



Shell LNG Outlook 2021

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01

Gas and LNG have a key role to play in a decarbonising world

2020 saw new net-zero emissions (NZE) announcements at both national and regional levels. Natural gas can help lower overall emissions, whether in partnership with renewables to deliver a reliable energy choice or to power hard-to-electrify sectors. 65% of the growth in natural gas use in the next twenty years is expected to come from non-power sectors. LNG is expected to be the fastest growing source of natural gas.



02

LNG shows its resilience and flexibility in 2020

While COVID-19 derailed expected forecasts, LNG demand still grew with trade reaching 360 million tonnes in 2020. The industry reacted swiftly to changing market conditions, diverting cargoes to shifting demand centres and through adjusting supply. Prices remained volatile, hitting a record low before rebounding to record high in early 2021. New LNG supply investment decisions ground to a halt due to the pandemic-driven economic crisis.



03

Complementary spot and term contract structures and cleaner pathways to drive LNG growth

LNG demand is expected to grow steadily with a supply-demand gap estimated to emerge in the middle of the current decade. With an increasing number of buyers and suppliers, the industry has evolved to offer a wider choice of commercial structures to meet changing needs. Against a backdrop of increasing NZE targets, the industry will need to further innovate to offer cleaner energy supply.

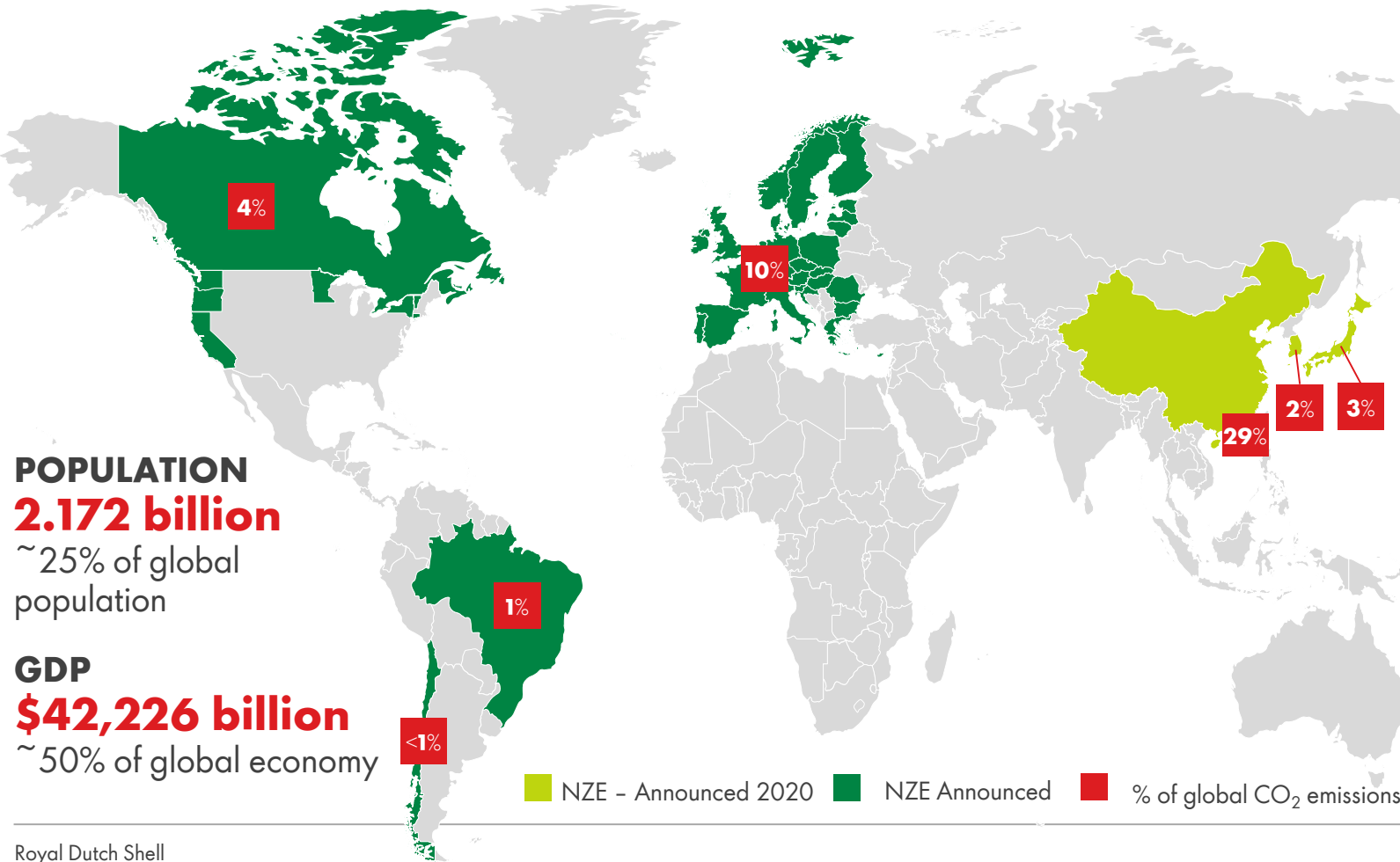
01

Gas and LNG have a key role to play in a decarbonising world

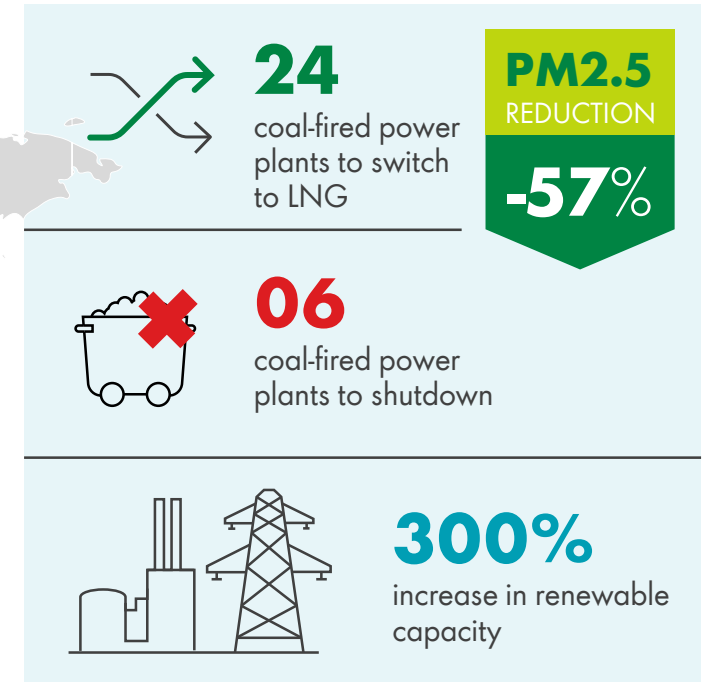


Three of the ten highest CO₂ emitting countries announce net-zero emissions (NZE) targets during 2020

NZE announcements globally



South Korea 2030's energy outlook

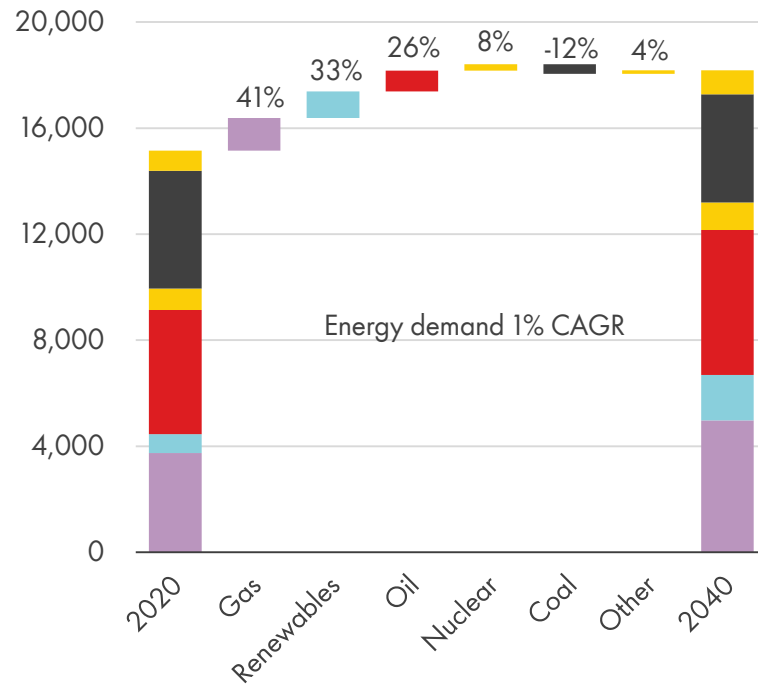


Source: Shell interpretation of Global Carbon Atlas, National Policy announcements, UNFCCC, Climate Action Tracker, World Bank, CDP and US Bureau of Economic Analysis and Ministry of Trade Industry and Energy South Korea 2019 and 2020 data

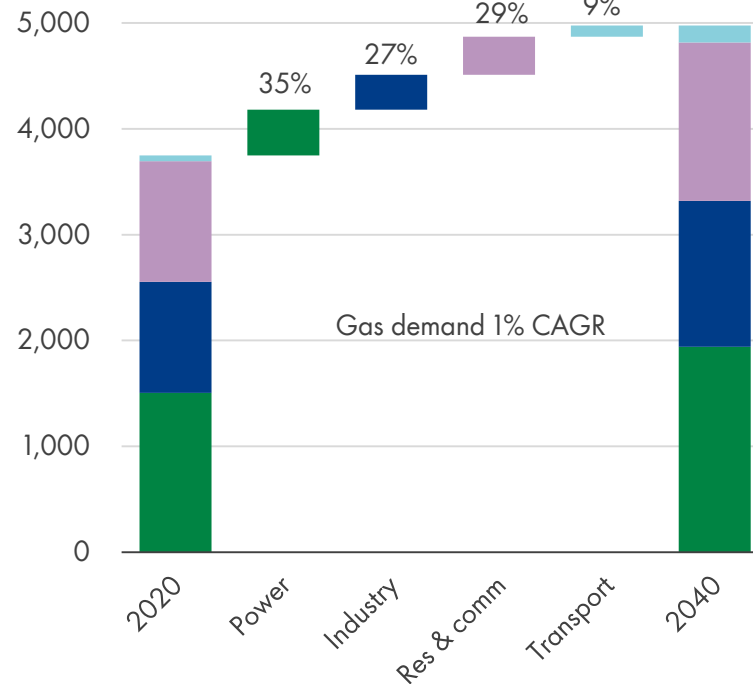
PM2.5: Particulate Matter 2.5 micrometres
Europe is EU 27+3, (Norway, Switzerland, UK)

Gas demand projected to grow and play a key role in decarbonising sectors

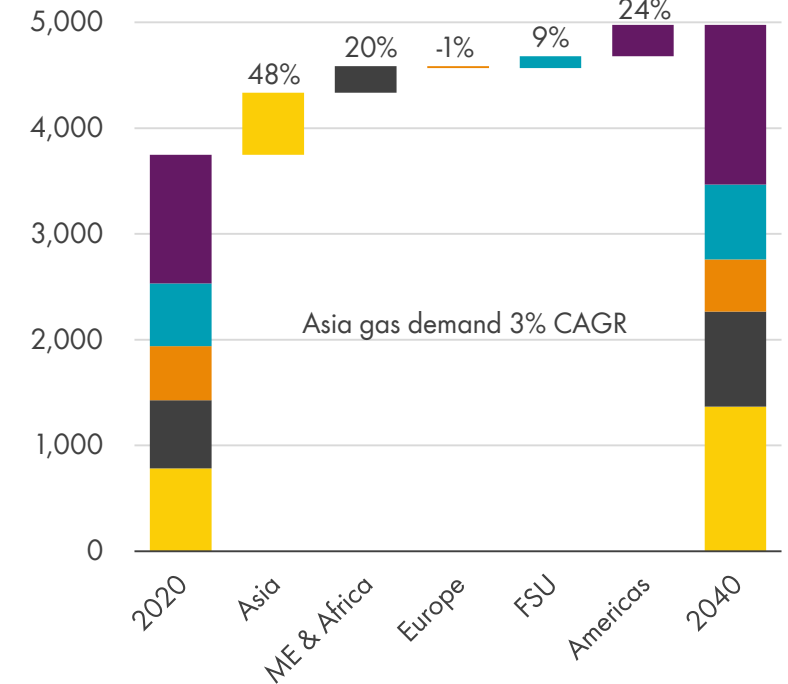
Global energy demand growth by fuel type
BCM



