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Measures and Achievements of Air Pollution Control in Beijing

Beijing Municipal Ecology and Environment Bureau
November 2023



Beijing in Brief

- ❑ A city with over 3000 years history and 800 years as capital
- ❑ surrounded by mountains on three sides and dustpan-shaped
- ❑ Area covers about 16,400 km², with a plain area of 6,400 km² (2/5)
- ❑ Fast social and economic development in the past over 40 years
 - ✓ **Resident Population:** 21.8 million
 - ✓ **GDP:** 4.1 trillion RMB yuan
 - ✓ **Registered Vehicle:** 7.1 million
 - ✓ **Energy consumption:** 71 million tons of coal equivalent
- ❑ The rapid socio-economic growth has brought huge pressure on the environment, and sustainable development has been taken as development strategy.



Introduction

- ❑ Over the past decade, Beijing has been devoted to **environmental protection** and **green development**, according to the national strategic deployment of pollution prevention.
- ❑ Since 2013, in order to reduce pollution, multiple methods have been adopted, including **source control**, **emission reduction at project scale**, **management improvement** etc.
- ❑ With the rapid economic and social growth, Beijing has achieved significant improvement in environment quality, which was reputed by UNEP as **"No other city or region on the planet has achieved such a feat"** .



Outline



Achievements



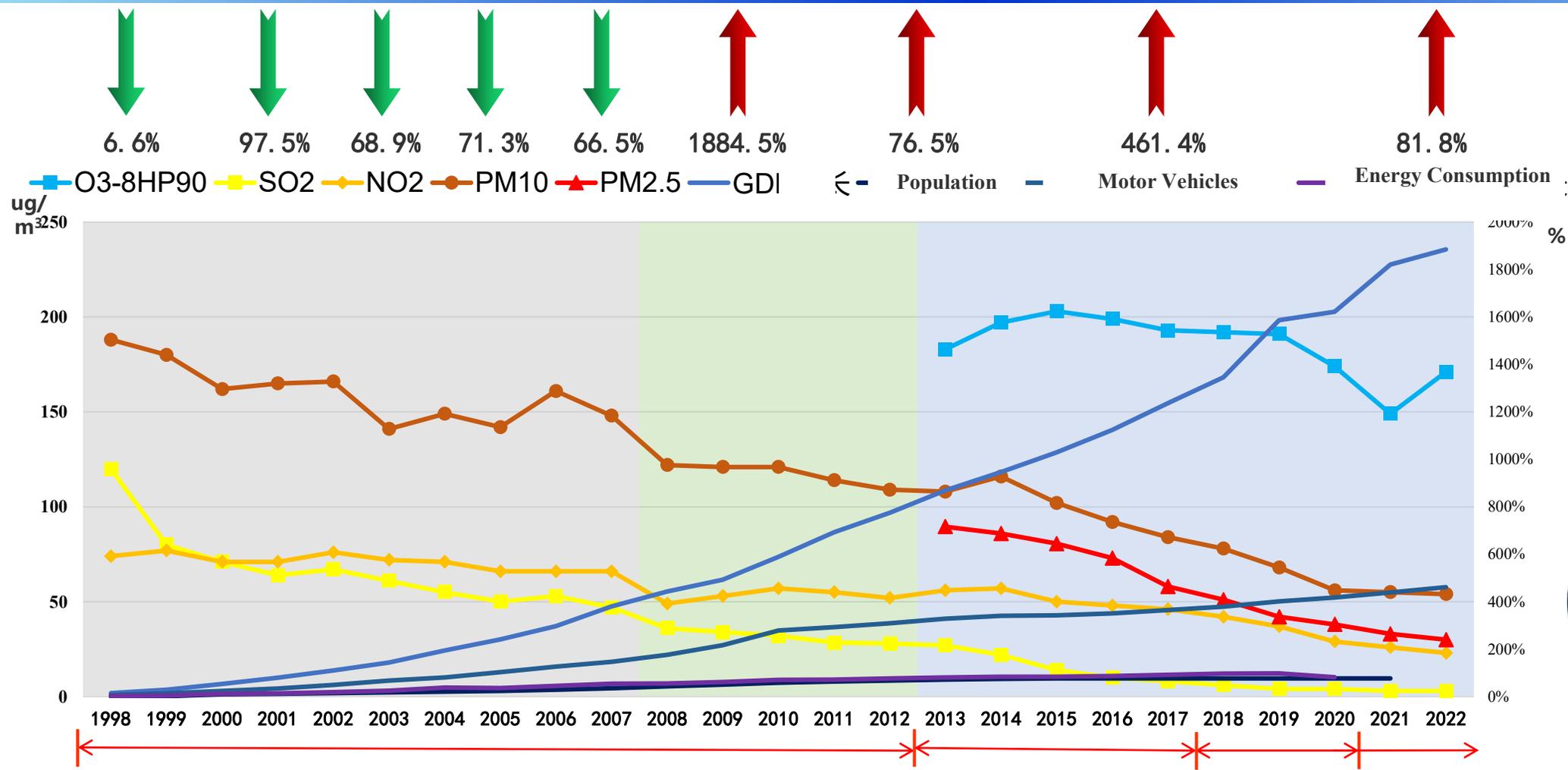
Measures



Future



Air quality significantly improved while the rapid development of economy



Economy growing



Environment improving

16 Stages' Air Pollution Control Measures (1998-2012)

Beijing Clean Air Action Plan (2013-2017)

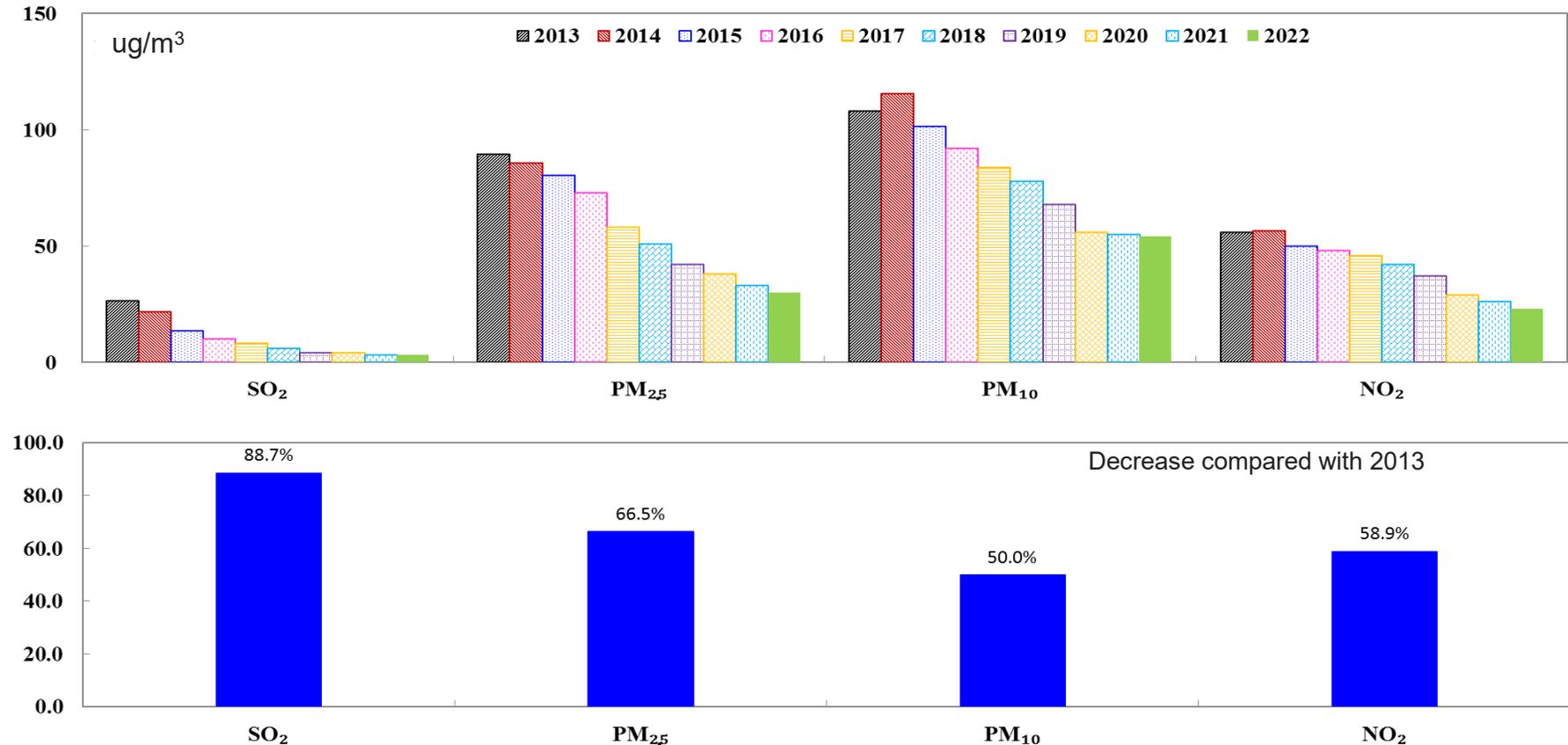
Beijing Blue Sky Action Plan (2018-2020)

