



CNPC

China's Natural Gas Market Overview

2016/11/9 · Tokyo





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2. Liberalization of China gas industry

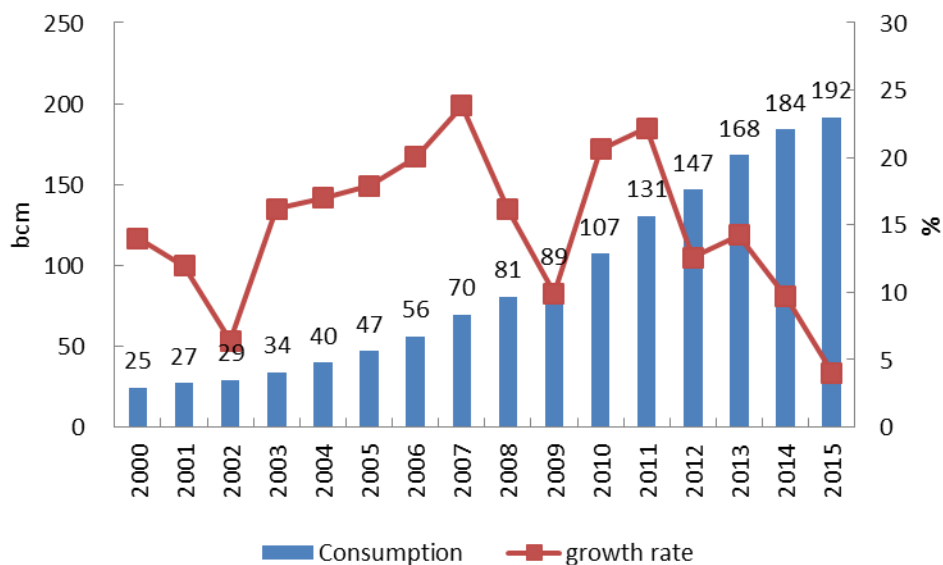
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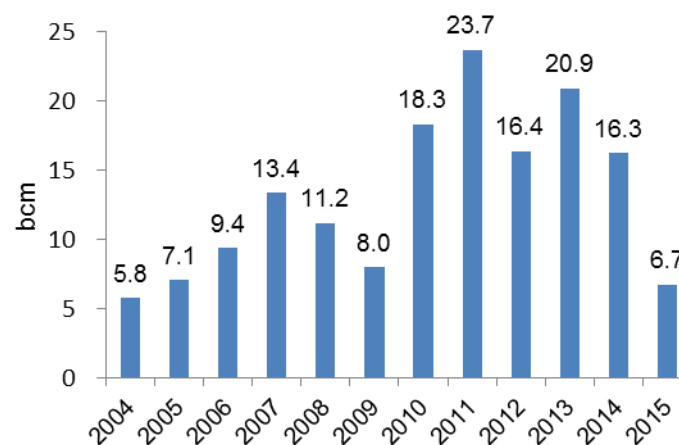
1.1 Gas demand growth slowed down in recent years

- During 2000-2013, China's gas consumption increased from 25 bcm to 168 bcm, with a skyrocketing average annual growth rate of 16%.
- In 2014 and 2015, gas consumption growth declined to 10% and 4%, due to
 - ✓ Economic downturn
 - ✓ Uncompetitive gas price
 - ✓ Alternative energy development
 - ✓ Mild weather



China's gas consumption, 2000-2015

Source: NDRC, CNPC ETRI



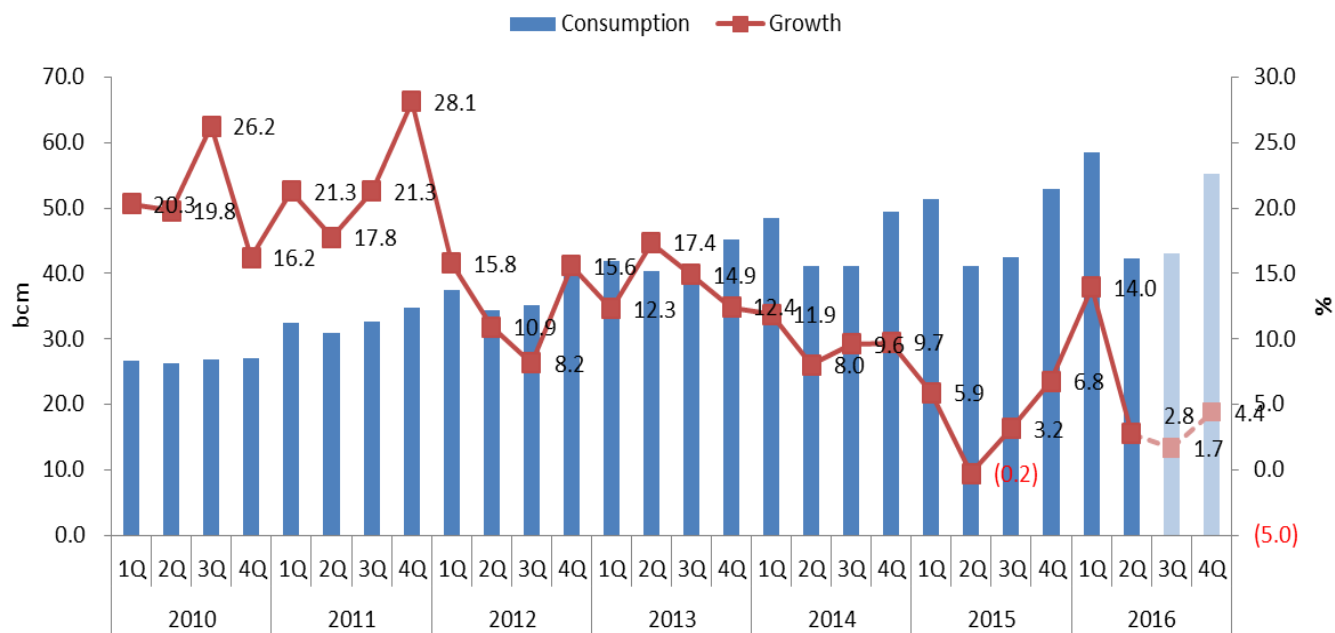
China's annual incremental gas consumption, 2000-2015

Source: NDRC, CNPC ETRI



1.1 Gas demand growth slowed down in recent years

- Gas consumption recovered during first half of 2016, totaled 100.7 bcm, increased by 9% y-o-y, due to
 - ✓ Low temperature during winter
 - ✓ Coal-to-gas switch projects
 - ✓ Lowered gate station gas price after Nov. 2015
- However, domestic demand is still generally weak influenced by economic gloom and over-capacity in power and industrial sectors.



