On Air Pollution and Protection

Wang Yu Fei

Veritas Collegiate Academy,China

Abstract: Since the industrial revolution and especially since the 20th century, many countries have embarked on the industrialization path for development. Although humans have created unprecedented material wealth, environmental problems have been always infected to many areas and have displayed a tendency of deterioration. Environmental problems have gradually been upgraded into a global focus. China-a developing country has witnessed economic development by leaps and bounds and its productivity level has been greatly improved as well by looking back the twentieth century. However, when the productivity in the traditional model drives the economic growth and brings lucrative profit for enterprises, it has also reduced our planet into grave pollution and getting overwhelmed.

Key words: air pollution pollution source control approaches

1. INTRODUCTION

Humans live with fresh air. Every day the air passes through our noses into our lungs many times in a regular manner. Thus the clean air plays a more dominating role than any other matters. Humans can still survive after a diet for five weeks and five weeks' no drinking water, but they will die only within five minutes with no air. It can be seen that air is indispensable for humans and other life organism all the moment. Unluckily, we are more scared about the air now and the seriously polluted "toxic air" makes us worried: whether the terrible chemical substances go into our bodies when we breathe in the air and bring us unpredictable consequences over time.

Air pollution means that new substances come into being apart from the normal compositions after the pollutants go into the atmosphere causing the air to have changes in the composition, smell, color and nature which are enough to endanger the survival of the humans and humans' living environment, do harm to people's health and cause adverse consequences for the normal industrial and agricultural production. In 1930, the Belgian Meuse Valley Fog Episode and the photochemical smoke in Los Angeles, the United States in the early 1940s all belong to pollutant nuisances due to air pollution. The atmospheric pollutants are countless, and those doing harm to humans or having attracted humans' attention are more than 100. Among these, dust, air-borne dust, SO2, CO, NO2, hydrocarbons (HC), H2S, NH3, etc. have posed threat to humans' health and exerted impact on people widely in that they are all hidden factors which are harmful to people's health. According to incomplete statistics, the annual emissions of pollutants discharged into the atmosphere at present amounted to 1,070,000,000 ton all over the world among which SO2 and CO account for a larger proportion. Imagine how many pollutants per person will inhale from the polluted air per day unconsciously.

2. AIR POLLUTANTS AND SOURCES

Pollutants in the atmosphere can be divided into natural pollutants and anthropogenic pollutants. The air pollutants mainly come from the latter caused by humans' production and living activities. There are five main types of anthropogenic pollutants sources:

A. Industrial pollution source comes from the process of thermal power, metal smelting, glass and food processing and the soot, dust and waste gas in the fuel combustion process. In 1948, the "Donora incident" in the United States just falls into such type. Donora is located in the horseshoe-shaped valley with Monongahela River passing through and hundreds meters' high hills on both sides. In the basin, there are large smelting plants, sulphate and zinc smelting plants. On 27th to 31st in October, Donora was struck by strong inversion layer causing various pollutants under the layer to break out. In a consequence, there were 6,000 people in hospital and 20 died.

B. Traffic and transport pollution sources come from the exhaust from cars, trains, aircraft, launch vehicles and other traffic vehicles, such as the "London smog episode" in 1952.

C. The pollutant from daily life comes from soot and waste incineration in people's cooking and heating. This is commonly seen in the mountainous areas.

D. Agricultural pollution sources mean that the methane gas from chemical fertilizers, pesticides and farmland in agriculture will evaporate into the atmosphere to cause pollution in both of the air and rain.

F. Military or scientific experimental pollution sources mean that the waste from nuclear tests, atomic bombs, spacecraft and debris after the destruction will cause severe pollution to the atmosphere. Once this pollution is born, it cannot be removed and will reduce people into grave harm.

3. THE COMPREHENSIVE PREVENTION AND CONTROL OF AIR POLLUTION

A. Ways to prevent air pollution

Air pollution does not only do harm to humans' health, what is worse is that the changes in the

atmospheric composition and proportion will cause the global climate changes, endangering the whole world. Against the context, it is imperative that some measures should be taken to improve the atmosphere and we should embark on the oath of sustainable development. In order to protect and improve the atmosphere and create a fresh and beautiful living and working environment for the people, we must take effective measures for air pollution:

B. Overall planning and reasonable distribution

To do a good job in planning, especially the industrial layout is of great importance in the atmosphere of a city. In the layout of the industry, the industrial production should be distributed in a balanced manner not only in local or a few megacities. In this way, there will be fewer pollutants in unit area which can go through natural purification easily. Besides, the plant location should be also selected with a reference to the plant type. In case of some harmful gases, the plant should be located in the lower reaches of the residential area.

C. To improve the combustion mode and the fuel composition

China's energy structure is not balanced now and coal holds up for more than 70% in the primary energy in China thus in the list of China's major energy. In industry, 80% of China's fuel power depends on coal and the coal for direct combustion in every year accounts for 84% of total coal consumption. From this, it can be seen that the low utilization worsens China's air pollution. Hence, we should improve China's energy structure, increase natural gas and petroleum and turn to exploit new energy. At the same time, some specific measures could be worked out, such as regional heating to achieve coal gasification.....

D. To improve people's environmental awareness and engage in a forestation for greening

Green plants are able to let off refreshing oxygen into the atmosphere constantly in order to adjust the air composition and purify the atmosphere, so a large number of trees should be planted so that the forests and green vegetation could play a regulatory role in the greenhouse effect. Meanwhile, the carbon content in the biological chain should be increased so as to stop a large number of carbon from being converted into CO2 into the atmosphere; besides, some new varieties of crops able to adapt to climate change should be cultivated and so on. All these can slow down the impact of greenhouse gases on the environment.

