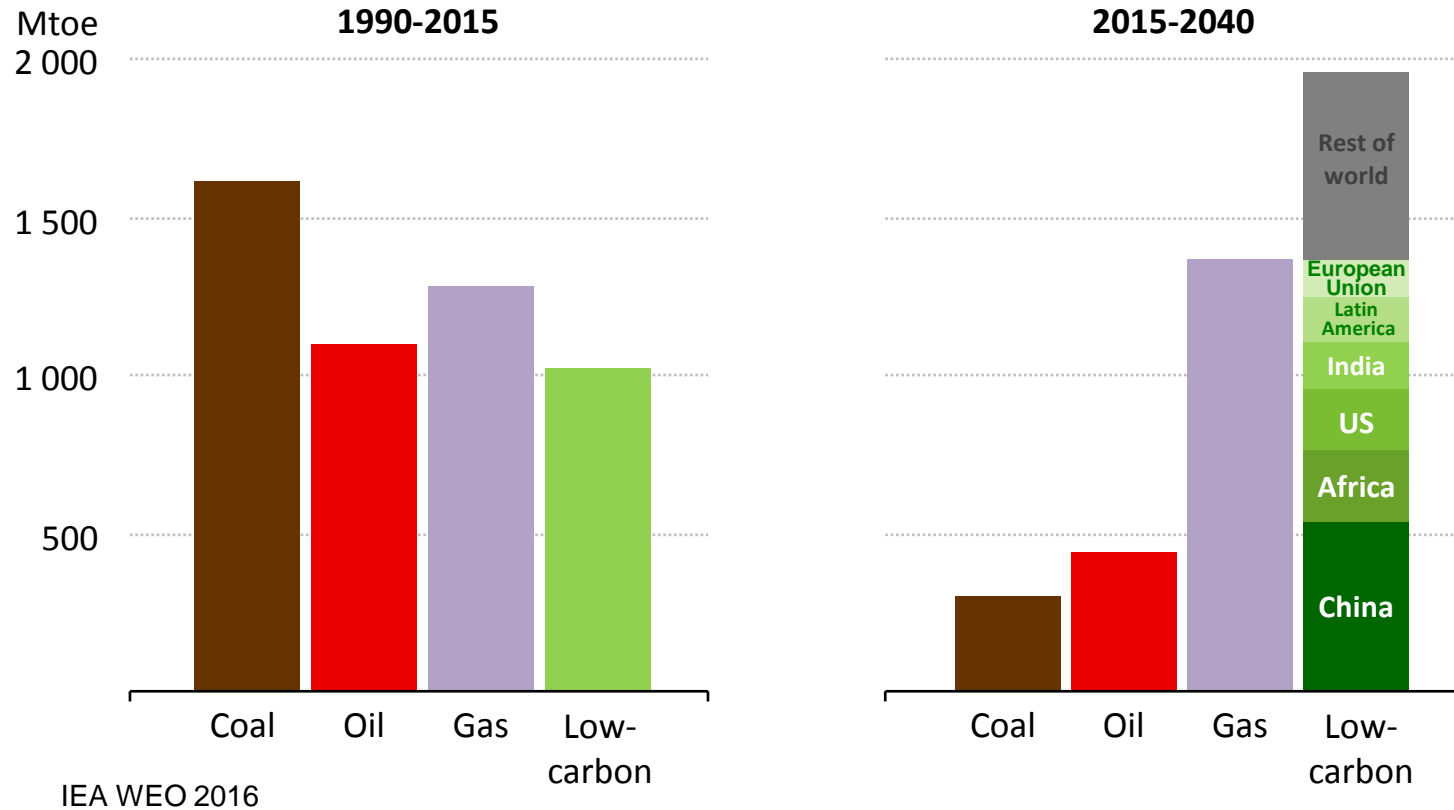


LNG PIYASALARINDA DEĞİŞEN DİNAMİKLER VE BEKLENTİLER

Doç. Dr. Sohbet Karbuz

TOBB, 28 Aralık 2016

Change in total primary energy demand



Low-carbon fuels & technologies will supply nearly half of the increase in energy demand to 2040

GAS INDUSTRY.

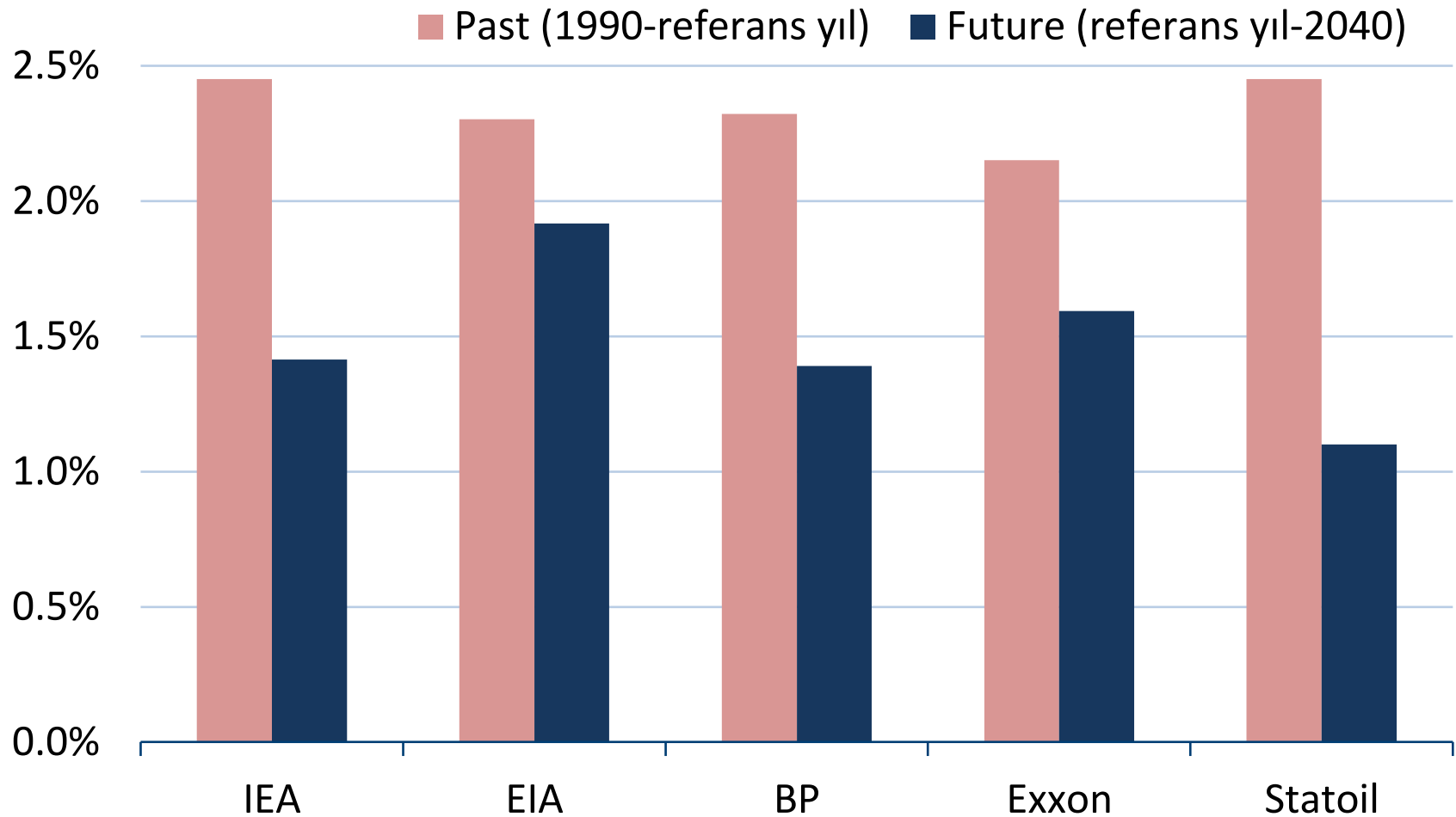


GUESS INDUSTRY.

