

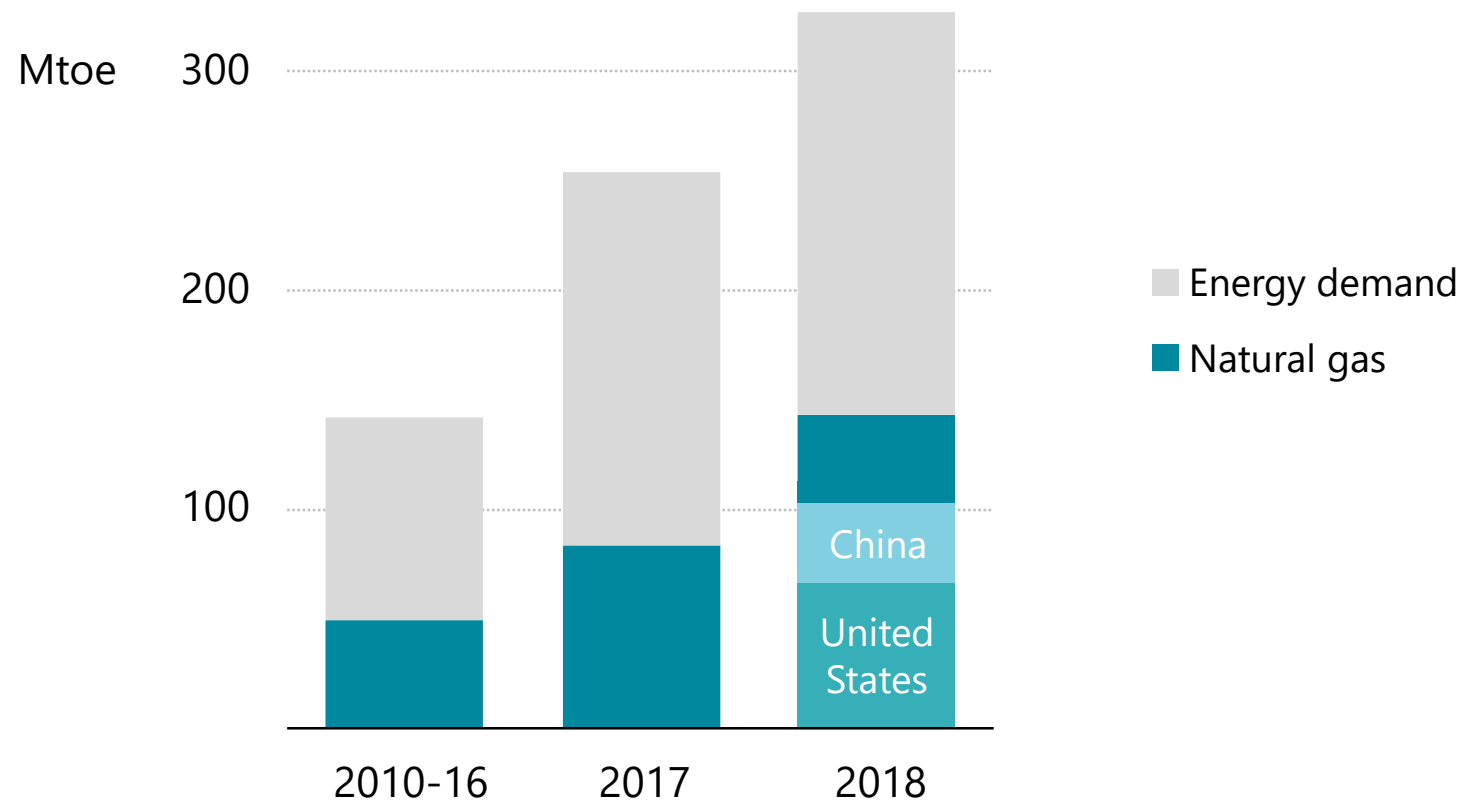


Gas 2019 market report

Peter Fraser, Gas, Coal and Power Markets Division
Oslo – 22 October 2019

2018 was another golden year for natural gas

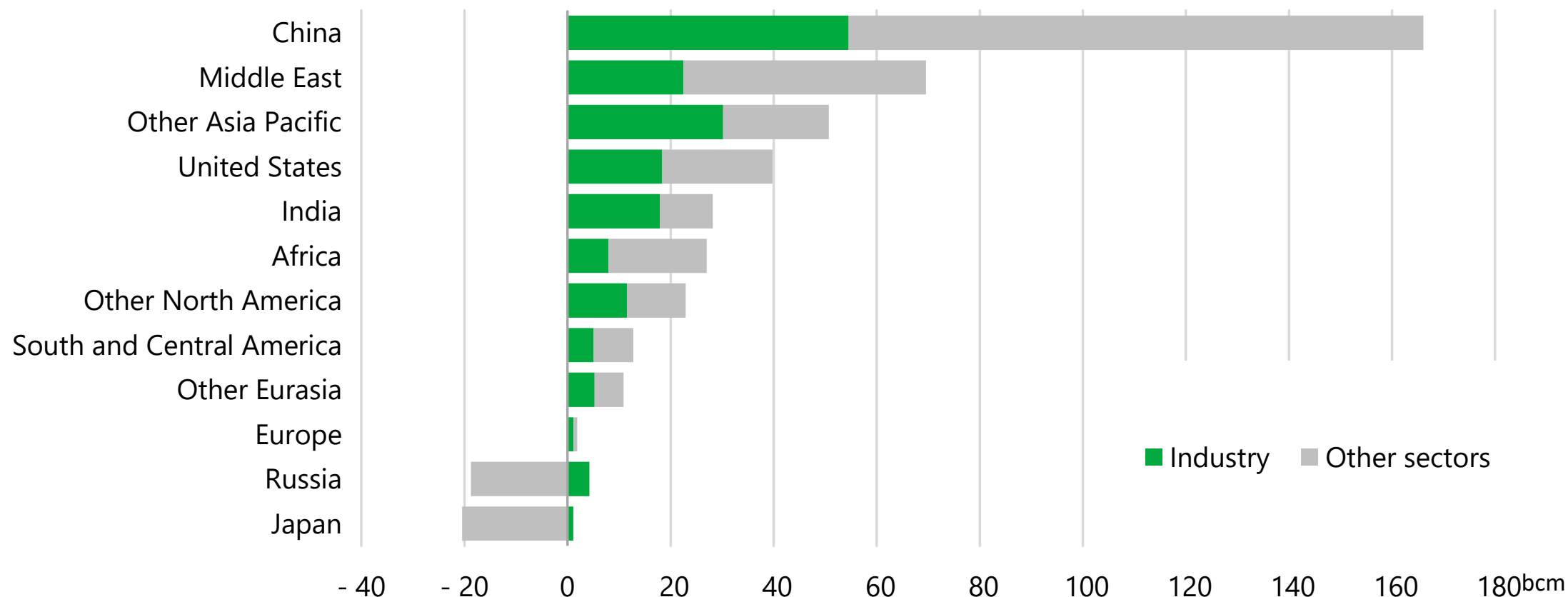
Average annual change in global primary energy demand, 2010-18



Gas demand jumped by 4.6% in 2018, accounting for nearly half of overall demand growth. The United States and China led the growth.