E. o adjust the energy strategy and make a use of clean energy.

To develop water resources vigorously, develop nuclear energy step by step and make efforts to use clean energy such as solar energy, wind energy, marine energy and so on. Only 5% of China's hydropower resources are explored and 95% are yet to be developed. Thus to vigorously develop and utilize water resources is the top task to adjust China's energy strategy and change the energy structure.

4. TO MONITOR THE QUALITY OF THE ATMOSPHERE

There are various hazardous substances in the atmosphere and the pollutants in different regions are different as well, so the atmospheric environmental indicators should be determined in accordance with the actual situation in various areas in the process of the air quality assessment. The common pollutants in the atmosphere include total suspended particulates, dust, inhalable particles, sulfur dioxide, nitrogen oxides, total hydrocarbons, lead, fluoride, ozone and benzopyrene. Determination of particulate matter: particulate matter holds the largest number of pollutants in the air, has a complex composition and various features and is extremely harmful. It can become toxic substances or a carrier for other toxic and harmful substances in the atmosphere, or the catalyst and the reaction bed. In some cases, a combination of particulate matter with the adsorbed gaseous or vaporous material will result in more severe synergistic toxicity than the individual component. Therefore, a study of particulate matter plays an important role in the control of air pollution. The detection of particulate matter in the atmosphere includes the determination of total suspended particulates, the determination of inhalable particles concentration and particle size distribution, the determination of dust fall volume and the determination of chemical components in the particles. Among them, the most common way for the determination of particulate matter concentration is the gravimetric method. Determination of sulfur dioxide: sulfur pollutants in the atmosphere mainly include H2S, SO2, SO3, CS2, H2SO4 and various sulphates. They mainly stem from the combustion of coal and petroleum fuels, smelting of sulfur-bearing ores, emissions from sulfuric acid and other chemical products. As one of the main indicators of air pollution, sulfur dioxide of air pollutants is the most widely distributed and is capable of bringing obvious impacts. Thus, sulfur dioxide is always the represented one for the detection of sulfur oxides. The determination of nitrogen oxides in the atmosphere can be divided into chemical and instrumental methods. Saltzman method (GB / T15435-95), acid potassium permanganate solution oxidation method, chromium oxide-arenaceous quartz sand oxidation method are commonly used chemical methods among which Saltzman method is only suitable for determining the content of nitrogen dioxide while the latter two methods are available to detect the total amount of nitrogen oxides in the atmosphere.

5. COMPREHENSIVE TREATMENT

Air pollution comprehensive realignment program is such a plan as is able to calculate the maximum allowable emission and reduction in the functional areas in terms of the proposed environmental objectives based on functional areas divided according to the status and development trend of urban area. The treatment depends on the city's energy structure and traffic conditions to determine the primary pollutants that have high concentration, exert a wide impacted range and do much harm so that the treatment is targeted in a right way. At present, most of urban air pollution in China is mainly subject to the backward combustion coal and automobile exhaust, so the primary pollutants are sulfur dioxide and total suspended particles. To this end, a long-term goal should be set to aim to improve the backward coal combustion, improve the combustion efficiency and make a use of gas fuel, briquette, and solar energy, geothermal and other pollution-free or less polluting energy in lieu of coal. Meanwhile, the regional central heating should be conducted to get rid of thousands of small chimneys, improve road hardening rate and create smoke-free areas by means of strengthening pollution sources treatment and improve pollution control technology and so on. What is more, the industrial layout should be adjusted so that the atmospheric environmental capacity can be utilized according to the scientific law of atmospheric self-purification; Also, the pollution source treatment should be strengthened to reduce the pollutant emissions; the technical and administrative means should be adopted to reduce vehicle exhaust pollution; the urban greening rate should be improved by means of planting trees with good immunity to pollution so that the plant purification can be enhanced in a vigorous manner.

CONCLUSION

Now China's current per capita consumption level is still very low, only accounting to the one quarter of the world per capita and its energy consumption is also showing a substantial upward trend. In the near future, the fact that China's energy structure is still coal-based and the coal consumption increases will worsen the urban air pollution, and there is difficulty to significantly increase the capital for the management of urban air pollution. Therefore, we are not optimistic about the development trend of China's atmospheric environmental quality. The experience of environmental protection work in China for many years indicates that China's urban air pollution control must depend on the command control and legal and regulatory means before the pollution of industrial pollution sources or fixed sources are fundamentally controlled; With the development of China's market economy, there is no denying that China's environmental policy is doomed to resort to environmental economic means.

REFERENCES

[1] Zhang Guotai: Introduction to Environmental Protection, China Light Industry Press, 2004.4.
[2] Guang Wen, Sun Yan: Climate and Environmental Protection, Shaanxi Tourism Press, 2004.7.
[3] Ye Wenhu: Introduction to Sustainable Development, Higher Education Press
[4] Tong Zhiquan, Chen Huanqin. Industrial Waste Gas Pollution Control and Utilization [M]. Beijing: Chemical Industry Press, 1989.
[5] Qin Shijin. On Comprehensive Utilization of “Three Wastes” in Yellow Phosphorus Production [J]. Hubei Chemical Industry, 1997, (2): 51-53.
[6] Xi Shengwei. Analysis of Air Pollution Hazard and Its Control Approaches [J]. Science and Technology Information Development and Economy, 2006, 16 (12): 153-154