

## Pollutant Discharge

### General Situation

**Main Pollutants in Wastewater** In 2014, a total of 22.946 mil. t COD was discharged within the year, down by 2.47% from a year earlier, as well as 2.385 mil. t ammonia nitrogen, down by 2.90% from a year earlier.

**Main Pollutants in Waste Gas** A total of 19.744 mil. t SO<sub>2</sub> was emitted within the year, down by 3.40% from a year earlier, as well as 20.780 mil. t NO<sub>x</sub>, down by 6.70% from a year earlier.

**Solid Wastes** Up to 3,256.2 mil. t industrial solid wastes were generated nationwide in 2014, and 2,043.302 mil. t were comprehensively utilized (including wastes generated in previous years), accounting for 62.13% of the total.

**Municipal Discharge** Up to 1,797 sewage treatment plants were set up nationwide by the end of 2014 with sewage treatment capacity of 131 mil. m<sup>3</sup>/d, up by 6.11 mil. m<sup>3</sup>/d. With sewage treatment rate totaling 90.2%, up to 38.27 bn. m<sup>3</sup> of wastewater was treated and disposed, up by 5.9% from a year earlier.

A total of 15.46 mil. t night soil was cleared away and 6.91 mil. t treated in 2014, with night soil treatment rate reaching

Discharge of main pollutants in wastewater in China in 2014

COD ( 10,000 t )					Ammonia nitrogen ( 10,000 t )				
Total	Industry	Municipal	Agriculture	Centralized	Total	Industry	Municipal	Agriculture	Centralized
2294.6	311.3	864.4	1,102.4	16.5	238.5	23.2	138.1	75.5	1.7

Emission of main pollutants in waste gas in China in 2014

SO <sub>2</sub> ( 10,000 t )				NO <sub>x</sub> ( 10,000 t )				
Total	Industry	Municipal	Centralized	Total	Industry	Municipal	Motor vehicles	Centralized
1974.4	1740.3	233.9	0.2	2,078.0	1,404.8	45.1	627.8	0.3

Industrial solid wastes generated and utilized in China in 2014

Generated ( 10,000 t )	Comprehensively utilized ( 10,000 t )	Stored ( 10,000 t )	Disposed ( 10,000 t )
325,620.0	204,330.2	45,033.2	80,387.5

44.7%. Up to 124,244 toilets has been set up, with 63,011 in the east region, 34,883 in the central region and 26,350 in the west region, respectively accounting for 50.7%, 28.1% and 21.2% of the total. Public toilet attaining Grade III standard totaled 92,997, accounting for 74.9% of the total, among which, 50,374 in the east region, 22,732 in the central region and 19,891 in the west region, respectively accounting for 54.2%, 24.4% and 21.4%.

A total of 179 mil. t municipal solid wastes were cleared away in 2014 from municipalities that administer one or more county-level cities in China. Up to 162 mil. t solid wastes were decontaminated and processed, with decontamination and processing rate totaling 90.3%. The environmentally sound processing capacity reached 0.529 mil. t/d, up by 37,000 t/d, leading to 1 percentage point (pps) increase of decontamination and processing rate. Of the total waste decontaminated and processed, 105 mil. t was disposed through sanitary landfill, accounting for 65%, 53 mil. t through incineration, accounting for 33%, and 2% through other disposal means.

The environmentally sound processing capacity of municipal solid waste incineration facilities totaled 185,000 t/d, accounting for 35.0% of total processing capacity, up 2.8 pps.

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## Measures and Actions

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**【Reduction of main pollutants】** Earnest efforts were made this year in implementation of the *12<sup>th</sup> Five-Year Comprehensive Work Programme on Energy Conservation and Pollution Reduction*, the *12<sup>th</sup> Five-Year Plan for National Environmental Protection*, and the *12<sup>th</sup> Five-Year Plan for Energy Conservation and Pollution Reduction*, as well as in the improved verification and regulation on the reduction of total load of main pollutants. Huge breakthroughs were made in constructing and operating the key reduction project targeting at 6 types of industrial plants (thermal power plant, iron and steel plant, cement plant, paper mill, municipal sewage treatment plant as well as livestock and poultry breeding farm) and motor vehicle. Quantified targets on environmental protection set in the Government Report were all achieved. Municipal sewage treatment capacity increased by 10.7 mil. t/d and the daily use of water reclaimed from municipal sewage by 2.85 mil. t, new leachate treatment facilities were set up in 73 solid wastes landfills. Wastewater advanced treatment and reclamation engineering was available for 830 key projects in paper making, printing and dyeing industries. The facilities for polluted water treatment and resource

