

2020

Shanghai

Ecological and Environmental Bulletin



Shanghai Municipal Bureau of Ecology and Environment

ADD : NO.100 DAGU ROAD SHANGHAI,CHINA
TEL : (8621) 23111111
FAX : (8621) 63556010
P.C : 200003

Shanghai Municipal Bureau of Ecology and Environment



According to the provision that “ the authorities of environmental protection of the people’s government at provincial level or above should issue the environmental bulletin regularly ”, which is stipulated in Article 54 of the Environmental Protection Law of the People’s Republic of China, and the provision that “ the Municipal Environmental Protection Bureau should issue a local annual environmental bulletin every year ”, which is provided for in Article 58 of the Shanghai Environmental Protection Regulations, 2020 Shanghai Environmental Bulletin is hereby issued.

Cheng Peng

General Director

Shanghai Municipal Bureau of Ecology and Environment

June 2020

程鹏



Contents

Overview

Status of Ecological
Environmental Quality

Key Tasks

/01/	Overview
/03/	Quality of the Ambient Air
/08/	Quality of the Surface Water Environment
/11/	Quality of the Groundwater Environment
/11/	Quality of the Marine Environment
/13/	Quality of the Soil Environment
/13/	Quality of the Acoustic Environment
/15/	Quality of the Radiation Environment
/16/	Ecological Index
/18/	Pollution Prevention and Control
/18/	The Three-Year Action Plan of Environmental Protection
/19/	Prevention and Control of Air Pollution
/20/	Prevention and Control of Water Pollution
/21/	Prevention and Control of Soil and Groundwater Pollution
/22/	Environmental Protection of Agriculture and Rural Areas
/23/	System Reform of Ecological Civilization
/23/	Major Progress
/23/	Environmental Protection Inspection
/24/	Three Lines One List Environmental Zoning Control
/24/	Reform of the Environmental Impact Assessment System
/25/	Reform of the Compensation System for Environmental Damage

Key Tasks

Supporting Measures

Public Involvement
and Supervision

/26/	Other Key Tasks
/26/	Epidemic Prevention and Control
/27/	Pollutant Discharge Permit Management
/28/	Total Amount of Pollutant Emission Reduction
/29/	Solid Waste Management
/30/	Radiation Safety Management
/30/	Marine Environmental Protection
/31/	Supervision and Administration of Natural Ecology
/32/	Comprehensive Environmental Improvement in Key Areas
/33/	Climate Change Response
/33/	Census of Pollution Sources
/34/	Collaboration in the Yangtze River Delta Region
/37/	Environmental Protection Investment
/37/	Environmental Legal System
/38/	Environmental Impact Assessment Management
/38/	Environmental Monitoring
/39/	Environmental Science and Technology
/40/	Environmental Standards
/40/	Environmental Informationization
/41/	Modern Environmental Governance System
/41/	International Cooperation
/42/	Team Building and Performance Improvement
/44/	Accepting Suggestions and Handling Proposals
/44/	Hearing Complaints
/45/	Coping with Environmental Emergencies
/45/	Model Units of Environmental Protection
/45/	Publicity for Environmental Protection
/46/	Government Information Disclosure



Overview

In 2020, further implementing General Secretary Xi Jinping's thought on ecological civilization and the spirit forged in his speeches during his inspection in Shanghai and at the 30th anniversary of the development and opening up of Pudong, Shanghai coordinated epidemic prevention and control, economic and social development as well as environmental protection, with the "people for the city of people, and city for the people of the city" philosophy applied. Efforts were made to fully insure stability on six key fronts and maintain security in six key areas. Solid steps were taken for pollution prevention and control, with joint efforts deepened on regional fronts. Reform and innovation were strengthened to accelerate the construction of the modern environmental governance system and the environment saw continuous improvement. (*The six fronts refer to employment, the financial sector, foreign trade, foreign investment, domestic investment, and expectations. The six areas refer to job security, basic living needs, operations of market entities, food and energy security, stable industrial and supply chains, and the normal functioning of primary-level governments.)

In 2020, the annual average concentration of fine particulate matter (PM_{2.5}) in the ambient air was 32 µg/m³ in Shanghai, a record low since monitoring began; the water quality of the main rivers in the city improved compared with 2019, with no monitored cross-sections inferior to Category V; the quality of all sources of centralized drinking water in use were all in full compliance with the national standards; the overall quality of the soil environment of agricultural land was good; the overall quality of the groundwater in Shanghai and that of the marine environment remained stable; the quality of the acoustic environment improved slightly; the ambient radiation was kept within normal range and the quality of the ecological environment was good.

Status of Ecological Environmental Quality

Quality of the Ambient Air

In 2020^[1] there were 319 days when the air quality index (AQI) varied in the range between excellent and good, 10 days more than in 2019. The annual rate of excellent/good-AQI days was 87.2%, up by 2.5 percentage points over the previous year. Among the 319 days, there were

- 117 days when the AQI was excellent;
- 202 days when the AQI was good;
- 39 days when the AQI denoted light pollution;
- 7 days when the AQI denoted moderate pollution; and
- 1 day when the AQI denoted heavy pollution.

The number of heavily polluted days remained the same as in 2019.

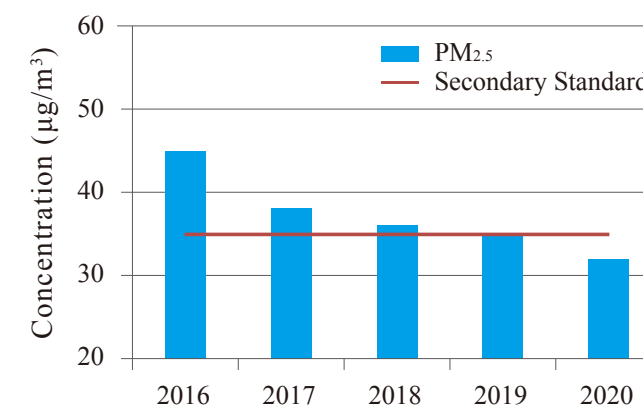
Among the 47 days when air pollution occurred, there were

- 27 days, 57.5% of the total 47 days, when ozone (O_3) was the primary pollutant;
- 16 days, 34.0% of the total 47 days, when the primary pollutant was fine particulate matter ($PM_{2.5}$); and
- 4 days, 8.5% of the total 47 days, when the primary pollutant was nitrogen dioxide (NO_2).

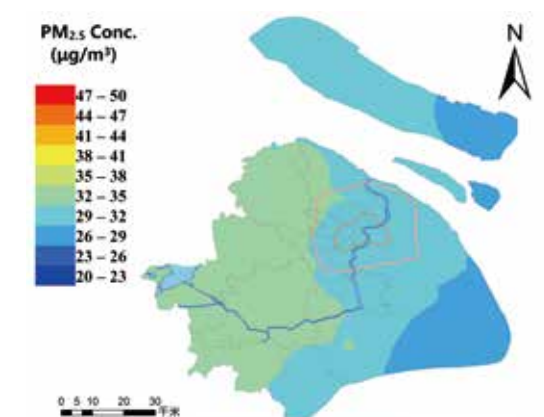
Primary Indicators of Pollution

Fine Particulate Matter ($PM_{2.5}$)

In 2020, the annual average concentration of $PM_{2.5}$ in Shanghai was $32 \mu g/m^3$, a year-on-year decrease of 8.6%, satisfying the secondary standard of the National Ambient Air Quality Standards (NAAQS). The lowest monthly figure was recorded in October at $19 \mu g/m^3$ and the highest in January at $53 \mu g/m^3$. The data monitored over the past five years show an overall downward trend of the annual average $PM_{2.5}$ concentration in Shanghai, with the spatial distribution of the concentration of $PM_{2.5}$ ranging from high to low from the west to the east.



Variation of the annual average concentration of $PM_{2.5}$ in Shanghai from 2016 to 2020

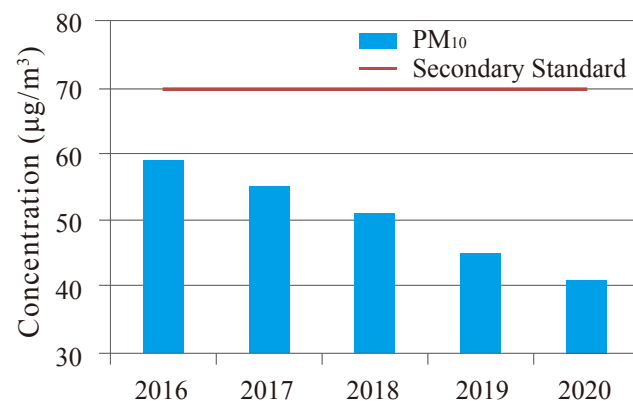


Spatial distribution of the concentration of $PM_{2.5}$ in different districts of Shanghai in 2020

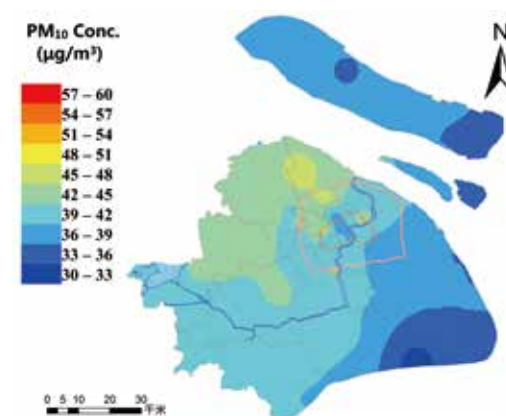
^[1]From 2019, the amended *Ambient Air Quality Standards* (GB 3095-2012) was implemented for ambient air quality monitoring. Therefore, the 2020 air quality index (AQI) and data related to the six major pollution indicators of $PM_{2.5}$, PM_{10} , SO_2 , NO_2 , O_3 , and CO can be compared with the 2019 data, and can be used for overall trend analysis but not for absolute comparison with published data over the years of and prior to 2018.

Inhalable Particulate Matter (PM₁₀)

In 2020, the annual average concentration of PM₁₀ in Shanghai was 41 $\mu\text{g}/\text{m}^3$, a drop of 8.9% over the previous year, meeting the secondary standard of the NAAQS. The data monitored in the past five years show that the annual averages of the concentration of PM₁₀ in Shanghai were all in compliance with the secondary standard of the NAAQS while seeing a downward trend on the whole. The spatial distribution of the concentration of PM₁₀ in the city's districts ranged from high to low from the west to the east.



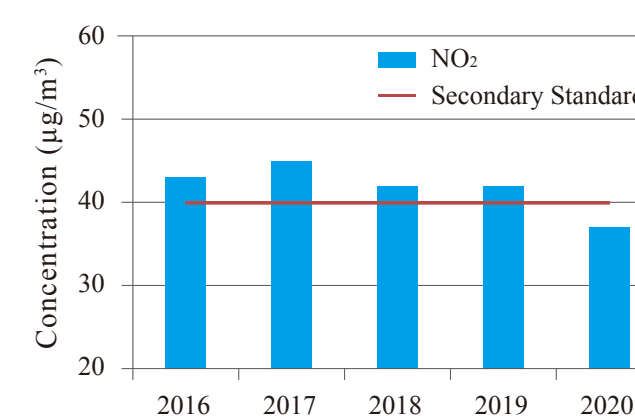
Variation of the annual average concentration of PM₁₀ in Shanghai from 2016 to 2020



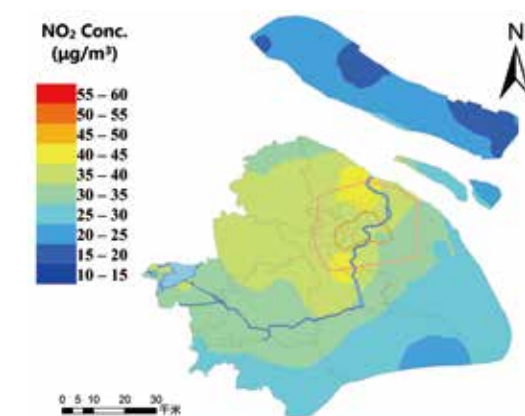
Spatial distribution of the concentration of PM₁₀ in different districts of Shanghai in 2020

Nitrogen Dioxide (NO₂)

In 2020, the annual average concentration of NO₂ in Shanghai was 37 $\mu\text{g}/\text{m}^3$, a year-on-year drop of 11.9%, meeting the secondary standard of the NAAQS. The data monitored in the past five years show that the annual average NO₂ concentration in Shanghai kept declining on the whole, with the spatial distribution of the concentration seeing a downward trend from downtown to its surrounding areas and the overall concentration in Puxi higher than that in Pudong.



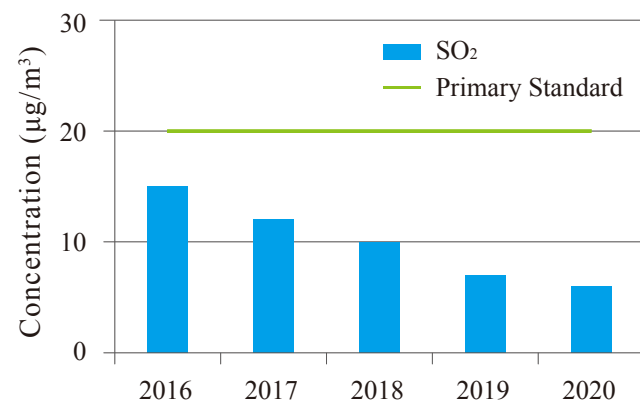
Variation of the annual average concentration of NO₂ in Shanghai from 2016 to 2020



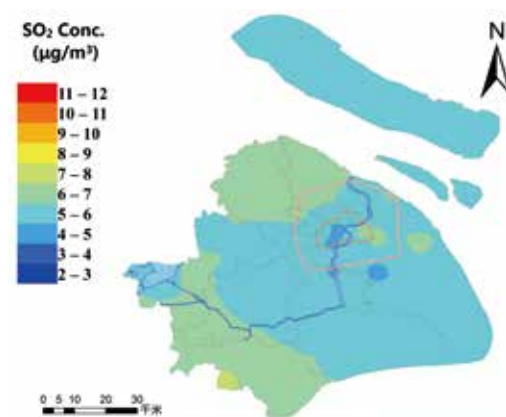
Spatial distribution of the concentration of NO₂ in different districts of Shanghai in 2020

Sulfur Dioxide (SO₂)

In 2020, the annual average concentration of SO₂ in Shanghai was 6 $\mu\text{g}/\text{m}^3$, a decline of 14.3% over the previous year, satisfying the primary standard of the NAAQS. The data monitored over the past five years show that the annual averages of the concentration of SO₂ in Shanghai all met the primary standard of the NAAQS, with the concentration on the whole going down and that in all districts remaining low.



