

Natural Gas in China – Prospects for the Future

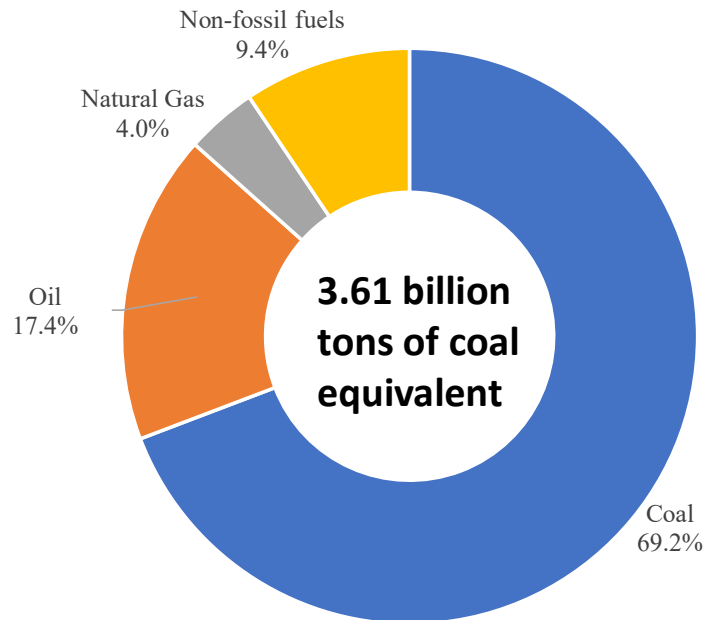


北京大学能源研究院
INSTITUTE OF ENERGY

China Energy System's Decarbonization

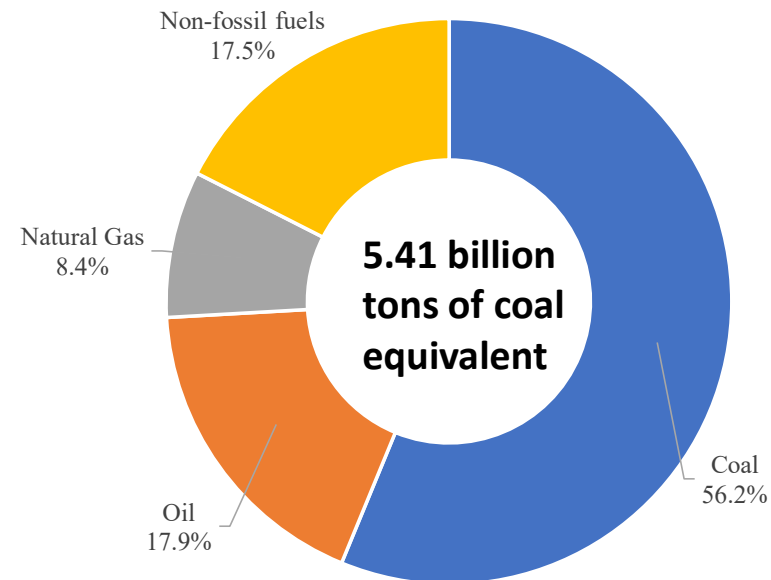


China's energy consumption mix in 2010



1 ton of coal equivalent = 0.7 ton of oil equivalent

China's energy consumption mix in 2022



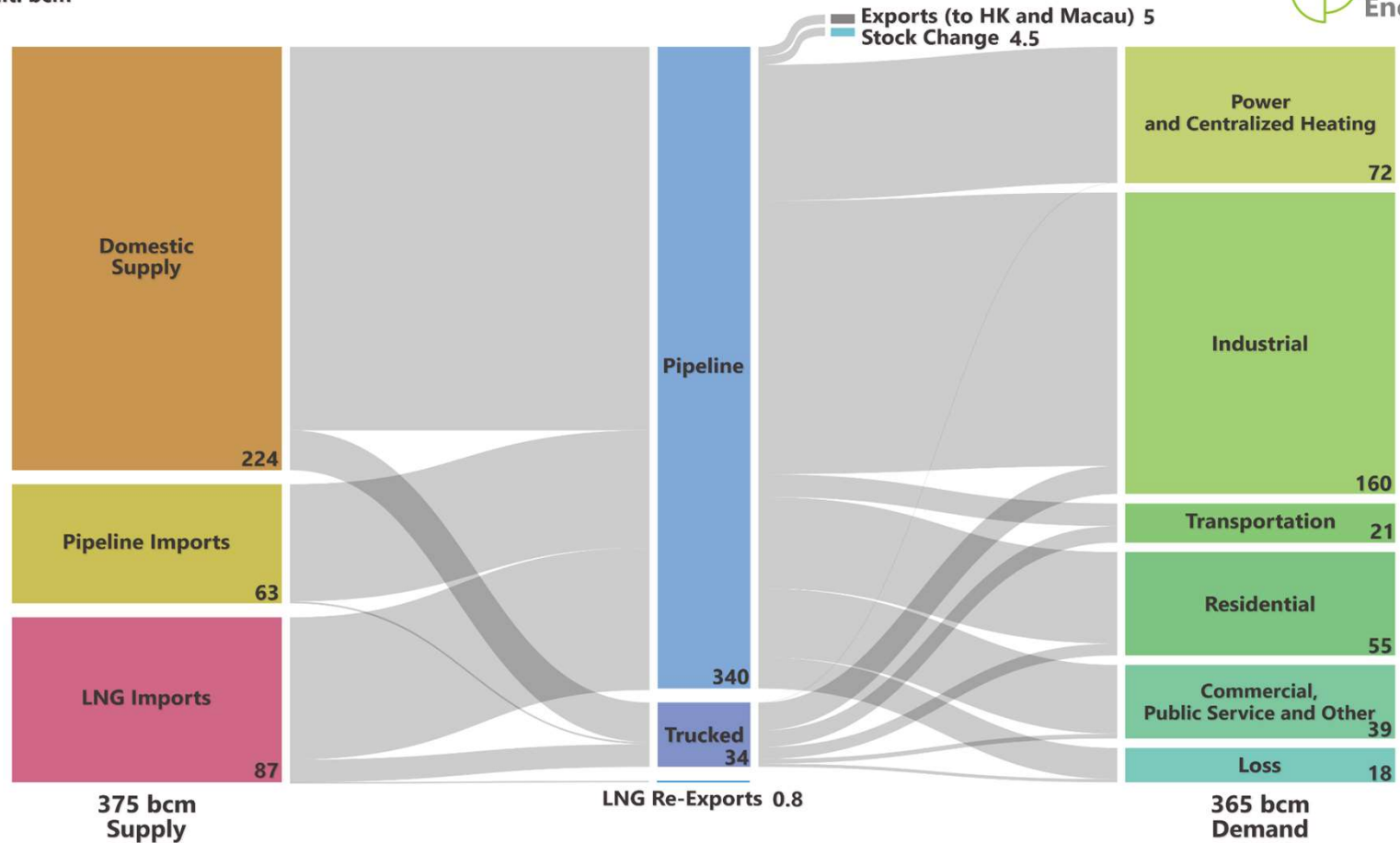
Data source: National Bureau of Statistics of China