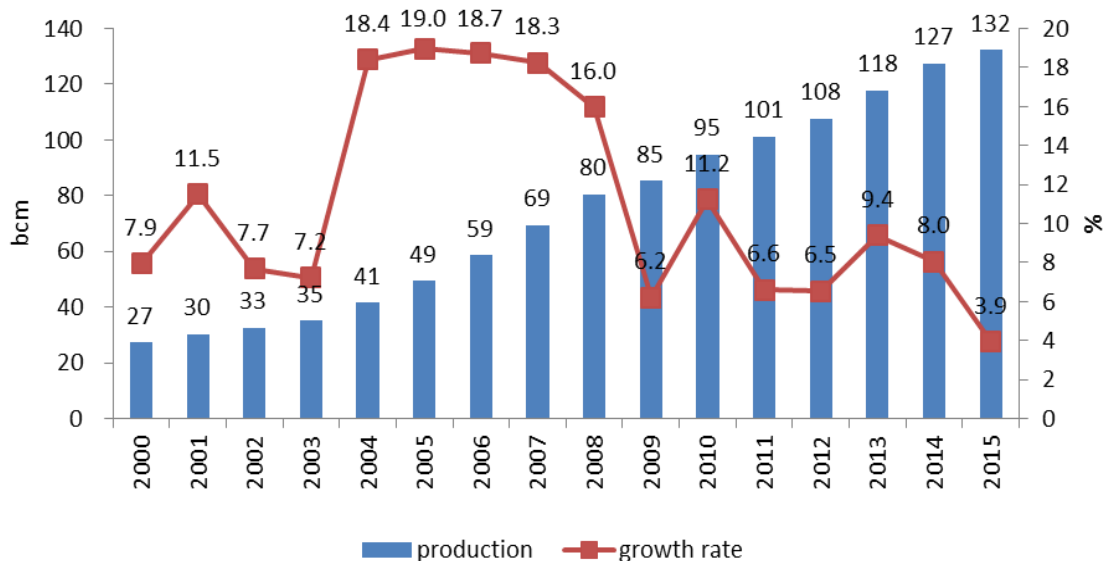
China's quarterly gas consumption, 2000-2016

Source: NDRC, CNPC ETRI



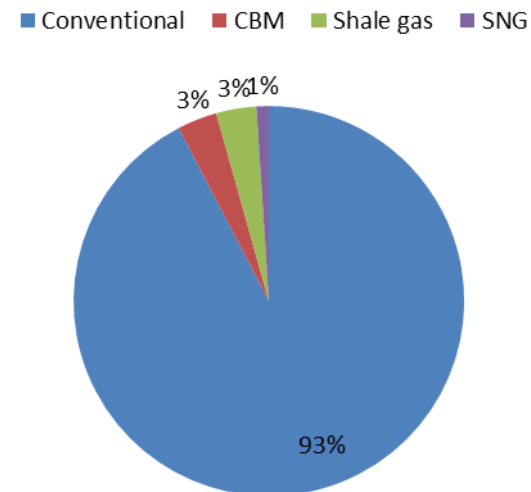
1.2 Domestic production kept tepid growth

- During 2000-2015, domestic gas production increased from 27 bcm to 132 bcm, with an average annual growth rate of 11%.
- In 2015, domestic gas production grew by 4% y-o-y.
 - CBM production was 4.4 bcm.
 - Shale gas output was 4.5 bcm.
 - Synthetic natural gas production was 1.4 bcm.
- Influenced by weak demand and LNG import increase, domestic production growth declined in 2016.



China's gas production, 2000-2015

Source: NDRC



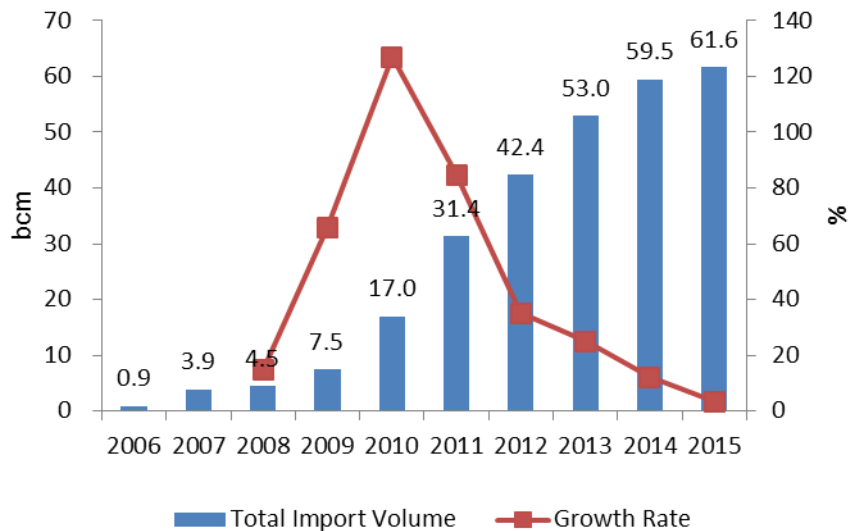
China's domestic gas production, 2015

Source: NDRC



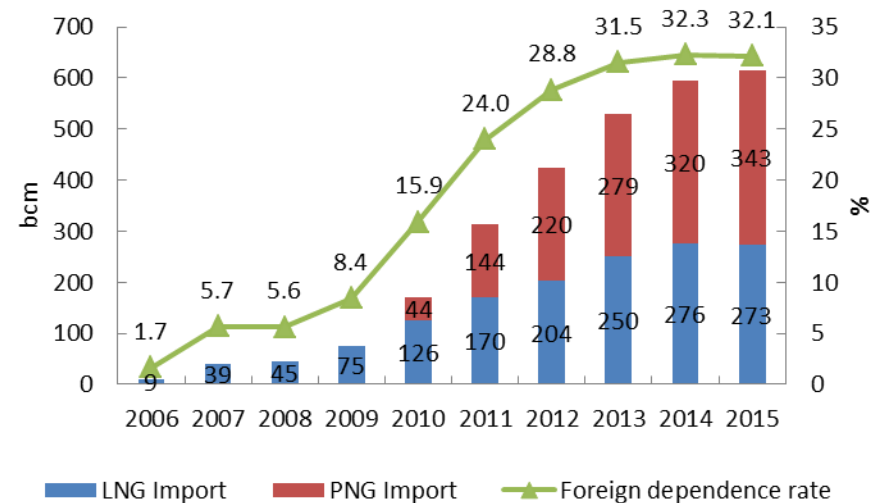
1.3 Gas import growth declined in recent years

- In 2015, China's natural gas imports totaled 62 bcm , with y-o-y growth rate of 3.5%.
- Foreign dependence rate: 32%.
- PNG imports: 34 bcm, grew by 7%.
- LNG imports: 19.65 MT(27 bcm), dropped by 1%.