Fast growing Asian markets drive future gas demand

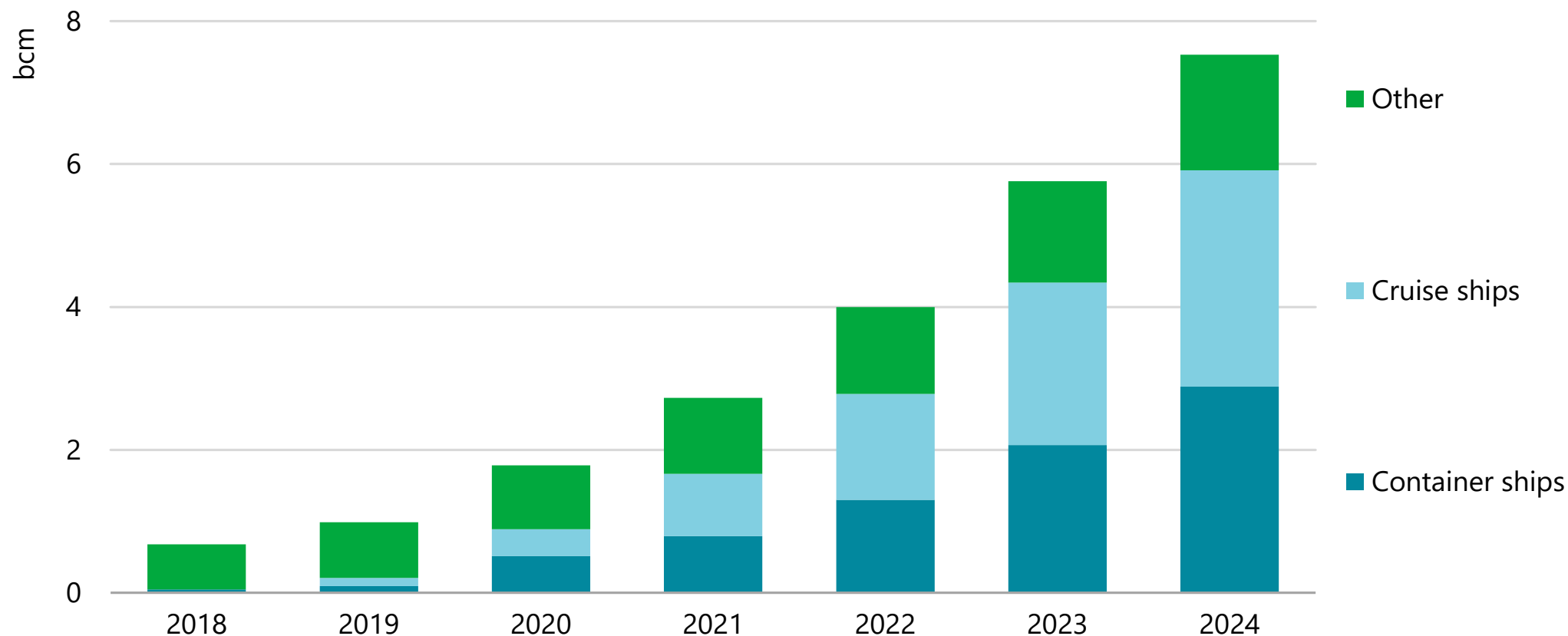
World natural gas consumption growth for selected countries and regions, 2018-24



China accounts for over 40% of global gas consumption growth. All sectors contribute to growth, with industry taking the lead in most markets.

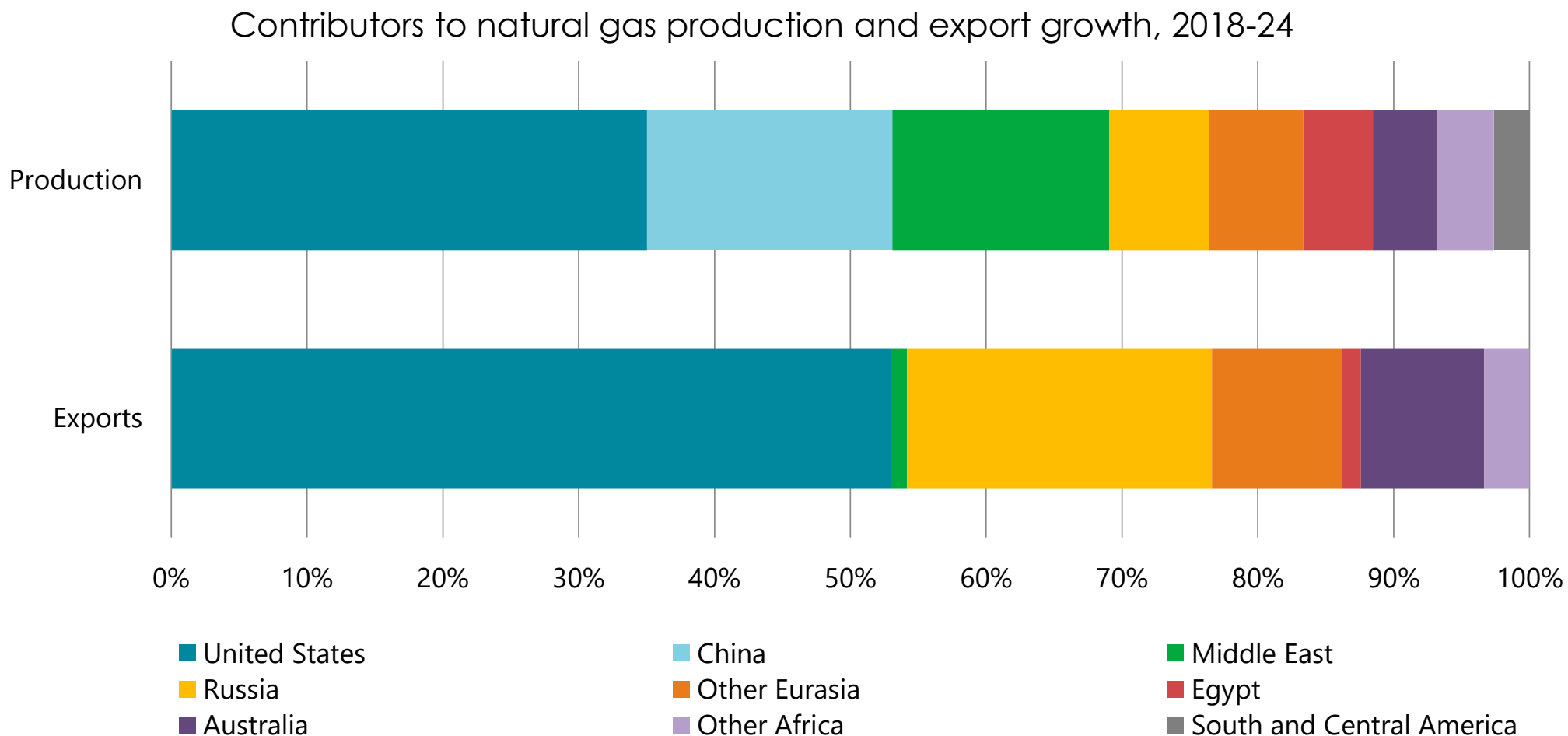
LNG emerges as an alternative marine fuel

LNG consumption for maritime shipping by main segment, 2018-24



The growth in LNG as a marine fuel is supported by two main segments – cruise and container ships – which account for 80% of expected consumption by 2024.