utilization were upgraded in 14,475 scaled livestock and poultry breeding farms. De-SO<sub>2</sub> facilities were being expanded and upgraded for 130 mil. kW in-service thermal power generating units. The flue gas bypass was dismantled from de-SO<sub>2</sub> facilities for 140 mil. kW in-service units. The flue gas sulfur removal facilities of sintering machines increased by 36,000 m<sup>2</sup> in iron and steel industry. Sulfur removal facility was made available to 26 sets of catalytic cracking devices with combined capacity at 40.05 mil. t in petroleum refining industry. The gas availability was up 2.5 bn. m<sup>3</sup>, owing to local coal-to-gas upgrading engineering, which had 5.2 mil. t raw coal replaced and 48,000 t SO<sub>2</sub> emission reduced. The total capacity of de-NO<sub>x</sub> electricity generating units increased by 260 mil. kW, de-NO<sub>x</sub> facility was made available to NSP cement production line with combined capacity at 650 mil. t and to plate glass production line with daily capacity at 31,000 t. Falsification, deception and illegal behaviors during operation of de-SO<sub>2</sub> facilities and de-NO<sub>x</sub> facilities were cracked down. Electricity tariffs equivalent to 510 mil. yuan were either fined or confiscated.

**【Prevention and control of pollution by solid wastes】** Mid-term evaluation and treatment of hazardous waste specified in *12<sup>th</sup> Five-Year Plan for Prevention and Control of Pollution by Hazardous Waste* was accomplished. Authority to issue hazardous waste business license was delegated to provincial environmental department and continuous progress was made to supervise and assess the standardized management of hazardous waste. The actual import of waste totaled 49.6 mil. t, of which, waste paper, waster plastic, scrap metal (including waste hardware appliances, waste communication cables and was electric machines) and scale cinder are the four largest imports. Hazardous waste export totaled 9,684 t, including electroplating sludge, waste battery, waste printer circuits plate, electronic waste and organic solvents waste. A total of 71.60 mil. appliances and electronic products including TV sets, refrigerators, washing machine, air-conditioner and microcomputer were processed by 106 enterprises that are qualified to get subsidies for processing waste appliance and electronic products. Chromium slag produced this year were all treated and disposed within the same year. 2013 Annual assessment on the implementation of *12<sup>th</sup> Five-Year Plan for Comprehensive Prevention and Control of Pollution by Heavy Metals* was carried out. Mid-term evaluation on the plan has already been finished and related information was open to the public.

**【Environmental Management of Chemicals】** *List of Environmental Management of Dangerous Chemicals* was released and implemented in 2014 and 84 chemicals were identified as severely hazardous to environment and human

health. *Circular on Environmental Supervision of Precursor Chemical Production and Use and its Innocent Treatment* was printed and circulated, which strengthened the environmental supervision to the enterprise on its use of precursor chemicals. *Notice for Building Labs on Chemical Testing Analysis and Evaluation* was printed and circulated, which enhanced ability on risk prevention and control. Environmental management registration and approval on new chemicals and poisonous chemicals were preceded. A total of 118 environmental management registration certificates were issued, including 14 kinds of poisonous chemicals. The registered chemicals totaled 3.8539 mil. t and 9,874 import and export licenses of poisonous chemicals were approved. Mid-term evaluation report on *12<sup>th</sup> Five-Year Plan for Prevention and Control of Pollution by POPs in Major Industries* and investigation report on *National Environmental Conditions of Chemical Production* were prepared.

**【Demonstration Project of Cap-and-trade Emissions Trading System】** *Instructions on Pilot Work of Cap-and-trade Emissions Trading System* was released and implemented by the General Office of State Council in 2014, marking the first regulatory document in the field of Cap-and-trade Emissions Trading in China. Pilot projects were approved and carried out successively in 11 provinces and municipalities including Zhejiang, Jiangsu province and Tianjin Municipality. Guangdong, Liaoning, Guizhou and other provinces also launched the pilot projects. By the end of

2014, the emission trading volume has totaled 5.3 bn. RMB. Emission trading administrations were established in many pilot zones. A number of regions have established platforms of transaction management and e-auctioning, thus further enhanced its management ability. Financing channels were expanded in several regions for enterprises to control pollution through emission trade mortgage and leasing.

**【Self-monitoring and information disclosure for Enterprises under Key National Supervision】** *Procedures on Self-monitoring and Information Disclosure for Enterprises under Key National Supervision (trial)* and *Procedures on Monitoring Source of Pollution and Information Disclosure of Enterprises under Key National Supervision (trial)* came into effect on January 1, 2014. Environmental protection departments of various levels urged relevant enterprises to actively establish and improve self-monitoring and information disclosure system so as to further rationalize mechanism of monitoring of pollution source and information disclosure. Up to 2014, 10,597 enterprises out of 14,462 enterprises of key supervision conducted self-monitoring. The environmental departments conducted monitoring to 51,594 enterprises. Municipalities and provinces across China except Tibet all established system of enterprise self-monitoring and information disclosure platform for supervising monitoring of pollution source, thus enabling public oversight on key emission enterprises.

