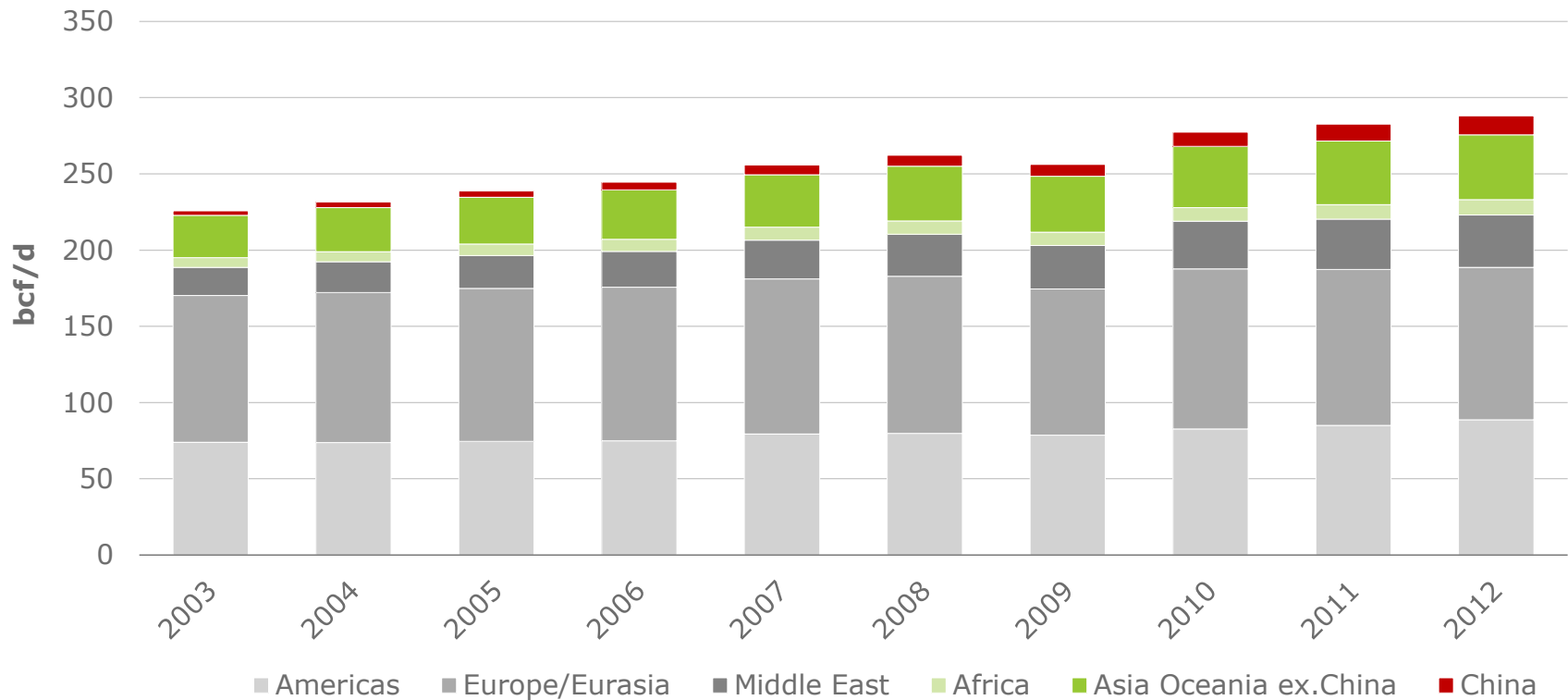


# 中国天然气进口分析

李遥 思亚能源

# 中国天然气消费量位居全球第三

## China Gas Consumption in Global Context



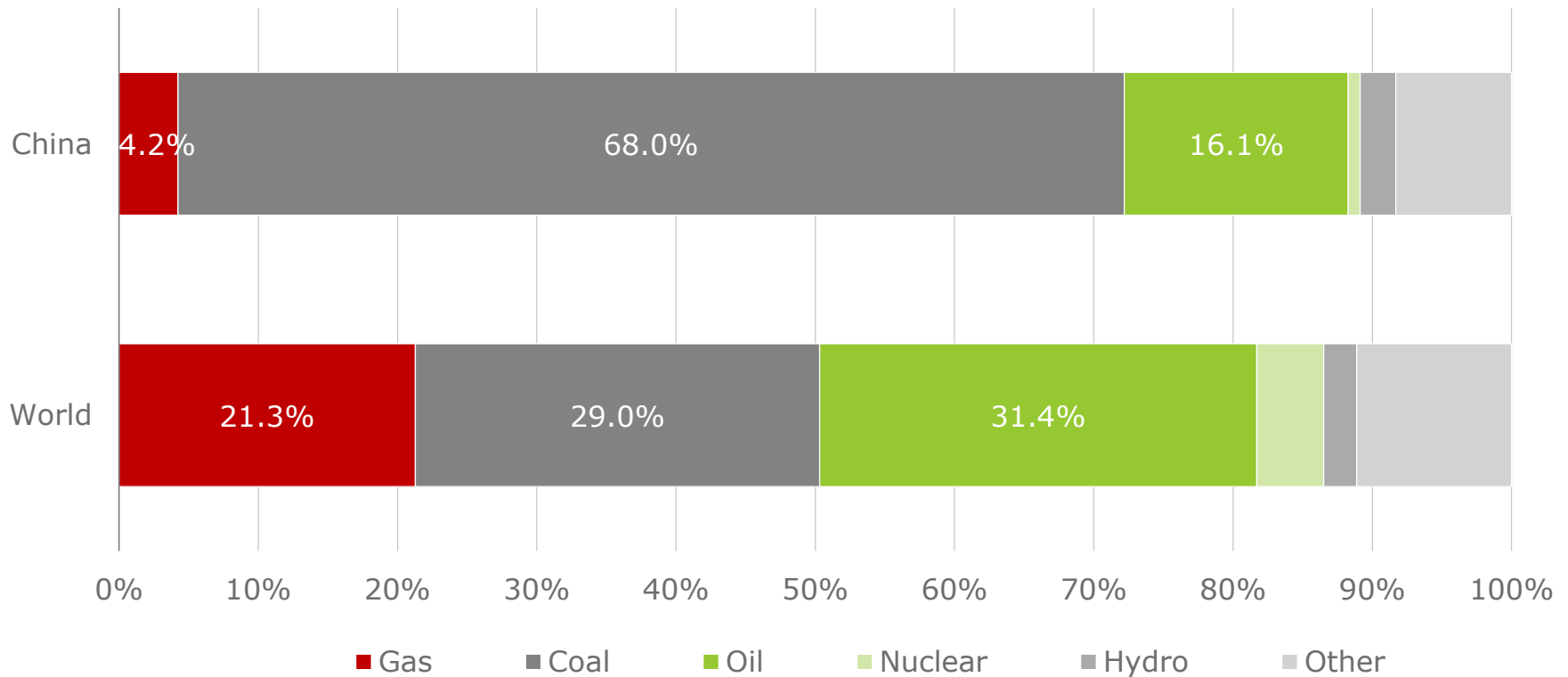
Source: SIA Energy created from IEA data

China's 2014 gas consumption was estimated at 17.8 bcf/d, ranking the third in the world, trailing only the United States (73.5 bcf/d) and Russia (44.2 bcf/d).

China's share in global gas consumption rose from 2.7% in 2008 to 4.3% in 2012. SIA Energy expects its share to reach 7.5% by 2020. China gas consumption remains low compare to other countries on per capita basis.

