

CHINA'S GAS MARKET

INVESTOR ROUNDTABLE

July 2020

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Beijing CBD district. Source: China Daily

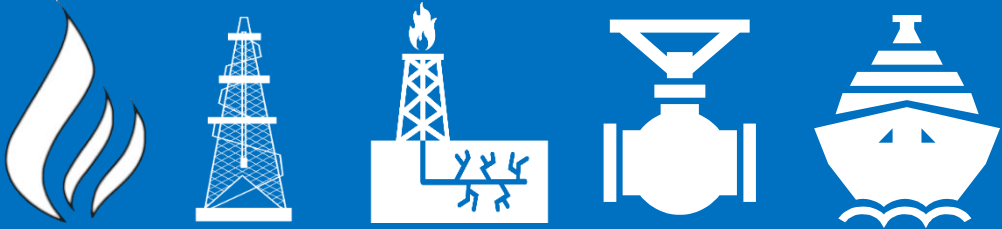


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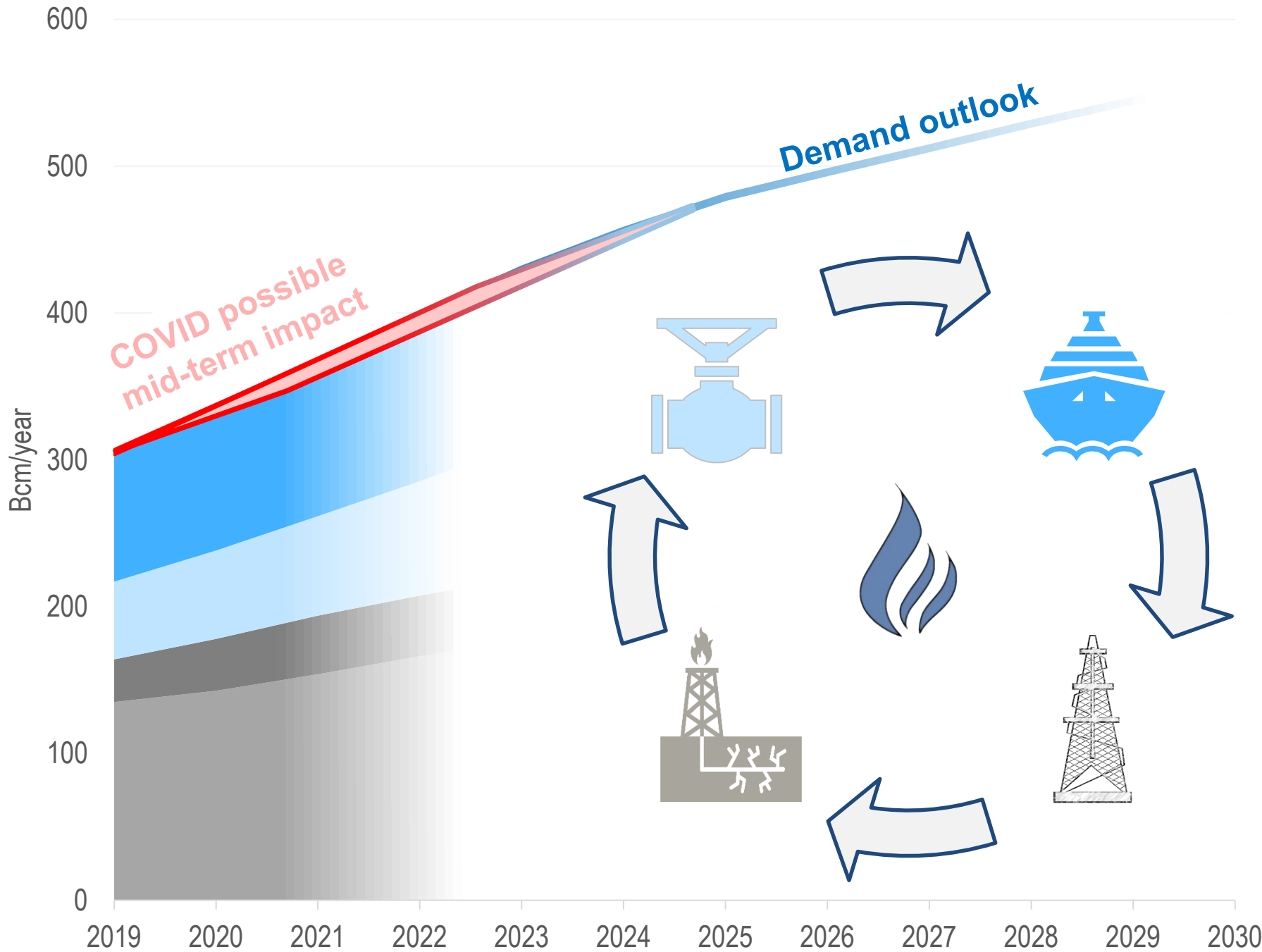
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CHINA GAS MARKET OUTLOOK. KEY QUESTIONS



China gas supply mix - long-term outlook



Demand and sources of supply: trends to watch

Gas demand:
Where will demand growth be concentrated?

LNG imports:
How will China's LNG import strategy develop?

Pipeline imports:
How will Power of Siberia change China's market?

Unconventional gas production:
Will we witness a shale "boom" in China?

Conventional production:
Is China's gas production growth sustainable?