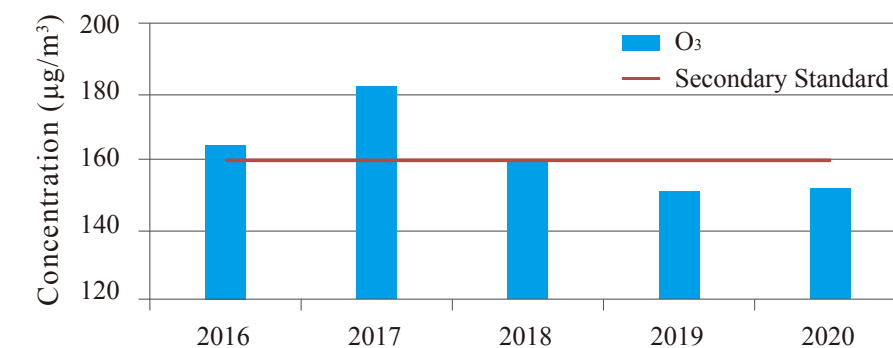
Variation of the annual average concentration of SO₂ in Shanghai from 2016 to 2020



Spatial distribution of the concentration of SO₂ in different districts of Shanghai in 2020

Ozone (O₃)

In 2020, the 90th percentile of the daily max 8-hour average measurements of O₃ in Shanghai was 152 $\mu\text{g}/\text{m}^3$, 0.7 % up from the previous year, meeting the secondary standard of the NAAQS. The data monitored in the past five years show that the 90th percentile of the daily max 8-hour average concentrations of O₃ in Shanghai fluctuated around the secondary standard limit (160 $\mu\text{g}/\text{m}^3$).

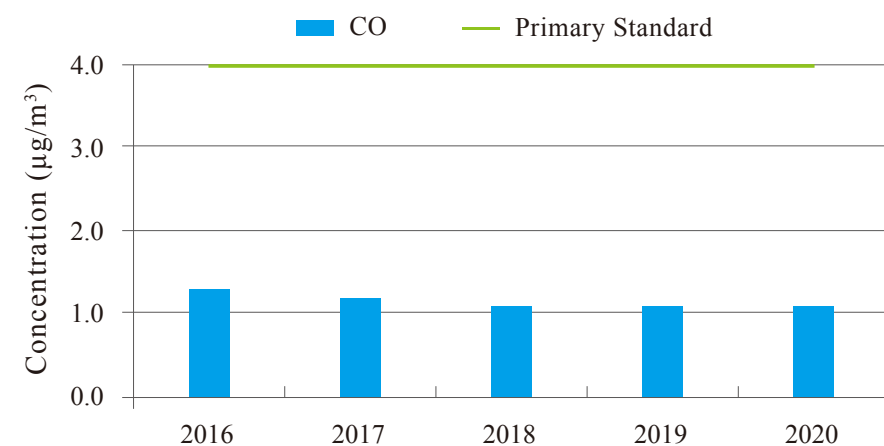


Variation of the concentration of O₃ in Shanghai from 2015 to 2019

^[2] According to the Technical Specification for Ambient Air Quality Assessment (Trial) (HJ 663-2013), the annual assessment indicators for ozone (O₃) and carbon monoxide (CO) are the 90th percentile of the daily max 8-hour average measurements and the 95th percentile of the 24-hour average measurements, respectively.

Carbon Monoxide (CO)

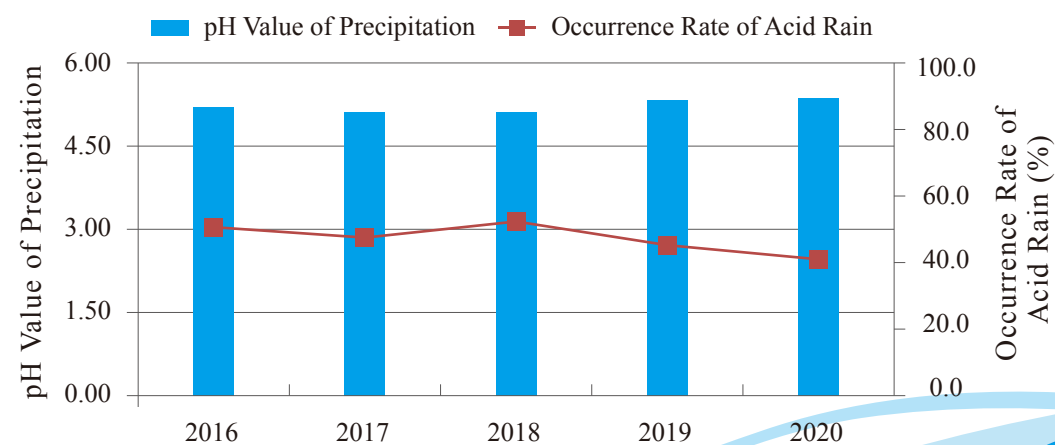
In 2020, the 95th percentile of the 24-hour average measurements of CO in Shanghai was $1.1 \mu\text{g}/\text{m}^3$, satisfying the primary standard of the NAAQS. The data monitored in the past five years show that the 95th percentile of the 24-hour average concentrations of CO in Shanghai all met the primary standard of the NAAQS.



Variation of the concentration of CO in Shanghai from 2016 to 2020

Acid Rain

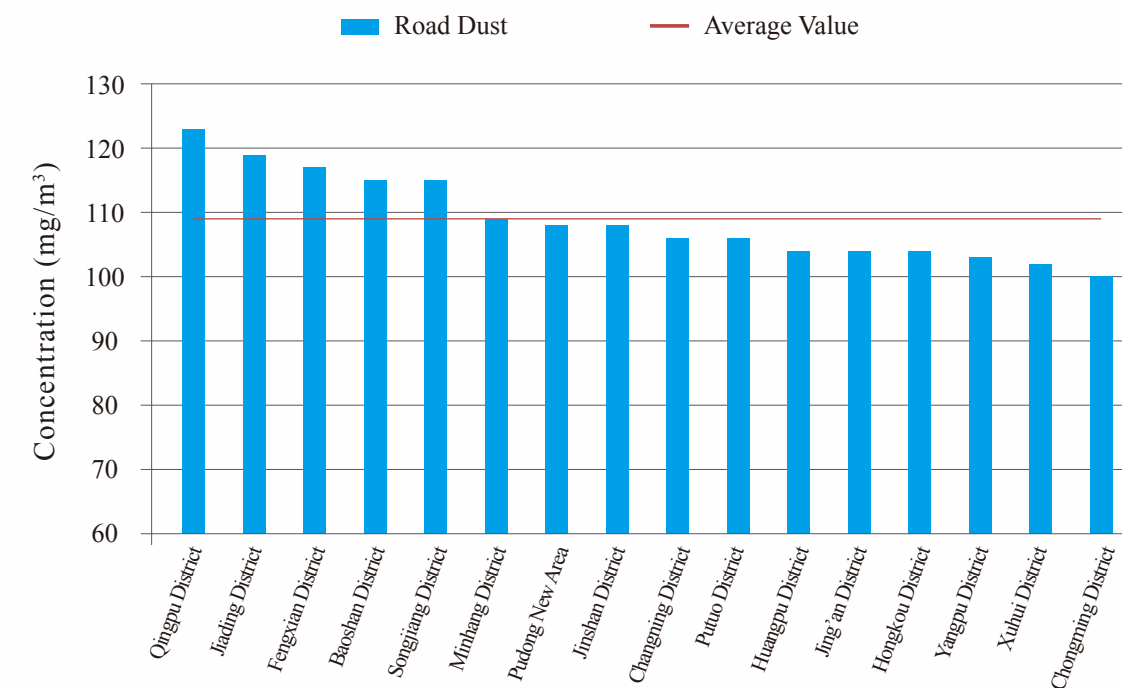
In 2020, the average pH value of precipitation in 2020 was 5.38; the occurrence rate of acid rain was 40.2%, 4.3 percentage points lower than that in 2019. The data monitored in the past five years show that air pollution caused by acid rain in Shanghai was, by and large, decreasing.



Variation of the average pH value of precipitation and the occurrence rate of acid rain in Shanghai from 2016 to 2020

Road Dust

In 2020, the average concentration of road dust recorded with mobile monitoring in all districts in Shanghai ranged from 100 to $123 \mu\text{g}/\text{m}^3$, with an average value of $109 \mu\text{g}/\text{m}^3$.



Concentration of road dust in different districts of Shanghai in 2019



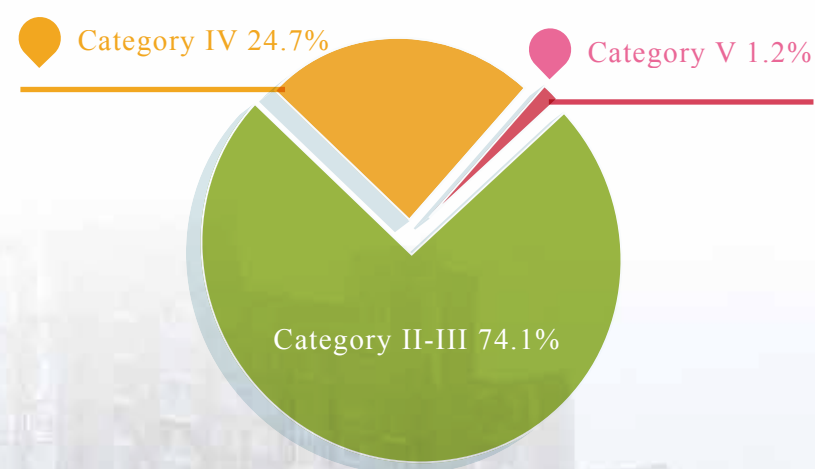
Quality of the Surface Water Environment

Water Quality of Main Rivers and Lakes

Assessments of water quality were carried out on cross-sections of all main rivers in Shanghai in accordance with the *Environmental Quality Standards for Surface Water* (GB3838-2002). In 2020, the water quality of 74.1% of the monitored cross-sections fell into Category II and III, 24.7% Category IV, and 1.2% Category V, with no water quality of cross-sections inferior to Category V.

The water quality of the cross-sections of main rivers in Shanghai was improved in 2020 when compared with that in 2019. The average value of the permanganate index was 4.1 mg/l, 6.8% down from the previous year; the average concentration of ammonia nitrogen was 0.51 mg/l, 16.4% lower than that in 2019; the average concentration of total phosphorus was 0.159 mg/l, a year-on-year drop of 16.8%.

The Dianshan Lake is mildly eutrophic, with a slight increase in the integrated nutrient status index from a year earlier.



Percentage of the category of water quality at cross-sections of main rivers in Shanghai in 2020

^[3]The total number of monitored cross-sections of the main rivers in Shanghai was 259.

The Huangpu River

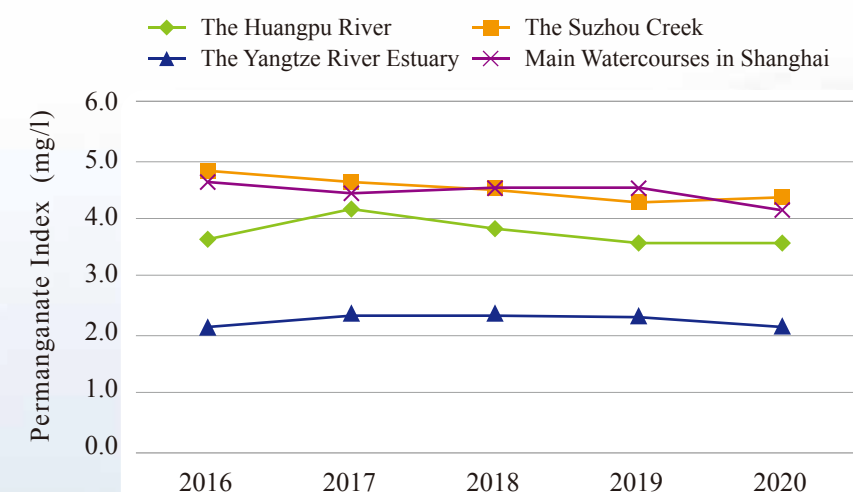
The water quality of five out of six cross-sections of the Huangpu River was up to the standard of Category III, and the other one met the standard of Category II. Compared with that in 2019, water quality improved on the whole, as the average concentration of ammonia nitrogen was 24.1% lower and the average permanganate index and average concentration of total phosphorus remained basically unchanged.

The Suzhou Creek

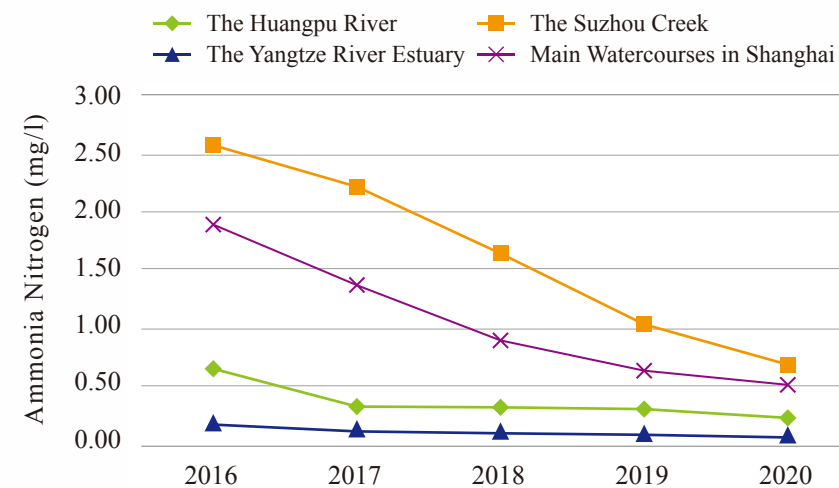
The water quality of four out of seven cross-sections of the Suzhou Creek fell into Category III, and the other three Category IV. Compared with that in 2019, water quality improved on the whole, as the average concentration of ammonia nitrogen and total phosphorous dropped by 35.6% and 11.5% respectively and the average permanganate index remained basically unchanged.