JOHN COLE
COMIC BOOKS, TRADING
CARDS, AND
CLOTHING
CHUCKLEBROOK.COM

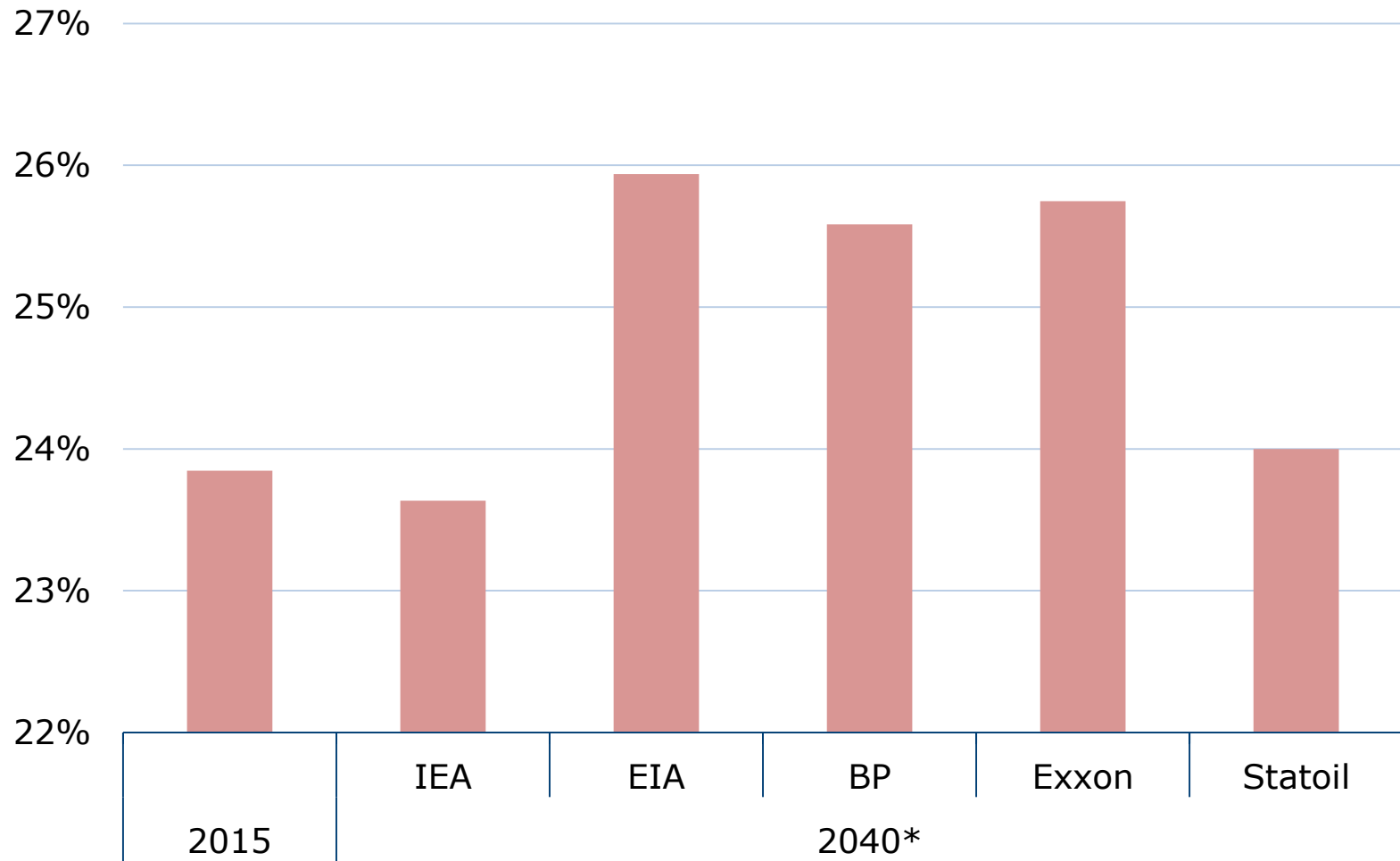


Past and future AAPG of world gas demand



Source: OME analysis

Share of gas in global energy demand



Source: OME analysis

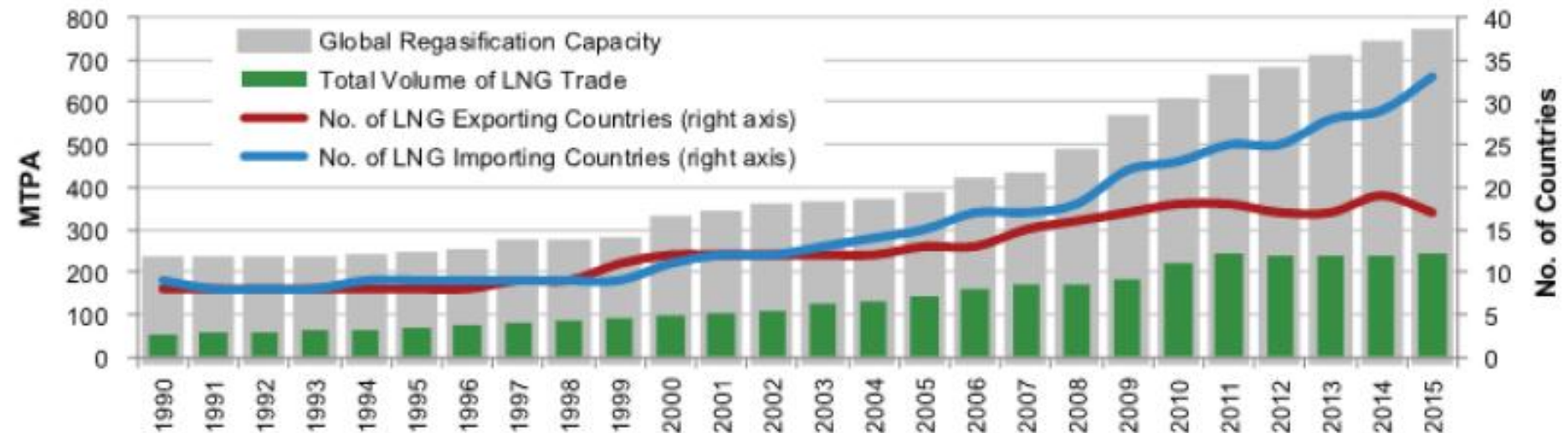
LNG on a global scale

1990: 9 imp, 8 exp countries

2000: 10 imp, 12 exp countries

2015: 34 imp, 19 exp countries

10 re-exp countries

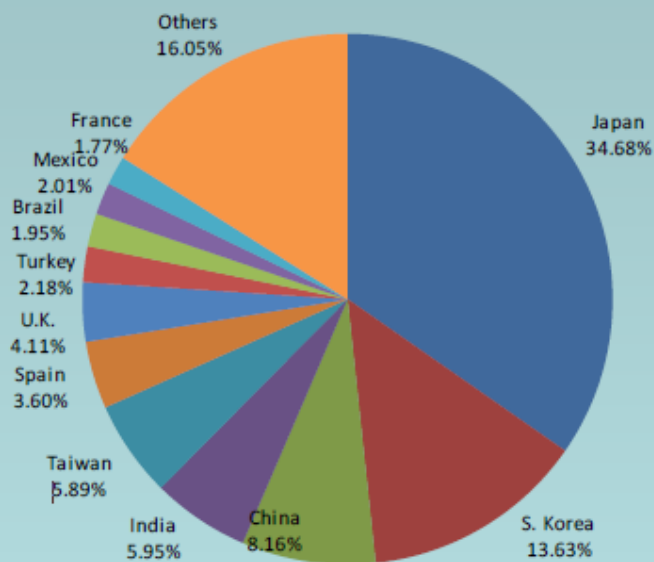


Source: IHS, IEA, IGU

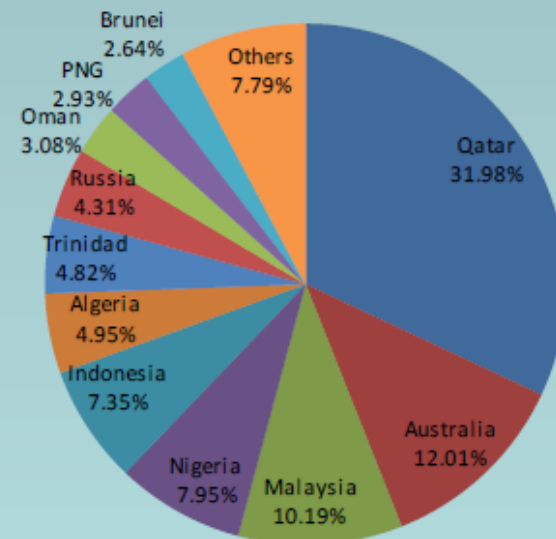
LNG on a global scale in Jan 2016

- **250 Mt/y LNG was traded globally**
 - **75 Mt/y on spot/short term basis**
- **301,5 Mt/y of liquefaction cap (81% UR)**
- **757 Mt/y of regas capacity (32% UR)**
 - **77 Mt/y of FSRU capacity** (tripled from 2011 to 2016)
- **410 LNG shipping vessels**

World LNG Importers by the Share in 2015



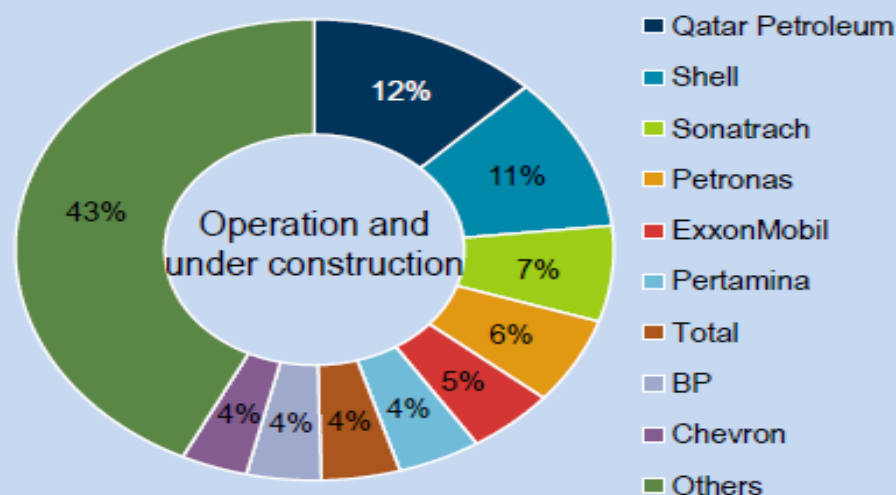
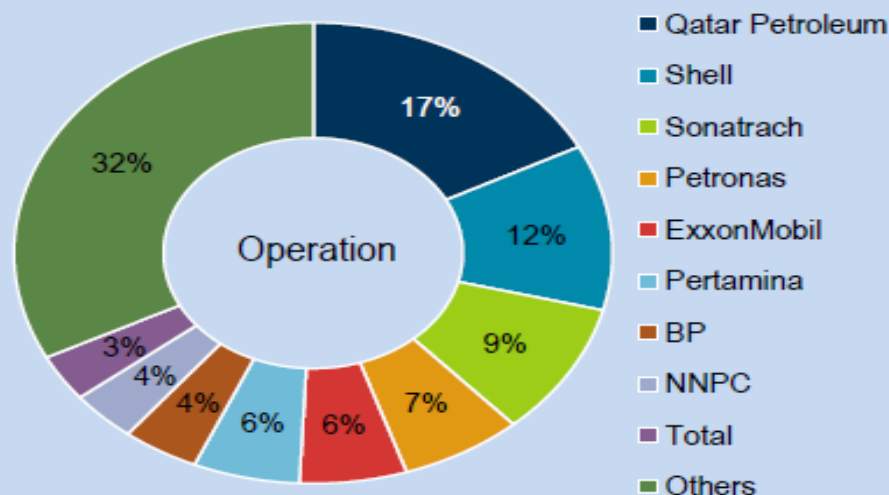
World LNG Exporters by the Share in 2015



Rankings

GLNGI

Figure 1.6 • Ownership of LNG export capacity, operational and under construction as of 2016

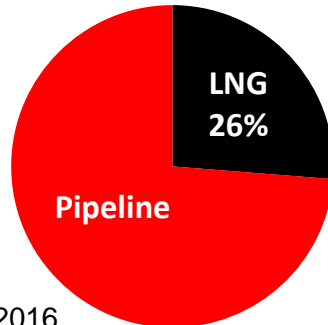


Notes: NNPC = Nigerian National Petroleum Corporation. Market share of US plants is calculated based on capacity bookings rather than on terminals' ownership.

Source: IEA analysis based on CEDIGAZ (2016), CEDIGAZ LNG service.

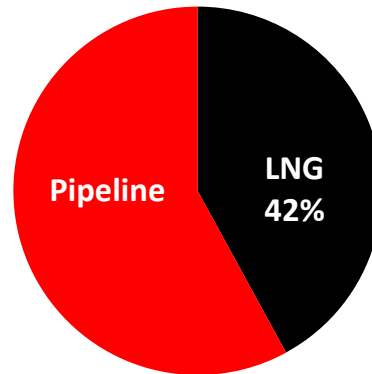
Share of LNG in global gas trade

2000
525 bcm

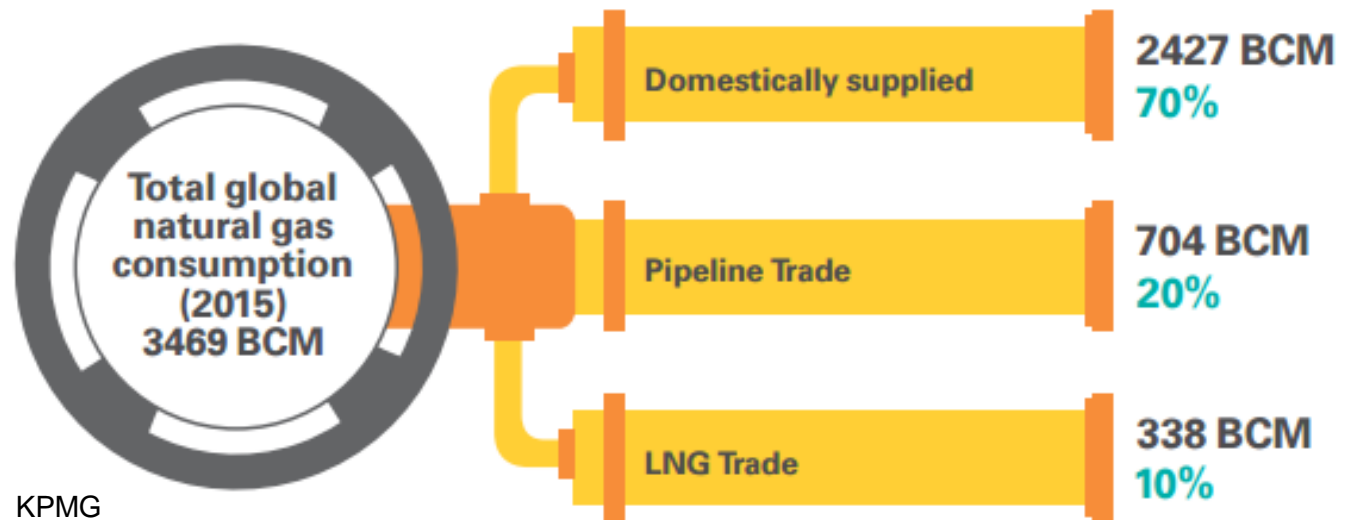
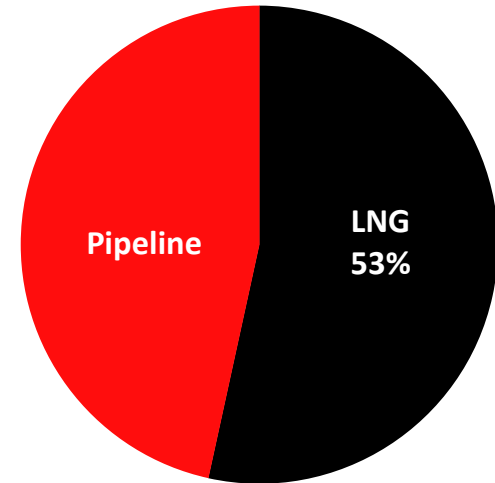


