The Article 54 of Environmental Protection Law of the People's Republic of China provides that "The administrative departments responsible for environmental protection of the State Council, provinces, autonomous regions and municipalities directly under the Central Government will issue environmental state bulletins regularly." The Article 21 of Shanghai environmental Protection Regulation provides that "The Municipal Environmental Protection Bureau will issue environmental state bulletin annually." Shanghai Environmental Bulletin 2014 is hereby issued.

Zheng Juan
General Director
Shanghai Environmental Protection Bureau
An Overview

2014 was the first year for deepening reform comprehensively and perfecting the construction of ecological civilization in our country. It was also a critical year for carrying out the Clean Air Action Plan and completing the 5th Round of Environmental Action Plan to quicken the improvement of environmental quality in Shanghai. For environmental protection the priority was placed on construction of ecological civilization and reform. The campaign against the four evil winds (formalism, bureaucracy, hedonism and extravagance) was deepened and the good results of the Education and Practice of the Party’s Mass Line were consolidated. As thorny problems encountered in the work of environmental protection were successfully tackled and difficulties were overcome, all the annual objectives have been achieved.

The environmental quality in Shanghai remained stable yet tending to become better in 2014. The average concentration of PM2.5 in ambient air was 52μg/m³, 16.1% lower than that in 2013; the quality of water environment improved; regional ambient noise was under control to meet the standards; and ambient radiation was kept normal.
State of Environmental Quality

Quality of Water Environment

General Review

In 2014, water quality at 24.7% of monitored sections of the major rivers in Shanghai was of Category III, and at 26% of monitored sections of the rivers water quality was of Category IV and V, at the other sections monitored water quality was worse than Category V. The main pollution indicators were ammonia nitrogen and total phosphorus.

The index of permanganate and the average concentration of ammonia nitrogen monitored in major rivers in Shanghai were 4.55 mg/l and 2.40 mg/l, 4.2% and 5.0% lower respectively than those in 2013, while the average concentration of total phosphorus was 0.313 mg/l remaining the same as in 2013. Generally, compared with that in 2013, water quality of the rivers in Shanghai was improved in 2014.

Dianshan Lake was slightly eutrophic, basically the same as in 2013.

[1] The rivers for statistics include the Huangpu River, the Suzhou Creek, the mouth of Yangtze River and other major waterways such as Longhua River, Hongqiao River, Yangshupu River, the Ghu Creek, the Chuanjiang River, the Dazhi River, the Dangpu River, Jinhaiyang River, Pudong Canal, the Taipu River, Youdang River, Xietang, Wenzaozhang River, New Lianji Creek, Beihong Diversion Canal and Nanhegong Diversion Canal. Water quality at 77 sections was involved.
Main Rivers

- The Huangpu River
  The water quality at one of the six sections of the Huangpu River was up to Category III. At the other five sections water quality was of Category IV, the major pollution indicators of which were total phosphorus, ammonia nitrogen and dissolved oxygen. Compared with that in 2013, water quality has improved a little as the concentration of total phosphorus and ammonia nitrogen were 20.2% and 6.3% lower respectively.

- The Suzhou Creek
  The water quality at all the seven sections of the Suzhou Creek was worse than Category V. The major pollution indicators were total phosphorus, ammonia nitrogen and dissolved oxygen. Compared with that in 2013, water quality was a little better as the index of permanganate and the concentration of ammonia nitrogen were 25.6% and 10.7% lower respectively.

- The Yangtze River Mouth
  The water quality at all the seven sections in the Yangtze River Mouth was up to Category III, slightly better than in 2013 as the concentration of ammonia nitrogen was 41.7% lower.

- Other Major Waterways
  The water quality at 19.3% of the 57 sections in other major waterways was of Category III; at 14% water quality was of Category IV; at 12.3% water quality was of Category V and at 54.4% water quality was worse than Category V. The major pollution indicators were ammonia nitrogen, total phosphorus and dissolved oxygen. Generally, water quality remained the same as in 2013.