# Atmospheric Environment

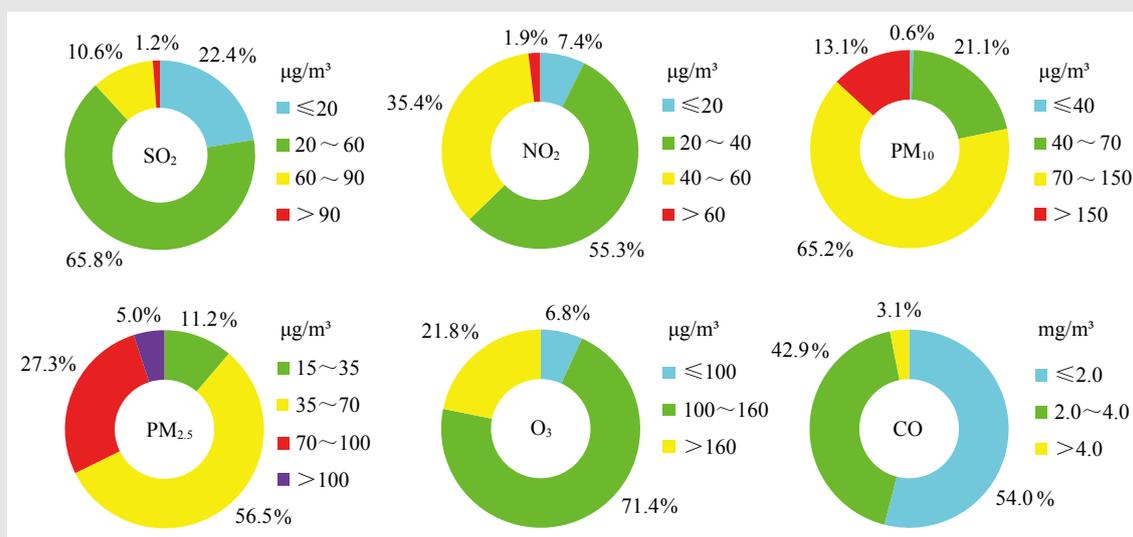
## General Situation

### Air Quality

**Cities enforcing new ambient air quality standards at Stages I and II** A total of 161 cities at or above the prefecture level including 74 cities at Stage I and 87 at Stage II enforced the new ambient air quality standards in 2014. Up to 90.1% or 145 cities failed to meet the new standards, and only 9.9% of them or 16 cities succeeded (better than national Grade II standards), namely Zhoushan, Fuzhou, Shenzhen, Zhuhai, Huizhou, Haikou, Kunming, Lhasa, Quanzhou, Zhanjiang, Shanwei, Yunfu, Beihai, Sanya, Qujing and Yuxi.

The analysis of specific indicators found the mean annual  $\text{SO}_2$  concentration ranged between  $2 \mu\text{g}/\text{m}^3$  and  $123 \mu\text{g}/\text{m}^3$  among those cities and averaged  $35 \mu\text{g}/\text{m}^3$ , down by 14.6% year on year. 88.2% of those cities attained air quality standards with regard to  $\text{SO}_2$ , up by 3.1 pps. The attainment

rate of mean daily  $\text{SO}_2$  concentration registered 74.4% ~ 100.0% and averaged 98.3%, up by 0.8 pps year on year, while the average non-attainment rate read 1.7%. The mean annual  $\text{NO}_2$  concentration ranged between  $14 \mu\text{g}/\text{m}^3$  and  $67 \mu\text{g}/\text{m}^3$  and averaged  $38 \mu\text{g}/\text{m}^3$ , the same with last year, and 62.7% of those cities attained air quality standards, an increase of 5.6 pps. The attainment rate of mean daily  $\text{NO}_2$  concentration registered 78.3% ~ 100.0% and averaged 96.8%, up by 1.6 pps year on year, while the average non-attainment rate read 3.2%. The mean annual  $\text{PM}_{10}$  concentration ranged between  $35 \mu\text{g}/\text{m}^3$  and  $233 \mu\text{g}/\text{m}^3$  and averaged  $105 \mu\text{g}/\text{m}^3$ , a 3.7% decrease, and 21.7% of those cities reached air quality standards, an increase of 2.4 pps. The attainment rate of mean daily  $\text{PM}_{10}$  concentration registered 30.9% ~ 100.0% and averaged 81.0%, up by 1.1 pps year on year, while the average non-attainment rate read 19.0%. The mean annual  $\text{PM}_{2.5}$  concentration ranged between  $19 \mu\text{g}/\text{m}^3$  and  $130 \mu\text{g}/\text{m}^3$  and averaged  $62 \mu\text{g}/\text{m}^3$ , and 11.2% of those cities attained the standards. The attainment rate of mean daily  $\text{PM}_{2.5}$  concentration registered 32.1% ~ 99.7% and averaged 73.4%, while the average non-attainment



Percentage of ranges of pollution indicator readings among the cities that enforced the new ambient air quality standards in 2014