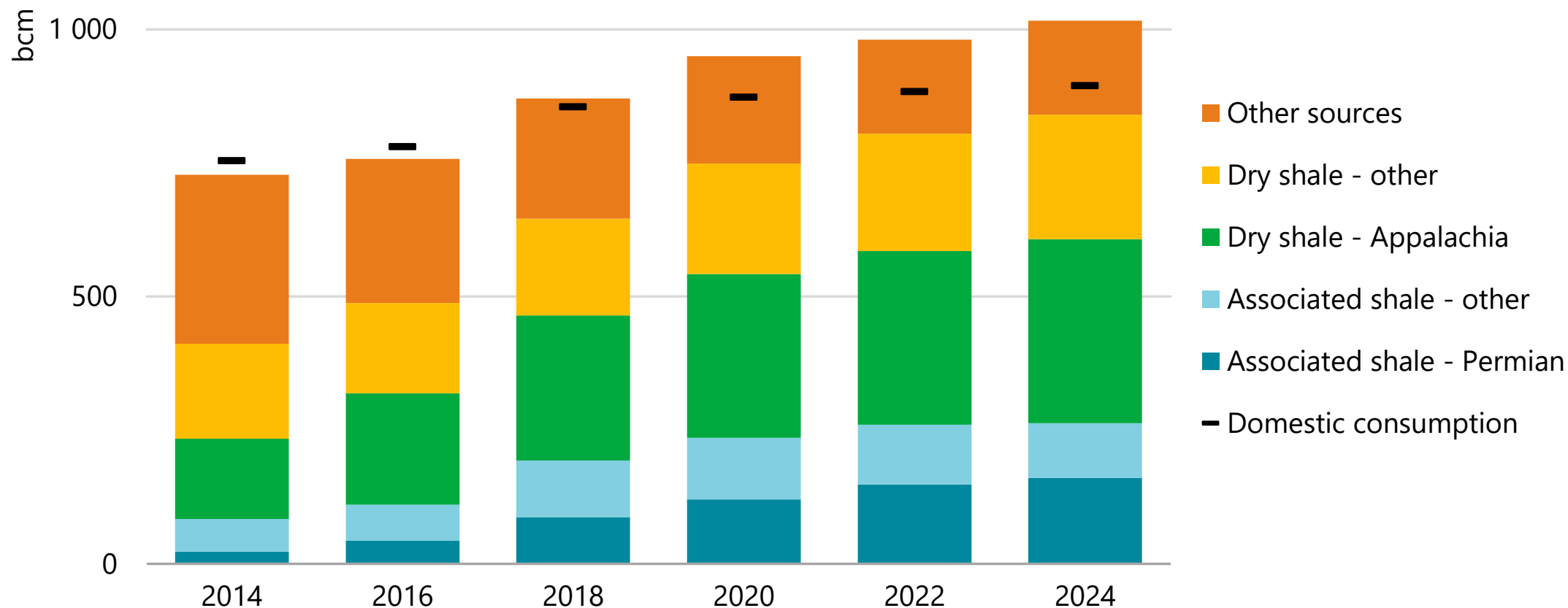
The United States leads production and exports growth



The United States and China account for over half of total production increment to 2024. US and Eurasian exports dominate LNG and pipeline trade growth.

US natural gas production reaches 1 tcm mark by 2024

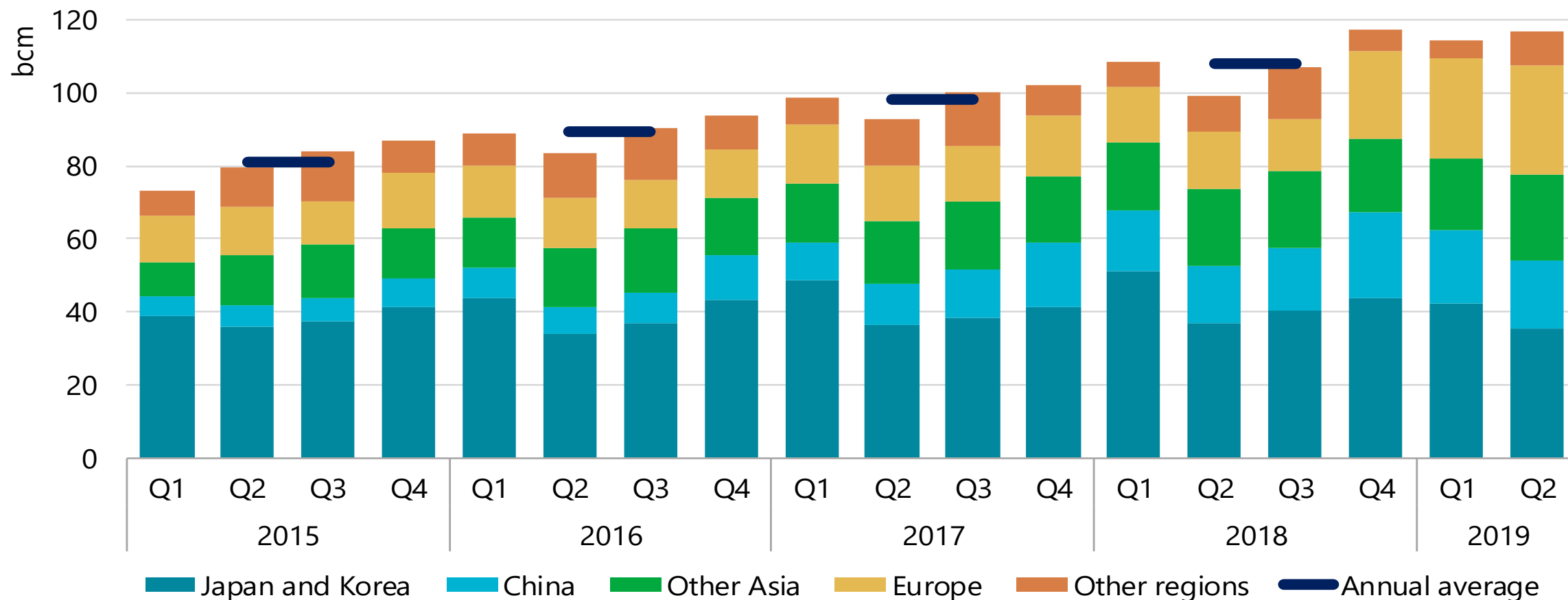
Natural gas production, United States, 2014-24



Associated shale strongly contributes to short-term production growth up to takeaway infrastructure limits and then slows with lesser LTO growth.