Global gas demand growth by sector
BCM



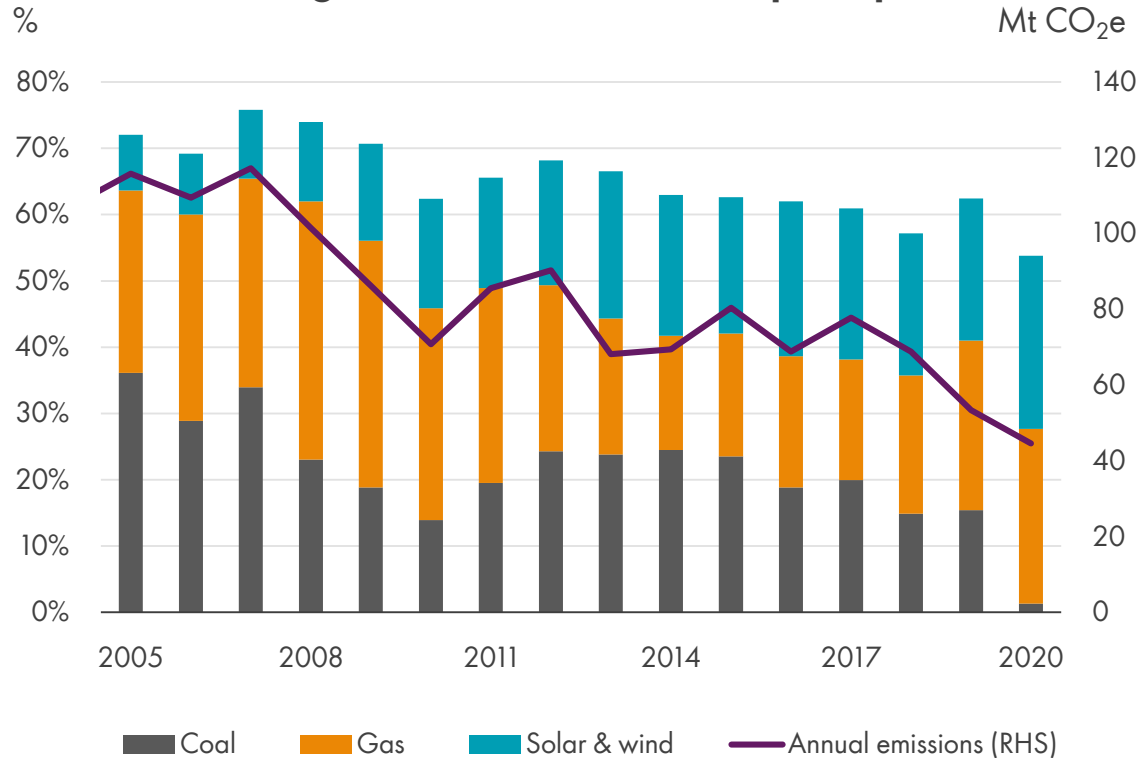
Global gas demand growth by region
BCM



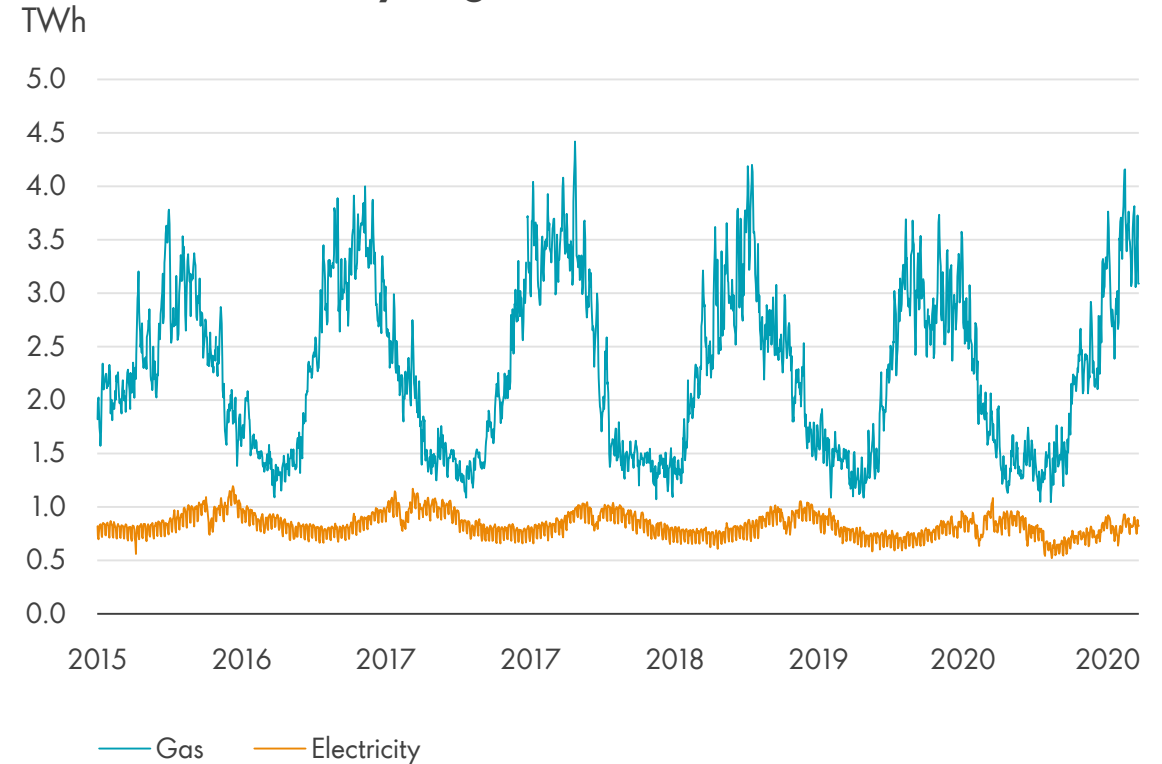
Source: Shell interpretation of Wood Mackenzie H1 2020 data
CAGR - Compound annual growth rate Res & comm: Residential and Commercial

Gas is a reliable partner to renewable power and provides flexibility to meet seasonal heating demand

Share of coal, gas & renewables in Spain power sector



UK total electricity & gas demand



Source: Shell interpretation of Wood Mackenzie, IEA, Aurora Energy Research, National Grid, Grid Watch UK 2021 and Sustainable Gas Institute White Paper 5 2020 data

Gas enables reduction of industrial emissions

Iron and steel sector benefitting from coal-to-gas switching

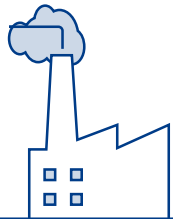
Benefits of using gas in the iron & steel sector



-36%
EMISSIONS

Coal-to-gas switching

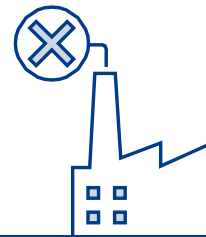
36% CO₂ emissions saving through the use of natural gas, hydrogen and LNG for direct reduced iron (DRI) steel production



-85% -90%
EMISSIONS

Carbon capture & storage

85-90% CO₂ emissions saving

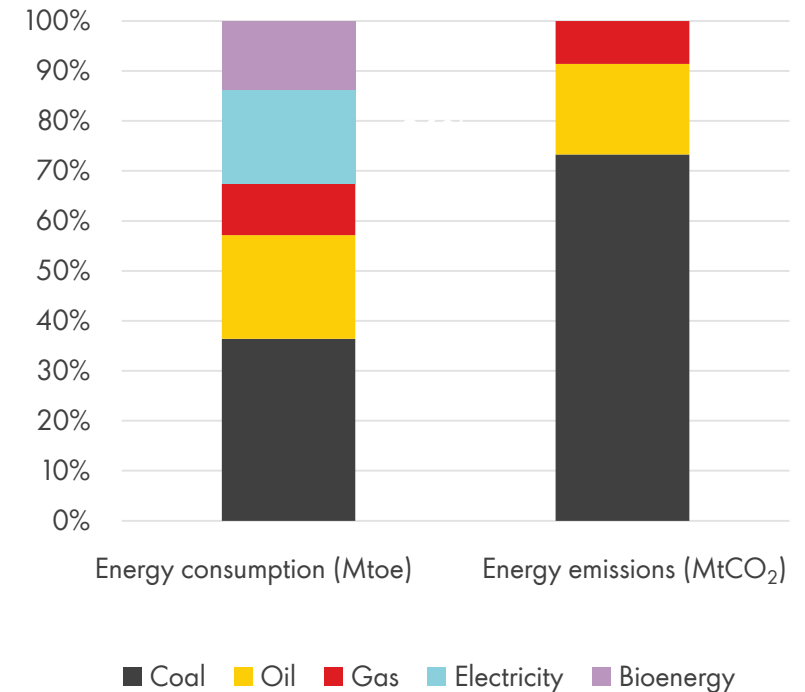


-100%
EMISSIONS

Biogas & BECCS

86% CO₂ emissions reduction using electric arc furnace (EAF)*
Potentially negative when using biogas / bioenergy + CCS

2020 industrial energy use and emissions in India



Source: Shell interpretation of IEA ETP, Wood Mackenzie, worldsteel data 2020 data

* If electricity is sourced from renewable generation BECCS: Bioenergy carbon capture & storage Mtoe: Million tonnes of oil equivalent MTCO₂: Million tonnes CO₂

Uptake of gas in the road transport sector

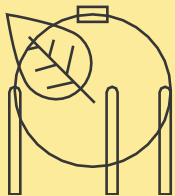
Demand increasing as number of LNG-fuelled vehicles increase



In 2020, China's road transport sector consumed nearly **13 million tonnes of LNG**



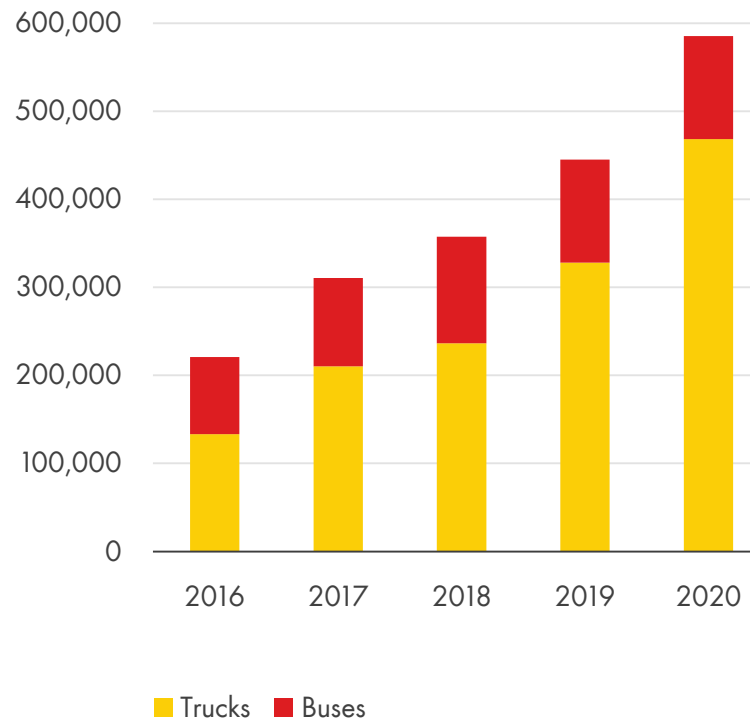
3,000+ LNG stations in China
300+ in 21 countries across Europe



7.9 million tonnes of LNG demand projected for road transport in Europe by 2030
40% of which is expected to be met with bio-LNG

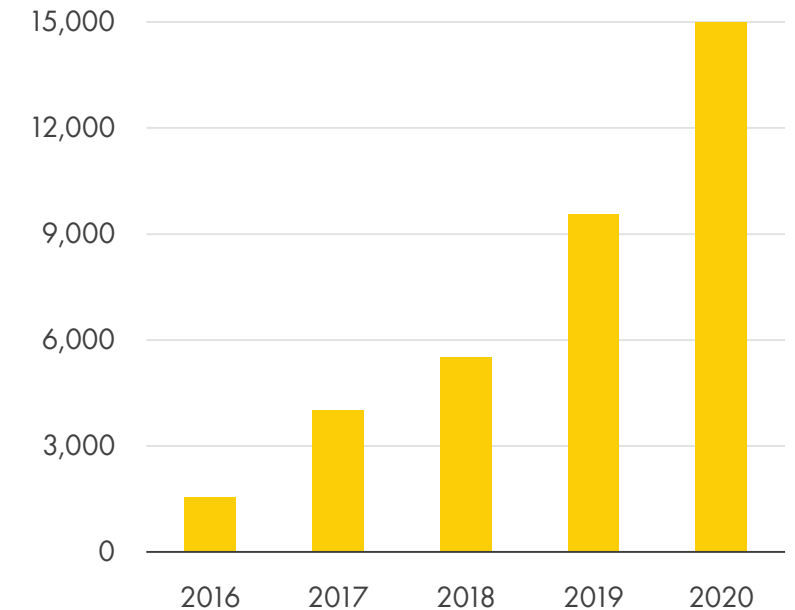
LNG-fuelled trucks & buses (China)

of vehicles



LNG-fuelled trucks (Europe)

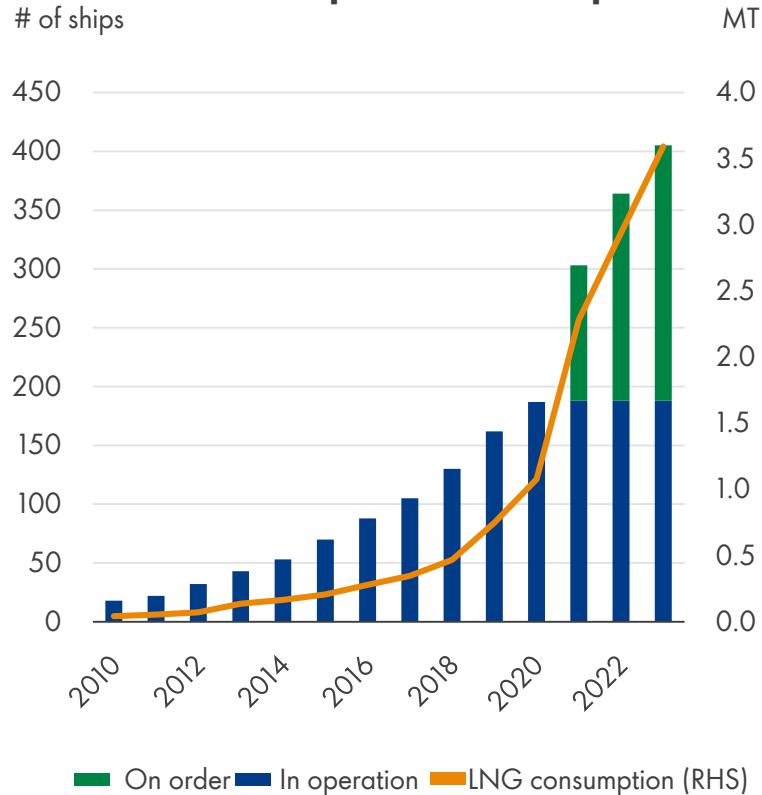
of trucks



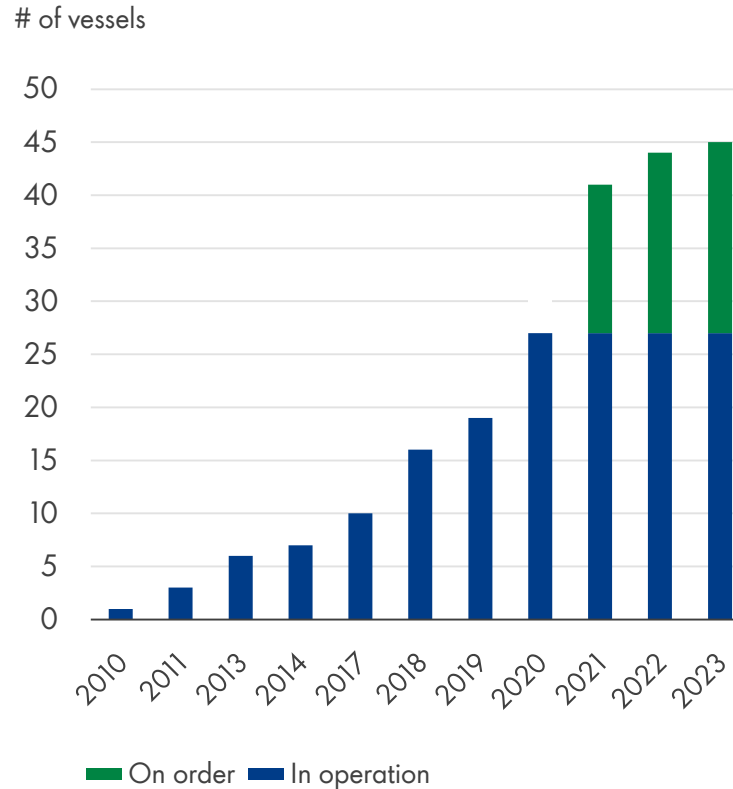
Source: Shell interpretation of NGVA 2020, Less Better, SCI China, CARTAC and other industry 2019 and 2020 data

Marine sector LNG demand grows as global bunkering infrastructure develops rapidly