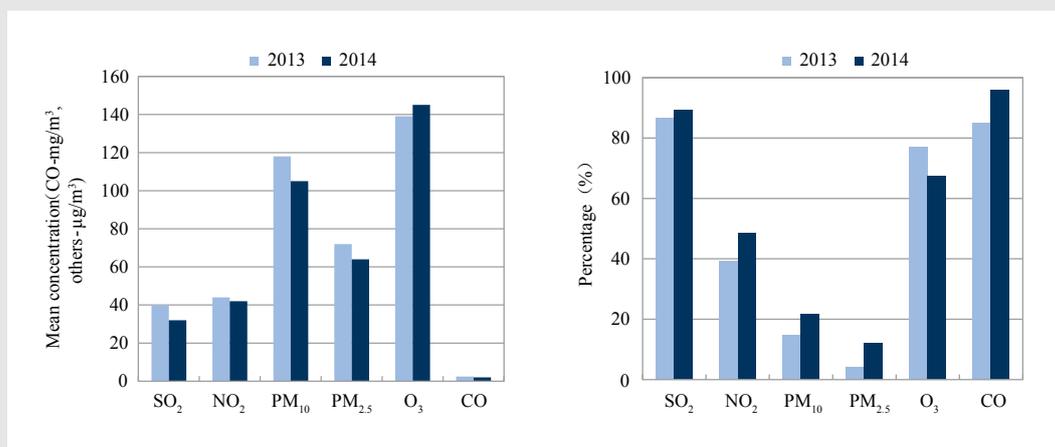
rate read 26.6%. The 90<sup>th</sup>-percentile value of the mean daily value of the maximum 8-hour O<sub>3</sub> reading ranged between 69 μg/m<sup>3</sup> and 210 μg/m<sup>3</sup> and averaged 140 μg/m<sup>3</sup>, and 78.2% of the cities met the standards. The attainment rate of mean daily value of the maximum 8-hour O<sub>3</sub> reading ranged 68.7% ~ 100.0% and averaged 93.9%, while the average non-attainment rate read 6.1%. The 95<sup>th</sup>-percentile value of the mean daily CO concentration ranged between 0.9 mg/m<sup>3</sup> and 5.4 mg/m<sup>3</sup> and averaged 2.2 mg/m<sup>3</sup>, and 96.9% of the cities attained air quality standard with regard to CO. The attainment rate of mean daily CO concentration ranged 88.4% ~ 100.0% and averaged 99.3%, while the average non-attainment rate read 0.7%.

**74 cities enforcing new ambient air quality standards at stage I** A total of 74 cities, including cities seated in the Beijing-Tianjin-Hebei region, Yangtze River Delta, and Pearl River Delta, as well as municipalities directly under the Central Government, provincial capital cities and cities listed separately in State plans, enforced the new ambient air quality standards in 2014 as scheduled. Among them, 8 cities met the standards, 5 more than last year, namely Haikou, Lhasa, Zhoushan, Shenzhen, Zhuhai, Fuzhou, Huizhou and Kunming. The rest 66 cities exceeded the standards to different degrees. According to the ranking of cities with air quality, the top 10 were Haikou, Zhoushan, Lhasa, Shenzhen, Zhuhai, Huizhou, Fuzhou, Xiamen, Kunming and Zhongshan, while the bottom 10 were Baoding, Xingtai, Shijiazhuang, Tangshan, Handan, Hengshui, Jinan, Langfang, Zhengzhou and Tianjin.

The analysis of specific indicators found the mean

annual SO<sub>2</sub> concentration ranged between 6 μg/m<sup>3</sup> and 82 μg/m<sup>3</sup> among those cities and averaged 32 μg/m<sup>3</sup>, down by 20.0% year on year. 89.2% of those cities attained air quality standards with regard to SO<sub>2</sub>, up by 2.7 pps. The mean annual NO<sub>2</sub> concentration ranged between 16 μg/m<sup>3</sup> and 61 μg/m<sup>3</sup> and averaged 42 μg/m<sup>3</sup>, down by 4.5%. 48.6% of those cities attained air quality standards, an increase of 9.4 pps. The mean annual PM<sub>10</sub> concentration ranged between 42 μg/m<sup>3</sup> and 233 μg/m<sup>3</sup> and averaged 105 μg/m<sup>3</sup>, an 11.0% decrease, and 21.6% of those cities reached air quality standards, an increase of 6.7 pps. The mean annual PM<sub>2.5</sub> concentration ranged between 23 μg/m<sup>3</sup> and 130 μg/m<sup>3</sup> and averaged 64 μg/m<sup>3</sup>, making an 11.1% decrease. 12.2% of those cities attained the standards, up by 8.1 pps. The 90<sup>th</sup>-percentile value of the mean daily value of the maximum 8-hour O<sub>3</sub> reading ranged between 69 μg/m<sup>3</sup> and 200 μg/m<sup>3</sup> and averaged 145 μg/m<sup>3</sup>, making a 4.3% increase. 67.6% of the cities met the standards, down by 9.4 pps. The 95<sup>th</sup>-percentile value of the mean daily CO concentration ranged between 0.9 mg/m<sup>3</sup> and 5.4 mg/m<sup>3</sup> and averaged 2.1 mg/m<sup>3</sup>, down by 16.0% year on year, and 95.9% of the cities attained air quality standard with regard to CO, up by 10.8 pps.