battle to prevent and control pollution (yearly)

Annual Average Concentration of air pollutants decreased significantly

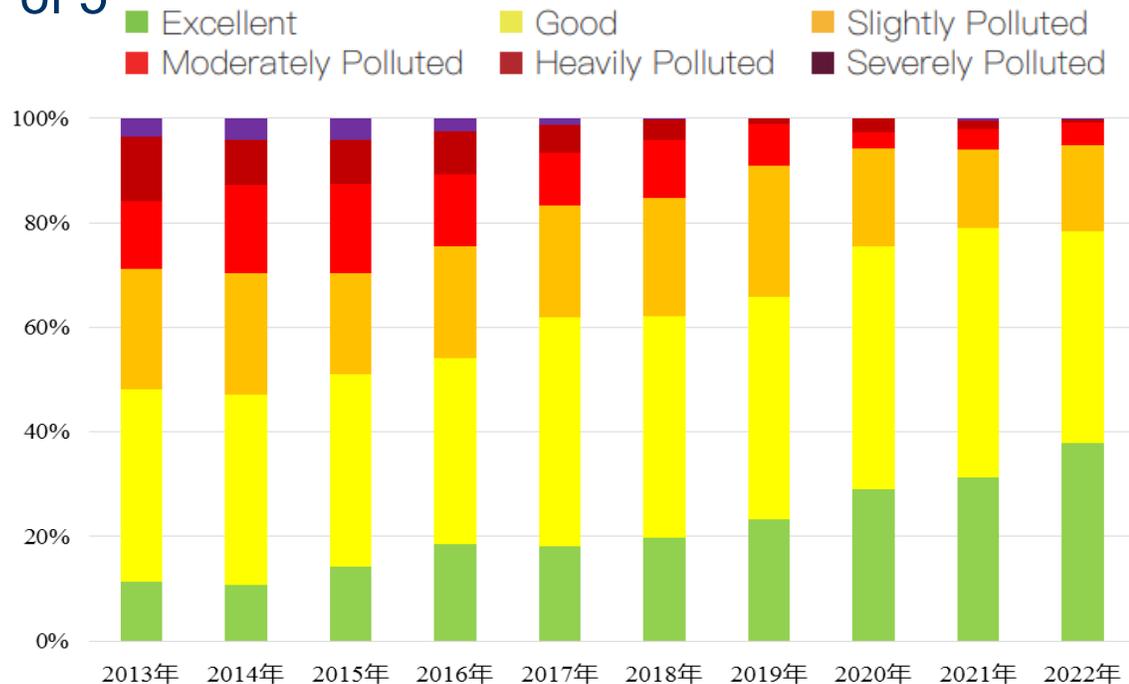
□ In 2022, Beijing's annual average concentrations of main air pollutants, such as PM_{2.5}, PM₁₀, NO₂, SO₂, decreased by 66.5%, 50.0%, 58.9% and 88.7% respectively compared to 2013.

