



# USING MARKET-BASED APPROACH FOR AIR QUALITY IMPROVEMENT AND COAL REDUCTION: BEIJING AIR QUALITY IMPROVEMENT PROJECT 利用市场机制减煤脱碳推动空气质量改善：北京燃气项目

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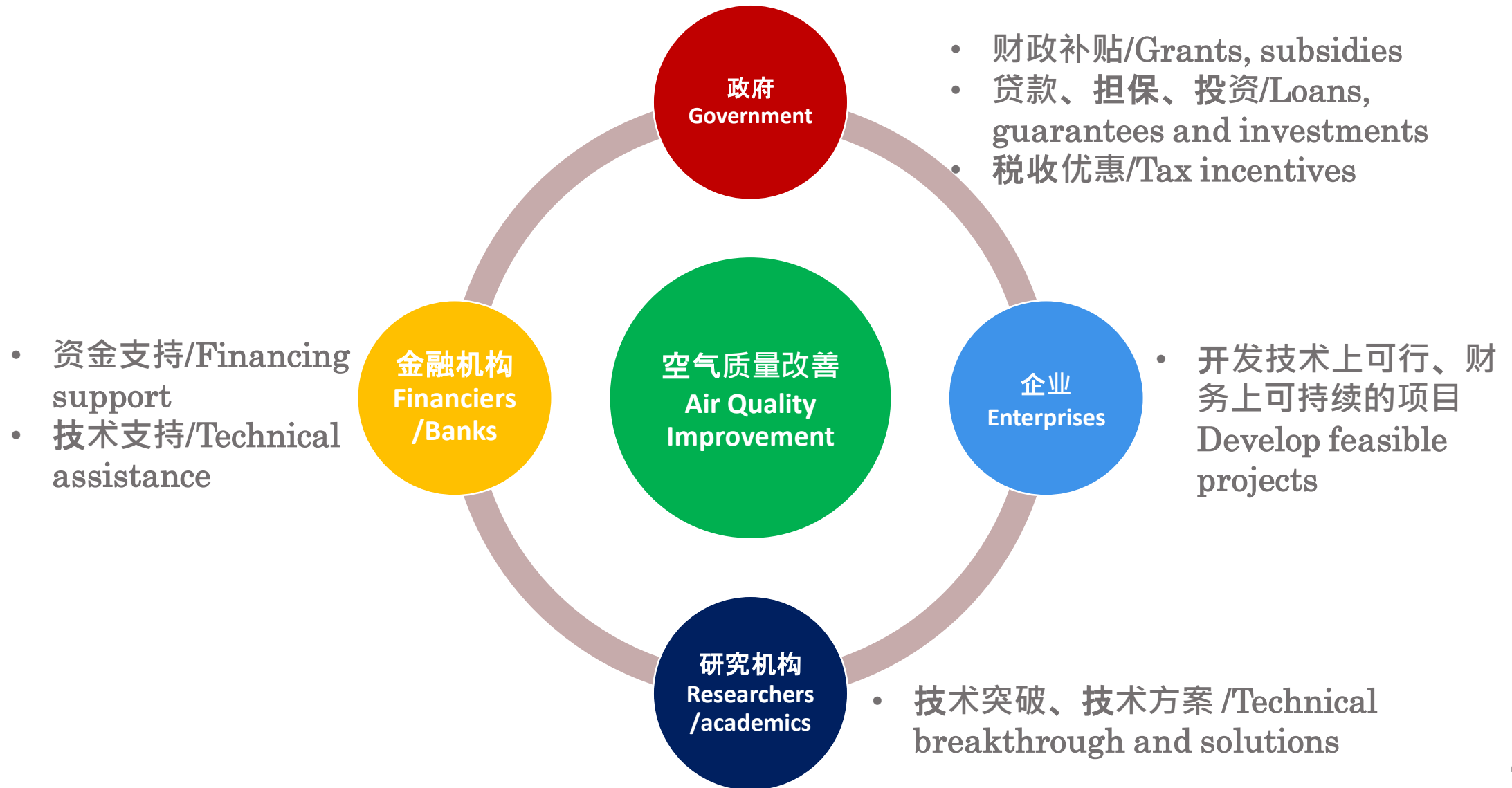
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# 宏观环境/Country Context