# 以煤主导的一次能源结构威胁中国的可持续发展

## Primary Energy Mix, 2012

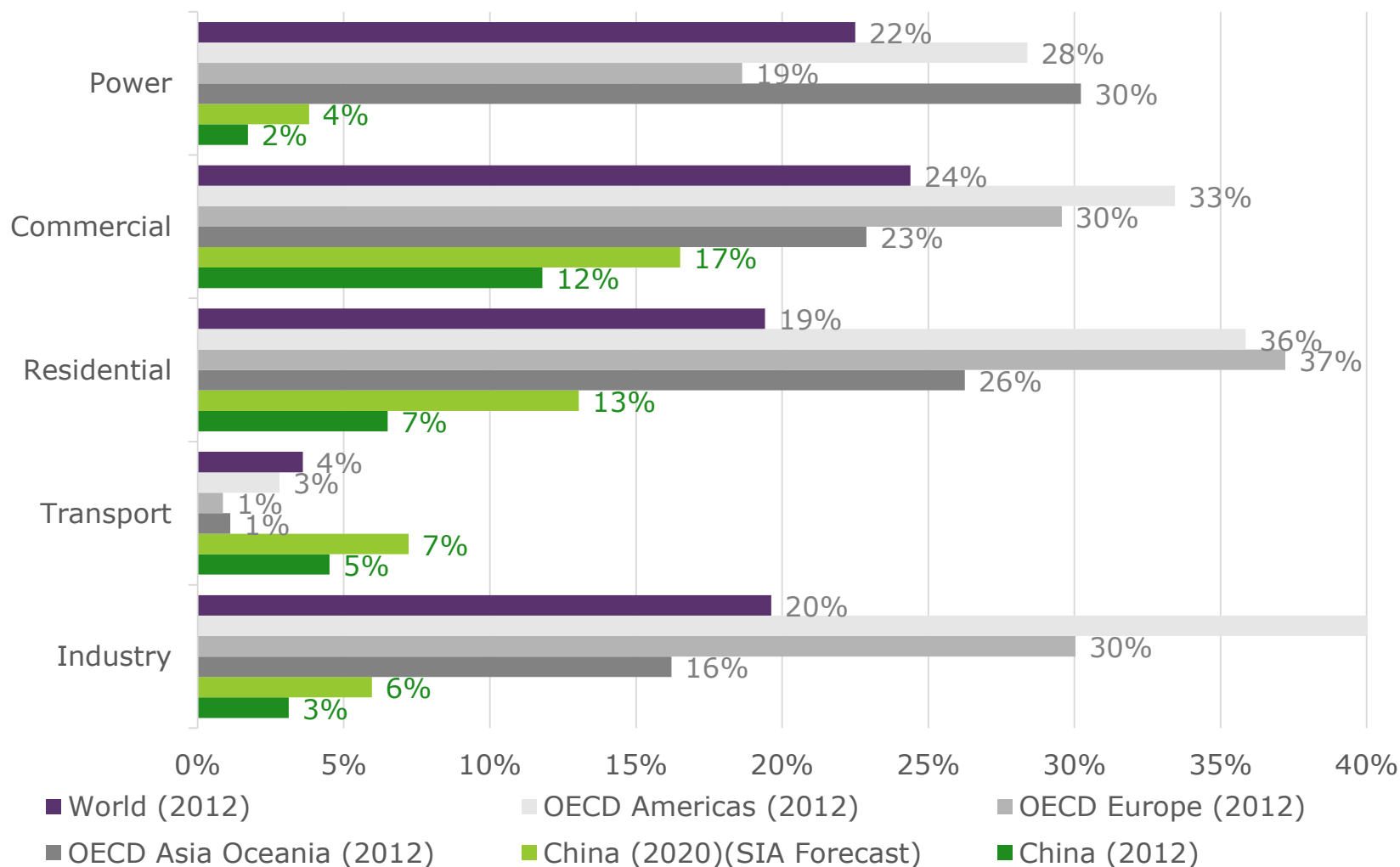


Source: SIA Energy created from IEA data

In the existing (2011-2015) and next Five Year Plan (2016-2020), Chinese government has committed to improve its energy mix by (1) Mitigating rapid total energy consumption growth through energy efficiency and shifting economic activity mix toward more service sector and more high-value added industry; (2) Tempering the use the coal and boosting cleaner alternative fuels to replace coal share in the fuel mix

# 天然气在中国各行业一次能源结构中的占比远低于 OECD 国家

## Gas Penetration in Primary Energy Mix by Sector



Source: IEA and SIA Energy

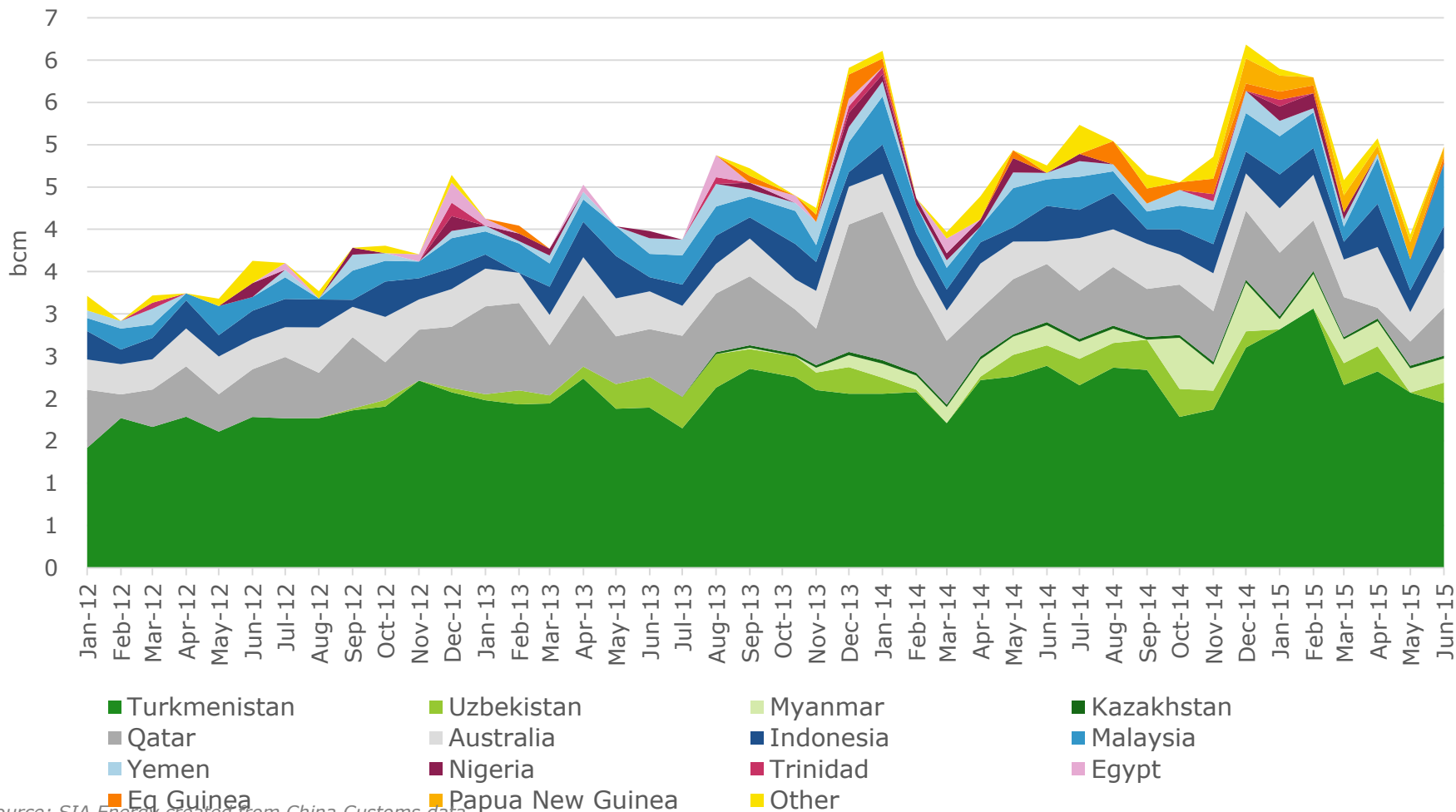
# 目前天然气利用政策是在供给紧张的市场条件下制定的

	Priority	Permitted	Restricted	Prohibited
<b>City Gas</b>	<ul style="list-style-type: none"> <li>Residential cooking and hot water</li> <li>Public service facilities</li> <li>Commercial</li> <li>Central heating (existing + new)</li> </ul>	<ul style="list-style-type: none"> <li>Individual residential heating</li> <li>Central heating to replace coal</li> </ul>		
<b>Transport</b>	<ul style="list-style-type: none"> <li>NGVs (dual-fuel and LNG-powered; truck, bus, taxi fleets)</li> <li>LNG-power ships for inland rivers, coastal trade</li> </ul>			
<b>Industries*</b>	<ul style="list-style-type: none"> <li><b>Interruptible</b> supply to industries</li> </ul>	<ul style="list-style-type: none"> <li>Replacing oil in industries</li> <li>New projects using natural gas</li> <li>Replacing coal in industries</li> </ul>		
<b>Storage, Others</b>	<ul style="list-style-type: none"> <li>City gas storage facilities for peak shaving</li> <li>Gas distributed energy with a utilization rate &gt;70%</li> </ul>	<ul style="list-style-type: none"> <li>Mini LNG for peak shaving</li> </ul>		
<b>Power</b>	<ul style="list-style-type: none"> <li>CBM Power generation</li> <li>Gas-fired Cogeneration</li> </ul>			<ul style="list-style-type: none"> <li>Baseload gas-fired power in major coal areas (Anhui, Shanxi, Shaanxi, In. Mongolia)</li> </ul>
<b>Chemicals</b>	<ul style="list-style-type: none"> <li><b>Interruptible</b> gas to produce hydrogen</li> </ul>	<ul style="list-style-type: none"> <li>Natural gas to hydrogen, except when interruptible</li> </ul>	<ul style="list-style-type: none"> <li>Ammonia (green//brownfield)</li> <li>As a raw material for other chemicals (acetylene)</li> <li>Fertilizer (newbuild)</li> </ul>	<ul style="list-style-type: none"> <li>Methanol (green//brownfield)</li> <li>Gas replacing coal for Methanol production</li> </ul>