![Chart 2: Variations of the index of permanganate in major rivers in Shanghai from 2010 to 2014](image)

![Chart 3: Variations of the concentration of ammonia nitrogen in major rivers in Shanghai](image)
Primary Indicators of Pollution

- **Fine Particulate Matter (PM$_{2.5}$)**

  In 2014 the annual average concentration of PM$_{2.5}$ in Shanghai was 52 $\mu$g/m$^3$, 17 $\mu$g/m$^3$ higher than that specified in the National Secondary Ambient Air Quality Standards (NSAAQS), yet 16.1% lower than that in 2013. This kind of pollution seasonally occurred in December and January. Monthly average concentration of PM$_{2.5}$ of the two months was 76 and 72 $\mu$g/m$^3$ respectively. Taking the spring, autumn, and winter as a whole, monthly average concentration of PM$_{2.5}$ was lower than in 2013, but it was higher in the summer than in 2013.

![Chart 4: Variations of monthly average concentration of PM$_{2.5}$ in 2013 and 2014](chart4.png)

Air Quality Assessment Stations have been established in all the districts and county by June of 2014. According to the monitoring data from June to December, spatial distribution of the PM$_{2.5}$ concentration showed a downward trend from west to east.

![Chart 5: Spatial distribution of the concentration of PM$_{2.5}$ in Shanghai from June through December in 2014](chart5.png)

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**General Review**

In 2014, there were 281 days when air quality index (AQI) varied in the range between good and moderate, 40 days more than in 2013; and the annual rate of good-or-moderate days was 77.0%, 11 percentage points higher than in 2013. There were:
- 48 days when AQI was good;
- 233 days when AQI was moderate;
- 58 days when AQI denoted minor air pollution;
- 22 days when AQI denoted medium air pollution; and
- 4 days when AQI denoted heavy air pollution, 19 days fewer than in 2013. No severe air pollution occurred in 2013.

Among the 84 days when air pollution occurred, there were:
- 58 days, 69.0% of the total 84 days, when fine particulate matter (PM$_{2.5}$) was the primary pollutant;
- 19 days, 22.6% of the total 84 days, when primary pollutant was ozone;
- 2 days, 2.4% of the total 84 days, when inhalable particulate matter (PM$_{10}$) was the primary pollutant;
- 4 days, 4.8% of the total 84 days, when primary pollutant was nitrogen dioxide; and
- One day, 1.2% of the total 84 days, when both PM$_{2.5}$ and ozone were primary pollutants.
In 2014 the annual average concentration of sulphur dioxide in Shanghai was 18 µg/m³, 25% lower than in 2013, conforming to the standard provided for in NSAAQS. The data monitored in the past five years showed that keeping meeting NSAAQS, the annual average concentration of sulphur dioxide in Shanghai was on the downward trend.

Generally, the concentration of sulphur dioxide in all the districts and county in Shanghai in 2014 was low and its spatial distribution from west to east showed a saddle-shape situation.
Nitrogen Dioxide

In 2014 the annual average concentration of nitrogen dioxide in Shanghai was 45 μg/m³, 5 μg/m³ higher than the standard provided for in NSAAQS and 6.3% lower than that in 2013. The data monitored in the past five years showed that having failed to meet NSAAQS, the annual average concentration of nitrogen dioxide in Shanghai was coming down on the whole.

In 2014 the spatial distribution of the concentration of nitrogen dioxide in Shanghai showed a situation that it decreased gradually beginning from downtown towards all directions. Generally, it was higher in west of the Huangpu River than in east of the river.

Ozone

In 2014 the average concentration of ozone in Shanghai, which was calculated on the base of the data monitored daily in the eight peak hours, was 149 μg/m³, 8.6% lower than that in 2013, conforming to the standard provided for in NSAAQS. 89.6% - 94.5% of the daily averages concentration of ozone based on the data monitored in eight peak hours at the state-run spots in Shanghai were up to NSAAQS, being better by degrees than in 2013.

Carbon Monoxide

In 2014 the daily average concentration of carbon monoxide monitored in Shanghai varied between 0.36 mg/m³ and 1.8 mg/m³ meeting the standard provided for in NSAAQS. The annual average concentration of carbon monoxide was 0.77 mg/m³, 9.4% lower than that in 2013.

The data monitored in the past five years showed that the daily average concentration of carbon monoxide 100% met the standard and the annual average concentration of carbon monoxide kept dropping.
● Acid Rain and Dust Fall

The average pH value of rainfall in 2014 was 4.90; the occurrence rate of acid rain was 72.4%, 2.7 percentage points lower than that in 2013. The data monitored in the past five years showed that the occurrence of air pollution caused by acid rain in Shanghai had no marked change.