□ In 2022, the annual average concentrations of PM_{2.5}, PM₁₀, NO₂, SO₂ in Beijing were 30, 54, 23, 3 ug/m³ respectively.



The Changes of AQI from 2013 to 2022

- **The number of days reached the standard** increased significantly. In 2013, 176 days. In 2022, 286 days, accounting for 78.4%, 110 days more than 2013.
- **The number of days reached excellent level** increased significantly too, from 41 days in 2013 to 138 days in 2022, an increase of 97 days.
- **Heavy polluted days** decreased year by year, from 58 days in 2013 to 3 days in 2022, a reduction of 55 days.



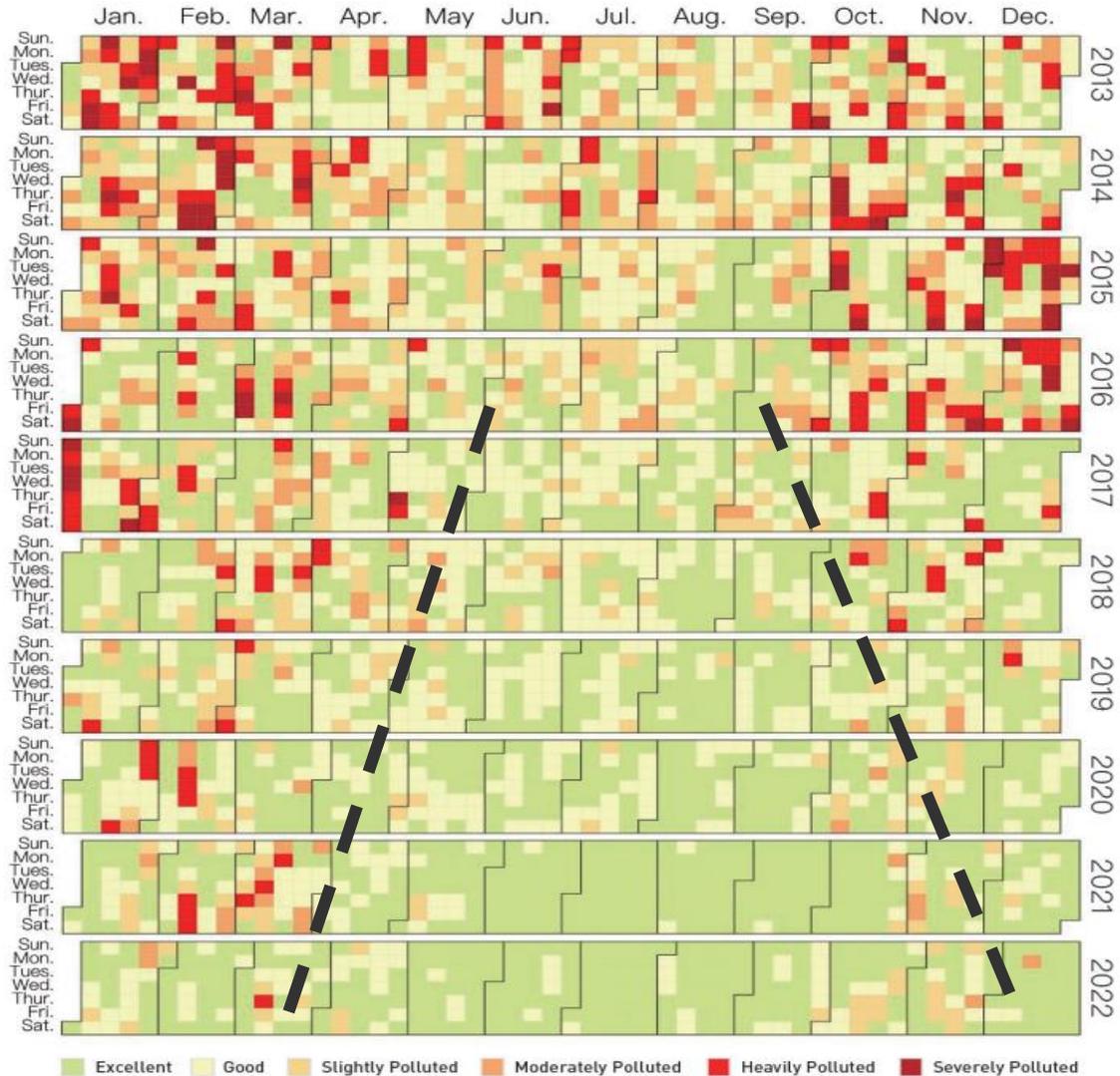
The Number of Excellent and Polluted Days in 2013 and 2022