\*Industries include: building materials, machinery, electronics, textile, petrochemical, metallurgy

# 2015年上半年天然气进口依存度达到32%

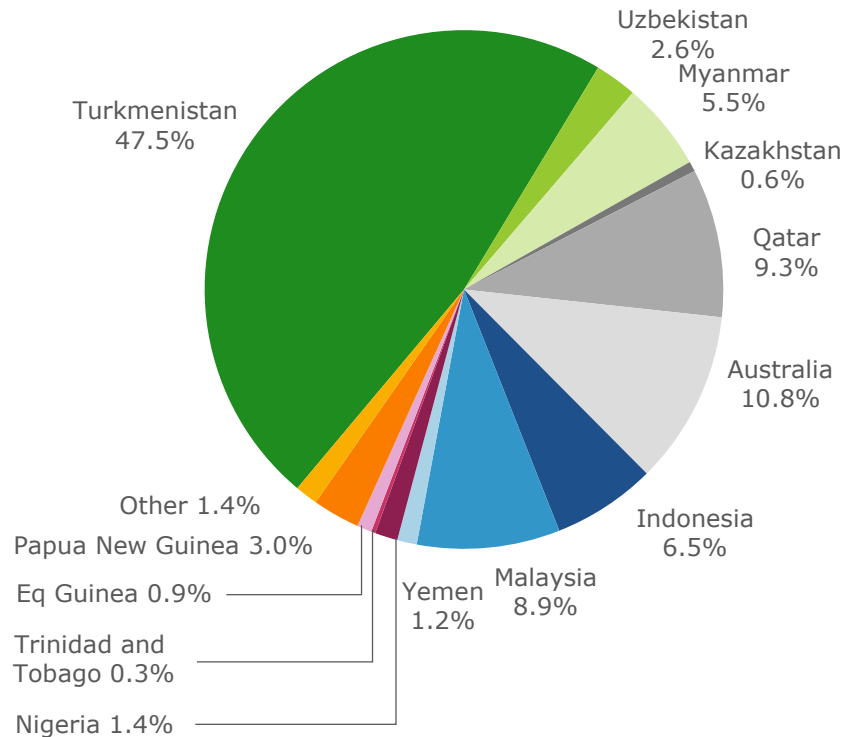
## China Gas Imports by Source (2012-June 2015)



Source: SIA Energy created from China Customs data

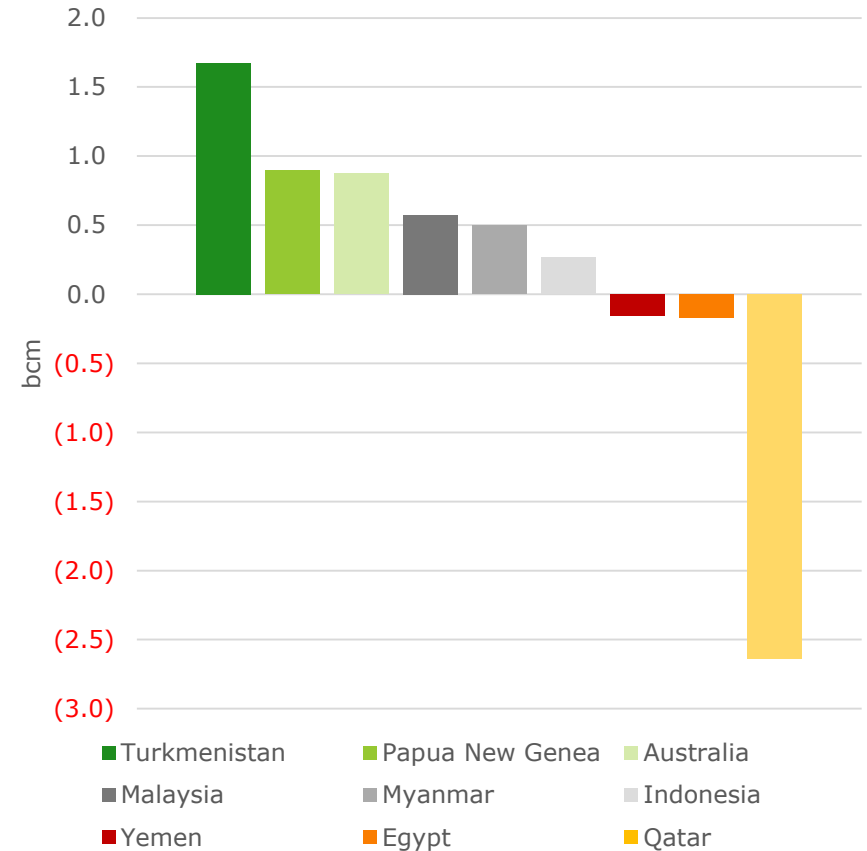
# 最大进口份额来自于土库曼斯坦、澳大利亚和卡塔尔

China Gas Imports 1H 2015



Source: SIA Energy created from China Customs data

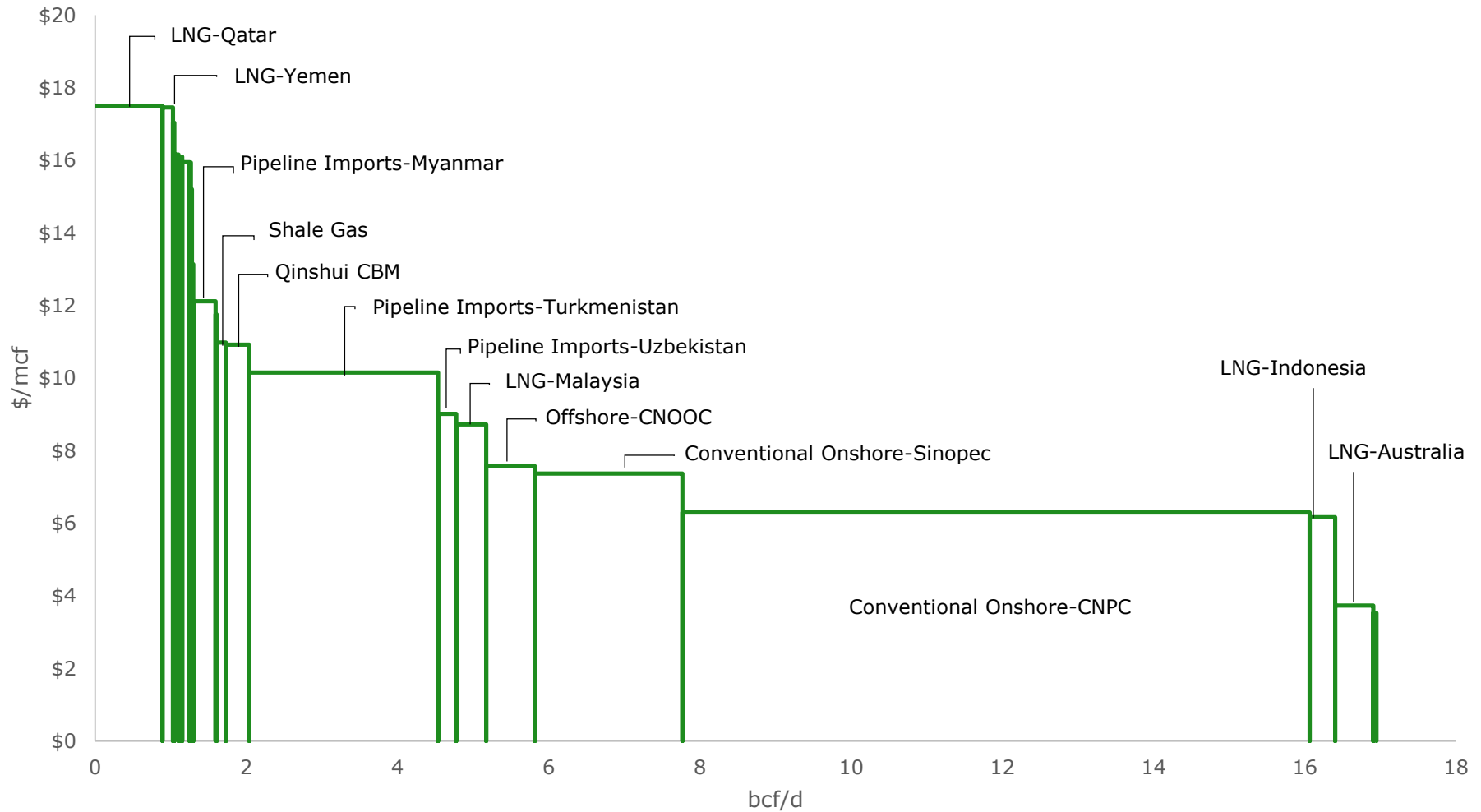
Year-on-Year Growth of Gas Imports by Source 1H 2015