IEA WEO 2016

2014
685 bcm



2040
1 150 bcm

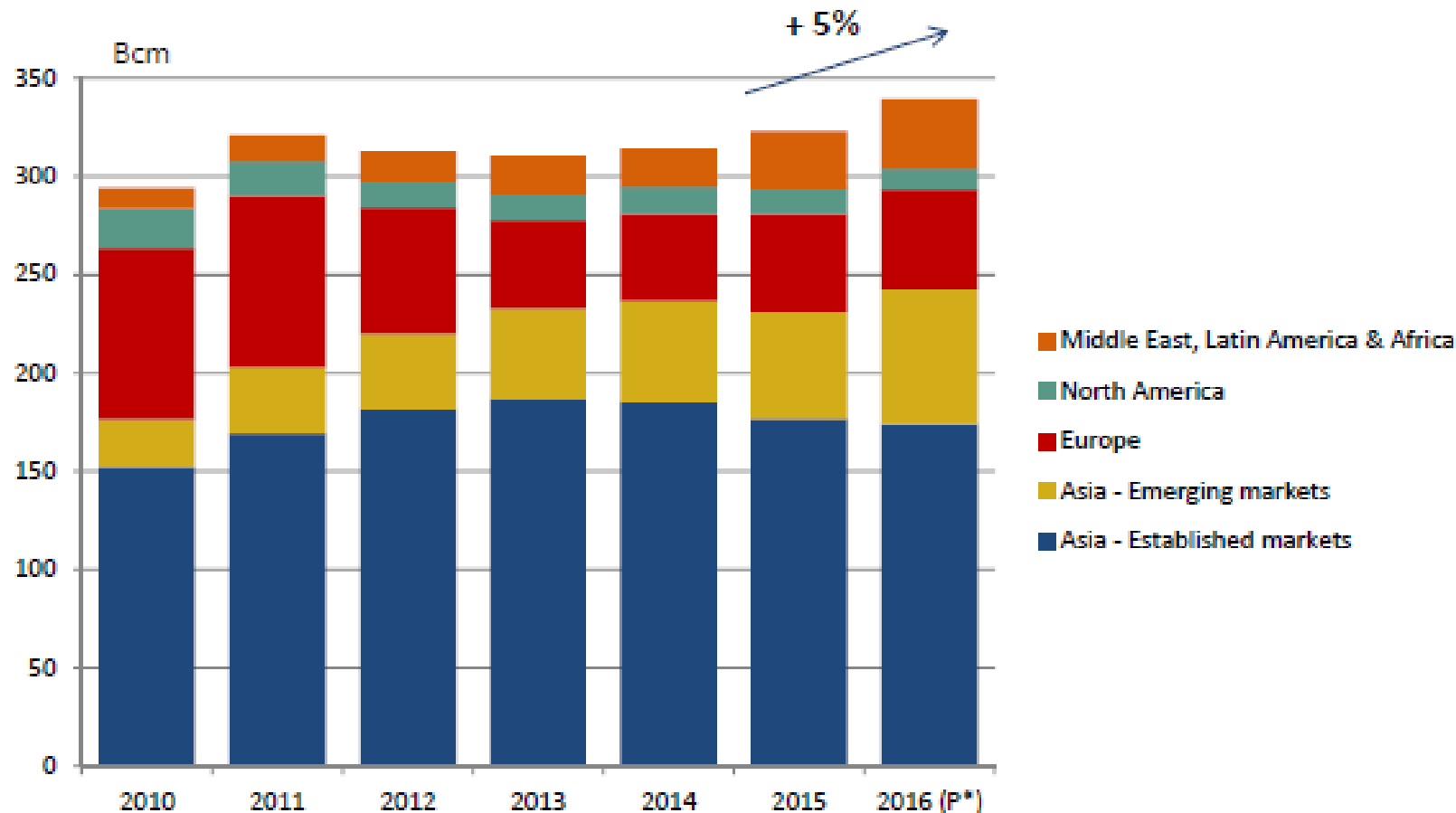


KPMG

Challenging path for LNG

- **Competition and liquidity**
- **Pricing and contract**
- **Uncertainties**
 - **New/emerging demand for gas**
 - **Resilience of producers**
 - **Impacts of policies on emissions & fuel choice**
- **FLNG/FSRU**
- **Low cost feed gas**
- **Technology**
- **Financing**

An clear acceleration in global LNG demand in 2016



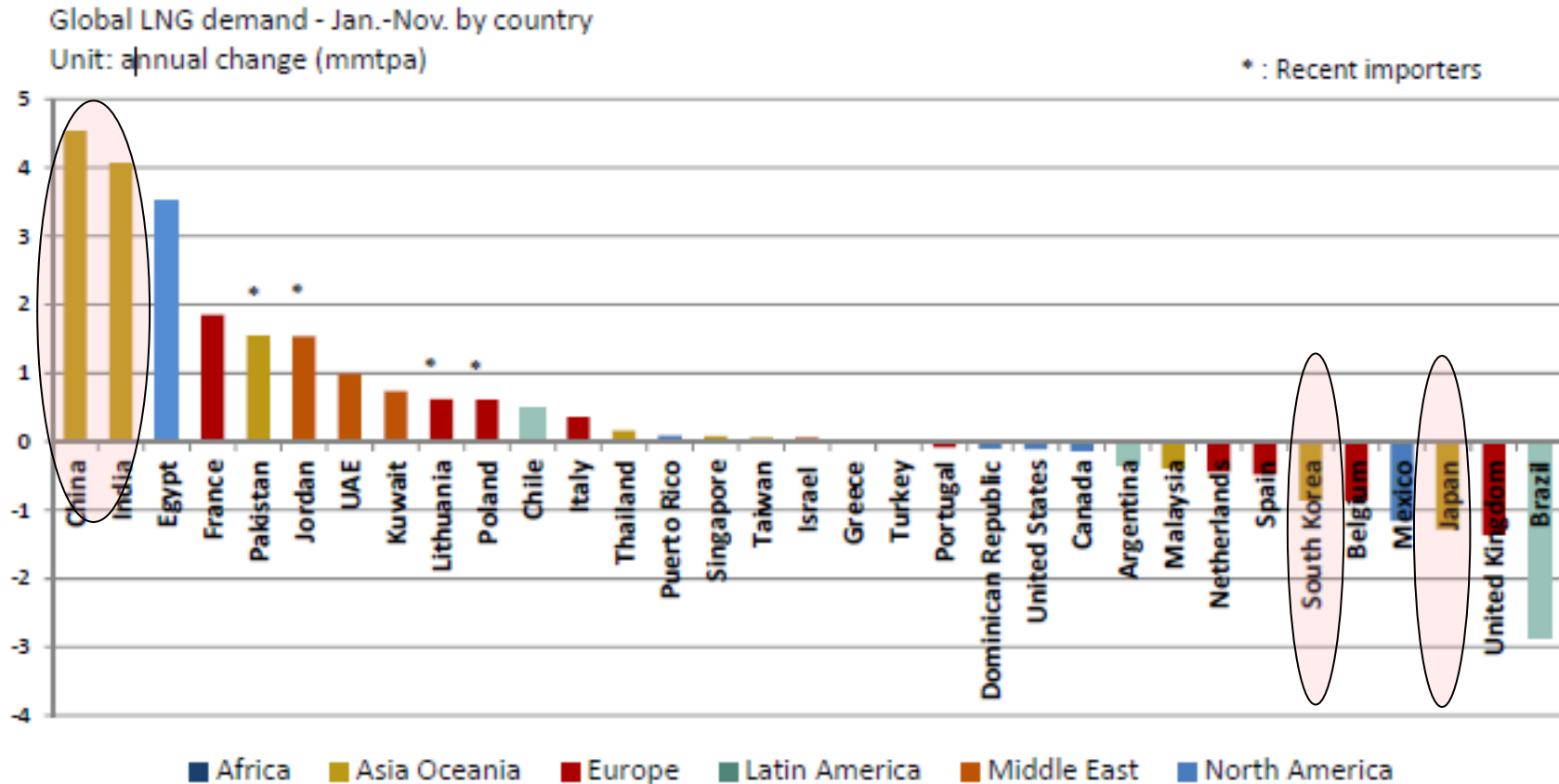
*(P): Provisional

Asia-Established markets: Japan, South Korea & Taiwan

Source: CEDIGAZ

The expansion of LNG trade is driven by emerging markets.