**Three key regions** In the 13 cities at or above prefecture level in Beijing-Tianjin-Hebei region, the mean annual PM<sub>2.5</sub> concentration registered 93 μg/m<sup>3</sup>, down by 12.3% year on year, and among these cities, only Zhangjiakou met the standards. The mean annual PM<sub>10</sub> concentration of these cities read 158 μg/m<sup>3</sup>, down by 12.7%, and all of the 13 cities exceeded the standards. The mean annual SO<sub>2</sub> concentration



Interannual change of the mean pollutant concentrations and the percentage of attainment cities at Stage I

of these cities fell by 24.6% to  $52 \mu\text{g}/\text{m}^3$ , and 4 cities had excessive  $\text{SO}_2$  emissions than allowed. The mean annual  $\text{NO}_2$  concentration of these cities read  $49 \mu\text{g}/\text{m}^3$ , down by 3.9% year on year and 10 cities exceeded the upper limits. The 95<sup>th</sup>-percentile value of the mean daily CO concentration read  $3.5 \text{ mg}/\text{m}^3$ , down by 14.6%, and the 90<sup>th</sup>-percentile value of the mean daily value of the maximum 8-hour  $\text{O}_3$  reading was  $162 \mu\text{g}/\text{m}^3$ , up by 4.5%. 3 and 8 cities exceeded the standards with regard to CO and  $\text{O}_3$  respectively.  $\text{PM}_{2.5}$  was deemed as the primary pollutant in the largest number of days throughout the year, followed by  $\text{PM}_{10}$  and  $\text{O}_3$ .

This year, the mean annual  $\text{PM}_{2.5}$  concentration registered  $85.9 \mu\text{g}/\text{m}^3$  in Beijing,  $83 \mu\text{g}/\text{m}^3$  in Tianjin and  $124 \mu\text{g}/\text{m}^3$  in Shijiazhuang, down by 4.0%, 13.5% and 19.5% year on year respectively.

In the 25 cities at or above prefecture level in Yangtze River Delta, the mean annual  $\text{PM}_{2.5}$  concentration fell by 10.4% year on year to  $60 \mu\text{g}/\text{m}^3$ , and among these cities, only Zhoushan met the standards. The mean annual  $\text{PM}_{10}$  concentration of these cities registered  $92 \mu\text{g}/\text{m}^3$  after a 10.7% decrease, and 22 cities failed to meet the standards. The mean annual  $\text{SO}_2$  concentration was reduced by 16.7% to  $25 \mu\text{g}/\text{m}^3$ , and all of the cities reached the standards. The mean annual  $\text{NO}_2$  concentration of these cities read  $39 \mu\text{g}/\text{m}^3$ , down by 7.1% year on year, and 11 cities exceeded the upper limits. The 95<sup>th</sup>-percentile value of the mean daily CO concentration read  $1.5 \text{ mg}/\text{m}^3$ , down by 21.1%, and all of the cities reached the standards. The 90<sup>th</sup>-percentile of the mean daily value of the maximum 8-hour  $\text{O}_3$  reading was  $154 \mu\text{g}/\text{m}^3$ , up by 6.9%, and 10 cities exceeded the standards.  $\text{PM}_{2.5}$  was deemed as the primary pollutant in the largest number of days throughout the year, followed by  $\text{O}_3$  and  $\text{PM}_{10}$ .

This year, the mean annual  $\text{PM}_{2.5}$  concentration registered  $52 \mu\text{g}/\text{m}^3$  in Shanghai,  $74 \mu\text{g}/\text{m}^3$  in Nanjing and  $65 \mu\text{g}/\text{m}^3$  in Hangzhou, decrease of 16.1%, 5.1% and 7.1% year on year

respectively.