Source: SIA Energy created from China Customs data

# 2014年中国天然气供给曲线：价格差异巨大

China 2014: Gas Supply Cost Curve (@ average Brent \$99/bbl)

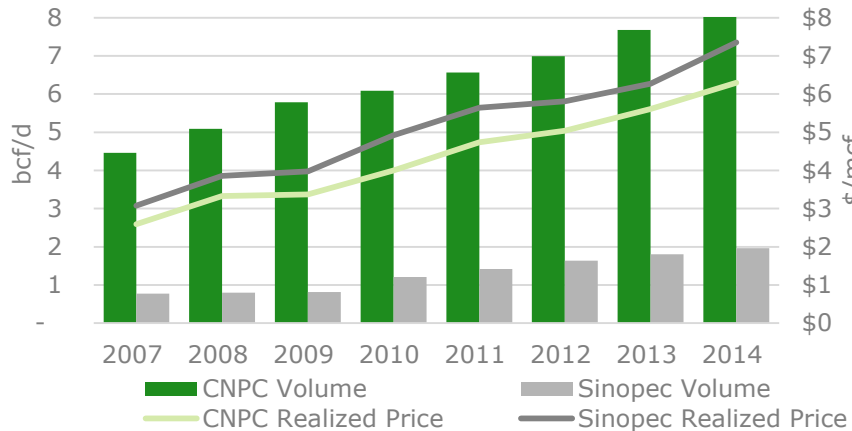


Source: SIA Energy



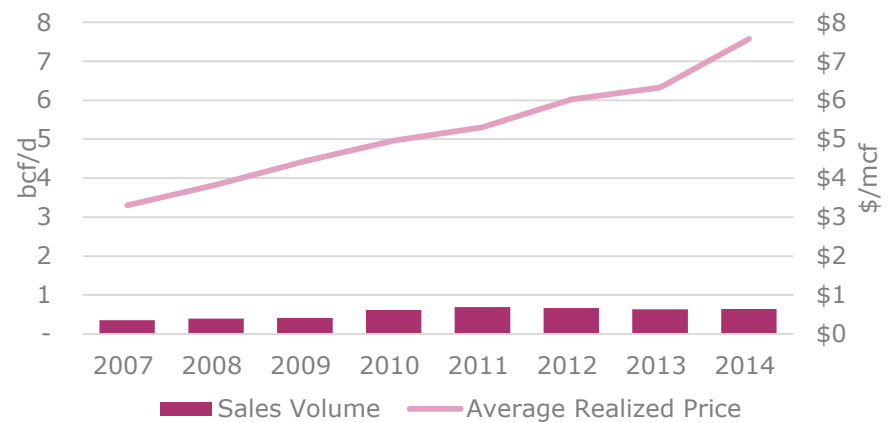
# 过去十年保持量价齐增，2015年出现走势变化

## Onshore Conventional Gas Realized Prices



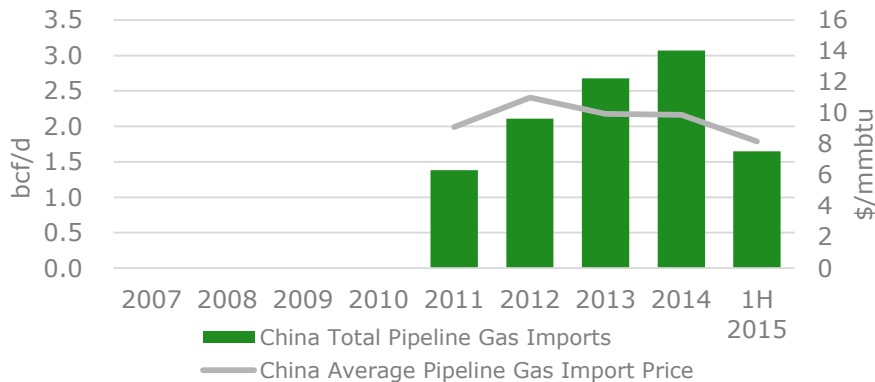
Source: SIA Energy created from PetroChina and Sinopec 20F reports

## Offshore Conventional Gas Realized Prices



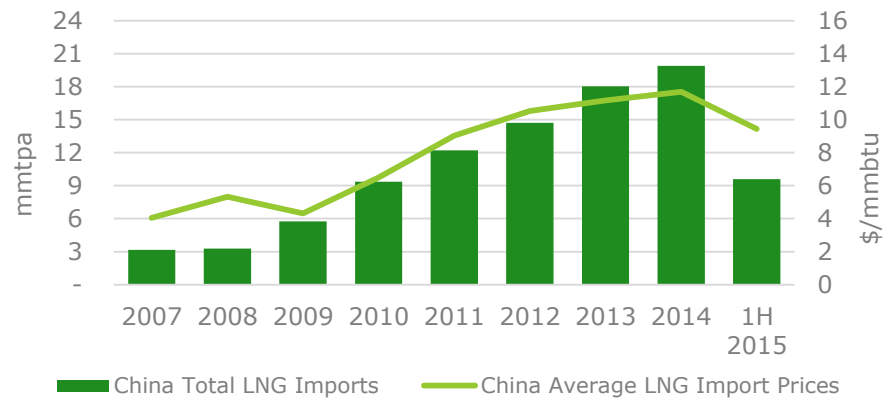
Source: SIA Energy created from CNOOC Ltd. 20F reports

## Weighted Average Border Prices for Pipeline Gas Imports



Source: SIA Energy created from China Customs data

## Weighted Average CIF Prices for LNG Imports



Source: SIA Energy created from China Customs data

# “供给过剩”是暂时性、局部性的

## Market symptoms:

- Coastal LNG storages are currently full – NOCs have difficulty marketing their gas and try to delay their take-or-pay import deliveries, leaving the questions of “over supply”.
- Large-scale downstream users refuse to take more gas due to weakness in demand for their end-product and gas cost hike in relative to competing fuels.

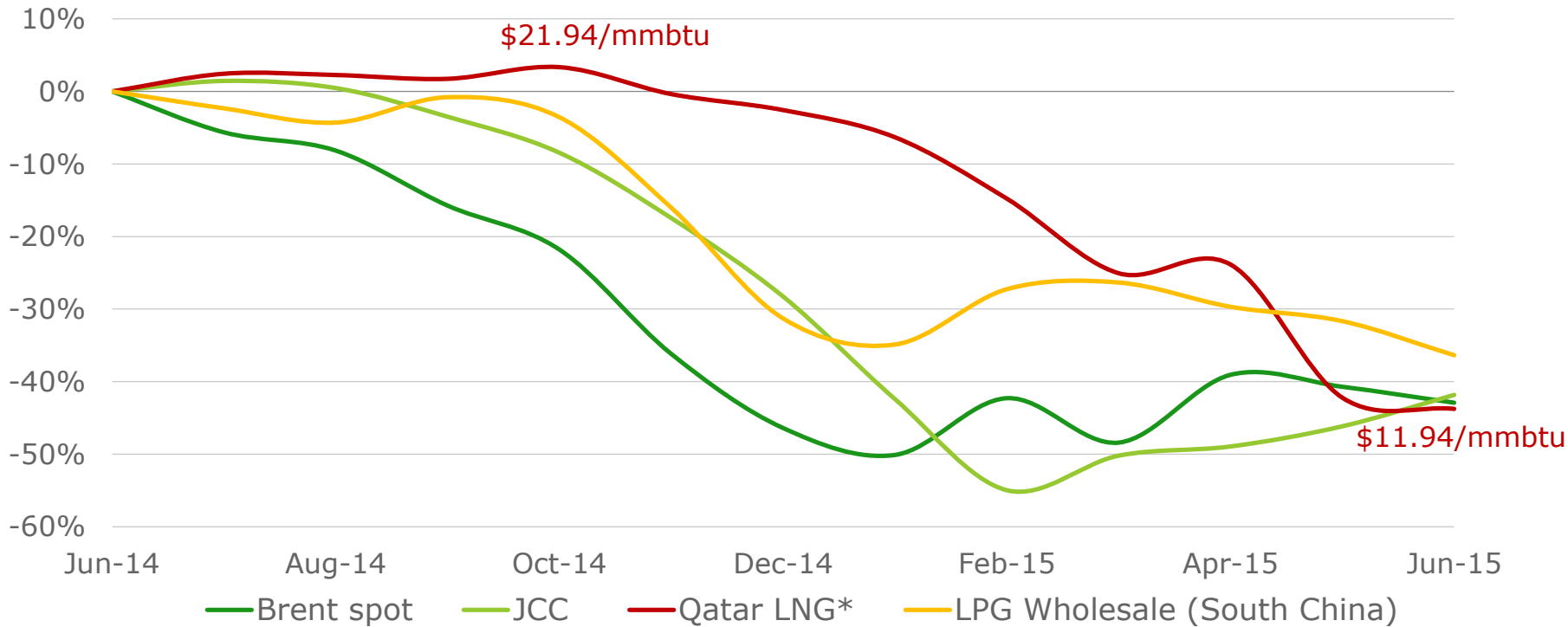
## SIA interpretation:

- The over supply challenge is real, but it is a temporary and localized issue. Reasons include:

- China’s economic restructuring lowered gas demand from high resource-intensive but low-value added industries. Power sector is experiencing its own over-supply cycle; gas power is facing competition from cheap coal and hydro power.
- The six-month lag in gas-on-oil pricing of Chinese imports makes retail gas too expensive in relative to oil in industrial and transport sectors.
- China’s non-residential gas pricing reforms lifted prices for over half of China’s downstream users for three consecutive years, however, the oil-linked formula was not closely observed when oil prices fell.
- **Lack of TPA access to gas infrastructure:** In an environment of falling international prices, NOCs are still hoping to market their old LNG imports linked with \$100/bbl oil at cost plus, unwilling to sell at loss; lack of 3<sup>rd</sup> party access to LNG terminal and gas pipelines leaves buyers no alternative to source cheaper gas from international markets.
- **Provincial grids add cost:** NOCs started to offer discount to direct supplied large industrial and power users, but they are reluctant to offer the same to the middle men – especially where provincial grids dominate local distribution.
- **City gas exclusive marketing rights defer rural pipeline development:** City gas operators usually pick the more lucrative markets first and leave much rural areas uncovered. As China’s urbanization continues and trunk pipelines become more available, city gas sector still has room to expand, but this takes 2-3 years to develop.
- Previously, due to limited gas supply, China’s gas utilization was constrained (certain gas-guzzling large industrial, chemical and power user were prohibited or restricted from gas access, even if they were willing and able to pay). With the newly available supply and infrastructure, gas utilization restriction is expected to be loosened, especially in the non-peak seasons.

# 上游：进口LNG价格变化较原油滞后 5-6个月

Brent, JCC, Qatar LNG CIF and LPG Wholesale Price Change from Peak



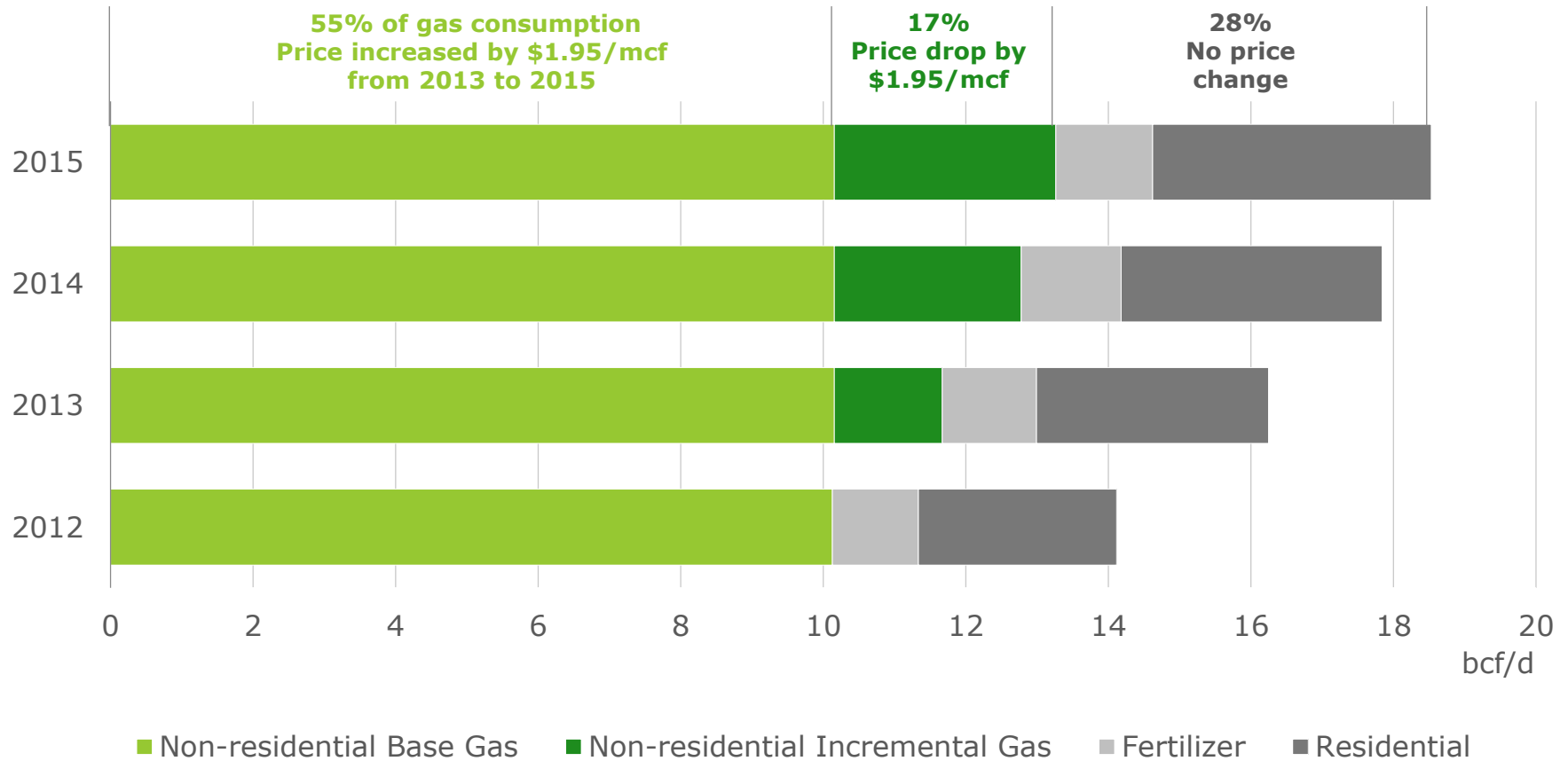
Source: SIA Energy

\*Qatar LNG price includes regasification cost and VAT

Implications: Planned oil-to-gas conversion in the transport sector in 2H2014 had been delayed; some industrial users switched back to LPG or coal gas. Situation for gas is expected to improve in 2H2015.