[Graph showing pH value of rainfall and occurrence rate of acid rain from 2010 to 2014]

The average regional dust fall in Shanghai in 2014 was 5.4 tons/km² per month, 0.4 ton/km² per month lower than that in 2013; the average dust fall on roads was 9.6 tons/km² per month, 0.6 ton/km² per month lower than that in 2013. The data monitored in the past five years showed that dust fall in Shanghai was on a downward trend.

[Graph showing variations of dust fall in Shanghai from 2010 to 2014]

● Quality of Sonic Environment

General Review

In 2014 the intensity of regional ambient noise in Shanghai remained at a general level. Road traffic noise was controlled within a stable range at daytime, but the noise level was on the rise at night.
Primary Indicators of Noise Pollution

Regional Ambient Noise

In 2014 the average equivalent sound intensity of regional ambient noise in Shanghai at daytime was 55.6 dB (A), 0.1 dB (A) higher than that in 2013; at night it was 48.1 dB (A), 0.1 dB (A) lower than that in 2013. The data monitored at daytime at 94.4% of the monitoring spots were excellent, good or mediocre, while at night the data monitored at 80.3% of the monitoring spots were good or mediocre.

Chart 15: The percentage of regional ambient noise intensities in Shanghai at daytime in 2014

Chart 16: The percentage of regional ambient noise intensities in Shanghai at night in 2014

The data monitored in the past five years showed that the intensity of regional ambient noise in Shanghai remained around 55 dB (A) at daytime and 48 dB (A) at night, keeping stable on the whole.

Road Traffic Noise

In 2014 the average equivalent sound intensity of road traffic noise at daytime in Shanghai was 69.6 dB (A), 0.2 dB (A) higher than that in 2013; at night it was 65.6 dB (A), 1.0 dB (A) higher than that in 2013. The data monitored at daytime at 76.8% of the total length of monitored road were excellent, good or mediocre, while at night the data monitored at 26.6% of the total length of monitored road were so.

Chart 18: The percentage of road length in Shanghai Corresponding to different intensities of road traffic noise at daytime

Chart 19: The percentage of road length in Shanghai Corresponding to different intensities of road traffic noise at night

The data monitored in the past five years showed that the intensity of road traffic noise in Shanghai at daytime remained between 69.0 and 70.0 dB (A), but it went up at night.

Chart 20: Variation of annual average intensity of road traffic noise in Shanghai from 2010 to 2014
Quality of Radiation Environment

On the whole, the quality of radiation environment in Shanghai was good in 2014.

Ionization Radiation

In view of natural ambient radiation conditions, the monitored data of absorbing rate of γ ray in the air and accumulated radiation amount of γ ray and the sample analysis of aerosol, precipitate in rainfall, vapor, surface water, groundwater, seawater and soil have shown that the concentration of radioactive nuclie in air, water bodies and soil in Shanghai was at a normal level; the absorbing rate of γ ray in air monitored in different places in the city remained the same as those monitored in previous years.

![Chart 21: The absorbing rate of γ ray in air in the years from 2011 to 2014](chart)

The data of radiation monitored in neighboring environment of radioactive sources (Category 1-5) and facilities of radioactive rays (Category 1-3) in Shanghai showed that the annual accumulated radiation amount of γ ray in neighboring zones around the sites where nuclear technology was applied complied with the limits of exposure defined for the public and the professionals in “Basic Standards for the Protection against Ionization Radiation and for the Safety of Radiation Sources” (GB 18871-2002).

Electromagnetic Radiation

In respect of surrounding electromagnetic radiation, the data monitored in the twelve places (Shanghai Zoo, Gongqing Forest Park, Longhua Martyrs’ Cemetery, the Century Park, Shanghai Seaside Forest Park, the People’s Park, Fengxian Guhua Garden, Jiading Confucius Temple, downtown People’s Square, industrial zone-Qingpu Industrial Zone, residential area-Zhongyuan Liangwan City and main line of transportation-No. 3 Subway) showed that the industrial-frequency electric field intensity varied from 0.115 V/m to 0.262 V/m; the industrial-frequency magnetic induction intensity, from 0.0168 µT to 0.0749 µT; the composite electric field intensity, from 0.14 V/m to 0.61 V/m. Compared with the data monitored in previous years, environmental background values of electromagnetic radiation in Shanghai had no marked change.

