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# LNG Outlook

# Definitions & cautionary note

Reserves: Our use of the term “reserves” in this presentation means SEC proved oil and gas reserves.

Resources: Our use of the term “resources” in this presentation includes quantities of oil and gas not yet classified as SEC proved oil and gas reserves. Resources are consistent with the Society of Petroleum Engineers (SPE) 2P + 2C definitions.

Discovered and prospective resources: Our use of the term “discovered and prospective resources” are consistent with SPE 2P + 2C + 2U definitions.

Organic: Our use of the term Organic includes SEC proved oil and gas reserves excluding changes resulting from acquisitions, divestments and year-average pricing impact.

Shales: Our use of the term ‘shales’ refers to tight, shale and coal bed methane oil and gas acreage.

Underlying operating cost is defined as operating cost less identified items. A reconciliation can be found in the quarterly results announcement.

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this release “Shell”, “Shell group” and “Royal Dutch Shell” are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words “we”, “us” and “our” are also used to refer to subsidiaries in general or to those who work for them. These expressions are also used where no useful purpose is served by identifying the particular company or companies. “Subsidiaries”, “Shell subsidiaries” and “Shell companies” as used in this release refer to companies over which Royal Dutch Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as “joint ventures” and “joint operations” respectively. Entities over which Shell has significant influence but neither control nor joint control are referred to as “associates”. The term “Shell interest” is used for convenience to indicate the direct and/or indirect ownership interest held by Shell in a venture, partnership or company, after exclusion of all third-party interest.

This release contains forward-looking statements concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management’s current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management’s expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as “anticipate”, “believe”, “could”, “estimate”, “expect”, “goals”, “intend”, “may”, “objectives”, “outlook”, “plan”, “probably”, “project”, “risks”, “schedule”, “seek”, “should”, “target”, “will” and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this release, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell’s products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; and (m) changes in trading conditions. There can be no assurance that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this release are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Royal Dutch Shell’s 20-F for the year ended December 31, 2015 (available at [www.shell.com/investor](http://www.shell.com/investor) and [www.sec.gov](http://www.sec.gov)). These risk factors also expressly qualify all forward looking statements contained in this release and should be considered by the reader. Each forward-looking statement speaks only as of the date of this release, February 20, 2017. Neither Royal Dutch Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this release.

With respect to operating costs synergies indicated, such savings and efficiencies in procurement spend include economies of scale, specification standardisation and operating efficiencies across operating, capital and raw material cost areas.

We may have used certain terms, such as resources, in this release that United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. U.S. Investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website [www.sec.gov](http://www.sec.gov).





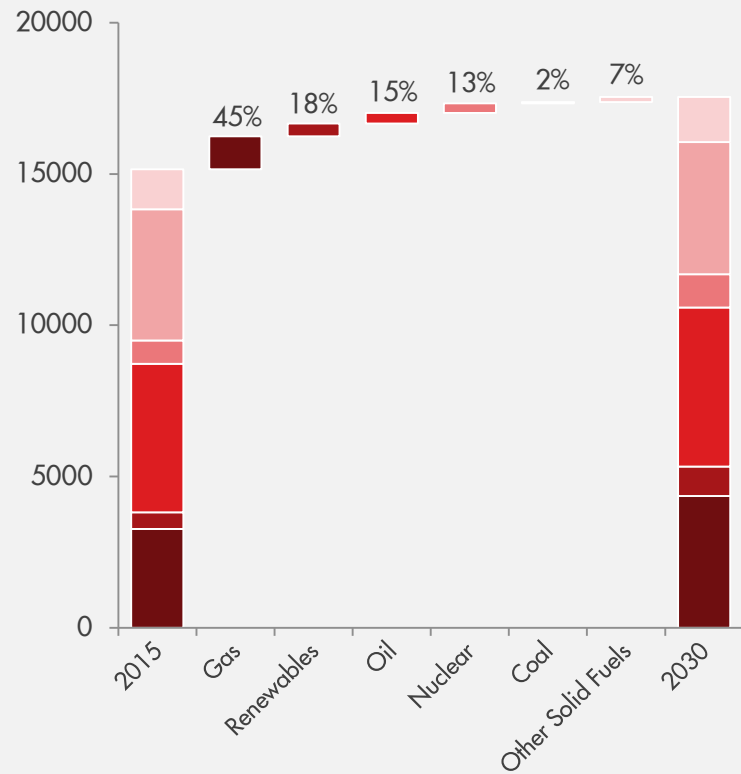
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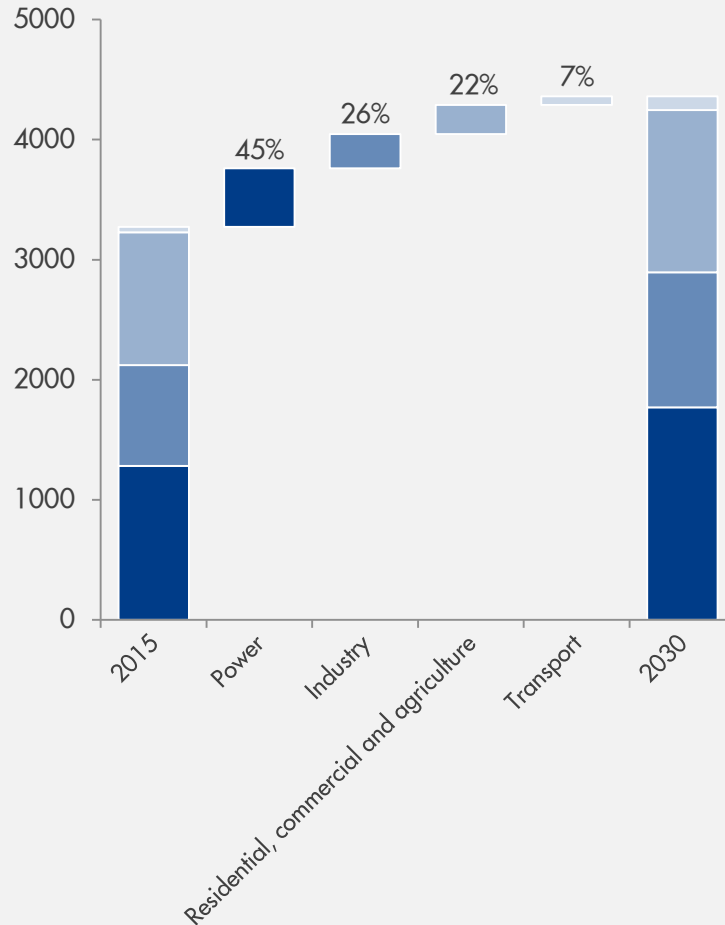


# Gas playing a prominent role in meeting growing energy demand

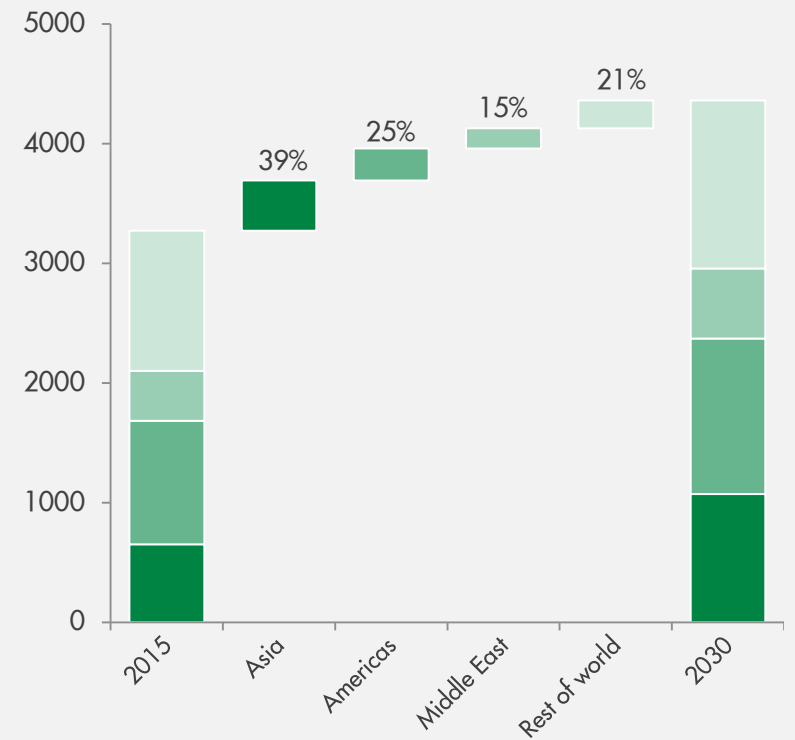
Global energy demand growth by fuel (bcm)



Global gas demand growth by sector (bcm)



Global gas demand growth by region (bcm)