Global gas trade is rising rapidly, driven by Asian demand

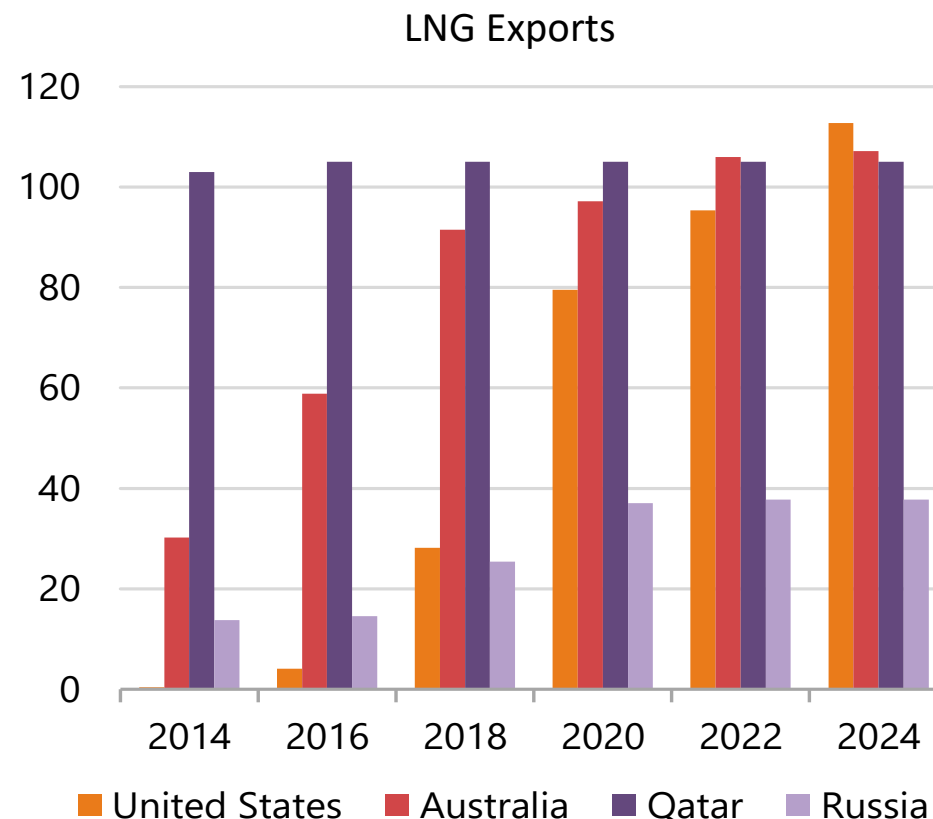
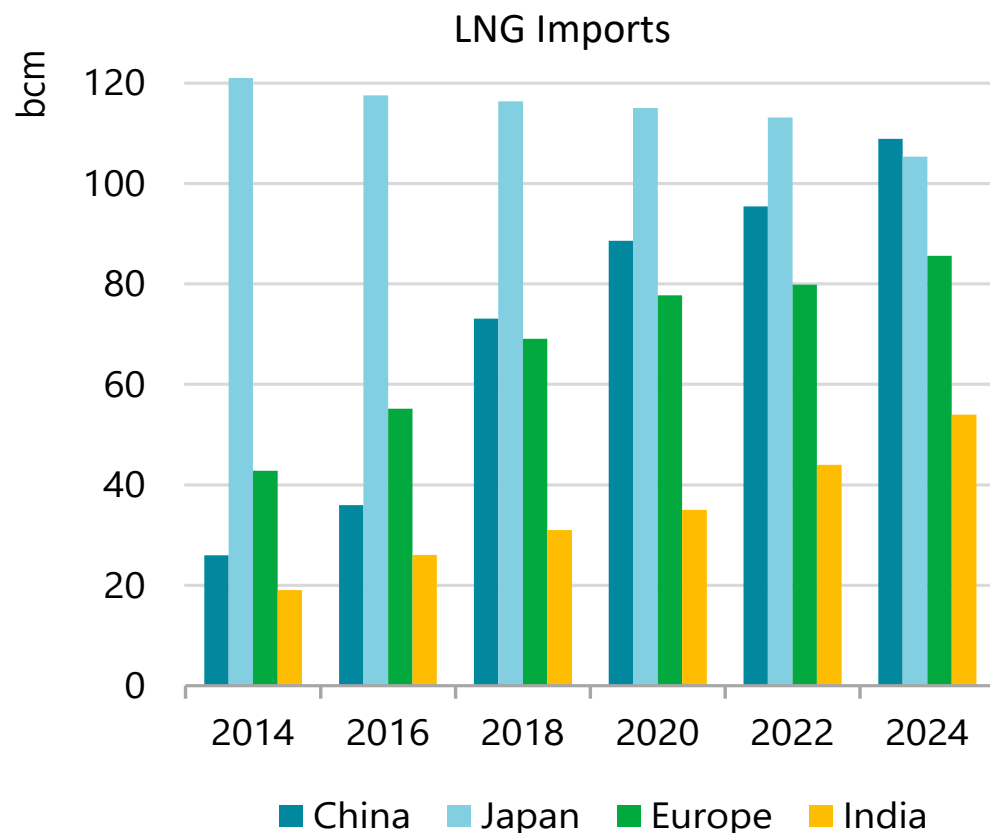
LNG imports, quarterly (2015-19)



European imports have increased attracted by low prices.

The United States and China become #1 LNG seller & buyer in 2024

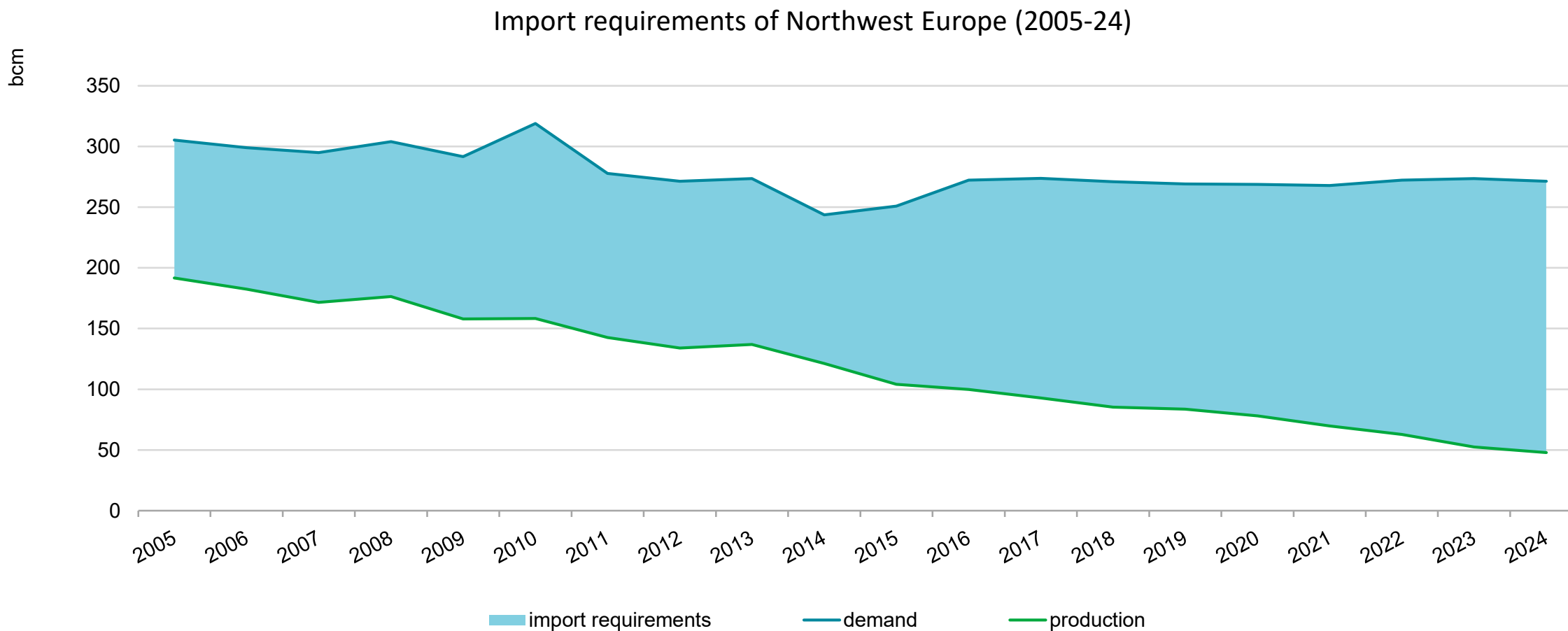
World LNG trade for a selection of importers and exporters, 2014-24



Fast growing Asian economies and Europe account for over 95% of the increase in LNG imports. US exports surge while Australia reaches a plateau and Qatar prepares for expansion*.