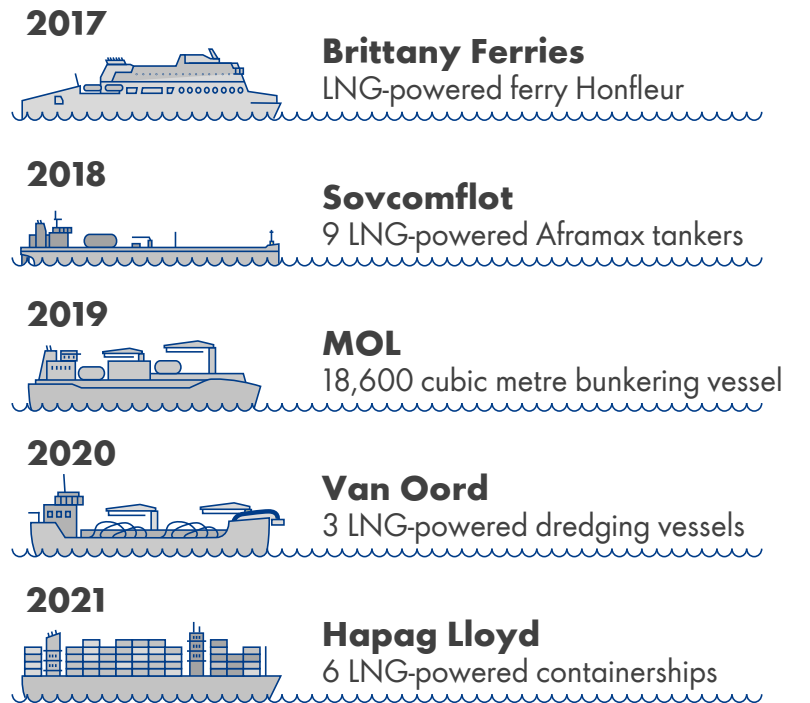
LNG fuelled ships & consumption



LNG bunker vessels



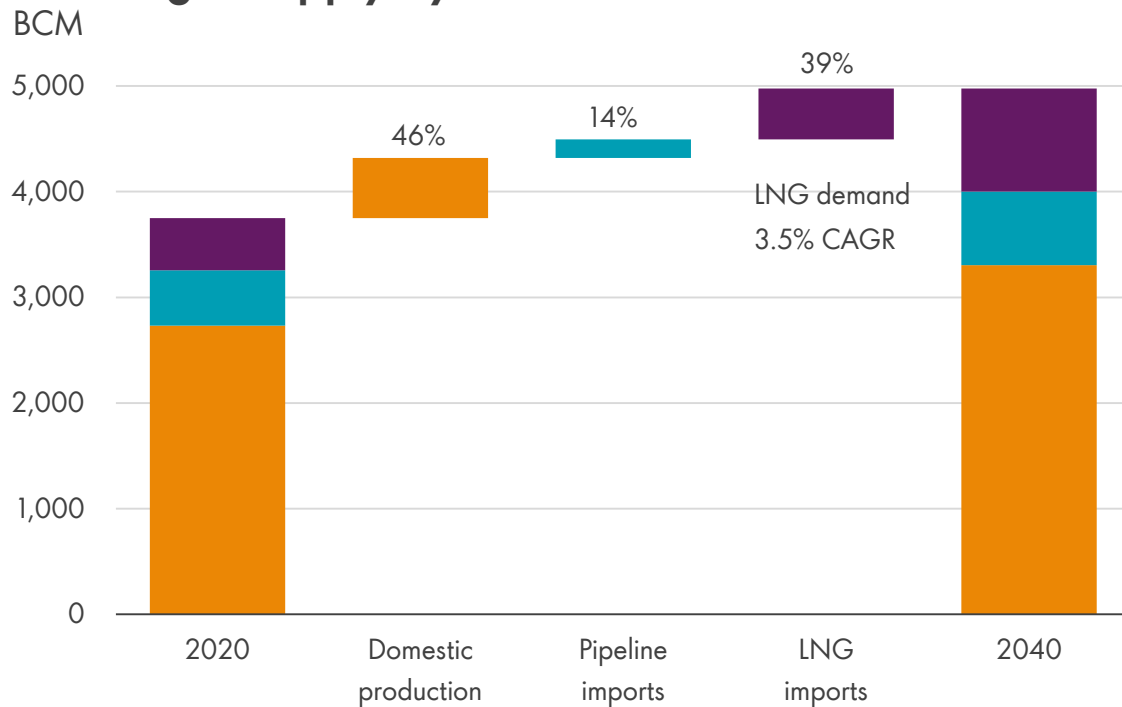
A choice of LNG enabling access to green financing



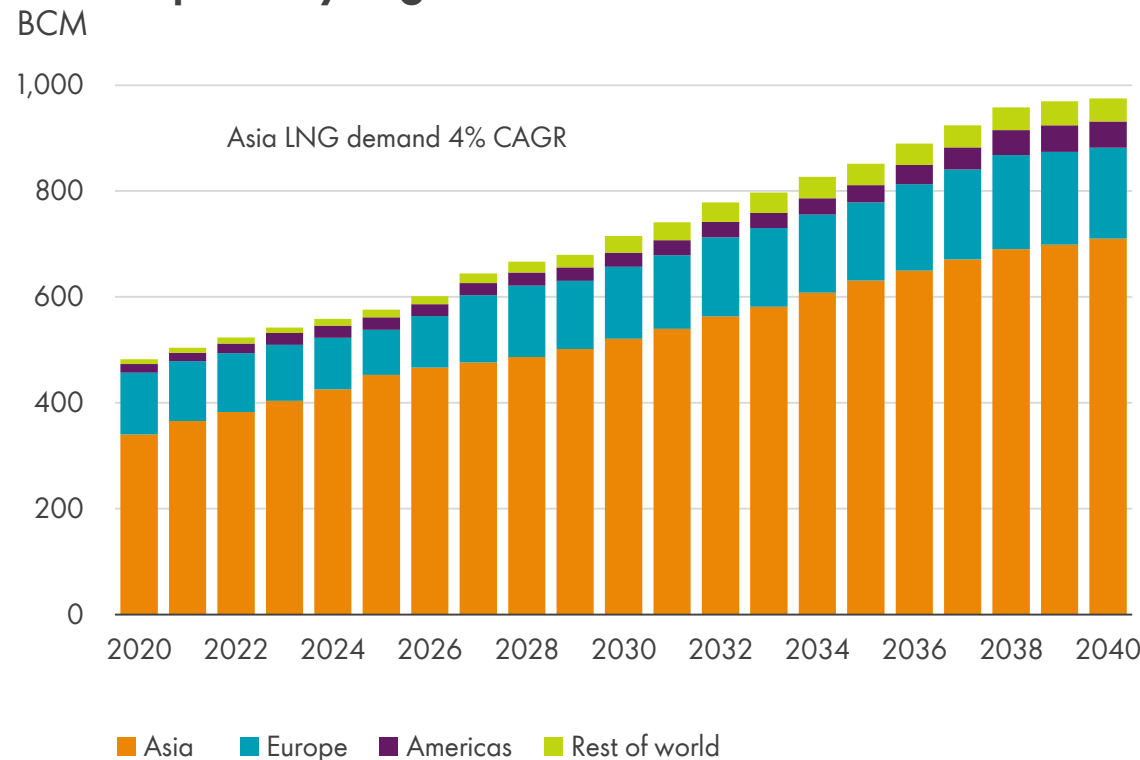
Source: Shell interpretation of DNV GL 2020 data and various news reports

LNG to play a pivotal role in meeting gas demand growth, particularly in Asia

Global gas supply by source



LNG imports by region



Source: Shell interpretation of Wood Mackenzie H1 2020 data CAGR: Compound annual growth rate

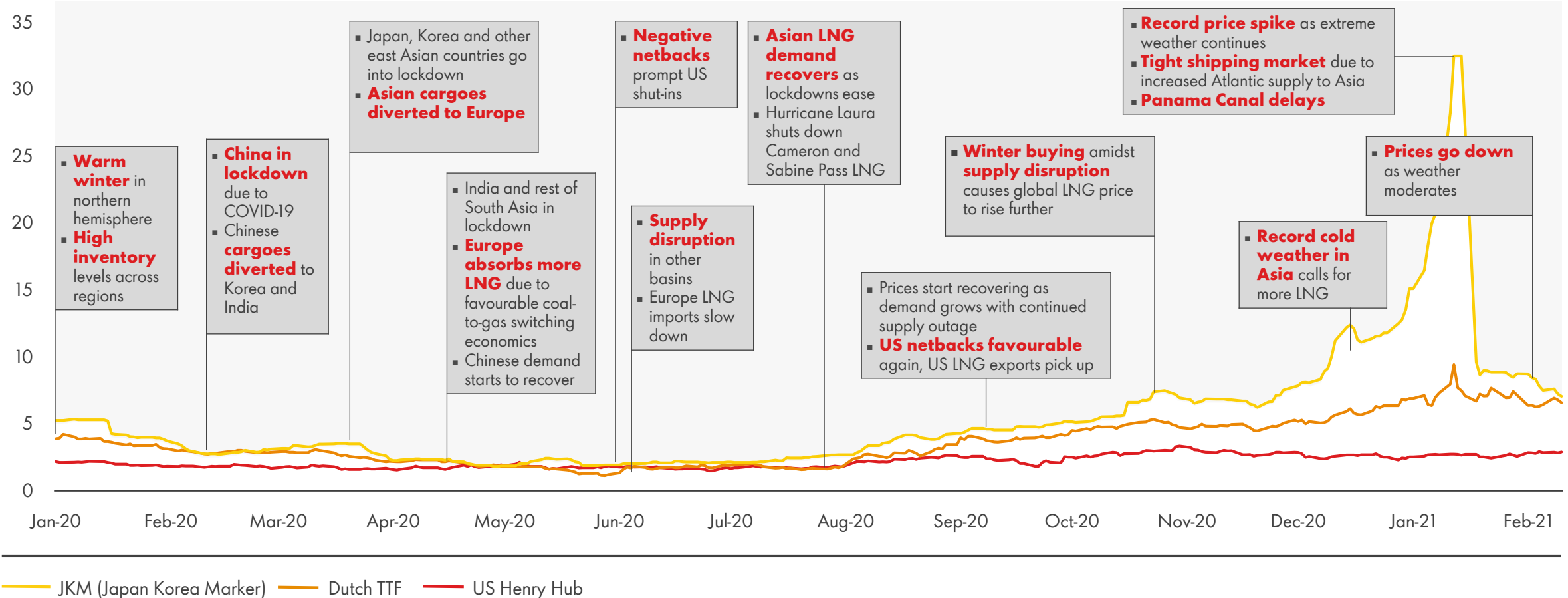


02

LNG shows its resilience and flexibility in 2020

LNG shows resilience and flexibility in a rapidly changing environment

\$/MMBTU

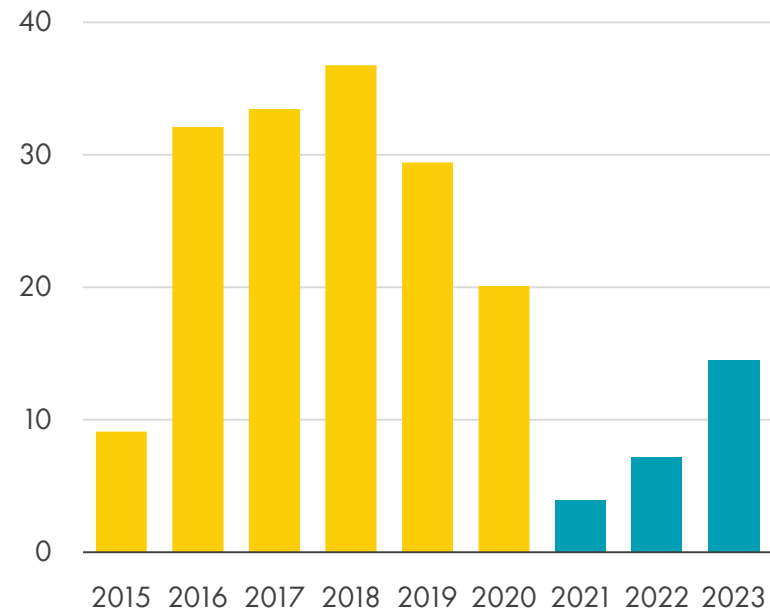


Source: Shell interpretation of ICE, CME, S&P Global Platts 2020 and 2021 data

2020 started with a well-supplied global gas and LNG market

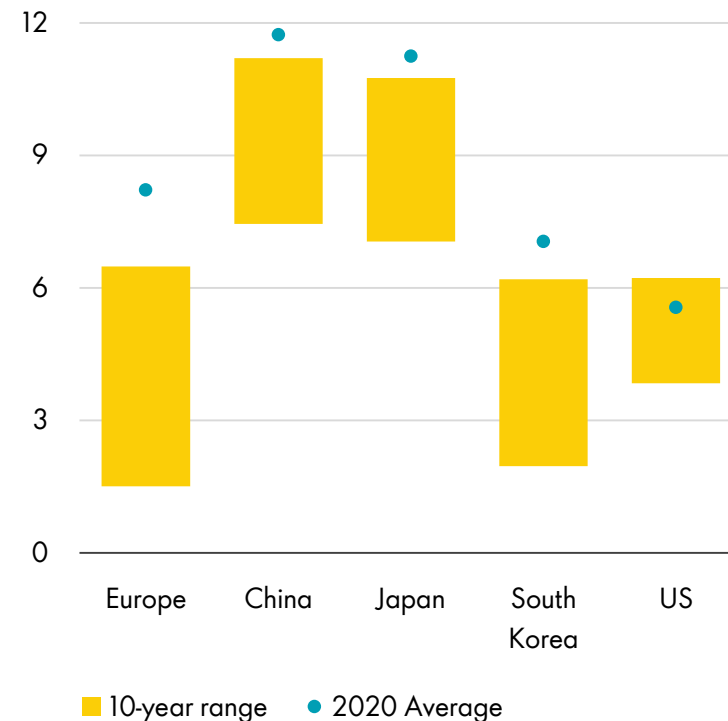
LNG liquefaction capacity additions

MT



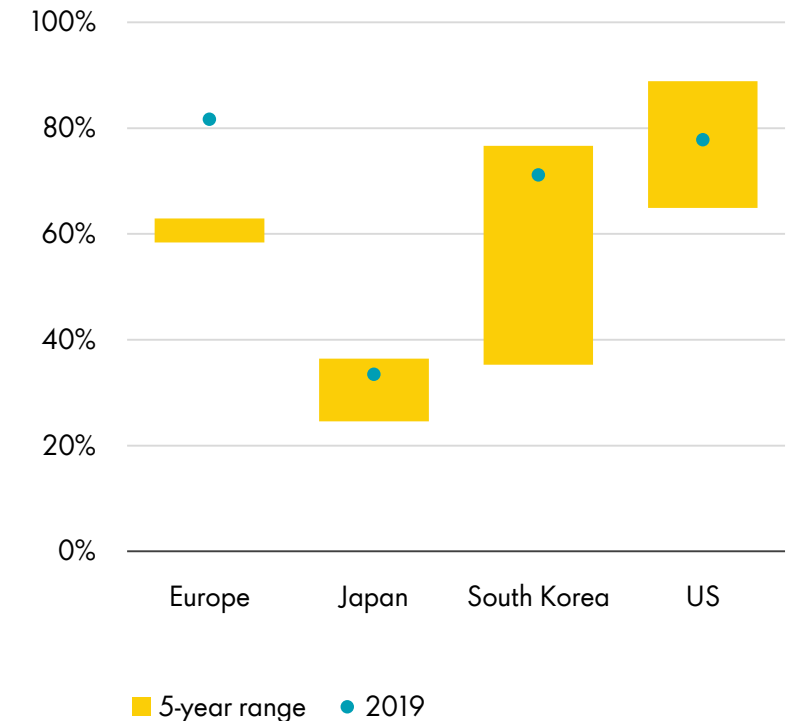
Winter* average temperature

Degrees Celsius



Gas/LNG storage level**

% utilisation



Source: Shell interpretation of IHS Markit, PIRA, AGSI, METI, KESIS and EIA 2020 data