In regard to the sources of electromagnetic radiation pollution, results of electromagnetic radiation levels monitored at Oriental Pearl TV Tower, Nanqiao 500kV Transformer Substation and other enterprises: transformer substations, 500 kV power transmission lines in Qiaochang and other three high-voltage power lines, the earth station, the radar station in Pudong Airport, the mobile communication substations, the maglev train and sides along the electric railway showed that the industrial-frequency electric field intensity, the industrial-frequency magnetic induction intensity and composite electric field intensity in the surroundings of the main electromagnetic-radiation-generating facilities were all within the limits defined in “Technical Criteria for Evaluation of Electromagnetic Radiation Environmental Influence of 500kV Super High-Tension Power Transmission and Transformer Engineering” (HJ/T24-1998), and have all met the relevant requirements stipulated in “Regulations for Protection against Electromagnetic Radiation” (GB8702-1988).
The Three-Year Action Plan of Environmental Protection

The 5th Round of the Three-Year Environmental Action Plan was Finished Successfully

As the system of job responsibility, step-by-step follow-ups and timely inspections were intensified, 96% of the 268 projects scheduled for the 5th Round of Three-Year Environmental Action Plan have been completed.

Environmental infrastructure was further perfected

The following projects have been completed:
- Phase 2 of the project of Bailonggang Sewage Treatment Plant;
- The amelioration project of the sewage pipeline in southern part of Bailonggang;
- The project of Zhuyuan Sludge Treatment Plant;
- Phase 1 of the construction of Laogang Centre for Utilization of Renewable Source of Energy;
- Closure of the sites of Phase 1-3 of Laogang Project and
- Phase 2 of ecological restoration in Laogang.

Rectification of major regional pollution was further strengthened

Tasks of comprehensive rectification scheduled for 2014 in the following areas have been fulfilled:
- Jinshanwei Chemical Industry Zone;
- Nanhu-Datuan area in Baoshan District;
- Gaoqiao Petrochemical Zone.

Achievement in ecological protection and construction
- 357 villages have been re-planned and reconstructed;
- As a part of the special project of ecological protection and construction along the Outer Circular Highway, 300 acres of land have been greened;
- 111 boulevards were named;
- The project of ecological control of Spartina alterniflora Loisel in Dongtan, Chongming, was entirely completed.

The 6th Round of the Three-Year Environmental Action Plan was formulated

Based on the experience obtained from the completion of previous phases and aiming at raising environmental quality and promoting transformation and development, the 6th Round of Three-Year Action Plan of Environmental Protection has been made. The following four principles were emphasized:
- Environment is given priority; 
- Bottom line for restrain; 
- Oriented by problem; and 
- Motivated by innovation.

232 projects belonging to eight specific fields (water, air, soil, solid waste, industry, agriculture/countryside, ecology and circular economy) were included in the plan in order to continuously carry forward environmental protection and ecological construction with higher demands, stricter standards and greater strength.

Pollution Emission Reduction

According to the Municipal Government’s working plan of prior tasks in energy conservation, pollution emission reduction and response to climate changes, all the objectives for 2014 were achieved in a way of “Each attends to his own duties and works in coordination with others”.

Projects for pollution emission reduction were intensified
Following the Three-Year Action Plan of Environmental Protection, projects of emission reduction were all being carried out steadily in coal-fired power stations, sewage treatment plants, industrial enterprises and agricultural sources to achieve completion and bring great benefits as soon as possible.

Continuing to build three systems
- The early-warning system based on statistical data was being built to examine and calculate the amount of increment and emission of pollutants;
- The system of pollution emission reduction monitoring was being improved to make both enterprises and governments perform their own responsibilities. Self-monitoring was clearly defined for enterprises to conduct and more information monitored at pollution sources was made known to the public.
- The system of emission reduction assessment was being strengthened. Rules of routine inspection, regular assessment and briefing were obeyed.

Management and operation of the facilities for emission reduction were standardized and energized
The concept of “Clean Power-generating and Green Power-dispatching” was populated. Control of sewage conveyance was optimized. New ways to manage emission reduction were explored.

A handbook of on-the-spot inspection of emission reduction was being compiled to guide inspections in prior enterprises and to guarantee effective operation of relevant facilities. The technology of denitrification during full-load operation was being actively researched for application. Pilot project of pollution prevention and control caused by gypsum rain was conducted with initial results.

