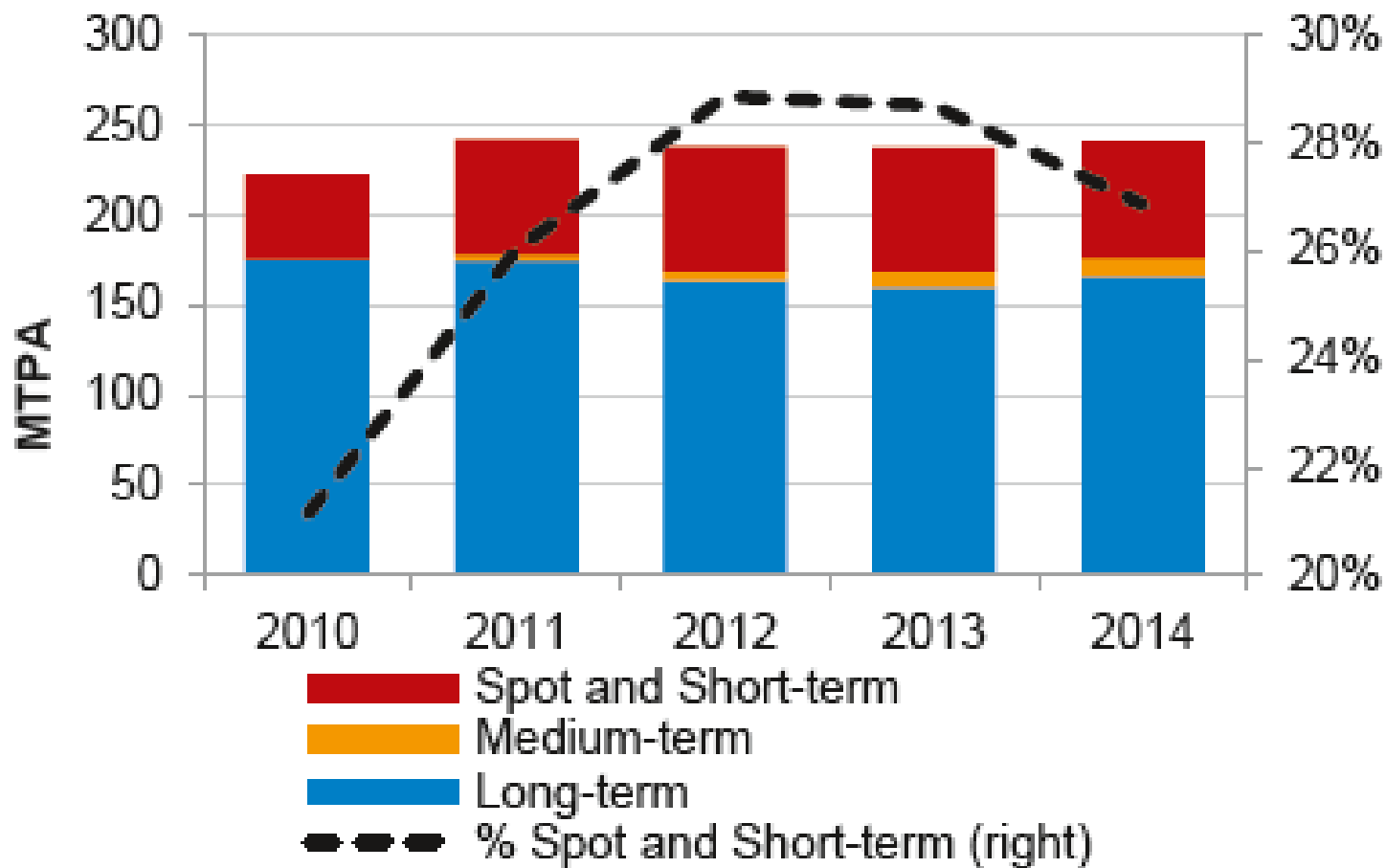


EVOLUTION OF GAS SUPPLY AND DEMAND IN EUROPE

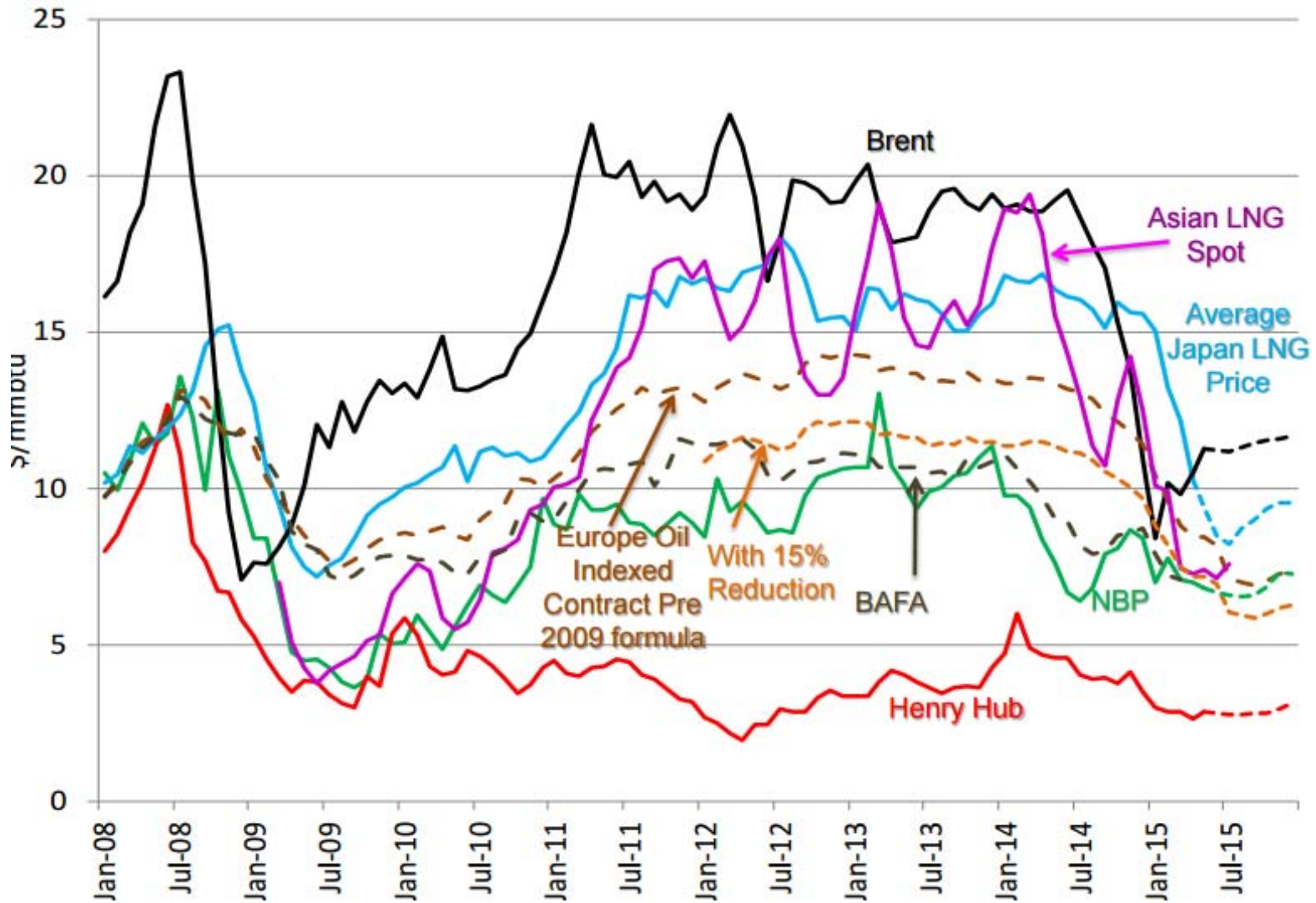


LNG Pricing: Past Evolution and Future Trends

EVOLUTION OF LNG PRICING



INTERNATIONAL NATURAL GAS MARKET: THREE PRICE LEVELS?