- 宏观经济表现：2016年，GDP 11.2万亿美元；增长率6.7%；名义债务余额：GDP的36.6%，其中外债约12.6%。
- Macroeconomic performance: in 2016, **GDP around US\$ 11.2 trillion and 6.7% growth rate**; nominal gross public debt around 36.6% of GDP (external debt: about 12.6% of GDP).
- 发展挑战：根据不同的研究，环境污染成本约占GDP的3-10%；环境污染造成的社会经济成本仍在增加。
- Development Challenges: **the costs of environmental degradation are about 3%-10% of GDP per various estimates**; economic costs from health impacts are still rising.
- 政府计划：空气污染控制是十三五期间（2016-2020）的重点；减煤减碳现在是空气质量改善政策和应对气候变化政策的双重点。
- Government's plan: air pollution control prioritized in the 13<sup>th</sup> Five Year Plan (2016-2020); coal reduction top priority under both air quality and climate change policy goals.

# 各参与方的作用/Roles of Different Stakeholders



# 行政手段和市场力量/Administrative Measures and Market Forces

- 行政手段：指令性目标、行业规章、准则和标准等
- Administrative measures: mandatory targets, regulations, codes and standards.
  - ✓ 优点：快
  - ✓ Merits: fast
  - ✓ 缺点：政策“一刀切”，容易产生“市场扭曲信号”
  - ✓ Limitations: standardized vs. customized targets, administrative discretion and creation of economic distortions
- 市场机制/ Market forces:
  - ✓ 优点：理论上经济效率高
  - ✓ Merits: economically efficient
  - ✓ 缺点：建立完善的市场机制需要时间
  - ✓ Limitations: putting sound institutions and optimal signals in place takes time.

# 行政手段和市场力量/Administrative Measures and Market Forces

- 现行措施高度依赖行政体系，取得了显著成效。举例而言，
- Current programs rely heavily on administrative systems, which have played a critical role in the success achieved so far. Examples,
  - ✓ 国家/各省的空气质量改善目标，指令性节能指标，强制性的去过剩产能，等等
  - ✓ National/provincial air quality improvement targets; mandated energy savings targets; Elimination of backward production capacity on iron/steel, cement, glass, aluminum.
- ❖ 未来的重点应该是如何利用市场力量来节能减排，包括探索使用“行政混合市场”的方式。
- ❖ More needs to be done to utilize market forces in the future, including measures to blend administrative and market-based approaches. Concepts and mechanisms need to be tested out.

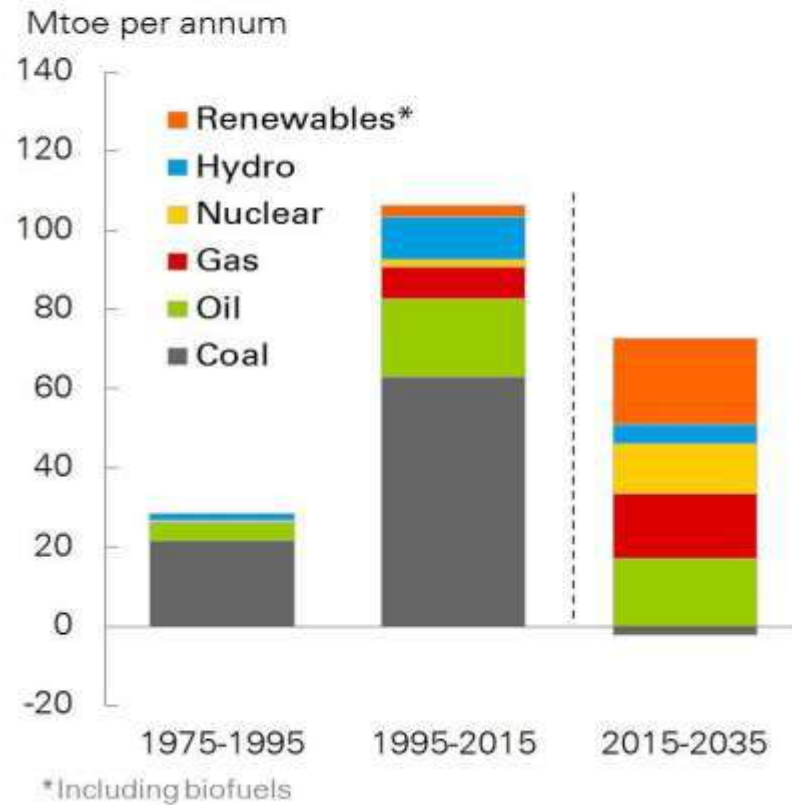
# 为什么选天然气/Why natural gas?