Where the gas comes and go



China Natural Gas Supply and Demand Flow 2022

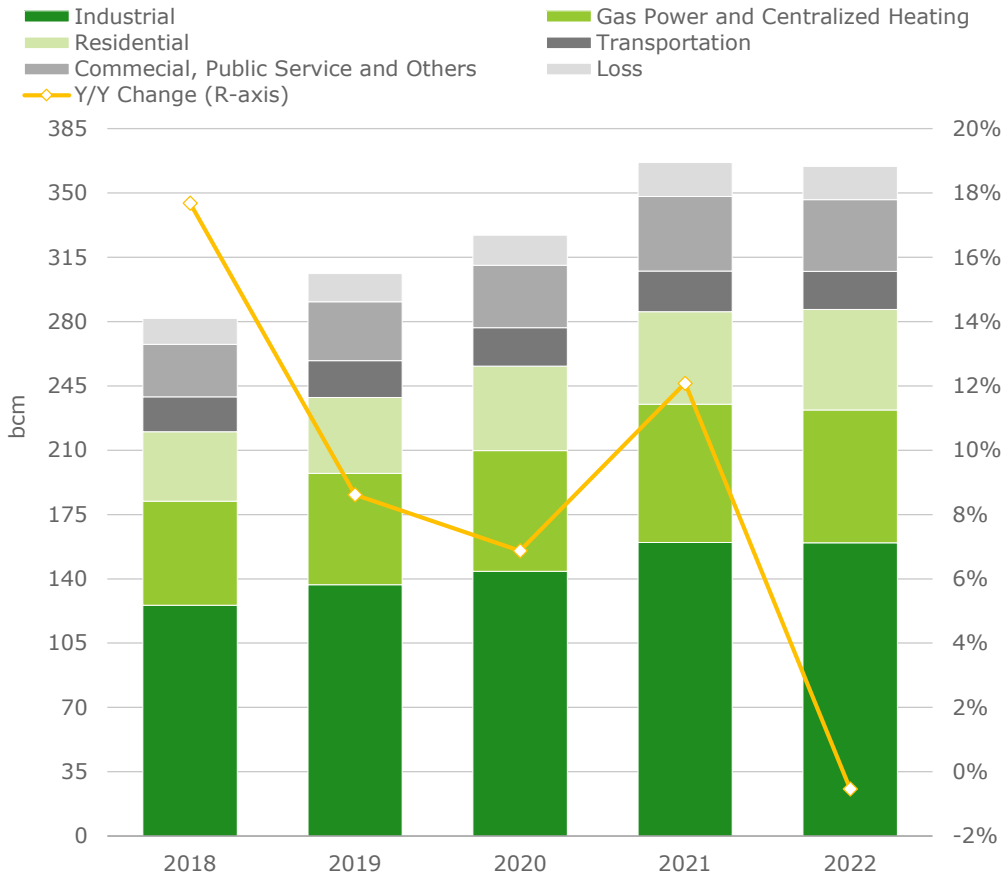
unit: bcm



The first YoY decrease in the decades

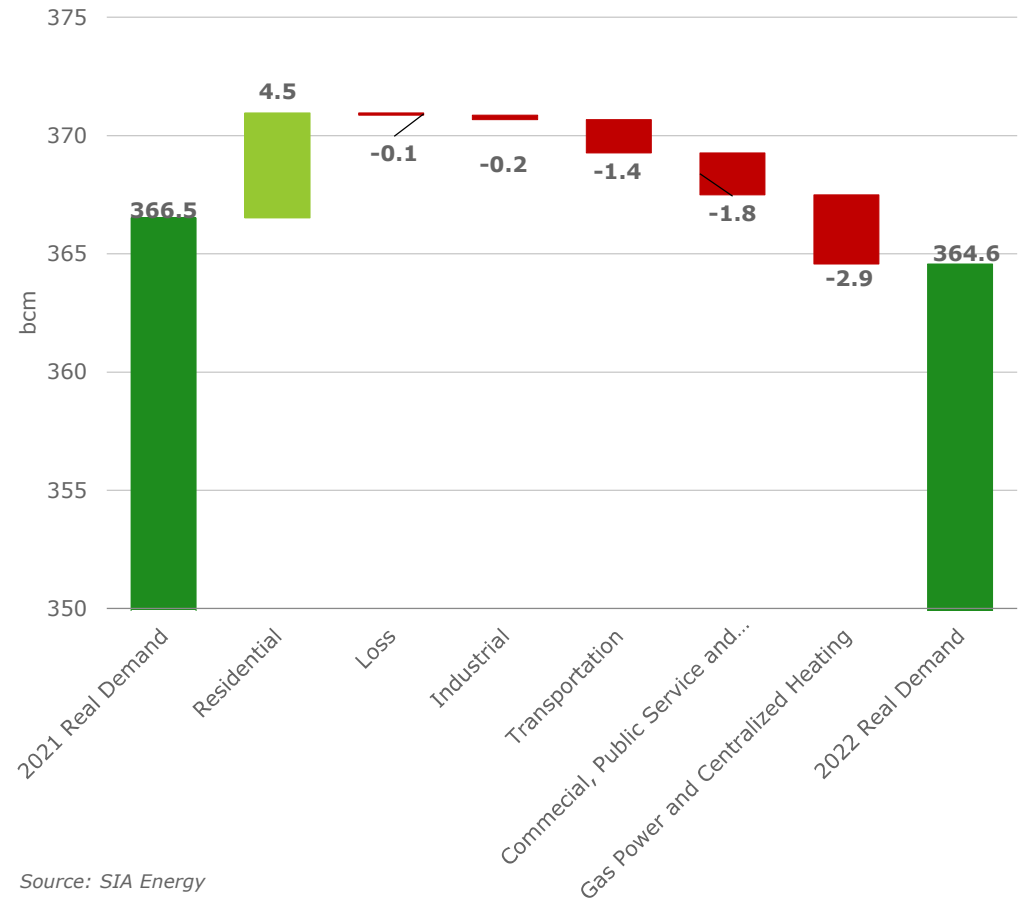


China Annual Gas Consumption by Sector



