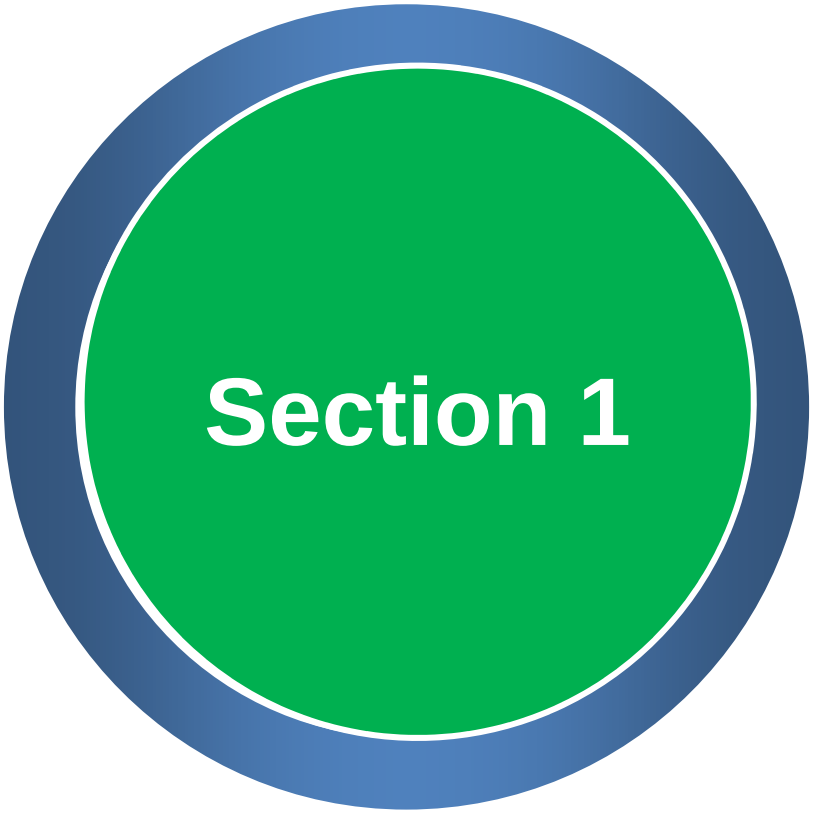
Environmental Monitoring Center Shenyang City

Plan to Improve Air Quality in Shenyang City - Blue Sky Project

Main Content

Section 1 Air quality and sources of pollution



(1) Overview of air quality

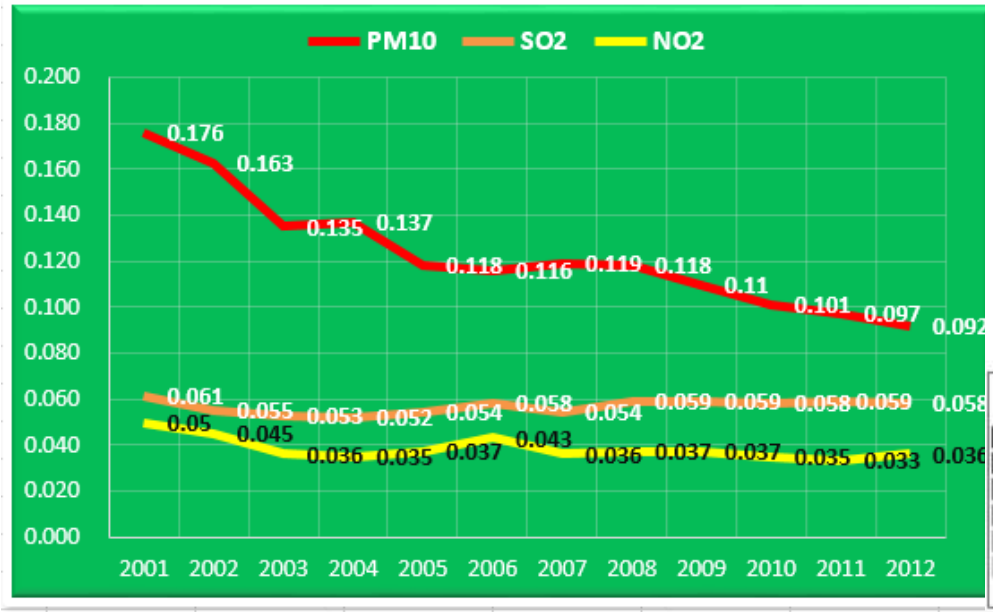
(2) Analysis of the causes of air pollution

(1) Overview of air quality

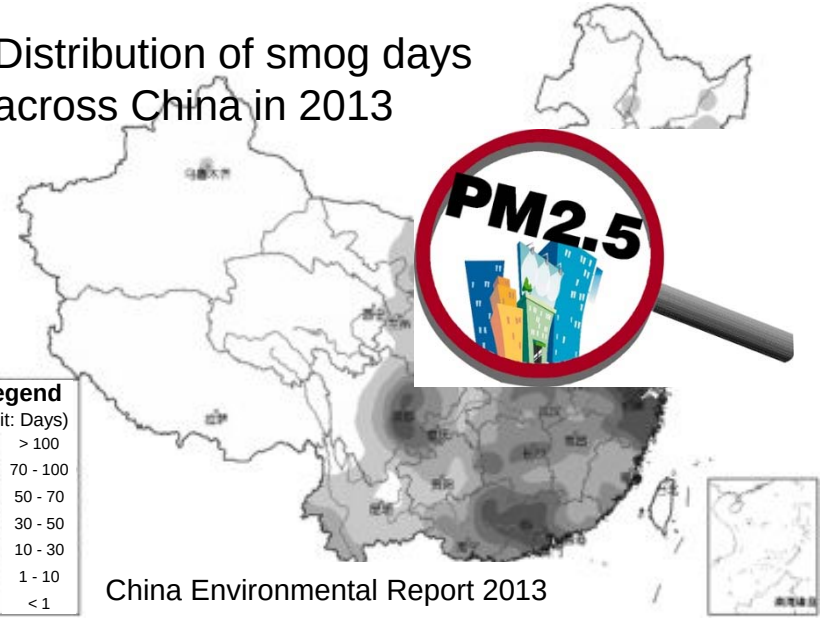
Located in the North East of China, Shengyang is a large-scale industrial city with fairly serious air pollution, caused by factors such as industrial manufacture and coal-fired heating. Following several years of intensive restructuring, air quality in Shenyang has significantly improved in response to key environmental projects including dismantling of chimneys, control of coal pollution, relocation of pollution sources, modification of facilities causing emissions, and development of clean energy resources such as electricity and gas.