- 天然气是，除可再生能源外，中国经济从高碳转向低碳的重要方式；
- Natural gas, as a clean fuel, is deemed to be an important solution to upgrade China's energy supply from high carbon to low carbon, in addition to renewables;
- 国务院办公厅近日印发《能源发展战略行动计划（2014—2020年）》：到2020年，天然气在一次能源消费中的比重提高到10%以上；推动煤改气项目。
- Per State Council's Strategic Action Plan for Energy Development (2014-2020): by 2020 more than 10% primary energy supply from natural gas; **the government is promoting coal-to-gas conversion;**

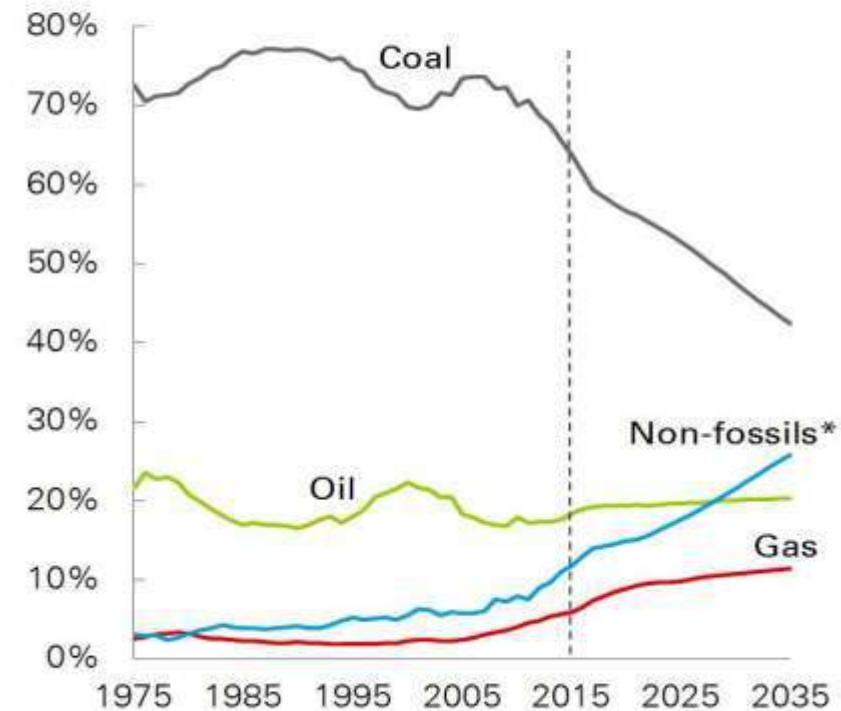


## China is also shifting towards a lower-carbon energy mix...

Primary energy demand  
growth by fuel



Shares of primary energy





# 北京情况/Beijing Context

- 北京面临的挑战：不断增长的能源需求和不断增加的污染控制压力。
- Beijing's challenge: increasing energy demand and pressing need for pollution control.
- 北京市政府的工作计划：逐步减少煤炭使用；2020年天然气占能源供应量35%；
- Beijing Municipal Government' workplan: to eliminate coal use step by step; by 2020, natural gas supply accounting for 35% of total primary energy supply.
- 天然气公用事业单位承担着很大的社会责任。
- Local gas utilities are expected to play an important role in achieving the policy target.