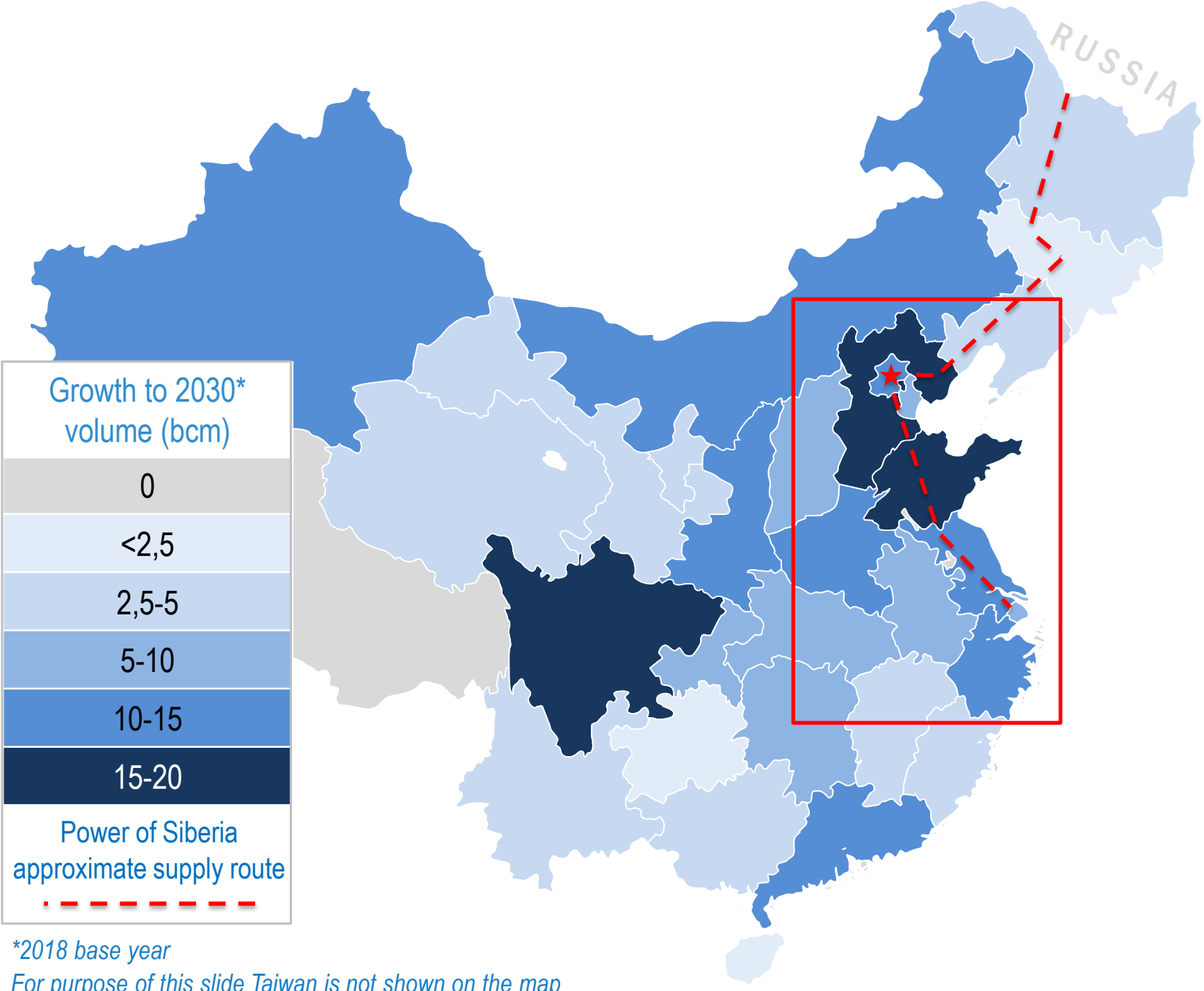
Source: Wood Mackenzie

SATISFYING THE DEMAND BOOM RESTS ON DOMESTIC PRODUCTION AND IMPORT DEVELOPMENT

DEMAND. STRONG FUNDAMENTALS



Forecast of Chinese regional gas demand by 2030

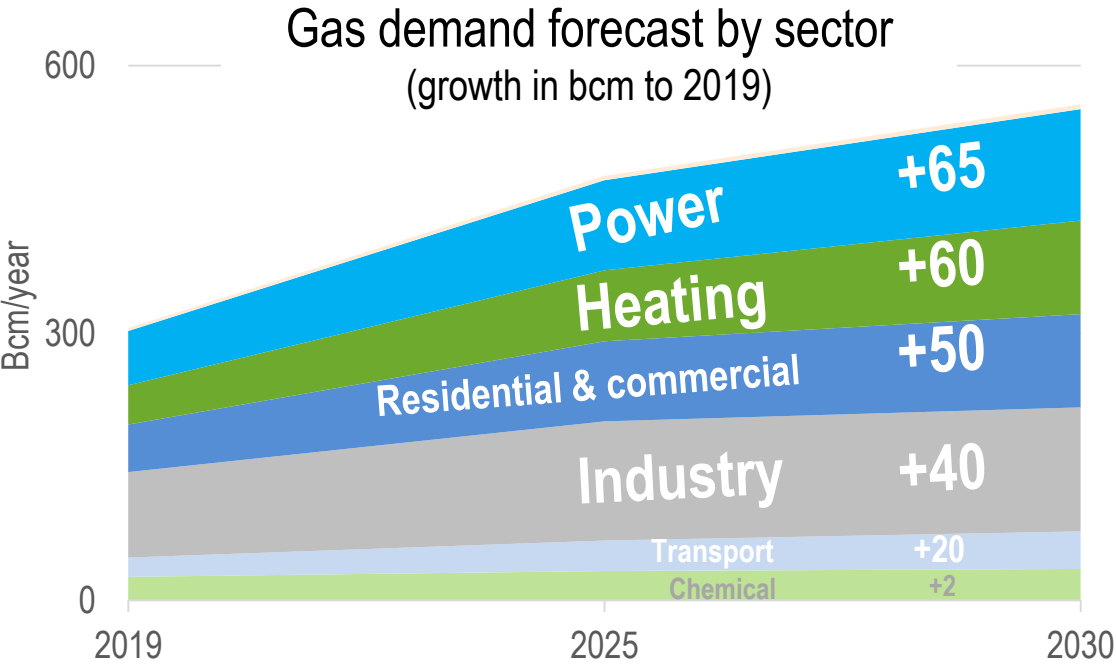


Regional and sectoral features of gas demand growth in China

- China's expected growth in gas demand will be driven by both governmental support and by strong sectoral and regional fundamentals :
 - A need for incremental gas supply in economically developed regions with high pollution;
 - A switch to gas across the whole China's economy, with power, heating, residential & commercial being the largest contributors due to coal-to-gas switch program.
- Regions targeted by the Power of Siberia pipeline (PoS) will experience different growth dynamics. This is down to uneven economic development between regions. Beijing and its neighboring regions will experience the most dramatic growth, where Russian pipeline gas is expected to be the most competitive imported supply source. On the other hand, the North-Eastern regions, with their comparatively low new gas demand, will be mostly satisfied with Russian gas in the absence of a comparable alternative supply.