Level	2013 (Days)	2022 (Days)
Excellent	41	138
Good	135	148
Slightly Polluted	84	60
Moderately Polluted	47	16
Heavily Polluted and Severely Polluted	58	3



Annual Proportion of Air Quality Levels in Beijing, 2013-2022

The PM_{2.5} calendar (2013-2022)



Ambient PM_{2.5} Level Calendar in Beijing, 2013-2022

- 2013-2022, the number of fine days of PM_{2.5} increased significantly and the number of heavy polluted days decreased significantly.
- 2013-2022, the number of continuous days without heavy polluted by PM_{2.5} increased significantly, to 274 days in 2022.
- 2022, heavy polluted days by PM_{2.5} in the non-heating season were almost gone, while the number in heating season was also improved obviously.



Highly valued by the international community

- **A Review of 20 Years' Air pollution Control in Beijing:** Beijing as a representative big city in developing countries, which has achieved remarkable results in improving the atmospheric environment quality, providing valuable experience for other cities in the world, especially for developing countries



- Mr. Kunsheng LI (a civil servant of BEE) received the International Air Quality Leadership of 2020-2021 Haagen-Smit Clean Air Award

- The project of "Phasing out coal in Beijing's heating system" won the 2022 C40 Cities Bloomberg Philanthropies Awards in "United to clean the air we breathe" category, making Beijing the only Chinese city to receive the award



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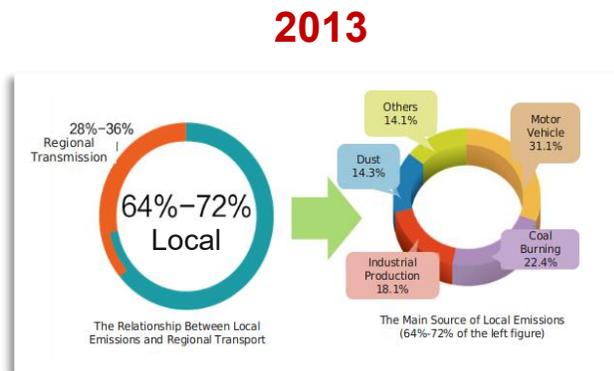


Future

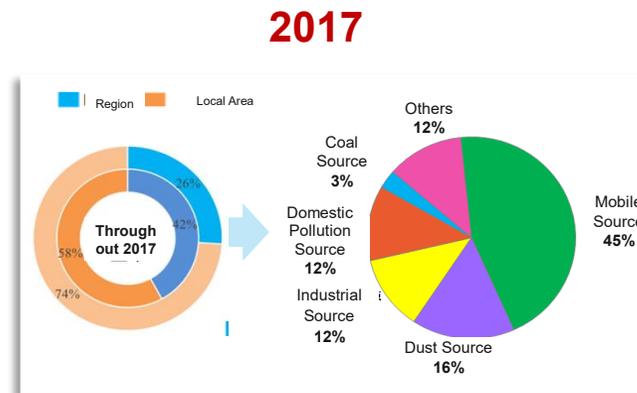


Source apportionment of PM_{2.5}

- **Source apportionment:** Complete three rounds of PM_{2.5} source apportionment
- **Main source:** motor vehicle, coal burning, industrial production, dust, domestic pollution, others