## 北京情况/Beijing Context (2)

- 北京郊区尚有超过100万农村家庭供暖或炊事使用煤炭；每个供暖季每户用煤3-5吨；贡献了大约14.4% - 18.5%的PM2.5；
- More than 1.0 million rural households still using coal for cooking and heating in Beijing; a household consumes 3-5 tons of coal per heating season, contributing about 14.4%-18.5% of PM2.5 in Beijing;



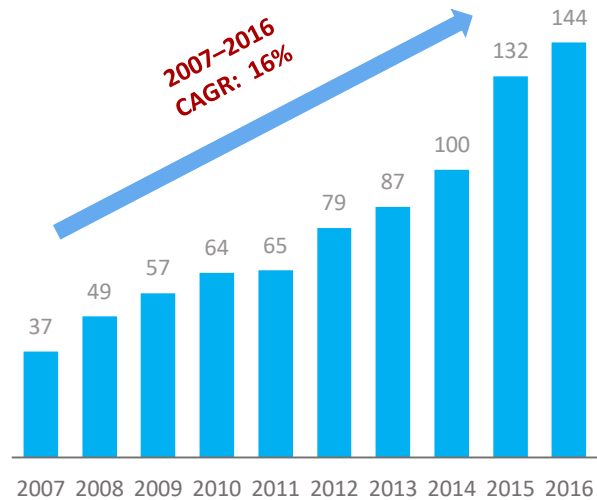
- 采暖成本：气煤相当/用气成本略高；采暖目前有补贴；
- Heating cost: gas comparably high; and heating is subsidized by local authorities at present;

# 北京燃气集团简介/Beijing Gas Brief

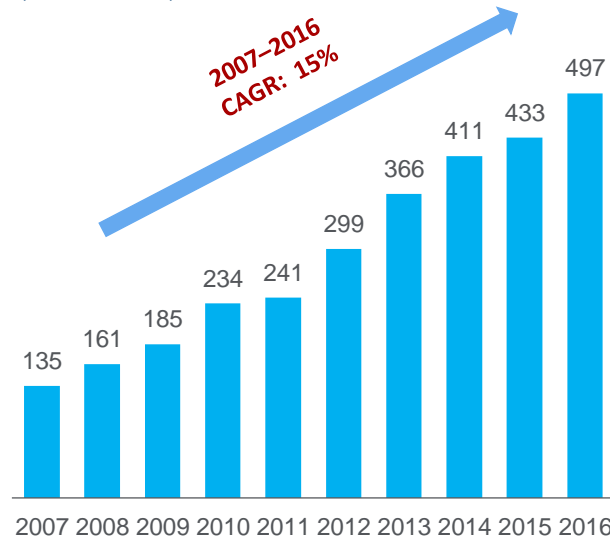
国内最大，在天然气供应量、运营效率、供气质量等方面行业领先  
Leading gas utility in terms of supply volume, operating efficiency and quality

- 🔥 **Enterprise Scale:** total assets US\$8.5 billion (as of June 2017); Revenue US\$5.1 billion ; EBITDA US\$714 million in 2016.
- 🔥 **Business Scale:** about 6.0 million gas consumers; length of pipeline amounted to 20,000 km; 8,862 employees, in 2016.
- 🔥 **Gas Purchase Volume:** Annual gas purchase increased to 15.2 billion m<sup>3</sup>, ranking No. 1 in China and Asia, and No.2 in the world.
- 🔥 **Operational Efficiency:** No. 1 in terms of operating revenue, net profit, gas sales volume, and number of customers per employee. .