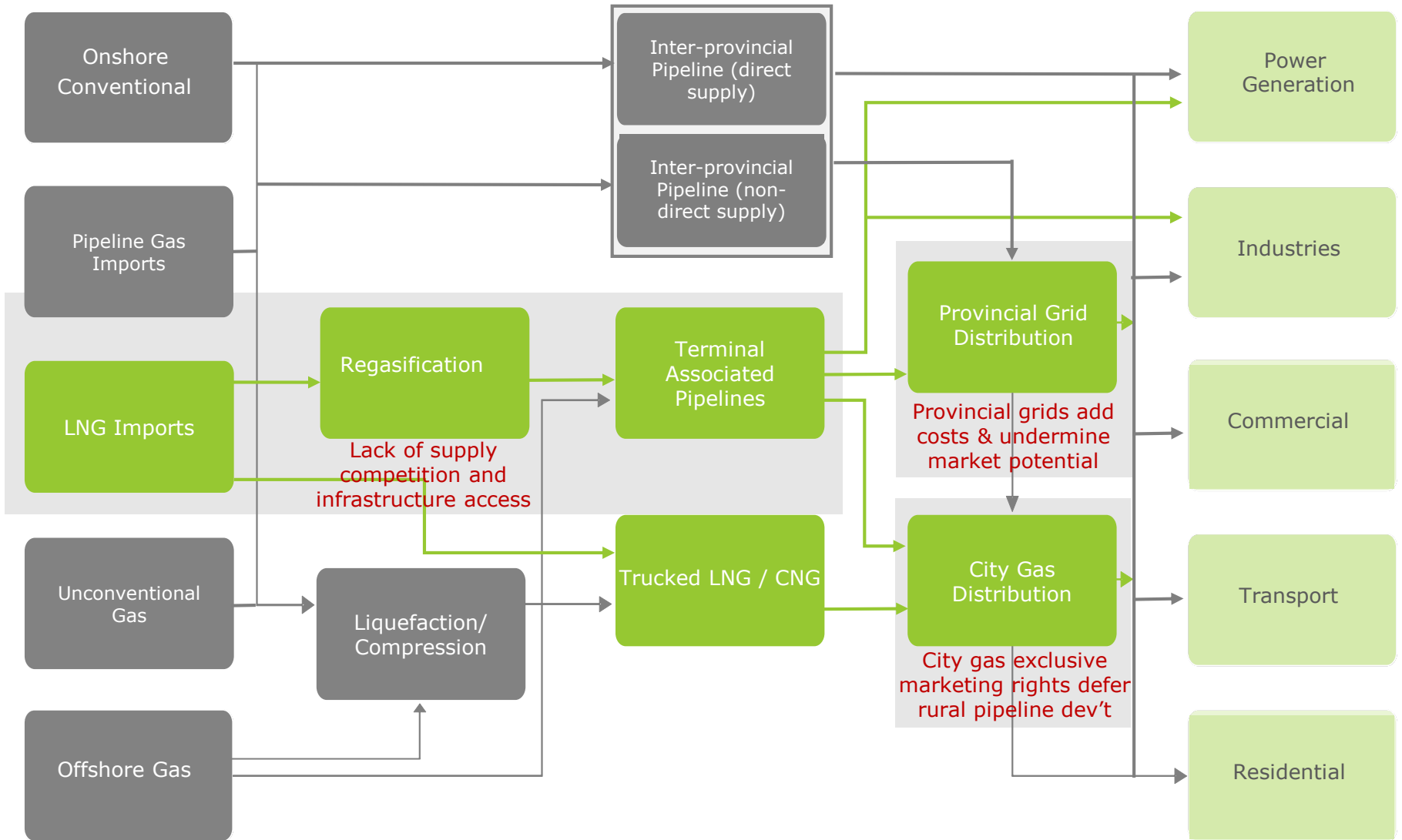
# 下游：国内一半以上天然气消费量连续三年涨价

End User Pricing Mix in China's Gas Consumption 2012-2015



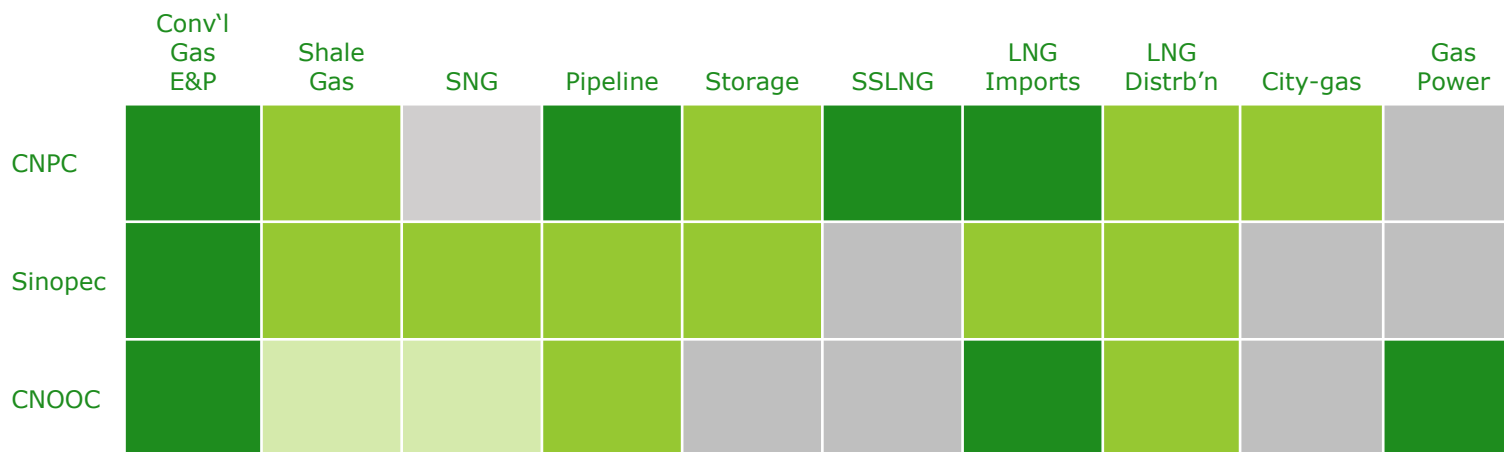
Source: SIA Energy

# 天然气产业链结构导致价格传导不畅



# 由需求驱动的第二梯队LNG进口商正在对供给驱动的“三桶油”发起挑战

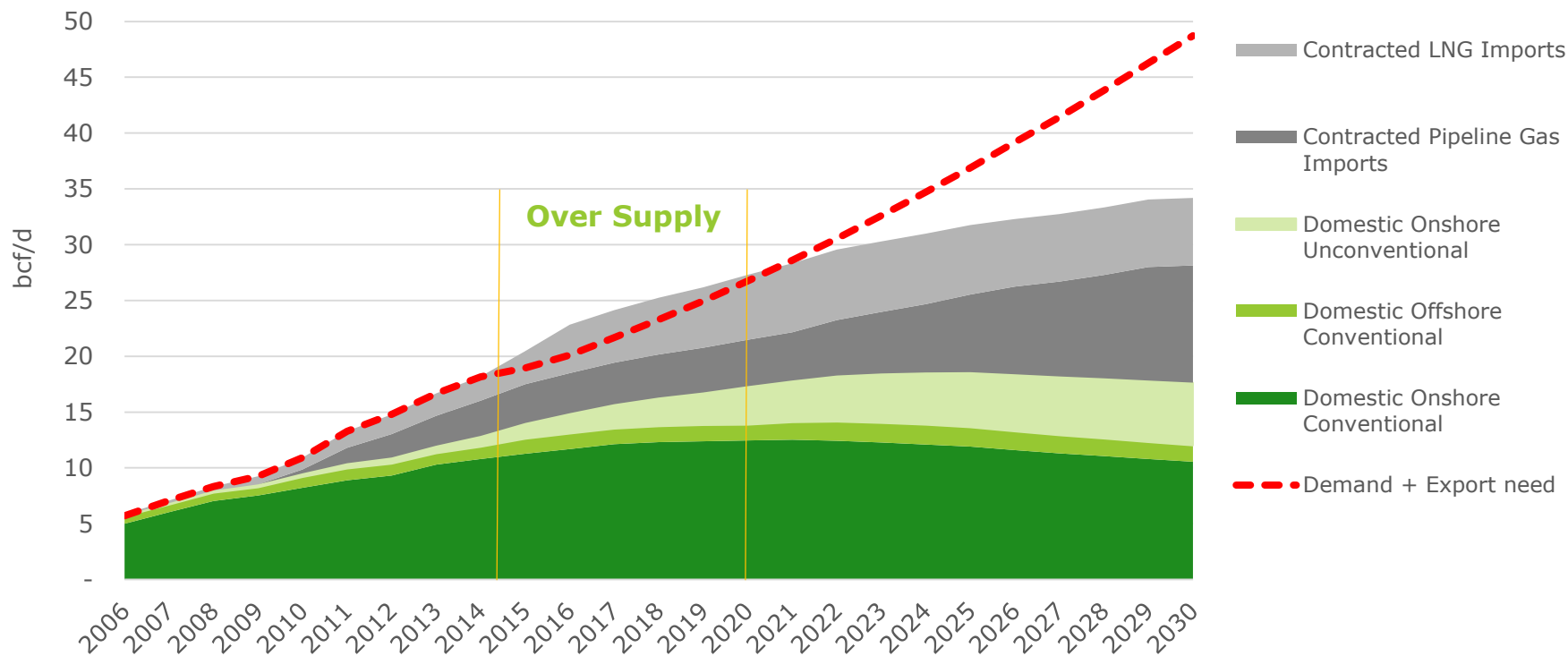
- They are market-pull (vs NOC's supply-push approach): NOCs are historically upstream driven, and downstream gas was not their strategic focus in the past; on the contrary, most second-tier players want to import gas for self use or existing captive market, and can gain an upper hand in a buyer's market.



