石家庄市煤炭消费总量控制方案和政策研究

Shijiazhuang Total Coal Consumption Control Plan and Policy Research

石家庄市煤控课题组

Shijiazhuang Coal Cap Research Group

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石家庄市作为河北省省会城市，未来的发展方向也被明确为京津冀区域中心城市和冀中南中心城市，成为京津冀世界级城市群“第三极”。

As the capital city of Hebei Province, Shijiazhuang is serving as a key city in the Beijing-Tianjin-Hebei Region. Located in the middle-south of the province, Shijiazhuang is aiming to become a “third pole of economic growth” in the world-class city cluster planned by the national urbanization strategy.

一、石家庄基本情况
1. Shijiazhuang Overview

石家庄市属于大气污染“重点控制区”，环境空气总体表现为“煤烟型”污染特征，且具有明显的季节性。 2015年74个重点城市中的空气质量较差的前10名城市石家庄排名第8位；2016年前3季度，74个城市中空气质量相对较差的10个城市中石家庄排名第6位。

Shijiazhuang is one of the key pollution control areas, for its air is heavily polluted by coal burning with seasonal variations. Last year, Shijiazhuang ranked 8th among the ten cities with the worst air pollution, out of the 74 key air pollution cities. Through the first three quarters of 2016, Shijiazhuang ranked 6th among the cities with the worst air pollution.

一、石家庄基本情况
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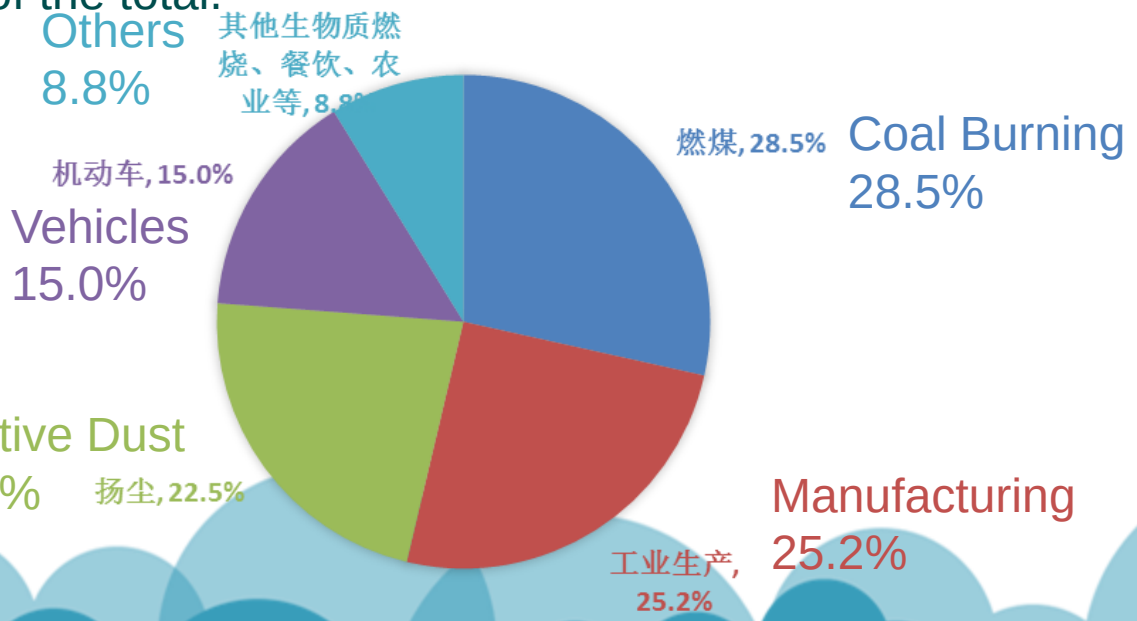
- $PM_{2.5}$中70%至77%来自本地污染

70-77% of Shijiazhuang's $PM_{2.5}$ is sourced from the city's own pollution.

- 本地来源中：燃煤占比最高，达到了28.5%

Burning coal is the largest source of local pollution, reaching 28.5% of the total.