LNG PRICES IN DIFFERENT MARKETS – JUN 2013 (US\$/MMBTU)



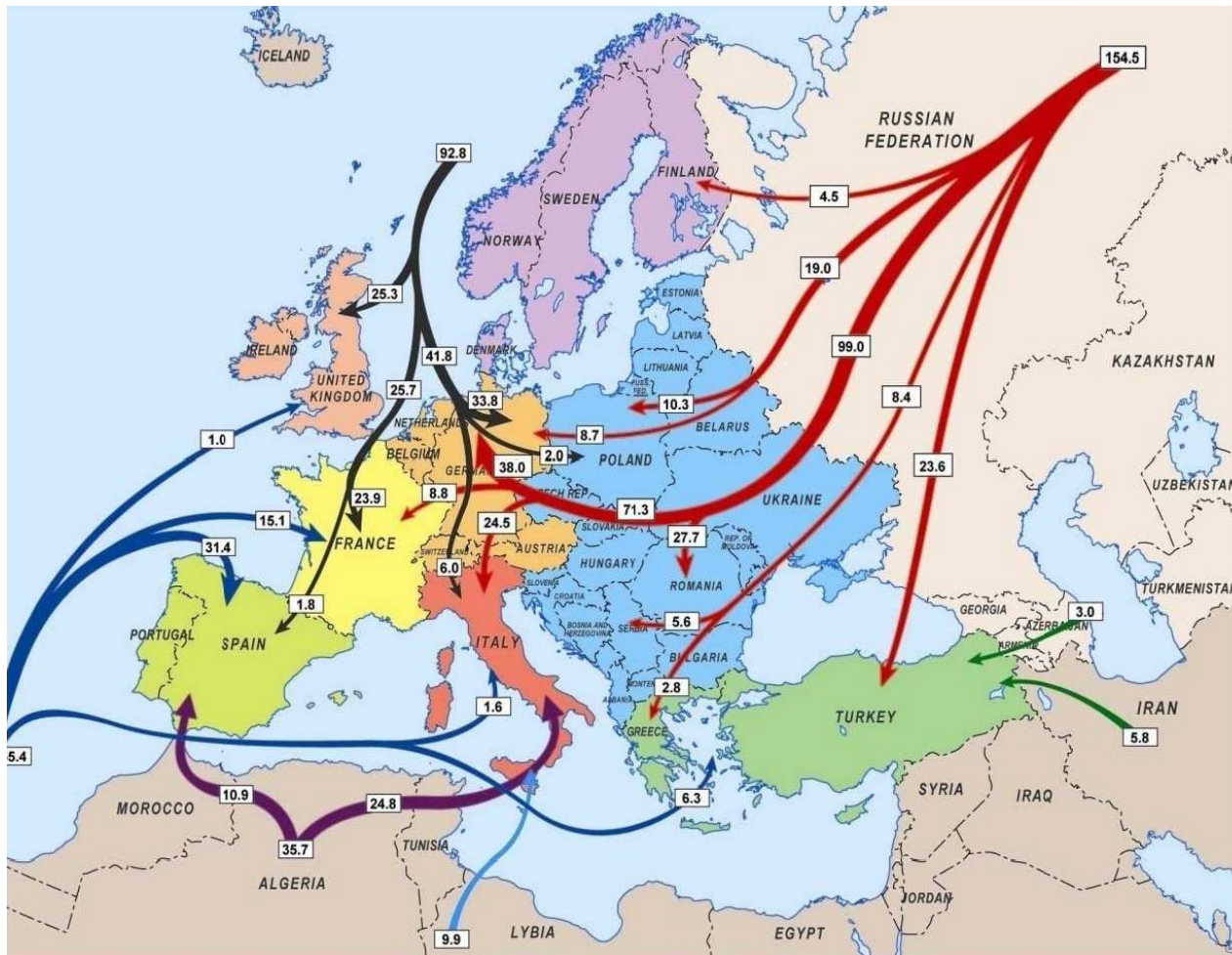
Source: Federal Energy Regulatory Commission and Waterborne Energy