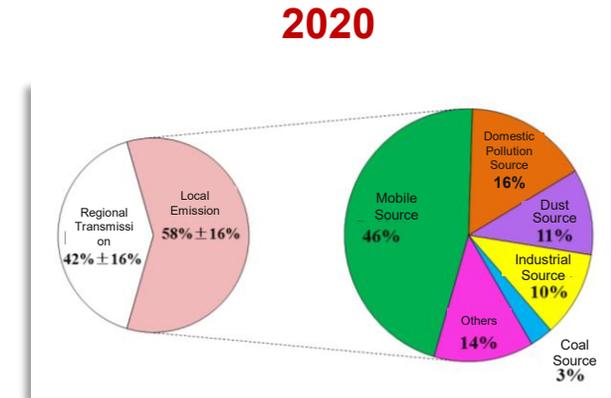


Beijing Clean Air Action Plan (2013-2017)



Beijing Blue Sky Action Plan (2018-2020)

PM_{2.5} source apportionment

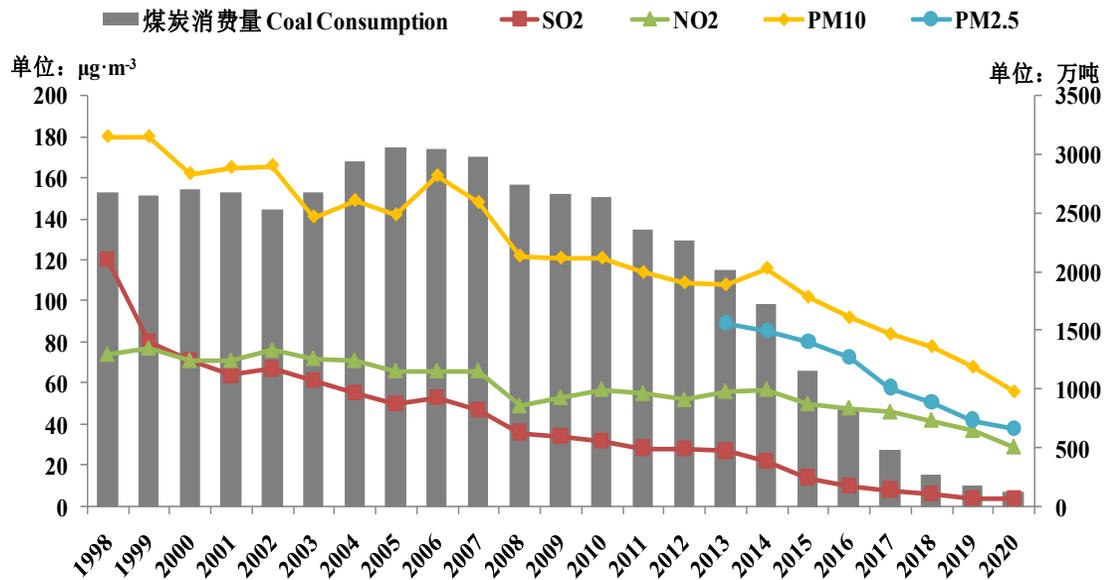


The 2021 Action Plan for Pollution Prevention and Control in Beijing

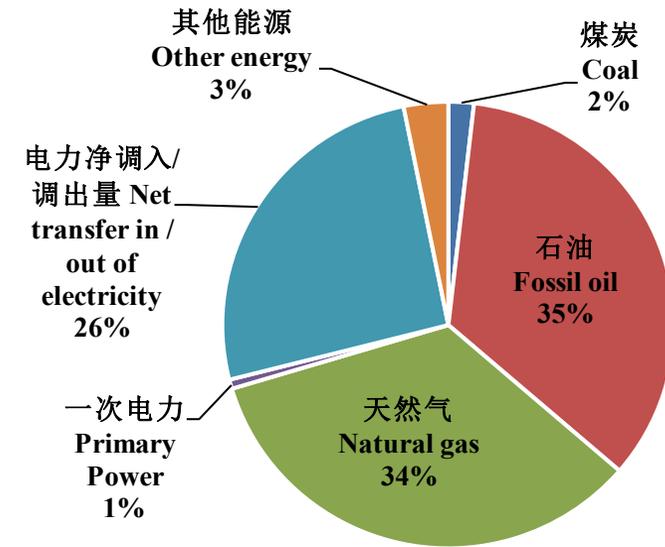


Reduce Coal

- ▣ **Substitution of coal-fired boilers:** A total of 28,000 MW of coal-fired boilers were renovated, and basically achieved no coal-fired boilers.
- ▣ **Household Coal Reduction:** Beijing completed “coal-to-gas” and “coal-to-electricity” transformation in 1.3 million households, and basically realized coal-free in the plain areas.



Trend of coal consumption and main pollutants



Composition of energy consumption in Beijing



Control of Vehicles and Fuel Use

- ❑ **Public transport priority:** By 2022, proportion of green travel in central urban area has reached 73.4%.
- ❑ **Improvement of emission and oil standards:** Beijing took the lead in PR China to implement National VI emission standards and fuel (including gasoline and diesel) standards.
- ❑ **Strict control of high emission vehicles:** Closed-loop management of high-emission heavy-duty diesel vehicles, implement travel ban for high-emission vehicles, demarcating low-emission zones for non road mobile machinery, etc
- ❑ **Promotion of new energy vehicles:** A total of 2.3 million old vehicles were obsolete, and

Enhance oil quality

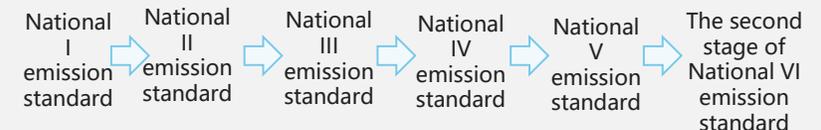


- Beijing first used unleaded gasoline in 1997, and subsequently launched a series of oil quality upgrades.
- Some indicators in the “Beijing VI emission standard” implemented since 2017 have been stricter than those of Europe.

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Emission standards have been tightened

Light petrol vehicle



Heavy-duty diesel vehicles



¹It is only implemented in urban public fleets such as public transport, sanitation, and postal services, and in long-distance social fleets such as freight transport and tourism

Industrial Production - Pollution Treatment and Emission Reduction