The Yangtze River Estuary

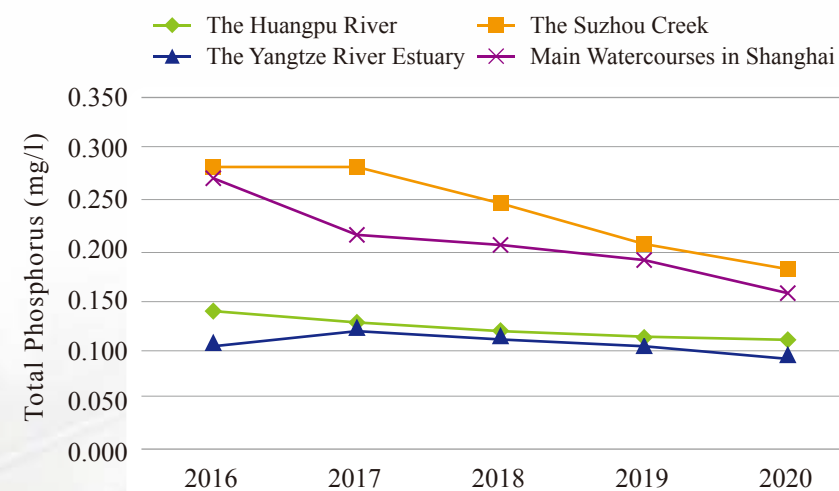
The water quality of four out of seven cross-sections of the Yangtze River Estuary fell into Category II, and the other three Category III. Compared with that in 2019, water quality improved on the whole, as the average concentration of ammonia nitrogen and total phosphorous and the average permanganate index dropped by 15.4%, 11.0%, and 8.7% respectively.



Variation of the average permanganate index in main rivers in Shanghai from 2016 to 2020



Variation of the concentration of ammonia nitrogen in main rivers in Shanghai from 2016 to 2020



Variation of the concentration of total phosphorus in main rivers in Shanghai from 2016 to 2020

Water Quality of the Sources of Centralized Drinking Water

There are four sources of centralized drinking water in use in Shanghai, namely the Qingcaosha Reservoir, the Dongfengxisha Reservoir, and the Chenhang Reservoir in the Yangtze River, and the Jinze Reservoir in the Huangpu River. In 2020, the water quality of the four reservoirs were all in full compliance with the *Environmental Quality Standards for Surface Water* (GB3838-2002) (at or above the Category-III standard).

Quality of the Groundwater Environment

In 2020, 13 monitoring sites included in the national groundwater quality assessment project were monitored and evaluated according to the *Quality Standards for Groundwater* (GB/T 14848-2017). As shown by the assessment results, the numbers of sites in the city with groundwater quality meeting the standard of Category III, Category IV, and Category V were 6, 5, and 2 respectively, accounting for 46.1%, 38.5%, and 15.4% of the total. The overall quality of groundwater in Shanghai remained stable. Specifically, the assessment result of the phreatic aquifers was mainly determined by the levels of iron, sulfate, and nitrite, with a high level of iron in the original phreatic aquifers and sulfate and nitrite subject to human activities; the assessment result of the confined aquifers was mainly determined by the levels of iron and manganese, which were both high in the original groundwater.

Quality of the Marine Environment

According to the *Quality Standards for Sea Water* (GB3097-1997), in 2020, among all the monitoring sites in Shanghai's marine areas, the water quality of 15.2% of them were compliant with the Category-I or II standard, 15.2% compliant with the Category-III or IV standard, and 69.6% inferior to the Category-IV standard. The main pollutants were inorganic nitrogen and reactive phosphate.

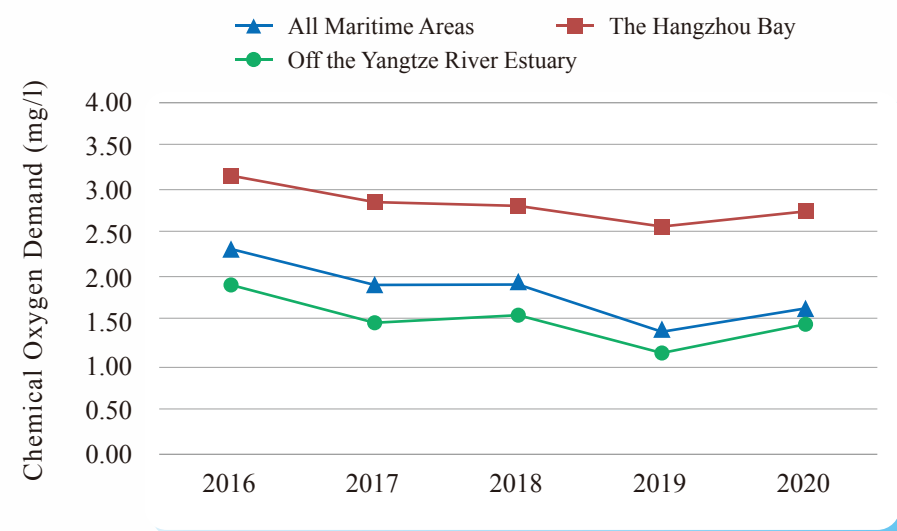
Compared with 2019, the number of monitoring sites whose water quality meeting the Category-I or II standard dropped by 5.3 percentage points, that satisfying the Category-III or IV standard increased by 4.9 percentage points, and that inferior to the Category-IV standard rose by 0.4 percentage points. Among the major indicators, the average concentration of chemical oxygen demand was 1.60 mg/l, a rise of 14.3% over the precious year; that of inorganic nitrogen was 0.781 mg/l, a year-on-year drop of 4.4%; and that of reactive phosphate was 0.0315 mg/l, an 11.8% decline from a year earlier.

Quality of Sea Water in the Offshore Area of the Yangtze River Estuary

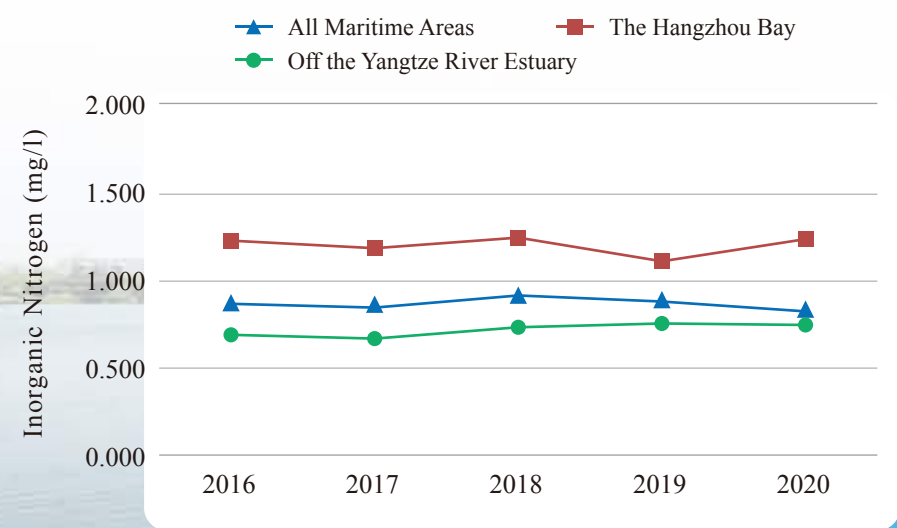
In the offshore area of the Yangtze River Estuary, the quality of sea water at 17.1% of the monitoring sites were compliant with the Category-I or II standard, 17.1% compliant with the Category-III or IV standard, and 65.8% inferior to the Category-IV standard. Among the major indicators, the average chemical oxygen demand rose by 25.9% compared with 2019, and the average concentration of inorganic nitrogen and reactive phosphate saw a year-on-year drop of 3.1% and 8.4% respectively.

Quality of Sea Water in the Hangzhou Bay

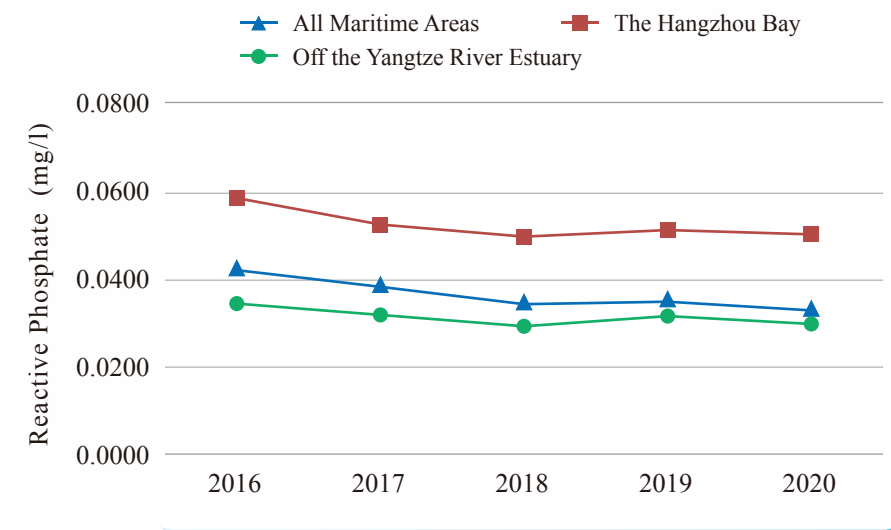
The quality of sea water at all the monitoring sites in the Hangzhou Bay were inferior to the Category-IV standard, without significant improvement. Among the major indicators, the chemical oxygen demand and the average concentration of inorganic nitrogen saw a year-on-year increase of 9.1% and 8.8% respectively, and the average concentration of reactive phosphate a drop of 5.9% over the previous year.



Variation of the average concentration of chemical oxygen demand in maritime areas in Shanghai from 2016 to 2020



Variation of the average concentration of inorganic nitrogen in maritime areas in Shanghai from 2016 to 2020



Variation of the average concentration of reactive phosphate in maritime areas in Shanghai from 2016 to 2020

Quality of the Soil Environment

The data monitored at the designated locations of the national soil environment monitoring network in Shanghai from 2017 to 2020 indicated a generally good quality of the soil environment of agricultural land.

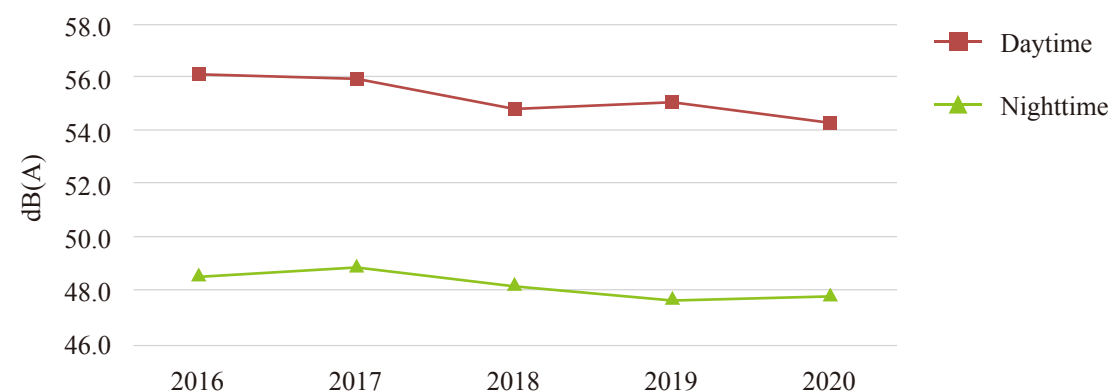
Quality of the Acoustic Environment

In 2020, the sound level of regional ambient noise in Shanghai was controlled within a stable range, and the conditions of road traffic noise improved.

Regional Ambient Noise

In 2020, the average equivalent sound level of regional ambient noise in Shanghai during the daytime was 54.2dB(A), a year-on-year decline of 0.7dB(A); and that at nighttime was 47.8dB(A), 0.1dB(A) up from 2019. The data monitored in the daytime at 94.4% of the monitoring sites were excellent, good, and fair, while at nighttime the data monitored at 79.9% of the monitoring sites were excellent, good, and fair.

The data monitored in the past five years show that the average sound level of regional ambient noise in Shanghai was around 54.0 to 56.0dB(A) during the daytime and 48.0 to 49.0dB(A) at nighttime, generally staying stable.

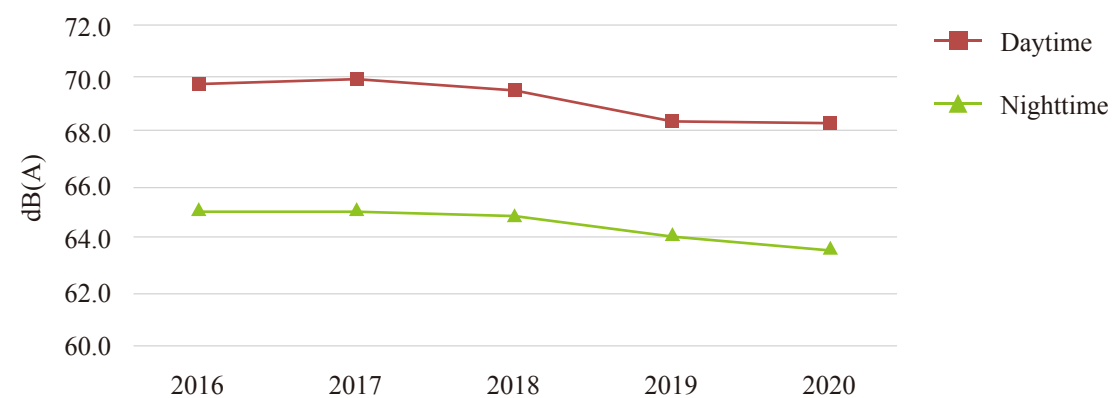


Variation of the sound level of regional ambient noise in Shanghai from 2016 to 2020

Road Traffic Noise

In 2020, the average equivalent sound level of road traffic noise in Shanghai during the daytime was 68.2dB (A), a year-on-year decrease of 0.1dB(A); and that at nighttime was 63.4dB(A), 0.5dB(A) down from 2019. The data monitored in the daytime at 90.7% of the monitoring sites were excellent, good, and fair, while at nighttime the data monitored at 32.3% of the monitoring sites were excellent, good, and fair.

The data monitored in the past five years show that the sound level of road traffic noise in Shanghai remained generally stable between 68.0 and 70.0dB (A) in the daytime and between 63.0 and 65.0dB (A) at nighttime.