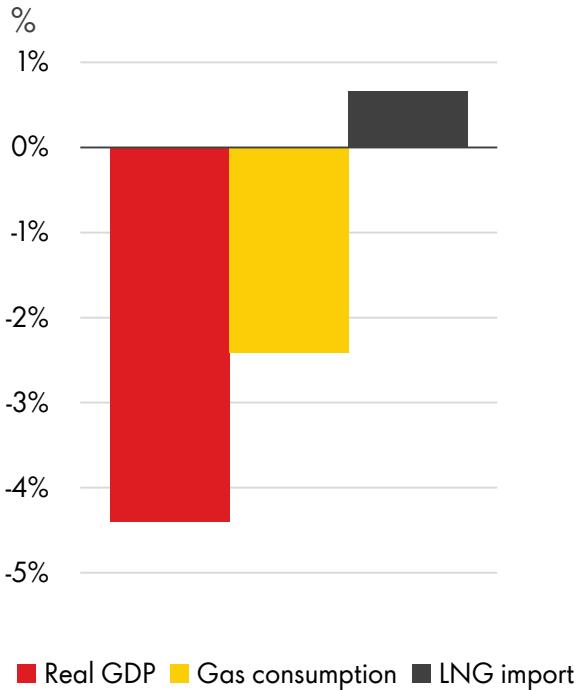
*Winter months are from October through March. 2020 winter average from October 2019 to March 2020

**As of 31st December 2019

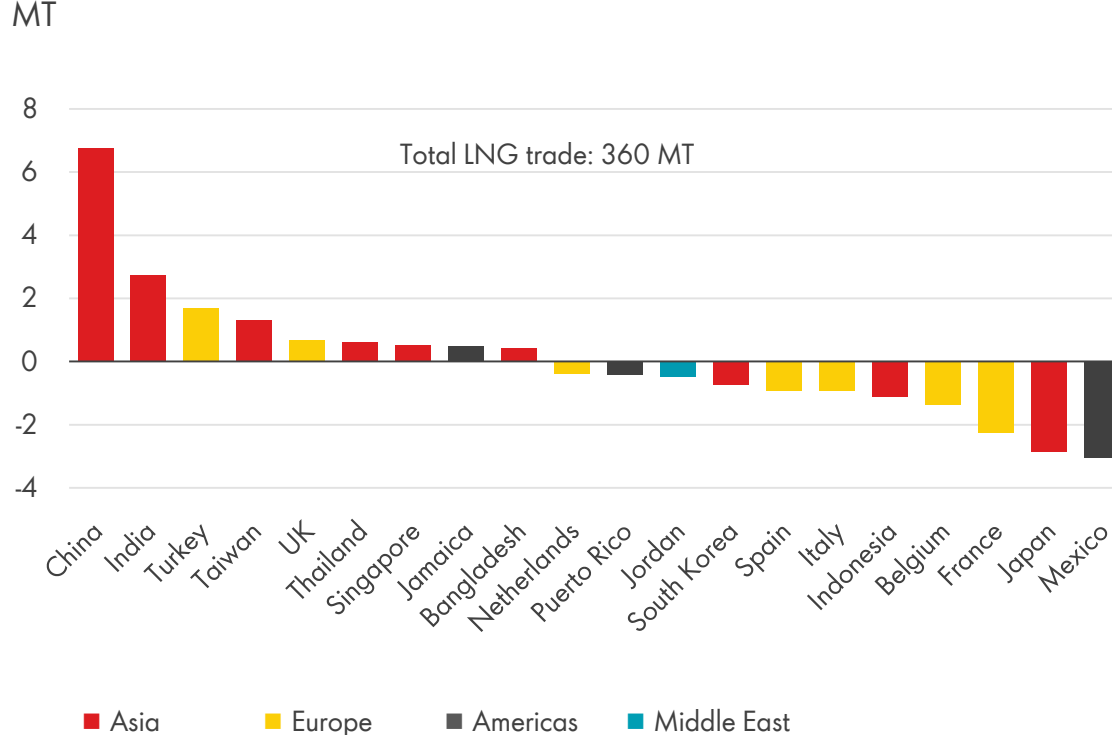
LNG demand continued to grow despite a global pandemic

China and India lead demand recovery

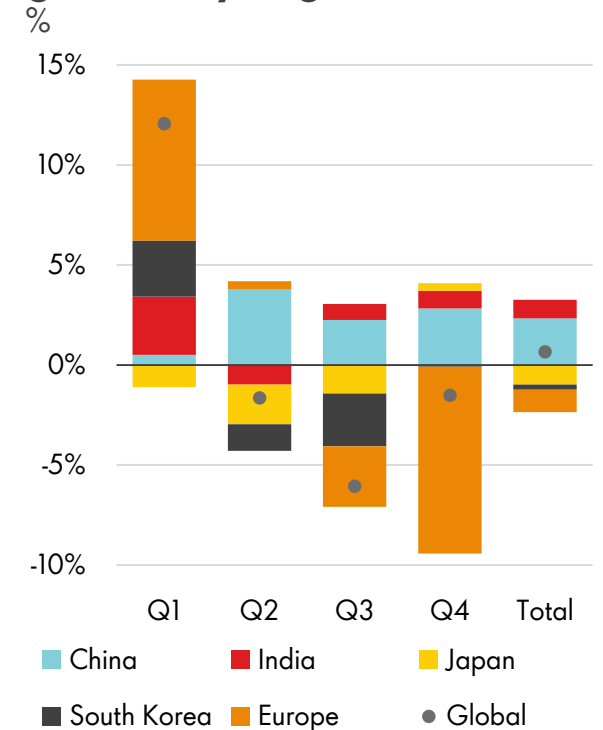
GDP, gas & LNG growth in 2020



Net LNG imports: 2020 y-o-y



2020 share of demand growth by region

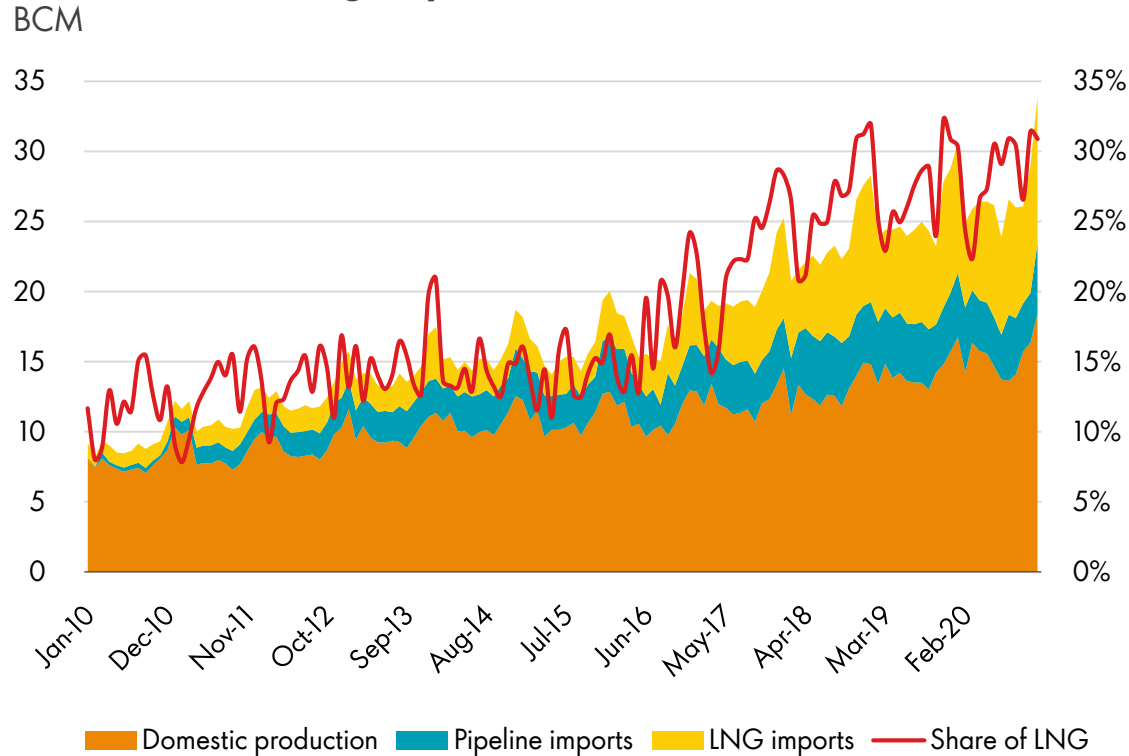


Source: Shell interpretation of IHS Markit, customs, Kpler and International Monetary Fund 2020 data
LNG importers with minimal year-on-year change are not included in this chart

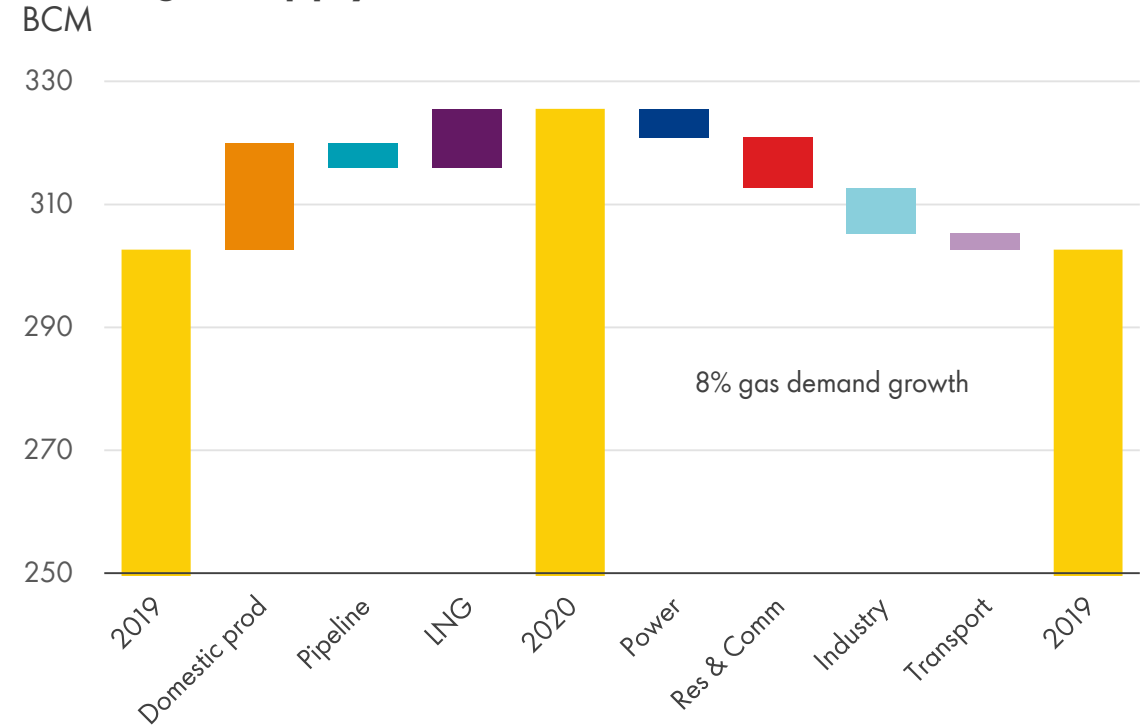
China gas demand growth remained resilient in 2020

Record Chinese LNG imports in December 2020

China domestic gas production & LNG demand



China gas supply & demand

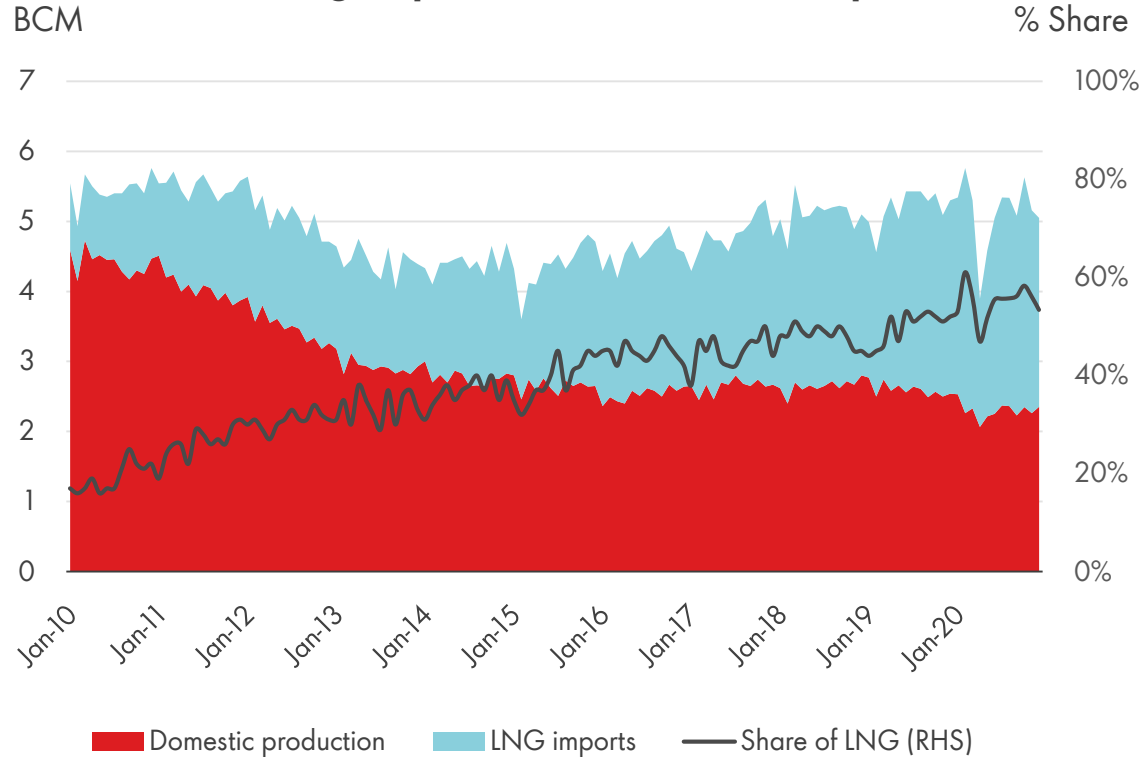


Source: Shell interpretation of IHS Markit and Chinese customs 2020 data
Res & Comm: Residential and commercial Domestic Prod: Domestic Production