China's energy market and economy fundamentals will support consumption growth and strong demand for new pipeline supply from Russia

Sources: Wood Mackenzie, IHS Markit

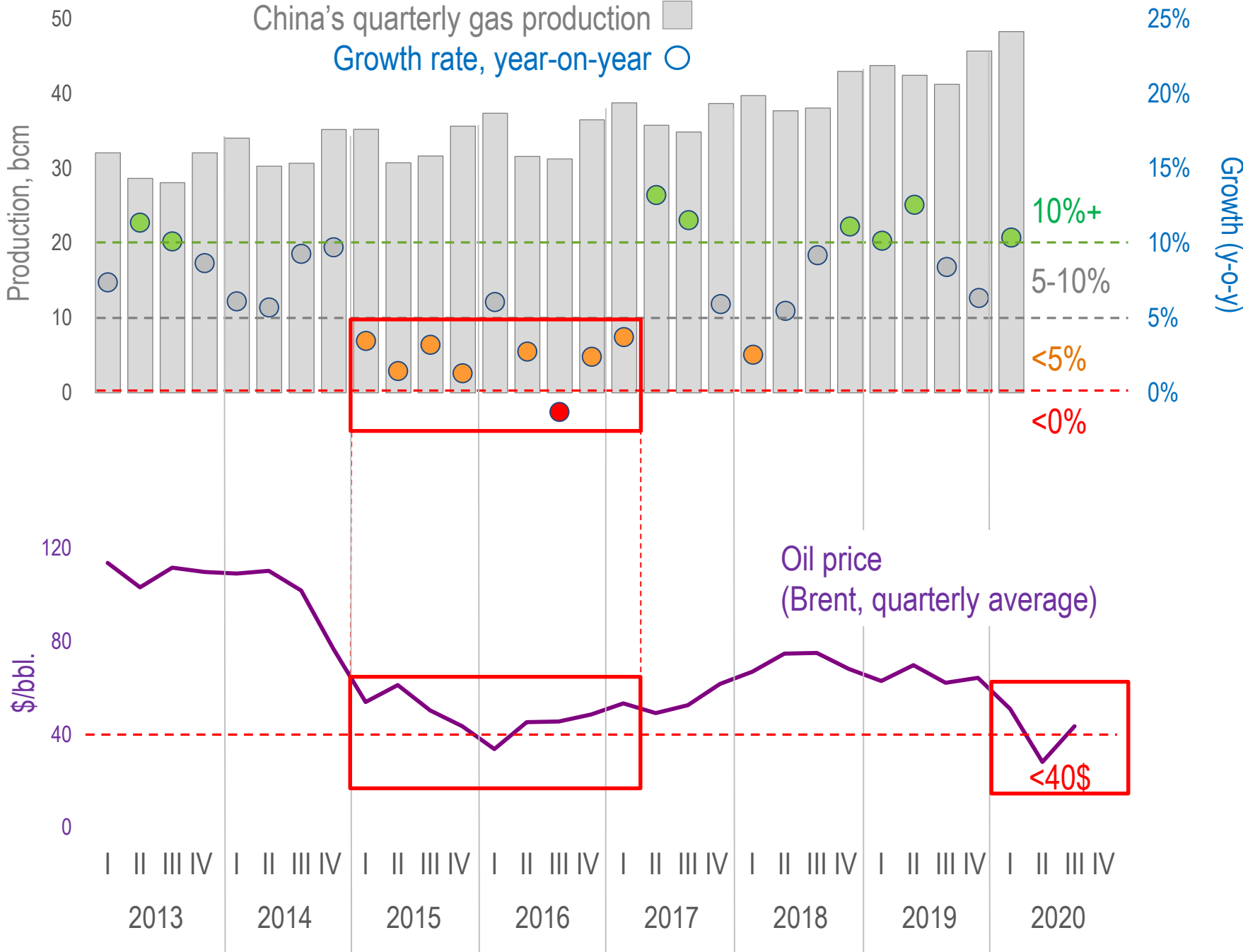


CHINA TO HAVE CROSS-SECTORAL GAS GROWTH WITH RUSSIAN PIPE GAS TARGET MARKETS SHOWING STRONG INCREASE IN DEMAND

DOMESTIC PRODUCTION. FRAGILE GROWTH



Relationship between Chinese domestic gas production and global oil prices

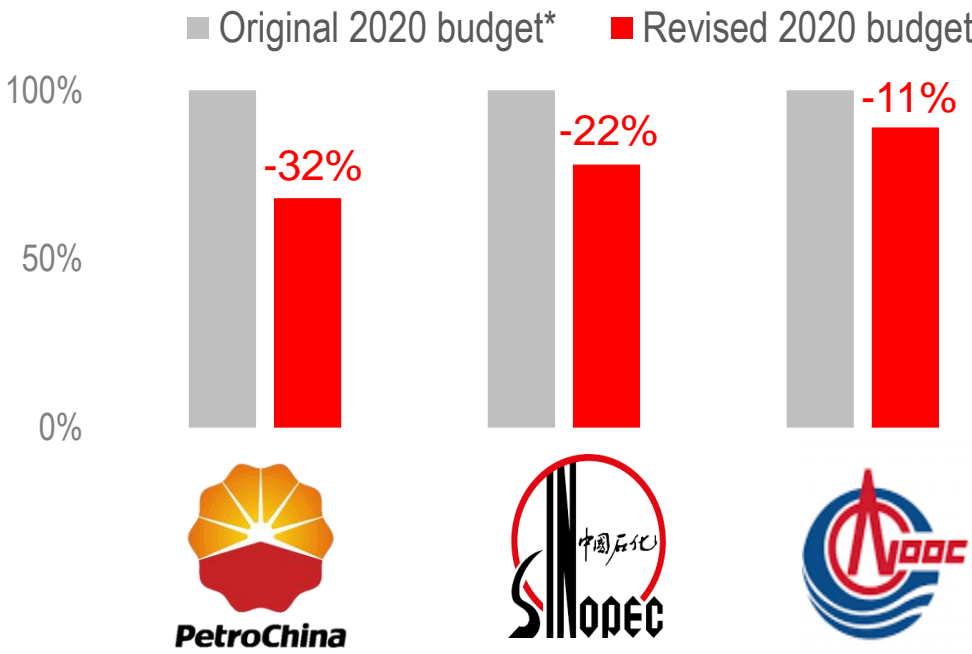


2020 crisis and its expected influence on China's domestic production

- Despite a certain time-lag, China's domestic gas production strongly correlates with global oil prices.
- When oil prices are stable and high, gas production in China shows strong growth, on occasion even **reaching double digit figures**.
- After the 2014 oil price collapse, China's gas production growth rate dramatically decelerated, falling to **negative numbers** in the 3rd quarter of 2016.
- Following this pattern, the 2020 oil price collapse may lead to the decline in the production growth rate and further speed up the rise of import dependency.