二、石家庄采取的控煤措施及效果
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（一）针对现状政府出台政策措施
Policies to Tackle Air Pollution and Reduce Coal Consumption

- 《石家庄市大气污染防治攻坚行动方案（2013—2017年）》（石发〔2013〕17号）
  Action Plan for Shijiazhuang Air Pollution Prevention and Control (2013-2017)
- 《石家庄市大气污染防治条例》（2016年修订）
  Regulations of Shijiazhuang Municipality on the Prevention and Control of Atmospheric Pollution （Revised 2016）
- 《石家庄市燃煤工业锅炉改造实施方案》（石政办函〔2015〕74号
  Implementation Plan for Improving Industrial Boilers in Shijiazhuang（2015）
- 《石家庄市清洁能源替代工作方案》
  General Planning for Replacing Fossil Fuels with Clean Energy in Shijiazhuang

二、石家庄采取的控煤措施及效果
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- 《石家庄市散煤污染整治专项行动方案》2016
  Action Plan for Controlling Pollution from Dispersed Coal in Shijiazhuang (2016)
- 《石家庄市人民政府关于进一步规范新建用煤项目煤炭等量或减量替代工作的通知》2016
  Notice of Shijiazhuang Municipality on Regulating New Coal-Consuming Projects and Reducing and Replacing Coal Consumption (2016)
- 《河北省人民政府关于印发河北省建设京津冀生态环境支撑区规划（2016-2020年）的通知》
  Notice of Hebei Provincial Government on Issuing a Plan on Developing an Ecological Environment Support Area for Beijing-Tianjin-Hebei Region (2016-2020)
- 《2012-2017年气化石家庄实施方案》
  Implementation Plan for Replacing Coal with Natural Gas in Shijiazhuang (2012-2017)
- 《石家庄市推进供给侧结构性改革实施方案》
  Implementation Plan for Promoting Supply-Side Reforms in Shijiazhuang

二、石家庄采取的控煤措施及效果
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（二）具体措施 Implementation

1. 淘汰高污染燃料锅炉
Phasing out boilers with heavy pollutant emissions

建成区禁止建设燃用高污染燃料锅炉，工业园区禁止新建20蒸吨/小时以下的燃用高污染燃料锅炉，其他地区禁止新建10蒸吨/小时以下的燃用高污染燃料锅炉。逐步淘汰市区建成区35蒸吨/小时以下燃煤锅炉，城镇建成区淘汰10蒸吨/小时以下燃煤锅炉，工业园区和企业聚集区淘汰自备燃煤锅炉。

Boilers using heavily polluting fuels are not allowed in urban areas. Boilers with capacity lower than 20 steam tons/hour are prohibited in industrial parks, and those with less than 10 steam tons/hour are not allowed outside industrial parks. Within the city boundary, phase out boilers with capacity smaller than 10 steam tons/hour. Phase out all the self-provided coal-burning boilers in industrial parks and enterprise regions.

二、石家庄采取的控煤措施及效果
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2. 石家庄气化工程
Replacing Coal with Natural Gas

石家庄市通过实施天然气设施建设工程、燃机发电建设工程、自备电厂煤改气工程、工业窑炉气化工程、燃煤锅炉气化工程、分布式能源示范工程、资源保障和应急储备能力建设等七大工程，扩大全市天然气用途用量，调整能源结构，达到削减煤炭、治理大气污染的目标。

Shijiazhuang is expanding the share of natural gas to reshape the energy consumption structure by implementing seven natural gas-based projects, aiming at reducing coal use and air pollution.

二、石家庄采取的控煤措施及效果
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3. 节能技改
Applying Energy-Saving Technology

开展对锅炉（窑炉）、电机、风机、变压器等高耗能设备，以及余热余压利用状况深入排查，实施改造。重点是燃煤锅炉节能改造提升，对相关项目予以资金补助。

Identify and improve industrial devices with high energy consumption. Government provides subsidies to support the technical upgrade of coal-burning industrial boilers.

二、石家庄采取的控煤措施及效果
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4. 新能源 Developing Renewable Energy

（1） 2014年底井陉太科光伏电力有限公司25兆瓦光伏电站项目和河北捷高藁城6.6兆瓦光伏项目并网；2015年平山宏润太阳能发电公司30兆瓦光伏电站项目并网；井陉润恒光电科技有限公司20兆瓦光伏电站项目，现已竣工并投入使用。目前我市光伏发电项目累计完成6.16万千瓦。

Up to now, Shijiazhuang has cumulatively installed 61.6 MW of solar power plants .