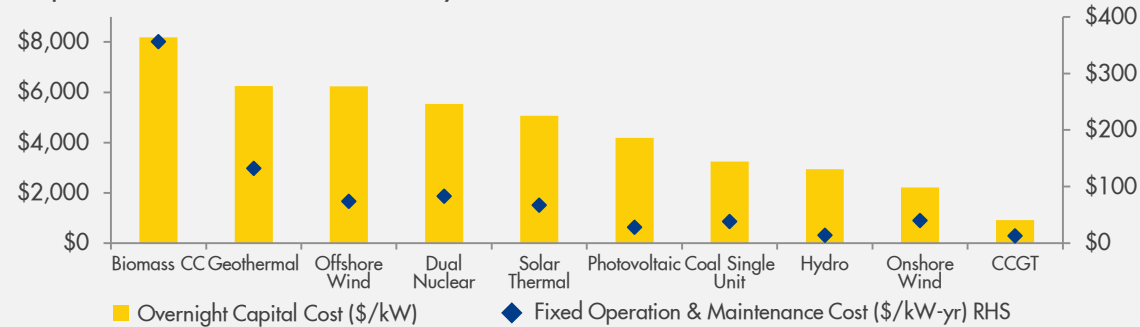


Source: Shell interpretation of Wood Mackenzie Q4 2016 data

# Gas provides competitive, flexible, cleaner energy

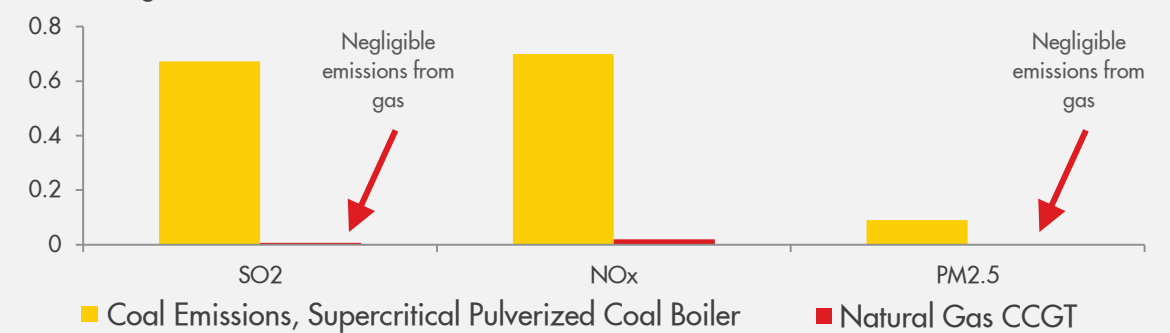
## Gas plants are cheaper to build & operate

Capital Cost Of Power Plants KW/yr



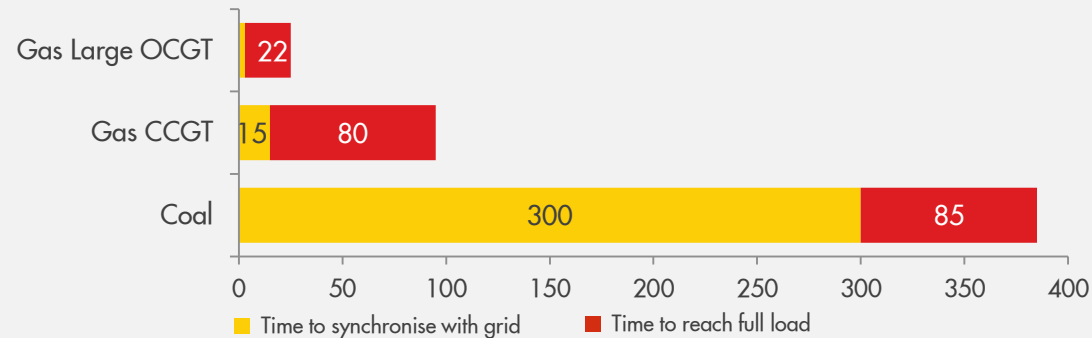
## Addressing local air quality concerns

lb/MWh gross



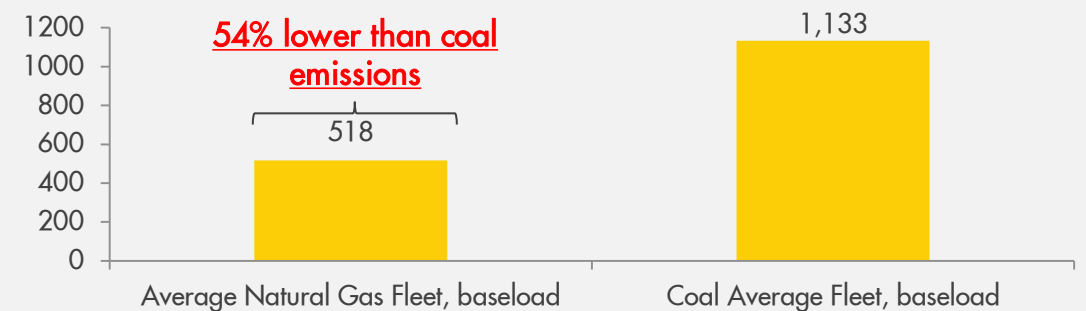
## Supporting renewable generation growth

Average Time Required To Come Online, Minutes



## Facilitating climate change objectives

Life-cycle GHG Emissions: kg CO2e/MWh, 100-year Global Warming Potential



# Polymakers increasingly choose gas



Leaders' Communique pledged to 'enhance collaboration on solutions that promote natural gas' as 'a less emission-intensive fossil fuel'



170+ members agreed sulphur limit in shipping fuel of 0.5% from 2020  
LNG as a fuel contains virtually zero sulphur vs. 3.5% specification for global marine fuel today



13<sup>th</sup> Five Year Plan targets 45 bcm of incremental gas consumption by 2020. China has suspended more than 100 coal-fired plants either approved or under construction



"We have given priority to move towards a gas based economy. Effort must be made to increase natural gas production while also creating import infrastructure to meet the growing domestic demand."  
*Prime Minister Modi*



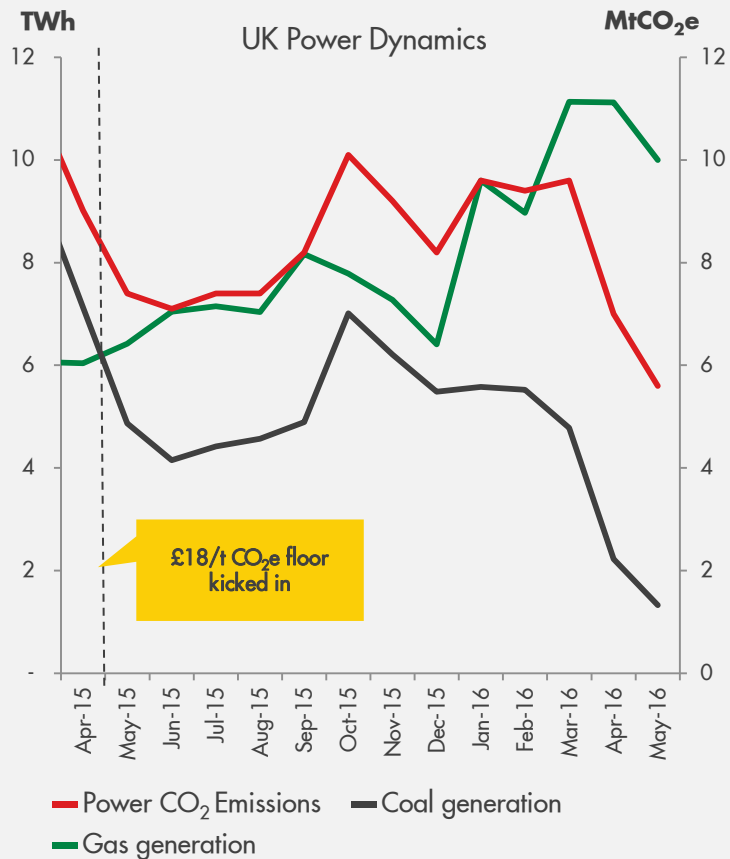
EU Liquefied Natural Gas Strategy acknowledged critical role of gas in support of energy security, increasing competitiveness and greenhouse gas emissions targets



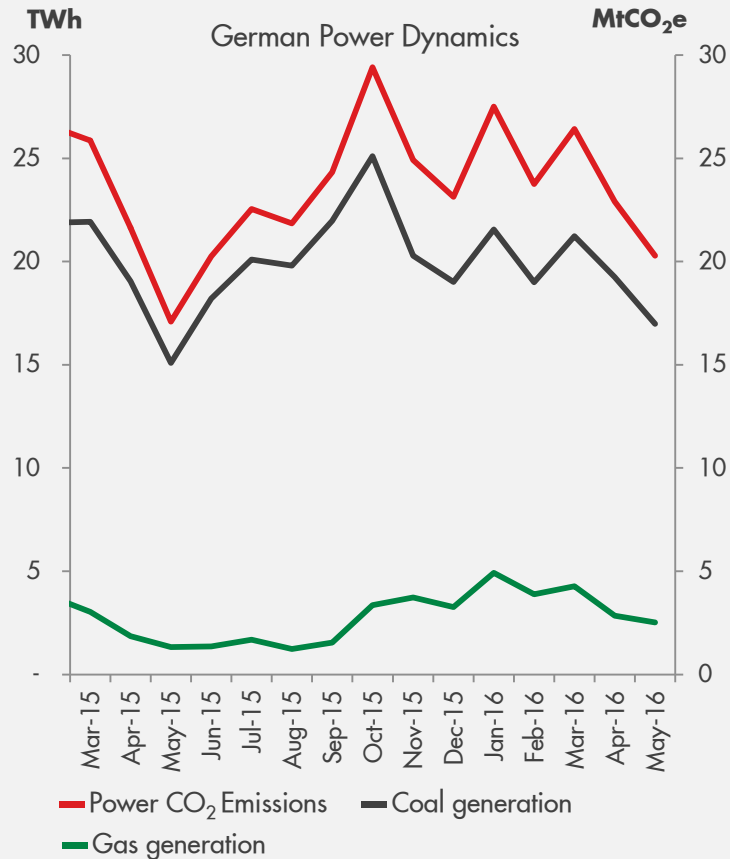
France and Canada announced plans to phase out coal fired generation by 2023 and 2030 respectively. They join Austria, Belgium, Britain, Denmark and Portugal in pledging to close coal fired generation by the end of the next decade