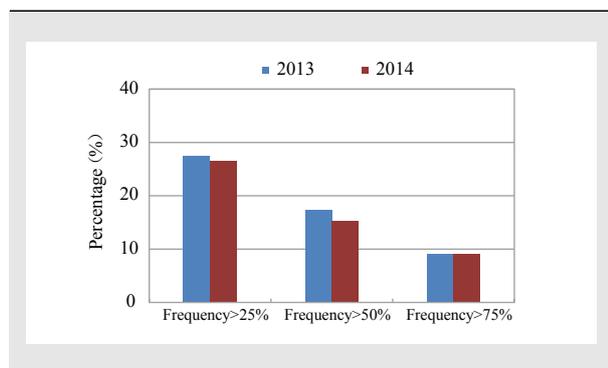
In 9 cities at or above prefecture level in the Pearl River Delta, the mean annual  $\text{PM}_{2.5}$  concentration fell by 10.6% year on year to  $42 \mu\text{g}/\text{m}^3$ , and only 3 of these cities met the standards. The mean annual  $\text{PM}_{10}$  concentration of these cities registered  $61 \mu\text{g}/\text{m}^3$  after a 12.9% decrease, and only Zhaoqing exceeded the standards. The mean annual  $\text{SO}_2$  concentration was reduced by 14.3% to  $18 \mu\text{g}/\text{m}^3$ , and all of the cities reached the standards. The mean annual  $\text{NO}_2$  concentration of these cities read  $37 \mu\text{g}/\text{m}^3$ , down by 9.8% year on year, and 3 cities exceeded the upper limits. The 95<sup>th</sup>-percentile value of the mean daily CO concentration fell by 6.3% to  $1.5 \text{ mg}/\text{m}^3$ , and all of the cities reached the standards. The 90<sup>th</sup>-percentile of the mean daily value of the maximum 8-hour  $\text{O}_3$  reading registered  $156 \mu\text{g}/\text{m}^3$ , up by 0.6%, and 4 cities exceeded the standards.  $\text{O}_3$  was deemed as the primary pollutant in the largest number of days throughout the year, followed by  $\text{PM}_{2.5}$  and  $\text{NO}_2$ .

This year, the mean annual  $\text{PM}_{2.5}$  concentration registered  $49 \mu\text{g}/\text{m}^3$  in Guangzhou and  $34 \mu\text{g}/\text{m}^3$  in Shenzhen, down by 7.5% and 15.0% year on year respectively.

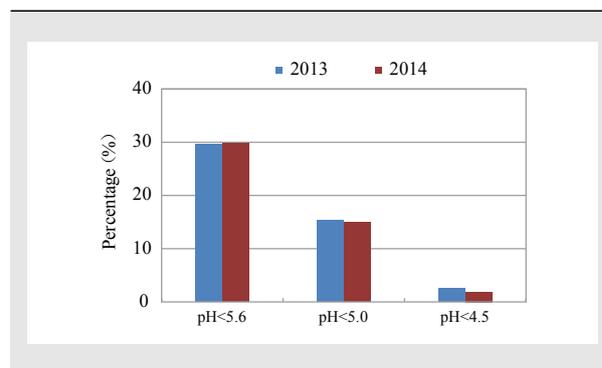
## Acid Rain

**Acid rain frequency** In 2014, acid rain was reported in 44.3% of the 470 cities (districts, counties) under precipitation monitoring program. With an average value of 17.4%, the acid rain frequency was above 25% in 26.6% of those cities, and above 75% in 9.1% of those cities.

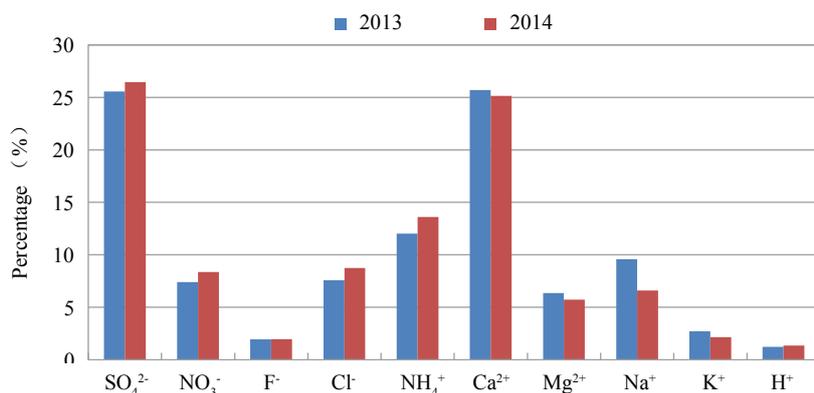
**Acidity of precipitation** The mean annual pH value of rainfalls was below 5.6 (acid rain) in 29.8% of the monitored cities, below 5.0 (relatively serious acid rain) in 14.9% of them, and below 4.5 (serious acid rain) in 1.9% of them this year. The proportion of cities with records of acid rain, relatively serious acid rain, and serious acid rain this year was



Year-on-year change of the percentage of cities with varied acid rain frequencies



Year-on-year change of the percentage of cities with varied mean annual pH values



Year-on-year change of the percentage of normality of main ions in precipitation

basically the same as the previous year.

**Chemical composition** The main positive ions in the precipitation were Ca<sup>2+</sup> and NH<sub>4</sub><sup>+</sup> this year, which accounted for 25.1% and 13.6% respectively of the total ion equivalent. The main negative ion was SO<sub>4</sub><sup>2-</sup>, accounting for 26.4% of the total ion equivalent. NO<sub>3</sub><sup>-</sup> took up 8.3%. Sulphate was the

leading acid-causing substance.