Policy for encouraging emission reduction was implemented
Implementing the policy for encouraging reduction of pollutant emission, the amounts of money awarded in 2014 were as follows:
- Reward for over-reduction of pollutant emission in power plants equipped with desulphurization and denitrification facilities——CNY 190 million
- Reward for over-reduction of pollutant emission in sewage treatment plants——CNY 130 million
- Compensation for power cost for environmental protection in coal-fired power plants——CNY 1,260 million
- Subsidy for denitrification projects——CNY 60 million
- Subsidy for replacement by clean energy——CNY 190 million
- Subsidy for elimination of yellow-labeled (exhaust-emission-standard-unattained) vehicles and out-of-date motors——CNY 840 million
- Subsidy for projects of agricultural emission reduction——CNY 50 million

It was checked and verified by the Ministry of Environmental Protection that in 2014 the chemical oxygen demand and the emission of ammonia-nitrogen, sulphur dioxide and nitrogen oxides were respectively 4.78%, 2.57%, 12.81% and 12.52% lower than those in 2013, successfully fulfilling the annual targets and one year ahead achieving the goals stipulated for Shanghai by the Twelfth Five-Year Plan.

Air Pollution Prevention and Control

The Clean Air Action Plan

Prevention and control of air pollution were the priorities of the municipal government in 2014. Replacing coal-fired burners by clean energy was listed as one of the to-be-finished practical projects. 187 projects of rectification scheduled by the Clean Air Action Plan were initiated in the six fields of energy, industries, transportation, construction, agriculture and living; nearly 30% of these projects have been completed.
Energy
High efficient dust removal devices for thirteen 4.87kw generating units and denitrification facilities for ten 2.14kw generating units were completed in coal-fired power plants. So far all coal-fired generating units have been equipped with facilities for desulphurization and dust removing, while facilities for denitrification were close to completion. 1,875 coal/heavy oil boilers and stoves have switched to use clean energy or have been shut down so that the annual goal was overfulfilled.

Industries
644 project of structural adjustment were completed. Rectification of pollution caused by volatile organic chemicals was carried out in 150 major enterprises of petrochemical industry, chemical industry, motor industry, shipbuilding industry, pharmaceutical industry and electronic industry.

Transportation
The State IV Standard for Vehicle Emission was put into practice ahead of time in May 2014. 171.6 thousand yellow-labeled vehicles and out-of-date motors have been eliminated, overfulfilling state-assigned annual task. The plan of promoting new-energy-using vehicles and supplementary policies were made; 10,886 such motor vehicles were sold in 2014.

Construction
Energy-saving projects were completed in public buildings with a total floor area of 4 million square meters. Buildings with a total floor area of 1.5 million square meters were built with assembly parts. 109 sets of monitoring system were installed in construction sites to monitor flying dust online. 60 stations of concrete mixing were modified for better environmental protection.

Agriculture
As the policy on subsidies was optimized, the rate of comprehensive utilization of crop stalks went up to 91% above; no stalk-burning was telemetered by satellite.

Living
A new way to rectify oil fume emission in catering business by the third party was explored in Huangpu, Changning, Zhebei and Songjiang District, where real-time monitoring of oil fume has been made. It was also promoted to curb air pollution in dry-cleaning industry.

Collaboration Mechanism on Air Pollution Prevention and Control in the Yangtze River Delta Region
According to the requirements of the Party’s Central Committee and the State Council, and following the principles of “ample consultation, confirmed common understanding and joint implementation”, a collaboration mechanism on air pollution prevention and control in the Yangtze River Delta Region was jointly built in January 2014 by the government leadership of Shanghai Municipality and Jiangsu, Anhui and Zhejiang Provinces in association with the Ministry of Environmental Protection and other seven ministries/commissions led by Han Zheng, Secretary of the CPC Shanghai Municipal Committee. It was made clear that work would be done through discussions, coordination with due division of labor, reciprocal chain reaction, scientific and technological cooperation and follow-up assessment. “Regulations for Implementation of the Action Plan of Curbs on Air Pollution in the Yangtze River Delta Region” was jointly worked out. In 2014 cooperation and joint action were organized in ten fields to ensure good environmental quality during the periods of Nanjing Youth Olympic Games, Shanghai Conference on Interaction and Confidence-Building Measures in Asia and other important events. Regional joint prevention and control of air pollution has had a good beginning.