# Emission reduction policies drive increased gas demand

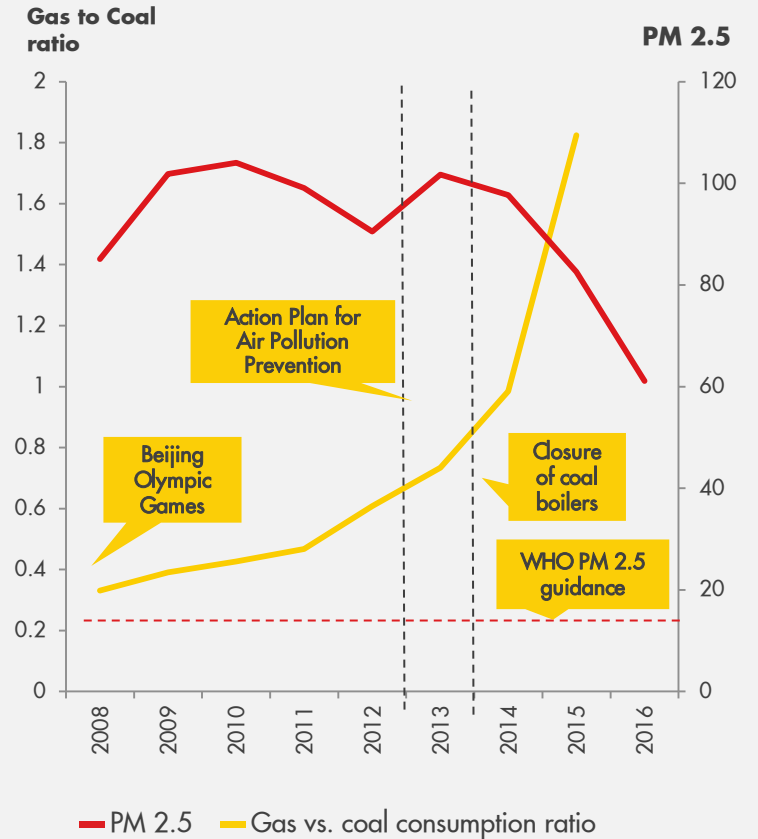
## UK: Lower CO<sub>2</sub> emissions



## Germany: Static CO<sub>2</sub> emissions



## Beijing: Improving air quality

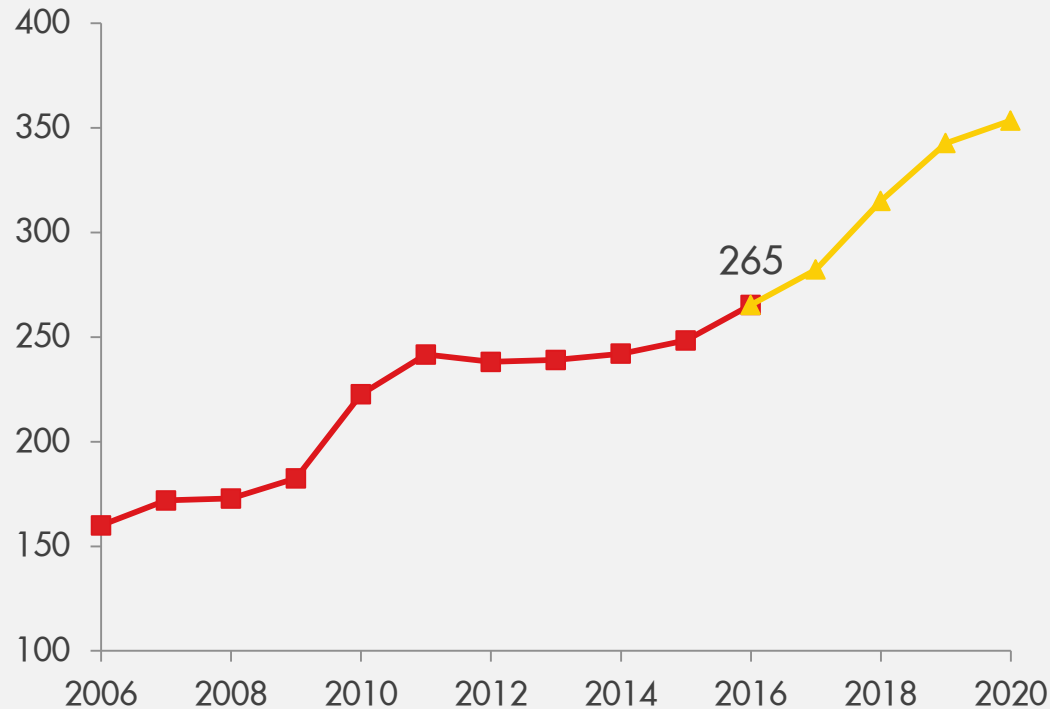


# One-third of new LNG supply growth already online

LNG volume set to expand 50% from 2014 to 2020

## Delivered volume

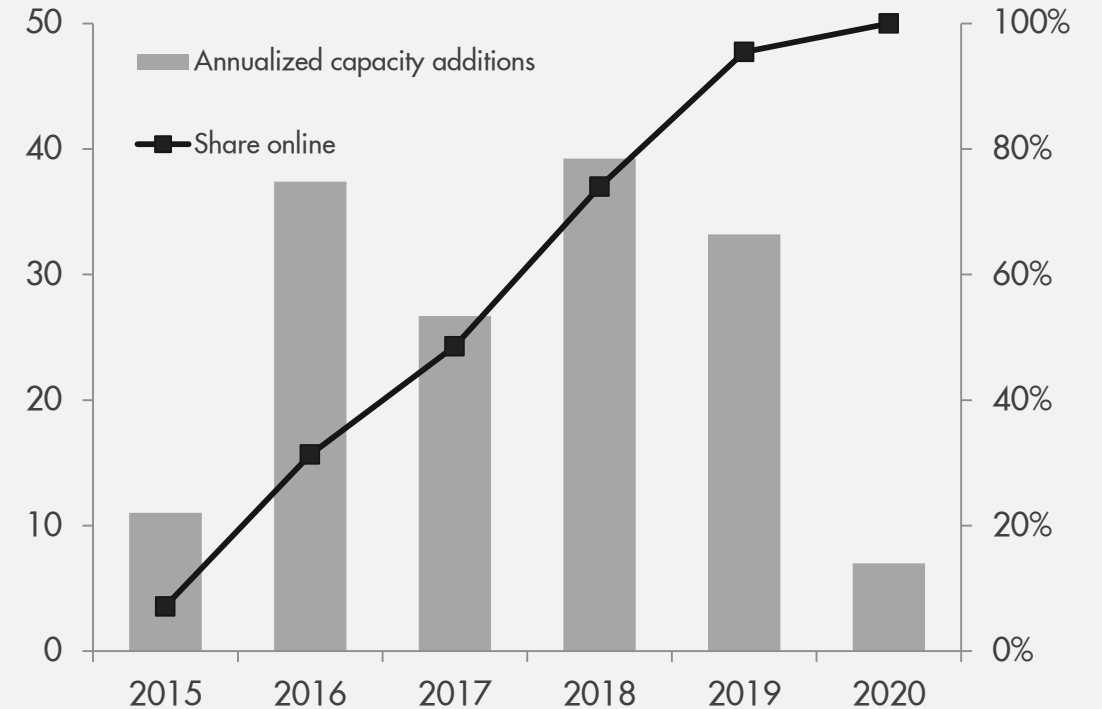
MTPA



Source: Shell interpretation of IHS (LNG Waterborne Trade, Liquefaction Projects Database) and Wood Mackenzie Q4 2016 data