Massive budget cuts announced by China's NOC could lead to output growth rate slow-down and further increase import dependency

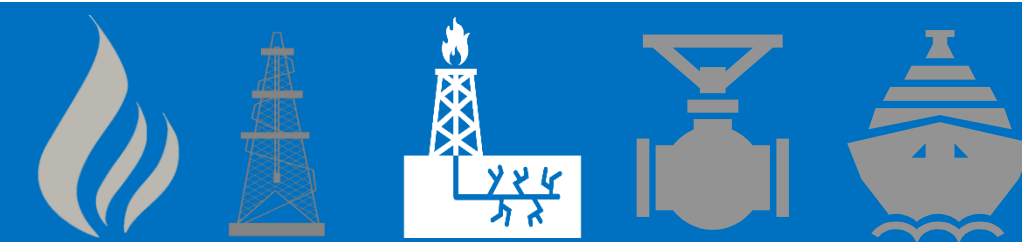
Sources: Wood Mackenzie, Thomson Reuters



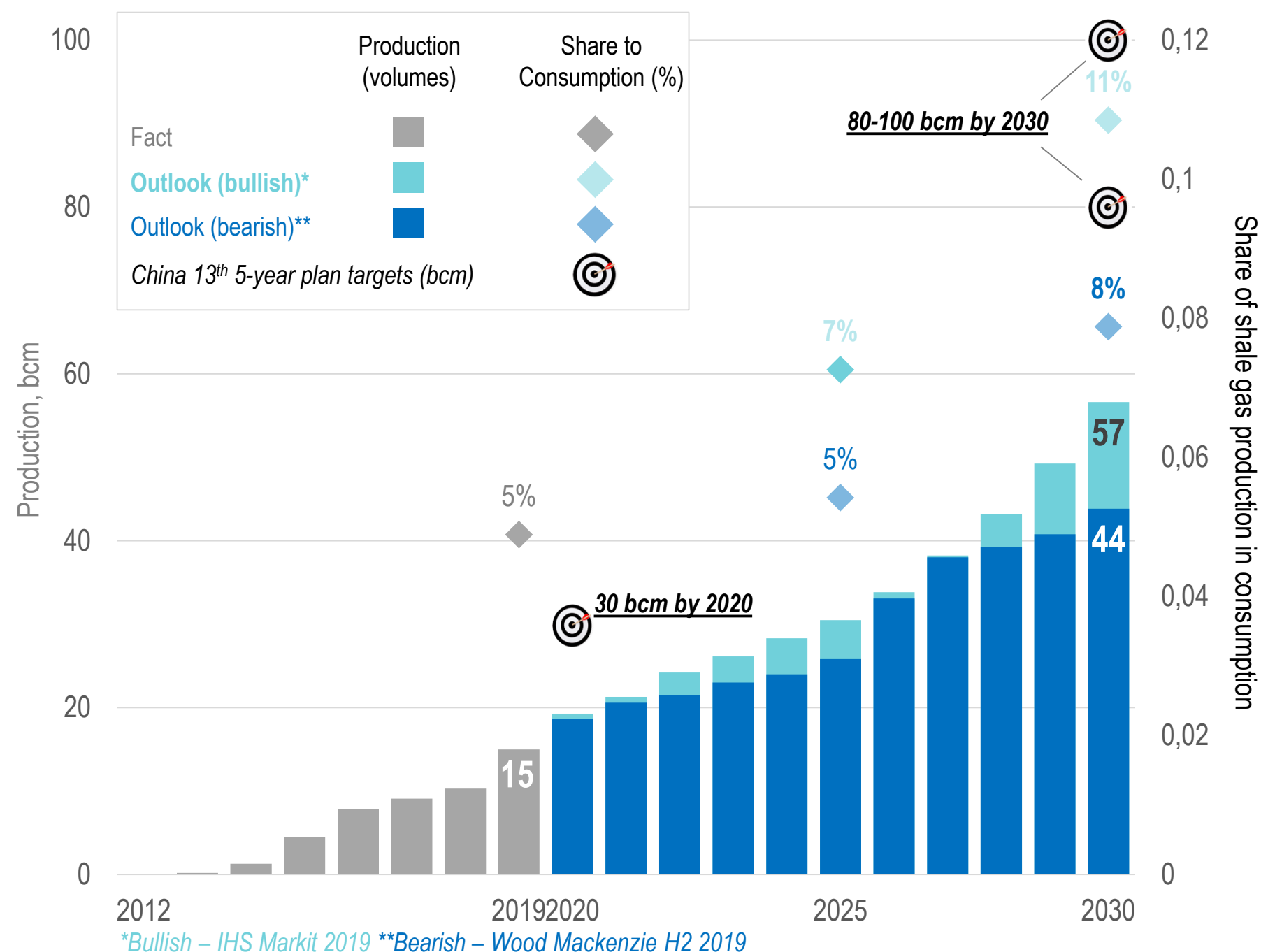
*Overall budget cuts, not only upstream investment

2020 CRISIS MAY LEAD TO UPSTREAM CAPEX UNDERINVESTMENT AND PRODUCTION GROWTH RATE DECLINE

UNCONVENTIONAL PRODUCTION. SHALE “BOOM”?