(1) Overview of air quality

From 2001 to 2012, air quality improved significantly, with PM_{10}, SO_2 and NO_2 concentrations decreasing year by year. In 2013, new environmental air quality standards were implemented, which introduced monitoring tests for $PM_{2.5}$, CO, and O_3 and more stringent limits for PM_{10} and NO_2. At the same time, adverse factors such as changes in the atmosphere and abnormal climatic conditions caused the frequency of smog, primarily consisting of the pollutants $PM_{2.5}$ and PM_{10}, in Shengyang to increase. This poses new issues and challenges for Shengyang's air pollution control.



Distribution of smog days across China in 2013



China Environmental Report 2013

(2) Analysis of the causes of air pollution

1. Excessively rapid increase in coal burning; relatively small use of clean energy

2. Outdated heating methods and pollution control facilities

3. The number of motor vehicles is continuously increasing

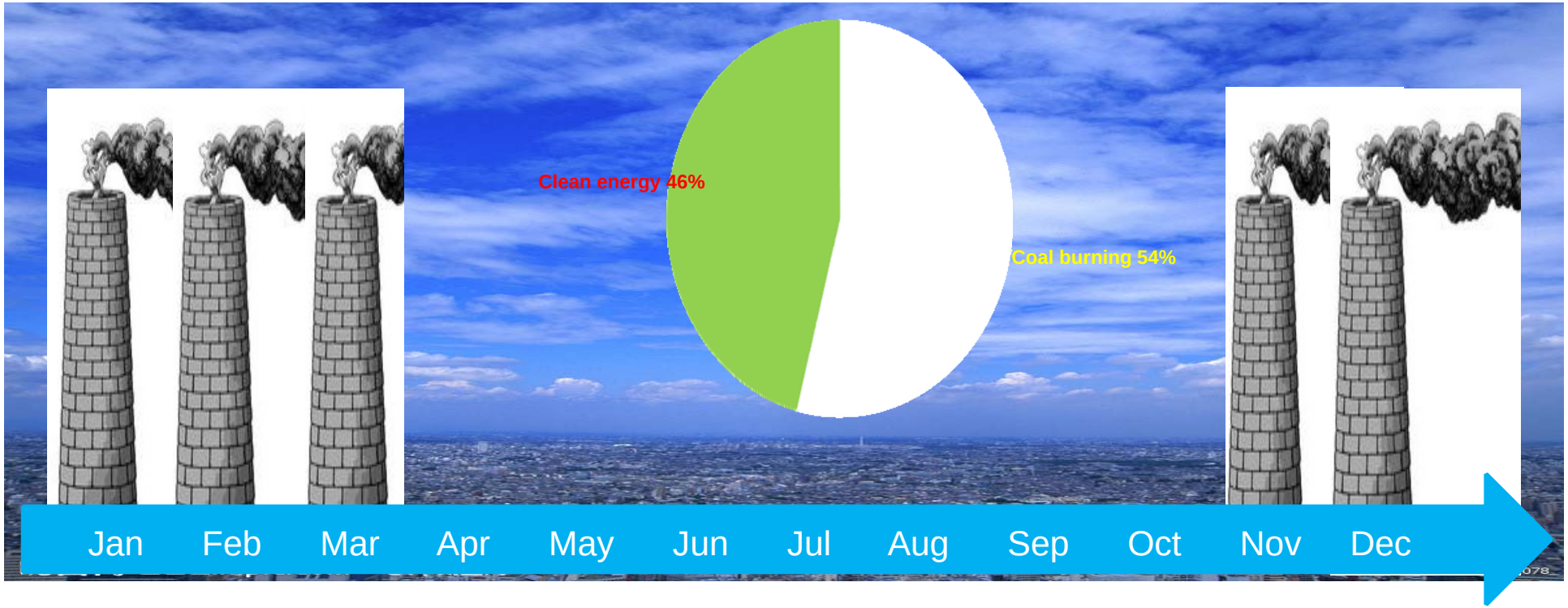
4. Dust pollution

5. Localized atmospheric pollution is prominent

(2) Analysis of the causes of air pollution

1. Excessively rapid increase in coal burning; relatively small use of clean energy

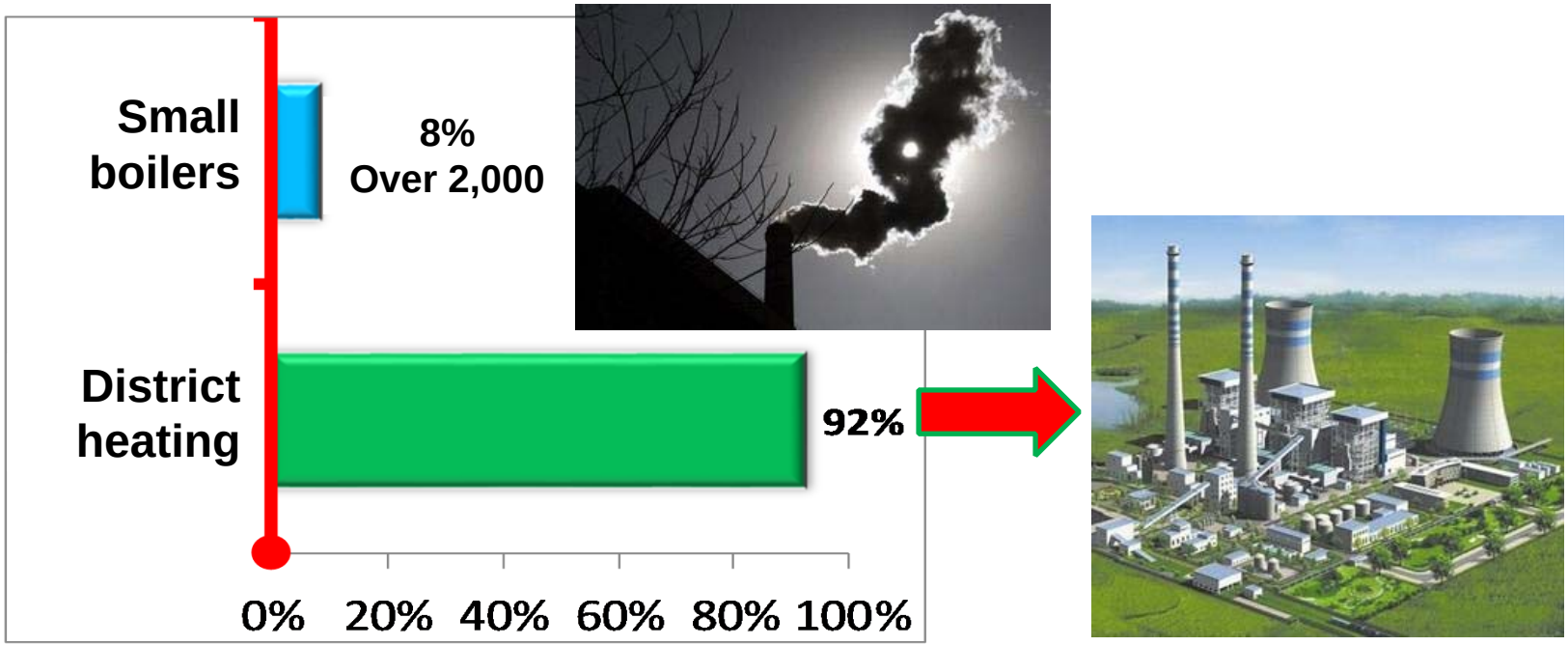
Shenyang is a key industrial city in the North East region. The winter heating period lasts 5 months, industrial production and heating primarily rely on coal burning, and clean energy use only accounts for 46%.



(2) Analysis of the causes of air pollution

2. Outdated heating methods and pollution control facilities

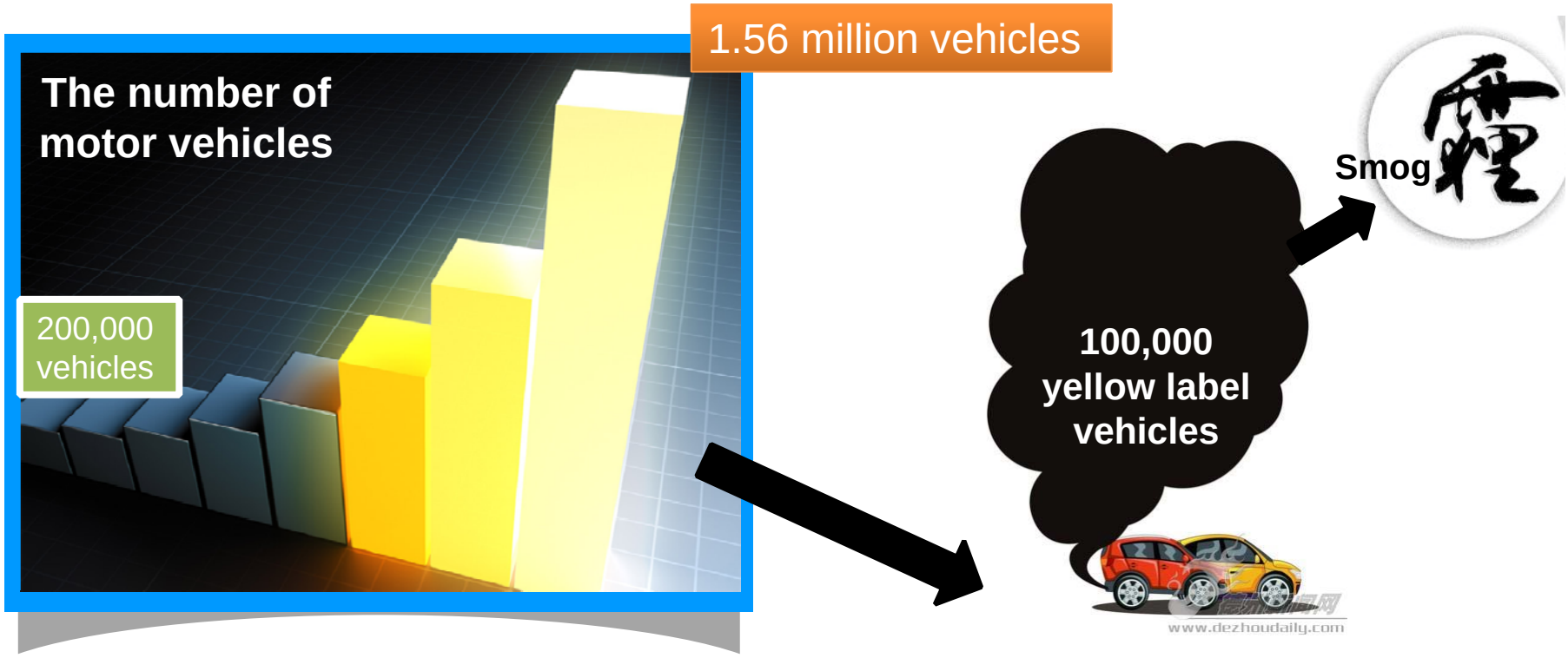
Although Shenyang provides district heating to 92% of the city area, there are still over 2,000 small boilers with outdated dust extraction and desulfurization facilities, making it impossible to achieve the pollutant removal efficiency that current air pollution controls demand.