## Capacity additions

MTPA



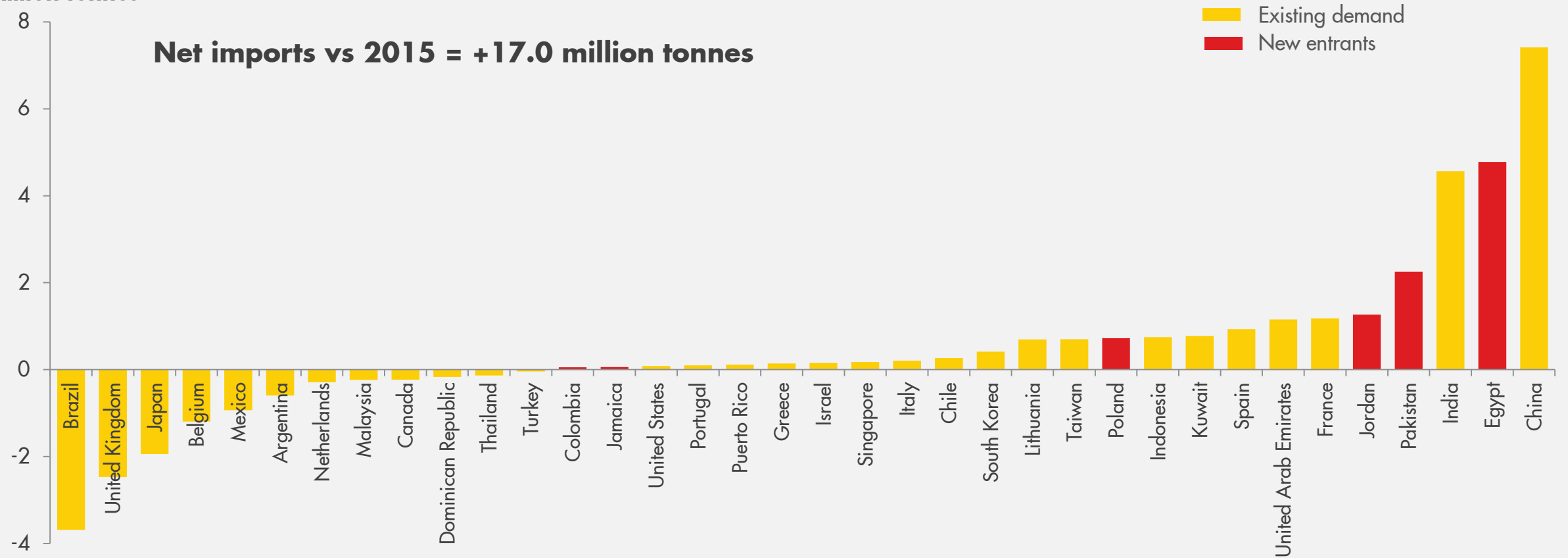
Note: only includes projects online by 2016 or currently under construction



# 2016 import growth dominated by China, India & new entrants

Million tonnes

Net imports vs 2015 = +17.0 million tonnes

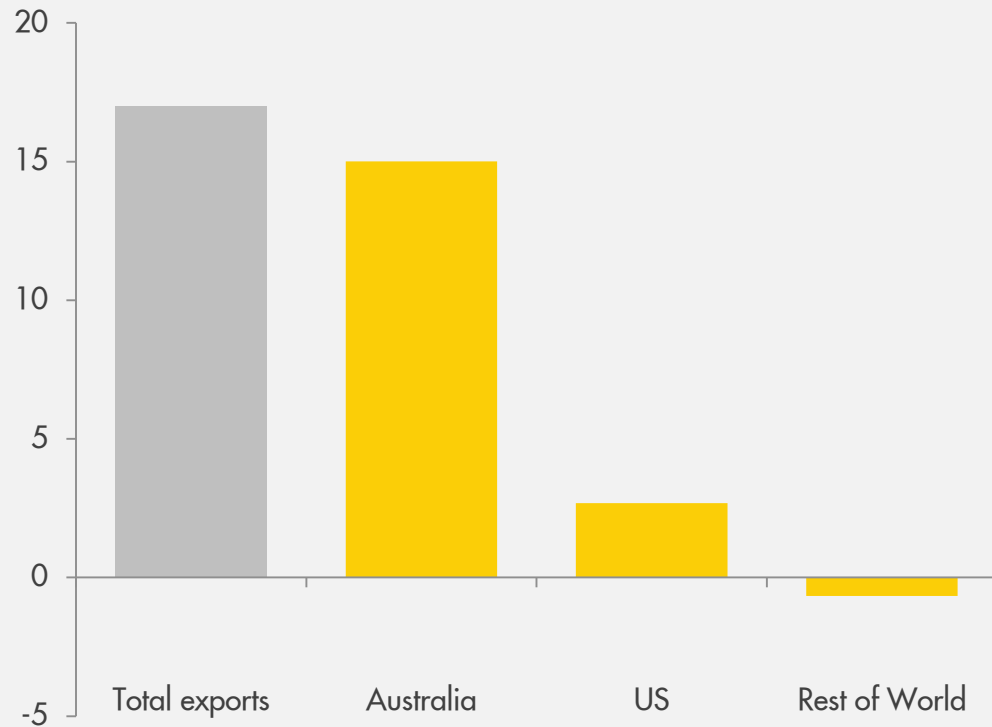


Source: Shell interpretation of IHS (LNG Waterborne Trade) data, delivered volumes; red denotes new entrants (2015-2016)