China's shale gas production outlook

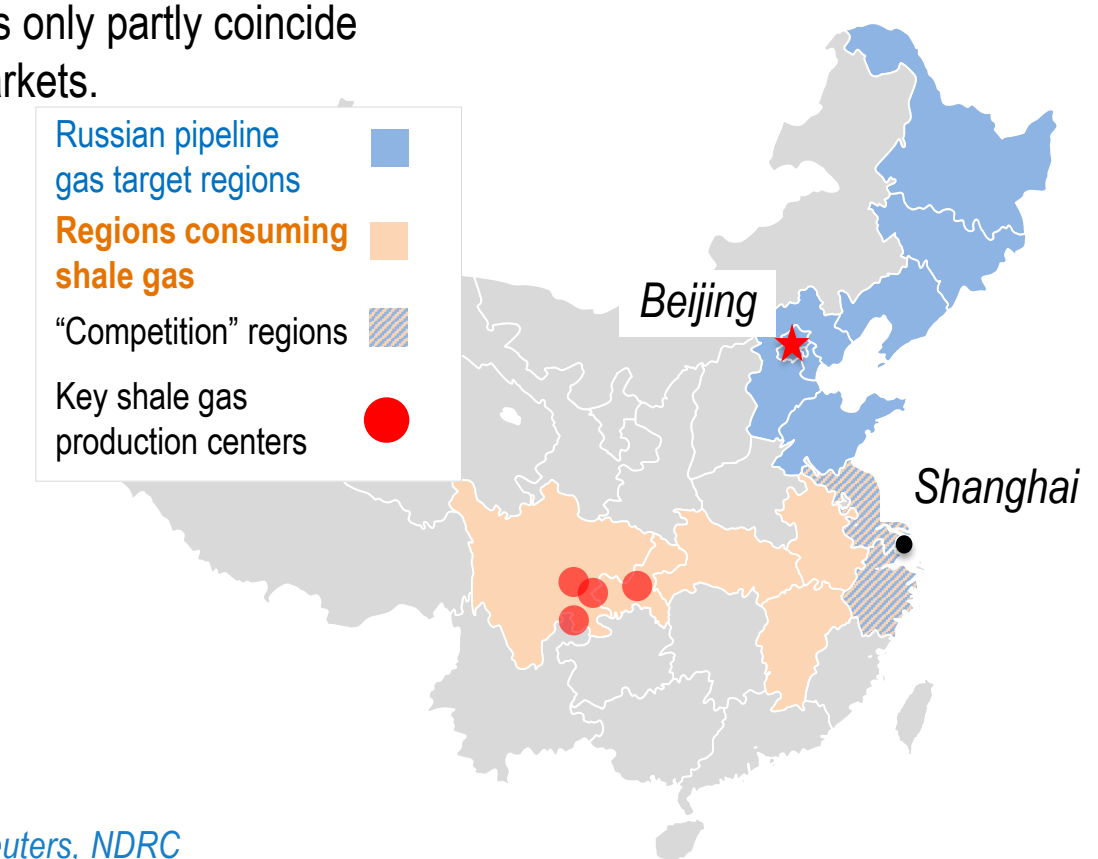


Shale gas development in China: influence on Russian pipeline supply

- China's shale gas production (<15 bcm in 2019) satisfied about 5% of China's domestic gas demand.
- 13th FYP target (30 bcm by 2020) is overly ambitious: 2020 production volumes will hardly reach 20 bcm. 2030 goals are even more "optimistic". 2030 forecasts range – from **44 (bearish) to 57 (bullish)** – reflects uncertainty about the prospects of the industry. The share of shale gas in China's consumption might reach 8-11% by 2030 .
- Shale gas will be consumed locally (Sichuan province) and within Eastern China (Shanghai). These shale gas consuming regions only partly coincide with Russian pipeline gas target markets.

Shale gas will likely remain a «local» story with limited influence on supply mix and Russian pipeline gas exports to China even in the long-term

Sources: Wood Mackenzie, IHS Markit, Thomson Reuters, NDRC

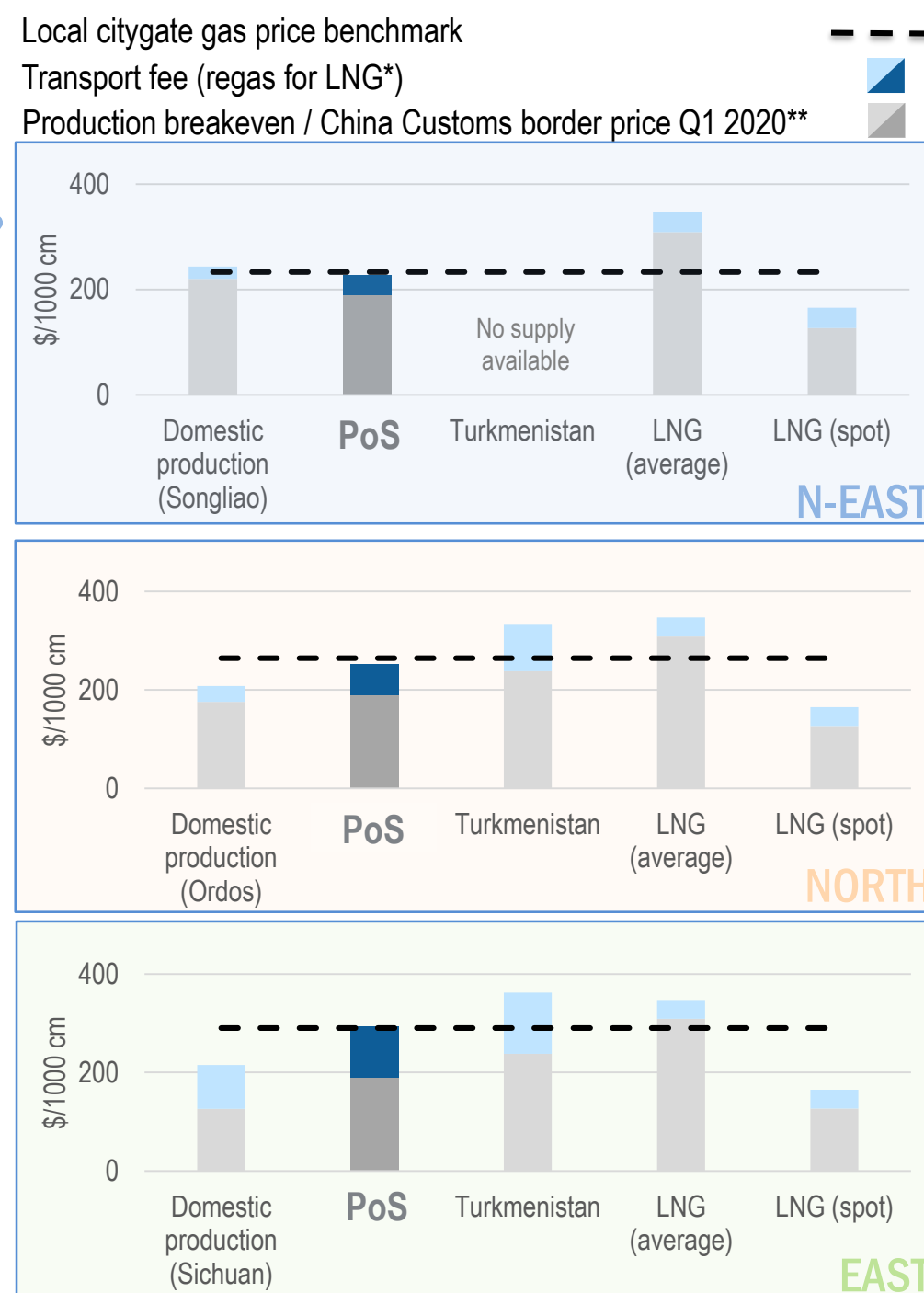
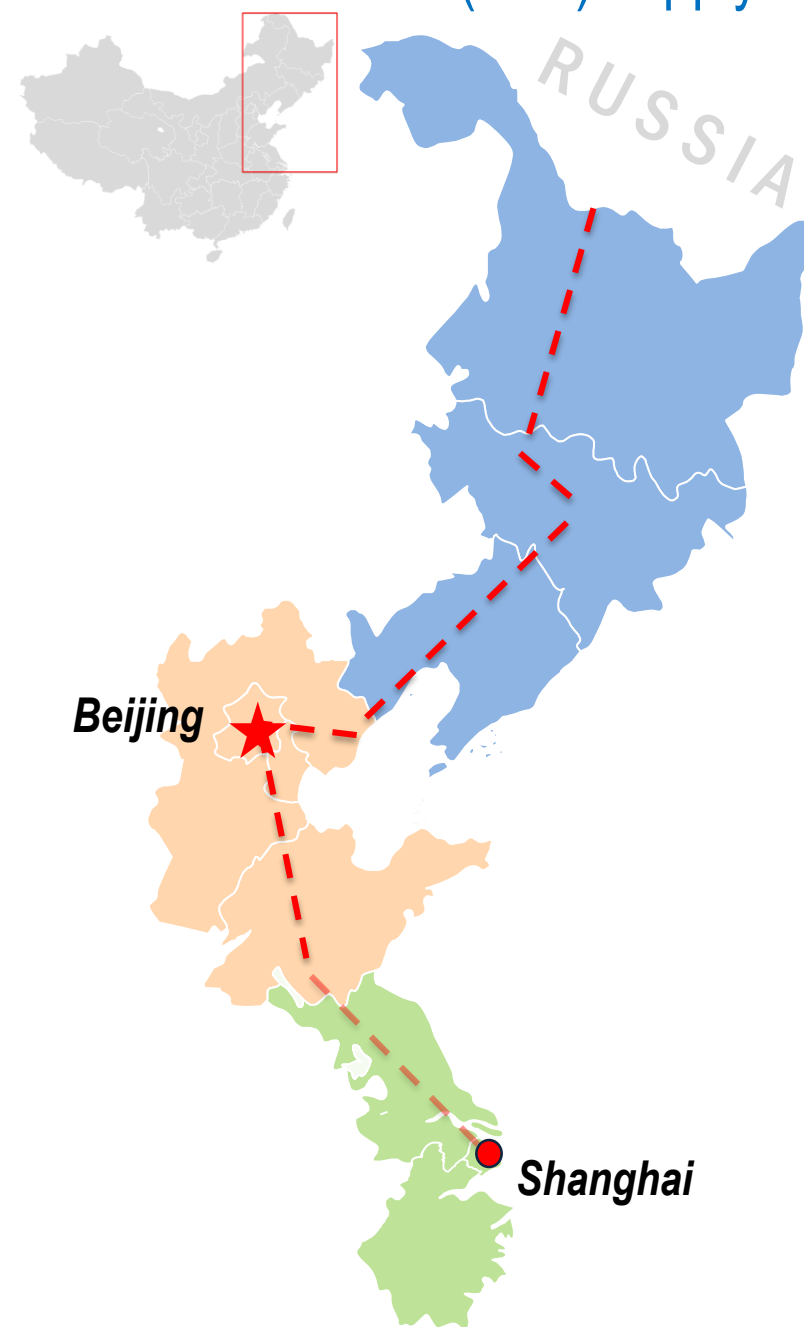