* Considering operating liquefaction plants, projects under construction or with FID as of early June 2019

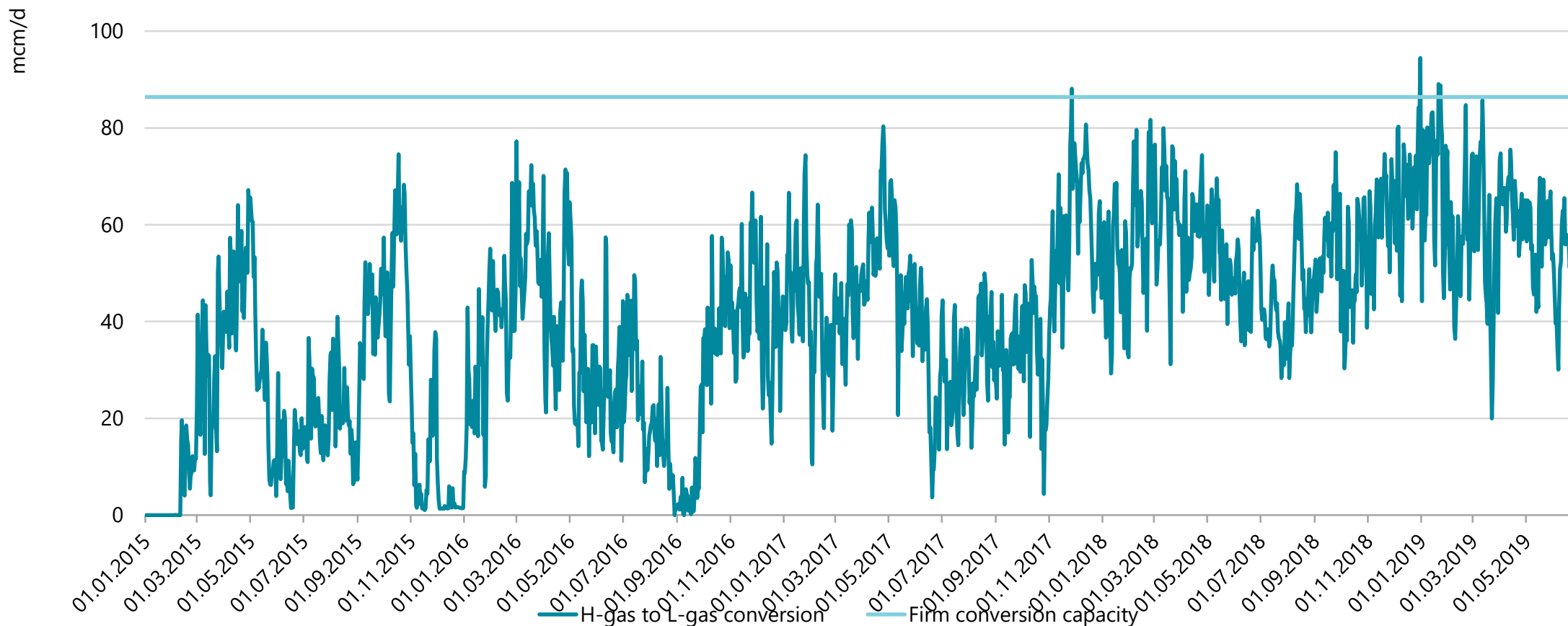
Northwest Europe supply gap increases...



Decreasing Groningen production will increase the region's import dependence.

Conversion facilities in the Netherlands are heavily used

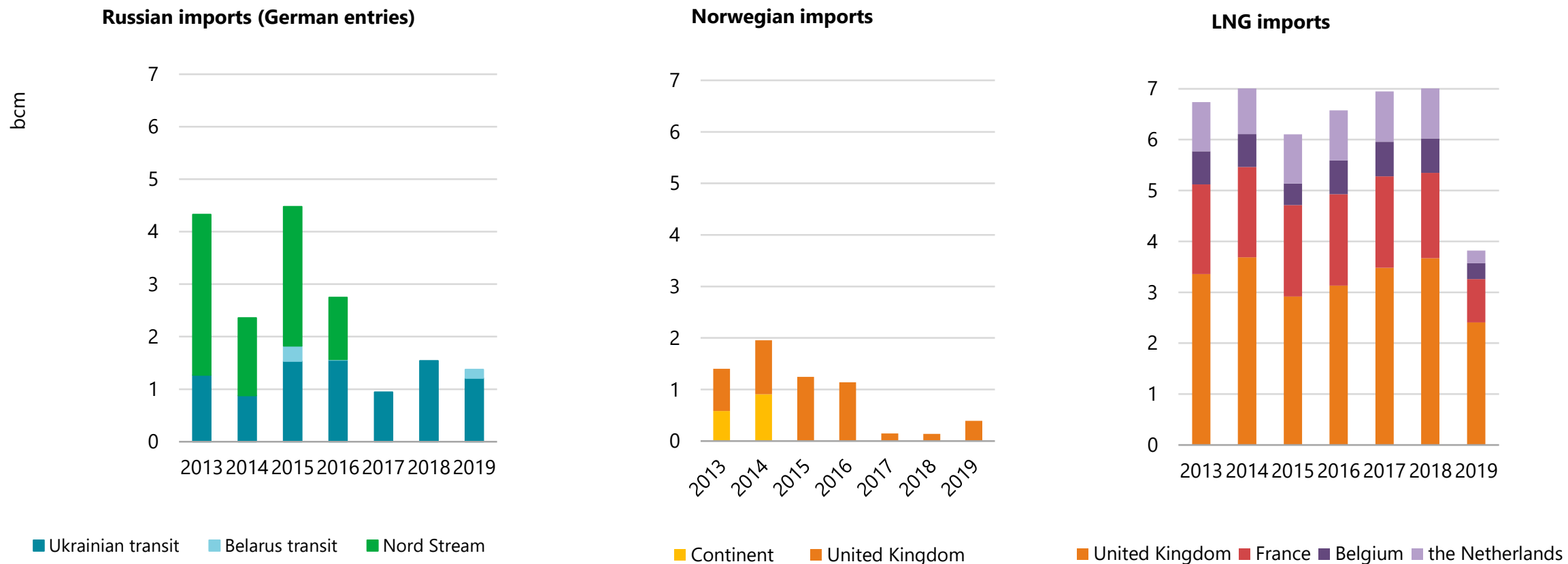
H-gas to L-gas conversion in the Netherlands (January 2015–June 2019)



Conversion facilities now account for 60% of L-cal gas production in the Netherlands, reaching an average utilisation rate of 88% in 2018.

....while spare capacity has declined...