# Growth in LNG demand absorbed increase in supply

## Net exports: 2016 YoY

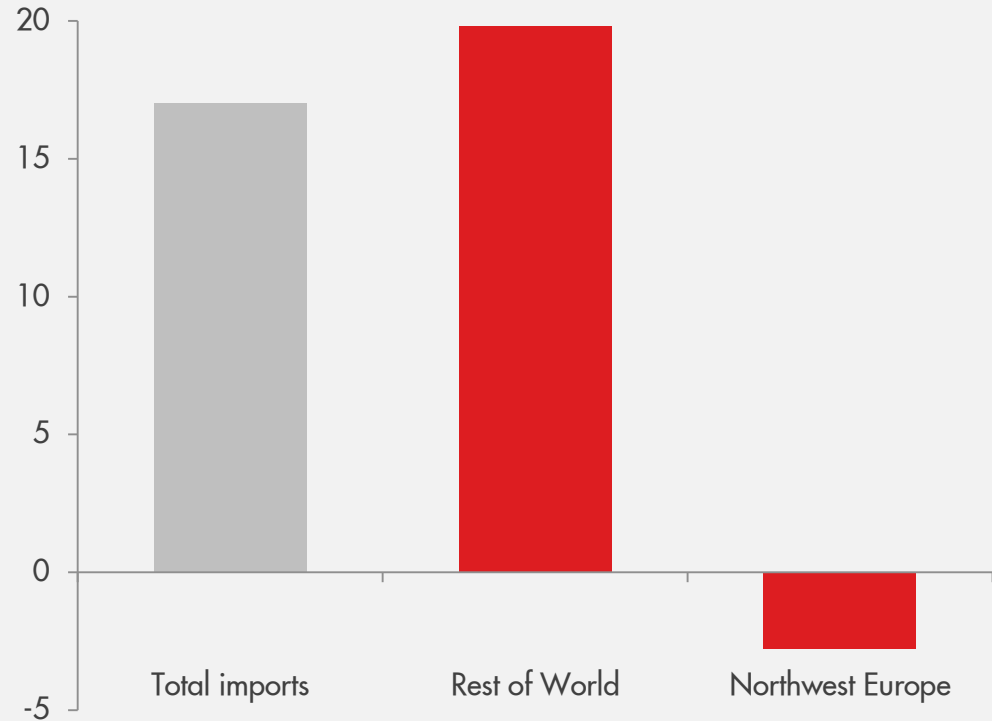
Million tonnes



Source: Shell interpretation of IHS data, delivered volumes

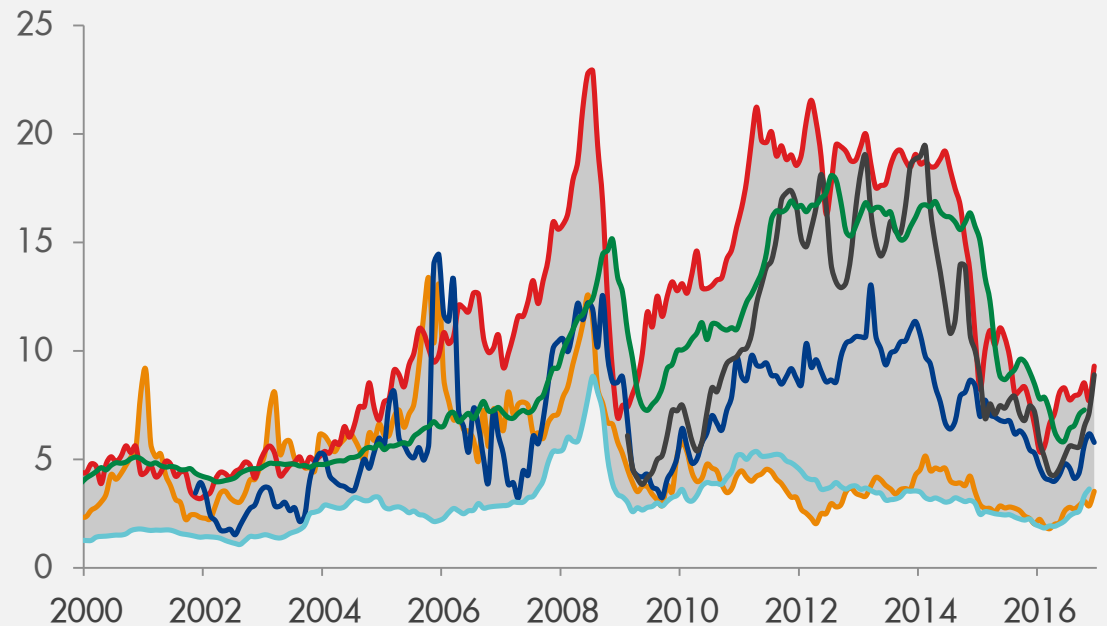
## Net imports: 2016 YoY

Million tonnes



# Robust spot prices reflect the market's ability to absorb new supply

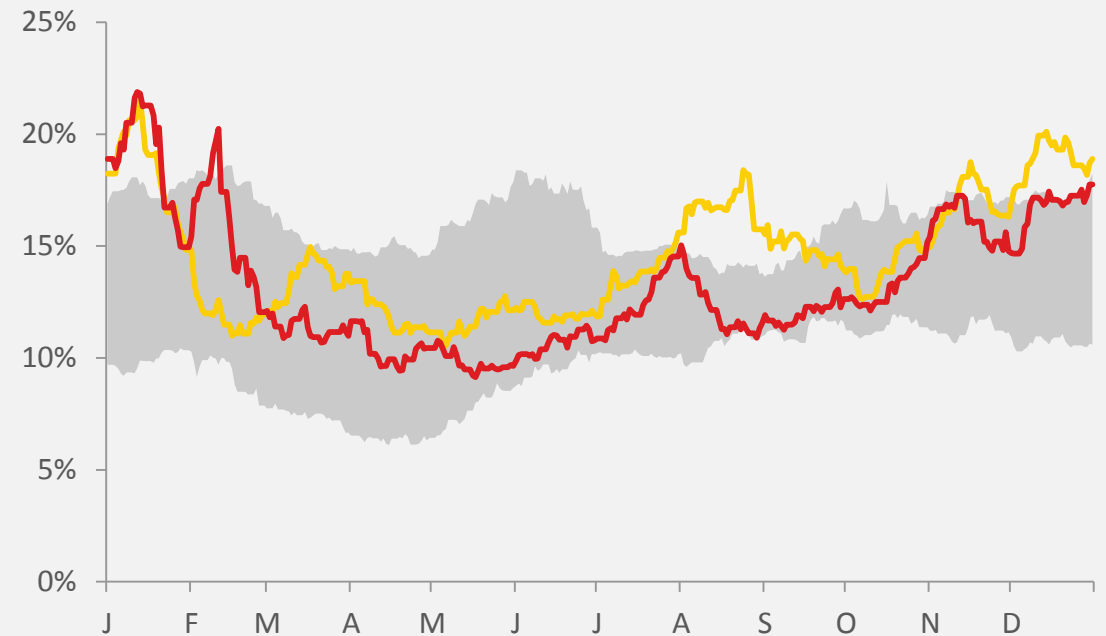
## Global LNG prices (\$/MMBTU)



Energy price range
  Henry Hub
  Brent
  NBP
  JKM (Platts)
  Japan LNG Import
  Coal (ARA)

Source: Japanese customs data (Japan LNG import), Platts (JKM), ICE (NBP, Brent, ARA coal), NYMEX (Henry Hub)

## Asia spot (JKM as % Brent)

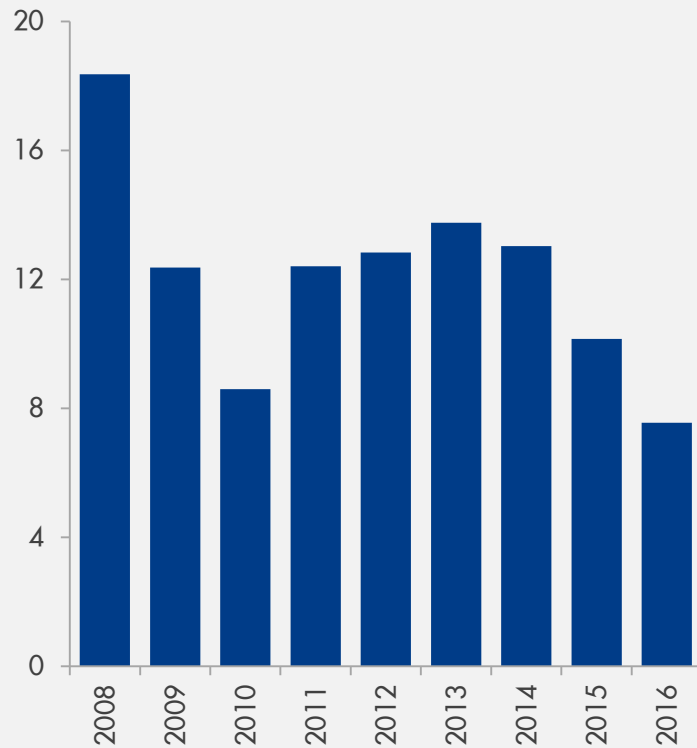


Range 2010-2014
  2015
  2016



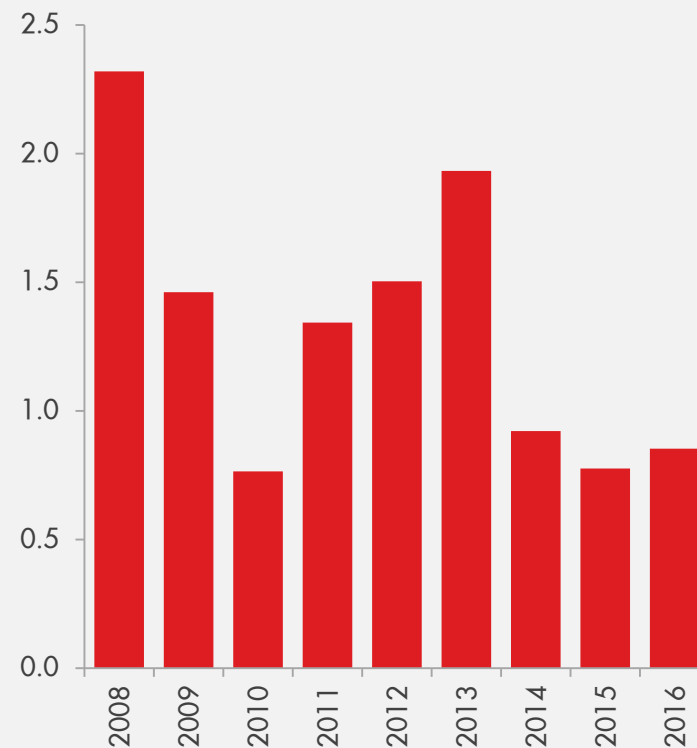
# Trend to shorter and smaller contracts with emerging buyers

## Average contract length, years

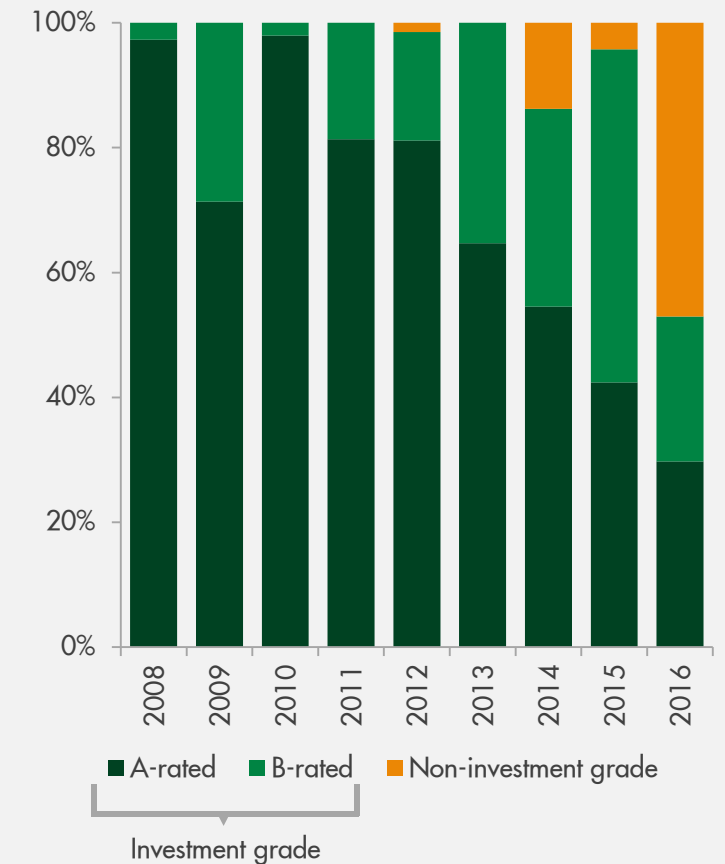


Source: Shell interpretation of IHS (Energy LNG Sales Contracts Database), Moody's and Fitch data