CHINA'S SHALE GAS PRODUCTION WILL FALL SHORT OF TARGETS AND WILL HAVE LIMITED INFLUENCE ON GAZPROM'S SUPPLY

PIPE IMPORTS. POWER OF SIBERIA: GAME-CHANGER



Power of Siberia (PoS) supply competitiveness (Q1 2020 China Customs data)



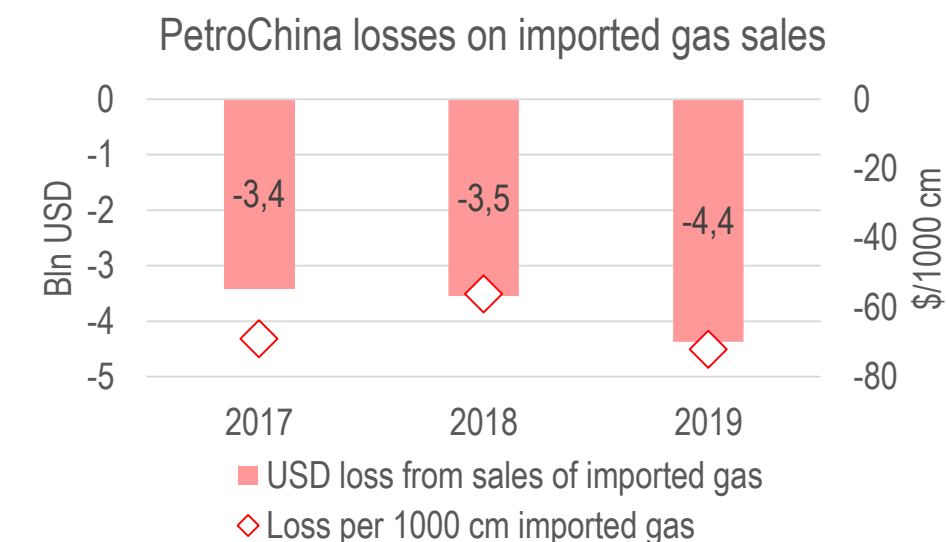
*In case of LNG no distribution fee included
 **JKM average in Q1 2020 for LNG (spot)

Power of Siberia is a win-win for both buyer and seller

- Competitive oil-linked contract formula and short transport distance (compared to Central Asian gas) makes Power of Siberia (PoS) gas supply one of the most competitive import supply sources in all target regions: North-East, North (Beijing), East (Shanghai).
- According to China Customs data, in Q1 2020 PoS helped CNPC to “breakeven” in North-East and North (Beijing) region (no supply to Shanghai yet). This makes PoS one of the most desirable import sources for CNPC, who has been reporting losses on gas imports under legacy pipeline and LNG oil-linked contracts. A return on investment for Gazprom combined with no further losses for CNPC can be referred to as the so-called 'golden mean' of this deal.
- In 2019, PetroChina reported losses associated with gas imports (\$4,4 bln total or ~\$70 per 1000 cm; 23% higher than in 2018). Due to pricing regulations and the high cost of delivering imported gas to consumption centers, PetroChina has been unable to turn a profit on its import operations. This may change with the further development of pipeline imports from Russia.