LNG PRICES IN DIFFERENT MARKETS – APR 2015 (US\$/MMBTU)



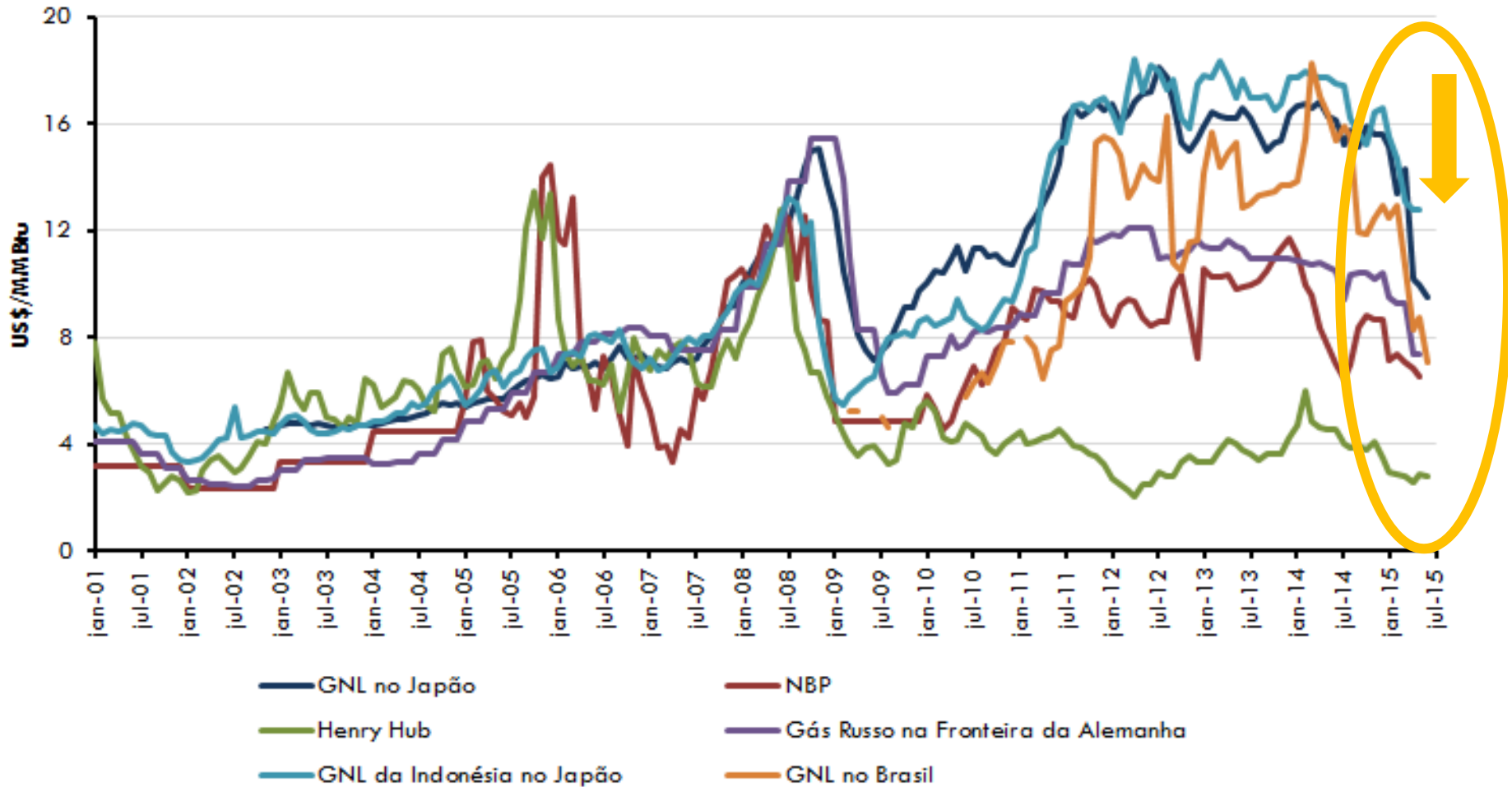
Source: Federal Energy Regulatory Commission and Waterborne Energy