Variation of the sound level of road traffic noise in Shanghai from 2016 to 2020

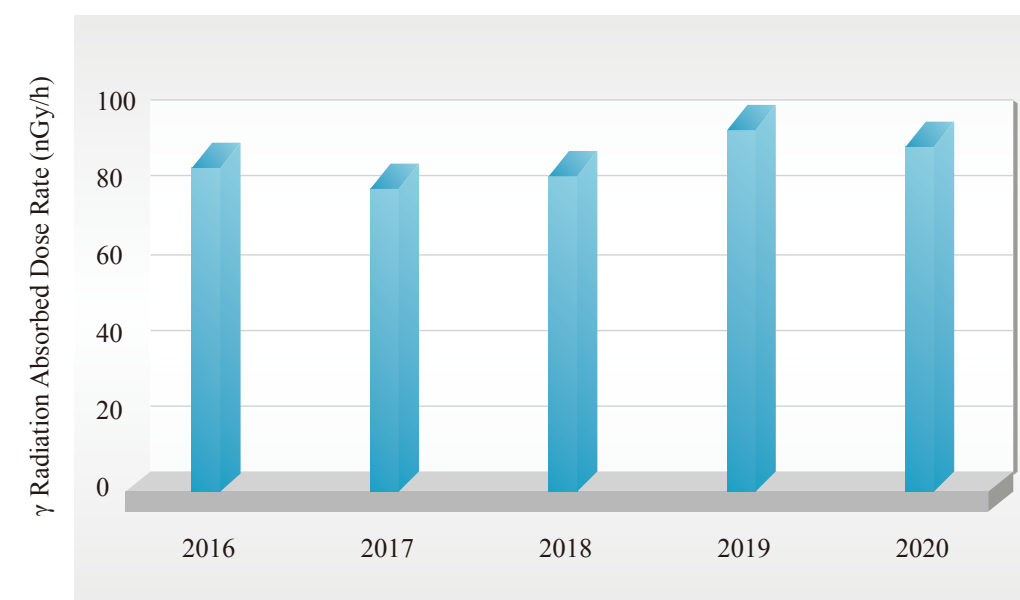
Quality of the Radiation Environment

The quality of the radiation environment in Shanghai remained generally good in 2020.

Ionizing Radiation

In terms of ambient radiation conditions, the monitoring results of the γ radiation absorbed dose rate and the cumulative dose of γ radiation and the sample analysis of aerosol, rainwater, sediment, water vapor, surface water, groundwater, seawater, soil, biological specimens and other samples show that the activity concentration of radionuclides in the atmosphere, water bodies, soil, and other media in Shanghai was at a normal level, and the γ radiation absorbed dose rate monitored at each site remained the same as those of previous years.

On nuclear technology application, the monitoring results of ambient radiation levels around typical radioactive sources (Categories I to v) and radioactive ray-generating devices (Categories I to III) in Shanghai show that the annual cumulative dose of γ radiation in neighboring sites around these nuclear technology applications complied with the exposure dose limits for the public and the professionals defined in the *Basic Standards for the Protection against Ionizing Radiation and for the Safety of Radiation Sources* (GB 18871-2002).



Variation of the annual absorbed dose rate of γ radiation from 2016 to 2020

Electromagnetic Radiation

In respect of the electromagnetic radiation environment, the data monitored in ten sites—Shanghai Zoo, Gongqing Forest Park, Changfeng Park, Century Park, People's Park, Fengxian Guhua Garden, Jiading Confucius Temple, a business area (People's Square), an industrial area (Qingpu Industrial Zone), and a residential area (Zhongyuan Liangwan City)—show that the industrial-frequency electric field intensity varied from 0.149 to 0.567 V/m; the industrial-frequency magnetic induction intensity varied from 0.0123 to 0.0573 μT ; and the composite electric field intensity from 0.24 to 1.51 V/m, with no significant change of levels compared with the data monitored in previous years.

In regard to electromagnetic radiation sources, results of electromagnetic radiation levels monitored around the Oriental Pearl TV Tower, two transformer substations including the Gulu 500kV Transformer Substation, two high-voltage power lines including the 500kV power line in Fenlin, satellite earth stations, the radar station in Pudong Airport, mobile communication substations, maglev trains, and electric railways show that the industrial-frequency electric field intensity, the industrial-frequency magnetic induction intensity, and composite electric field intensity in the surrounding environment of facilities with electromagnetic field or electromagnetic radiation (excludes ionization) all met the relevant requirements stipulated in the *Limits for Controlling the Electromagnetic Environment* (GB 8702-2014).

Ecological Index

As evaluated in accordance with the *Technical Criterion for Ecosystem Status Evaluation* (HJ192-2015), the Ecological Index (EI) of Shanghai in 2019^[4] registered 62.5, and the ecosystem status was rated as good with relatively high vegetation coverage and biodiversity.

Compared with the data in 2018, the variance in EI ($|\Delta\text{EI}|$) in 2019 was 0.1, and the ecosystem status remained stable on the whole. Specifically, the Pollution Load Index, the Vegetation Coverage Index, the Biological Richness Index, the Water Network Density Index, and the Land Stress Index all kept stable.

The ecosystem status of all the districts in Shanghai in 2019 were rated as either good or average^[5], with the Chongming District, the Jinshan District, the Qingpu District, the Fengxian District, the Songjiang District, the Pudong New Area, the Jiading District, and the Minhang District rated as good, and the other rated as average.



Shanghai's ecosystem status in 2019



Key Tasks

^[4]As of the date of publication of this bulletin, the data of 2020 is still under review, therefore the 2019 data is used here.

^[5]The ecosystem status is rated as good when $55 \leq \text{EI} < 75$, and graded as average when $35 \leq \text{EI} < 55$.

Pollution Prevention and Control

The Three-Year Action Plan of Environmental Protection

2020 was the final year in implementing Shanghai's Seventh Three-Year Action Plan of Environmental Protection. We improved and leveraged the coordination and promotion platform established by Shanghai Municipal Government's leading team for environmental protection to advance the seventh round of the action plan in an orderly manner, successfully completing the tasks set and fully achieving the work objectives.

In terms of **the special action for water**, the third phase of the expansion project of the Jiading Anting sewage treatment plant and the Zhuyuan initial rainwater treatment plant project started. The construction in the pilot section of the Suzhou Creek deep drainage and storage pipeline system project was steadily advanced, and the initial rainwater storage tank project in Dawuchuan was basically completed. Over the three-year period, comprehensive steps were taken on improving the water quality of a total of 1,393 kilometers of waterways and 2,740 beheaded rivers, with basically no water bodies left inferior to Category V.

In respect of **the special action for ambient air**, 1,653 small and medium-sized oil (gas) boilers were upgraded, efforts were made to promote more than 120,000 new energy vehicles, and the total length of rail transit lines in operation in Shanghai reached 729 kilometers.

With regard to **the special action for solid waste**, the effectiveness of waste sorting was significantly improved, with the amount of recyclables, hazardous waste, and wet waste sorted increasing by more than 57%, 320%, and 27% respectively year-on-year, and the amount of dry waste disposed decreasing by 20% over the previous year. The waste disposal capacity was continuously improved, with projects including the second phase of the Songjiang Tianma renewable energy utilization project, the Laogang wet waste utilization facility project, and the Pudong construction waste utilization project completed. The total capacity of treatment for domestic waste in a harmless way reached 42,000 tons/day and wet waste treatment capacity hit 7,000 tons/day.

As to **the special action for industry**, the Guidance Category of Restricted and Eliminated Projects for Shanghai Industrial Restructuring (2020 Version) was revised and updated, with the industrial restructuring of 820 municipal projects and of 8 key regions (special). The acceptance of clean production audit for 80 enterprises was completed, and 966 reconstruction projects for clean production were advanced.

Concerning **the special action for agriculture and rural affairs**, the comprehensive utilization rate of livestock and poultry manure reached 97%, with manure treatment facilities and equipment 100% available on large-scale livestock and poultry farms. More than 700 tons of pesticide packaging waste was recycled, with a recycling rate of almost 100%.

Regarding **the ecological special action**, an area of 90,000 mu was afforested, and 1,202 hectares of green space, 212 kilometers of greenways, and 430,000 square meters of three-dimensional green space were built. The construction of key municipal ecological corridors around Laogang, Tianma, Waigang, and the Shanghai Chemical Industry Park was basically completed, and the landscape forests along the Wusong River, the Hulu Expressway and other key municipal ecological corridors started to work. The forest coverage rate in Shanghai reached 18.49%, with per capita green space of 8.5 square meters.

On the special action for circular economy, the "cleaning service network and recycling network" system was basically established, with more than 15,000 recycling service stations, 201 transfer stations, and 10 collection and distribution areas for recyclables. The construction of the system for gradient utilization and

recycling of new energy vehicle power batteries was completed, so was the waste solvent recycling project of the Shanghai Chemical Industry Park.

Prevention and Control of Air Pollution

In 2020, further efforts were continued in the prevention and control of air pollution, over-fulfilling the air quality targets set in the 13th Five-Year Plan. In 2019^[6], the carbon intensity in Shanghai fell by a cumulative 19.93%, exceeding the cumulative target issued by the state for the 13th Five-Year Plan period, with a completion rate of 118.6%.

In terms of **coal pollution control**, the control over the total amount of energy and coal was strengthened, with the total coal consumption as a share of the primary energy decreasing to about 31% and the share of non-fossil energy increasing to 17.6%. The total installed capacity of wind, photovoltaic, and biomass power generating units reached 2.6 million kilowatts. The upgrading of small and medium-sized oil and gas boilers was fully completed, where the transformation of a total of 1,653 units (4,100 steam tons) was finished in 2020.

With regard to **industrial pollution control**, progress was made in the three special tasks of upgrading key steel industries to achieve ultra-low emissions, carrying out comprehensive control of industrial furnaces, and deepening control of VOCs. Comprehensive measures (version 2.0) for VOCs control were introduced, with a total of 14,268,500 tons of steel production capacity achieving ultra-low emissions and 811 industrial VOCs emitters and 91 industrial furnaces upgraded.



In respect of **the control of pollution from mobile sources**, steps integrating "vehicles, oil, and roads" were taken to prevent and control pollution brought by diesel trucks. From June 1, all-day traffic restrictions within the outer-ring S20 expressway were placed on diesel trucks meeting the national 3 emission standard. From July 1, the national 6a emission standard was implemented on the city's vehicles and heavy gas vehicles. From October 1, the scope of traffic restrictions on diesel trucks conforming to the national 3 emission standard was expanded to the G1503 expressway, or the Shanghai beltway, and the use of non-road mobile machinery complying with the national 1 emission standard or below was banned across the city. Intensified efforts were made to optimize the fleet structure and the freight structure, promote new energy vehicles, manage in-use motor vehicles (machinery), strictly implement the I/M system, and supervise mobile sources. A cumulative number of 426,000 new energy vehicles was promoted, and the size of rail-sea intermodal containers reached 267,900 TEU. 70,000 diesel vehicles complying with the national 3 emission standard were removed ahead of schedule, with a reduction of more than 12,000 tons of nitrogen oxides emissions. More than 1.7 billion yuan of subsidies for early retirement of 36,000 diesel vehicles meeting the national 3 emission standard were issued in 8 batch-

^[6] As of the publication of this bulletin, the data of 2020 is still under counting and analysis, therefore the 2019 data is used.

es. 67,000 non-road mobile machinery was registered. The remote online monitoring devices of 60,000 heavy-duty diesel vehicles and more than 2,600 non-road mobile machinery were installed and connected to the internet, so were those for 625 gas stations with an annual sale of more than 2,000 tons of gasoline. As to **other aspects**, the third-party pollution treatment and intensive treatment on catering enterprises were advanced, and the improvement of oily fume treatment of 580 restaurants was completed. Shanghai led the promotion of green building and prefabricated construction in the country, with a cumulative total of 233 million square meters of green building promoted, a cumulative total of nearly 150 million square meters of prefabricated construction carried out, and 11 green ecological urban areas successfully created.

Prevention and Control of Water Pollution

In 2020, taking full advantage of the river chief system, Shanghai accelerated the action plan on water pollution prevention and control to continue to comprehensively improve the water quality of small and medium-sized rivers, achieving the goal of eliminating water bodies inferior to the Category-V standard by 2020 as scheduled, with the water quality of 259 major river cross-sections all meeting standards. Based on the water pollution prevention and control mechanism, dynamic tracking was carried out on the fluctuation of water quality at key cross-sections and the advancement of key projects, and efforts were made in strengthening water quality analysis, project progress scheduling, and the reporting mechanism for cross-section inspections, so as to mobilize the initiative of each district for water quality improvement; the annual assessment of the implementation of water pollution prevention and control action plan was enhanced by making the results public for supervision. Concerning major tasks, **the sewage treatment capacity was further enhanced**. In 2020, a sewage treatment design scale of 60,000 cubic meters/day was added, 83.44 kilometers of new sewage collection networks was constructed, and the design scale of urban sewage treatment plants reached 8.403 million cubic meters/day in Shanghai. These facilities all conformed to the primary (A) discharge standard or above and, Shanghai over-fulfilled the 13th Five-Year Plan objectives; **comprehensive measures were furthered to improve the water quality of small and medium-sized rivers**. With the fourth phase of the comprehensive environmental improvement project for the Suzhou Creek as guidance, the sewage treatment facilities of 35,000 rural households were renovated, the water conditions of more than



1,096 beheaded rivers were improved, and the mixed rain and sewage treatment systems in 1,870 residential areas were overhauled; **coordinated development of pollution source control was promoted**. Comprehensive measures were taken to regulate enterprises discharging Category-1 pollutants. Compliance assessment of wastewater treatment of was carried out for chemical enterprises outside industrial parks and industrial enterprises under regulator's control. Inspections of industrial enterprises around rivers continued for consolidation of efforts; **the source tracing of pollutants from the discharge outlets of the Yangtze River was completed**. The monitoring and improvement work started.

Prevention and Control of Soil and Groundwater Pollution

The Law of People's Republic of China on the Prevention and Control of Soil Contamination was implemented and the regulatory system was improved. First, inspections were carried out on the implementation of the Law. Entrusted by the National People's Congress, Shanghai Municipal People's Congress conducted a comprehensive inspection of the systems, mechanisms, and standards for the implementation of the Law in Shanghai, strengthening the synergistic mechanism for the prevention and control of soil contamination in various sectors and identifying weak links in the institutional and regulatory capacity of soil contamination prevention and control. **Second**, the construction land pollution prevention and control system was implemented. Shanghai Municipal Bureau of Ecology and Environment, in conjunction with Shanghai Municipal Bureau of Planning and Natural Resources, Shanghai Municipal Commission of Agriculture and Rural Affairs, and Shanghai Landscaping & City Appearance Administrative Bureau, jointly issued the *Notice on the Issuance of the "Plan on the Implementation of the Soil Contamination Prevention and Control Law to Promote the Resolution of Outstanding Soil Contamination Problems"*, clarifying the responsibilities and tasks of different departments and further strengthening the implementation of various soil contamination prevention and control systems for agricultural land and construction land. The Additional Provisions for Investigation, Risk Assessment, Risk Control and Remediation Plan Preparation, and Risk Control and Remediation Effect Assessment of Soil Contamination in Construction Land in Shanghai (Trial) was issued, connecting with the relevant national technical standards to further standardize the work of construction land. **Third**, the management system of agricultural land was implemented. According to the *Notice on the Issuance of the "Work Plan on Prioritizing Protection of Soil Environment in Arable Land Concentration Areas" and Other Plans*, Shanghai Municipal Agriculture and Rural Affairs Committee, Shanghai Municipal Planning and Natural Resources Bureau, and Shanghai Municipal Bureau of Ecology and Environment promoted the classification and management of arable land. Planting structure adjustment, agronomic control and other measures were taken on arable land classified under the safe use category and the strict control category; for the reclaimed new arable land, Shanghai Municipal Committee of Agriculture and Rural Affairs, Shanghai Municipal Bureau of Ecology and Environment, and Shanghai Municipal Bureau of Planning and Natural Resources jointly issued the *Notice on the Investigation of Soil Contamination of Arable Land Proposed to be Reclaimed*, focusing on clarifying the investigation mechanism, testing standards and technical specifications to further standardize the investigation of soil contamination in arable land proposed to be reclaimed in Shanghai.