Russian pipeline gas is the preferable import source for CNPC, guaranteeing high nominations and high utilization rate of the PoS pipeline

Sources: Wood Mackenzie, IHS Markit, Thomson Reuters, China Customs

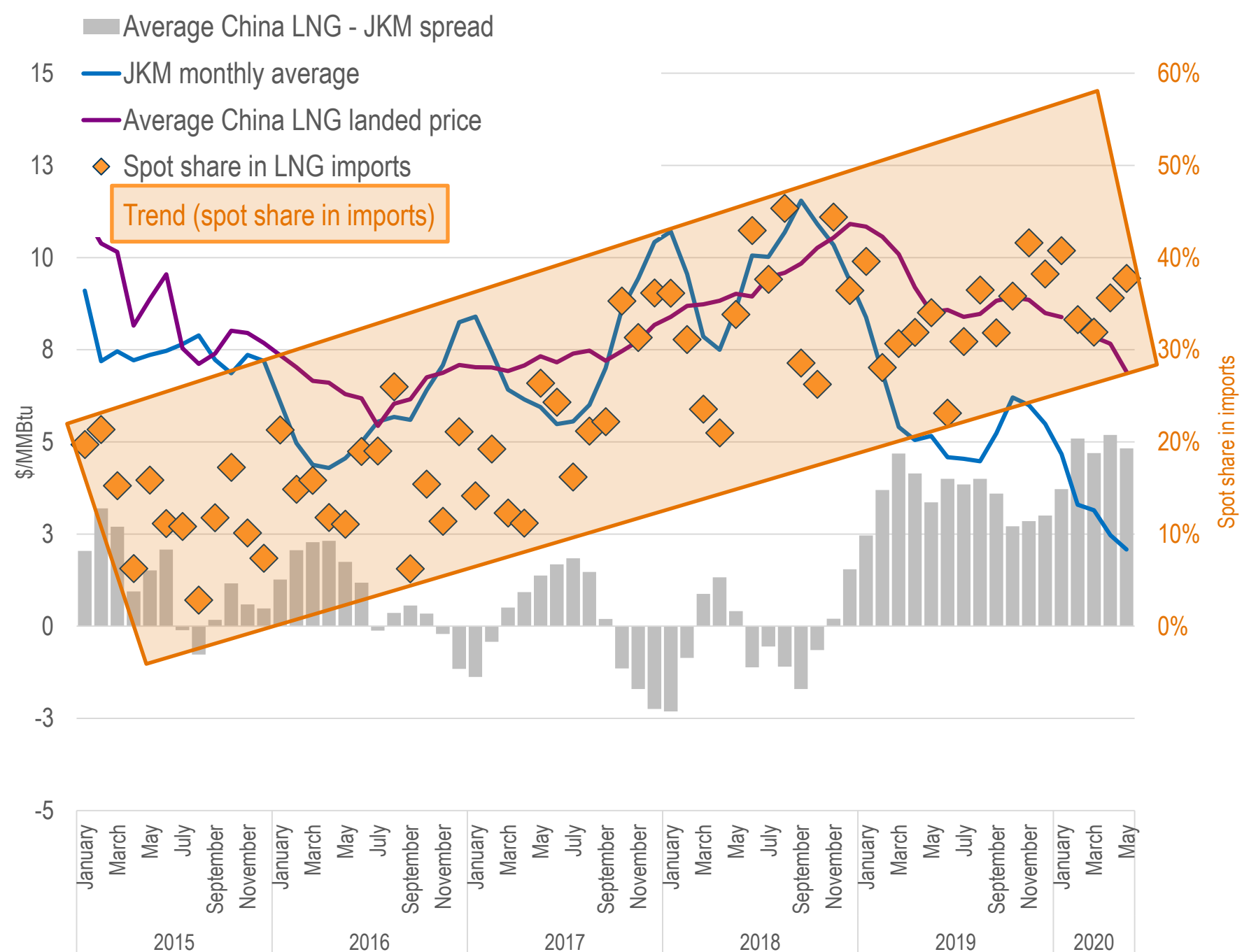


COMPETITIVE IMPORTS VIA POWER OF SIBERIA WILL STRENGTHEN CHINESE APPETITE FOR NEW SUPPLY OF RUSSIAN PIPELINE GAS

LNG IMPORTS. GROWING EXPOSURE TO SPOT



China LNG import prices and spot purchases



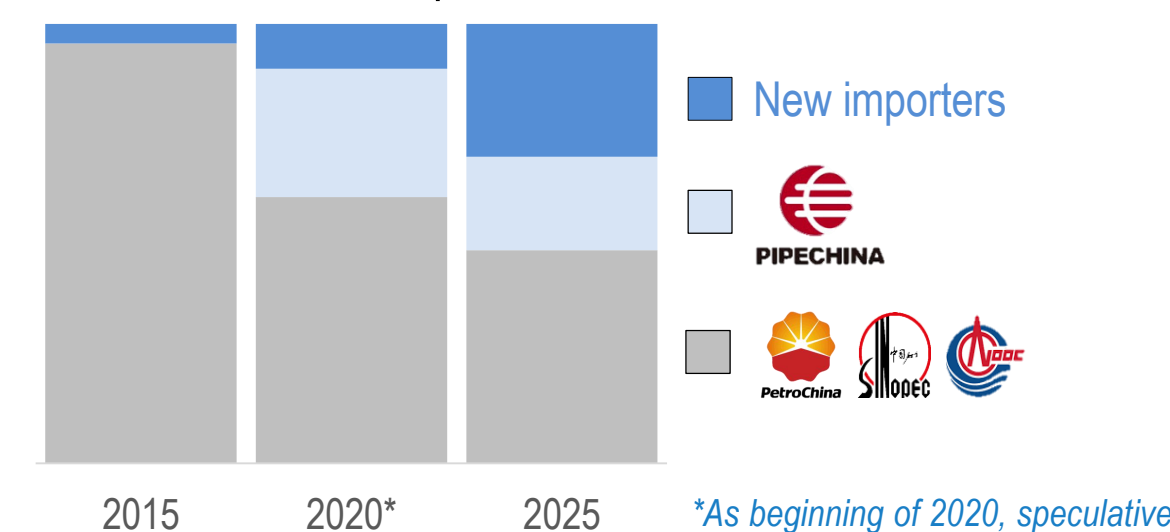
China's LNG procurement strategy and midstream reform

- China's LNG average landed price, mainly based on long-term contracts, effectively 'smoothed out the peaks and troughs' of Asian spot price (JKM) volatility in 2015-2018.
- However, against the backdrop of the Asian spot prices meltdown since 2018, the differential between average LNG landed prices and Asian spot prices dramatically increased to the level of up to \$5/MMBtu in 2020.
- In response to the spot price decrease, Chinese buyers have stepped-up spot purchases, whose share has raised from 10-20% in 2015-2016 to the level of 30-40% of LNG imports in 2020. China is expected to continue to intensify spot purchases as long-term contracts expire.
- In the future, China will be even more exposed to LNG market volatility as midstream reform unveils and new buyers with small LNG portfolio increase their activity in the LNG market both through their own terminals and PipeChina infrastructure.