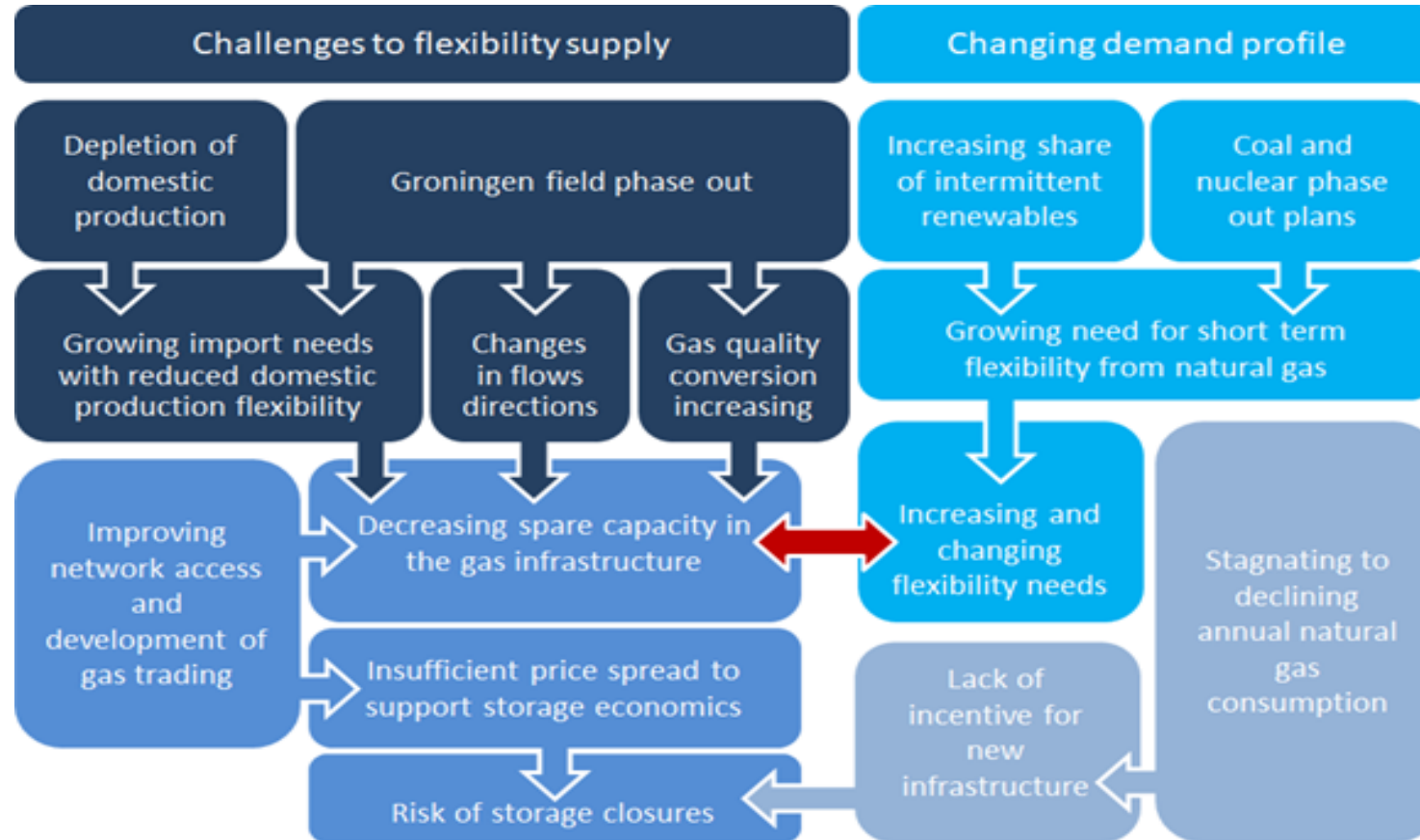
January spare import capacity to Northwest Europe by origin of imports (2013-18)



Little spare import capacity during January in the last two heating seasons.

...in a transforming energy system

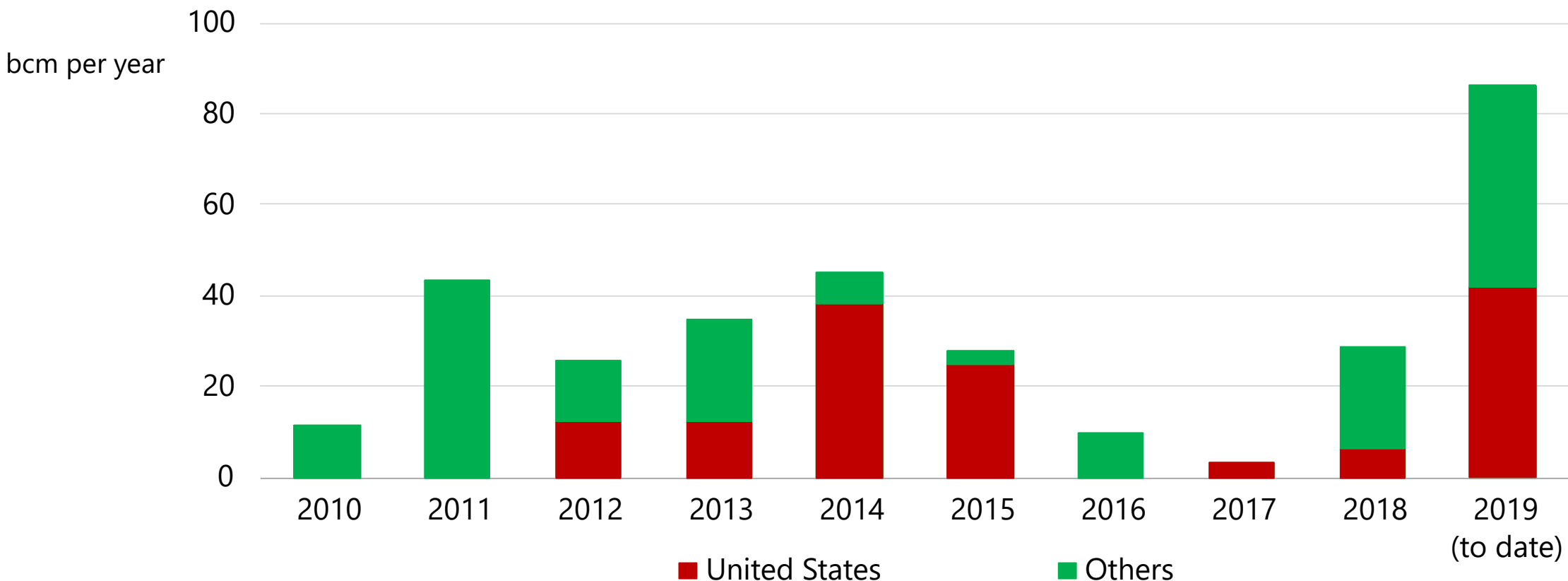
Northwest Europe's changing gas flexibility landscape



Northwest Europe could face even greater need for gas on cold, calm winter evenings as nuclear and coal are reduced suggesting more investment in flexible downstream infrastructure is needed.

Leading the new wave of LNG investment

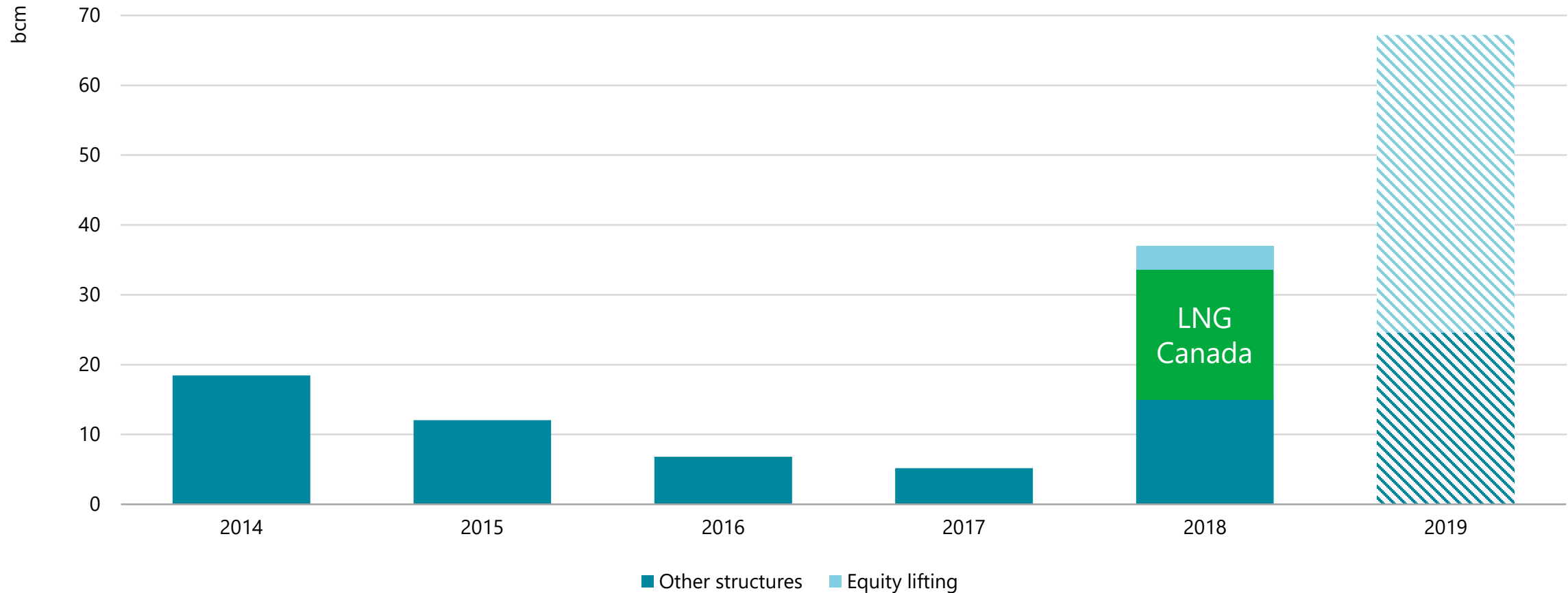
Final investment decisions in new LNG liquefaction capacity (worldwide)