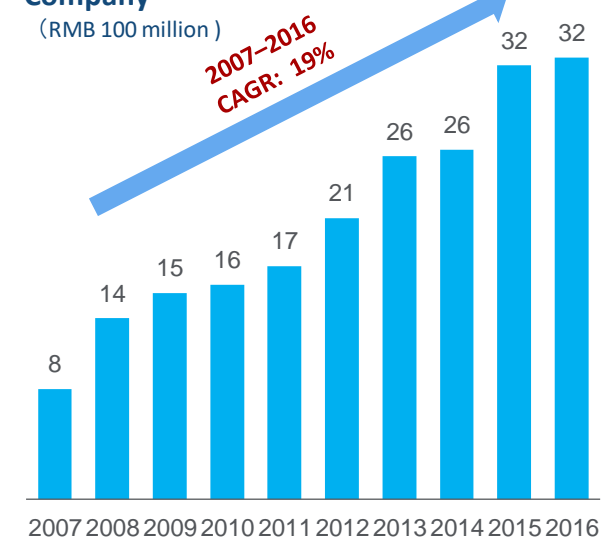
**Rapid Growth Gas sale volume**  
(bn m3)



**Steady Increase of Total Assets**  
(RMB 100 million)



**Net Profit Attributable to Owners of the Company**  
(RMB 100 million)



# 北京燃气集团简介/Beijing Gas Brief

企业在国内外有较强的影响力/Beijing Gas has strong industry influence domestically and internationally.

## 国内影响力/Domestic Influence

- 主持/参与了20多项行业标准制定； Leads and participates in the establishment of 20 national industry standards for domestic gas industry.
- 中国燃气协会副主席单位和秘书处/The First Vice-Chairman and Secretariat of the China Gas Association.

## 国际影响力/ International Influence

- 2016年主办了G20天然气日活动, Hosted G20 Natural Gas Day in 2016, bringing together G20 ministers, policy makers and representatives of international gas enterprises to discuss the role of natural gas in future energy supply.
- 2017年10月26日, 成功竞选国际燃气联盟2021-2024年度主席, 北京作为2024年度世界天然气大会主办城市； On October 26, 2017, Chairperson of Beijing Gas was elected as the President of International Gas Union (IGU) for 2021-2024, with Beijing to host the 2024 World Gas Conference.



# 北京燃气集团业务/Beijing Gas Businesses

业务以燃气配送为主，同时覆盖上游的燃气输送和生产/focuses on downstream gas distribution, and presents in midstream and upstream transmission and production.

## ❖ Downstream

- Pipeline: 20,000 km
- Yearly sale: 15.2 bn m<sup>3</sup>
- Customers: 6.0 million



## ❖ Midstream

- Four Shanxi-Beijing pipelines
- Receiving stations
- Gas storage tanks



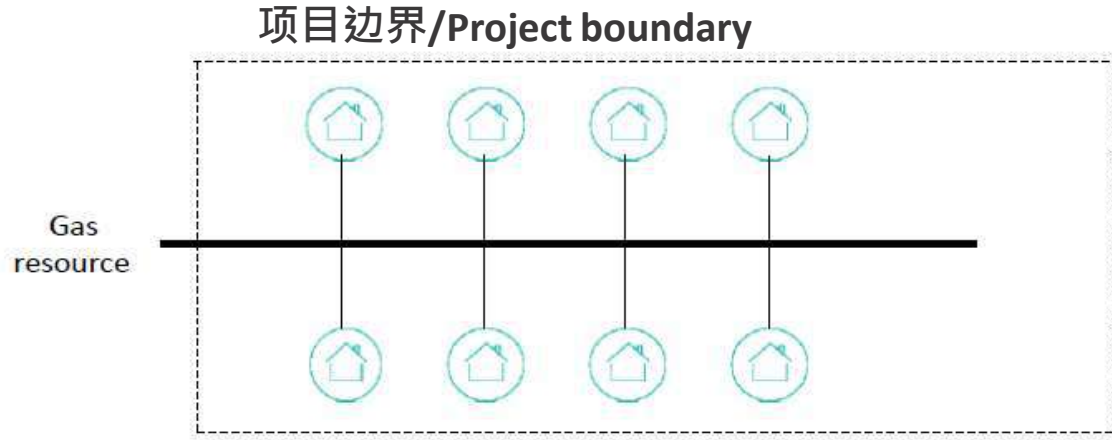
## ❖ Upstream

- Exploration
- Production





# 项目简介/Project Description



- 在京郊约510村敷设燃气配送设施，包括村庄主管道、入户接入以及燃气计量仪表等；
- To finance the construction of natural gas distribution networks in about 510 rural villages of Beijing, including low-pressure village gas pipelines, household connections, and household gas consumption meters.