## Average contract volume, MTPA

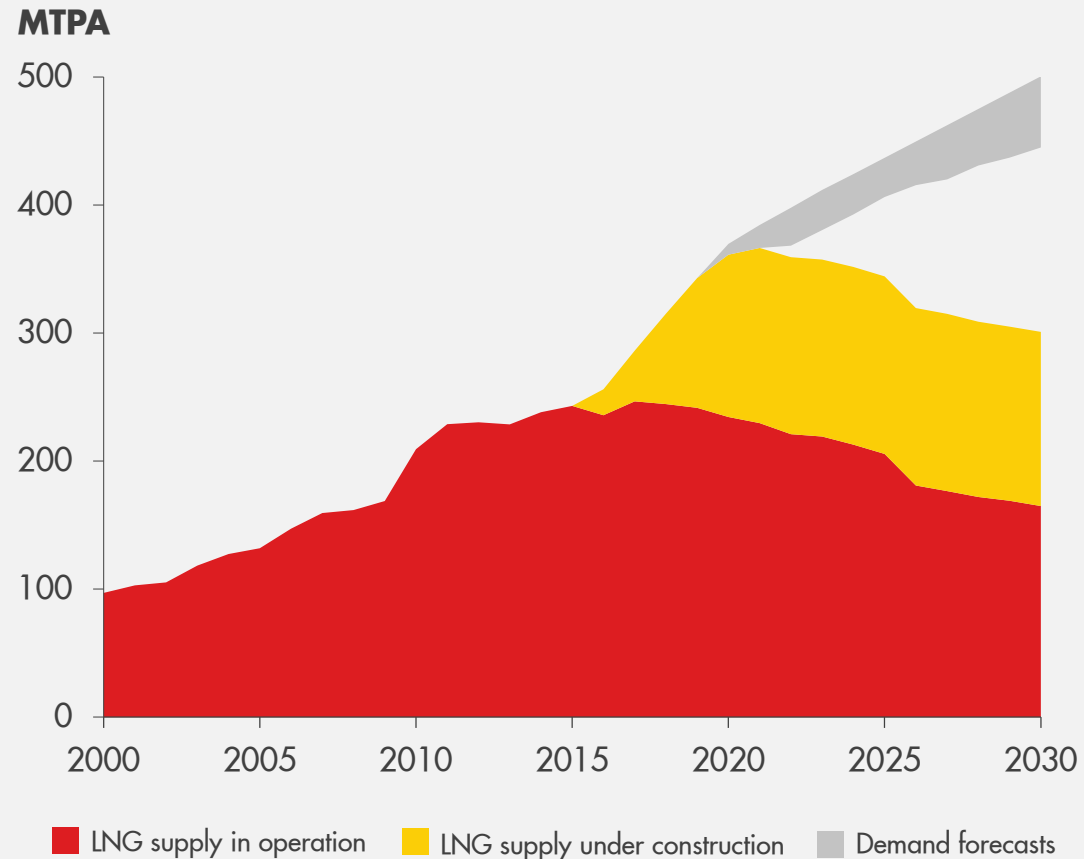


## LNG buyer credit ratings

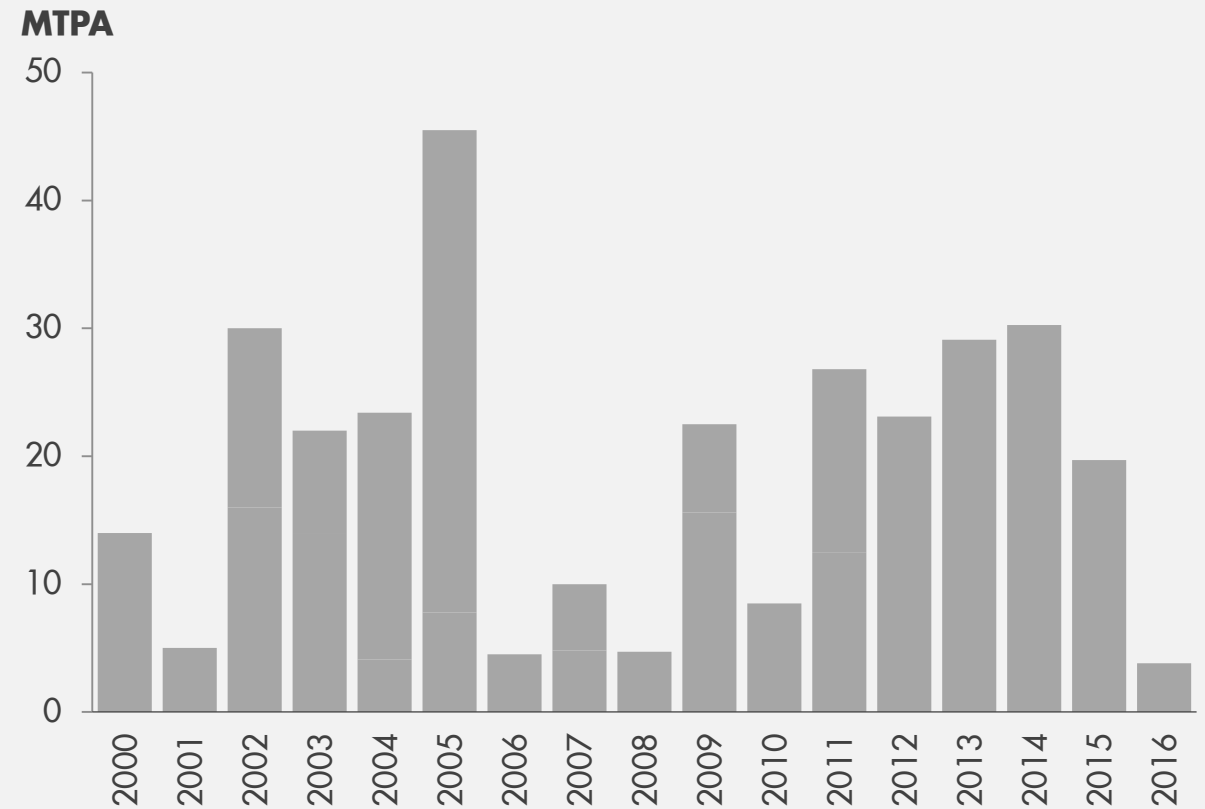


# New FIDs required to meet demand growth after 2020

## LNG supply/demand gap

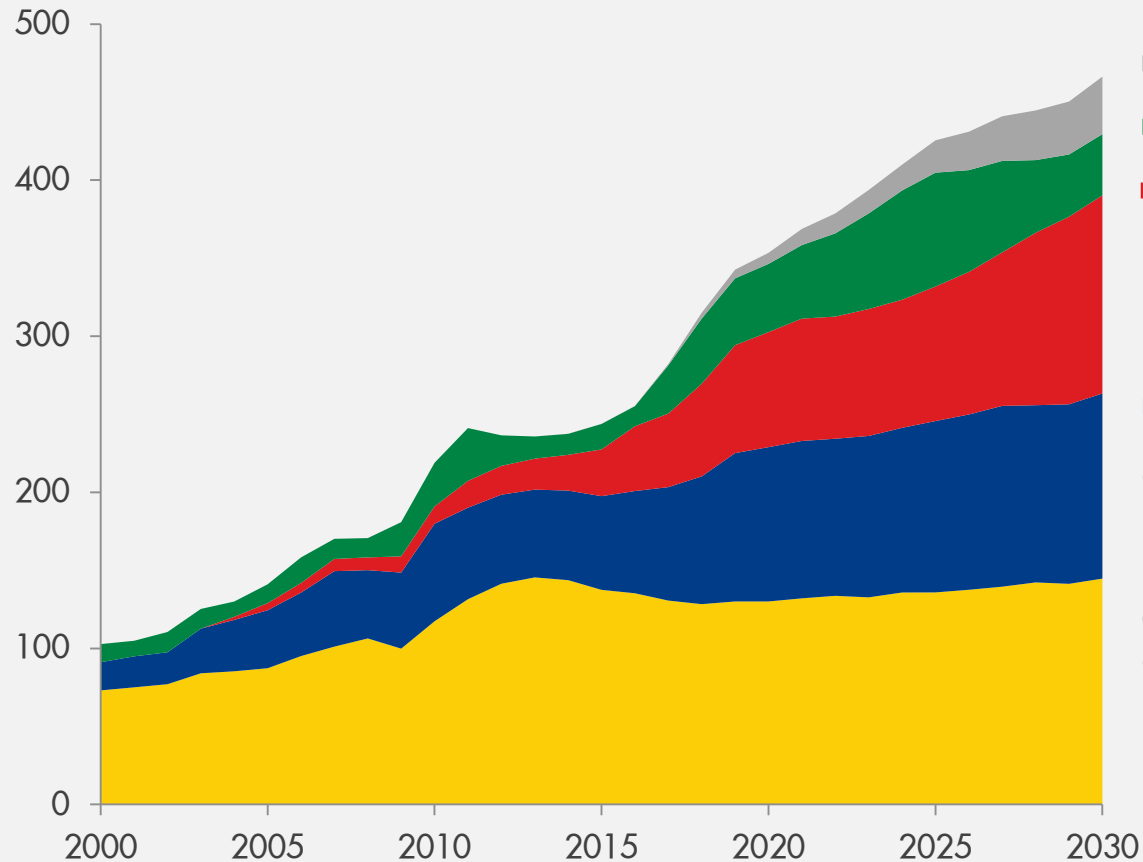


## Overview of LNG FIDs



# Changing drivers of LNG demand growth

LNG imports by role in meeting gas demand (MTPA)