The Implementation Plan for the Action to Prevent and Control Soil Contamination in Shanghai was fully advanced, with efforts made in the fulfillment of specific objectives and tasks. Shanghai fully fulfilled the *Implementation Plan for the Action to Prevent and Control Soil Contamination in Shanghai* and the *Shanghai Soil Contamination Prevention and Control Responsibility Statement*, meeting the established goals of the safe utilization rate of contaminated land and the safe utilization rate of contaminated arable land as well as solidly completing all the tasks. **First**, the prevention and protection system was implemented. The list of enterprises under key soil contamination supervision was updated, and those enterprises were urged to

take on their soil contamination prevention and control obligations. Enterprises under key soil contamination supervision in Shanghai established systems for checking pollution hazards and self-monitoring and carried out related work. **Second**, the safe utilization of contaminated land was promoted with emphasis. The *Notice on the On-Site Inspection of the Safe Utilization of Contaminated Land* was issued, urging all districts to strengthen the supervision and management of contaminated land and increase inspection efforts to prevent illegal development and utilization. Shanghai Municipal Bureau of Ecology and Environment and Shanghai Municipal Bureau of Planning and Natural Resources were responsible for the calculation of the safe utilization rate of contaminated land in Shanghai. **Third**, the investigation of soil contamination in land used by enterprises from key industries was basically completed. Pilot trials of risk classification and result integration were conducted in assistance of the national efforts, and the preliminary integration of results from the investigation of land used by enterprises was finished. **Fourth**, Shanghai Municipal Bureau of Ecology and Environment and Shanghai Municipal Bureau of Planning and Natural Resources jointly organized the review of the risk assessment of soil contamination in construction land and of the assessment of the remediation effect, and the *List for Risk Control and Remediation of Soil Contamination of Construction Land in Shanghai* was updated according to the review results. Information on remediated land was open for public supervision in accordance with national requirements.

The Implementation Plan for the Prevention and Control of Groundwater Pollution in Shanghai was carried out to steadily promote the prevention and control of groundwater pollution. **First**, the requirements of zoning prevention and control and classification management were proposed to tackle groundwater pollution in accordance with related national technical guidelines, with zoning prevention and control implemented. **Second**, the list of sites with contaminated groundwater was published according to related technical requirements and with reference to the list for risk control and remediation of soil contamination of construction land, so as to strengthen the synergistic prevention and control of soil and groundwater pollution. **Third**, the investigation and assessment of the groundwater of key pollution sources were carried out.

Environmental Protection of Agriculture and Rural Areas



Decisive progress was made in pollution control in agriculture and rural areas. Strictly following the “mandatory tasks” and “mandatory indicators” of the national requirements, Shanghai organized the implementation of the *Implementation Plan for the Action to Control Pollution in Agriculture and Rural Areas in Shanghai*. Relevant departments strengthened coordination and actively took a variety of effective measures to promote the implementation of tasks and objectives. In successive progress briefings, Shanghai was among the top in the country in work progress. Assessment of pollution control efforts in agriculture and rural areas was carried out in accordance

with national requirements, and the assessment results show that Shanghai had fully fulfilled the key tasks required, with the key assessment indicators completed meeting both quality and quantity requirements and some tasks finished ahead of schedule or exceeding the target requirements. As a result, positive advances were made in promoting the green development of agriculture, improving the environmental quality in rural areas, etc.

Efforts were made in the guidance and supervision of agricultural non-point source pollution control. The *Plan for the Zoning of Prohibited Areas for Livestock and Poultry Breeding in Shanghai* was issued and implemented to guide relevant districts to adjust the prohibited areas for raising livestock and poultry in accordance with the law and promote the resource utilization of livestock and poultry manure. Supervision-based monitoring of domestic sewage in rural areas were carried out, and the results were reported in time to urge departments concerned to perform their duties in place to ensure that the domestic sewage treatment facilities in rural areas were adequately managed and effectively operated. According to the unified deployment of the Ministry of Ecology and Environment, a review was conducted again to check out black, smelly water bodies in rural areas, and no such water bodies were found. Continuous efforts were taken to consolidate the work on prohibiting straw burning, with integrated air-ground inspection using helicopters and drones and improved frequency and coverage of inspection.

System Reform of Ecological Civilization

Major Progress

In 2020, focusing on high-quality economic development and high-level environmental protection, Shanghai steadily advanced the reform tasks introduced in recent years, continuing to deepen the reform and innovation for promoting ecological progress. A municipal leading group for the promotion of ecological progress was established, with the municipal party secretary as the head and the city mayor as the executive vice head. The *List of Responsibilities for Environmental Protection in Shanghai* was issued. The *Implementation Opinions on Accelerating the Construction of the Modern Environmental Governance System* and implementation rules were issued, specifying a total of 58 major tasks and detailed measures around 8 major systems. The *Implementation Plan for the Assessment of the Effectiveness of Pollution Prevention and Control in Districts in Shanghai* was promulgated and the assessment was launched. Audits of natural resource assets were conducted on 31 off-office or in-office senior officials.

Environmental Protection Inspection

Inspection system development. To further refine and implement the functions and responsibilities of environmental protection inspectors, Shanghai Municipal Bureau of Ecology and Environment prepared the *Measures for Implementing the “Central Environmental Protection Inspection Rules” in Shanghai* (Exposure Draft), and formulated the “Looking Back” Workflow for Ecological Environmental Protection Inspection in Shanghai (Trial), further improving the mechanism for removing well-rectified projects from the rectification list for the central environmental protection inspection in Shanghai.



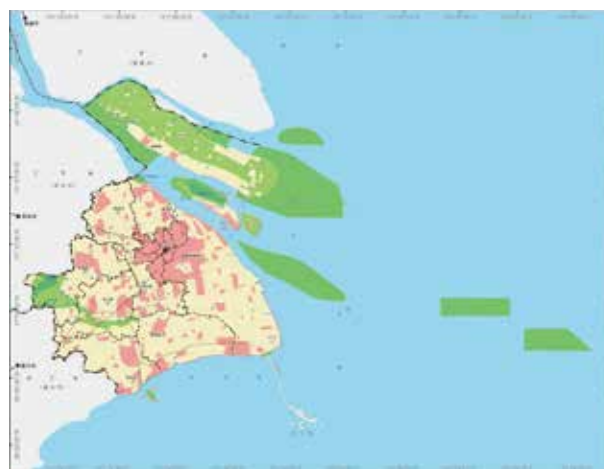
Central government inspection. By the end of 2020, 11 out of the 24 rectification tasks from the second round of central environmental protection inspection were basically completed in 2020. Among the 2481 complaints filed during the second round of the central environmental protection inspection, 1989 were closed and 453 were closed by stage, with a closing rate of 98.4%.

Municipal inspection. Accountability process was carried out in the four districts of Pudong, Jiading, Jinshan, and Fengxian, which were included in the first batch of the municipal environmental protection inspection in 2019; inspection feedback was provided for and accountability process was conducted in the four districts of Putuo, Hongkou, Yangpu, and Chongming, which underwent the second batch of the municipal inspection. Trial work on “looking back” at the municipal environmental protection inspection in Shanghai was initiated in the Changning District and the Qingpu District.

Three Lines One List Environmental Zoning Control

Following the overall national plan, in May 2020, the Shanghai Municipal Government officially released the *Implementation Opinions on Three Lines One List Environmental Zoning Control*. The city was divided into 293 units under the three categories of priority protection, key control, and general control, with refined environmental access and control requirements featuring “one policy for one unit.” The Three Lines One List environmental zoning control system was initially established.

(*The three lines refers to the red line for ecological protection, the bottom line for environmental quality, and the limit line for resource utilization, and the one list refers to the access list of environment)



Reform of the Environmental Impact Assessment System

The review and approval methods of the environmental impact assessment (EIA) system was improved for preventing and controlling the epidemic. The *Notice on Optimizing the Review and Approval Process of Environmental Impact Assessment during the Coronavirus Epidemic* was issued to further improve and streamline EIA review and approval and reduce office visits, thus helping with the epidemic prevention and control. For the temporary establishment, renovation, expansion, or conversion of medical and health projects, research and experimental projects, and other construction projects that were in urgent need for epidemic prevention and control, “green channels” including exemption from EIA, informed commitment, and make-up EIA after operation were permitted. The review and approval office provided precise and dedicated guidance to ensure that supporting environmental protection facilities were put into operation and pollutant emission standards were met. A total of 144 projects directly related to epidemic prevention and control were exempted in 2020.

The scope of exemption from EIA and the coverage of informed commitment were further expanded. The *Notice on Further Expanding the Implementation Scope of EIA Exemption and Informed Commitment*

during the Coronavirus Epidemic was issued. Projects, under 30 project categories in 10 industries that helped with epidemic prevention and control, ensuring people's livelihood, social undertakings, and services and with filed environmental impact registration forms at the same time, were exempted from EIA procedures. Industries that could control overall environmental impact, were seriously affected by the epidemic, or were employment-intensive and other industries related to basic living needs were permitted for using the informed commitment approach, with the covered project categories increasing from 15 in 2019 to 44 in 2020. A total of 1,132 projects in Shanghai obtained EIA approval documents by way of informed commitment in 2020, accounting for about 25% of the total projects applying for EIA review and approval in the city.

The identification of major changes of projects for EIA was optimized. The *Notice on Standardizing the Work concerning Environmental Impact Assessment Changes of Construction Projects in Shanghai* was issued to facilitate the connection between the EIA of construction projects and pollutant discharge permit management. About 20% of the projects in Shanghai could be exempted from EIA procedures through non-major change identification, and be directly included into the pollutant discharge permit management system.

The interconnected area of planning EIA and project EIA was continuously broadened. 15 new industrial parks were included in the interconnected area in 2020. By the end of 2020, a total of 26 industrial parks in Shanghai had been included in the interconnected area, accounting for about 25% of the total number of industrial parks in the city. More than 80% of construction projects in the interconnected area had benefited from simplified and optimized measures such as exemption from EIA, downgrading, and informed commitment.

Intensified efforts were made in deepening the reform and innovation in the Lingang New Area free trade zone, etc. The *Several Opinions on Supporting the High-Quality Development and Environmental Management of China (Shanghai) Pilot Free Trade Zone Lingang New Area* was issued, after the implementation of which about 60% of the projects could be exempted from EIA procedures and more than 80% of the projects adopted informed commitment for EIA. The “two permits in one” model integrating EIA approvals and pollutant discharge permits was first rolled out in Shanghai.



Reform of the Compensation System for Environmental Damage

In 2020, Shanghai fully stepped up the tasks concerning environmental damage compensation reform. Under the *Implementation Plan for the Reform of the Environmental Damage Compensation System in Shanghai*, Shanghai Municipal Bureau of Ecology and Environment, together with Shanghai Municipal Bureau of Justice, Shanghai Municipal Bureau of Planning and Natural Resources, Shanghai Municipal Commission of Agriculture and Rural Affairs, Shanghai Municipal Bureau of Water Affairs, and Shanghai Landscaping & City Appearance Administrative Bureau, jointly formulated the *Management Measures for Environmental Damage Investigation in Shanghai*, the *Management Measures for Environmental Damage Compensation Consultation in Shanghai*, the *Management Measures for Environmental Damage Resto-*

ration Assessment in Shanghai, and the Measures for Disclosure of Information on Environmental Damage Compensation in Shanghai. Then, each district issued its own implementation plan of compensation for environmental damage, and the construction of relevant institutional systems were roughly completed. To strengthen the connection between administration and justice, Shanghai High People's Court, Shanghai People's Procuratorate, Shanghai Public Security Bureau, Shanghai Municipal Bureau of Ecology and Environment, Shanghai Municipal Commission of Agriculture and Rural Affairs, Shanghai Municipal Bureau of Water Affairs, and Shanghai Landscaping & City Appearance Administrative Bureau jointly formulated the *Opinions on Establishing a Multifaceted Mechanism for the Joint Protection of the Environment and Resources*, strengthening the connection between civil public interest litigation for the environment and the compensation system for environmental damage and exploring the connection between the responsibility for environmental restoration and criminal liability. Case practice was deepened, and the work on environmental damage compensation was advanced in accordance with the requirement that the compensation should cover a comprehensive range and all needed to be compensated should be compensated.

Other Key Tasks

Epidemic Prevention and Control

Since the outbreak of the coronavirus epidemic, the majority of party members and cadres working in Shanghai's ecological and environmental system resolutely had aligned their thoughts and actions with the spirit of General Secretary Xi Jinping's series of important speeches and the decisions and plans of the Party Central Committee, the State Council, and the Shanghai Government. From January to April 2020, 32,900 party members and cadres from the Shanghai's ecological and environmental system worked hard on the front line of the fight against the epidemic. Environmental protection work related to epidemic prevention and control was stringently carried out, in accordance with the requirements of 100% coverage of environmental supervision and services for all medical institutions and facilities in the city and 100% implementation of timely and effective collection, transfer, treatment, and disposal of medical waste and medical sewage. A three-tier contingency plan for emergency medical waste collection and disposal was developed to schedule the medical waste treatment and disposal capacity and operation in Shanghai. In June, Shanghai Municipal Bureau of Ecology and Environment issued the *Several Measures on Further Innovation of Environmental Protection Initiatives in Routine Epidemic Prevention and Control for Greater Support of High-Quality Economic Development*, clearly putting forward 27 initiatives to support employment and promote development. During the epidemic period, the medical waste related to the epidemic was disposed of on the same day of generation. Investigation and supervision of medical sewage treatment were conducted, and the preparations for early warning monitoring and emergency monitoring of water quality of drinking water sources were strengthened. Guidance and regulation on medical waste disposal, medical wastewater disinfection, self-monitoring and some other work were provided for municipal public health clinical centers, ensuring the safety and order of medical waste



emergency collection and disposal with strong measures. These efforts were fully recognized by the ninth steering group promoting the joint epidemic prevention and control mechanism of the State Council.