(2) Analysis of the causes of air pollution

3. The number of motor vehicles is continuously increasing

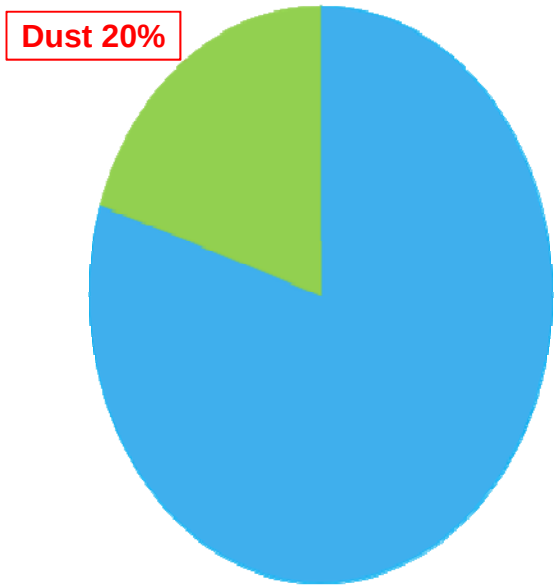
The number of motor vehicles in the city has increased dramatically from over 200,000 in the year 2000 to 1.56 million, of which nearly 100,000 are “yellow label vehicles” (heavy polluters) that are the major source of $PM_{2.5}$ and city smog.



(2) Analysis of the causes of air pollution

4. Dust pollution

Over recent years, there has been more construction projects in the city, leading to an increase in dust emissions. The frequency and area of cleaning with water for the main roads is relatively small, and dust accounts for over 20% of total particle pollution.

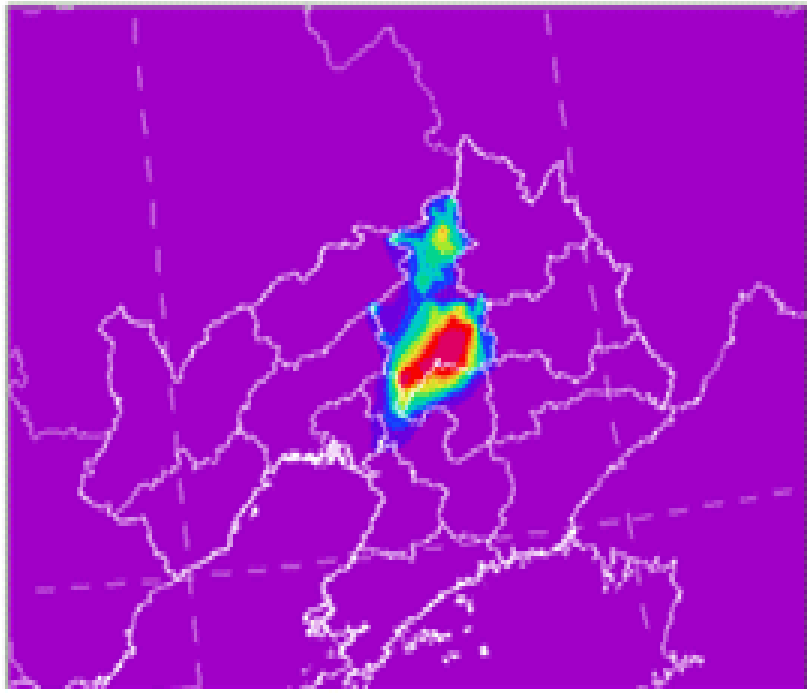


Source of particles

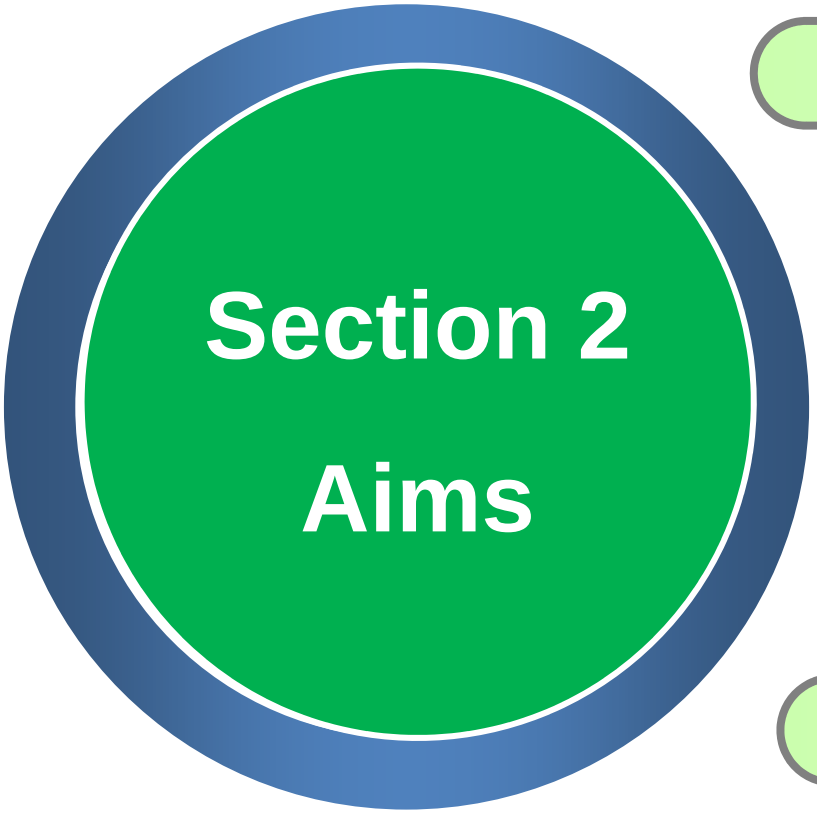
(2) Analysis of the causes of air pollution

5. Localized atmospheric pollution is prominent

Shenyang is at the center of the Shenyang Economic Zone, and neighboring cities such as Anshan, Fushun, Liaoyang, Benxi and Tieling have an increasingly significant effect on the air quality in Shenyang. A coordinated regional response is needed.