Water Pollution Prevention and Control
Drinking Water Source Conservation
The project of excavating a lake as water source was initiated by the end of 2014 to lay the foundation of the prospect that in 2017 there will be four closed water sources located in Qingcaoosha, the upper reaches of the Huangpu River, Chen-hang, and Dongfeng Xiahan Chongming. It is expected that the quality of raw water will be up to the state standard and the capability of guarding against emergencies of pollution will be greatly enhanced. The subsidy system continued to play an important role in ecological conservation of drinking water sources and accumulatively, CNY 2.900 million has been paid since 2009. As an effective measure, the policy for and the plan of subsidy for clean-up and renovation in primary conservation areas of water source was approved by the municipal government by the end of March 2014.

Improvement of Water Environment
In 2014, priorities were given to the constructions of sewage treatment plants, pipelining for catching and conveying polluted water right at its discharging sources, and facilities for sludge treatment.
- Upgrade and renovation of sewage treatment plants have been initiated.
- 63.6% of the pipelining was completed so that the rate of sewage treatment in urban area in Shanghai was raised over 89%.
- Facilities for extreme dehydration of sludge in exigency were installed at Songdong, Songxi and Xinjiang Sewage Treatment Plants.
- Zhuyuan System of Sludge Burning was completed and equipment has being tested.
- Qingpu Sludge Dehydration Plant was built.
- The annual objectives scheduled by “Planning for Curbs on Water Pollution in the Basin of Middle and Lower Reaches of the Yangtze River” and “Overall Plan of Comprehensive Reclamation of Water Environment around Taihu Lake (Revised)” were all fulfilled.

**Solid Waste Management**

In 2014, there were 29 units in Shanghai licensed to deal with comprehensive disposal of hazardous waste, which was divided into five categories: landfill, incineration, physical-chemical treatment, comprehensive utilization and used-barrel washing. The total annual disposal capacity approved was 536,500 tons relating to hazardous waste and 1.21 million used barrels. Among them, the annual disposal capacity approved for hazardous waste incineration was 129,400 tons with medical waste excluded. The annual disposal capacity approved for landfill was 103,400 tons.

In 2014, 387,800 tons of hazardous waste (not including medical waste) were transported and disposed within the range of the city;
- 972,600 used barrels were washed out;
- 80300 ton of hazardous waste was transported to other provinces for disposal;
- 34,600 tons of medical waste was incinerated and the rate of centralized and harmless disposal of it was 100%.

There were five companies in Shanghai qualified to deal with discarded home appliances and electronic products, whose annual capacity of dismantling TV sets, refrigerators, washing machines, air conditioners and computers was 3,771,700 pieces. Totally in 2014, 2,003,000 items of abandoned home appliances and electronic products were collected, among them, 1,986,200 ones (weighing 51,600 tons) have been dismantled including 1,696,600 TV sets, 8,800 refrigerators, 47,600 washing machines, 7,600 air conditioners and 225,600 computers.

**Radiation Safety Supervision**

The license of radiation safety was renewed, re-applied or newly-issued for 279 unit-times. It was examined and approved to be transferred for 292 unit-times and to be exempted for 53 unit-times. As a result of the standardization of radiation monitoring and supervision, departments of environmental protection in most districts were accredited to monitor and measure radiation items. To ensure that radiation safety was not violated because of using radioactive isotope during the Conference on Interaction and Confidence-Building Measures in Asia (CICA) held in Shanghai, personnel of over 1,500 person-times was dispatched to make on-the-spot check-up in 364 units where radioactive isotope was used. During these check-ups, 60 radioactive sources left over from the past were removed as hidden danger from 9 units and appropriately stored up.

In order to intensify the management of radioactive sources scrapped in the past or lying idle in medical institutions, special checks were jointly made by Shanghai Municipal Bureau of Environmental Protection and Shanghai Municipal Commission of Health and Family Planning. During the checks in the places where the radioactive sources were used, removed, or stored as useless equipment, 17 pieces of not-licensed radioactive sources from 5 institutions were properly disposed.

**Environmental Legislation and Law Enforcement**

The Regulation on Air Pollution Prevention and Control in Shanghai was reviewed and approved by the Standing Committee of the Municipal People’s Congress on July 25, 2014 and has been put into effect since October 1, 2014. The Regulation fully reflects the demand of socially joint rectification and formulated the rights and obligations of governments, enterprises and the public. In the Regulation,
- Strictest legal responsibilities are explicitly defined;
- Maximum limit of fine is greatly raised;
- Rules of day-by-day successive penalty and “twin penalty” are stipulated;
- Both the way to rectify pollution through the third party and the means of economic sanction are adopted;
- Pollutant emission should be licensed and purchase of such license can be discussed;
- It is prescribed that public-service corporations are obliged to give active cooperation to the enforcement of environmental law.