- ❑ **Raising the entry threshold:** Revised Catalog for Banned and Restricted New Industries in Beijing
- ❑ **Exit of polluting enterprises:** Revised Catalog for Adjustment and Elimination of Polluting Industry, Production Process and Equipment, a total of 3212 general manufacturing and polluting enterprises were eliminated, and 12,000 polluting businesses and enterprises were disposed of by classification
- ❑ **Technological transformation of enterprises:** All industrial sources have taken measures, 778 “Environmental protection technical transformation” projects were implemented. More than 18,000 key catering enterprises have updated their oil fume purification facilities.



Environmental protection technical transformation



Comprehensive Treatment

- ❑ **Science-based Pollution Control:** forming a “space-air-land” integrated air quality monitoring network, and building a high-density sensor monitoring network covering townships and streets
- ❑ **Strengthen legislation:** formulation of the Regulation on Air Pollution Prevention and Control in Beijing
- ❑ **Strict standards:** current effective local standards for the atmosphere in Beijing have reached over 40
- ❑ **Increased investment:** introducing many economic incentive policies, including subsidies for "coal-to-gas" "coal-to-electricity" conversions, elimination of old and polluting vehicles and other supporting funding subsidies



Outline



Achievements



Measures



Future



We will **Further Strengthen** the work

- Beijing has achieved remarkable results in air pollution control, however there is still a gap compared with other cities of developed countries.
- We will deeply implement the green Beijing development strategy, promote continuous improvement of air quality, and accelerate the construction of a beautiful Beijing.
- It's warmly hoped that more communications and cooperations will be conducted between us in the future. So as to find out more effective paths and methods for air pollution treatment.



**Thanks for Your
Attention**