Section 2 Aims of the Blue Sky Project

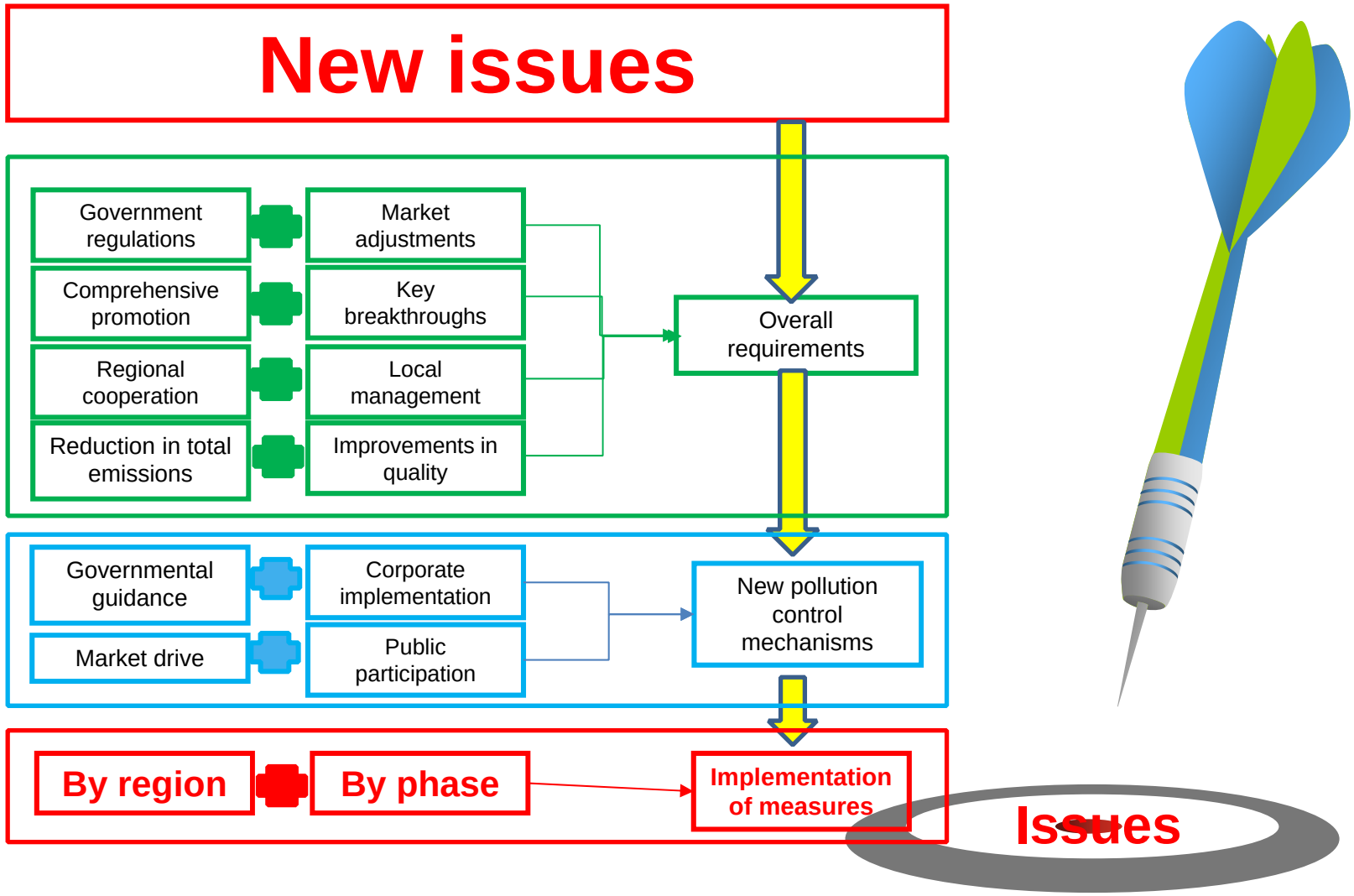


(1) Overall concept

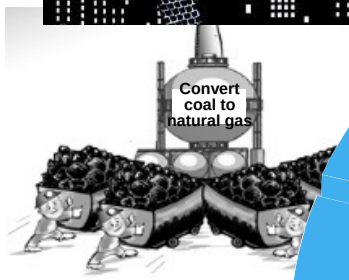
(2) Specific measures

(3) Overall targets

(1) Overall concept of the Blue Sky Project



(2) Specific measures



Remove yellow label vehicles

1. Remove the network of boilers less than 20 tons; increase use of clean energy such as electricity and gas; significantly reduce coal consumption across the city

2. Rebuilding of all shanty areas across the city

3. Improvement and modification of smoke treatment facilities for coal-fired boilers

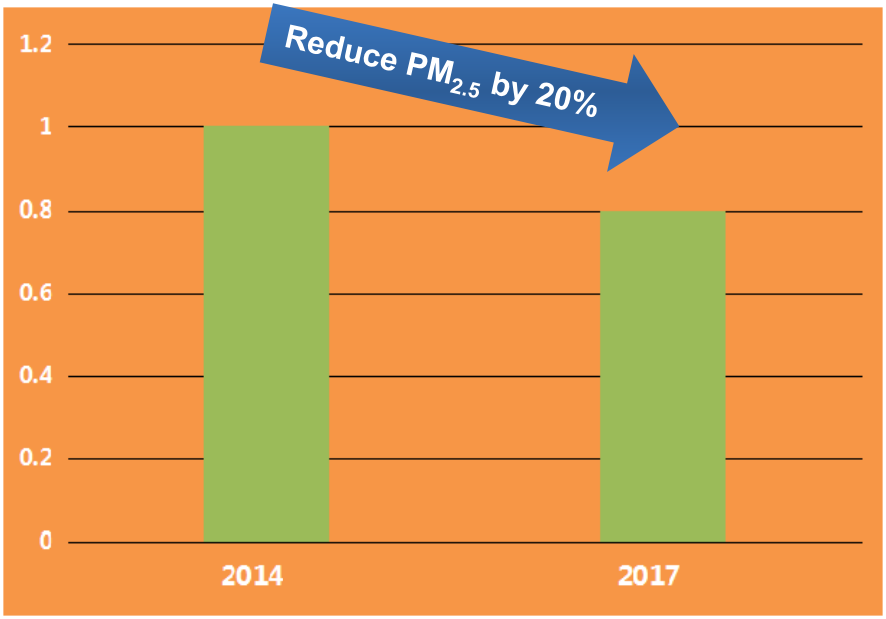
4. Conduct mechanized cleaning of streets graded level two and above to reduce dust pollution