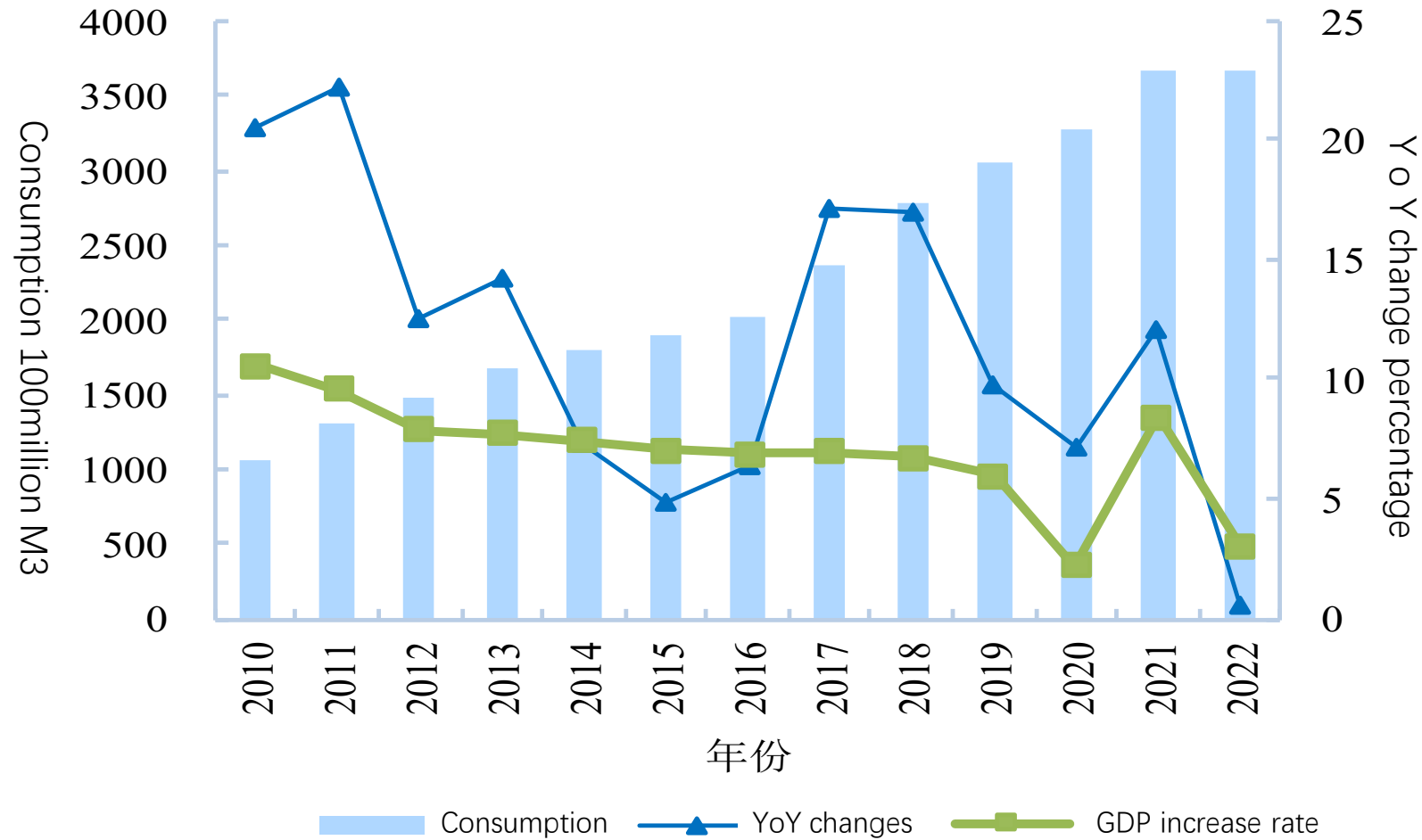
Source: SIA Energy

China Sectoral Gas Demand Change 2022 vs. 2021



Source: SIA Energy

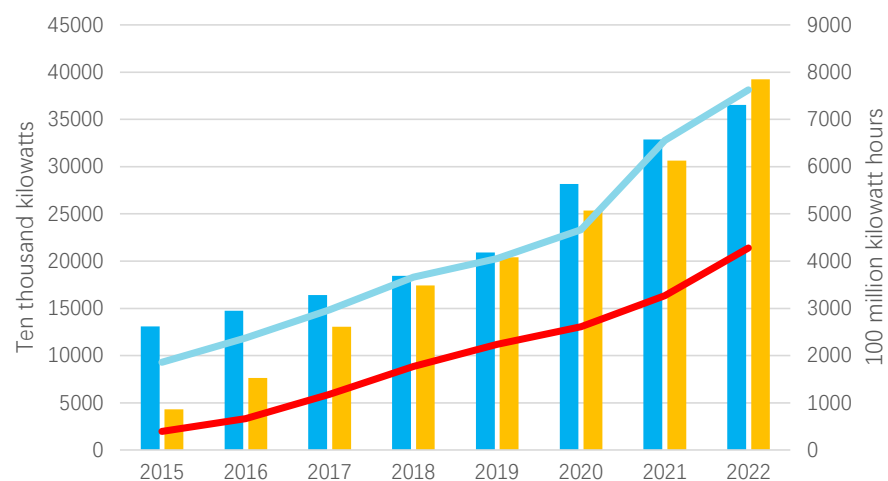
Gas consumption is market and policy driven