China's gas import, 2006-2015

Source: China Customs



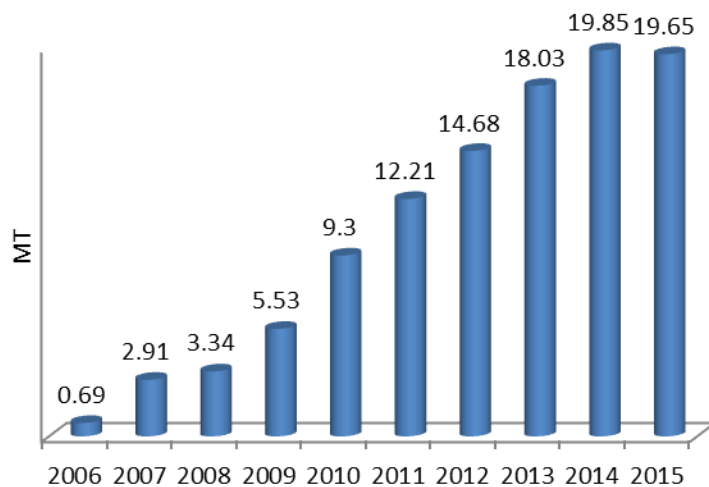
China's LNG and PNG import, 2006-2015

Source: China Customs



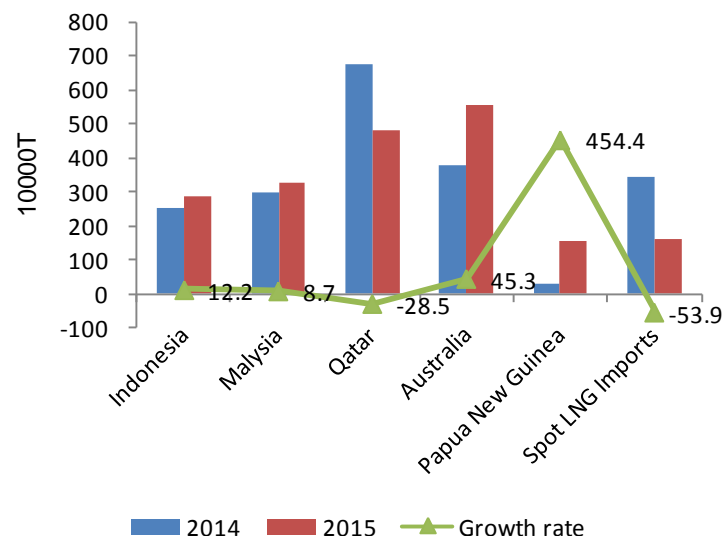
1.4 LNG import decreased for the first time in 2015

- Influenced by weak demand, in 2015, spot and short-term LNG import decreased sharply
 - by 54%, accounting for 8% of total gas imports (down from 17.5% in 2014).
 - Medium and long-term LNG import increased by 10%, accounting for 92% of total imports (up from 82.5% of 2014)
- In 2015, import volumes from Qatar dropped by 29% y-o-y; imports from PNG significantly rose.
- CNOOC and Sinopec are looking to sell their long-term LNG volumes.
 - CNOOC resold several QCLNG cargoes to European portfolio buyers
 - Sinopec resold several APLNG cargoes to Mexican, Singapore and Korea.



China's LNG Import, 2006-2015 (MT)

Source: China Customs



China's LNG Import growth rate by source in 2015

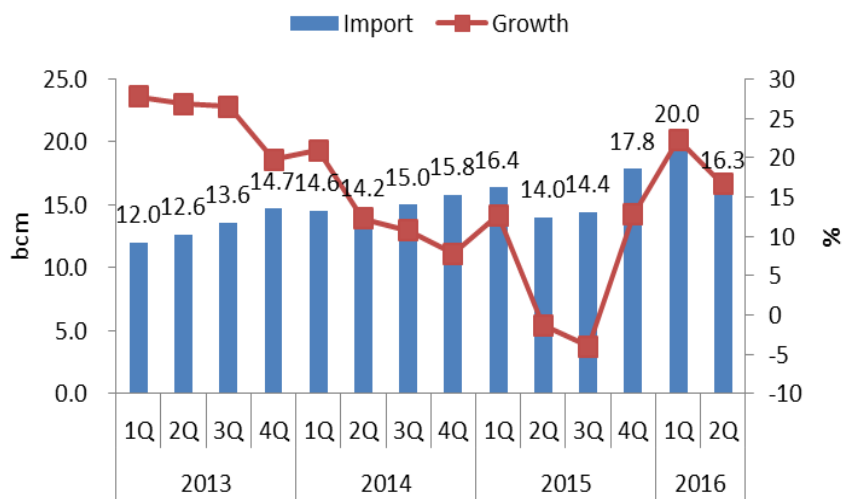
Source: China Customs



1.5 Gas import is picking up in 2016

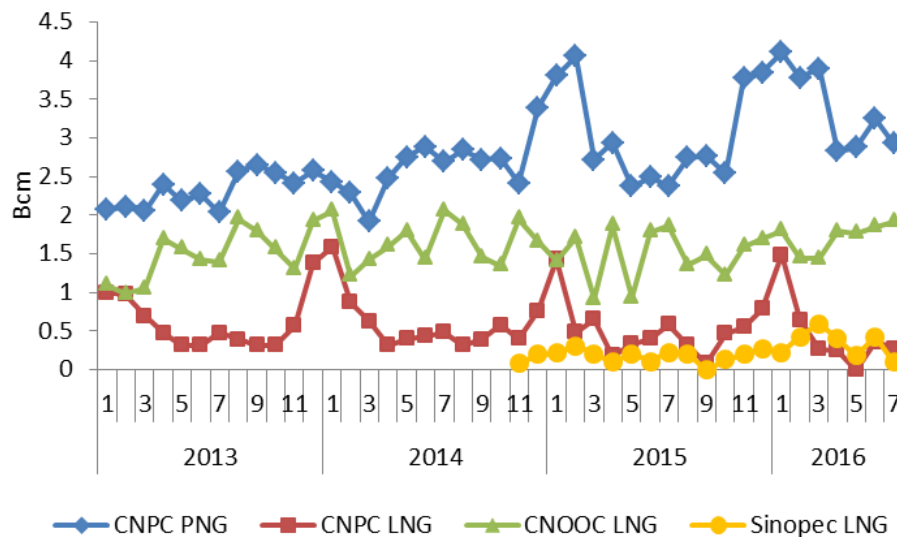
➤ Due to low LNG gas price and delivery of new contract volumes, gas import increased by 17% y-o-y from Jan to Jul

- PNG: 23 bcm, grew by 19% y-o-y
- LNG: 18 bcm, grew by 15% y-o-y



China's quarterly gas import, 2013-2016

Source: China Customs



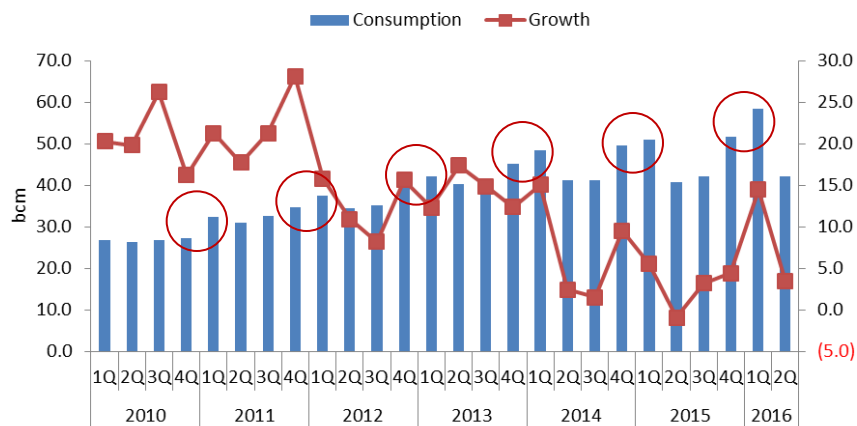
Monthly PNG and LNG import by companies, 2013-2016

Source: China Customs



1.6 Supply shortage during peak season

- The sharp temperature differences between winter and summer in northern China have led to the noted fluctuations in gas consumption throughout a year.
- During peak seasons, many industrial users have to reduce or stop using gas.
- Lack of gas storage capacity is the main reason. By the end of 2015, China has built 11 gas storages (groups), working capacity of 5.3 bcm, accounting for only 2.7% of total gas consumption, well below the world average.