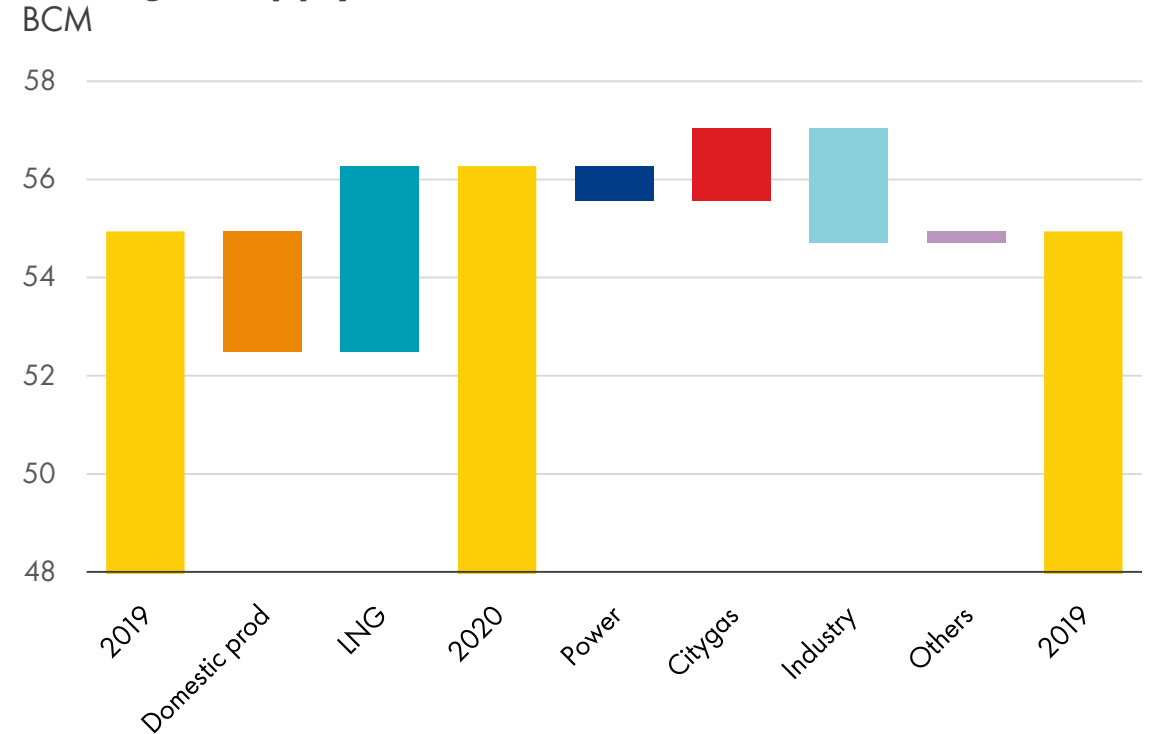
Lower-priced LNG results in 11% increase in Indian imports

LNG supplements reduced domestic gas production

India domestic gas production & LNG imports



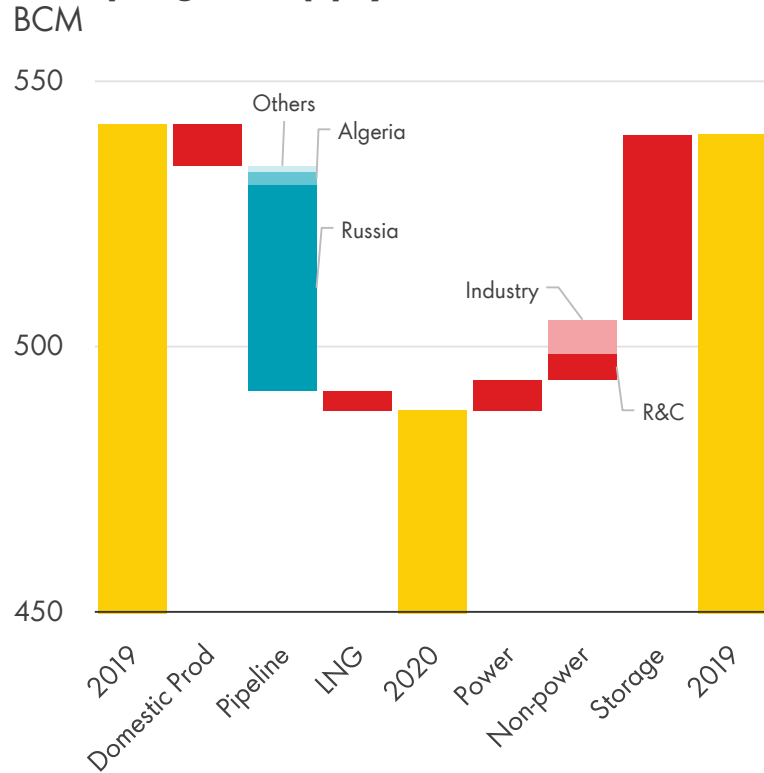
India gas supply & demand



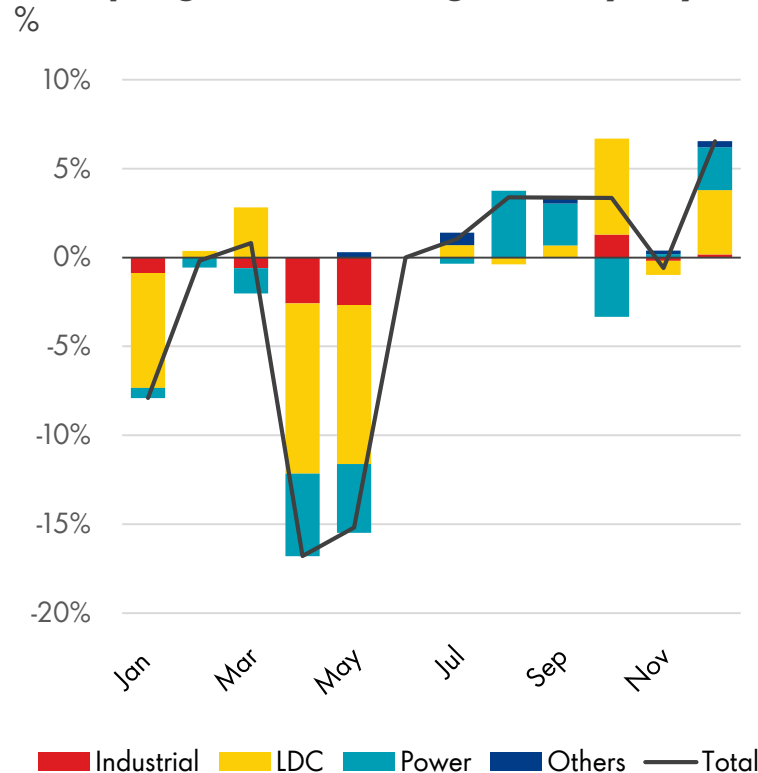
Sources: Shell interpretation of Petroleum Planning and Analysis Cell (PPAC), Central Electricity Authority (CEA), IHS Markit and Kpler 2020 data

Flexibility in European gas supply sources helped with global LNG balance

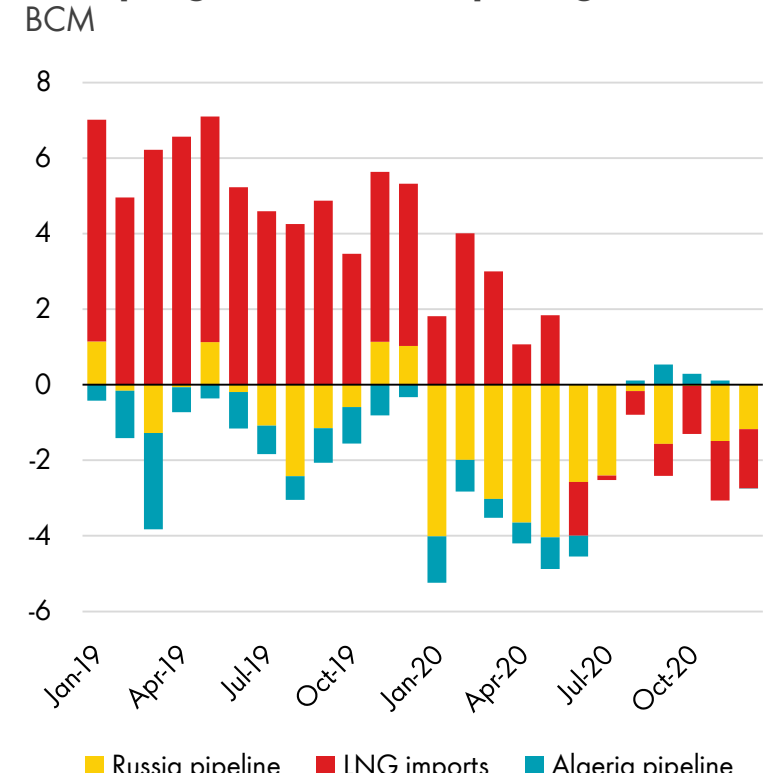
Europe gas supply & demand BCM



Europe gas demand growth y-o-y %



Europe gas & LNG import growth BCM

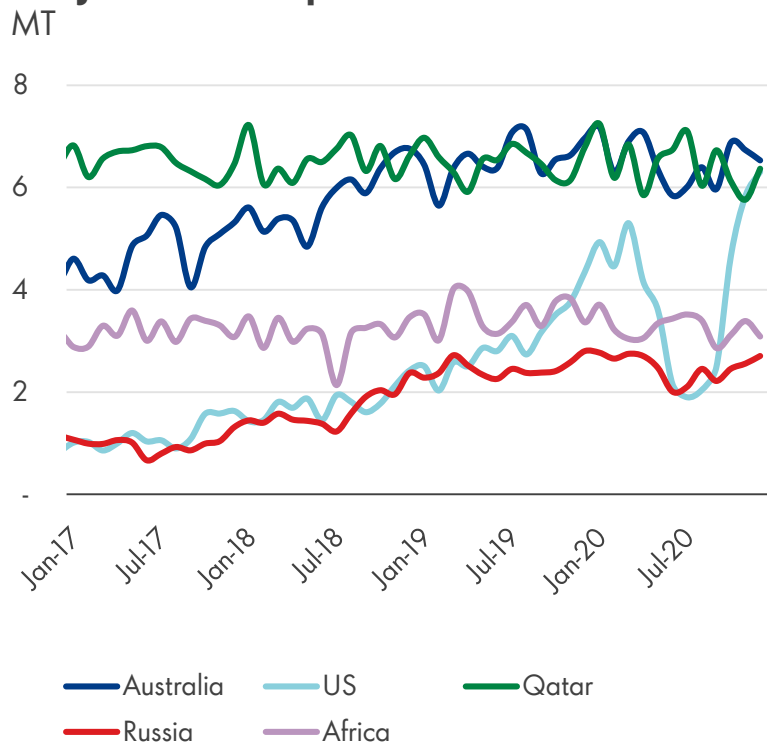


Source: Shell's interpretation of ENTSOG, Wood Mackenzie and European TSO 2020 data
LDC - Local distribution company R&C: Residential and commercial

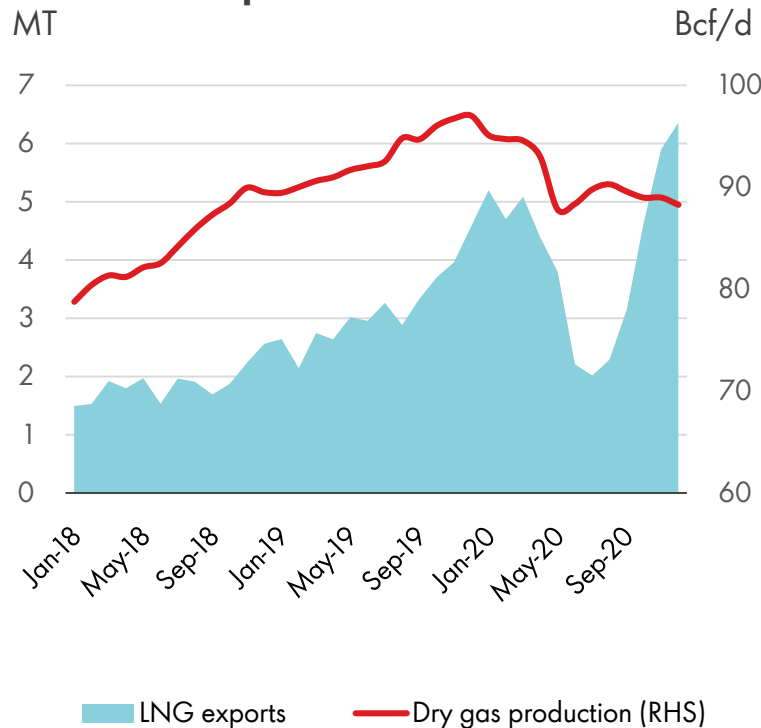
Supply response to changing market conditions

US supply added volume and flexibility

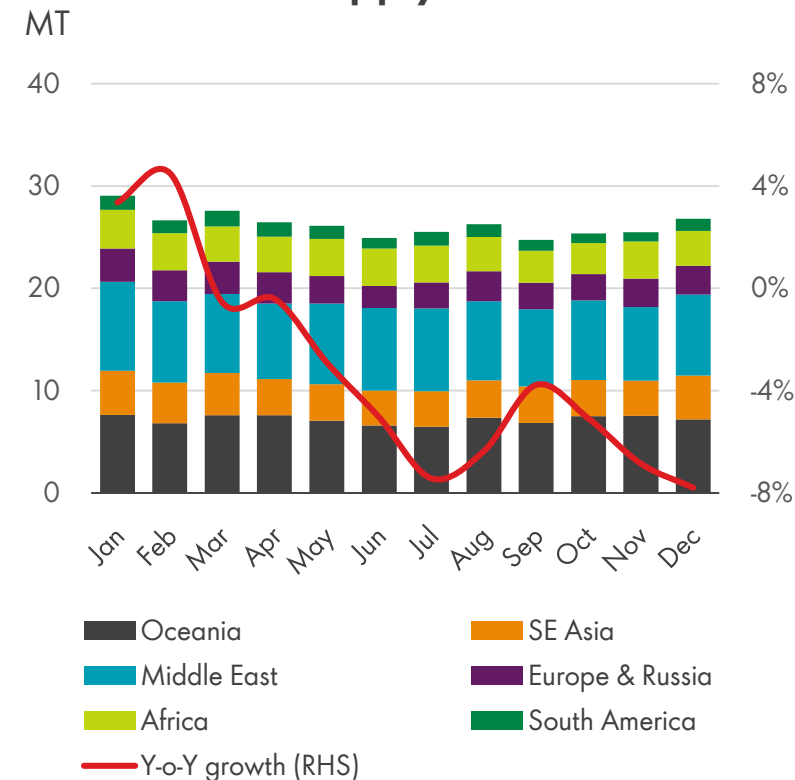
Major LNG exporters



US LNG exports



Non-US LNG supply

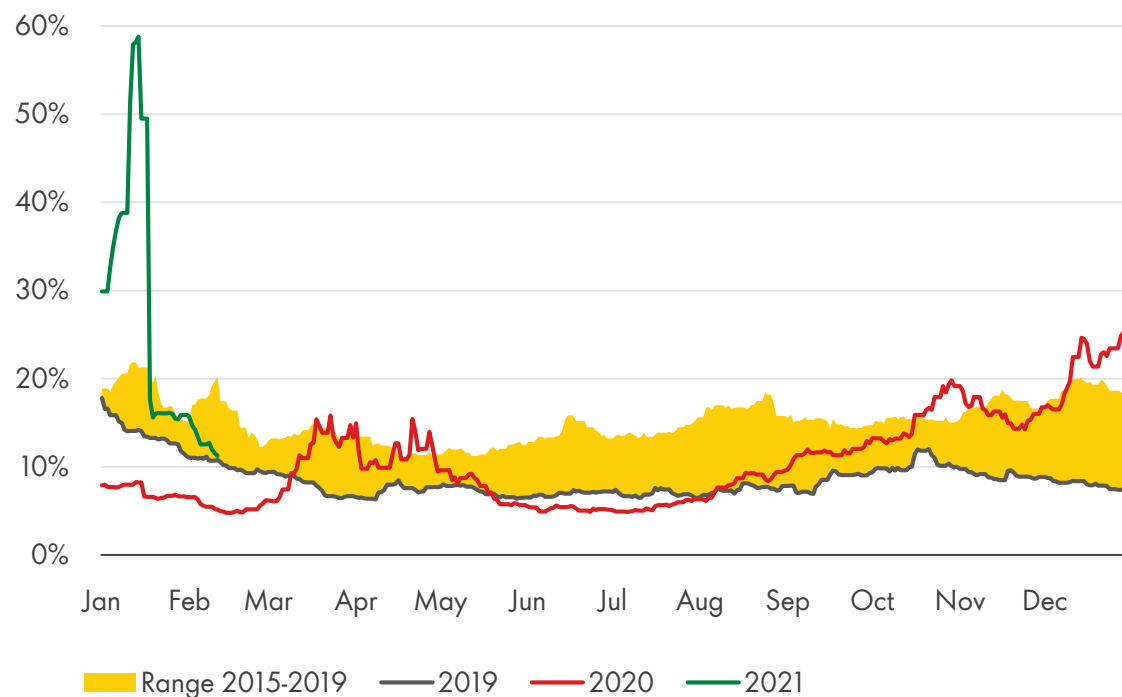


Source: Shell interpretation of Kpler, EIA and Wood Mackenzie 2020 data

Global LNG prices hit a record low before rebounding to hit a record high in January 2021