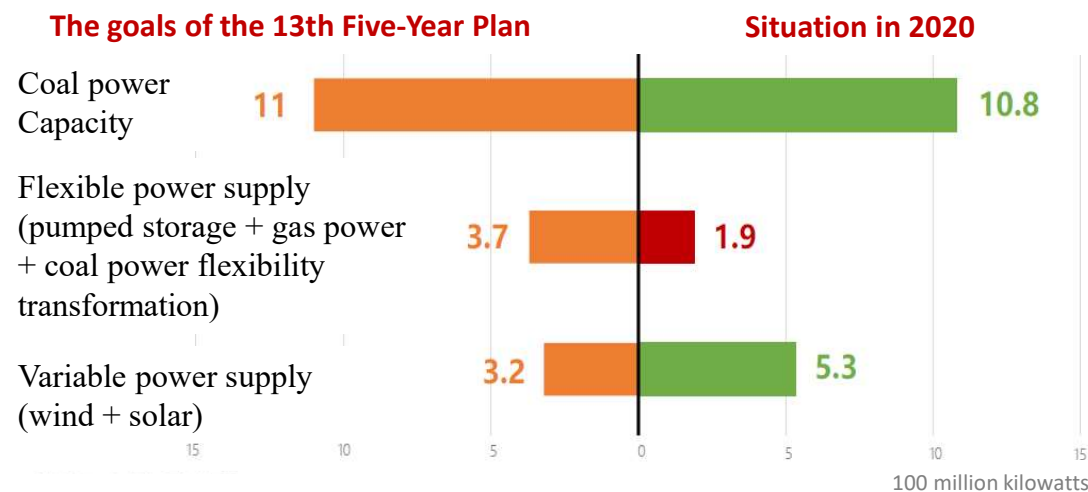
The energy system challenges



- By 2022, China's installed wind power capacity has reached 365 GW and photovoltaic capacity has reached 393 GW, increasing 11.2% and 28.1% respectively compared to 2021.
- The flexibility of China's power system is insufficient, and the safety issues increasingly become concerns.



■ Installed wind power capacity (10,000 kW) ■ Photovoltaic installed capacity (10,000 kW)
■ Wind power generation (100 million KWH) ■ Photovoltaic power generation (100 million KWH)



Data sources: China Electricity Council, National Energy Administration of China

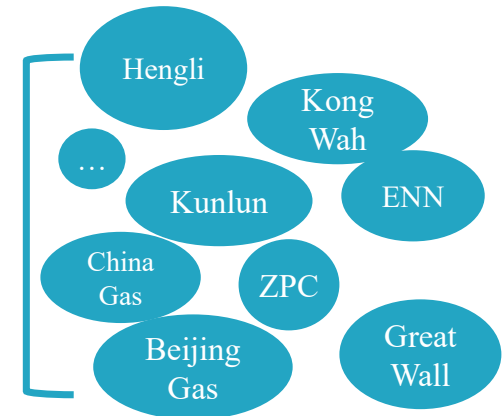
More momentum must be gained through reform



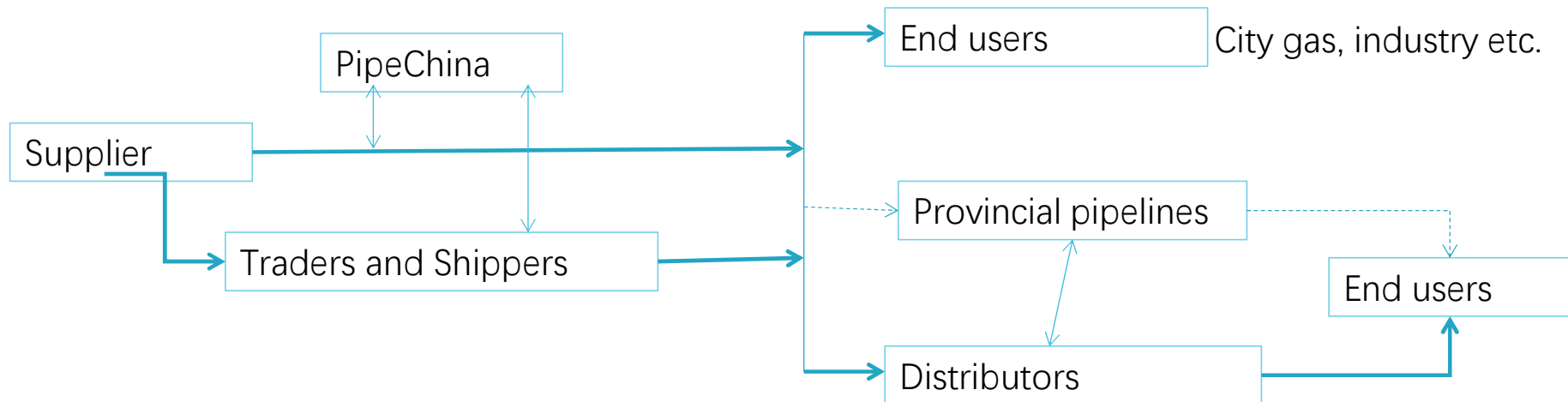
Upstream resources are supplied by multiple subjects and channels