China's quarterly gas consumption, 2010-2016

Source: NDRC, CNPC ETRI

Gas storage versus gas consumption for main countries

	Number of Gas storage	Working Capacity (Bcm)	Total Gas Consumption (Bcm)	Working Capacity/ Total Gas Consumption
US	400	133.7	759.4	18%
Russia	24	69.6	409.2	17%
Canada	61	23.2	104.2	22%
France	13	12.2	35.9	34%
Netherlands	5	10.2	32.1	32%
China	11	5.3	193.2	2.7%

Source: IEA



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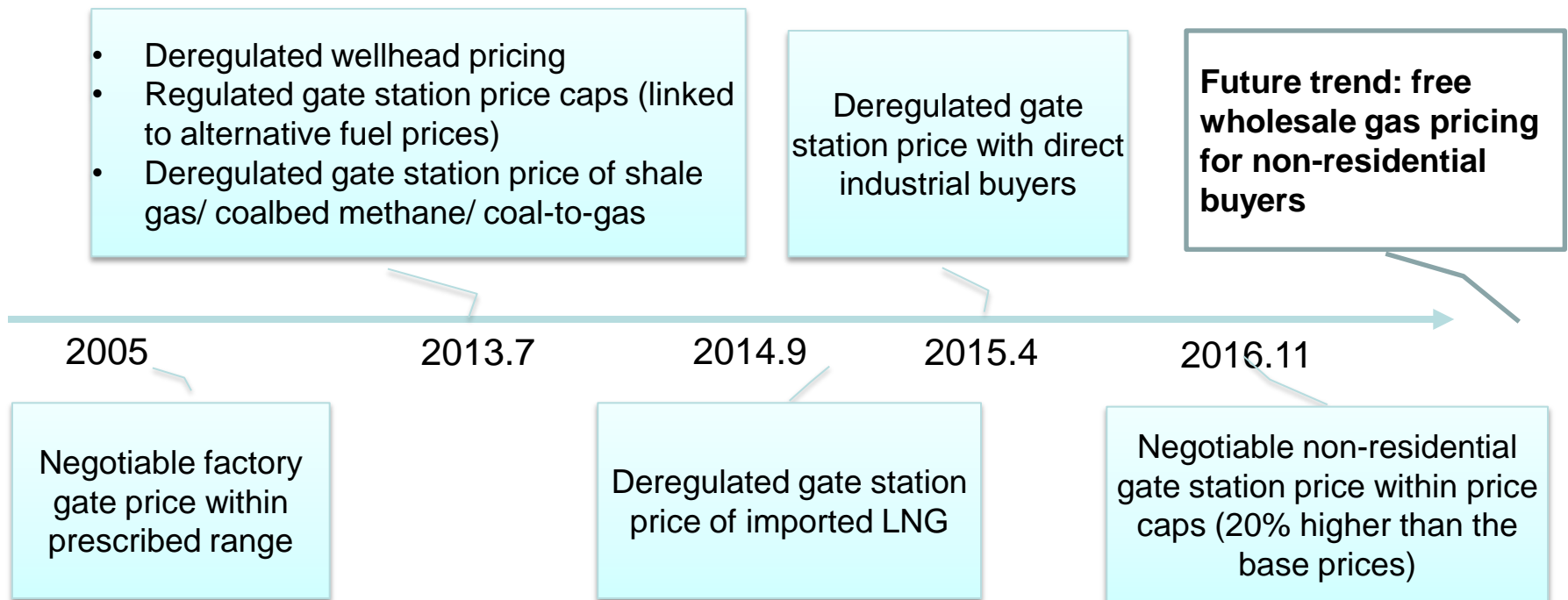
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2.1 Deregulation of wholesale gas pricing is underway

- Deregulation of wholesale gas prices (gate station prices) accelerated in recent three years. For non-residential users, free wholesale gas pricing will be a trend.
- However, gas prices for residential users remain to be regulated, and unreasonably low compared to the distribution costs.





2.2 Gas pipeline reform accelerated

- The government is pushing independent operation and third-party access of gas infrastructure, and
- Reinforcing regulation of gas pipeline rates – including both national and provincial pipelines.

2014.2, NEA

- Requires TPA of infrastructure if surplus capacity is available

2014.3, NDRC

- Encourages investment of gas infrastructure by all kinds of capital
- Requires independent accounting of gas infrastructure operation

2016.8, NDRC

- Policy for national gas pipeline pricing, base on “permitted costs plus reasonable profits”
- Policy for gas pipeline price supervision

2016.8, NDRC

- Policy to regulate provincial and local gas pipeline pricing
- Aimed to lower end-user's costs



2.3 Establishment of gas trading exchange

- Shanghai Petroleum and Gas Exchange started operation in July 2015. Aimed to provide price benchmark for Asian gas market.
- Main stakeholders: Xinhua News Agency, CNPC, Sinopec, CNOOC, Shenergy, Beijing Gas Group, ENN, etc.
- Jan-Aug 2016 trading volume: PNG 1.88 bcm, LNG 0.22 MT (0.31 bcm)
- Few participants, stale gas prices. -> More work need to be done to increase liquidity before the exchange became actually functional.