- The new LNG deals will have more competitive pricing structure and contract terms: with no historical baggage, their import deals can be more competitive vs NOC's pipeline and LNG imports signed years ago in seller's market. Supply and infrastructure competition will also enhance 2<sup>nd</sup>-tier players' bargaining power in gas price negotiation with NOCs.
- They can cut middle men and lower supply costs: some of them are provincial grids (Zhejiang Energy, Yudean), some are city-gas distributors (ENN, Shenzhen Gas, Guangzhou gas, Beijing gas) or LNG distributors. Cutting distribution layers can significantly improve cost competitiveness.
- In a growing market with de-regulation trend, prime terminal sites with suitable port conditions along the coast line are scarce resources by themselves: companies with forward-looking visions have to position themselves early enough to occupy strategic sites in order to capture future market potentials.
- They are more willing to offer TPA to other second-tier players: provincial or private players are more profit driven than NOCs and interested in improving utilization rate of their terminal investment.

# “供大于求”有可能持续到2020年...

## China: Gas Supply-Demand Balance

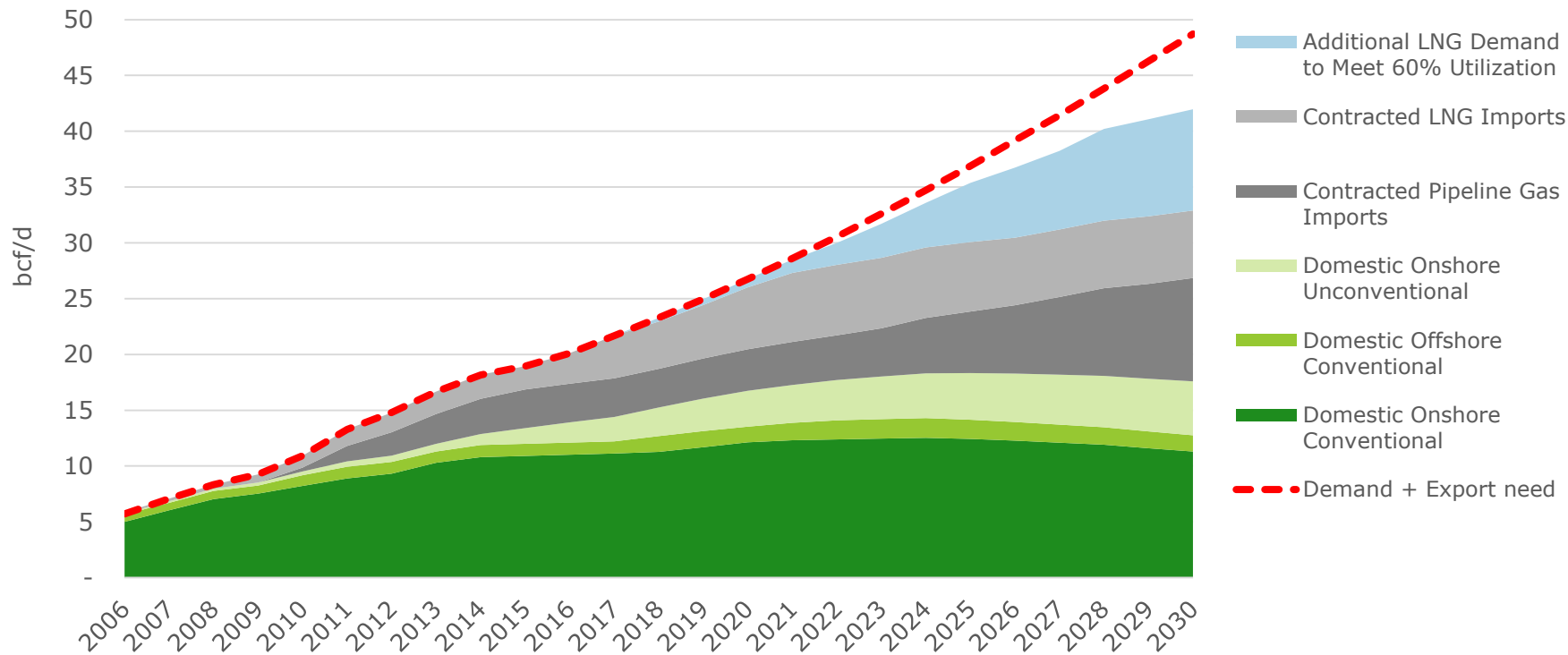


Source: SIA Energy

China enjoyed double-digit gas demand growth until 2014. Demand slow down was mainly due to supply/infrastructure monopoly, lag in price adjustment and incomplete cost pass-through along the value chain.

# ...但2020年以后仍然有较大的供需缺口

## China: Gas Supply-Demand Balance

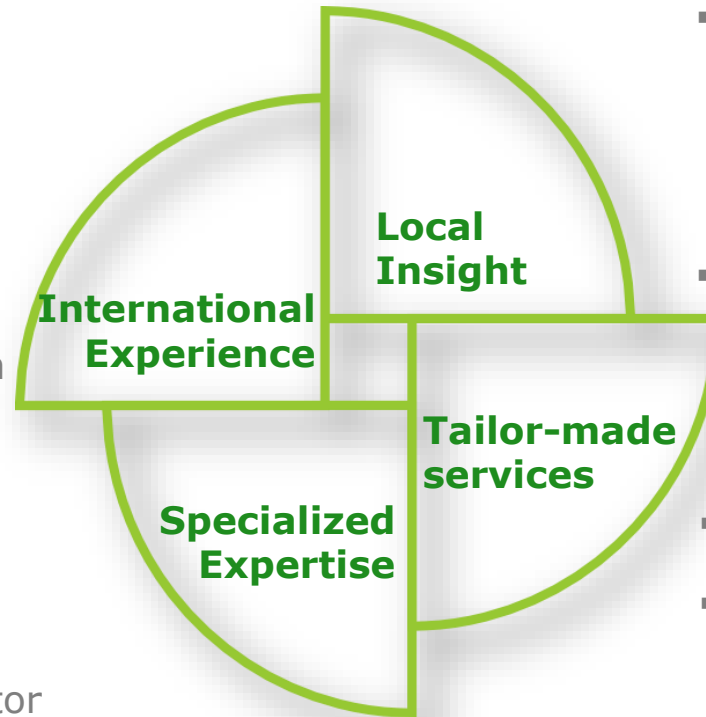


Source: SIA Energy

There will be additional LNG demand before 2020, mostly from second-tier LNG players for their under construction terminals. NOCs will take at least five years to digest their over contracted volumes before making new deals in the longer term.



- International team - 70% members have overseas academic or professional experience, 80% with masters and above degrees, 100% bilingual
- Global consulting experience with international perspective
- Professional training from top global energy consultancy
- Founded in Beijing, our primary focus is covering the Chinese oil & gas sector
- Core competency of understanding NOCs, policy implications and geopolitics of oil & gas



- On-the-ground team with local background and connection
- Daily interaction with policy makers and industry players of all types—state-owned and private, large and small, foreign and domestic
- First-hand market survey combined with multi-source data and in-depth local insight
- Tailor-made retainer services
- Promptly response to clients' inquiries
- Timely commentary on market and policy developments
- Business-relevant and actionable recommendations

# What We Do – Research & Retainer Services

## • Annual Research & Retainer Subscriptions

- Energy Policy Service
- China Gas Markets Service
- Company Strategy Service
- China Crude Oil Import Monitor
- China Shale Gas Monitor
- China CBM Monitor
- China SNG Monitor

## • Multi-Client Studies

- China Reform Outlook (2014)
- Chinese NOC Engagement Strategies (2014)
- China Lubricants Market Report (2014)
- Guangdong Gas Power Study (2015)
- Yangtze River Transportation LNG Demand Outlook (2015)

## • Maps

- Printed wall maps and map books for China oil & gas infrastructure and markets
- SIA oil and gas data terminal
- Interactive mapping tool



### China Lubricants Market Report

China's lubricants market has been attracting big, its strong demand potential, decent margins, and openness to non-state investors. But for all players in this market—seven Chinese NOCs—real data is hard to come by, making it difficult to understand true market size, demand structure and competitive environment. This report, based on SIA's sustained monitoring of the market, answers these important questions:

**This report will help you...**

- access valuable market data:** In China, standards and definitions behind public data are not uniform, requiring all data be analyzed and verified. SIA's Lubricants Database is based on our expertise and local data access.
- understand the supply and demand situation:** As an example, we not only examine blending capacity, real production by Group and by player.
- develop a forward-looking view:** This study answers an important question for investors: "Will the market continue to grow in 2015?" Our 2015 forecast offers an insightful, uncensored view of the market.
- understand the competitive positions and strategies:** We look at the current positions of top state-owned players and the challenges they may be facing.




### China: Reform Outlook

The Xi-Li administration – China's new leadership – has redesigned the current political and economic system to boost China's economic growth. The importance of the 2nd Plenary Session, for the new party leadership's reform plans, China's oil and gas sector cannot be understood without this study.