5. Increase the number of natural gas stations to 120; replace all remaining yellow label vehicles; promote clean oil products

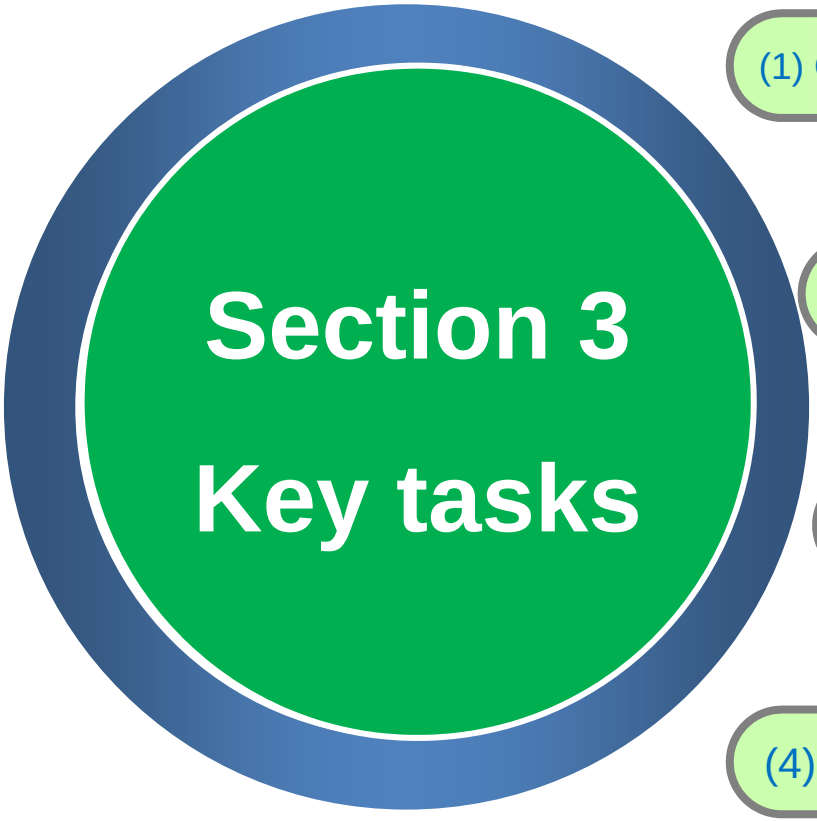
Blue Sky Project

(3) Overall targets

To effectively control smog by 2017. To reduce particle ($PM_{2.5}$) concentrations in the city by 20% or more in comparison to 2014.



Section 3 Key tasks of the Blue Sky Project



(1) Control the total consumption of energy resources

(2) Complete removal of the network and shanty areas

(3) Strengthen pollution control

(4) Develop monitoring capability

(1) Control the total consumption of energy resources

1. Implement clean energy projects

Vigorously promote the research and development of energy conservation projects and promote their implementation. Increase the proportion of heating by clean energy resources such as geothermal, solar, and electric power. Restructure energy use to effectively control total energy consumption. By the year 2017, implement non coal-fired, clean energy projects, complete conversion of 110 600-ton plants to clean energy, and increase the number of natural gas stations to 120.