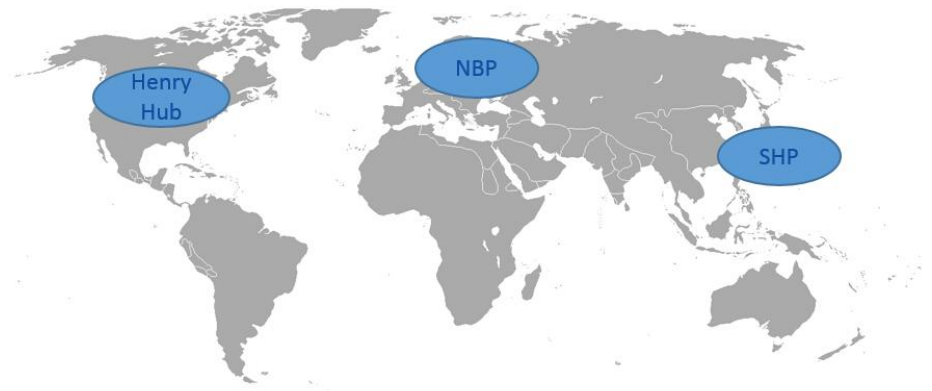




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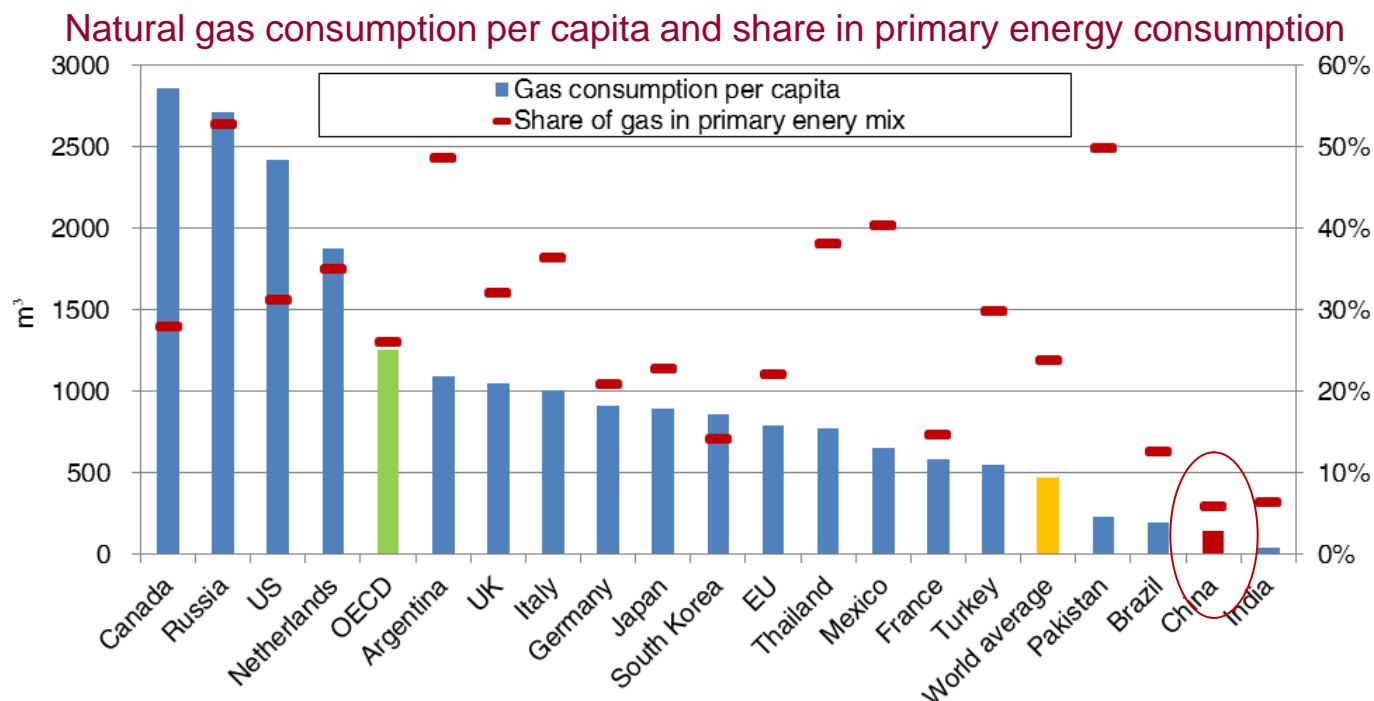
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3.1 Huge potential market

- China's per capita natural gas consumption was 144 m³ in 2015 and the share of natural gas in total primary energy consumption is only 6%, while the world averages were 472 m³ and 24%.
- China's gas market development is still in relative early stage. If calculated with world average consumption level, 1.4 billion population would mean a demand of 660 bcm.

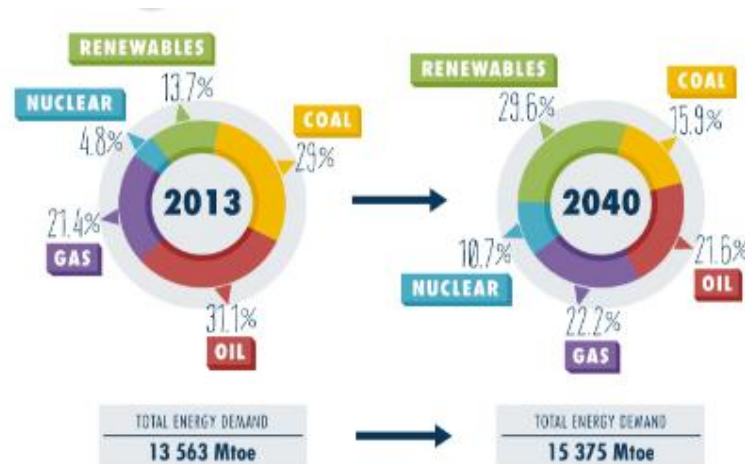
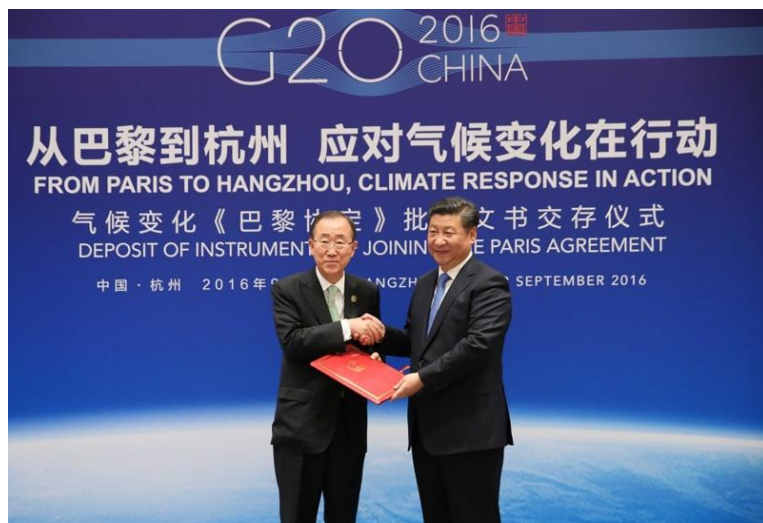


Source: BP, World bank



3.2 Opportunities from environment protection

- China's primary energy mix, which heavily relies on coal, has caused serious air pollution. As a major carbon emitter in the world, China has to limit its carbon emission.
- In September 2016, China announced to join the **Paris Agreement on Climate Change**. To reach the emission reduction targets under Paris Agreement, the share of coal in the energy mix must be cut down.
- Natural gas, which is much cleaner than coal, and cheaper and more reliable than renewables, is an effective way to cut emission and mitigate climate change.