2019 is already a record year for new LNG investment decisions, as North America is leading a wave of investments in LNG supply, supporting a more flexible, resilient & interconnected global gas market

Equity-lifting model gaining popularity

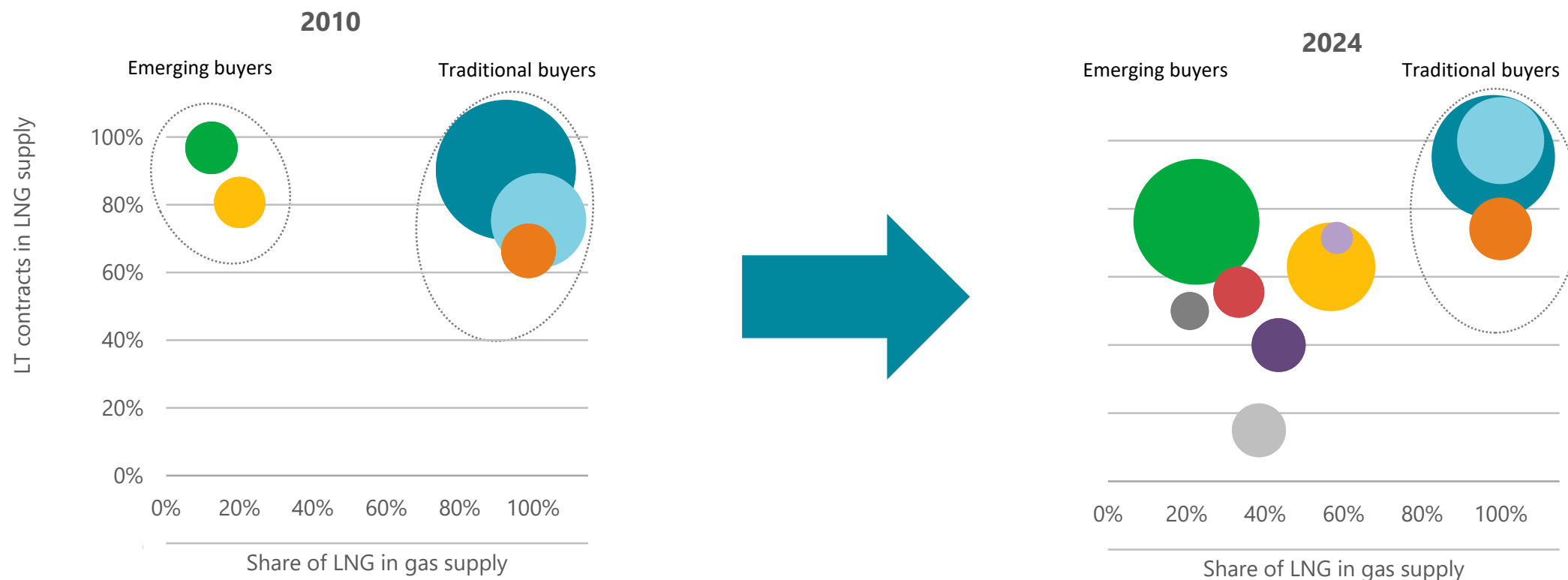
FID-enabling contracts by signing year and structuring model (2014-19)



Equity-lifting has recently facilitated the FID taken on projects such as LNG Canada, Greater Tortue FLNG, Golden Pass LNG, and Arctic LNG 2.

...to a rapidly transforming Asian market

Evolution of Asian LNG buyers types (2010-2024)



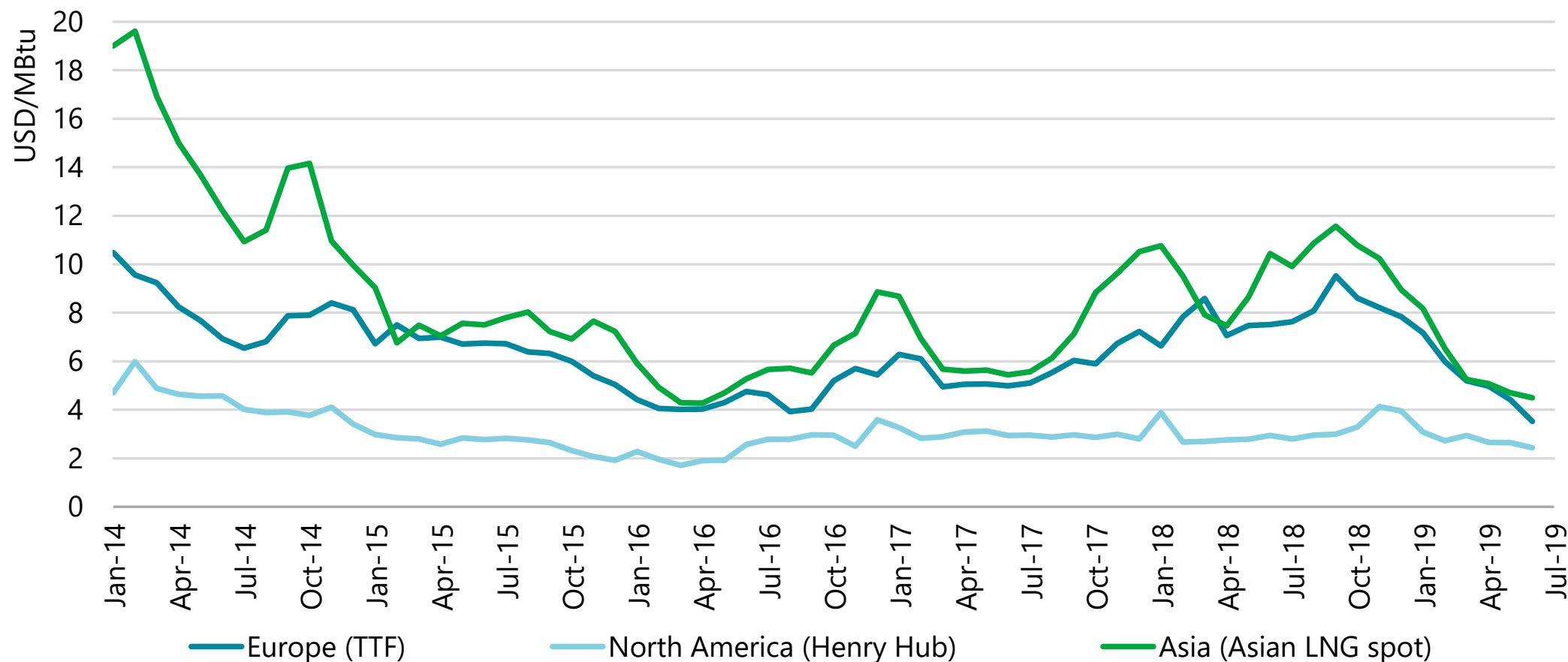
*size of the bubbles indicates annual LNG imports

● Japan
 ● Korea
 ● China
 ● India
 ● Chinese Taipei
 ● Thailand
 ● Pakistan
 ● Singapore
 ● Malaysia
 ● Bangladesh

Emerging Asian buyers driving future LNG demand growth see LNG as a component of their gas supply portfolio.