二、石家庄采取的控煤措施及效果

2. Shijiazhuang Coal Cap Measures and Effectiveness

（2）石家庄市桥东污水源热泵总建筑面积12069平方米，管网（DN400-1000）37400米。以桥东污水处理厂为轴心，为5公里范围内的800万平方米建筑提供采暖负荷300MW，夏季制冷负荷210MW。全年用电量为125.25M kWh，折合标准煤15393吨。年用水量8030 m3，折合标准煤 0.69吨。全部能源消耗折合标准煤年用量为15394吨/年。

Shijiazhuang is using wastewater as a heat source for heat pumps to replace coal consumption, providing 300 MW of heating and 210 MW of cooling capacity. The wastewater plant is able to provide the equivalent of 15,394 TCE per year of thermal energy in summer and winter to cut air conditioning and heating costs.

二、石家庄采取的控煤措施及效果

2. Shijiazhuang Coal Cap Measures and Effectiveness

（3）石家庄基力垃圾发电厂，位于省城西南方向。日最高处理垃圾可达1500吨，装机总容量为7500千瓦，年发电量可达6000万千瓦时，目前年处理垃圾17万吨。

石家庄市平山圣地生物质热电有限公司垃圾焚烧热电站，位于平山县县城东南石阎公路西侧，新安村东侧。日处理垃圾400吨，总装机容量12兆瓦。

Two waste-to-energy plants were built to cut coal use in the power sector. One of them is located in the southwest of the city with an ability to treat 1,500 tons of waste per day, with a capacity of 75 MW and generating 60 gigawatt hours of electricity per year.

二、石家庄采取的控煤措施及效果
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5. 散煤治理措施 Reducing the use of dispersed coal

（1）城市区推进集中供热和清洁能源利用，基本实现散烧归零。
Developing district heating systems and clean energy in urban areas, to basically eliminate dispersed coal use for heating.

（2）农村地区推进清洁燃料替代，实现清洁利用。
Promote cleaner fuels in rural areas

（3）流通领域强化煤炭质量管控，实现散煤达标。
Ensure control of dispersed coal quality in coal trading

（4）强化源头管控，把住劣质散煤出入口。
Strengthen management of dispersed coal quality on the coal production side to prevent trading of dirty coal

（5）增强保供能力，推进清洁能源调整利用。
Enhance reliable supply of energy and promote the adjustment of clean energy use

二、石家庄采取的控煤措施及效果
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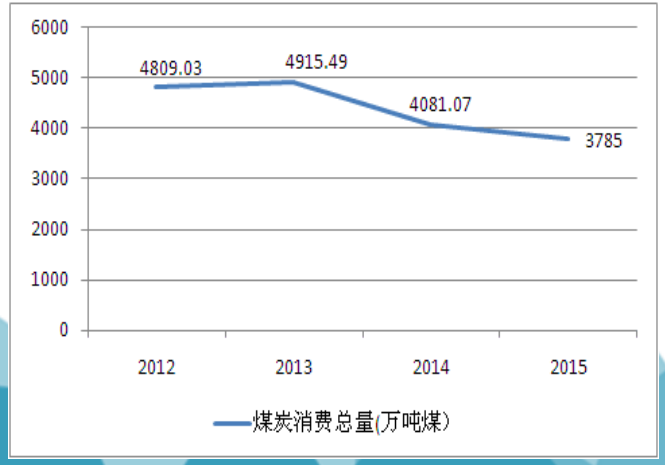
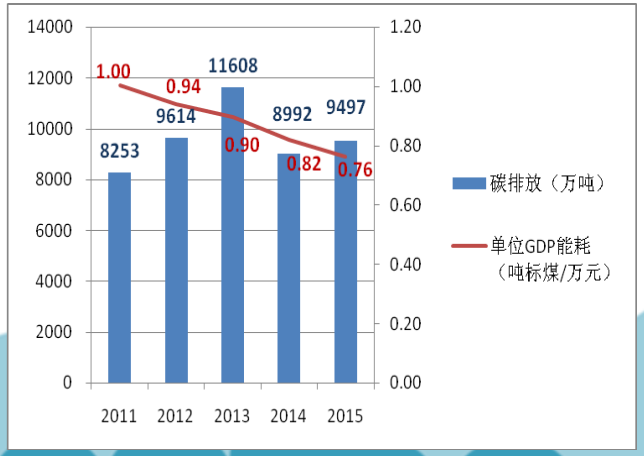
（三）取得效果 Achievements and Effectiveness