A. 村主管/Village main pipe



B. 入户接入/H-connection



C. 家用燃气炉/Household heater



❖ A and B: covered by the Project

❖ C: costs shared between household, village, and local authority

# 项目根据/Project Rationale

- 促进可持续发展/foster sustainable development.
- 降低能源供应的碳强度、减少区域污染、提高能效/**reducing the carbon intensity of energy supply, managing local and regional pollution, and realizing energy efficiency potential.**
- 和中国的改善空气质量、降低碳排放的政策目标一致/aligned with China's policy goals on air quality improvement and carbon emission reduction.
- 符合巴黎协定精神和国际社会减碳的努力一致/aligned with global/MDBs' efforts to reduce CO<sub>2</sub> emissions in energy supply.

# 项目分析/Project: Annual Economic and Environmental Benefits



年减煤65万吨  
Reduction of 650,000 tons



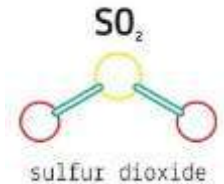
年节能11.3万吨标煤  
Energy savings of  
113,000 tons of SCE



年减碳排放59.6万吨  
Reduction of 595,700 tons



年减PM2.5约3700吨  
Reduction of 3,700 tons



减1488吨  
Reduction of 1,488 tons



减氮氧化物4442吨  
Reduction of 4,442 tons

Upon completion of the Project, ambient air quality and quality of rural environment in Beijing will improve. The risk of respiratory diseases, cardiovascular disease, and ischemic heart disease will be mitigated (Health Effects Institute and Tsinghua University, 2016). The most vulnerable to such adverse effects, such as children, the sick, the elderly, and women, will benefit the most.



## 亚投行的附加值/Value Addition of AIIB

- 帮助北京燃气集团降低项目资金的不确定性、提高项目财务可行性
- Help Beijing Gas reduce the Project's financing uncertainty and improve financial viability;
- 帮助北京燃气加深对国际规则的认识，特别是在环境和社会保障措施方面
- Help Beijing Gas deepen its understanding on international good practices;
- 通过财务尽调帮助北京燃气强化管理能力、完善管理体系
- Help Beijing Gas further strengthen its management capacity and systems through financial due diligence activities.
- 探索吸引市场资源进入低碳发展、环境保护和空气质量改善领域的途径
- Help attract more social resources into the field of low-carbon development and environmental protection/air quality improvement.

## 项目成本估算/Cost and Financing Plan (US\$ million)

Source	百万美元/US\$ (million)	%
自有资金/Equity		
a. 北京燃气/Beijing Gas	252.77	33.21
赠款/Grant		
b. 北京市政府/Beijing Municipality	228.33	30.00
贷款/Debt		
c. 亚投行/AIIB	250.00	32.85
d. 中国清洁机制中心/China CDM Fund	30.00	3.94
合计/Total Financing	761.10	100

# 改善空气质量的3个A / 3A of Air Quality Improvement

## 雄心/Ambition

- 长短期目标相结合
- **short and long term strategy**
- 项目实施要注意成效
- **strong implementation mechanism**



## 认识/Awareness

- 营造有利的政策环境
- **favorable policy environment**
- 赢得广泛参与
- **extensive participation**



## 行动/Action

- 持之以恒的项目实施
- **dedicated stakeholders**
- 切实可行的方案和目标
- **realizable plan and targets**



为了明天的蓝天白云，让我们一起努力！

**Let's create tomorrow !**

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