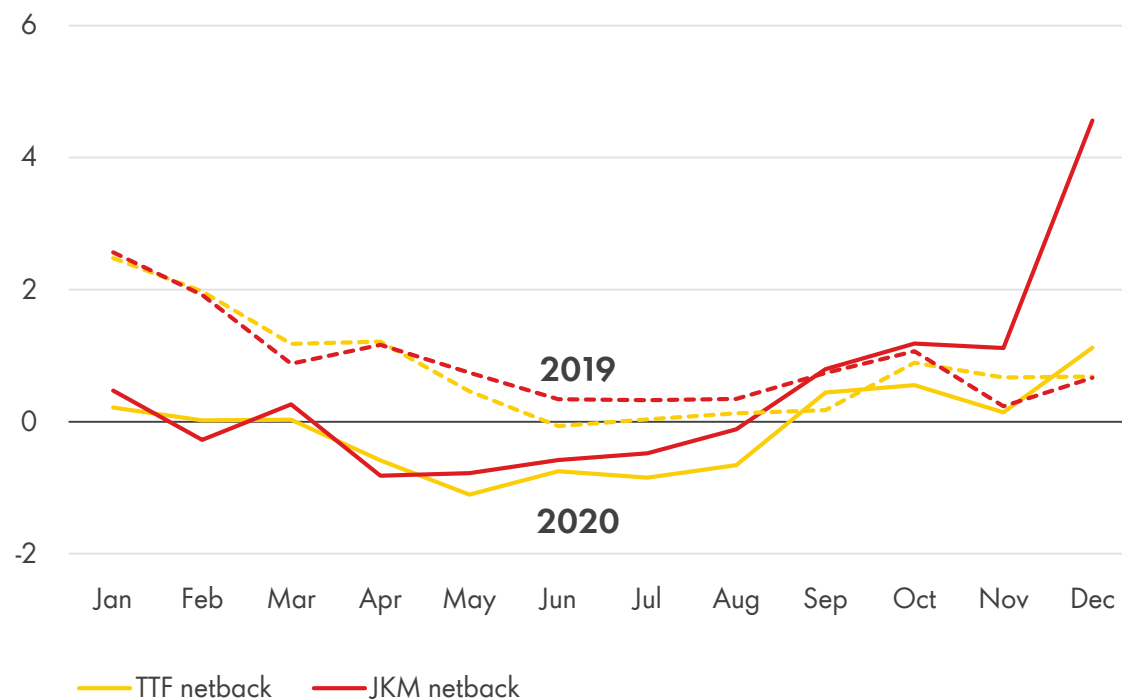
Asia spot price

JKM as % of Brent



US LNG export margins*

\$/MMBTU

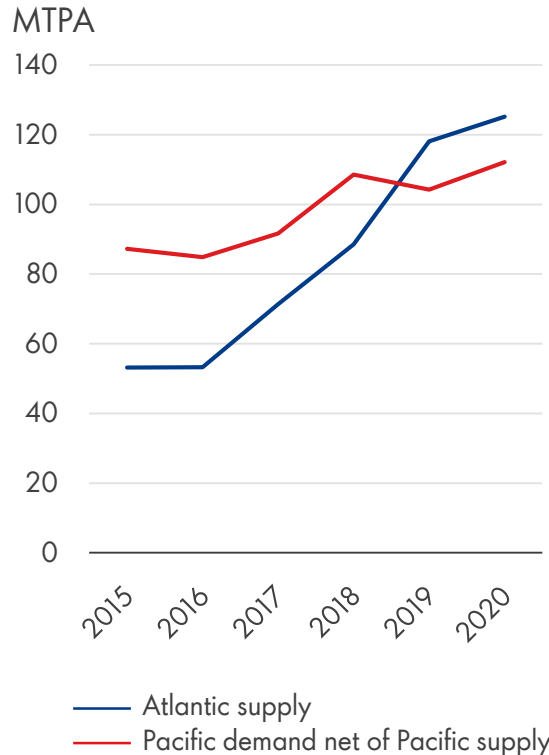


Source: Shell interpretation of ICE, CME, S&P Global Platts 2020 and 2021 data

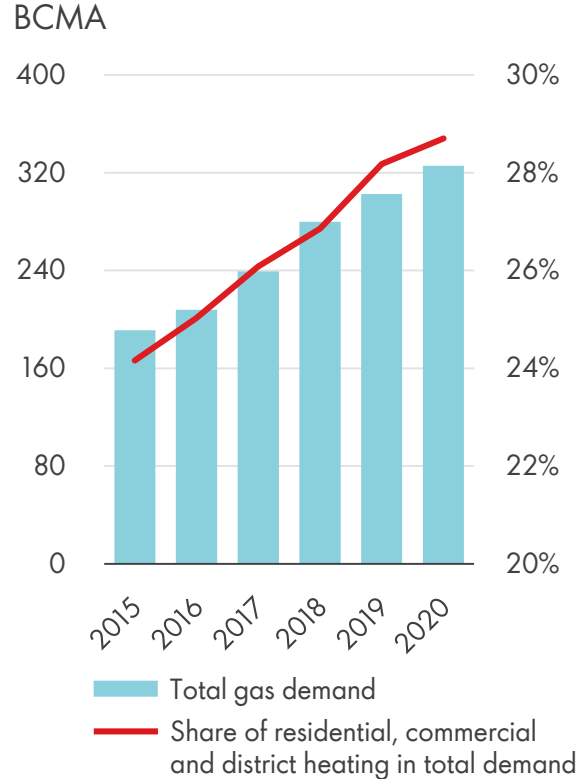
*Excludes liquefaction fee; netback calculated as: JKM and TTF minus regasification and transportation cost minus 115% Henry Hub

A combination of structural issues and singular events caused the price rally

Regional supply & demand

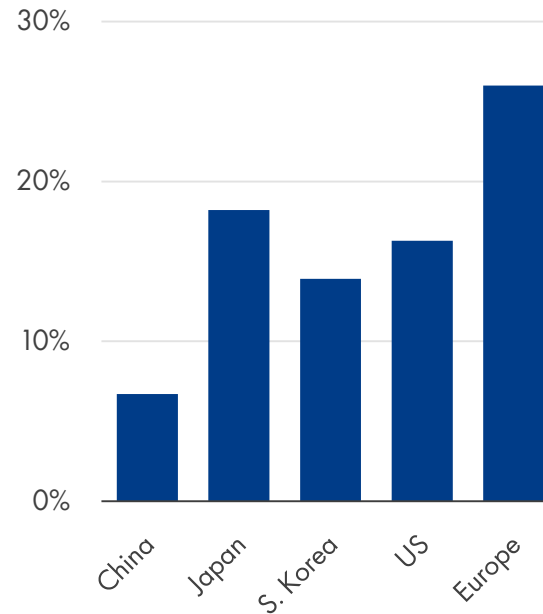


China heating demand



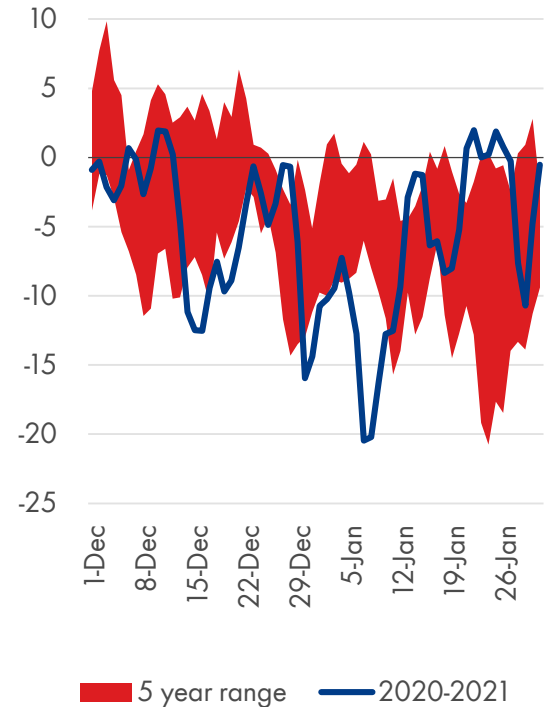
Gas storage capacity

Share of storage in total gas demand



North Asia temperature

Degrees Celsius



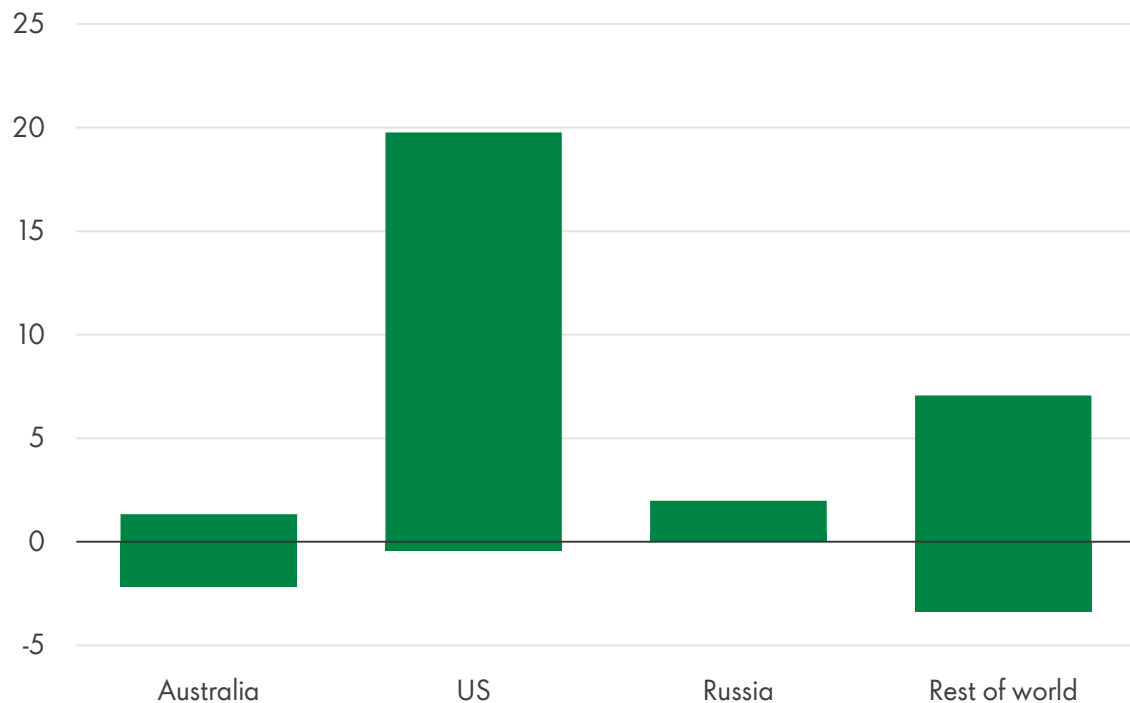
Source: Shell interpretation of IHS Markit, Wood Mackenzie and S&P Global Platts 2020 and 2021 data

