

# The Roving Scout

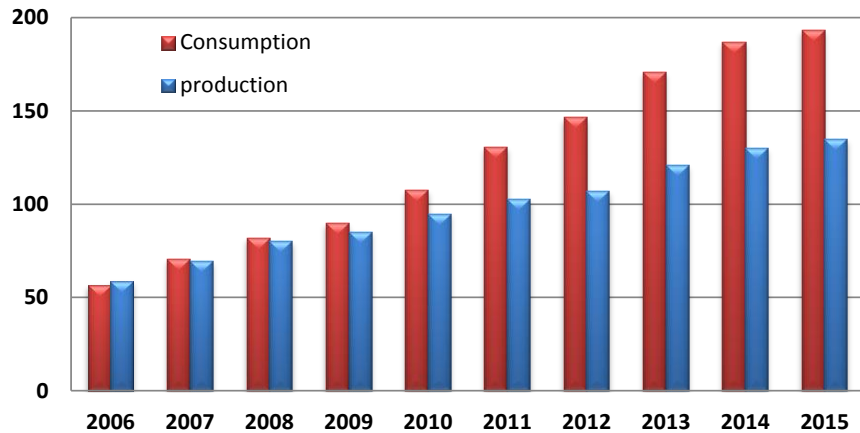


Will China “Gas” Out Coal???

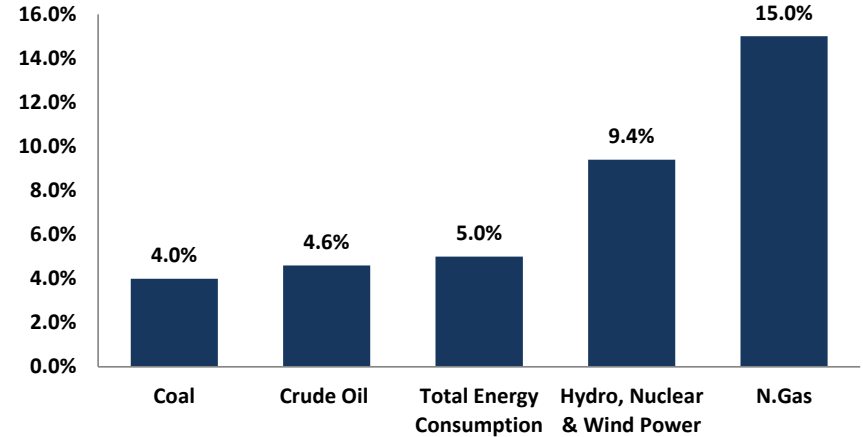
26<sup>th</sup> July 2016

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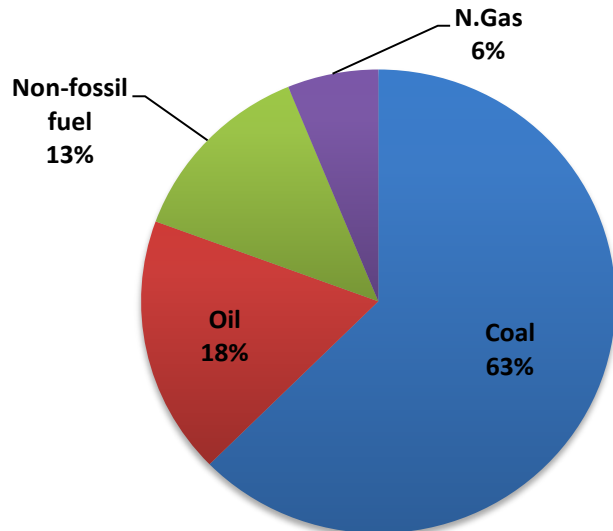
China N.Gas Demand Supply Imbalance (in Bln. Cu. M)