Towards a global convergence of natural gas prices?

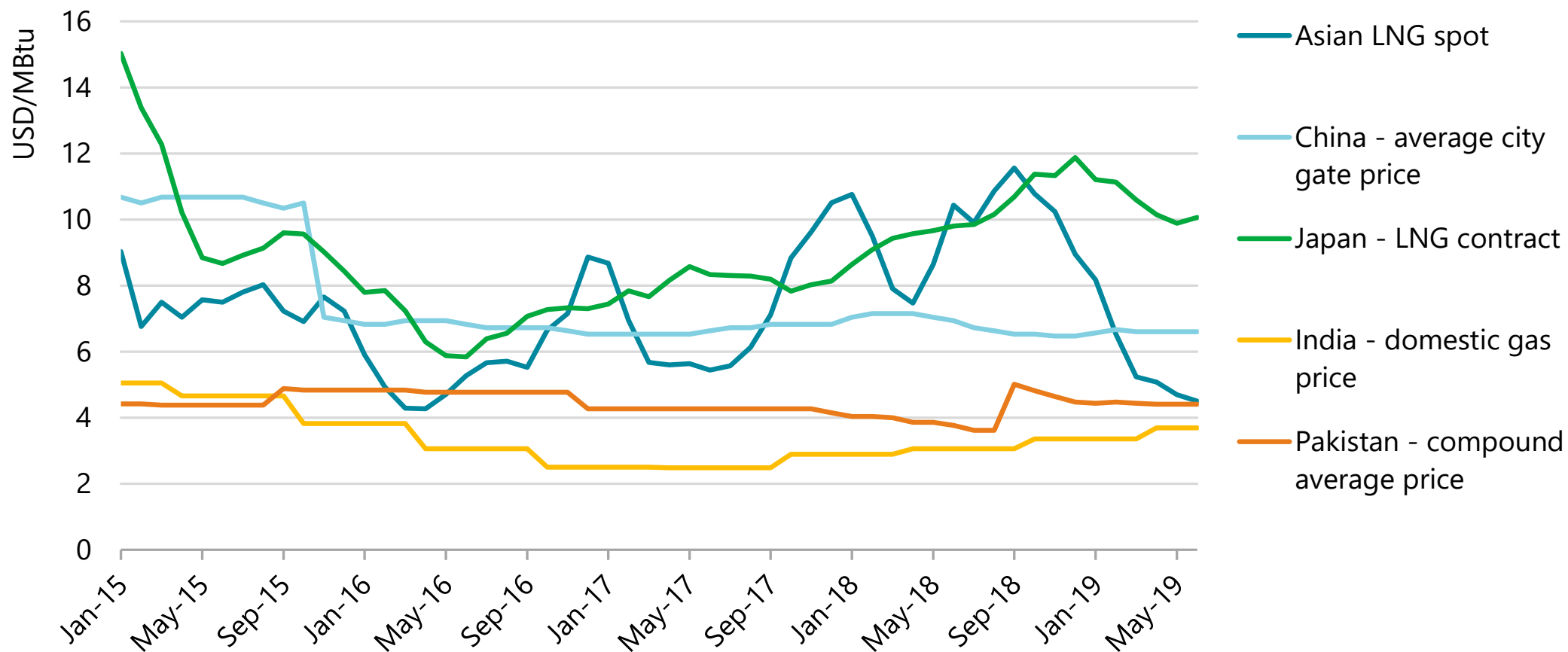
Evolution of natural gas spot market prices, 2014-19



Gas markets in major regions are closing the price gap thanks to the development of global LNG trade. The Asian spot market still faces a higher degree of price volatility.

All markets are not (yet) equal when it comes to end users

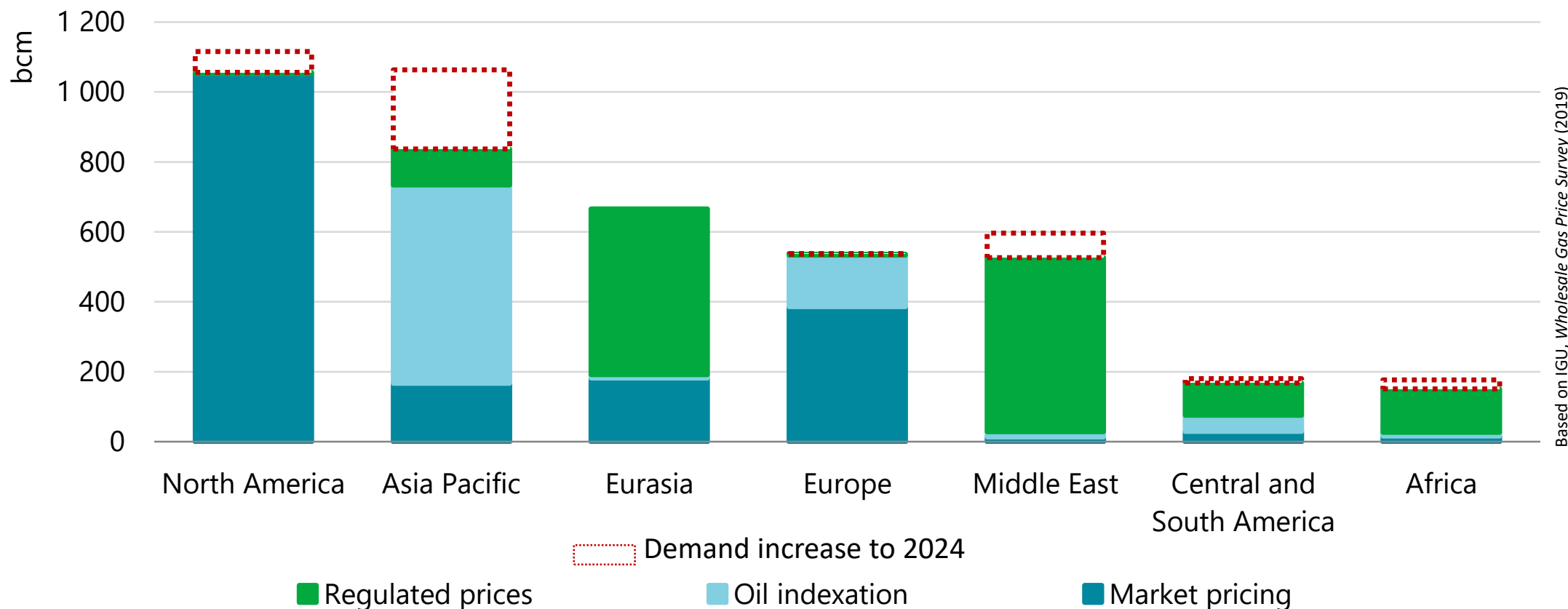
Asian spot LNG price and domestic prices for a selection of Asian importing countries (2015-19)



The influence of market pricing on end users' prices remains currently limited for most Asian markets.

Pricing remains a challenge in developing markets

Natural gas consumption and price mechanisms per region, 2018, and growth to 2024



Market pricing dominates in North America and Europe – but 85% of growth takes place in other regions. Reforms are underway in major emerging economies to foster gas growth.

Conclusions

- Natural gas demand will continue to grow in the medium-term, driven by emerging Asian economies – and led by China.
- Although production increases in many regions, most of additional exports will come from US LNG and Eurasian pipeline.
- LNG trade remains the main driver of gas market globalisation, and a major source of incremental supply for Asia and Europe.
- This growth is supported by a rebound in investment.
- Market prices are converging as global LNG trade expands, and the share of market-driven pricing is increasing in all regions.
- Current gas reforms in major emerging economies are a prerequisite to ensure competitive pricing and sustainable growth in the longer term.

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