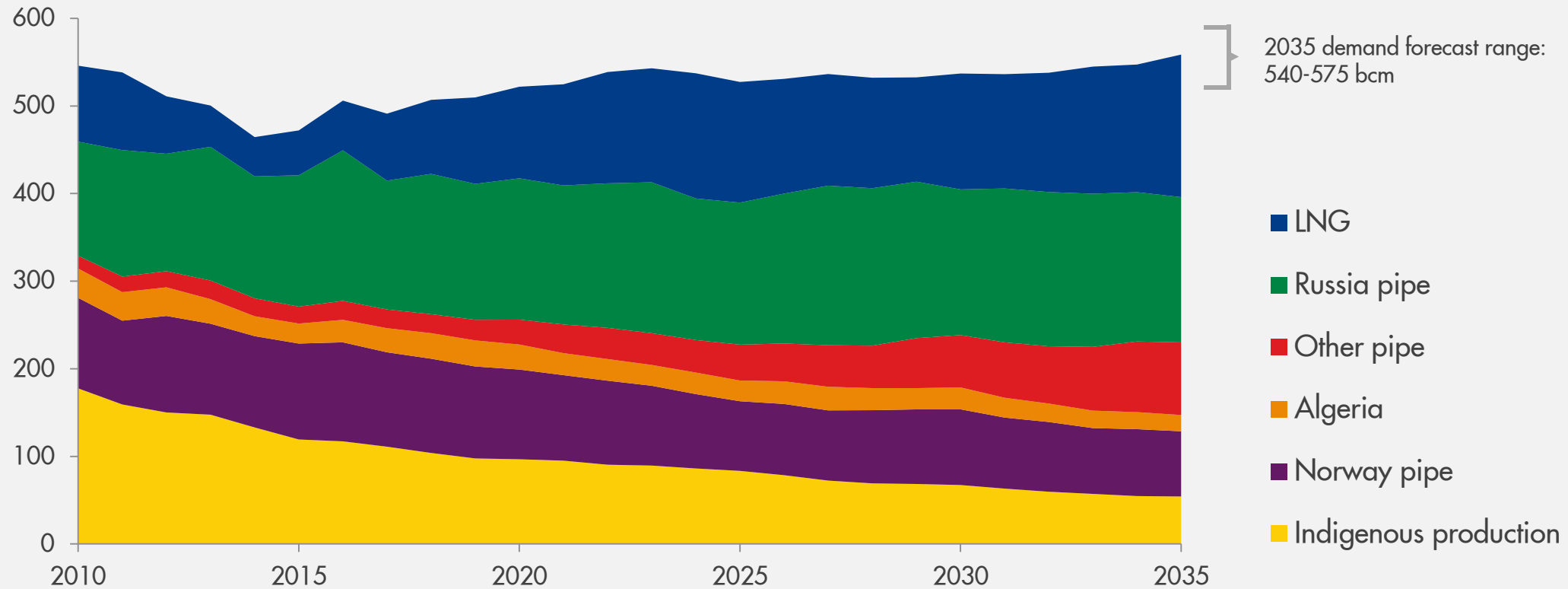
LNG demand driver	Countries/regions
Bunker fuel	<ul style="list-style-type: none"> <li>■ Atlantic</li> <li>■ Middle East</li> <li>■ Pacific</li> </ul>
Balances LNG supply	<ul style="list-style-type: none"> <li>■ Northwest Europe</li> </ul>
LNG replaces declining domestic production into existing demand	<ul style="list-style-type: none"> <li>■ India</li> <li>■ Thailand</li> <li>■ Indonesia</li> <li>■ Malaysia</li> <li>■ Pakistan*</li> <li>■ Egypt*</li> <li>■ Kuwait</li> <li>■ UAE</li> <li>■ Colombia*</li> <li>■ Bangladesh*</li> <li>■ Bahrain*</li> <li>■ Philippines*</li> <li>■ Vietnam*</li> </ul>
LNG complements domestic and pipeline supply	<ul style="list-style-type: none"> <li>■ Southern Cone</li> <li>■ Eastern Europe</li> <li>■ Southern Europe</li> <li>■ North America</li> <li>■ China</li> <li>■ Singapore</li> <li>■ Morocco*</li> <li>■ Jordan*</li> <li>■ Israel</li> </ul>
Gas supply solely dependent on LNG	<ul style="list-style-type: none"> <li>■ Japan</li> <li>■ Korea</li> <li>■ Taiwan</li> <li>■ Puerto Rico</li> <li>■ Dominican Republic</li> <li>■ Jamaica*</li> <li>■ Panama*</li> </ul>

Source: Shell interpretation of Wood Mackenzie Q4 2016 data  
 \* Denotes new or emerging LNG importing countries



# LNG to take larger share of European gas demand

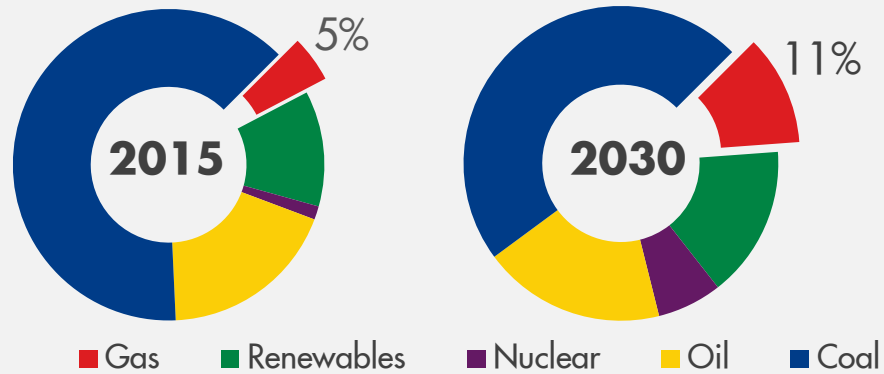
## European gas supply (bcm)



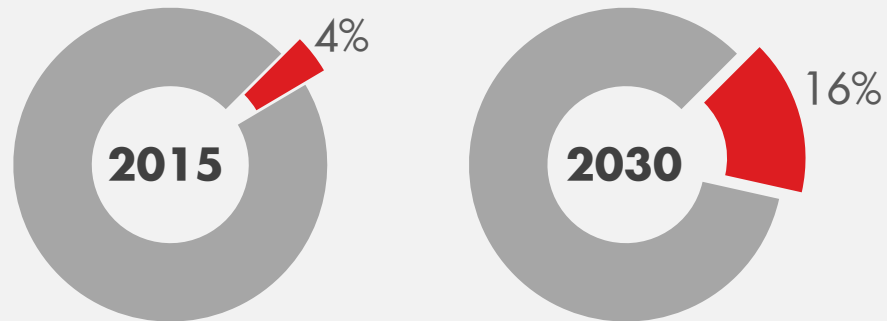
Source: Shell interpretation of Wood Mackenzie Q4 2016, IHS, and Eurogas data