110 plants

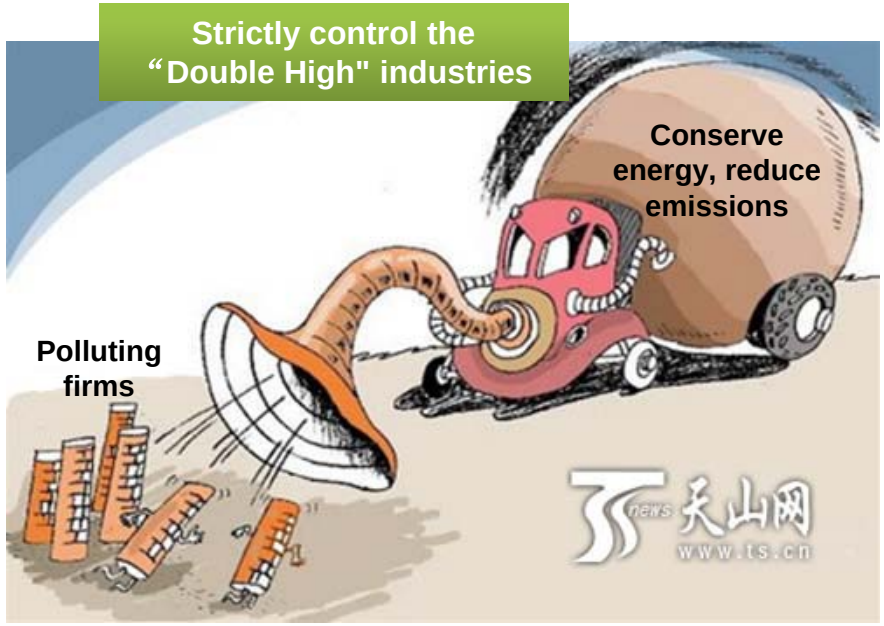
Convert to

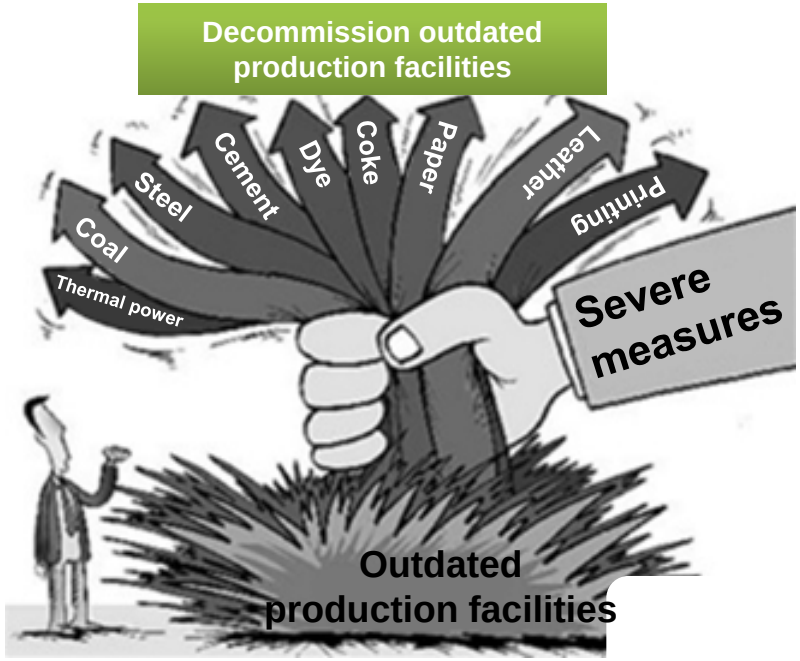
600 tons

(1) Control the total consumption of energy resources

2. Promote the decommission and relocation of key polluting firms

Formulate policies to strictly control market access for companies with high energy consumption and high level of pollution. Research and formulate new energy conservation standards, and develop a decommissioning mechanism for the “Double High” (high energy consumption and high level of pollution) industries and surplus production. Optimize industrial structure, increase decommissioning for outdated industries such as thermal power stations and cement, petroleum and plate glass manfacturers.





(2) Complete removal of the network and shanty areas

3. Vigorously implement removal of the network of small coal-fired boilers

Fully implement removal of the network, formulate a plan for the removal of small coal boilers, and gradually promote a scientific combustion method for heating provision to increase energy efficiency. Complete removal of the network of coal-fired boilers of less than 20 tons by 2017; heating to be provided by 51 large scale thermal plants and decentralized clean energy facilities in the city by 2020.

(2) Complete removal of the network and shanty areas

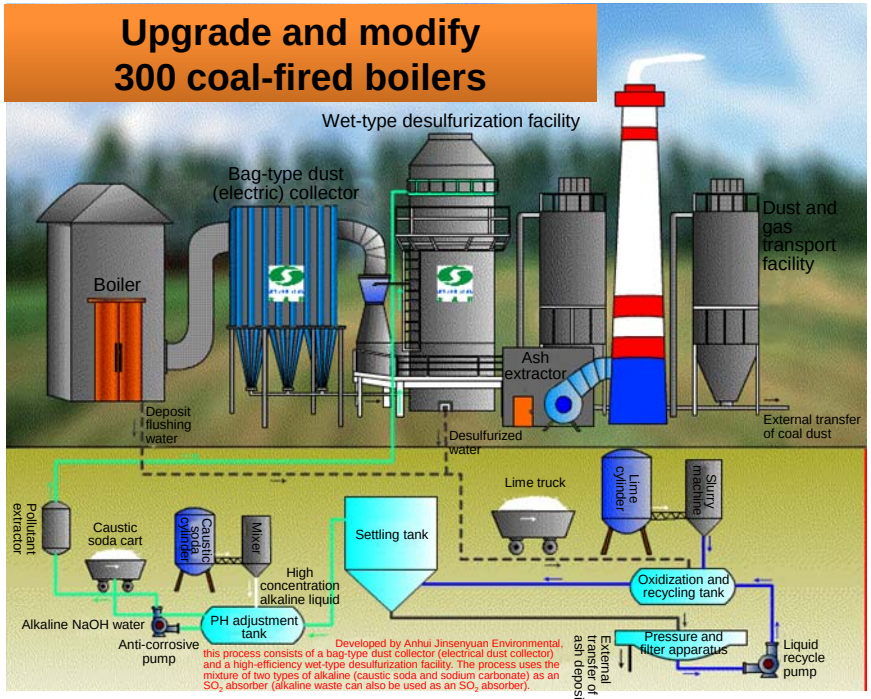
4. Launch the project to remove shanty areas

Vigorously implement removal of shanty areas, eliminate low-lying pollution. Complete rebuilding of 170 shanty areas within three years.

(3) Strengthen pollution control

5. Implement projects to ensure coal-fired boilers hit targets

Decommissioning for outdated industries such as small-scale cement and construction material manufacturers will be increased. Introduce more stringent emission standards for power generation industries and launch upgrade projects. Introduce high-efficiency dust extraction and desulfurization upgrades to coal-fired boilers and formulate plans for upgrading flue gas purification facilities. By the end of 2017, a plan to upgrade standards of dust extraction and desulfurization/denitration for large scale coal-fired boilers will be completed.



(3) Strengthen pollution control

6. Construct green roads, remove yellow label vehicles

The city has already created a green road zone, which prohibits entry of yellow label vehicles, within the city's Second Ring Road. In the coming two years, the removal of yellow label vehicles will be completed, and public transport vehicles will be converted to run on gas, all of which will effectively reduce emissions from automobiles and improve air quality in the city.

(3) Strengthen pollution control

7. Accelerate the modification of oil vapor recycling control

Implement national stage IV standards for combustion powered cars, provide petroleum and diesel that meet national IV standards. Accelerate the modification of facilities that recycle oil vapor in current gas stations, depots, and trucks. Basically complete all modification projects for oil vapor recycling and establish a monitoring system for oil product quality by the end of 2017.