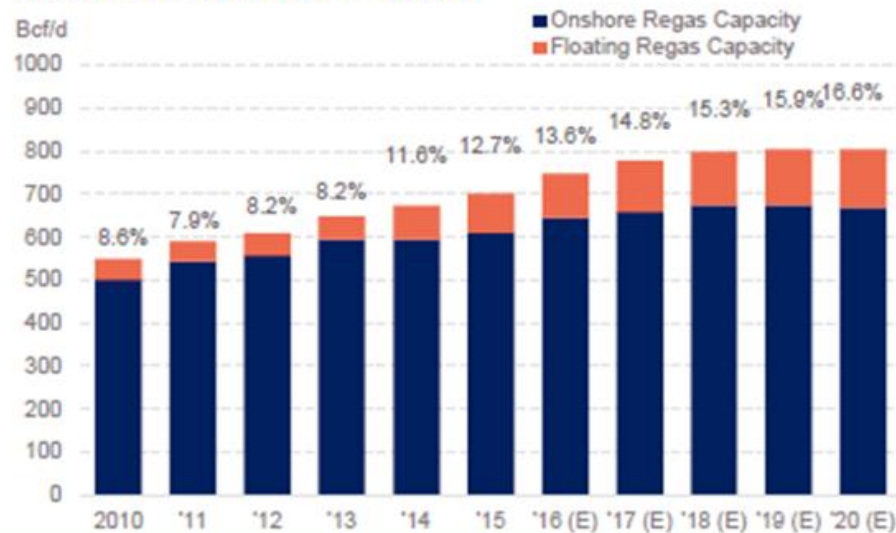
LNG demand growth by country in 2016



Source: CEDIGAZ LNG Service

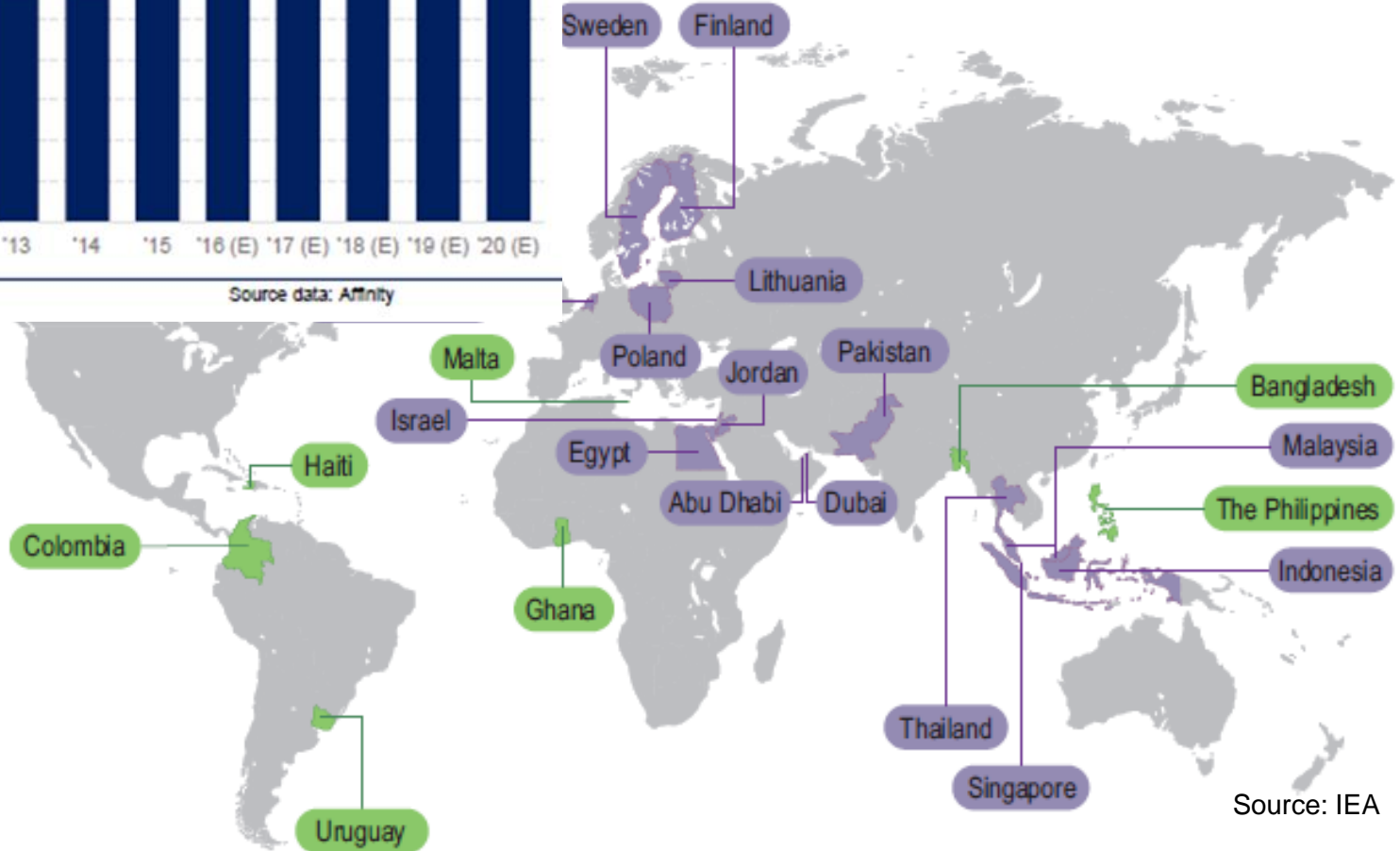
LNG demand will continue expanding

Total Global LNG Regas Capacity



DYNAGAS

Source data: Affinity



Source: IEA

Started importing in the period 2010-2016 Due to start importing before 2020

This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area.

LNG demand will continue expanding

MTPA

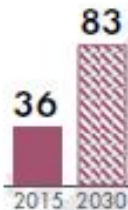
GLOBAL LNG DEMAND

2015	2030
247 MTPA	492 MTPA

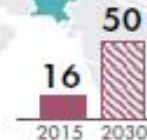
Latin America



Europe



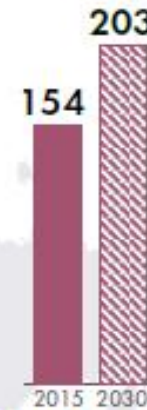
New markets



India



North-east Asia



NORTH-EAST ASIA

- Japan
- China
- Korea
- Taiwan

NEW MARKETS

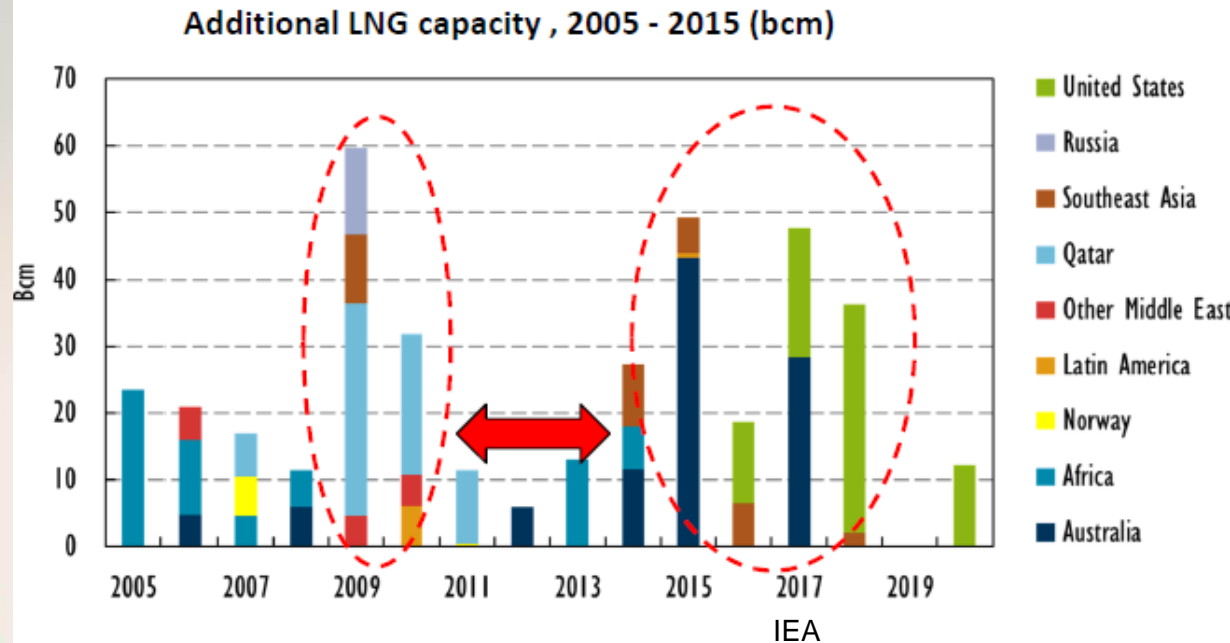
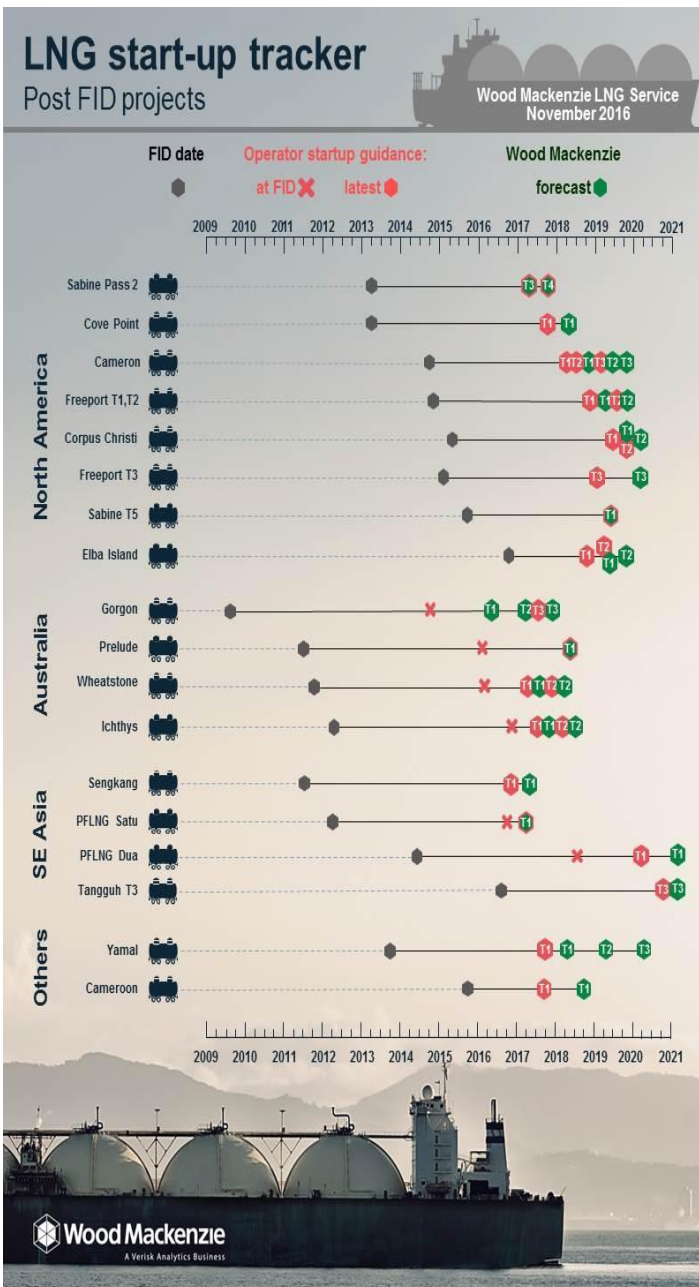
- Bangladesh
- Pakistan
- Morocco
- Philippines
- Myanmar
- Thailand
- Vietnam
- Kuwait
- Singapore
- Indonesia
- Malaysia

■ Demand, MTPA
■ Demand IHS
■ Demands FGE, Oxford TER, statement of the Indian government

Each of the specified regions is featured by different consumption drivers and different demand patterns and quality properties

Source: Novatek

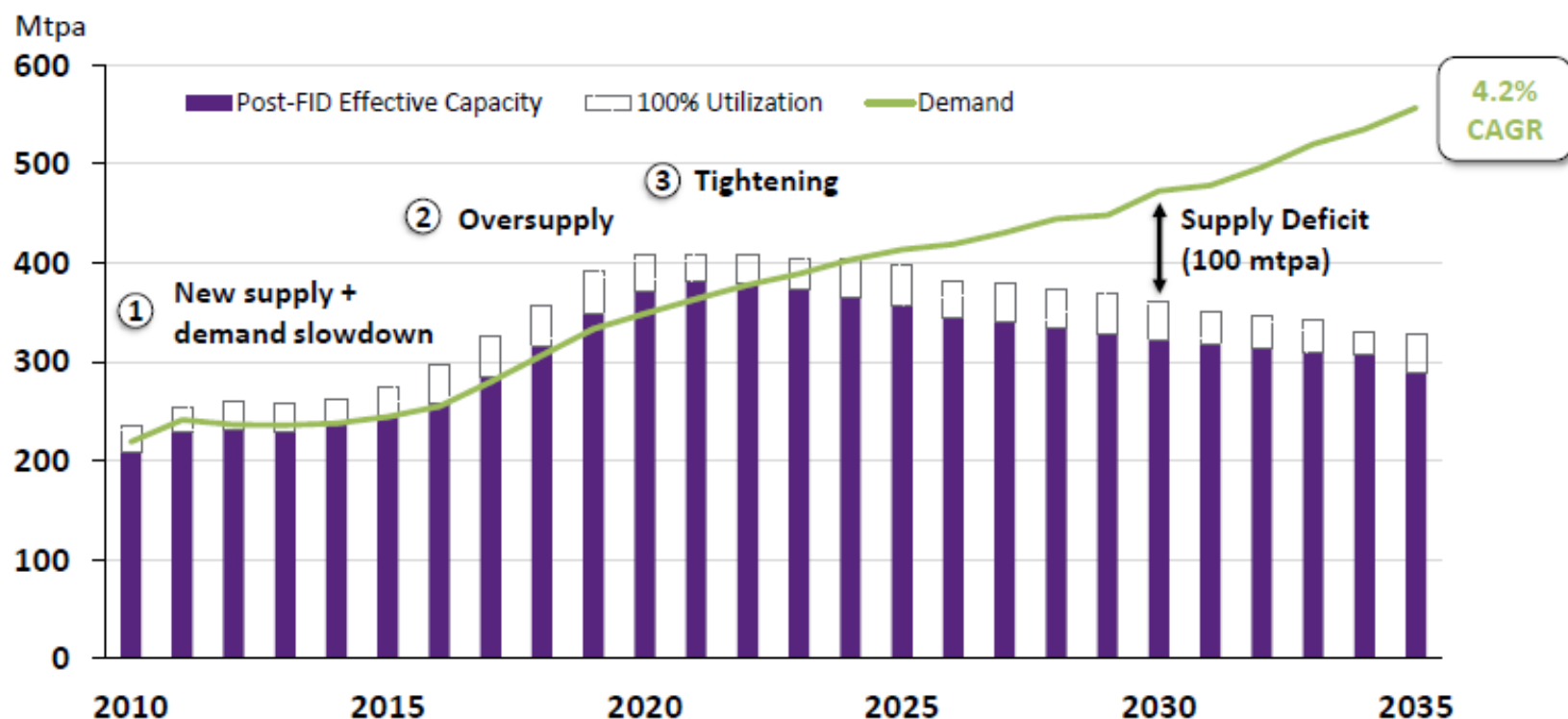
LNG supply will increase faster



17 new projects with total export capacity of 175 bcm are under construction as of today, with Australia and the United States accounting for roughly 80% of total.