Liberalize gas market by unbinding



Downstream market is fully competitive



More momentum must be gained through reform



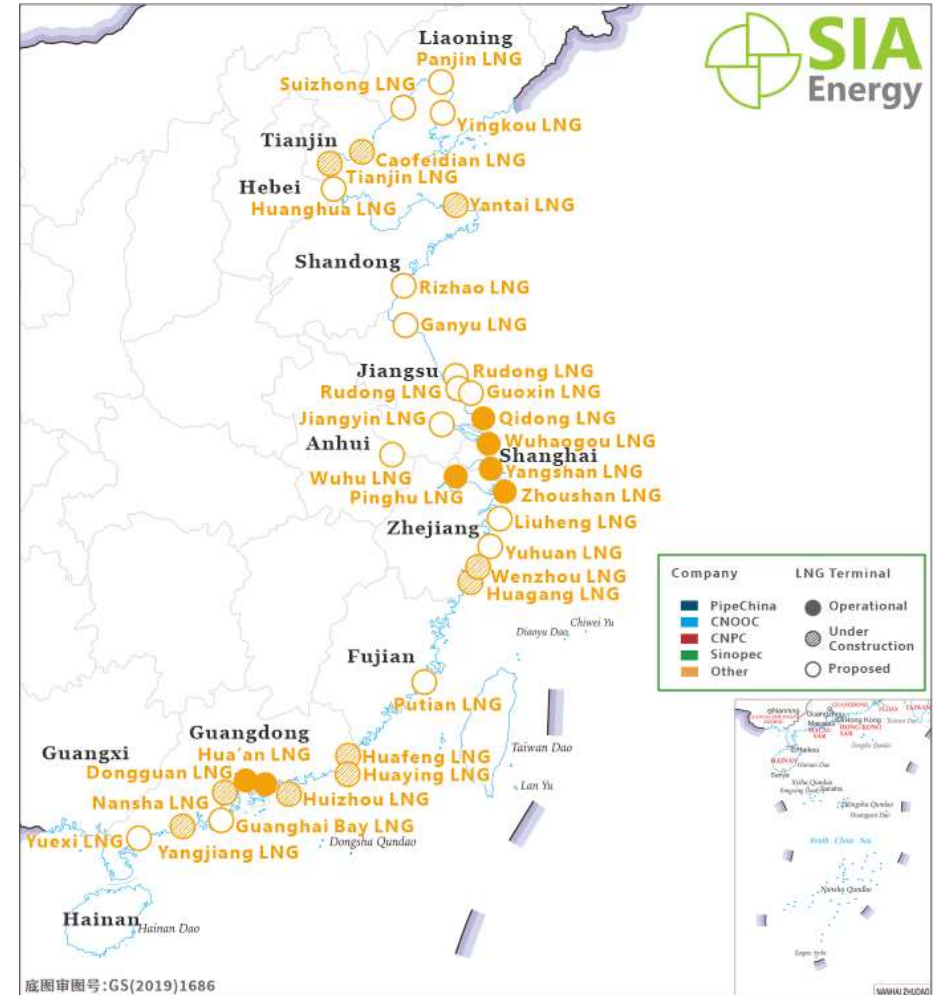
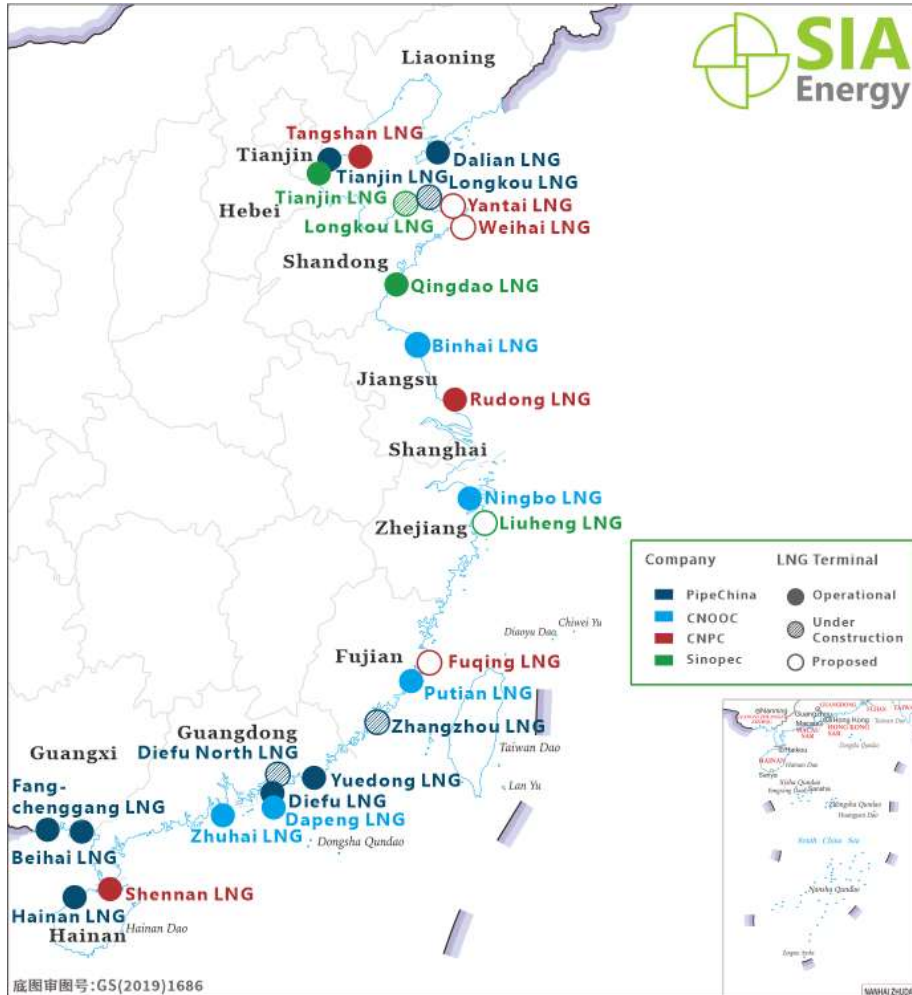
Who are taking actions?

Who may take actions?



Compared to NOCs, Tier-2 LNG players are more downstream-oriented, they desire to be more integrated along the value chain