Graph: Lin Congming

(3) Strengthen pollution control

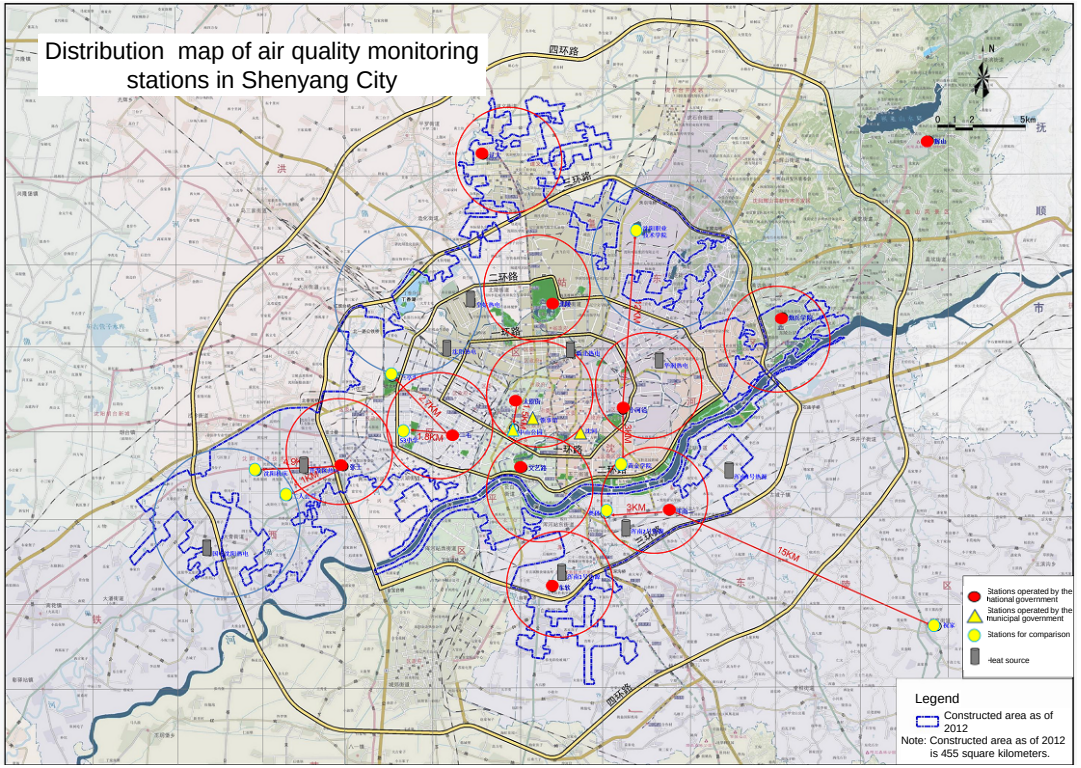
8. Strengthen the management of dust pollution

Develop dust control monitoring systems for the city in which responsibility is shared between the local government (who will take overall responsibility) and the various departments (who will take their own respective responsibilities) and which contain mechanisms and working patterns that promote cooperation. Create a new monitoring system for dust management that combines public participation and supervision by public opinion. Formulate dust management measures for construction sites, increase mechanized cleaning for main roads, and promote wet cleaning methods.

(4) Develop monitoring capability

9. Improve automatic atmospheric monitoring and forecasting

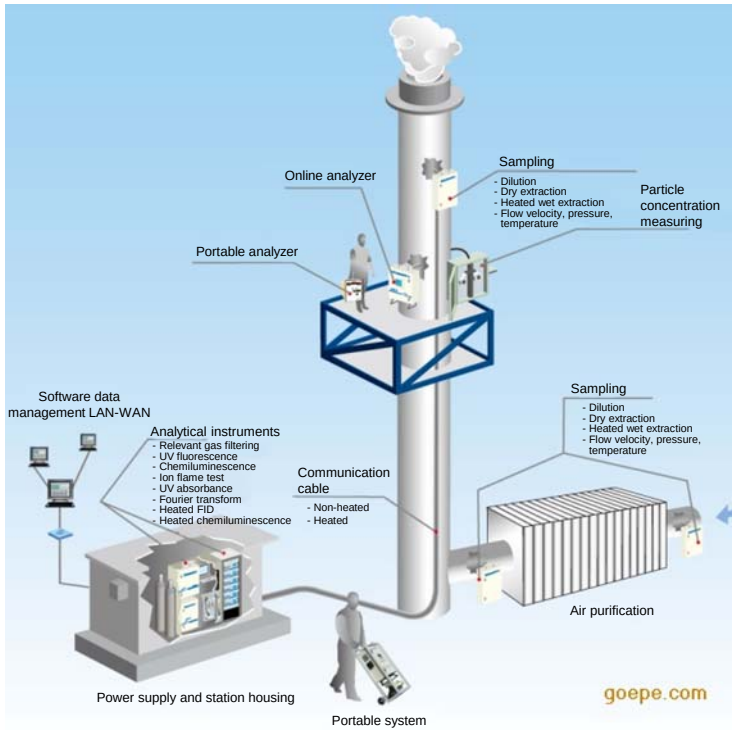
Establish monitoring stations for air quality that cover the entire city to fully respond to air quality in our city. Improve air quality forecast and early warning capabilities. Formulate, improve and promptly implement contingency plans that appropriately respond to heavily polluted weather.



(4) Develop monitoring capability

10. Develop online monitoring capability

Ensure that the current system that monitors emissions of atmospheric pollutants is working properly. Large scale thermal plants to be retained in future will be integrated into the online monitoring system. Achieve modern management, promote coal-fired flue gas emission standards, and improve monitoring of coal-fired boilers.



Section 4 Conclusions

You have seen the plan for improving air quality in our city, Blue Sky Project. We sincerely hope that the experts here can provide their valued opinions and recommendations to assist us in better controlling pollution and improving the environment.

Improving the air quality in Shenyang is the duty of all environmental workers, and our government is currently increasing its investment and support for this work. As environmental workers, we will learn from the successful experiences of other nations, use advanced technology, and spare no efforts to improve the air quality in Shenyang.

Environmental Monitoring Center Shenyang City

Thank you for your attention!