WORLD LNG MARKET OVER-SUPPLY TO LAST UNTIL MID-2020's

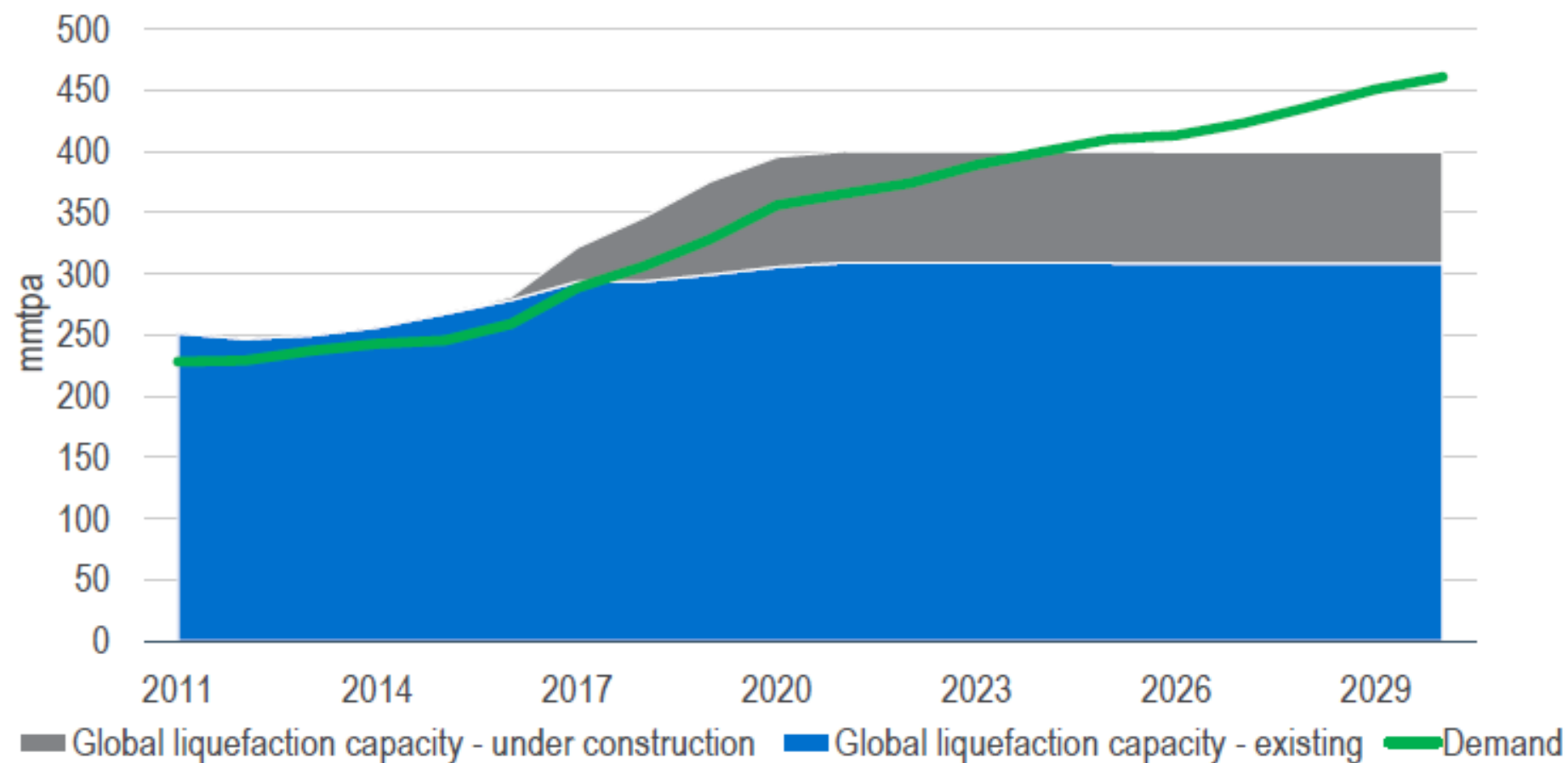
Long-Term LNG Supply & Demand



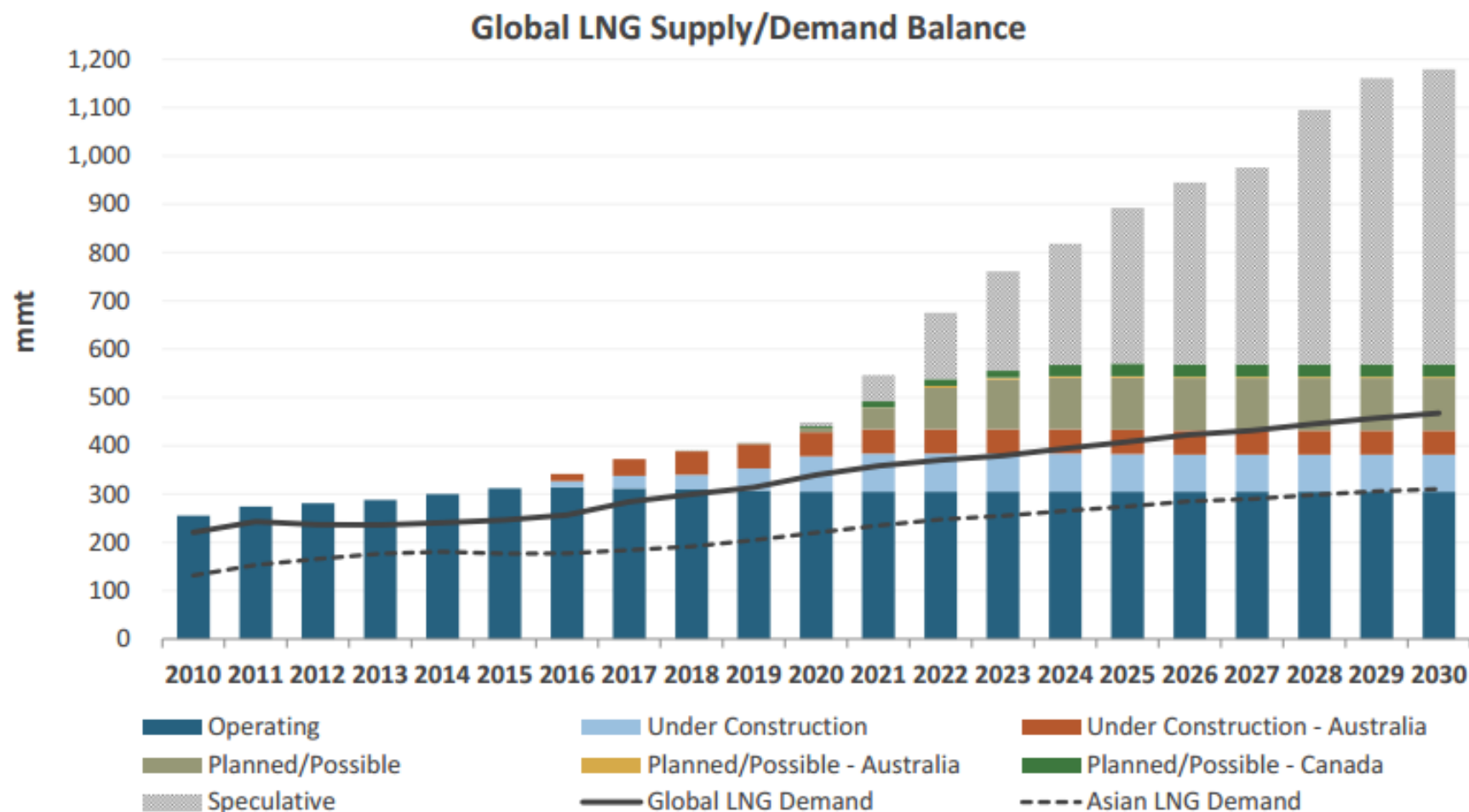
1. Overly-bullish expectations for Asian demand do not materialize in the wake of mild winters and nuclear restarts. At the same time, several projects are sanctioned as a result of newly economical reserves from the U.S. and Australia.
2. As the new wave of LNG projects come online, the market becomes flooded with excess gas that increasingly is sent to spot markets.
3. Structural demand drivers, such as expiring contracted volumes, increasingly-depleted domestic gas supplies, and geopolitical considerations eventually overtake supply before 2025.