China will become more exposed to the liquid LNG spot market as spot purchases increase and midstream reform gains momentum

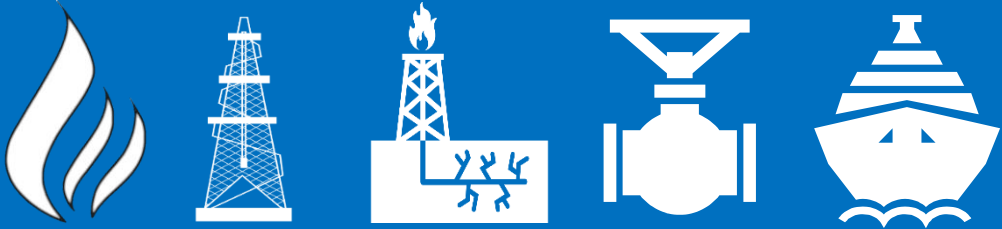
Sources: Wood Mackenzie, IHS Markit, Thomson Reuters

LNG terminals development forecast

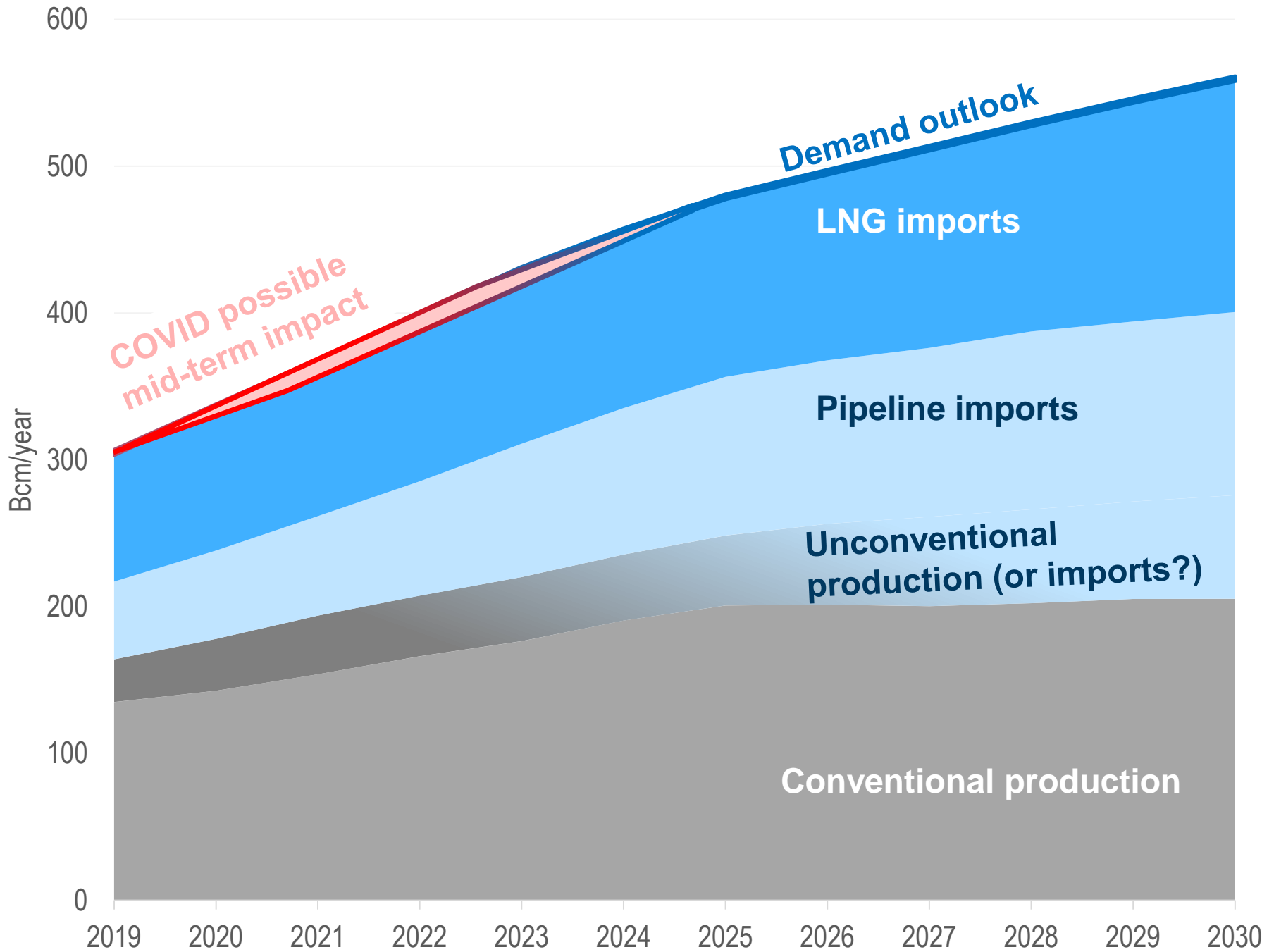


WHILE EXPOSURE TO VOLATILE LNG MARKET GROWS, CHINESE BUYERS WILL NEED A MORE STABLE PIPE SUPPLY AS A BASELOAD


CHINA GAS MARKET OUTLOOK. CONCLUSIONS




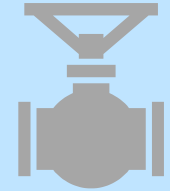
China gas supply mix – long-term outlook

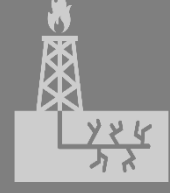


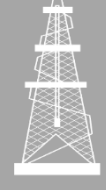
Demand and sources of supply: findings

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Gas demand:
PoS target markets to become centers of demand growth
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LNG imports:
China will be more exposed to volatile spot market
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Pipeline imports:
PoS to become win-win project for Gazprom and CNPC
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Unconventional gas production:
Shale development will barely influence supply balance
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Conventional production:
Output growth rate may decline due to external factors

GAZPROM'S PIPELINE EXPORTS ARE EXPECTED TO BECOME A MAJOR NEW SUPPLY SOURCE TO THE FAST-GROWING CHINA'S MARKET

**THANKS
FOR YOUR ATTENTION**