In 2020, centering on serving the overall situation and taking into consideration of epidemic prevention and control and the resumption of production and work, Shanghai Municipal Bureau of Ecology and Environment paid in-depth extensive visits to enterprises and full implemented online approval process. Relying on the "all-in-one access" platform and the "all-in-one management" platform, all kinds of environmental protection business were able to be handled via the Internet or telephone, facilitating EIA services for enterprises involved in epidemic-related expansion and conversion of production and supporting the presumption of work and production of enterprises, especially small and medium-sized enterprises. Environmental policies were adjusted and optimized, and tax and fee-cutting measures such as extending rectification period, flexible environmental supervision, postponing carbon trading reports, exemption of some EIA procedures and radiation safety licensing procedures were taken to reduce the pressure of environmental management of enterprises. On-site guidance and field inspection in districts were conducted in collaboration with proactive services to help enterprises conform to compliance and run a green business.

Pollutant Discharge Permit Management

The goal of full coverage of pollutant discharge permits was achieved. The *2020 Work Plan on Pollutant Discharge Permit Management for Fixed Pollution Sources* was issued in January, and the *Notice on Carrying Out Work on 2020 Pollutant Discharge Permit Licensing and Registration Management in Shanghai* was issued in February. Based on the second pollution source census and the information on EIA results, environmental law enforcement, and public complaints and proposals since 2018, Shanghai organized and mobilized streets, towns, and industrial parks to carry out comprehensive investigation and grading of fixed pollution sources, and ecological and environmental departments at all levels promoted the licensing and registration of pollutant discharge permits and the "looking back" work in three stages in an orderly manner, ensuring the full coverage target. By the end of 2020, a total of 52,000 pollutant discharge units had been investigated in the city, among which 38,000 were included in the pollutant discharge permit management, including around 5,600 licensed units and 32,000 registered units.

The quality of permit issuance was improved. Standard templates for pollutant discharge permits in key industries such as gas stations and biopharmaceuticals were prepared. The *Workbook for Pollutant Discharge Permit Cleanup and Issuance Registration and the Guide for Pollutant Discharge Registration of Fixed Pollution Sources* were compiled and issued. The WeChat mini-program for "pollution discharge permit category query" was developed and rolled out to promote the improvement of permit issuance management at the primary level and guide enterprises to independently apply for registration. The *Notice on Carrying out Work on 2019 Quality Assessment of Pollutant Discharge Permit Issuance* was issued, with more than 180 permits issued in 2019 taken for comprehensive quality assessment. The assessment results show that the quality of pollutant discharge permits issued in Shanghai had steadily improved over the past three years.





Continuous efforts were made to strengthen supervision after the issuance of permits. The environmental law enforcement departments in Shanghai rolled out special law enforcement action for pollutant discharge permits to urge enterprises to “discharge pollutants with a permit” and “discharge pollutants in accordance with the permit category,” with a total of 14,000 law enforcement officers deployed and more than 7,000 enterprises inspected. The environmental monitoring departments in the city inspected more than 500 permit holders and urged them to take on the main responsibility of self-monitoring.

Total Amount of Pollutant Emission Reduction

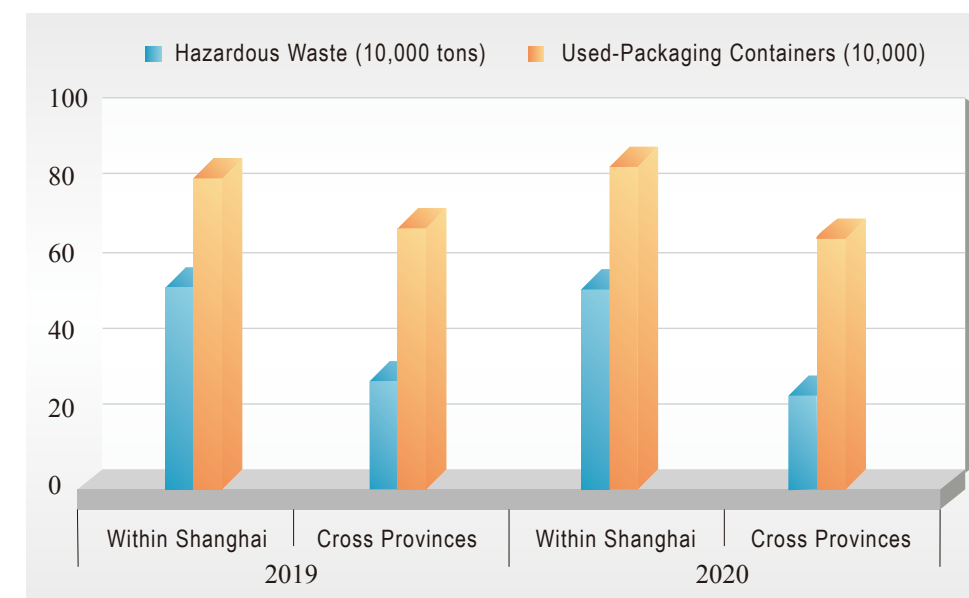
Under the guidance of the 2020 *Key Work Arrangement of Energy Conservation, Emission Reduction, and Climate Change Response in Shanghai*, Shanghai Municipal Bureau of Ecology and Environment, together with Shanghai Municipal Commission of Development and Reform, Shanghai Municipal Commission of Economy and Information Technology, Shanghai Municipal Commission of Agriculture and Rural Affairs, Shanghai Municipal Bureau of Water Affairs, Shanghai Municipal Bureau of Statistics, and other departments, deepened collaboration among each other and reinforced the fulfillment of the target responsibilities of each district and unit, comprehensively promoting measures such as emission reduction via engineering, management, and structural means to ensure the successful completion of the key discharge reduction tasks. In 2020, the production of the Bailonggang sewage plant upgrading project and the Hongqiao and Taihe new sewage plant construction projects fully started; Zhuyuan No.1, Zhuyuan No.2, and other sewage plant upgrading projects continued to play a role in reducing pollutant discharge. The Baosteel ultra-low emission project for sintering was completed and the operation began. The advanced treatment of VOCs from industrial sources was furthered, so was the elimination of diesel vehicles complying with the National 3 Pollution Emission Standard. Emission standards were made stricter for domestic waste inciner-

ation plants. As a result, the total amount of pollutant emission gradually declined. At the same time, the “project approval and total amount verification” system was constantly optimized, with improvement in the total amount verification and ledger management mechanism for the equivalent reduction substitution and multiplicative reduction substitution of new major pollutants. Intensified efforts were made to ensure that the indicators of the total amount of major pollutants in key areas such as the Lingang New Area, the demonstration zone of green and integrated ecological development of the Yangtze River Delta, the Zhangjiang Science City, and the G60 Science and Technology Innovation Corridor met standards, and to support the orderly implementation of policies targeting strategic emerging industries such as integrated circuits, biomedicine, new energy vehicles, and artificial intelligence, so as to promote clean industry transformation, product technology upgrading, and high-quality economic development. Verified by the Ministry of Ecology and Environment, the emissions of chemical oxygen demand, ammonia nitrogen, sulfur dioxide, and nitrogen in 2020, compared with 2015, were cut by 68.1%, 38.1%, 46.0% and 25.1%, respectively, over-fulfilling the target for reducing the total amount of major pollutant emission set in the 13th Five-Year Plan.

Solid Waste Management

In 2020, there were 33 units in Shanghai licensed to deal with hazardous waste disposal, with a total approved operation capacity (excluding medical waste) of 989,800 tons per year and 1,723,800 used-packaging containers disposed of. The approved collection capacity was 125,200 tons per year; there were 3 landfill enterprises with a total approved land-filling capacity of 126,200 tons per year; there are 9 incineration enterprises with a total approved incineration capacity (excluding medical waste) of 361,900 tons per year; there were 22 enterprises for utilization and physical and chemical disposal of hazardous waste, with a total approved utilization and physical and chemical disposal capacity of 376,500 tons per year.

In 2020, 568,900 tons of hazardous waste (excluding medical waste) and 888,300 used-packaging containers were transferred within the city; 263,200 tons of hazardous waste and 688,400 used-packaging contain-



Shanghai Hazardous Waste Transfer from 2019 to 2020

ers were transferred across provinces and cities; 56,900 tons of medical waste were harmlessly disposed, with a harmless medical waste disposal rate of 100%. Centralized disposal of medical waste from small medical institutions was promoted by developing the last-one-kilometer collection and transportation network.

In 2020, there were 4 companies in Shanghai qualified to deal with discarded home appliances and electronic products, whose total dismantling capacity was 4,251,200 items per year. Throughout 2020, 1,465,000 abandoned home appliances and electronic products were collected, among which 1,444,400 items (weighing 42,600 tons) were dismantled, including 1030,000 TV sets, 58,800 refrigerators, 132,800 washing machines, 180,300 air conditioners, and 42,500 computers.

/ Radiation Safety Management

The license of radiation safety was issued under municipal approval for nearly 1,223 units in 2020. Sanction was given for 358 radioactive isotope transfers, approval was given to 132 radioactive construction projects, and 14 exemption records of radioactive isotopes and radioactive ray-generating devices were registered. Nearly 2,331 site inspections were made. Radioactive waste was collected at 57 sources and 1820 kilograms of radioactive waste was stored.

Assisting in epidemic prevention and control. With pre-analysis of needs, initiative, and in-advance deployment, radiation safety supervision services were implemented for medical institutions during epidemic prevention and control, a positive list for radiation supervision and law enforcement during the epidemic was developed, and the “Shanghai Radiation Safety and Protection Knowledge Self-Test Platform for Nuclear Technology Utilization” was developed and completed in the first instance to meet the needs of enterprises for training and assessment of radiation safety and protection knowledge during the epidemic.

Strengthening risk prevention. The *Contingency Plan for Nuclear and Radiation Accident Emergency Response by Shanghai Municipal Bureau of Ecology and Environment* was formulated; efforts were made to ensure radiation safety for major events such as the 3rd China International Import Expo and the 30th anniversary celebration for the development and opening up of Pudong; radiation safety hazard investigations were carried out for nuclear technology utilization units in Shanghai, and self-assessments of radiation monitoring and emergency work were conducted by ecological and environmental departments at city and district levels; the “online monitoring platform for high-risk mobile sources” in Shanghai was completed, providing dynamic online monitoring of high-risk mobile radioactive sources in use in the city; the security upgrade of the municipal radioactive waste repository in Shanghai was completed, and clean decontrol of around 10 tons of very short-lived medical radioactive waste was completed.

Exploring new ways of management. Quality verification of data from the “National Radiation Safety Management System for Nuclear Technology Utilization” was conducted to improve data quality and management efficiency; the Shanghai examination center of the “Radiation Safety and Protection Examination for Nuclear Technology Utilization by the Ministry of Ecology and Environment” was set up, with a total of 95 exam sessions held annually and a total of 11,210 seats provided to meet the assessment needs of related nuclear technology utilization units.

/ Marine Environmental Protection

In 2020, the tasks for marine environmental protection in Shanghai were promoted. *The Planning for Marine Environmental Protection during the 14th Five-Year Plan Period* specific to Shanghai was compiled and the

pilot work was initiated. Tasks specified in the *Plan for Yangtze River Estuary and Hangzhou Bay Near-Shore Marine Pollution Prevention and Control in Shanghai* was continuously advanced. With adherence to law-based administration, marine engineering EIA and other administrative matters were handled in a strict manner, the *Management Measures for the Acceptance of Marine Engineering Construction Project Environmental Protection Facilities in Shanghai* was developed and implemented, the requirement of full online processing and that of halving both the processing time and submission materials were fulfilled, and the supervision during and after marine engineering construction was reinforced. Marine environmental The verification of pollutant outfalls into the sea was carried out and records were set up, and study was done for the establishment of a long-term regulatory mechanism. Collaboration with the marine police was deepened, the *Memorandum on Law Enforcement Collaboration Between Shanghai Municipal Bureau of Ecology and Environment and Shanghai Marine Police Bureau* was signed, and the “Green Sea 2020” special law enforcement action was jointly carried out. Marine environmental emergencies caused by ship collisions in the near-shore waters of the Yangtze River Estuary were addressed in a positive manner.



/ Supervision and Administration of Natural Ecology

The supervision and administration of the red line for ecological protection were improved. In 2020, Shanghai Municipal Bureau of Planning and Natural Resources, together with Shanghai Municipal Bureau of Ecology and Environment, Shanghai Landscaping & City Appearance Administrative Bureau, and other departments, completed the evaluation of the city's ecological protection red line and formed the *Adjust-*



ment Plan for the Ecological Protection Red Line in Shanghai, which was agreed by Shanghai Municipal Government and submitted to the relevant national ministries for review; the Shanghai Landscaping & City Appearance Administrative Bureau, together with Shanghai Municipal Bureau of Ecology and Environment and Shanghai Municipal Bureau of Planning and Natural Resources, integrated and optimized nature reserves in the city and formed the *Plan for Integration and Optimization of Nature Reserves in Shanghai*, which was agreed by Shanghai Municipal Government and submitted to the relevant national ministries for review.

The supervision and administration of natural reserves were strengthened. In August, under the unified national decisions and plans, Shanghai Municipal Bureau of Ecology and Environment, together with Shanghai Landscaping & City Appearance Administrative Bureau, Shanghai Municipal Commission of Agriculture and Rural Affairs, Shanghai Municipal Bureau of Water Affairs (Municipal Oceanic Administration), and Shanghai Marine Police Bureau, jointly launched the “Green Shield 2020” special action to strengthen the supervision of nature reserves, and conducted on-site verification of suspected human activities found by national remote sensing satellites. In October, Shanghai Municipal Bureau of Ecology and Environment, Shanghai Landscaping & City Appearance Administrative Bureau, and Shanghai Marine Police Bureau signed a memorandum on law enforcement cooperation concerning water-related nature reserves to improve the working mechanism in the field of nature and ecological protection and enhance the synergy of supervision.