**Geographical distribution of acid rain** In 2014, the acid rain in China mainly spread in the area south of the Yangtze River and east of the Tibetan Plateau, covering most parts of Zhejiang, Jiangxi, Fujian, Hunan, Chongqing, as well as Yangtze River Delta and Pearl River Delta.

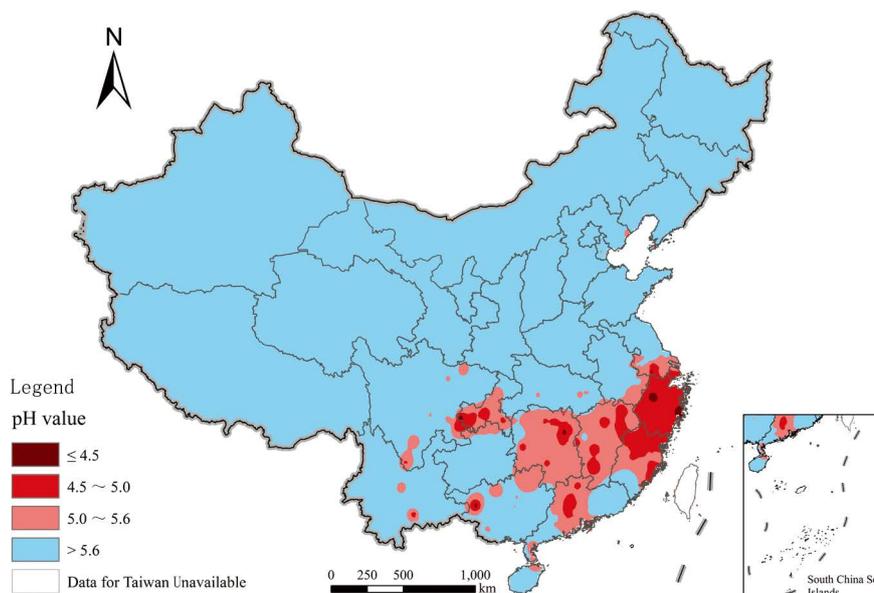


Diagram of the isoline of the mean annual pH value of precipitation in China in 2014

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## Measures and Actions

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**【Full implementation of the Action Plan for Air Pollution Prevention and Control】** 2014 is a critical year for the implementation of the *Action Plan for Air Pollution Prevention and Control*. Under the leadership of the CPC Central Committee and the State Council, centering on the main line of air quality improvement, all localities and departments with high attention introduced supporting policies, implemented the responsibility system, and made positive progress in the practical work. 1) Performance assessment. The State Council issued the *Performance Assessment Measures for the Action Plan for Air Pollution Prevention and Control (Trial)* which established the quality-centered evaluation system. 2) Environmental regulations. In line with the amendment by the Legislative Affairs Office, the State Council executive meeting discussed and passed the *Draft Amendment to Law of the People's Republic of China for Air Pollution Prevention and Control* on November 26, 2014, and set out 22 policies supporting the *Action Plan for Air Pollution Prevention and Control* on February 12, 2014. 3) Regional cooperation mechanisms. The regional coordination mechanisms for the Beijing-Tianjin-Hebei region and the surrounding area, Yangtze River Delta and Pearl River Delta played an active role in solving common regional air pollution. Based on these mechanisms, China strengthened regional cooperation and carried out joint prevention and control, and completed source apportionment of atmospheric particulates in major cities. 4) Ambient air quality in major events. In conjunction with the Beijing-Tianjin-Hebei region and Yangtze River Delta cooperation mechanisms, the *Program for Air Quality Assurance in Beijing-Tianjin-Hebei region and the Surrounding Area during the 2014 Asia-Pacific Economic Cooperation Summit* and the *Work Program for Air Quality Assurance during the Second Summer Youth Olympic Games* were worked out and guaranteed the ambient air quality.

**【Research on source apportionment of atmospheric particulates in major cities】** To implement the spirit of the 39<sup>th</sup> State Council executive meeting and deployments of the *Action Plan for Air Pollution Prevention and Control*, the *Circular on Carrying out the Phase I Research on Atmospheric Particulate Source Apportionment* was issued, and in January, 2014, the work was kicked off in all municipalities, capital cities (except Lhasa) and cities

(totally 35) specified in state plans. In accordance with the State Council's requirements, the joint working mechanism was established for Ministry of Environmental Protection, Chinese Academy of Sciences and Chinese Academy of Engineering. At the end of 2014, the feasibility studies on source apportionment in 9 major cities of the Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta were successfully completed, and the research findings have been applied to the local air pollution prevention and control. The source apportionment proceeded steadily in other 26 cities.