There are various market expectations: liberalized gas prices, greater access to downstream, more upstream sectors and independence of the gas sector. With 13 years of experience working with oil and gas companies in China, SIA members have "China's Reform Outlook" study to help client companies understand the challenges they may be facing.

#### Key Client Questions

- What is the Xi-Li administration trying to achieve?
- How are these reform goals directly or indirectly affecting the oil and gas sector?
- What is likely to be achieved? What is not?
- What makes the current administration's political and economic views and what are the implications?
- The anti-corruption campaign is unprecedented. How will it impact the Chinese NOCs, especially CNPC?
- What is driving change in the relationship between China and the West?
- What are likely / possible scenarios for the oil and gas sector – each scenario?



### Shale Gas Monitor

Our Shale Gas Monitor gives you an in-depth look at how shale gas and tight oil projects in China, as well as the industry as a whole, are progressing. Covering wholly-owned NOC shale projects, blocks with foreign cooperation, and MLR-awarded blocks, we take a granular approach to assessing the medium and long-term outlook for shale gas and tight oil.

In addition to project details and supply forecasts, the monitor explores above-ground and monetization issues including shale policy, infrastructure access and pricing.

*Risked shale gas and tight oil supply and infrastructure development outlook, built up from project-level analysis*

#### At a Glance

- Shale Gas and Oil Status Update**  
Quarterly report on exploration, pilot and development progress and challenges at major shale gas and tight oil projects in China.
- Shale Gas and Oil Project Database**  
Detailed project-level information covering 1) NOC self-operated shale blocks, 2) Sino-foreign shale blocks including both joint studies and PSCs, and 3) MLR-awarded shale gas blocks.
- Shale Gas Pipeline Database**  
Detailed database on shale gas-dedicated pipelines (partners, operator, status, gas source, design capacity, length, announced start date, risked start date).
- Reliable Maps**  
Clear and up-to-date maps of valid shale gas and tight oil blocks and pipeline access.
- Responsive SIA Commentary**  
Timely and insightful commentary on industry events, policy and implications.

# What We Do – Bespoke Consulting Services

- **Politics, Policy and Geopolitical Analysis**
  - 12<sup>th</sup> Five Year Plan and Plenary Session
  - Overseas investment and loan-for-oil
  - South China Sea
  - China-Russia and China-Central Asia
- **National Oil Company (NOC), State-Owned Company (SOE) Analysis**
  - Includes Chinese national service companies (NSCs)
  - Characteristics and power mapping
  - Domestic and overseas investments and drivers
- **Market Studies**
  - Crude, oil products and natural gas
  - Supply, demand, pricing, imports, infrastructure
  - National, regional provincial and sub-provincial
  - Service sector market outlook and demand drivers
- **Market Entry, Growth Strategies and Partnership Strategies**
  - Upstream (conventional, CBM, Shale, etc), midstream, downstream gas, downstream oil, service sector
  - Competitive landscapes
  - Partnering strategies with Chinese NOCs, Energy SOEs, NSCs and private companies
- **Fiscal Terms and PSC Analysis**
  - Model contracts and operational and fiscal term design for China-foreign shale gas PSC
  - Onshore conventional PSC model contracts
  - EOR PSC model contract
- **Seminars and Trainings**
  - Capacity-building for Chinese companies
  - Seminars on China's market & policy environment for foreign companies
- **Other**
  - Due diligence

# China Gas Market Service – the Offerings



China Gas Market Data House  
中国天然气市场数据库

China Gas Supply Demand Data – Monthly  
中国天然气供需数据 – 月度发布

China Gas Imports Data – Monthly  
中国天然气进口数据库 – 月度发布

China Land-based LNG Data – Monthly  
中国陆上LNG工厂项目与运营数据 – 月度公布

China LNG Import Contract Data – Quarterly  
中国LNG 进口长约合同数据库 – 季度发布

Company Gas Profile  
公司天然气业务分析报告

CNPC/Sinopec/CNOOC Gas Profile - Annual  
中石油/中石化/中海油天然气业务分析报告 – 年度

Second-tier Gas Profile - Annual  
第二梯队天然气业务分析报告 – 年度

Gas Monitor Report  
天然气追踪报告

China Gas Imports Monitor - Quarterly  
中国天然气进口追踪报告 – 季度

China Land-based LNG Monitor – Quarterly  
中国陆上LNG工厂追踪报告 – 季度

China Gas Policies & Market  
Commentaries  
中国天然气政策和市场即时评论

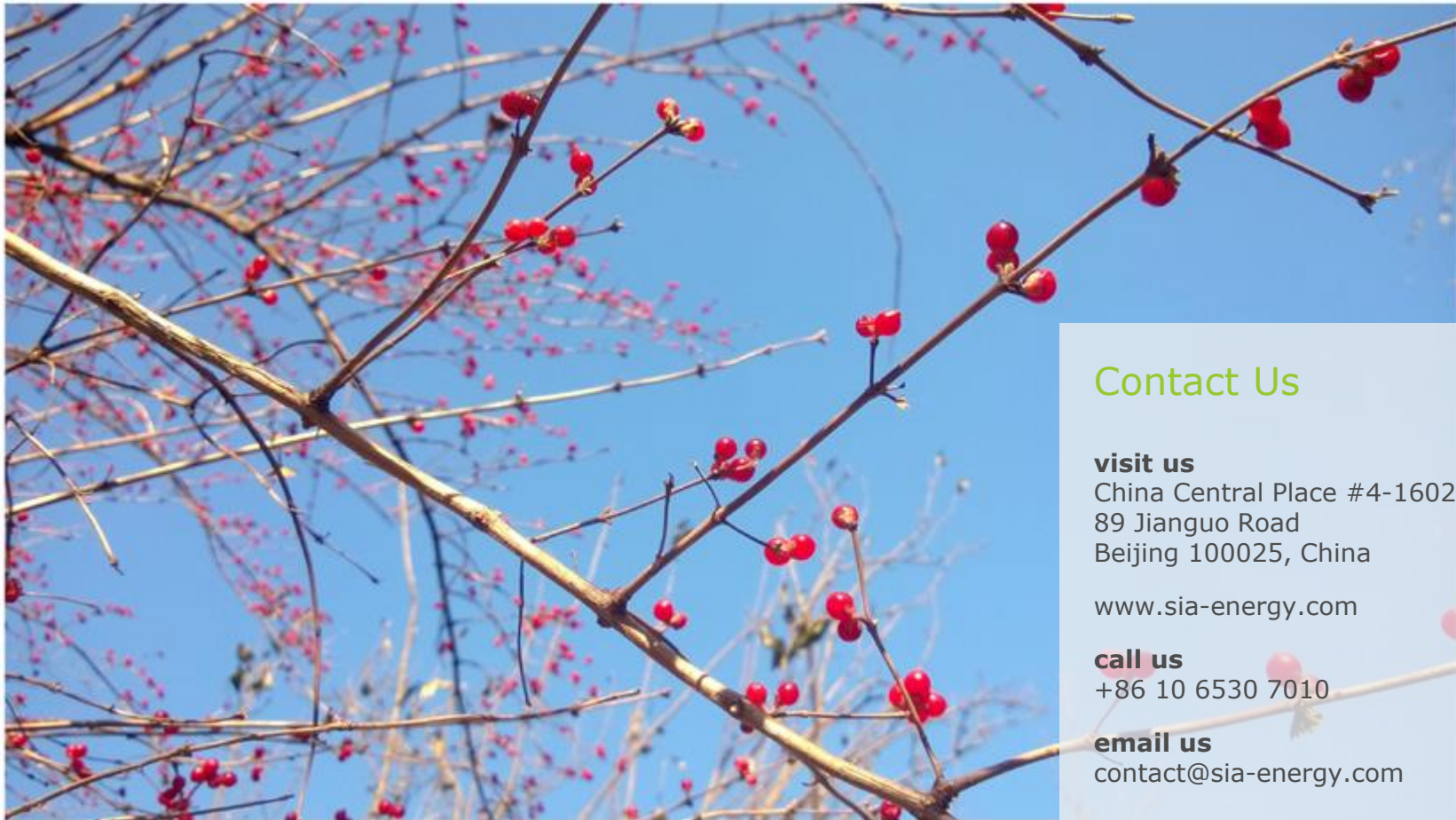
Policy 101: Third Party Access; Natural Gas Pricing  
政策101：三方准入；天然气定价；等等

SIA Commentaries  
SIA天然气市场即时评论

China Gas Maps  
中国天然气示意图

China SNG Projects Map; China Gas Pipelines Map; China LNG Terminals Map; China Underground Gas Storage Map; China Shale Gas Block Map  
中国煤制气项目图；天然气管道示意图；LNG接收站示意图；地下储气库图；页岩气区块图

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