Asian LNG demand recovery projected to continue in 2021

LNG exports from the US expected to offer flexible supply

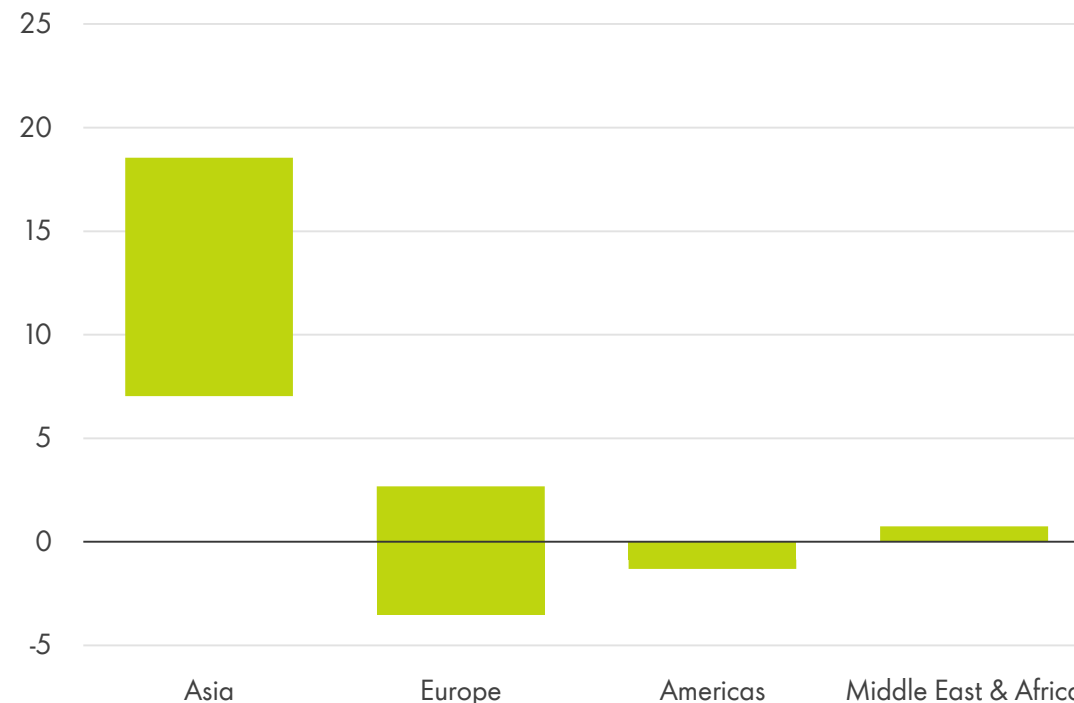
LNG supply growth range by country

MTPA



LNG demand growth range by region

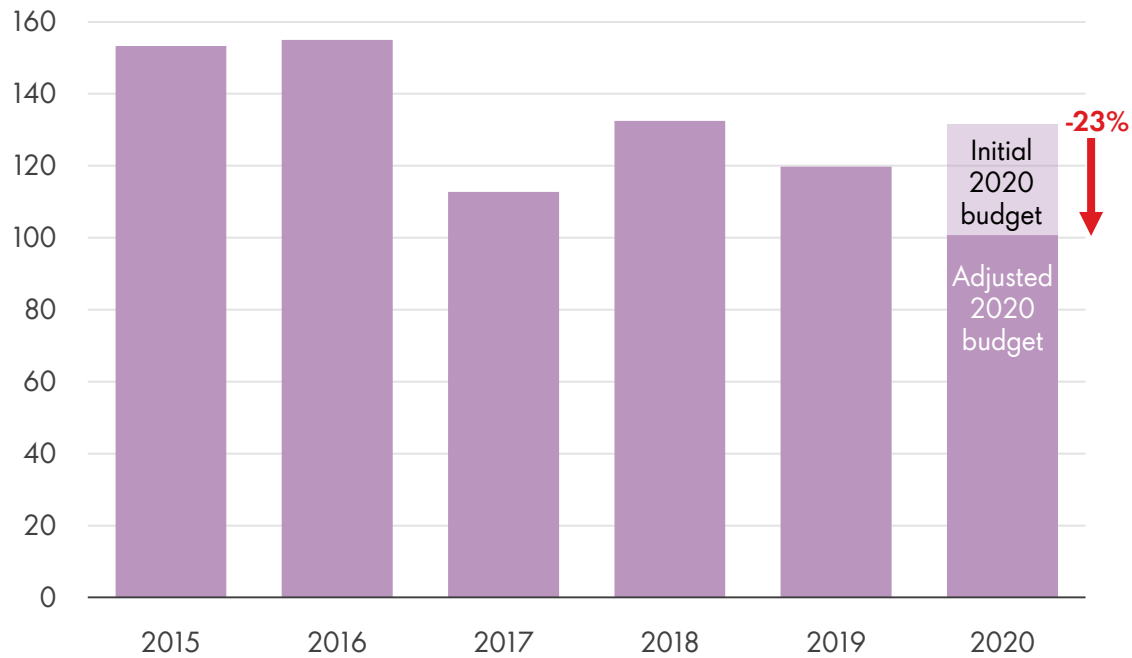
MTPA



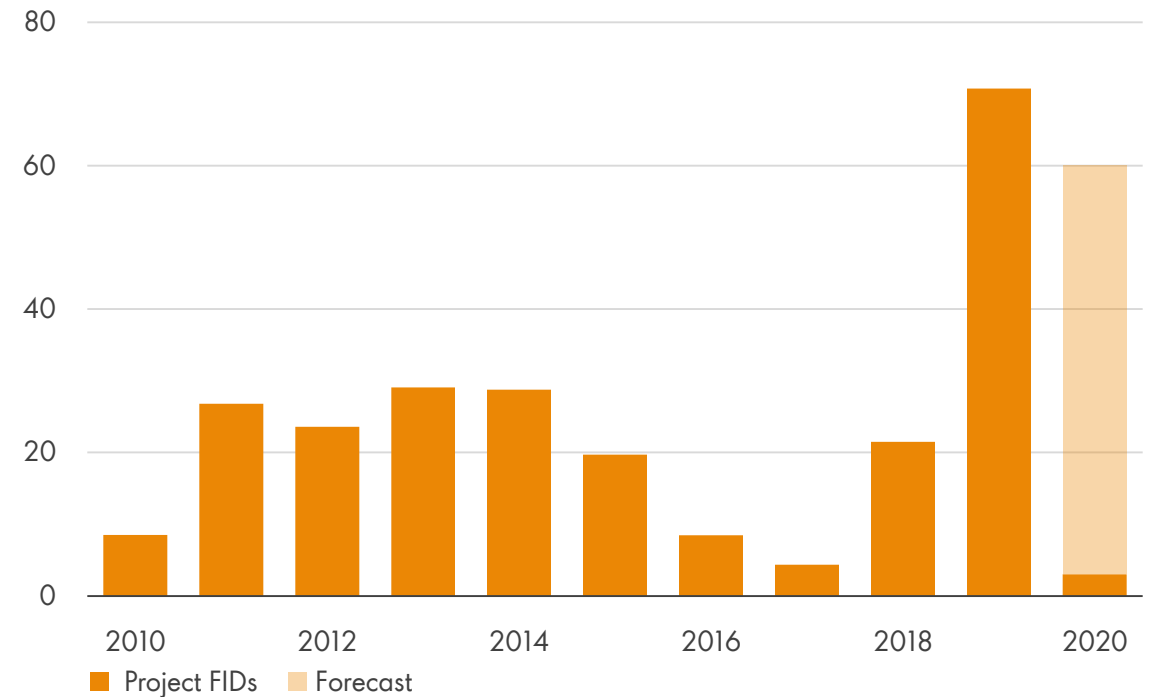
Source: Shell interpretation of IHS Markit and Wood Mackenzie 2020 data

LNG supply investment halts due to pandemic-related economic crisis

Oil & gas industry* capex spend \$billion



Investment in liquefaction capacity MTPA



Source: Shell interpretation of IHS Markit and Wood Mackenzie 2020 data

*Industry represents estimated capital budgets of ExxonMobil, Shell, Chevron, Total, BP, Equinor and Eni, as calculated by Wood Mackenzie

03

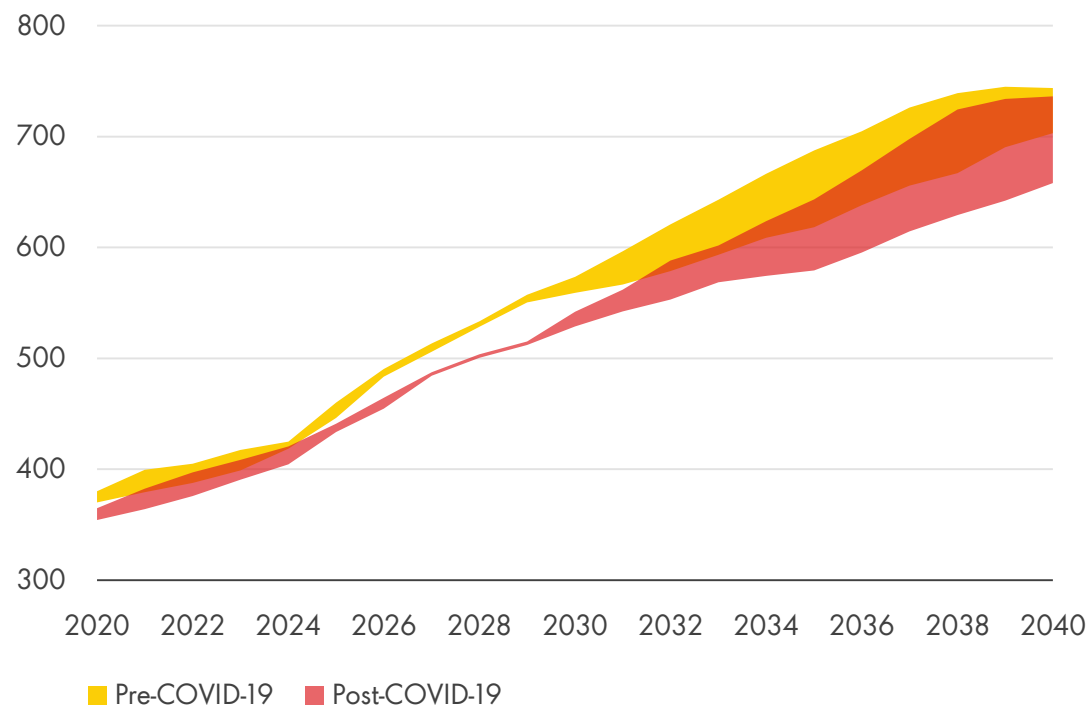
Complementary spot and term contract structures and cleaner pathways to drive LNG growth

COVID-19 pandemic delays project construction timelines

Lasting impact expected on LNG supply not demand

Global LNG supply forecast

MTPA



EU LNG import forecast change

MTPA



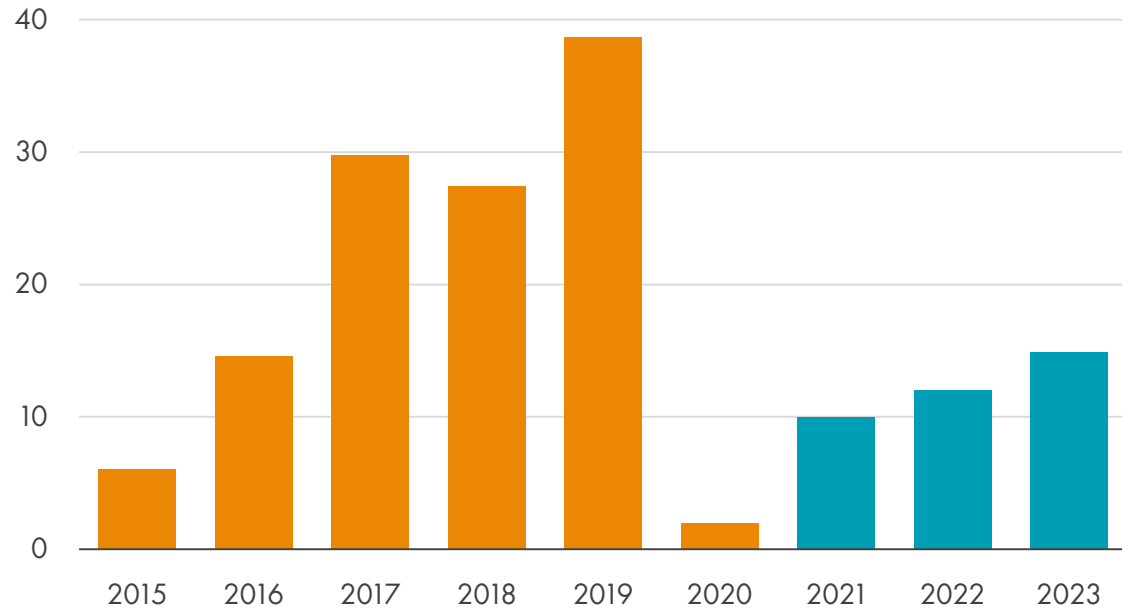
Source: Shell interpretation of Wood Mackenzie and IHS Markit 2020 data

Supply-demand gap estimated to emerge in the middle of the current decade as demand rebounds

Shell
LNG Outlook 2021

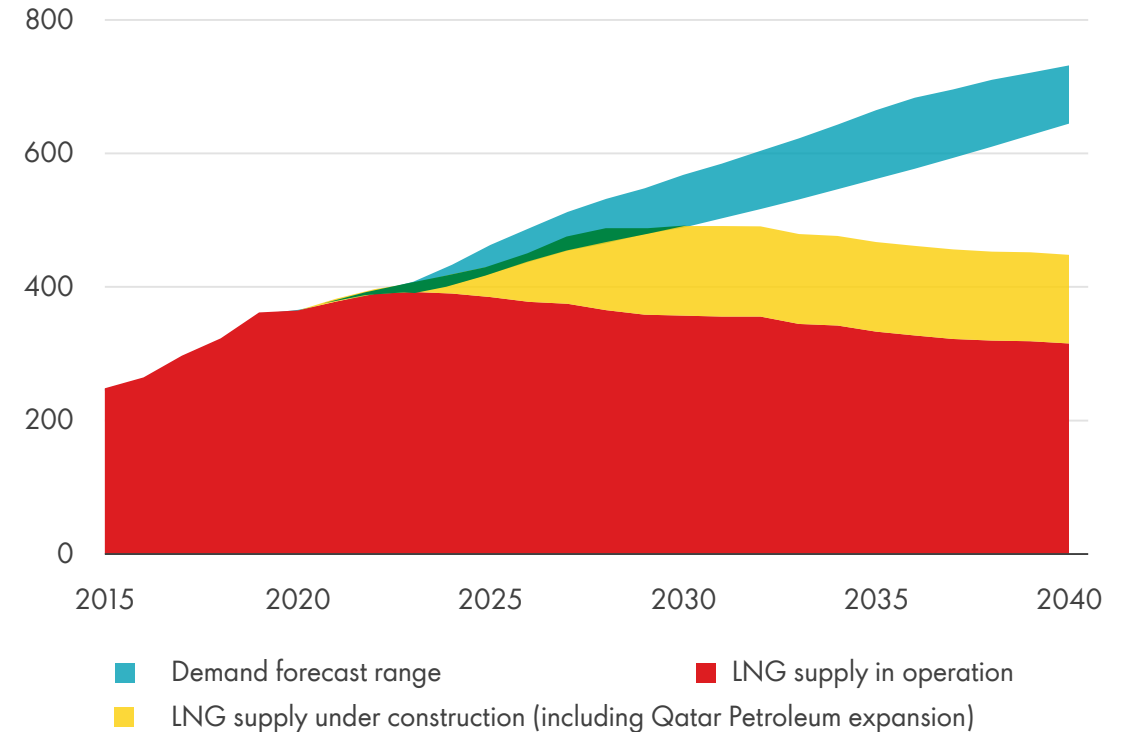
LNG trade volume growth

MTPA



Emerging LNG supply-demand gap

MTPA



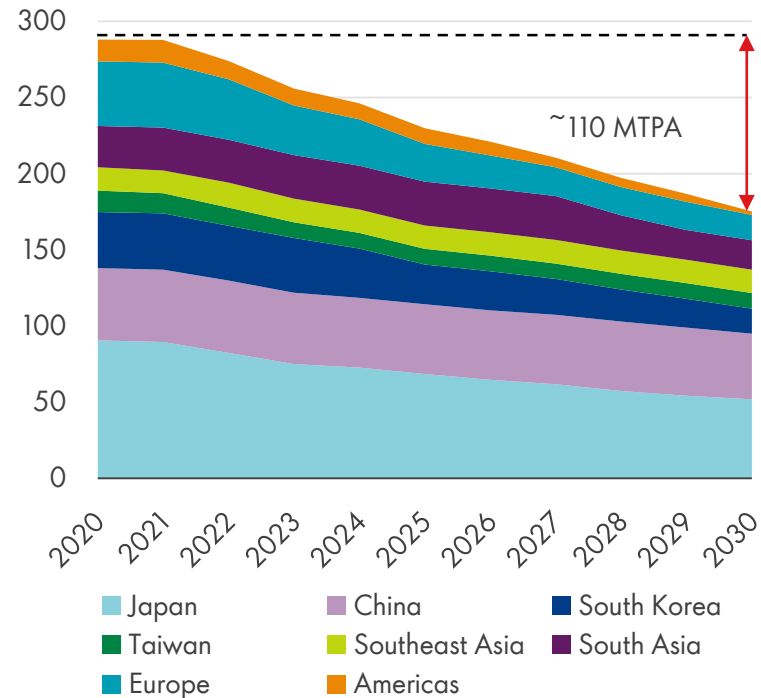
Source: Shell interpretation of IHS Markit, Wood Mackenzie, FGE and Poten & Partners 2020 and 2021 data
Qatar Petroleum LNG expansion announced in February 2021