1. 石家庄市煤炭消费总量显著下降，2012-2015年煤炭消费总量分别为4809.03万吨、4915.49万吨、4081.07万吨、3872.5万吨。2015年比2012年煤炭消费降低了936.53万吨。单位GDP能耗逐年下降，由2011年的1吨标煤/万元，下降到2015年的0.76吨标煤/万元，下降了24%。

Shijiazhuang has enjoyed a significant drop in coal use. Coal consumption decreased from 48.0903 million tons in 2012 to 38.725 million tons in 2015, a decrease of 9.3653 million tons. Energy Intensity of GDP declined year over year from 1 TCE/10,000 RMB in 2011to 0.76 TCE/10,000 RMB in 2015.





二、石家庄采取的控煤措施及效果

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2. 大气环境明显改善 Air quality improved

全市$PM_{2.5}$年均浓度由2013年155μg/m^3降低到2014年125μg/m^3、2015年的89μg/m^3，2015年全市$PM_{2.5}$年均浓度比2013年下降了42.58%。

The concentration of $PM_{2.5}$ dropped 42.58% from 155μg/m^3 in 2013 to 89μg/m^3 in 2015.

三、“十三五”生态红线约束下煤控途径及保障措施建议

3. Policy Options under the 13th FYP Ecological Redlines Restrictions

（一）情境目标 General Goals

石家庄市生态环境控制红线：2020年$PM_{2.5}$为64μg/m^3，2018年退出全国重点监测城市空气质量排名后10位。

Shijiazhuang Ecological Redlines: Achieving PM2.5: 64μg/m^3 by 2020. Aiming to not be listed one of the ten cities with worst air pollution by 2018.

用水总量30.57亿m^3，其中地下水16.51亿m^3；早死亡人数下降到3850人，二氧化碳排放量9959万吨。

- Fresh water consumption: 3.057 billion m^3, including 1.651 billion m^3 of underground water.
- The number of premature death decreasing to 3,850 persons
- CO_2 emissions decreasing to 99.59 million tons

三、“十三五”生态红线约束下煤控途径及保障措施建议

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（二）煤控目标 Coal Cap Goals

2020年石家庄煤耗2136万tce，总能耗：4283万tce
2030年：1820万tce，总能耗：4938万tce

Coal consumption by 2020: 21.36 million TCE
Total energy consumption by 2020: 42.83 million TCE

Coal consumption by 2030: 18.2 million TCE
Total energy consumption by 2030: 49.38 million TCE

三、“十三五”生态红线约束下煤控途径及保障措施建议

3. Policy Options under the 13th FYP Ecological Redlines Restrictions

（三）保障措施建议 Policy Options

石家庄市要实现煤炭消费总量控制，可以通过经济结构调整、能源结构优化和能源效率提高的路径来实现

To achieve the goals of energy and coal consumption, it is suggested to optimize the energy and economic structures and improve energy efficiency.

1. 保持现有政策持续有效贯彻实施

Ensure the implementation and enforcement of current policies and regulations.

2. 加大产业结构调整：2020年的产业结构调整为5.2:42:52.8，2030年的产业结构调整为2.4:32:65.6

Adjust the share of the three economic sectors:

By 2020 – Primary 5.2% Secondary 42% Tertiary 52.8%

By 2030 – Primary 2.4% Secondary 32% Tertiary 65.6%

三、“十三五”生态红线约束下煤控途径及保障措施建议

3. Policy Options under the 13th FYP Ecological Redlines Restrictions

3. 加大能源结构调整和能源安全供应
Push forward energy structure reforms and ensure reliable energy supply

2020年煤炭、石油、天然气、可再生能源、外来电力比重为：0.50、0.17、0.17、0.05、0.11。一次能源中，煤炭占比大幅下降。
By 2020, reduce coal’s share in primary energy consumption. Coal: 50%, Oil: 17%, Natural gas: 17%, Renewables: 5%, Imported power: 11%. Coal’s share of primary energy decreases significantly.

2030年 煤炭、石油、天然气、可再生能源外来电力比重为：0.37、0.10、0.23、0.13、0.17。
By 2030: Coal: 37%, Oil: 10%, Natural gas: 23%, Renewables: 13%, Imported power: 17%

汇报完毕

谢谢！

Thank you!

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