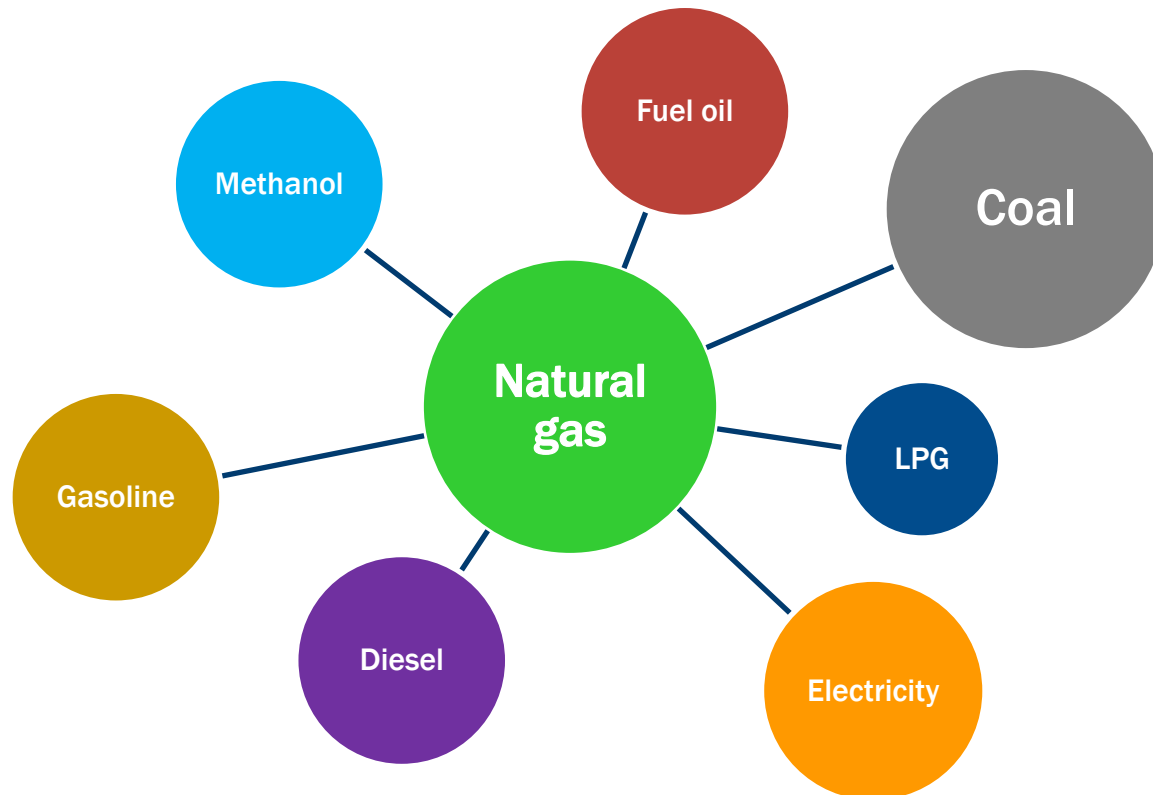


Global energy mix consistent with the 2°C goal set by Paris Agreement



3.3 Replacing coal will be the main potential market

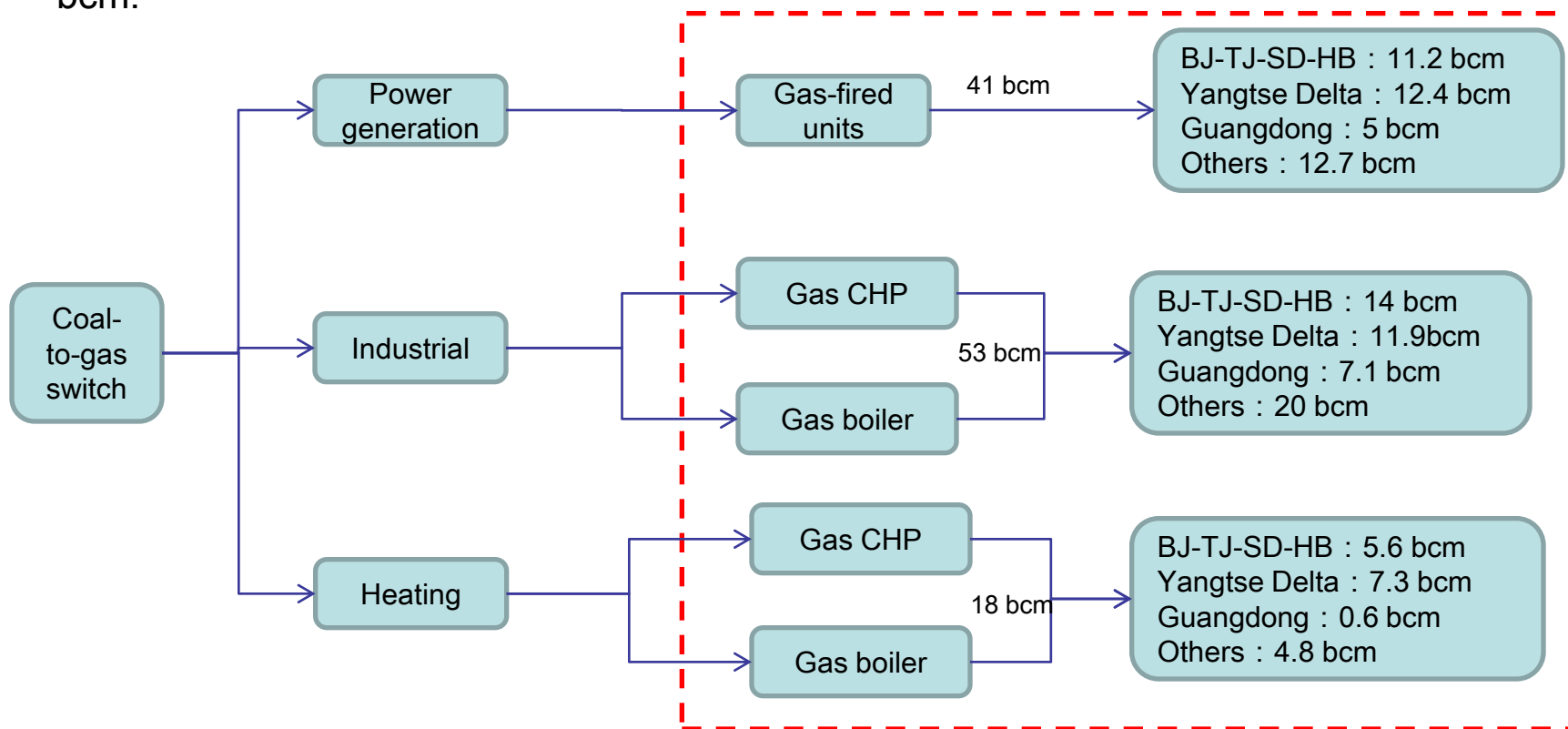
- Natural gas is considered an alternative fuel of LPG, fuel oil, gasoline, diesel, etc.
- Due to environmental considerations, replacing coal will be a big potential market for natural gas.





3.3 Replacing coal will be the main potential market

- The potential incremental demand for coal-to-gas switch during 2016-2020 is 110 bcm.
- During 2020-2025, the potential incremental demand for coal –to-gas switch is 160 bcm.