Triggers exist for change in the global LNG market

More market participants with increasingly diverse needs

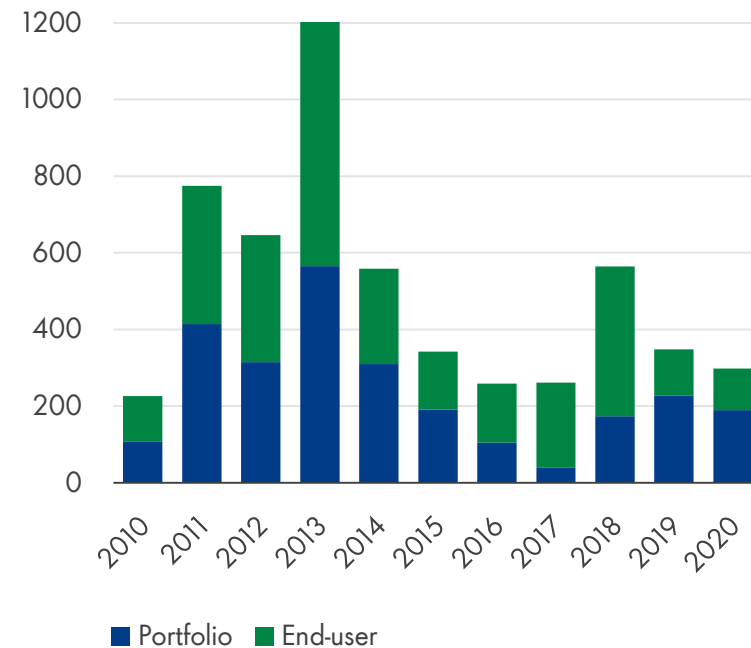
Long-term LNG contract expiries

MTPA



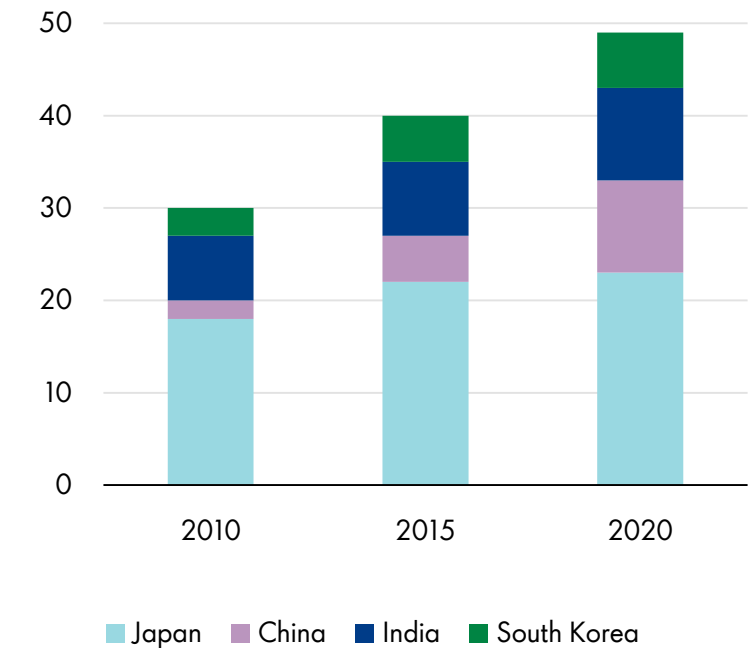
Total LNG contract volumes by buyer type

MT



LNG importers

of regasification capacity holders in Japan, China, India and South Korea

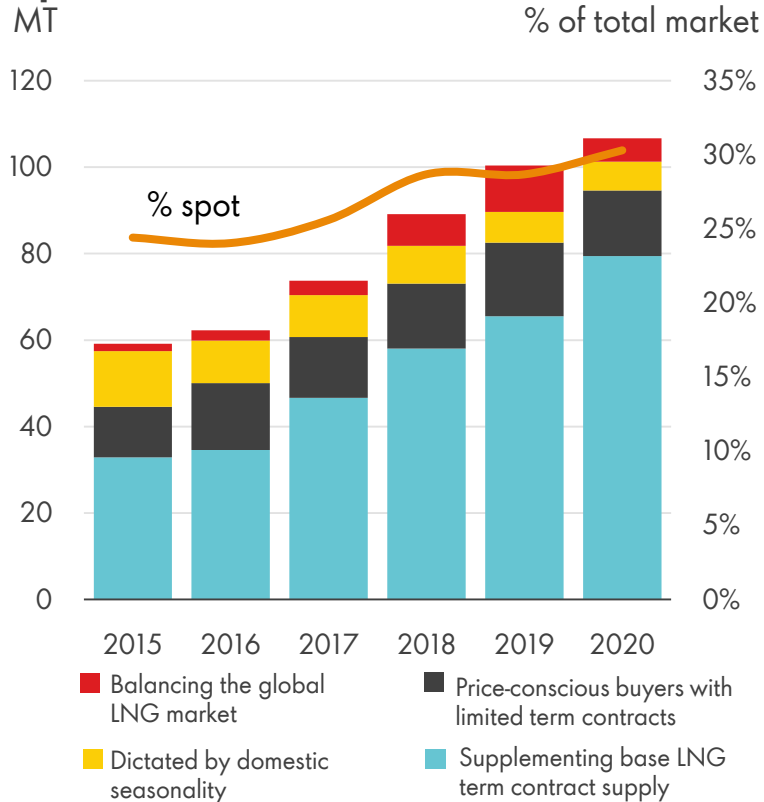


Source: Shell interpretation of IHS Markit 2020 data

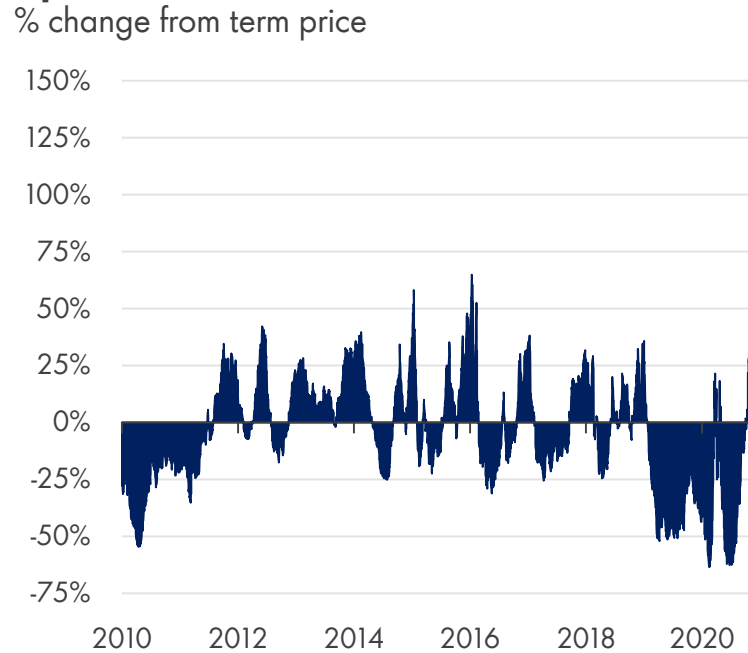
Current industry structure appears sustainable

No acceleration in the move to commoditisation

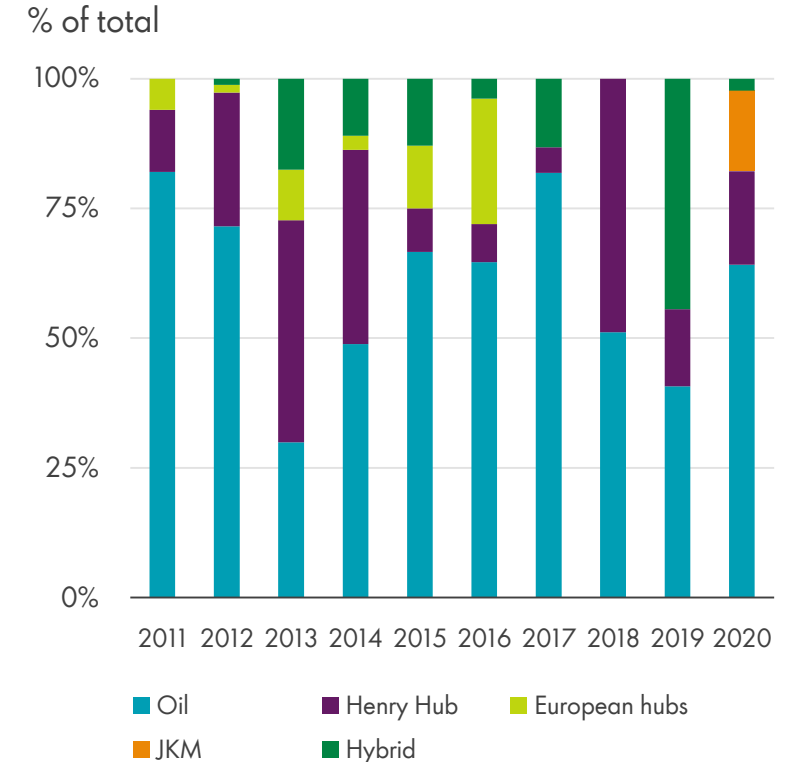
Spot LNG deliveries



Spot deviation from term



Term contract indexation

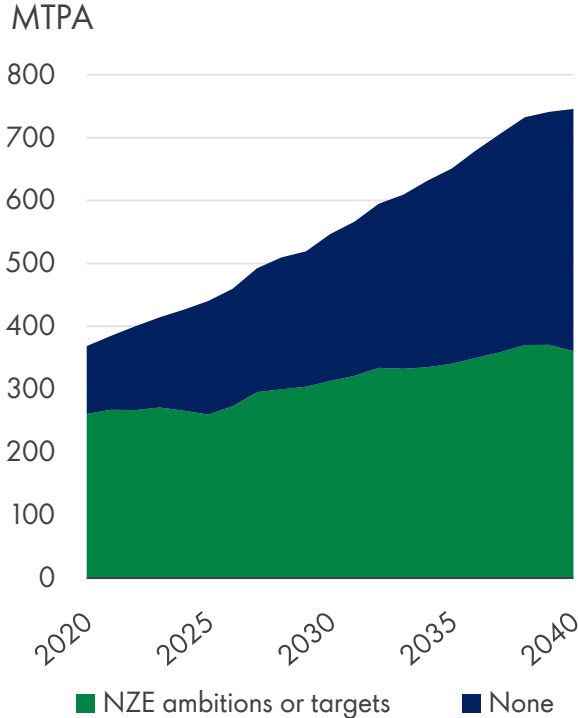


Shell interpretation of IHS Markit, Wood Mackenzie, ICE, CME and S&P Platts 2020 and 2021 data

NZE targets will need cleaner and innovative solutions

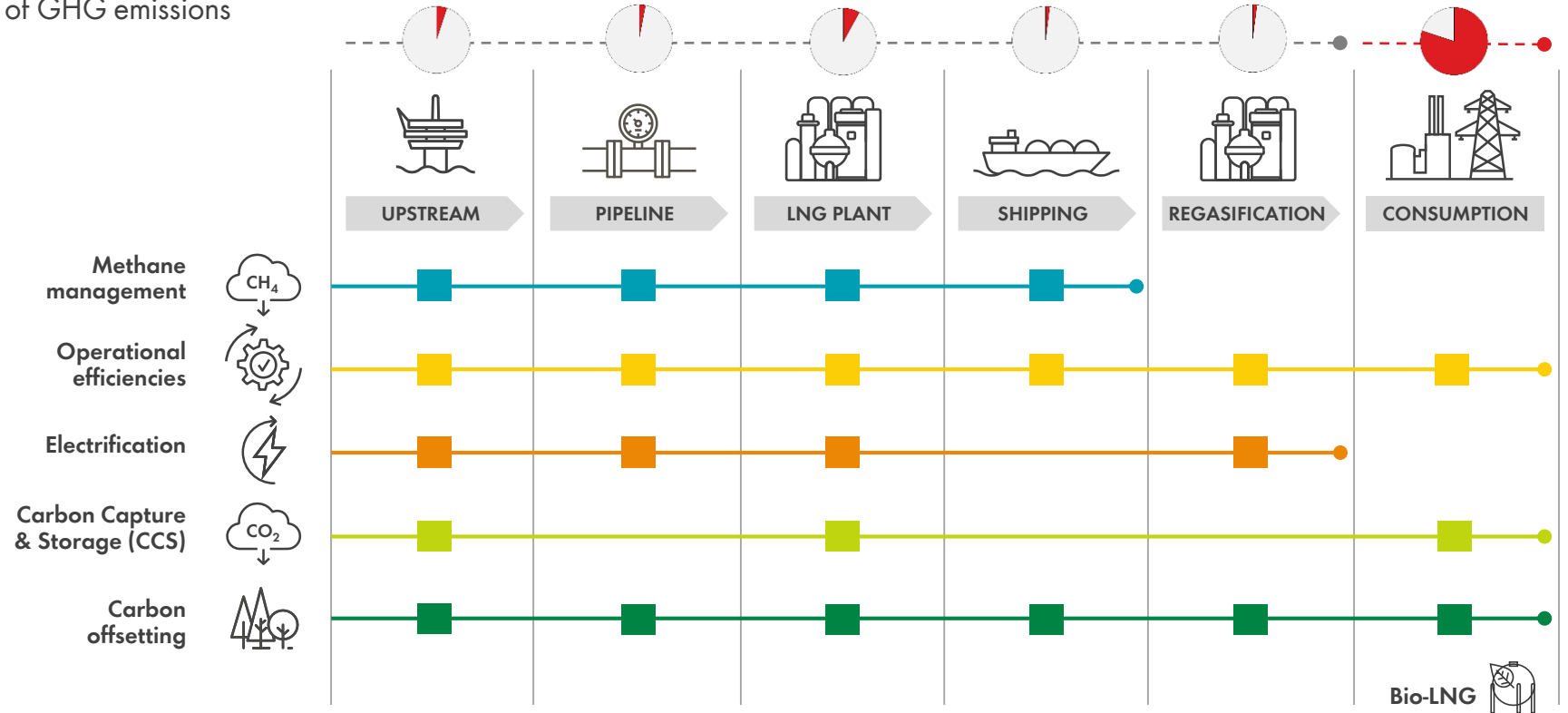
All levers needed to decarbonise LNG

LNG demand forecast by net-zero emissions pledge



LNG value chain emissions and mitigation options

% of GHG emissions



Source: Shell interpretation of IHS Markit, Wood Mackenzie and IEA 2020 data

Summary



Gas and LNG have a key role to play in a decarbonising world

- Net-zero emissions announcements across the globe
- Gas and LNG can play a key role in decarbonising hard-to-electrify sectors
- Nearly half of gas demand growth in the next 20 years expected to come from Asia



LNG shows its resilience and flexibility in 2020

- LNG demand continued to grow despite the global pandemic and ensuing economic crisis
- Global LNG prices hit a record low before rebounding to hit a record high in January 2021
- New LNG supply investment decisions ground to a halt



Complementary spot and term contract structures and cleaner pathways to drive LNG growth

- Supply-demand gap estimated to emerge in the middle of the current decade
- Current industry structure supports the changing needs of buyers
- Net-zero emissions targets will need cleaner and innovative energy solutions