Source: NextDecade interpretation of Wood Mackenzie data

WORLD LNG MARKET OVER-SUPPLY TO LAST UNTIL MID-2020's



WORLD LNG MARKET OVER-SUPPLY TO LAST UNTIL MID-2020's

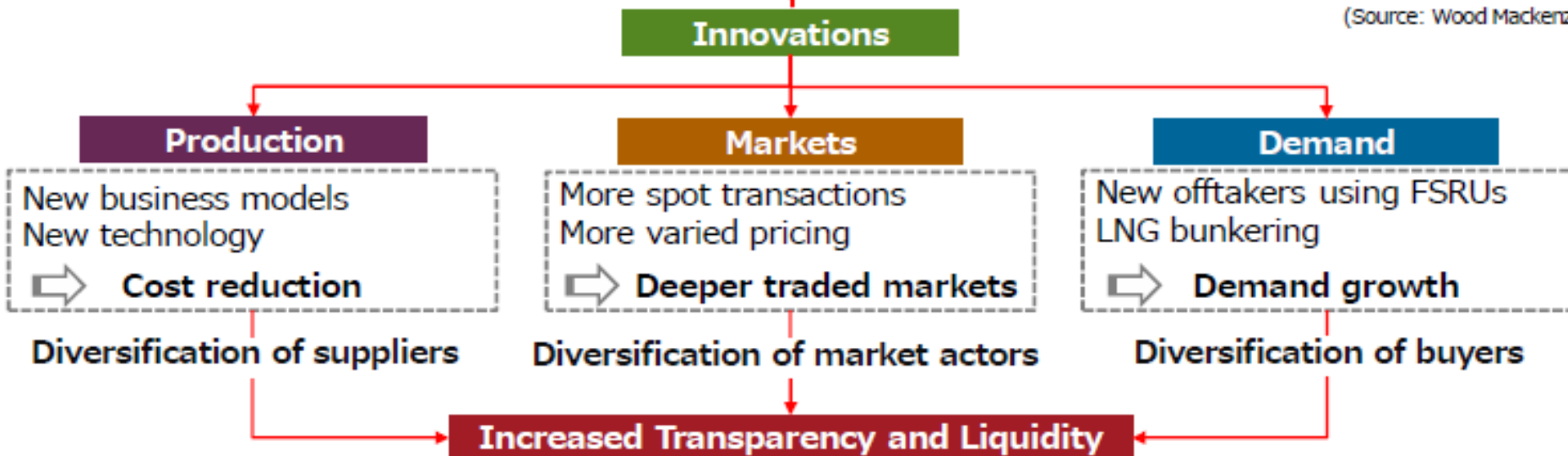
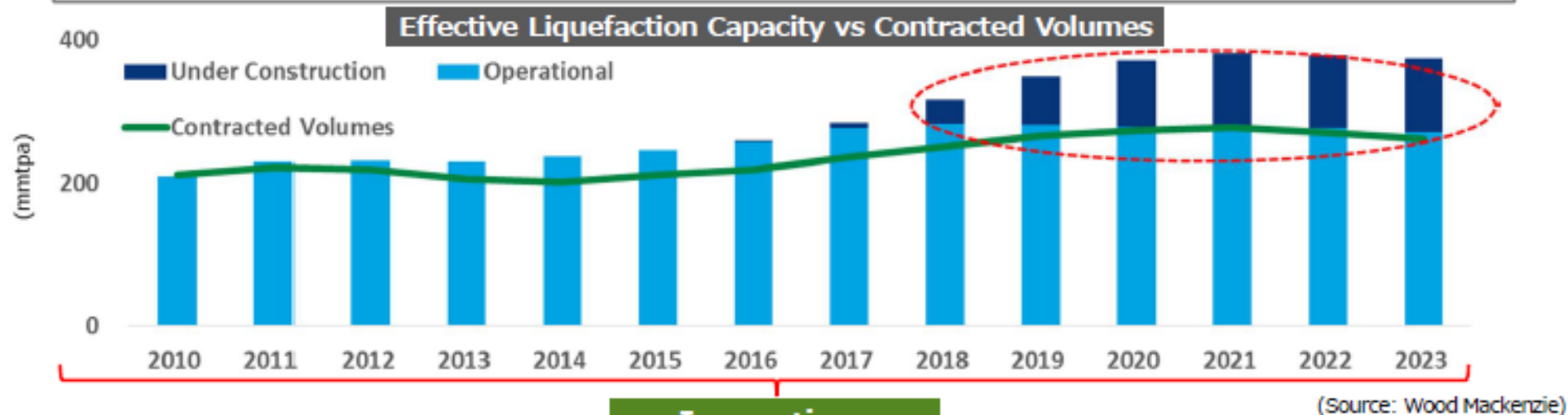


Source: FGE estimates

Changes in the Global LNG Market

Potential Supply-Demand Imbalance and Innovations

The expected over supply of LNG from 2018 will have an enormous impact on the market and open the way to significant innovation.



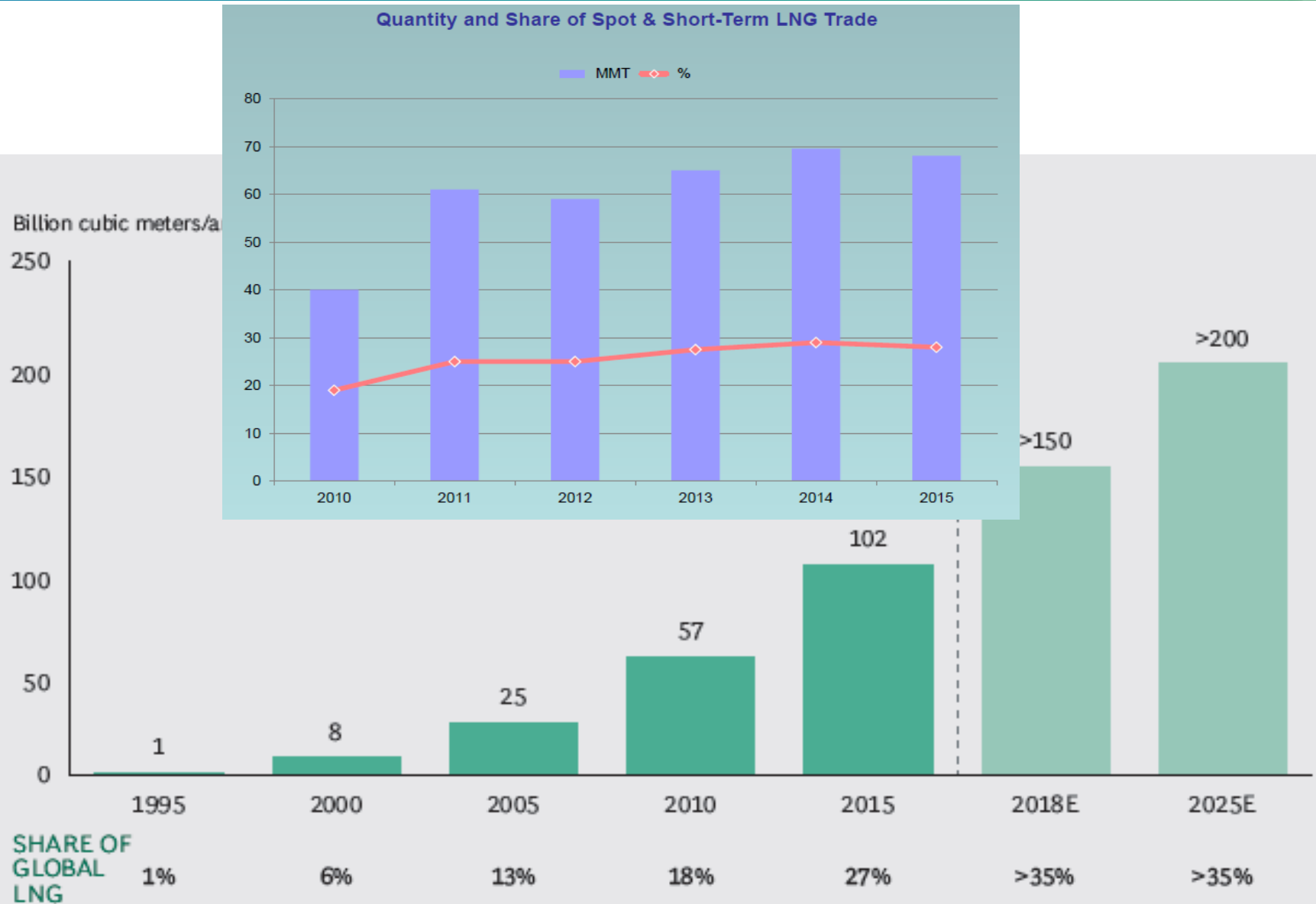
Change in commercial terms

BUYERS' MARKET IS REQUIRING CHANGES IN COMMERCIAL TERMS



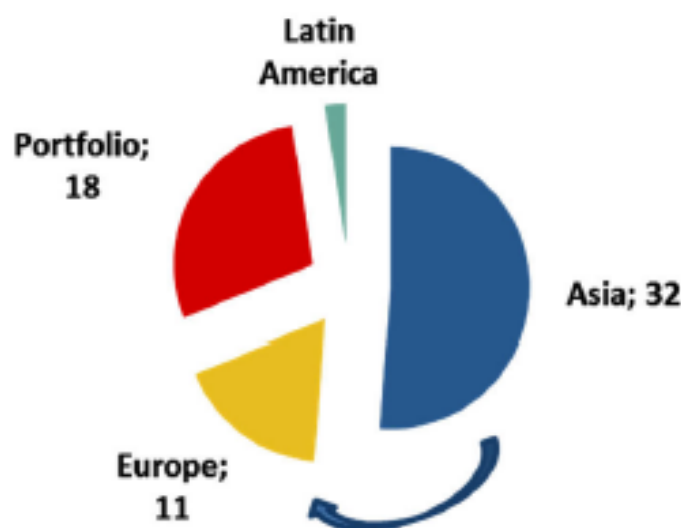
	Past	Today	Future
Term	Long-term (15-25 yrs)	Spot / Short-term (<5 yrs)	Mix of spot, short-term and long-term
Delivery Flexibility	Point-to-Point, limited diversion rights	More flexible cargo delivery rights	Higher flexibility
Index	Oil-linked (Brent, JCC, etc.)	Oil-linked from Australia HH-linked from USA	Multiple regional indices
Pricing	Oil-linked slopes	Tolling or SPA (HHx115% + Capex Recovery)	Mixture of tolling & SPAs (oil or HH linked)
Buyer Flexibility	Very limited	Mix of inflexible legacy terms with flexible terms	Flexible

Spot & Short-term LNG trade



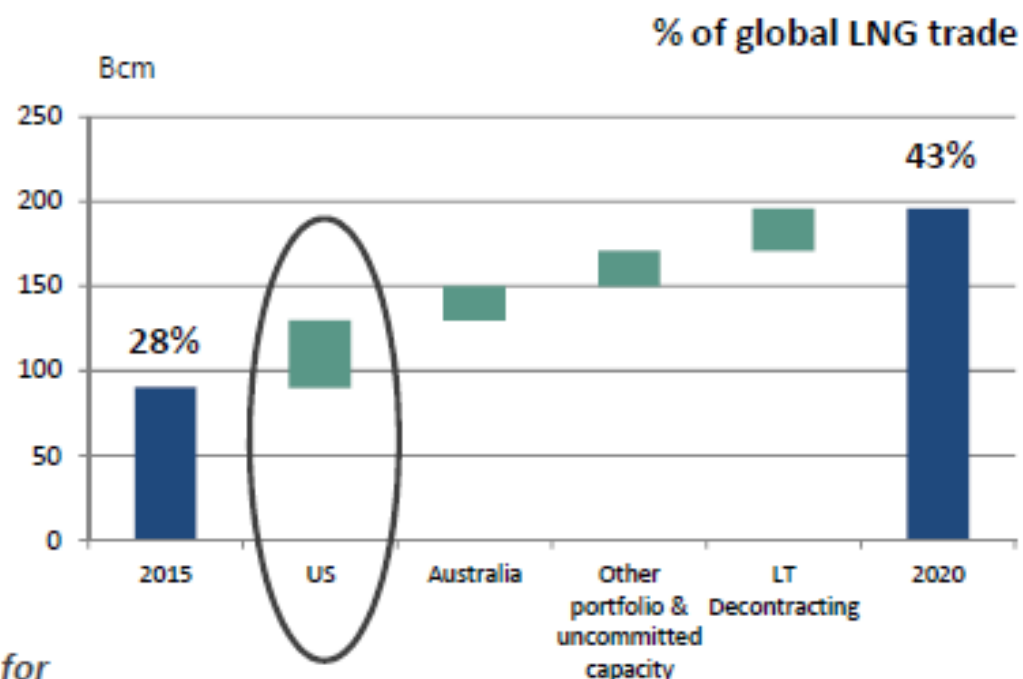
US LNG exports: a major source of flexible and spot LNG

US LNG LT contracted volumes*
(Mt)