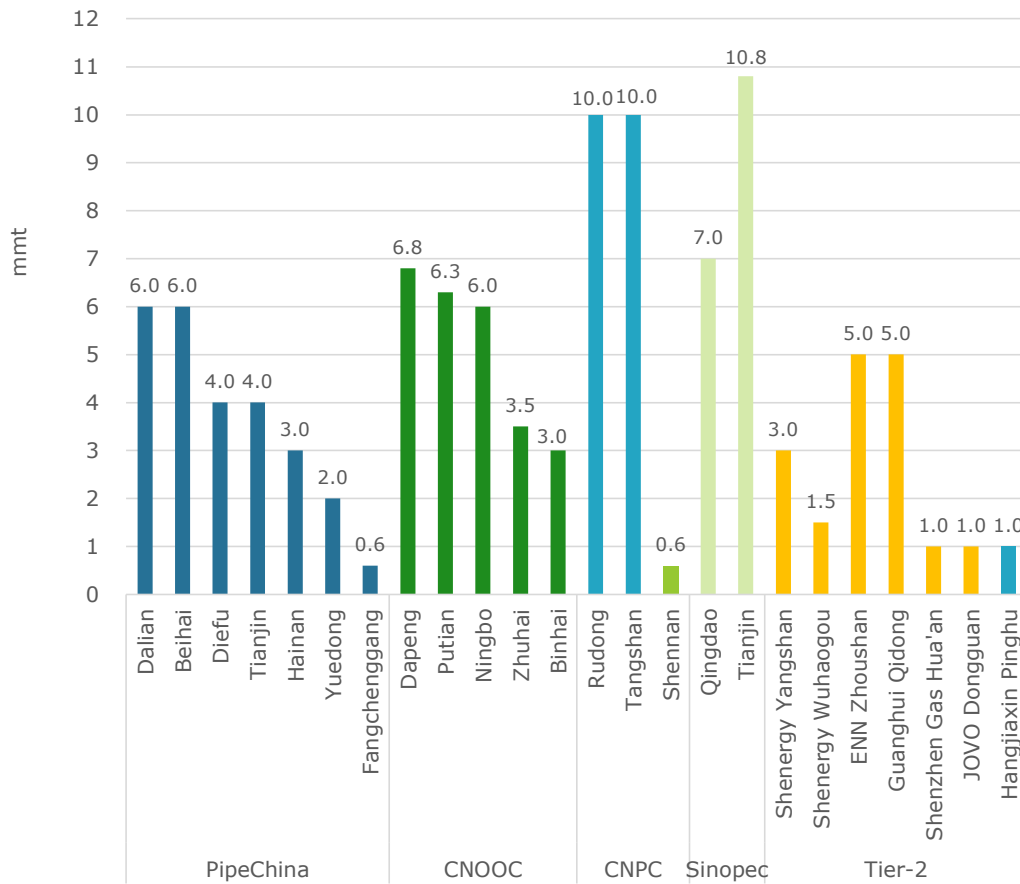
More Non-NOCs LNG terminals



More Non-NOCs LNG receiving capacity



LNG Receiving Capacity in Operation (Dec. 2022)



Source: SIA Energy

China LNG Receiving Capacity Outlook 2040



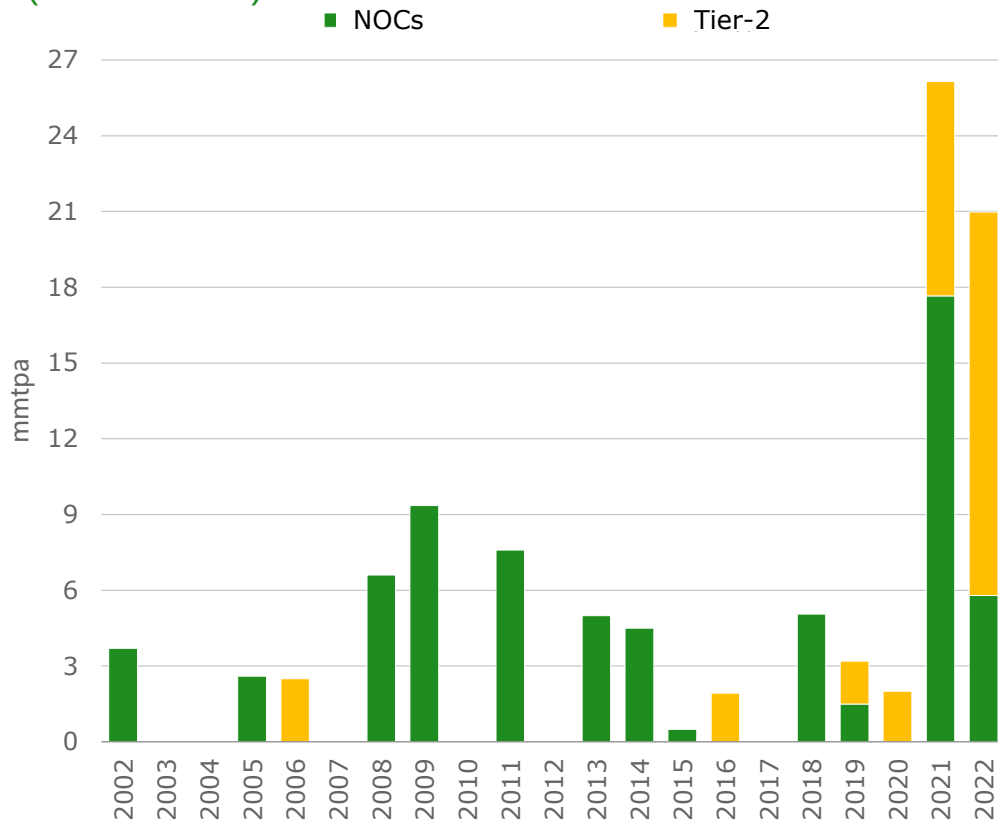
Source: SIA Energy

Tier-2 player's LNG receiving capacity will grow to 98 mmt by 2030 and 108 mmt by 2040, making up ~40% of total

More LNG contracts from Non-NOCs

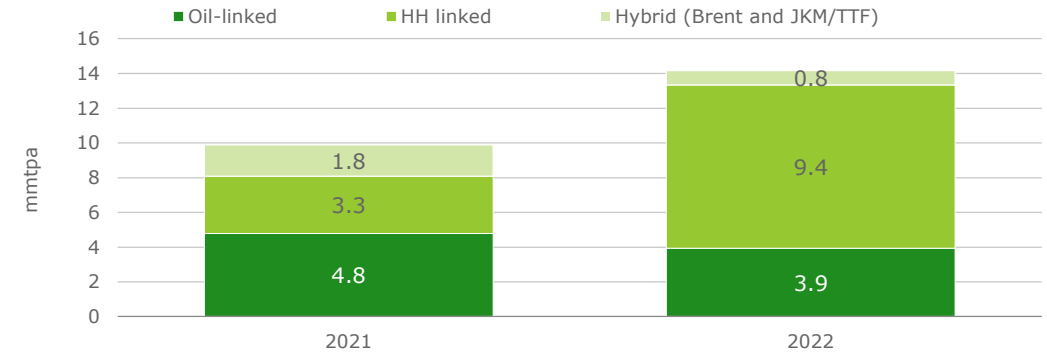


Long Term LNG Contracts Inked by Chinese Buyers (2002-2022)



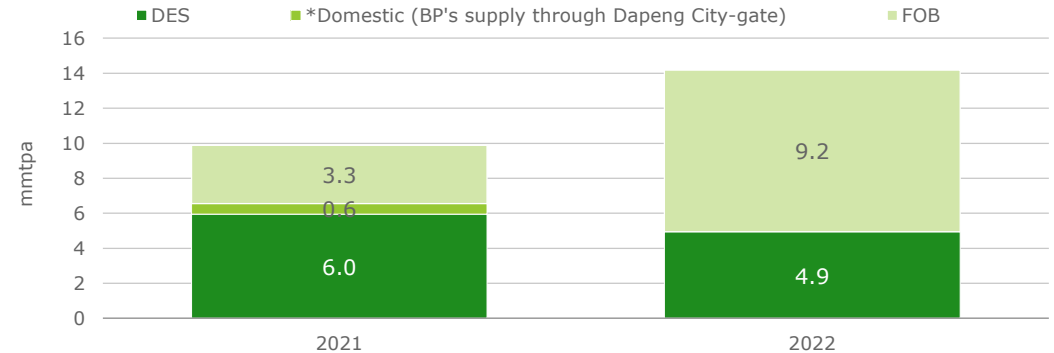
Source: SIA Energy

Tier-2 Players' Newly Signed Term Contracts by Pricing



*Sinochem's contracts with Foran and Guangzhou Development Gas Trading were excluded as they are the trading deals between tier-2 buyers.
Source: SIA Energy