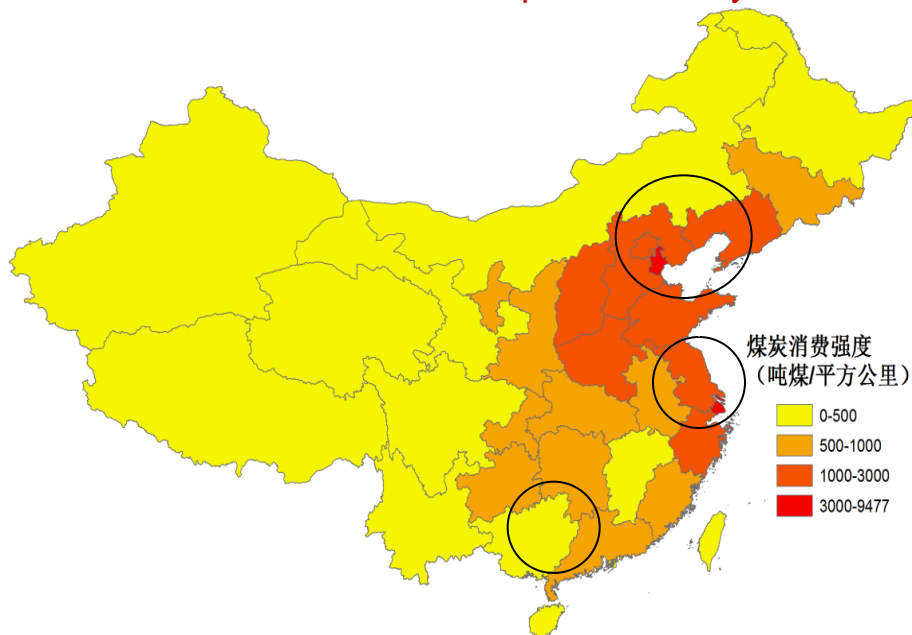
Source: CNPC ETRI



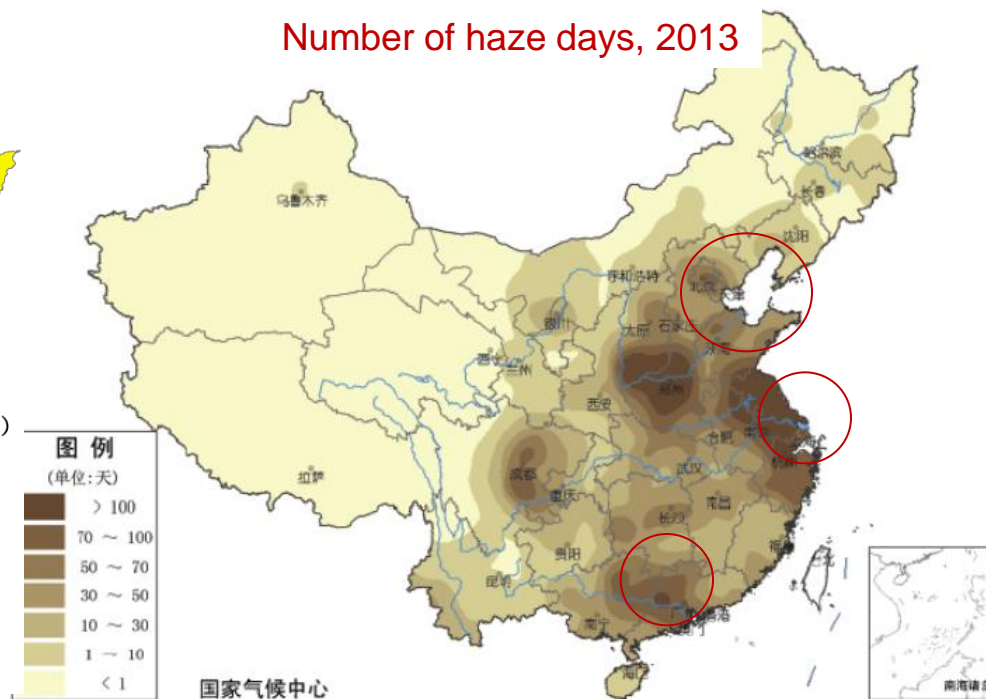
3.4 Coastal areas will be the target region

- Bohai Coastal Region, Yangtze River Delta and Peral River Delta along the east coast are coal demand centers with extremely high environment pressure.
- The emission level in where coal power plants concentrate is 5 times of national average, leaving potentials for gas-power development.
- Also, natural gas is more affordable in these areas than in other parts of China.

China's coal consumption intensity



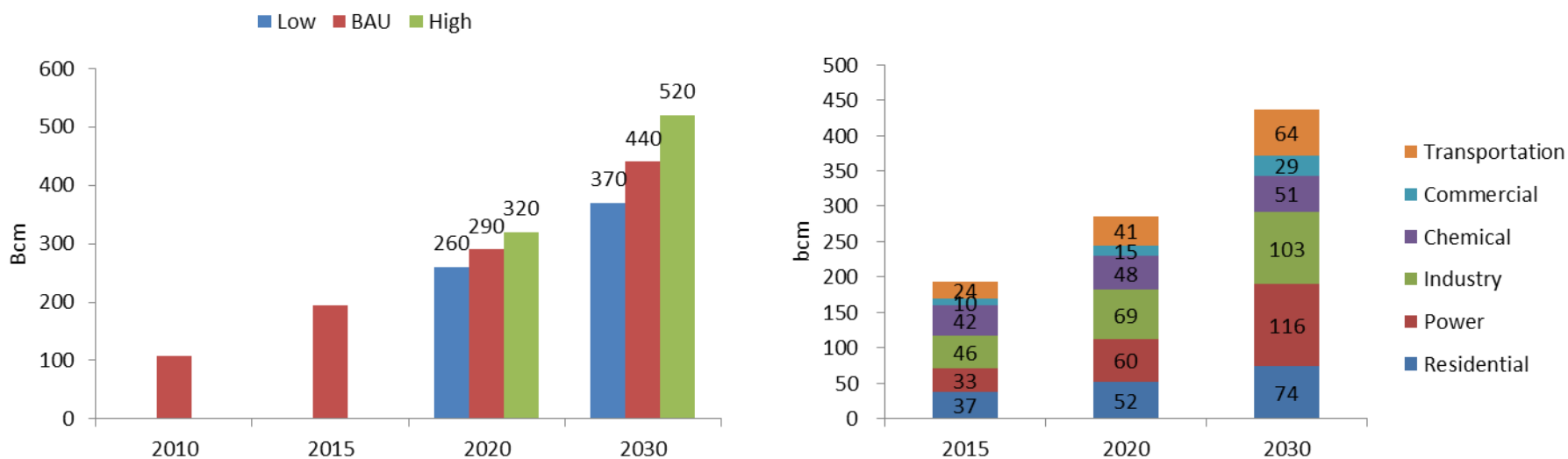
Number of haze days, 2013





3.5 Gas demand will grow to 290 bcm by 2020

- Under the BAU scenario, we project China natural gas demand to grow to **290 bcm** by 2020 and **440 bcm** by 2030. (The average annual growth rate will be 8.6% for 2015-2020, and 4.3% for 2020-2030)
- If powerful policies are adopted, gas demand is likely to reach 320 bcm by 2020 and 520 bcm by 2030.



Gas Demand Forecast of China 2020-2030

Source: CNPC ETRI



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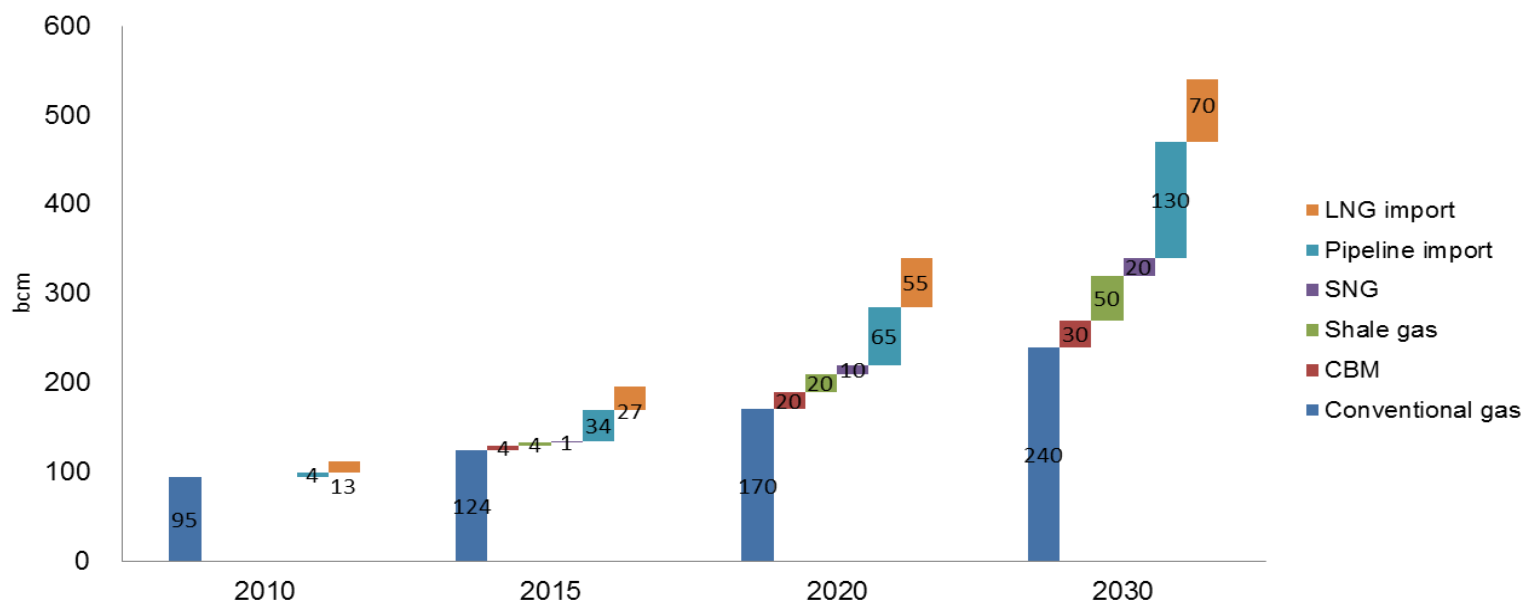
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4.1 Gas supply capacity will be 340 bcm in 2020