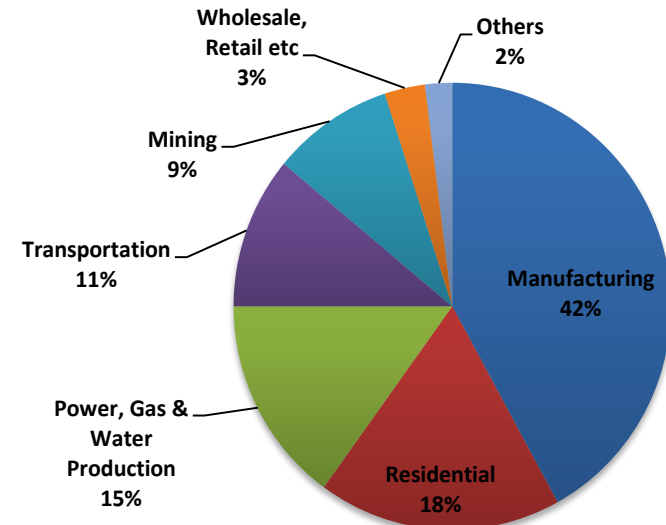
N. Gas fastest-growing fuel source in China (CAGR 2005-2015)



China Energy Consumption by Fuel - 2015



China N.Gas Consumption by Sectors (2015)



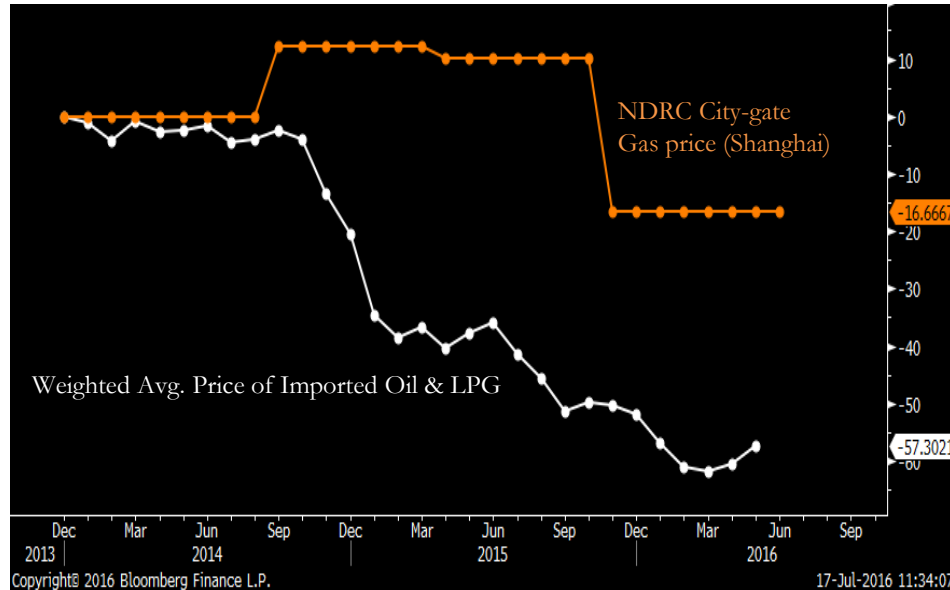
*“China is 3<sup>rd</sup> largest user of N.Gas in the world, behind the US and Russia”*

# Key trends in China's N. Gas Consumption

- Manufacturing sector is the largest consumer of natural gas, at 42% of total, followed by residential (18%), utilities (15%) and transportation (11%)
- Power/heat generation and the transportation sectors is expected to be driving future gas consumption
- China's 2015 natural gas consumption of 193 billion cubic meter (BCM) fell short of the government's target of 230 BCM
- China's **total energy consumption has been growing at a slower rate than GDP**, at 1.0% y/y growth in 2015 vs GDP growth of 6.9%
- N.gas is the fastest-growing fuel source in China, however **N.gas constitutes only 6% of China's total energy consumption**
- **Coal still remains the key fuel source**, at 63% of total energy consumption

# Policy Paralysis: Negative Impact on N.Gas Demand

## 1. Implementation of Market-Pricing Reform



- China's speed in adopting market-driven pricing for gas will be key cost competitiveness against oil and coal
- Brent Crude price has plunged 58% from a peak in July 2014, while the government-controlled oil-linked city-gate gas price fell 17% only – aimed at protecting struggling National Oil Companies

- The slow wholesale-price decline has weakened the economic advantage of gas
- Liberalized pricing process will bring transparency to cost trends, and lower risks in gas-related investments
- A lower city-gate price will help the utilities lower their retail prices and boost demand