Comprehensive Environmental Improvement in Key Areas

2020 was the final year in the second round of comprehensive environmental improvement in the Jinshan District. Scientific planning and comprehensive decisions and plans were made at the municipal level. The Jinshan District, the Fengxian District, the Shanghai Chemical Industry Park, Shanghai Petrochemical and other entities were active in fulfilling their responsibilities, and the relevant commission offices and departments joined forces to successfully conclude the overall environmental improvement efforts. Key results were: shutting down a number of enterprises such as Shanghai XianKe Chemical Co., Ltd. And Shanghai Shenyue Ink Co., Ltd.; completing a



number of industrial upgrading and environmental improvement projects such as those involving Sinopec Shanghai Petrochemical Co., Ltd. (clean refining upgrading), Shanghai Huayi New Material Co., Ltd., Shanghai Qianlang Coating Co., Ltd., and Shanghai Macklin Biochemical Technology Co., Ltd; completing waterway improvement projects such as those for the Reservoir Village in the Caojing Town and the Jiefang River in the Jinshanwei Town; finishing a number of woodland and green space projects such as the construction of ecological corridors on both sides of the Shenhai Expressway and that of the first phase of the Zhelintang Protection Forest; completing regional environmental remediation projects such as collection and treatment of domestic sewage in the rural areas of the Caojing Town, Shanyang Town, and Jinshanwei Town in the Jinshan District, reduction of waste amount in 198 areas, and rural domestic sewage treatment and village transformation for the Zhelin Town in the Fengxian District; finishing a number of infrastructure projects including those for comprehensive utilization of solid waste (disposal of wet waste) in the Jinshan District, construction of sorting centers for household waste and construction

waste in the rural areas of the Zhelin Town and Qingcun Town in the Fengxian District, and rectification of environmental hazards in waste catalyst warehouses of Sinopec Shanghai Petrochemical; fulfilling a number of capacity-building projects such as construction of the big data platform for the Jinshan Second Industrial Zone, a smart zone, establishment of online-monitoring systems for smoke and gas at the fixed pollution sources of Sinopec Shanghai Petrochemical, and research on early warning and source tracing models for environmental management in the Shanghai Chemical Industry Park. As a result, the environmental quality of Jinshan District continued to improve, with less complaint on environmental matters and improved the public recognition level.

Climate Change Response

Continuously advancing carbon trading. First, the pilot local carbon trading scheme was deepened, and work was organized for the management of carbon emissions monitoring, reporting, verification, and review in 2019 for enterprises entitled to carbon emissions trading in Shanghai. Quota clearance in 2019 was successfully completed, achieving 100% compliance for seven consecutive years. The carbon market in Shanghai performed well, with the cumulative turnover of all varieties ranking among the top in the country. Second, efforts were made to vigorously promote the construction of the national carbon trading market, complete the construction of the national carbon emissions permit trading system, and actively promote the establishment of the national carbon emissions permit trading agency.

Building pilot low-carbon demonstration projects. The construction of low-carbon practice zones, low-carbon communities, and low-carbon parks was moved forward, and the acceptance of the second batch of low-carbon communities and the mid-term review of low-carbon development practice zones in Shanghai were completed. Near-zero carbon emissions demonstration projects were actively carried out, with the Hongqiao State Guest Hotel project in the Changning District completed, the industrial plants on Neijiang Road orderly renovated, and the near-zero carbon emissions park of Shanghai Garment Group on Hongqiao Road updated.

Publicity in the National Low Carbon Day. The 2020 National Low Carbon Day - Shanghai theme campaign was launched on July 2 on the “cloud,” focusing on “sustainable consumption” and promoting the formation of a new concept and culture of sustainable consumption in the five aspects of clothing, food, housing, transportation, and use. The “Low Carbon Diary” themed promotional video was released to give the public a glimpse of the low-carbon lifestyle and the carbon reduction of different low-carbon behaviors from a Lego perspective.



Census of Pollution Sources

In 2020, Shanghai finished the second national census of pollution sources and released the Bulletin on the Second National Census of Pollution Sources in Shanghai. Census data were finalized, summarized, and submitted in a timely manner. A combination of online and on-site approaches was taken to review the

census work carried out in each district, and the overall census taking place in Shanghai successfully passed the national acceptance. The database of the second national census of pollution sources was established and a number of significant reports were released, including the work summary report, quality control report, data analysis report, technical report, census diagrams, and chronicle of events. Also, findings of seven Shanghai-specific reports were published, involving dust, aircrafts, ships, non-road mobile machinery, liquid bulk terminals, heavy metal (nickel and antimony) in wastewater, and municipal pumping stations, all of which provided prospective reference for the compilation of work such as the environmental protection planning of Shanghai's 14th Five-Year Plan and the Territorial Development Pattern Planning of the Yangtze River Economic Belt, while supporting environmental management tasks such as air quality assurance during the 3rd China International Import Expo, environmental protection inspections, and investigation in and improvement of the Yangtze River outfall. Recommended by Shang-



hai Municipal Census Office and selected by the National Census Office, 28 groups and 170 individuals from Shanghai were awarded as being outstanding for their performance during the second national census of pollution sources. The Technical Report on the Second National Census of Pollution Sources in Shanghai was awarded the first prize of the Excellent Technical Reports and the report named Carrying out Census of Pollution Sources at Municipal Pumping Stations, and Promoting Management and Control of Non-Point Source Pollution won the second prize of the Special Reports.

Collaboration in the Yangtze River Delta Region

In 2020, three provinces (Zhejiang, Jiangsu and Anhui) and one city (Shanghai) thoroughly studied and implemented General Secretary Xi Jinping's instructions on the integrated development and environmental protection of the Yangtze River Delta Region. With integrated and high-quality development at the center, Shanghai consistently followed the principles of extensive consultation, shared governance, joint contribution, and shared benefits, delivering remarkable environmental outcomes through joint regional pollution prevention and control. Shanghai also played a leading role during this process by coordinating actions taken by the pollution prevention and control offices of different regions in the Yangtze River Delta, which further strengthened the connection in the region in terms of integrated development and promoted the joint protection and improvement of the environment.

The guiding role of planning was strengthened. To apply the Outline of the Integrated Regional Development of the Yangtze River Delta Region, the implementation plan tailored to Shanghai was introduced. The Planning of Collaborative Regional Environmental Protection in the Yangtze River Delta Region was jointly prepared and issued.

Collaboration on key tasks was promoted. The regulatory measures for the second phase of the ship emission control area in the Yangtze River Delta were implemented, and the comprehensive treatment of autumn-winter air pollution and summer ozone pollution was completed. Good air quality was ensured during major events such as the 3rd China International Import Expo. Shanghai, Jiangsu, and Zhejiang

jointly established a collaborative river chief mechanism for the Taihu Lake and the Dianshan Lake, aiming to promote investigation in and improvement of the Yangtze River outfall and facilitate coordinated treatment of ship and port pollution. The plan on the unification of regional environmental standards was jointly prepared, mutual supervision and recognition of regional environmental law enforcement was deepened, rewards and punishment were administered according to the joint regional environmental credit evaluation, and administrative penalty discretionary standards were generally unified. The second "Green Yangtze River Delta" forum was successfully held.

The construction of the demonstration zone of green and integrated ecological development of the Yangtze River Delta fully kicked off. The special plan on environmental protection in the demonstration zone of green and integrated ecological development of the Yangtze River Delta was prepared and the special program of coordinated protection of cross-regional water environment was rolled out. Also, the "three unifications" system, which included the unification of ecological and environmental standards, the unification of environmental monitoring, and the unification of environmental supervision and law enforcement, was put in place. Two districts and one county (Qingpu District, Shanghai; Wujiang District, Suzhou City, Jiangsu Province; and Jiashan County, Jiaxing City, Zhejiang Province) set up a joint law enforcement team for joint action.



Supporting Measures

Environmental Protection Investment

In 2020, Shanghai invested around 108.786 billion yuan in environmental protection, equivalent to 2.8% of the city's gross domestic product (GDP) in the same year. Among them, the investment in urban environmental infrastructure construction was 45.461 billion yuan, in pollution prevention and control 23.398 billion yuan, in environmental protection and development 1.272 billion yuan, in rural environmental protection 15.105 billion yuan, in environmental management capacity building 1.027 billion yuan, in operating costs of environmental protection facilities 21.972 billion yuan, and in circular economy and other aspects 551 million yuan, accounting for 41.8%, 21.5%, 1.2%, 13.9%, 0.9%, 20.2% and 0.5% of the total investment, respectively.

Environmental Legal System

Legislation for and research work in key areas were strengthened. The amendment of the Measures for Implementing the "Environmental Impact Assessment Law" in Shanghai was advanced in cooperation with Shanghai Municipal Bureau of Justice. Research on local legislation on pollution prevention and control in the fields of soil, mobile sources, etc. was promoted, and post-legislative evaluation and research on the amendment of the Several Provisions on Radioactive Pollution Prevention and Control in Shanghai were conducted. Innovation of collaborative legislation in the Yangtze River Delta region was promoted, and the preliminary research on the development of regulations for the protection of drinking water sources in the demonstration zone of green and integrated ecological development of the Yangtze River Delta was started.

In 2020, in line with the main keynote of environmental protection, economic development and benefit of people's livelihood, on the basis of special law enforcement for epidemic prevention and control, the city-wide environmental law enforcement departments stuck to the tough battle against pollution with the same strength by highlighting enforcement with accuracy, science and legal basis. All the efforts were directed to help enterprises resume work and production, guide enterprises in their law-abiding operation and promote high-quality economic development. Under the premise of guiding enterprises to better perform their responsibilities, 889 cases were investigated into and dealt with by the municipal ecological and environmental system, down 63.37% compared to last year, and a total amount of about 107 million yuan was fined, down 68.30% from the prior year. 21 cases were sealed up and distrained, down 82.64% from the prior year, 2 cases were limited for production or stopped from production for rectification, down 81.82% from the prior year, and 9 cases of violations of environmental law were transferred to the police, down 67.86% from the prior year.



In 2020, people working at Shanghai's ecological and environmental system studied and implemented Xi Jinping Thought on the Rule of Law and consciously fulfilled requirements of the responsibility system asking for "whoever enforces the law popularizes the law." Laws and regulations such as the *Law of the*

People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste were disseminated; “cloud” training was organized for main environmental protection workers at different levels; the public was mobilized to widely participate in the online legal knowledge quizzes; more efforts were put in the interpretation of policies from newly developed management documents; intensified efforts were made in promoting the rule of law. The mechanism of promoting the rule of law by case was established and improved, with typical cases regularly published in the “E-Case E-Discussion” column of the “Shanghai Environment” WeChat account to strengthen the warning and education function of law enforcement cases. The popularization of law was embedded in the whole process of law enforcement, which, together with accurate popularization of law, was the basic requirements of law enforcement officers. By doing so, it helped enterprises to consciously comply with the law.

Environmental Impact Assessment Management

In 2020, Shanghai implemented the environmental assessment institutional reform and adopted the Three Lines One List system, giving impetus to high-quality green economic development. Based on the pollutant discharge permit system, the management of pollution sources was reinforced, with firm adherence to the bottom line for environmental quality and risks.

The departments of ecology and environment at both municipal and district levels examined and approved 4,896 EIA documents, among which there were 146 EIA reports, 2,997 EIA statements, and 1,753 projects conducting EIA via the means of informed commitment. Meanwhile, 38,708 EIA registration forms were put on records.

Environmental Monitoring

In 2020, Shanghai further built its environmental monitoring capacity to better prevent and control pollution. The layout of the state-controlled air quality monitoring sites crafted by the Fourteenth Five-Year Plan was optimized by setting up monitoring sites in all 16 districts in the city. Shanghai improved air quality monitoring of transportation and promoted the car-mounted mobile air quality monitor, while finishing the construction of three water quality automatic monitoring stations in the Yangtze River Economic Zone which came into trial operation. The national-level groundwater monitoring sites in Shanghai stipulated in the Fourteenth Five-Year Plan were adjusted, soil samples collected from the key units of soil contamination and the surrounding areas of industrial parks were analyzed, and the shallow groundwater in Shanghai were monitored. Further regulations were rolled out on the self-monitoring and check of sewage disposal entities to strengthen the self-monitoring and supervision regarding the sewage disposal entities in the city. Shanghai Municipal Bureau of Ecology and Environment



joined force with departments such as Shanghai Municipal Market Supervision Bureau to conduct key inspections under the “Two Random” principle, further regulating the quality of social monitoring institutions. The Management Measures for the Social Service Supervision System for Environmental Monitoring in Shanghai was issued to strengthen management in relevant fields. Focusing on promoting the development of the high-end and smart environmental monitoring system, work concerning environmental monitoring during the 14th Five-Year Plan period in Shanghai was outlined to further enhance the city’s automatic, intelligent, and comprehensive monitoring capability as well as integrated support capability.

Environmental Science and Technology

In 2020, Shanghai Municipal Bureau of Ecology and Environment revised the *Management Measures for Scientific Research Projects of the Shanghai Municipal Bureau of Ecology and Environment*, compiled the *Management Measures for Youth Scientific Research Projects of the Shanghai Municipal Bureau of Ecology and Environment*, and jointly made the *Guidelines for Science and Technology for Environmental Protection in Shanghai* with Shanghai Science and Technology Committee.

53 scientific research projects centering on key tasks were organized, including the “Continuous Improvement of Air Quality in Shanghai and the Technology Path to Full Compliance with the National Standards” project, with focus on major dedicated research such as the “Research on the Planning of Environmental Protection in Shanghai during the 14th Five-Year Plan Period and on Shanghai’s 8th Three-Year Action Plan on Environmental Protection” project and the “Research on the Planning of Environmental Protection Demonstration Zone and Green Development in the Yangtze River Delta Region” project.

The “Research, Development, and Application of Key Technologies for Treatment and Supervision of Industrial Volatile Organic Compounds” project led by the Shanghai Academy of Environmental Sciences, and the “Development and Application of Key Technologies for Smart Supervision and Tracing of Odor Pollution in Industrial Parks” project and the “Application of Big Data Mining-Based Technologies for Real-Time Dynamic Control of Road Dust” project led by the Shanghai Environmental Monitoring Center won the 2nd prize of the 2019 Shanghai Science and Technology Improvement Award. The “Research on Environmental Protection Red Line Zoning Control and Ecological Space Optimization in Shanghai” project, with Shanghai Academy of Environmental Sciences as the first research unit, won the 2nd prize of the Shanghai Decision-Making Consulting Research Achievement Award, and the “Key Technologies for Environmental Capacity Evaluation & Early Warning and Emergency Impact Prediction of Estuaries and Bays” project with Shanghai Academy of Environmental Sciences as the second research unit, won the 3rd prize of the Guangxi Science and Technology Advancement Award.

The development of related national-level platforms were promoted. The National Environmental Protection Key Laboratory for Environmental Impact Assessment of Emerging Contaminants project jointly launched by Shanghai Academy of Environmental Sciences, Shanghai Municipal Center for Disease Control and Prevention, and Shanghai Jiao Tong University was approved.