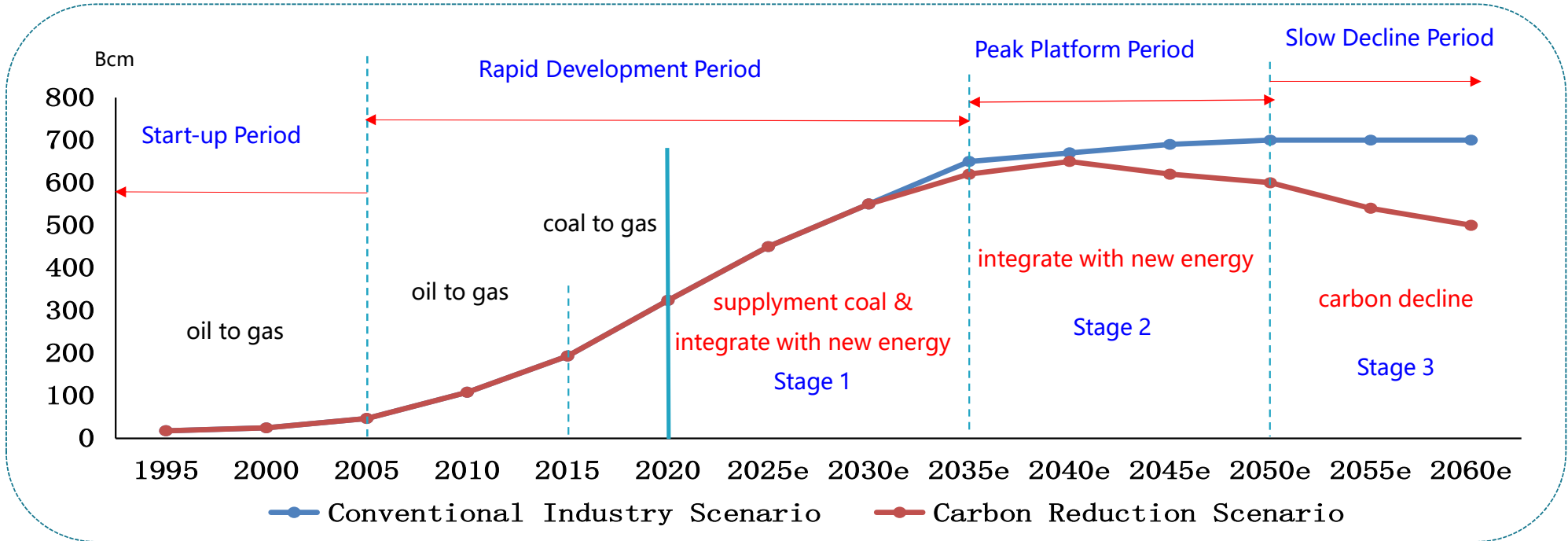
Tier-2 Players' Newly Signed Term Contracts by Delivery



*Sinochem's contracts with Foran and Guangzhou Development Gas Trading were excluded as they are the trading deals between tier-2 buyers.
Source: SIA Energy

48 mmtpa of long-term LNG contracts in the last two years, Tier-2 players contributed half

Outlook for the middle and long terms



- **Before 2035, rapid development period.** As a supplement to coal, natural gas will mainly fill the gap left by the reduction in coal consumption, while integrate with new energy.
- **2035-2050, peak platform period, reach its peak around 2040,** at approximately **650** billion cubic meters. Natural gas will mainly be driven by integrated development with new energy.
- **After 2050, slow decline period.** Carbon reduction will be achieved gradually through the withdrawal of decentralized utilization, with focusing on centralized utilization.

Prospects for the middle and long terms



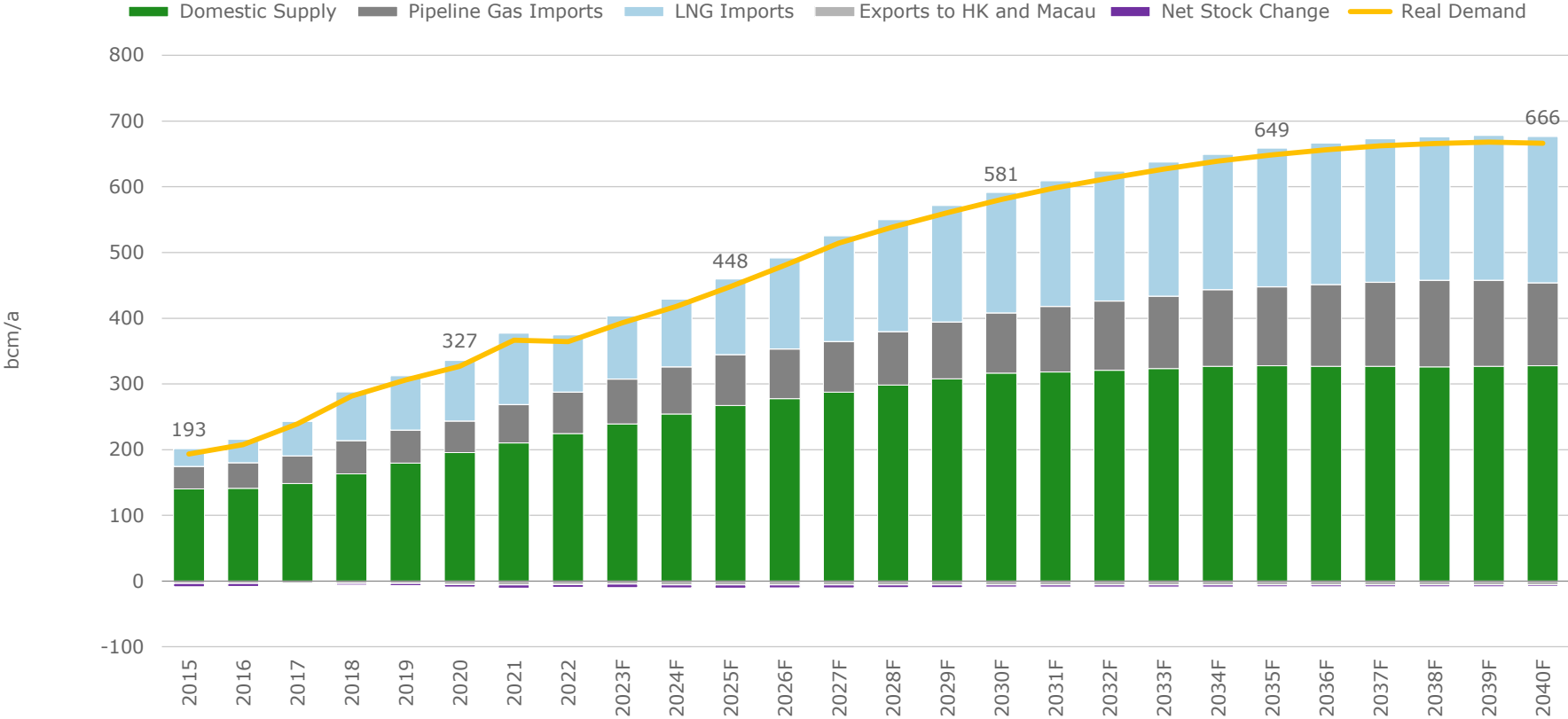
Period	Energy Characteristics	Main Roles	Application Scenario	Reasons
Before 2035	Low Carbon & High Efficiency	Basic Energy	<ul style="list-style-type: none">• Developed Coastal Provinces• Coal-fired Boilers and Kilns	<ul style="list-style-type: none">• With the retirement of coal power and the withdrawal of coal-fired boilers and kilns, there will be a shortage of local power and energy supply, which requires natural gas to fill the gap.
After 2035	Flexibility & Easy Storage	Peak Shaving Energy	<ul style="list-style-type: none">• Power System	<ul style="list-style-type: none">• Natural gas is helpful in solving the problem of "stable output" of wind and solar power.