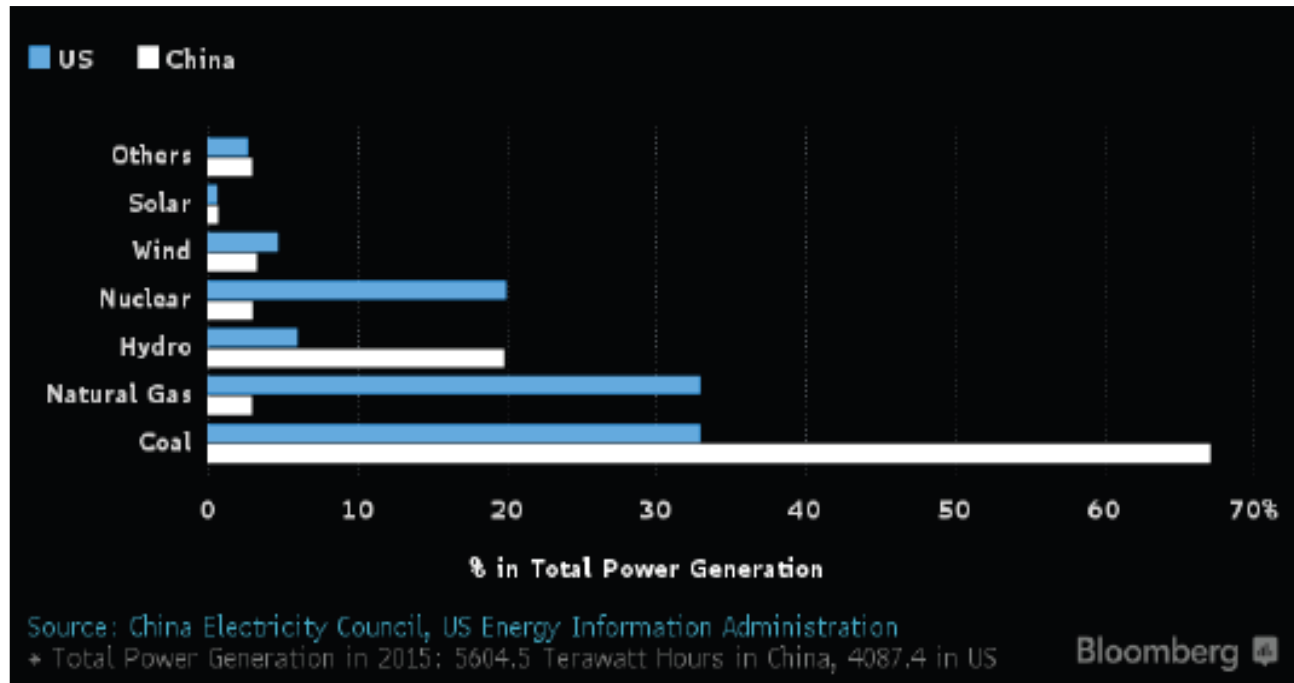
# Policy Paralysis: Negative Impact on N.Gas Demand

## 2. Power-Plant Profitability

	Jiangsu Jinling CCGT Plant (Gas)		Jiangsu Jinling Coal-fired Power Plant	
	2015	2014	2015	2014
Fuel Unit Price (1)*	2.86	2.76	421.31	532.62
On-grid Tariff (Yuan/MWh) (2)	712.13	606.21	385.24	408.24
Unit Fuel Cost (Yuan/MWh) (3)	572	551.2	155.5	196.6
Dark Spread (Yuan/MWh) (2 - 3)	140.13	55.01	229.74	211.64
Gross Margin (%)	19.70%	9.10%	59.60%	51.80%
Utilization Hours	3309	2429	5693	5615
Note: (1) Gas: Yuan/Cu.M; Coal: Yuan/Ton				
Source: Bloomberg				

- **Lower power plant profitability** is main hurdle to increase use of N.gas in power generation – lower dark spread for gas plant as against coal fired plant
- The **fuel cost of gas-fired power is three times higher than for coal** – despite of reduction in city gate price in late 2015 price economics is not yet favourable for power plants
- Even with the cuts, the **avg. “city-gate” price is equivalent to ~US\$10/MMBtu** – higher than international standards and compared to other energy sources in China
- Allowing generators to pass on costs to end users is one crucial step – looks overly ambitious