**【Industrial pollution prevention and control】** The *Comprehensive Management of Volatile Organic Compounds (VOCs)* was officially kicked off. Focus efforts were made to eliminate coal-fired boilers and promote integrated retrofit projects for energy saving and environmental protection. The demonstration on heating supply based on biomass briquette fired boilers was carried out in order to reduce outdoor biomass combustion and air pollution from coal-fired boilers. To support these actions, a group of documents were rolled out, including the *Program for the Comprehensive Management of Volatile Organic Compounds in the Petrochemical Industry*, *Emission Standards for Air Pollutants from Boilers (GB 13271-2014)*, *Standards for Pollution Control on Municipal Garbage Burning (GB 18485-2014)*, *Exhaust Emission Limits and Measurement Methods for Diesel-fired Non-road Mobile Machinery (Phases III and IV) (GB 20891-2014)*, *Emission Standards for Tin, Antimony and Mercury in Industrial Sectors (GB 30770-2014)*, *Program for the Coal-fired Power Transformation and Upgrading for Energy Conservation and Emission Reduction*, and *Circular on Carrying out the Heating Demonstration Project of Biomass Briquette Fired Boilers*.

**【Pollution prevention and control of motor vehicles】** A monthly reporting system combined with economic incentives and travel restrictions on high-polluting vehicles were implemented, which forced the retirement of more-than-expected 6 mil. yellow-label vehicles and old vehicles. The supervision for environmental compliance of new vehicles was strengthened, lending a powerful blow and deterrence to non-compliance producers. A total of 1,318 vehicle (engine) models from 109 companies in 20 cities in the Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta were inspected. The mechanism for joint management of motor vehicle pollution took the initial shape. A special operation on motor gasoline and diesel was launched in the Beijing-Tianjin-Hebei region to rectify and combat against counterfeit and inferior fuel. The country began to supply as scheduled the standards IV motor gasoline and diesel on a national scale and standards V in Beijing, Tianjin, Shanghai, Jiangsu, Guangdong and Shaanxi, in order to fundamentally

solve the long-standing vehicle-fuel matching problem.

**【Special inspection for air pollution prevention and control】** Ministry of Environmental Protection printed and distributed the *Inspection Program for Air Quality Assurance in the Beijing-Tianjin-Hebei Region and the Surrounding Area during the Asia-Pacific Economic Cooperation Summit* and sent 16 inspection teams to relevant cities from October 20 to November 12, 2014. The special inspection has made a positive contribution to air quality during the APEC meeting. In the winter of 2014, an inspection operation for air pollution prevention and control was carried out, involving inspection to key areas on a monthly basis, and a total of 283 problems were identified and publicized during October-December. This year, unmanned aerial vehicles were introduced in law enforcement and inspection for 40 times and the flying range of a variety of aircrafts used exceeded 6,000 km.

**【Remote sensing of straw burning】** The remote sensing and monitoring of straw burning and information dissemination were strengthened. Unauthorized straw burning sites were destroyed based on remote sensing results of environmental satellites and meteorological satellites and on-site inspection and verification in major agricultural areas. In 2014, totally 5,034 straw burning sites (excluding removed ones) were found nationwide, a decrease of 2,949 or 36.9% over last year. In terms of distribution, there were 1,145 sites in Henan, 787 in Heilongjiang, 722 in Anhui, 547 in Jilin, 469 in Liaoning, 330 in Shandong, 256 in Inner Mongolia, 149 in Hebei, 148 in Shanxi, and 133 in Hubei. In terms of fire intensity per 1,000 ha. cultivated land, the top 10 were 0.1445 in Henan, 0.1260 in Anhui, 0.1148 in Liaoning, 0.0988 in Jilin, 0.0665 in Heilongjiang, 0.0439 in Shandong, 0.0365

in Shanxi, 0.0361 in Ningxia, 0.0358 in Inner Mongolia and 0.0302 in Beijing.

**【Action program for energy-saving low-carbon development】** The State Council printed and distributed the *2014-2015 Action Program for Energy-saving, Low-carbon Development*, further clarifying targets in 2014 and 2015, strengthening measures, and quantifying the division of tasks. The action program made specific arrangements in eight aspects, industrial restructuring, project development, energy conservation and carbon reduction in key fields, technical support, policy support, market-oriented mechanisms, monitoring, early warning and supervision and inspection, and fulfillment of responsibilities. The targets and tasks in the two years were decomposed to regions, covering incremental energy consumption, elimination of coal-fired boilers, emission reduction projects for major air pollutants, and elimination of yellow-label cars and old vehicles. Work priorities, schedule, and time requirements were also clarified.

**【Heavy pollution weather emergency management】** The heavy pollution weather emergency plan was unveiled in 194 cities at or above the prefecture level in 21 provinces (autonomous regions and municipalities), and the emergency plan of 11 provinces in the Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta and 5 provinces in other areas was archived. In 2014, the country issued more than 170 alerts of heavy pollution weather, including over 60 yellow or higher-level alerts in the Beijing-Tianjin-Hebei region. During the APEC meeting, Beijing, Tianjin and Hebei took Level- I emergency response measures which effectively secured the ambient air quality in Beijing.