NATURAL GAS SUPPLY TO EUROPE



- Large dependence on 3 suppliers: Russia, Algeria and Norway
- Predominance of oil-linked contracts

INTERNATIONAL NATURAL GAS MARKET: TWO PRICE LEVELS NOW?



Fonte: MME, Index Munc

Opportunities and Challenges for Latin America

LNG IN LATIN AMERICA



Latin America is a net LNG importing region

- 8 regas plants with 25 MTPA (93 MMm³/d)
- 6% of world LNG demand in 2014
- 2 liquefactions plants

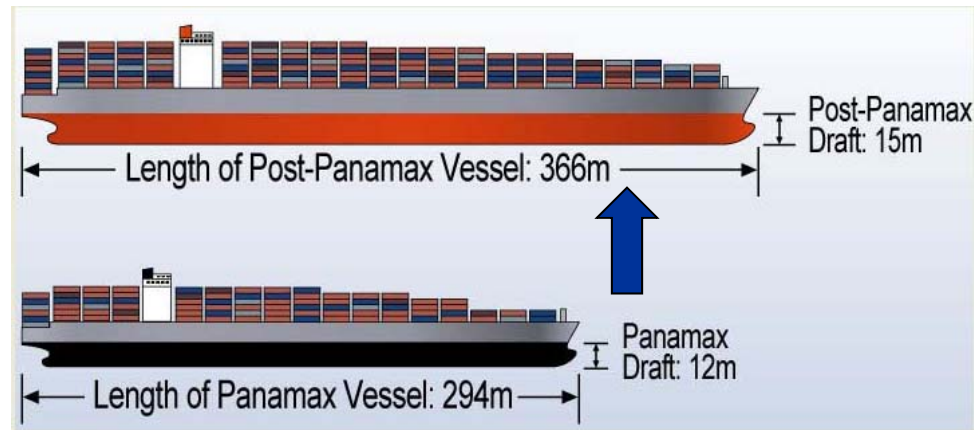
Opportunities for Latin America:

- ✓ **Lower LNG prices for importers**
- ✓ **Higher energy security of supply**
- ✓ **New scenario reduces geopolitical tensions**
- ✓ **Energy integration negotiations gets less difficult**

Source: Galway, 2015.

PANAMA CANAL EXPANSION WILL HAVE AN IMPORTANT IMPACT FOR LNG MARKET

- Expansion of Panama canal will allow further integration between Atlantic and Pacific Basins
- Spot LNG importers (Brazil and Argentina) will benefit from increasing integration between the Pacific and Atlantic Basins
- South American importers and exporters will benefit from lower transportation costs



Source: Circle of Blue, 2015.

US LNG EXPORTS TO CHILE: FROM 19 TO 8 DAYS



Source: GNL Mejillones, 2015.

MAIN CHALLENGES FOR LATIN AMERICAN GAS

- Lower LNG prices will affect regional prices
 - Several LNG import projects under negotiation
 - LNG prices will be a benchmark for long term gas contracts negotiation within the region
- Lower gas prices is a challenge for upstream and pipeline transport projects
- South America can become LNG dependent with lot of stranded gas resources

BRAZIL: GROWING LNG DEPENDENCE



Source: Own elaboration

GRACIAS



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