# China's N.Gas Potential & Impact on Coal Sector

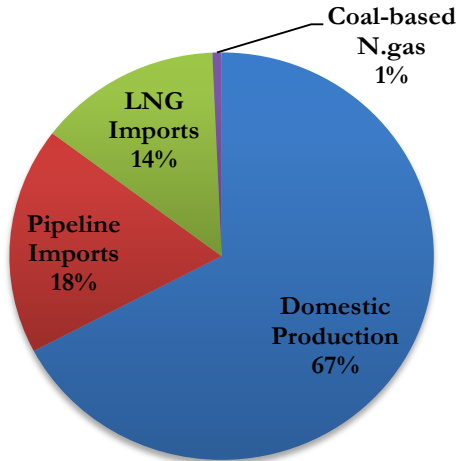


- In 2015, gas fueled just 3% of power generation in China v/s 33% in the US
- Assuming same level of plant efficiency and current fuel pricing to be constant, if China had to match US N.Gas consumption levels (33%), it's N.gas consumption for gas-fired power generation would have been 493 BCM – 158% higher than actual demand (193 BCM in 2015)

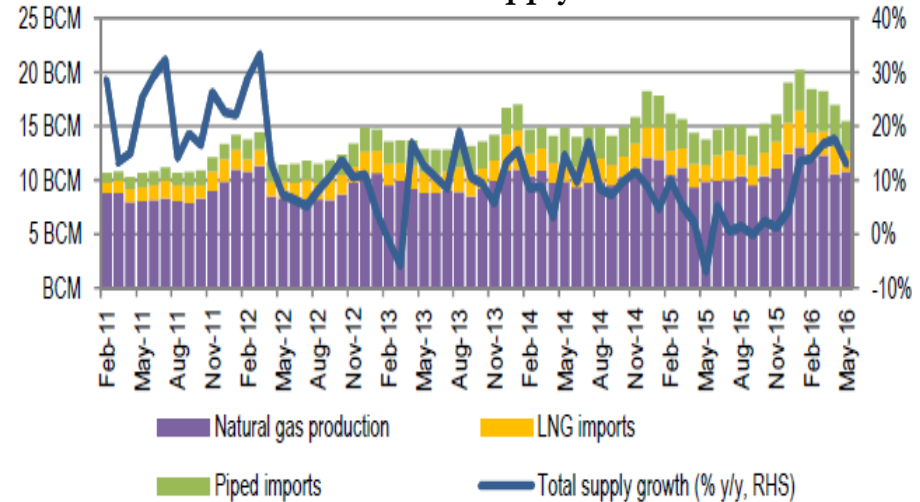
**“Assuming other things remain constant and N.Gas consumption rise by 158% – potential downfall in China’s Coal Consumption to be ~470 million metric tonnes”**

# China - N.Gas Trade Pattern

Composition of China's N.gas Supply - 2015



China Total Gas Supply – in BCM



- Currently China imports N.gas from 4 countries namely: Turkmenistan; Myanmar; Kazakhstan and Uzbekistan
- Along with market pricing reforms and power plant profitability – China aims to bring infrastructure at par with forecasted N.Gas consumption rate
- China has signed 30 year contract with Russia's Gazprom to build a major pipeline to supply gas as much as 38 billion cubic meters annually starting from end of 2018 – this would result in change in trade flow and decline in demand for thermal coal from power sector



# COP21 : Will China Act???



China needs to work on 3 specific action points to cut the targeted greenhouse gas emissions per unit of GDP by 60-65% from 2005 levels:

1. **Reduction in energy intensive industries:** The end of its large-scale urban development, its footprint will naturally begin to decline. With growth of urban population stabilizing, energy intensive industries will be replaced by a greater contribution of the service economy, and reductions in resources (energy) intensity will be seen throughout the economy
2. **Increased investment in cleaner energy systems:** The short-term primary fuel will continue to be Coal. But in medium to long term, increased investment in renewables and restructuring of energy industry should help achieve carbon emission reduction goals
3. **Adjusting Resource Pricing:** People will not be driven to change unless it directly impacts their daily lives. The recent announcements by NDRC to move energy pricing to a more market-orientated system should bring change in behaviour with increased cost of energy to residential, commercial and industrial users