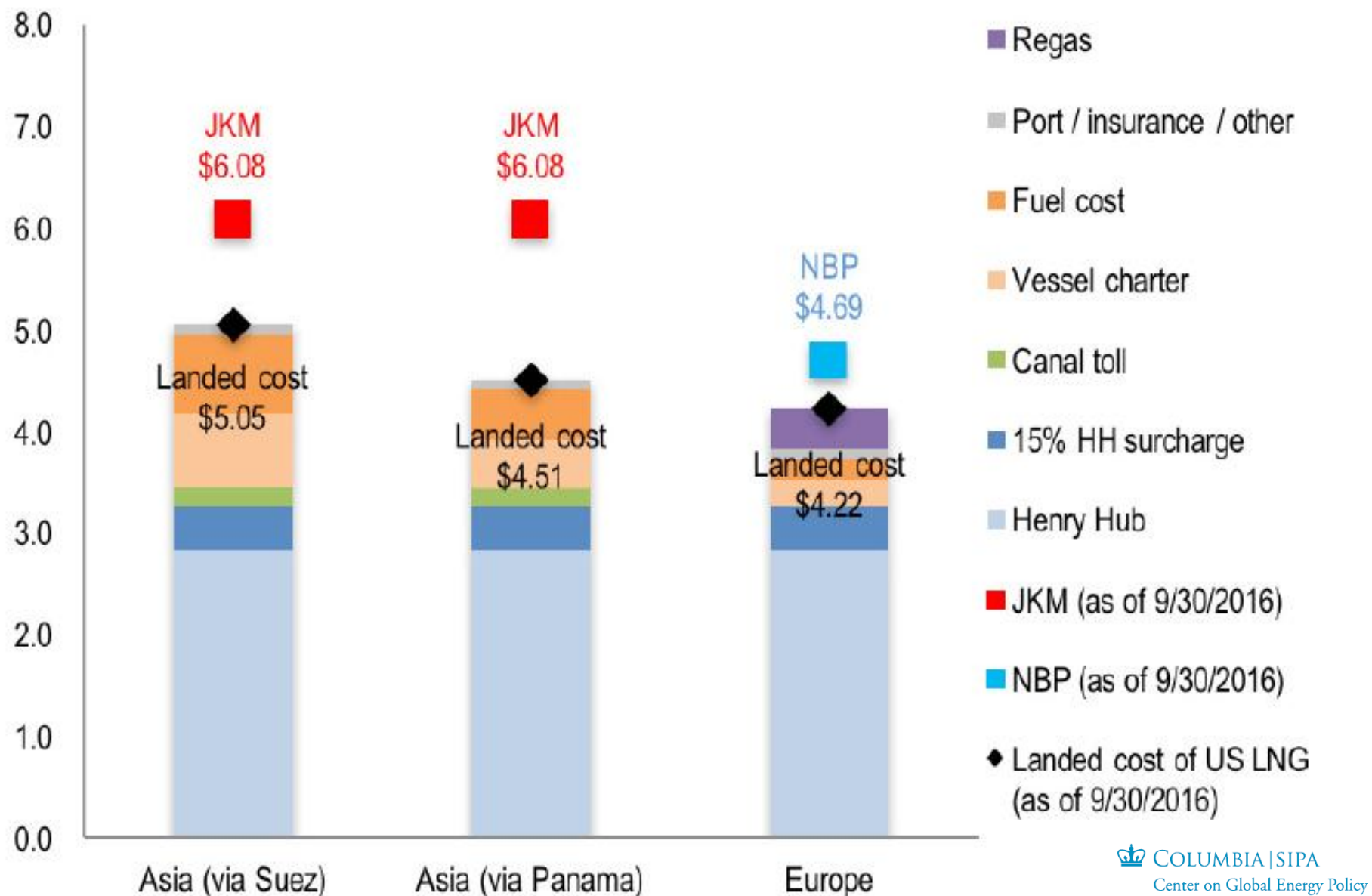
Some flexible US volumes contracted for Asia likely to be resold

Prospects for incremental spot/short-term LNG



* US projects under construction only. No destination restrictions.

Figure 3: Delivered Cost of US LNG in Asia and Europe (as of 9/30/2016, \$/MMBtu)



LNG contracts by price index

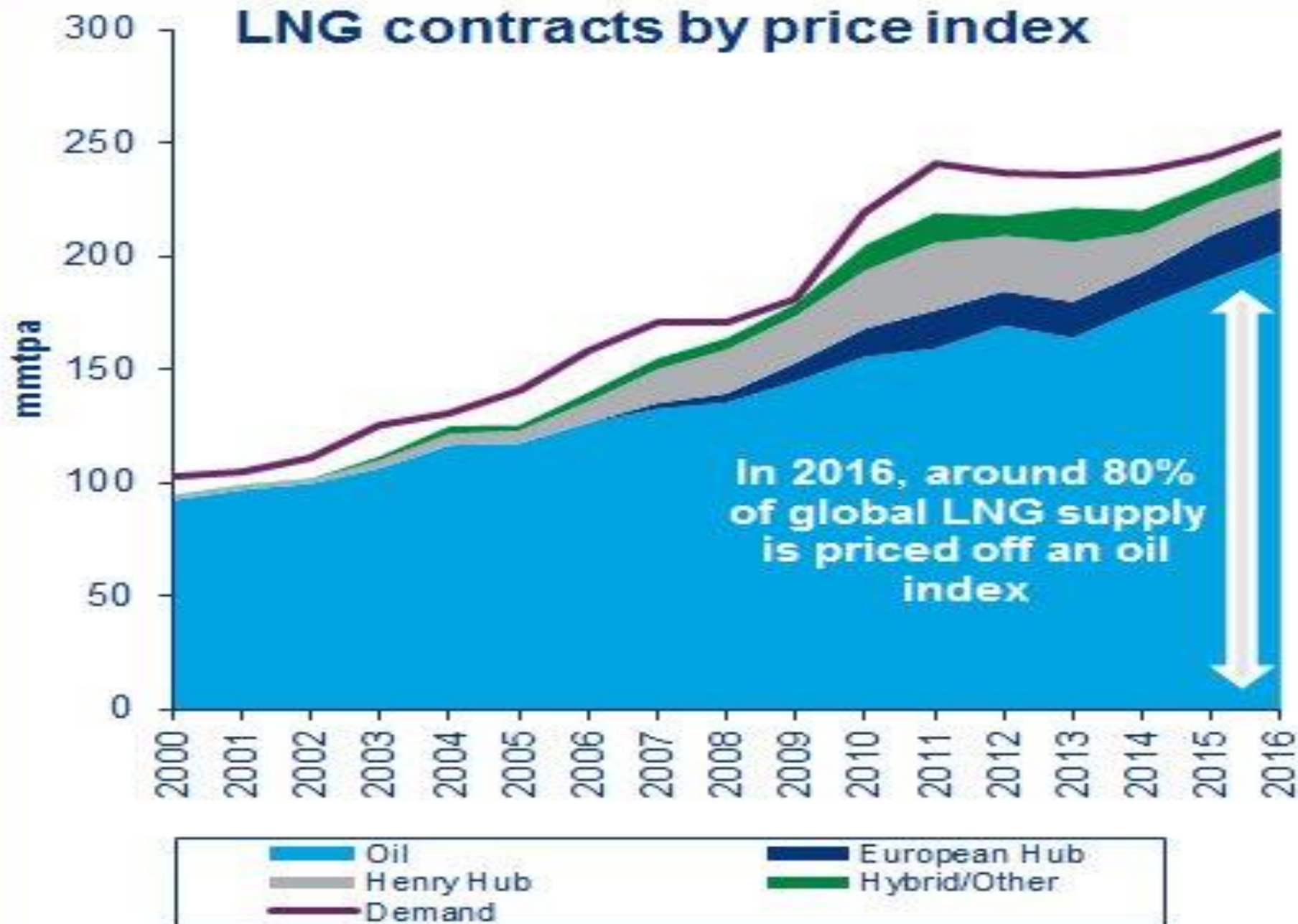
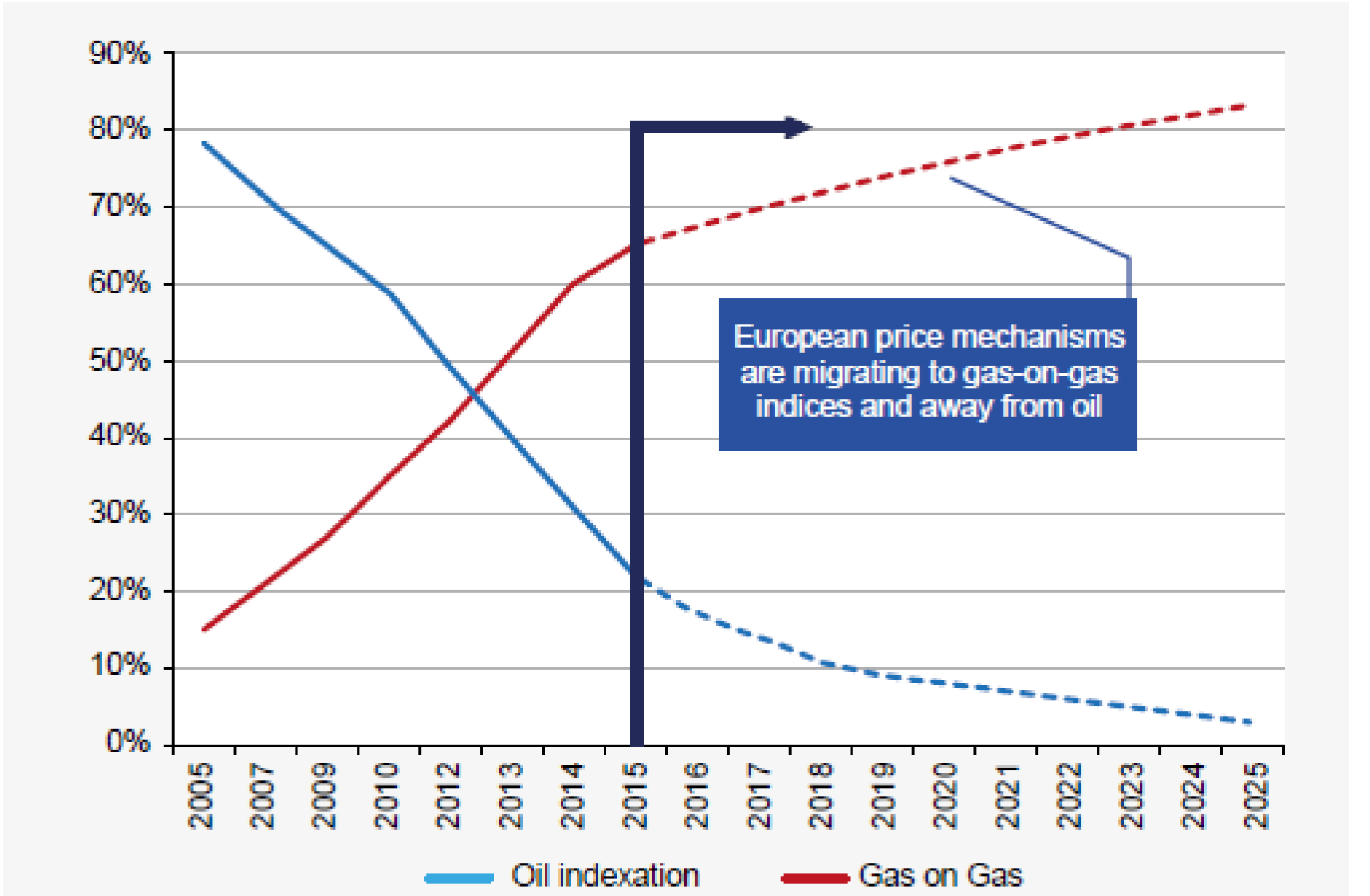
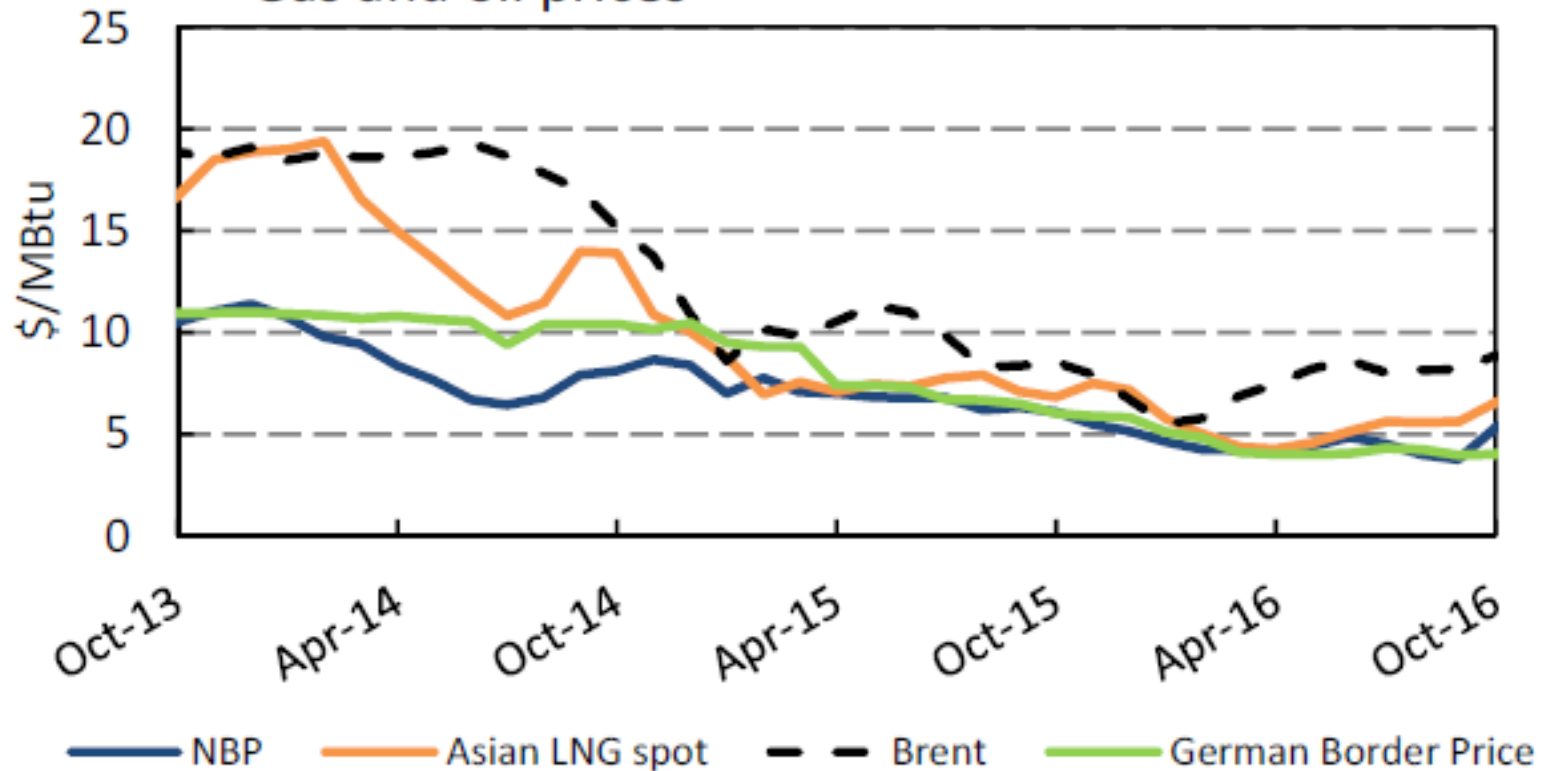