- It is expected that the supply capacity will be **340 bcm** in 2020, with 220 bcm domestic gas, and 120 bcm imported gas.
- Supply capacity will be as much as **540 bcm** in 2030, with domestic production of 340 bcm and 200 bcm imported gas.
- A potential glut is expected compared with the demand. (290 bcm in 2020 and 440 bcm in 2030)



Gas Supply Capacity of China 2010-2030

Source: CNPC ETRI



4.2 Importing pipeline capacity increases rapidly

- By 2015, the capacity of all importing pipelines amounted to 67 bcm, with pipeline utilization rate of around 50%.
- We expect PNG import capacity to reach 100 bcm by 2020, and over 130 bcm by 2030.
- We expect PNG import volume to reach 65 bcm by 2020, and further reach 130 bcm by 2030.

Import pipeline capacity in China by 2015

Project	Designed capacity (bcm/yr)	Status	Operation start date
Central Asia Gas Line A	30	Operation	2009.12
Central Asia Gas Line B		Operation	2010.10
Central Asia Gas Line C	25	Operation	2014.5
Central Asia Gas Line D	30	Delayed	—
Myanmar-China gas pipeline	12	Operation	2013.07
China-Russia east gas pipeline	38	Under construction	—
China-Russia west gas pipeline	30	Planned	—

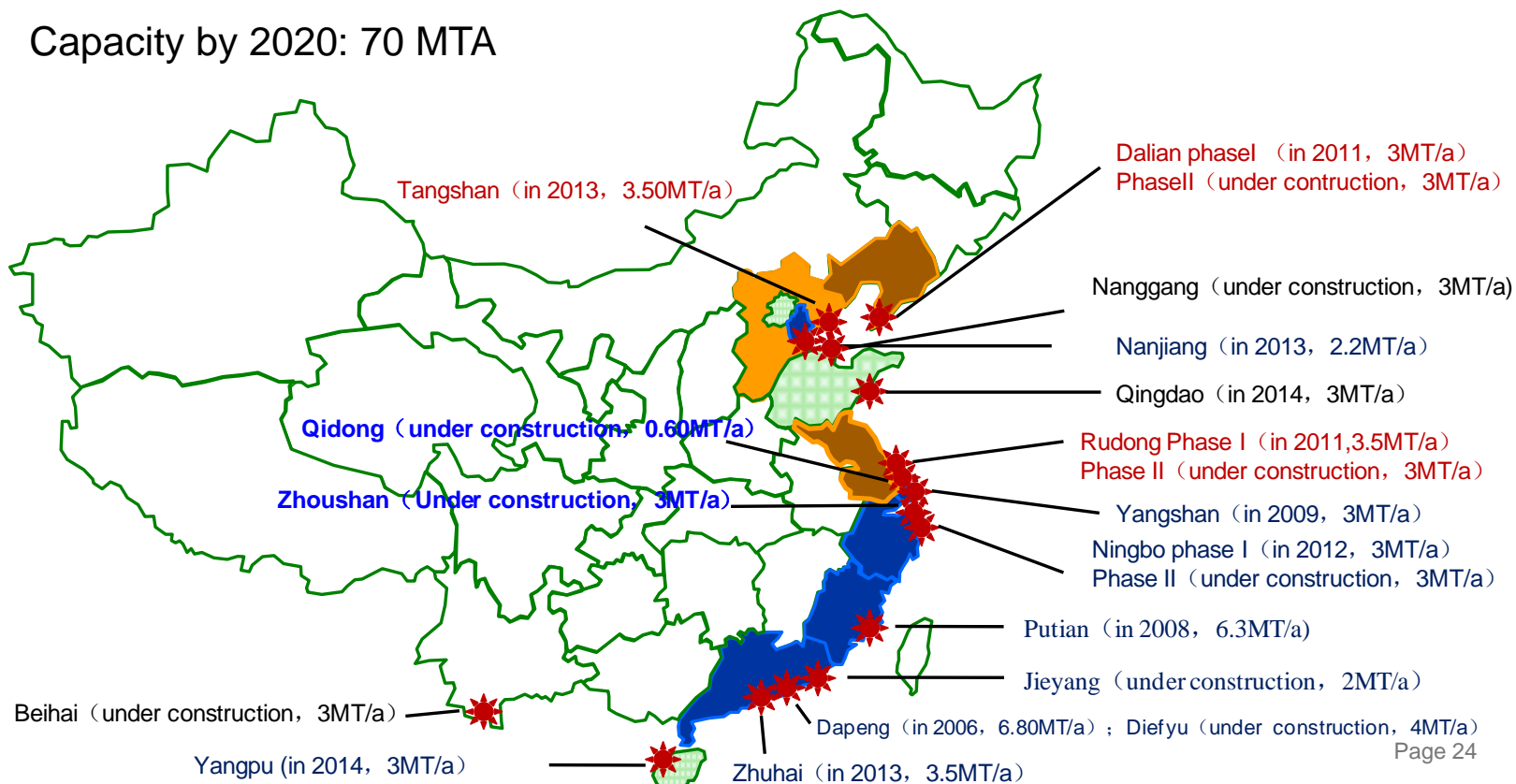
Source: CNPC ETRI



4.3 Abundant long-term LNG supply

➤ LNG import capacity grows rapidly, by 2015

- 11 LNG terminals in operation, along southeast coast of China
- 6 new terminals under construction, + 3 for extension
- Total capacity: 40.8 MTA
- Capacity by 2020: 70 MTA





4.3 Abundant long-term LNG supply

- By 2015, long-term contract volumes has been signed is over 50 MT/a.
 - CNOOC: 22.4 MT/a, CNPC: 10.3 MT/a, Sinopec: 13.8 MT/a
 - China Huadian, ENN, Beijing Gas: 4.3 MT/a
- In recent years, several long-term contracts started delivery.
- We expect that LNG imports will be over 40 MT (55bcm) by 2020, and over 50 MT (70 bcm) by 2030. **Long term contracts starting delivery in recent years**

Buyer	Resource	Volume (mtpa)	Period (yr)	Contract year	Delivery start year
CNOOC	TOTAL Portfolio	1	11	2014	2014
	BG QCLNG	3.6	20	2010	2014
	BG combined resources	5	20	2012	2015
CNPC	Shell Gorgon	2	20	2008	2016
	ExxonMobil Gorgon	2.25	20	2009	2016
Sinopec	PNG LNG	2	20	2009	2014
	APLNG	4.3	20	2011	2015
	APLNG	3.3	20	2011	2016

Source: CNPC ETRI



Summary

- Influenced by economic gloom, China gas demand growth slowed down in recent years. The market faces challenges including weak demand and insufficient infrastructure.
- The liberalization of gas industry is in progress, although in a slow pace.
- In the long-term, the potential market for natural gas in China is huge. Replacing coal in power and industrial sectors will be the main direction.
- Gas supply is expected to be abundant in the next 15 years. By 2020, the demand is projected to be 290 bcm and supply capacity would be around 340 bcm.



Thank you