*“While COP21 is not legally binding, China has already begun a process of transacting on commitments to bring emissions under control”*

# Future Growth Drivers...

- By 2020, **China is expected to consume 360 BCM of N.Gas** – growth rate of 13% p.a. in next five years – as against the potential consumption of 493 BCM (Slide no. 7)
- N.gas **Consumption from manufacturing sector is expected to decline** from 42% in 2015 to 35% by 2020
- Future growth in gas consumption will come from:
  - **Coal boiler conversion to natural gas** – aimed to reduce air pollution and replace coal boilers with natural gas boilers or electricity for centralized heating, industrial production, and other activities
  - **Rise in residential penetration rate** from 35% to ~85% ([CLICK HERE](#)) and
  - **Increase in LNG and CNG demand** from transportation sector
- Gas-fired power installed capacity is expected to reach 100GW by 2020 from 66GW in 2015 – implying an 8.5% CAGR from 2015 to 2020

# Global N.Gas Demand-Supply Forecast

## Natural gas: consumption

(bn cu metres unless otherwise indicated)

	2013	2014	2015	2016	2017
US	739.9	759.3	781.0	793.4	803.8
OECD Europe	502.6	451.8	469.6	474.7	479.1
Russian Federation	413.5	409.3	398.7	392.3	393.9
China	170.3	184.9	190.5	201.4	214.0
Iran	159.8	170.6	184.1	199.0	214.2
Japan	122.1	123.7	122.3	118.5	115.2
Saudi Arabia	100.1	108.3	114.2	118.6	121.9
Canada	104.1	104.5	104.4	106.6	107.2
United Arab Emirates	66.9	69.4	70.3	71.6	73.5
Mexico	70.9	70.2	66.0	68.4	70.0
Others	921.8	928.3	929.5	951.6	969.1
<b>World total</b>	<b>3,372.0</b>	<b>3,380.4</b>	<b>3,430.7</b>	<b>3,496.1</b>	<b>3,562.0</b>
% change	1.3	0.2	1.5	1.9	1.9

Sources: International Energy Agency (IEA); BP; The Economist Intelligence Unit.

## Natural gas: production

(bn cu metres unless otherwise indicated)

	2013	2014	2015	2016	2017
US	689.2	727.8	771.6	777.8	788.6
Russian Federation	604.8	578.7	570.6	574.6	581.0
Iran	164.0	172.5	187.7	204.8	218.7
Qatar	176.5	177.2	185.9	191.4	199.3
Canada	155.5	160.7	162.8	165.4	167.2
China	124.9	134.5	138.7	144.4	149.8
Norway	109.0	111.0	120.5	123.0	124.9
Saudi Arabia	100.0	108.2	113.5	117.5	120.7
Algeria	81.5	83.3	84.0	85.3	86.3
Turkmenistan	62.3	69.3	72.2	74.4	76.2
Others	1122.8	1114.5	1107.5	1120.9	1144.4
<b>World total</b>	<b>3,390.5</b>	<b>3,437.7</b>	<b>3,514.9</b>	<b>3,579.5</b>	<b>3,656.9</b>
% change	0.8	1.4	2.2	1.8	2.2

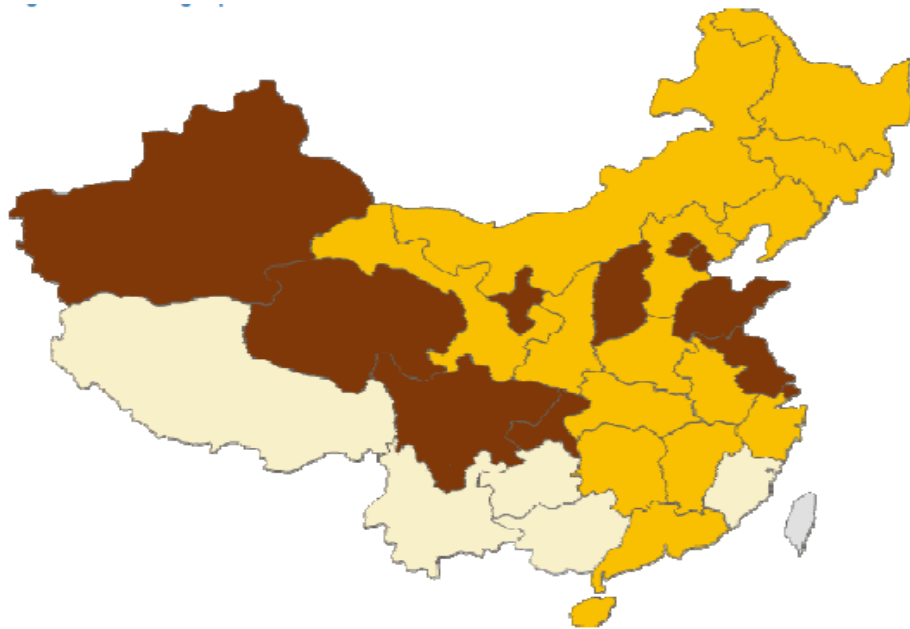
Sources: IEA; BP; The Economist Intelligence Unit.