Figure 6: European Migration Towards Gas on Gas Pricing



Source: Gaffney, Cline & Associates

Gas and oil prices

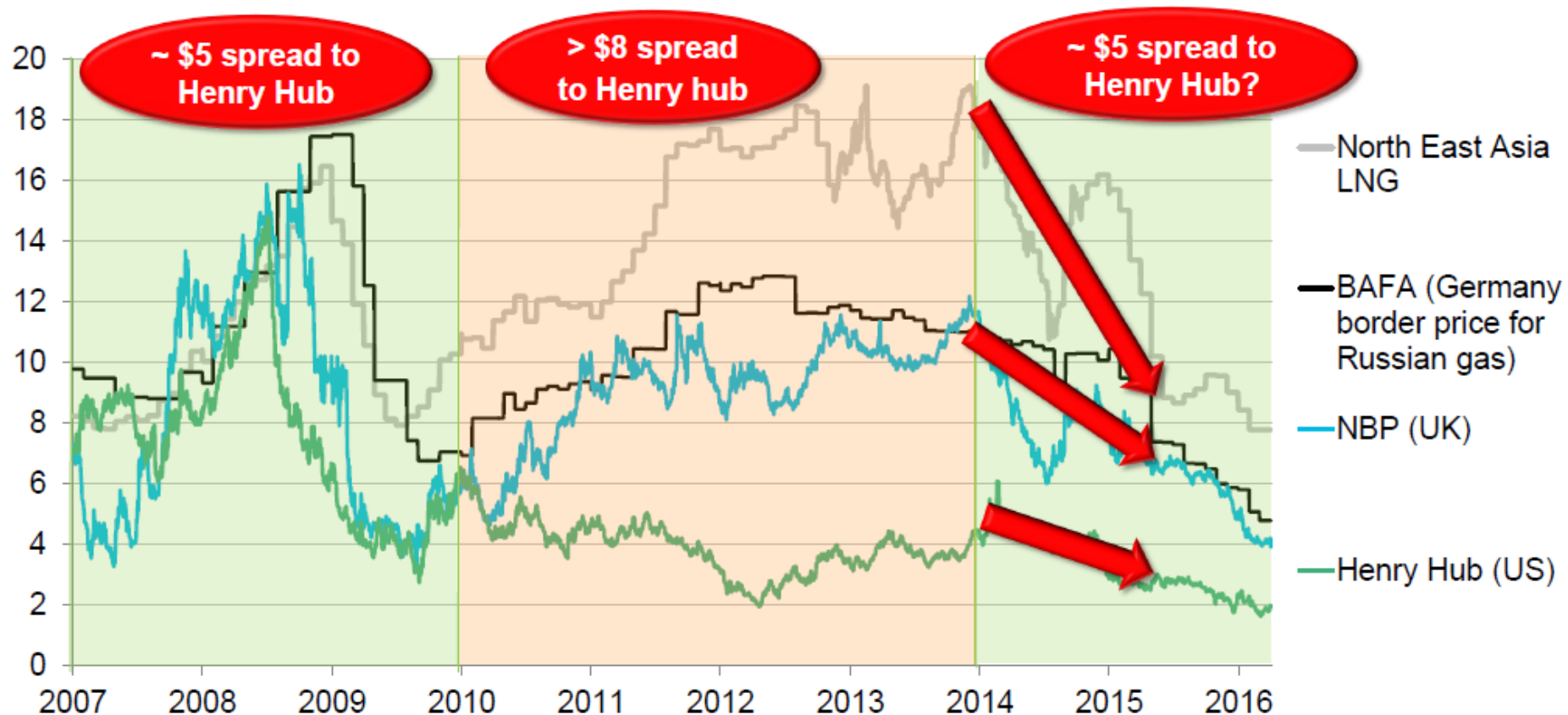


Source: IEA 2016

- *Global gas prices are set to stay under pressure as a huge amount of LNG export capacity is coming online just as demand slows.*
- *The process of market rebalancing is likely to take longer for gas than for oil.*

GLOBAL NATURAL GAS PRICES

(\$/MMBTU REAL 2016\$)



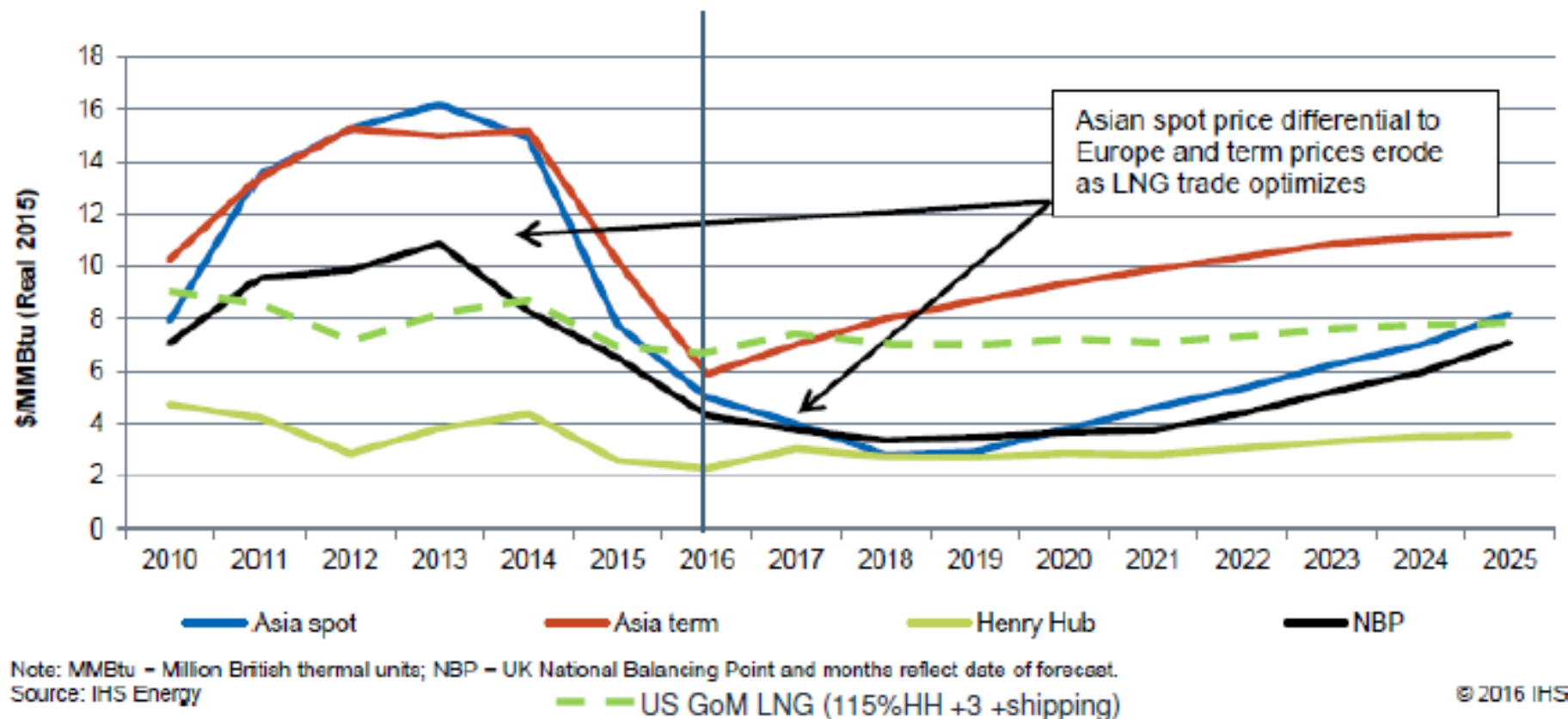
World LNG Estimated Landed Prices: Oct-16



Source: Waterborne Energy, Inc. Data in \$US/MMBtu. Landed prices are based on a netback calculation.
Note: Includes information and Data supplied by IHS Global Inc. and its affiliates ("IHS"); Copyright (publication year) all rights reserved.
Prices are the monthly average of the weekly landed prices for the listed month.

Updated: Nov-16

Gas and LNG price outlooks



Kissadan hisse

- ❑ LNG demand will continue to increase
- ❑ Role of LNG changing (usage, supply, infr)
- ❑ The LNG landscape and dynamics are changing
- ❑ Market competition intensifies
- ❑ Lower prices → collapse in new investment → tigher market
- ❑ Traditional contract terms are eased
- ❑ A more flexible LNG industry

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