# Policy and macroeconomics driving gas demand growth in China

## China total primary energy demand

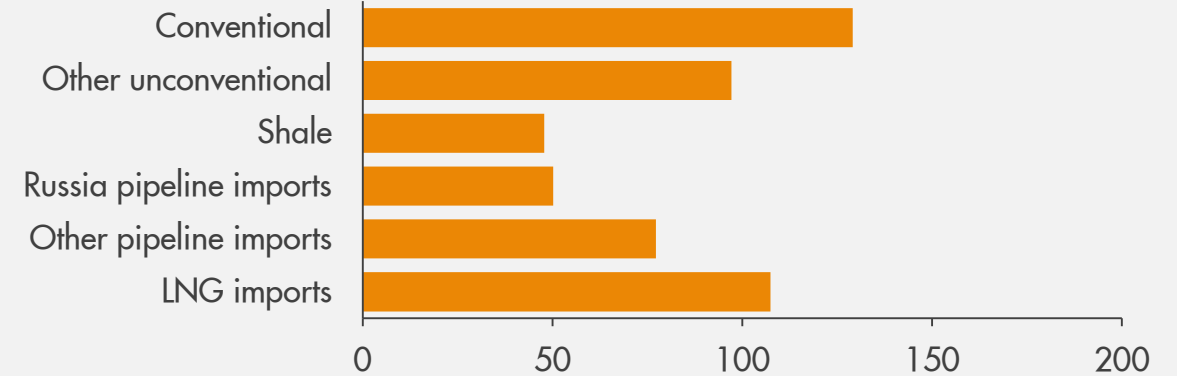


## China's share of global LNG demand

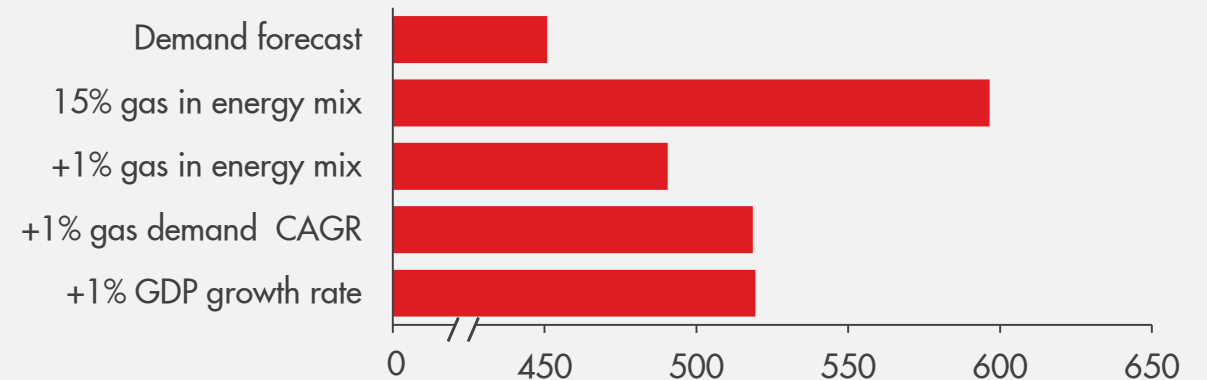


Source: Shell interpretation of Wood Mackenzie Q4 2016 data

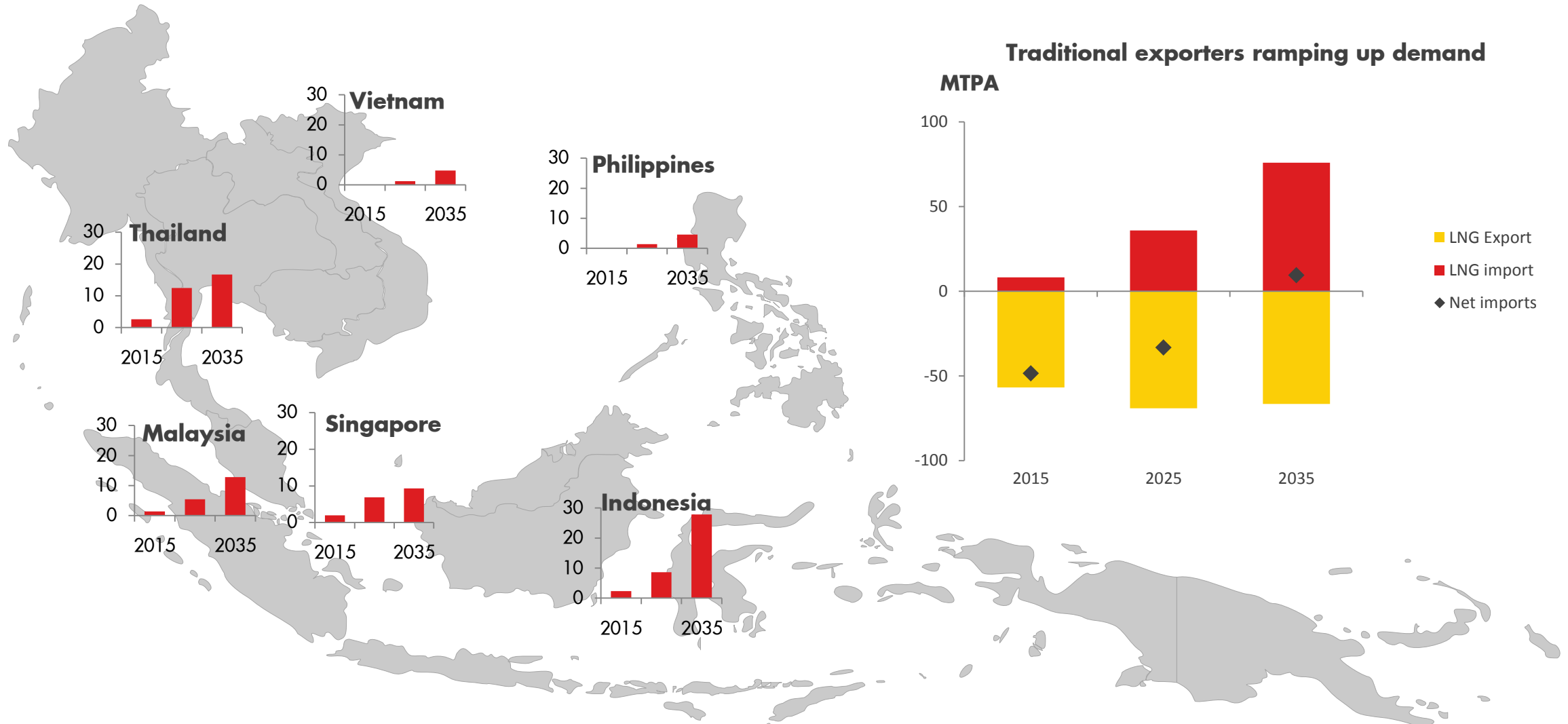
## Gas supply by source 2030, bcm



## Gas demand potential 2030, bcm



# Southeast Asia to become net LNG importer by 2035

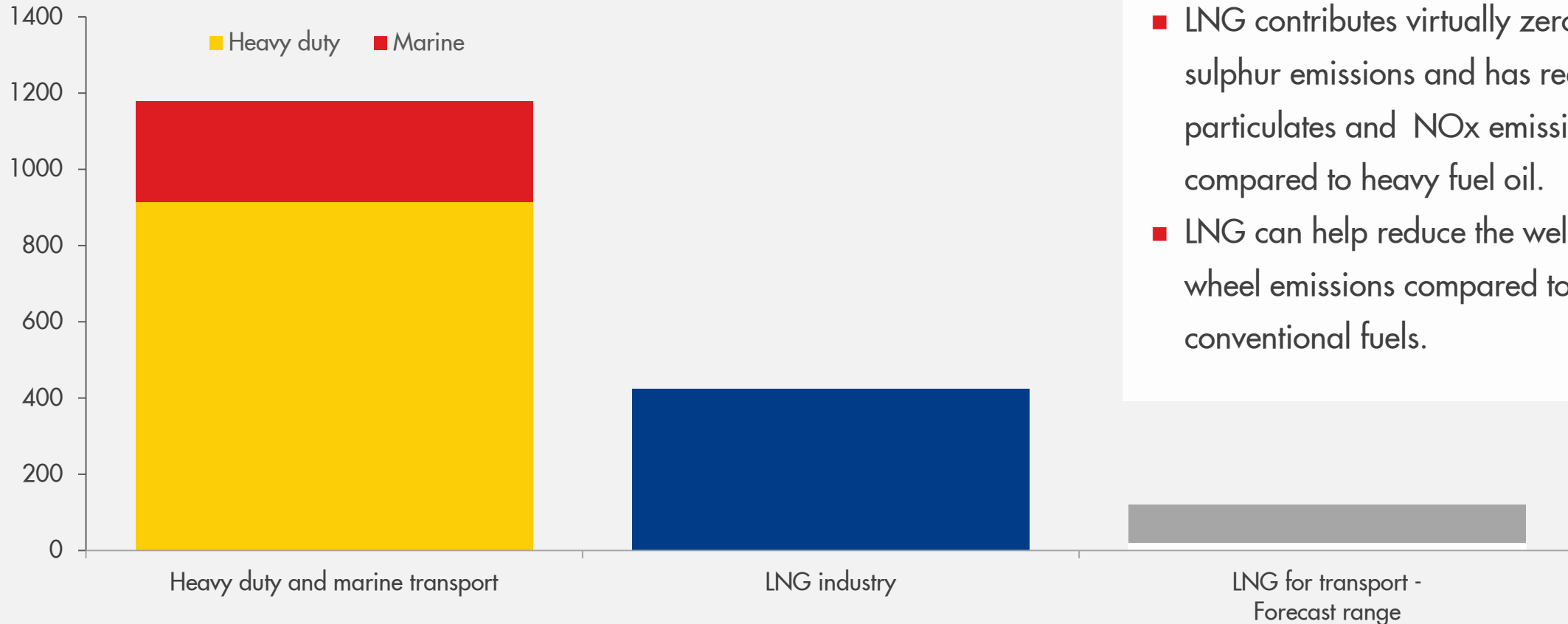


Source: Shell interpretation of Wood Mackenzie Q4 2016 data  
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# Potential demand upside from transport sector

## MTPA equivalent, 2025



- LNG contributes virtually zero sulphur emissions and has reduced particulates and NOx emissions, compared to heavy fuel oil.
- LNG can help reduce the well-to-wheel emissions compared to conventional fuels.

Source: Shell interpretation of Wood Mackenzie and IHS

# Summary

- Strong growth in LNG supply in 2016, one-third of new supply online
- LNG demand growth from China, India and new entrants absorbed supply growth in 2016
- Continued LNG supply growth to 2020
- Global demand for gas is expected to increase by 2% a year between 2015 and 2030; LNG is set to rise at twice that rate at 4 to 5%
- Future LNG demand growth will be driven by: policy, floating storage regasification units, replacing declining domestic gas production, small scale LNG and transport
- LNG and Russian gas imports required to balance European gas demand
- New investments required to meet growing LNG demand after 2020
- LNG trade is changing to meet the evolving needs of buyers, including shorter-term and lower-volume contracts