- **Before 2035**, the role of a **basic energy** will be strengthened, due to the obvious advantages in low carbon and high efficiency
- **After 2035**, the role of a **peak shaving energy** will be more and more prominent, due to flexibility and easy storage

Outlook for the middle and long terms



China Gas Supply Forecast 2040

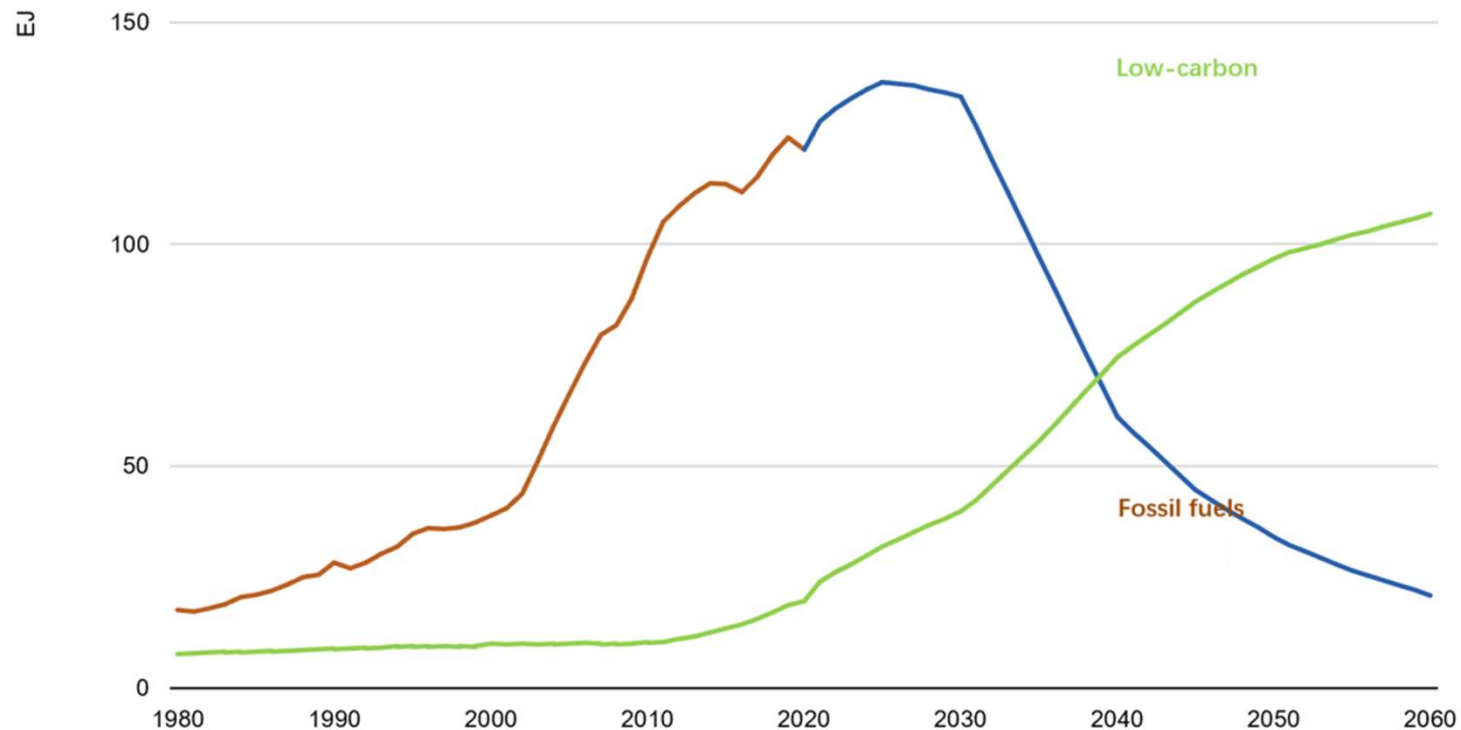


Source: SIA Energy

The whole picture



Primary energy demand projection under China's carbon neutrality pledge



Data source: IEA

- China's carbon neutrality pledge is an important contribution to the fight against climate change; but the global emissions budget for limiting the global temperature rise to 1.5 °C is very tight.
- China's commitment to carbon neutrality means that by around 2045 solar energy will become the most dominant primary energy source, and by 2060 demand for coal, oil and natural gas will drop by more than 80%, about 60%, and more than 40% respectively.



thanks

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