The construction of science and technology innovation platforms for environmental protection was facilitated. With support from the Shanghai Municipal Engineering Design Institute (Group) Co., Ltd., the Shanghai Municipal Environmental Protection Center for Risk Prevention and Control and Remediation Engineering Technology for Soil Contamination of Construction Land was established; with support from the Shanghai Huayi (Group) Company, the Shanghai Municipal Environmental Protection Center for Engineering Technology for Whole Process Control of Pollution in the Chemical Industry was constructed; and with support from East China University of Science and Technology, the Shanghai Municipal Environmental Protection Key Laboratory for Environmental Standards and Risk Management for Chemical Pollutants was set up.

Environmental Standards

In 2020, led by Shanghai Municipal Bureau of Ecology and Environment, together with the coordinated efforts from the departments of ecological environment of Jiangsu, Zhejiang, and Anhui, environmental standards in the Yangtze River Delta Region were unified, so were standards for the demonstration zone of green and integrated ecological development of the Yangtze River Delta, with new breakthroughs achieved in uniform standards for project approval, preparation, and review. Shanghai Municipal Bureau of Ecology and Environment also finished the preparation of environmental standards in the Yangtze River Delta Region, including the *Standards for the Emission of Air Pollutants in the Pharmaceutical Industry*, the *Technical Criteria for the Quality Control and Assurance System of Super Air Quality Stations*, and the *Technical Criteria for Control of Equipment Leaks of Volatile Organic Compounds*. The Bureau also prepared a number of standards for the demonstration zone of green and integrated ecological development of the Yangtze River Delta, such as the *Technical Criteria for Ambient Air Quality Forecast*, the *Technical Criteria for Car-Mounted Mobile Volatile Organic Compounds Monitoring* and the *Technical Criteria for Field Monitoring of Fixed Source Pollution*.

Environmental Informationization

Shanghai Municipal Bureau of Ecology and Environment (SMBEE) continued to optimize the “all-in-one access” platform. By the end of 2020, 13 administrative approval items, 12 items of other categories, and 28 public service items had been made accessible via the “all-in-one access” platform, achieving unified access and unified processing. With dedication to promoting the “all-in-one access” platform, the construction of environmental application scenarios such as those concerning environmental management and air quality assurance was completed, which were integrated into the city’s operational system. Data governance of fixed source pollution was conducted, with integrated data from pollutant discharge permits, the 2nd pollution source census, construction project approvals, and environmental law enforcement to establish a basic database of fixed source pollution. The sharing of public data resources was actively promoted and environmental data was harnessed in favor of enterprises, society, and citizens. SMBEE was awarded Outstanding Department in 2020 for the application effectiveness of public data sharing in Shanghai. The responsibility system for cyber security was reinforced by real-time monitoring of critical systems, regular vulnerability scanning, revision of cyber security plans, and emergency drills of cyberattacks and defenses. Various trainings were organized to advocate cyber security, and checks were conducted on cyber security performance of all units.

Modern Environmental Governance System

In 2020, Shanghai Municipal Bureau of Ecology and Environment (SMBEE) and the Fengxian District People's Government signed the *Strategic Cooperation Agreement on Building a Demonstration Zone of Integrated Modern Environmental Governance System*, demonstrating joint efforts in building a demonstration zone of integrated environmental governance system in Shanghai. SMBEE and the Shanghai branch of the Industrial Bank Co., Ltd signed the *Strategic Cooperation Agreement on Green Finance* to facilitate innovation in green finance, stimulate market vitality and optimize business environment. SMBEE also signed with the Shanghai Federation of Industry and Commerce the *Strategic Cooperation Framework Agreement* to work together to support small and medium-sized enterprises to promote the green development of private enterprises.

The third-party pollution treatment services was actively promoted by issuing China’s first ever *Standards for Third-Party Environmental Services* (DB31/T 1179-2019). Guided by SMBEE, Shanghai Environmental Industry Association held the second council meeting and the general meeting of the members. SMBEE participated in the 20th China IE Expo.

Green supply chain demonstration projects were furthered, and the *Guidance on Green Supply Chain in the Auto Industry* (Exposure Draft) was completed. The first phase of the Information Service Platform for Green Supply Chain in the Yangtze River Delta region was basically finished, and the closed-loop supply chain management project (Fuji Xerox) for large office equipment (copiers and printers) in the Yangtze River Delta region was launched.

International Cooperation

The Sino-Japanese demonstration projects of atmospheric environment improvement in Shanghai continued. SMBEE participated in the pilot projects of technologies for cooking fume pollution prevention in the catering industry, as well as the demonstration projects of wide-range ozone treatment and conservation. SMBEE promoted the demonstration projects of key technology and application for supercritical CO₂.

A series of related international exchanges took place, including the “China-Norway Innovation for a Sustainable Ocean” online seminar on Oceans Day in June 2020, the video dialogue on “Environment, Climate, and Post-Pandemic Green Recovery” jointly held by the Chinese People's Association for Friendship with Foreign Countries, the Ministry of Ecology and Environment of People's Republic of China, and the government of the U.S. state of California in July, and the China-Italy environmental technology dialogue co-organized with the Italian Ministry of Environment in August. In October, Shanghai Municipal Bureau of Ecology and Environment and Shanghai Science and Technology Committee jointly organized the Expert Roundtable during the 6th Shanghai International Nature Conservation Festival, in which experts and scholars in the fields of nature conservation brainstormed ecological protection.

Team Building and Performance Improvement

Education activities concerning the Four Histories, namely the histories of the CPC, the People's Republic of China, China's reform and opening-up, and socialism were carried out in an orderly manner. Party organizations at all levels of the municipal ecological and environmental system participated in various forms of education activities, such as collective studies, cadre-led studies, consulting lectures and on-site learning. Party secretaries at all levels gave 52 lectures on the topic of the Four Histories, some of which were selected as the best online Party lectures. After the themed education of the Four Histories, all party members stood firmer in support of their ideal and conviction, becoming more confident and determined about environmental protection.

Activities were held to facilitate the performance of the leading team. Principles of selection and appointment of officials were upheld to ensure law-based administration and duty execution. Great opportunities were provided for officials to put environmental protection into practice and shoulder more responsibilities. Efforts were made to cultivate cadres on the front line against the epidemic, as well as in key tasks and battle against pollution. A number of young cadres were sent to the district-level ecological environment bureaus and relevant municipal departments to assume a temporary post for personal training. Cadres were



also sent to participate in the central environmental protection inspection, the national census of pollution sources, and investigation of soil contamination, etc. Throughout 2020, 7 individuals were honored at the municipal level or above, 3 were awarded for their contributions in the fight against the coronavirus epidemic, and 6 groups and 56 individuals were awarded by the Ministry of Ecology and Environment. Efforts were made to build the team of professional and technical talents. 14 leading talents and 19 tip-top talents were selected in the new round of selection of professional and technical talents for the municipal ecological and environmental system. With improving the governance capability and capacity of environmental protection at the heart, cadre education and training received much attention with a list of over 100 training sessions being carried out both online and offline, covering over 6,000 cadres.

Efforts were made to motivate cadres and party members to devote to work. 10 task forces dedicated to environmental protection during the epidemic were put together, with focus on medical waste disposal, emergency monitoring, and so on. 80 party cadres were sent to communities in the Qingpu District to support epidemic prevention and control, who performed community volunteer services, visited enterprises, and made donations amounting to more than 147,000 yuan. The call for the China International Import Expo Party Alliance was well answered, with 6 temporary Party branches dedicated to environmental protection during the 3rd China International Import Expo set up and over 100 Party cadres, inspired by the spirit of the good environmental protection force, successfully completed all work tasks (environmental protection, air quality assurance, etc.) during the event.



Public Involvement and Supervision

Accepting Suggestions and Handling Proposals

In 2020, 102 written proposals and motions from the deputies of Shanghai Municipal People's Congress (SMPC) and Shanghai Municipal Party Committee members of the CPPCC were received by the Shanghai Municipal Bureau of Ecology and Environment, among which there were 50 suggestions from the MPC (5 for the Bureau to process, 6 for cooperative processing, 39 for supporting processing) and 52 proposals from the CPPCC (9 for the Bureau to process, 4 for cooperative processing and 39 for supporting processing). Besides, Shanghai Municipal Bureau of Ecology and Environment processed 1 case proposed by the CPPCC. All of them were satisfactorily handled in time with 100% rate of processing and satisfaction rate, and solutions to all proposals were accepted. Some key environmental protection issues that concerned the deputies from the MPC and the CPPCC included: collaboration in the Yangtze River Delta Region, prevention and control of soil contamination, management of hazardous waste, development of environmental monitoring capability, and suggestions on pollution treatment.

Hearing Complaints

In 2020, the municipal ecological and environmental system received 24,762 reported cases of all kinds in total, of which 19,504 cases were received from the citizen hotline 12345, a year-on-year decrease of 31.7% and 2,168 from the hotline 12369, an online management platform for reporting of environmental protection violations (via WeChat or website), with a year-on-year decrease of 45.6%. The categories of the reported cases received via hotline 12345 included: 11,885 cases of air pollution, accounting for 60.9% of the total, which were mainly in fields of industrial waste gas, catering waste gas, and undefined odor; 2,834 cases of noise pollution, 14.5% of the total, mainly in fields of industrial noise and catering noise; 1,561 cases of automobile related consultancy, taking up 8% of the total; 984 cases of construction projects, 5.0% of the total; 841 cases of water pollution, 4.3% of the total. Also, there were other complaints and consultancy involving solid waste, electromagnetic radiation, air quality, and government and industries ethos, comprising 7.3% of the total.

In 2020, 4,097 pollution cases were received via letters, calls and visits, registering a 42.2% year-on-year decrease. Among them, there were 2,206 cases of air pollution problems, 53.8% of the total and mostly involved catering waste gas and industrial waste gas; 1,162 cases of noise pollution, 28.4% of the total and mostly about industrial noises; 298 cases of water pollution, 7.3% of the total and mostly about industrial waste water; 431 cases of other complaints, comprising 10.5% of the total.

Coping with Environmental Emergencies

In 2020, 237 environmental emergencies occurred, most of which were about fire, traffic accident, and other safety issues, with an increase in the number of marine incidents-related emergencies. All cases were handled on the spot properly and effectively based on the on-site processing standards, without affecting the surrounding areas or threatening social stability.

Model Units of Environmental Protection

In 2020, the construction of the second batch of pilot low-carbon communities in Shanghai was completed, and a total of 9 communities passed the review, 3 of which, namely Huilong Xinyuan-Mengxi Community on the Dapugiao Street in the Huangpu District, Xiangyi Community on the Xianxia Street in the Changning District and Xinyong Village-Xinbei Village-Mingyong Village of the Hengsha Town in the Chongming District, were awarded the title of "Shanghai Model Low-Carbon Community."

In 2020, 2 quiet residential communities were set up in Shanghai (with the construction area of 361,600 square meters), benefiting about 8,500 million residents. So far, 211 municipal level quiet residential communities were set up in Shanghai (with the construction area of 20.2836 million square meters), providing about 528,800 residents with a quiet and comfortable living environment.

In the 2019 review and assessment of National Eco-Industry Demonstration Parks, the Northern Shanghai Hi-Tech Service Park was graded as "outstanding." Reviewed by experts, the Shanghai Lingang Fengxian Industrial Park was also accepted as an Eco-Industry Demonstration Park in Shanghai.

Publicity for Environmental Protection

In 2020, Xi Jinping's thought on ecological civilization and the spirit of the National Working Conference on Environmental Protection were vigorously promoted in Shanghai. In the context of epidemic prevention and control, approaches and channels of publicity were innovated, ensuring the safe and orderly launch of publicity campaigns accessible and appealing to the public. Centering around critical tasks such as the protection of blue sky, clean water, and unpolluted soil, the central environmental protection inspection, reform on EIA mechanism etc., a variety of themed campaigns were carried out and related news was broadcasted during prime time, with the news reports on Shanghai's environment distributed and reposted

in various media outlets for nearly 69,000 times. At the same time, 1,455 posts and 7,244 posts were published on the official WeChat account and Weibo of Shanghai Environment.

With the theme of “I am a Contributor to Beautiful China”, various publicity campaigns celebrating the June 5th World Environment Day, the International Biological Diversity Day, and the National Low-Carbon Day were carried out throughout the city to raise public awareness and involvement. The Bureau cooperated with Shanghai Municipal Spiritual Civilization Office, Shanghai Association of Science and Technology, Shanghai Municipal Bureau of Water Affairs, Shanghai Landscaping & City Appearance Administrative Bureau, and the



Liberation Daily to organize a series of activities, including rewarding the most beautiful environmental protection volunteers, photo exhibitions featuring humans and nature, the bureau chief hotline and “brilliant ideas” about Shanghai’s environmental protection, to put in place a universal environmental protection system with multiple levels and forms and can reach the public via various channels. Campaigning contents surrounding air quality forecast, environmental law enforcement, and census of pollution sources, including short films, short videos, illustrations, and animation demonstrations, were published. Progress and achievements in environmental protection were shared and broadcasted on the “Shanghai Environment” website and its partner platforms, MMTV, xinhuanet.com and eastday.com, receiving a lot of praise.

Efforts were made to continue to promote the opening of environmental protection facilities to the public and the establishment of environmental education bases. In 2020, 90 national environmental protection facilities in Shanghai that opened to the public organized 73 online activities, attracting more than 237,000 participants in total, while holding 1,328 in-person activities, receiving more than 45,000 visitors in total. Shanghai Municipal Bureau of Ecology and Environment also provided guidance to 17 schools that were up for the declaration or review of international eco-schools, and there were 77 such schools in the city.



Government Information Disclosure

In 2020, under the requirements of the *Provisions on the Disclosure of Government Information and the Provisions of Shanghai Municipality on Government Information Disclosure*, Shanghai Municipal Bureau of Ecology and Environment optimized the government information disclosure platform, prepared and published the *Standard Catalog of Government Affairs Disclosure of Shanghai Municipal Bureau of Ecology and Environment*, and released the list of major decisions. Altogether, 172 policy papers and official documents were disclosed. 132 applications for public disclosure were received, including information disclosure concerning EIA of construction projects, environmental monitoring, and environmental law enforcement, all of which were completed. The “Shanghai Environment” website was structured with 6 primary columns and 83 secondary columns. In 2020, the website released 1,631 pieces of government information and received 2,168 comments from 1,319,072 visitors. The website also promoted the environmental information disclosure of 1,117 key pollutant discharge entities on the Information Release Platform of Shanghai Enterprises and Institutions.