# THANK YOU!!!

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# Annexures: N. Gas Penetration rate across China

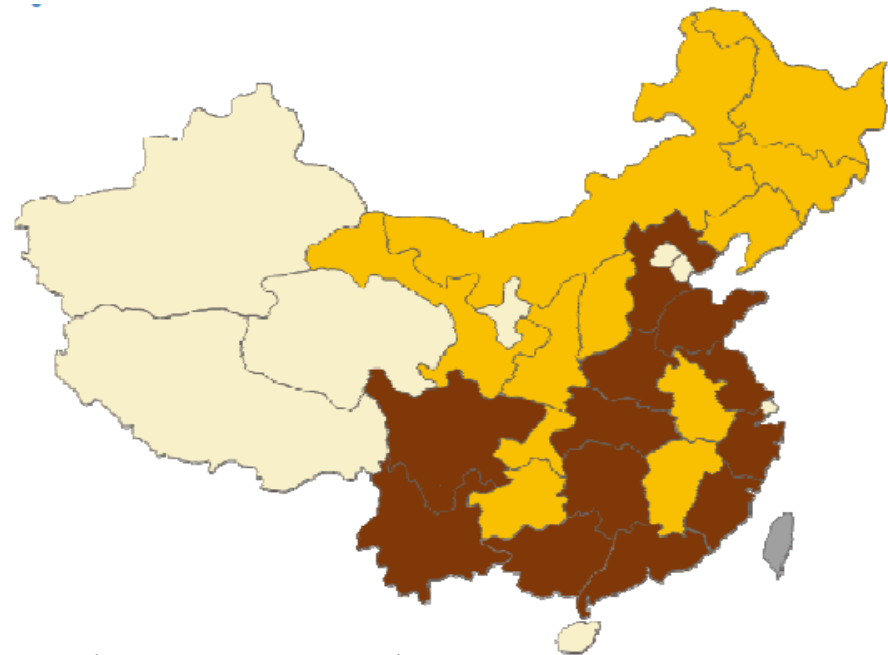
N. Gas Penetration across China



Color	Penetration	Province
Dark Brown	> 40%	Beijing, Shanghai, Tianjin, Chongqing, Xinjiang, Ningxia, Qinghai, Shandong, Sichuan, Shanxi, Jiangsu
Yellow	20% - 40%	Shaanxi, Hubei, Anhui, Jilin, Henan, Inner Mongolia, Liaoning, Heilongjiang, Hebei, Gansu, Hainan, Zhejiang, Hunan, Guangdong, Jiangxi
Light Yellow	< 20%	Fujian, Guangxi, Tibet, Guizhou, Yunnan

Source: NBS, J.P. Morgan estimates.

Potential New Household Connections



Color	Potential new household connections	Province
Dark Brown	> 5MM	Guangdong, Shandong, Jiangsu, Henan, Zhejiang, Hebei, Hunan, Sichuan, Hubei, Fujian, Guangxi, Yunnan
Yellow	1-5 MM	Liaoning, Anhui, Jiangxi, Heilongjiang, Guizhou, Shaanxi, Shanxi, Inner Mongolia, Jilin, Gansu, Chongqing
Light Yellow	< 1 MM	Shanghai, Tianjin, Beijing, Xinjiang, Hainan, Ningxia, Qinghai, Tibet

Source: NBS, J.P. Morgan estimates.

[CLICK HERE](#)