As environment-concerned legislation was promoted, enforcement of environmental law was intensified. Statistical figures of 2014 were as follows:

- 69,420 person-times of personnel were sent out for 22,080 times to enforce environmental law;
- On-the-spot inspection was carried out in enterprises and institutions for 51,643 unit-times;
- 11,830 sets of facilities for sewage treatment, 20,900 sets of facilities for reducing waste gas and smoke dust, 3,422 sets of apparatus for noise abatement and 5,520 sets of equipment for disposal of solid waste were checked up;
- 1,942 unit-times of administrative penalties, 41% more than those in 2013, were meted out and totally, over CNY 103 million, 52% more than that in 2013, was fined;
- CNY 171.05 million as payment for licensed pollutant emission was imposed for 22,330 unit-times;
- 20 cases, in which more than 80 people were involved in violation of environmental law, were transferred to the judicial department.
In 2014 the annual input for environmental protection in Shanghai amounted to CNY69.989 billion, equaling to 3.0% of local GDP in the same year.

### Amount of Each Expenditure Item and Its Percentage in Total Annual Input for Environmental Protection

<table>
<thead>
<tr>
<th>Expenditure Item</th>
<th>Amount (CNY)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of Urban Infrastructure</td>
<td>27.179 billion</td>
<td>38.8%</td>
</tr>
<tr>
<td>Renovation at Pollution Sources</td>
<td>26.014 billion</td>
<td>37.2%</td>
</tr>
<tr>
<td>Ecological Conservation and Construction</td>
<td>5.29 billion</td>
<td>0.8%</td>
</tr>
<tr>
<td>Environmental Protection in Rural Area</td>
<td>4.245 billion</td>
<td>6.1%</td>
</tr>
<tr>
<td>Promotion of Environmental Management</td>
<td>4.56 billion</td>
<td>0.7%</td>
</tr>
<tr>
<td>Operation of Facilities for Environmental Protection</td>
<td>8.883 billion</td>
<td>12.7%</td>
</tr>
<tr>
<td>Input for Circular Economy and others</td>
<td>2.685 billion</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

The input of environmental protection in Shanghai kept rising in the past five years, equaling to a percentage around 3% of local annual GDP.

### Promotion of Third-Party-Rectification of Environmental Pollution

Guiding Opinions for Promotion of Third-Party-Rectification of Environmental Pollution in Shanghai was issued by the municipal government in October 2014 and then, the Municipal Bureau of Environmental Protection issued a pilot working scheme. To promote the third-party-rectification, emphasis was placed upon bearing the responsibility for keeping rectification and pollutant emission in pace, and strengthening environmental supervision. Supporting policies, combining guidance with pressure, were made to guide and help with market-oriented, standardized and self-disciplined practice in all industries.

Pilot work was carried out in the following seven fields:
- Desulphurization, denitrification and dust-settling in power plants;
- Sewage treatment in urban area;
- Treatment of industrial waste water;
- Treatment of organic exhaust;
- Rectification of oil fume produced in catering industry;
- Curb on pollution caused by flying dust; and
- Online monitoring at pollution sources.

Market mechanism was introduced into environmental administration as the old practice of “He who produces pollution has to control it” was switching to “He who produces pollution has to pay for it while it is dealt with by third-party-rectification”.

![Chart 22: Variation of the input for environmental protection in Shanghai from 2010 to 2014](chart.png)
Adjustment in the Policy on Charging for Pollutant Emission in Shanghai

In order to promote control of pollution and meeting the state requirement and the needs of deepening reform in Shanghai, adjustment was made to the standards of charging for pollutant emission. Charges for emission of main pollutants would be raised to meet the new standards in three stages as follows:
- Sulphur dioxide: CNY 8/kg;
- Nitrogen oxides: CNY 9/kg;
- Chemical oxygen demand: CNY 5/kg;
- Ammonia nitrogen: CNY 6/kg.

Discharging sewage containing heavy metals such as lead, mercury, chromium, cadmium and metalloid arsenic should be also charged. Standards of charge vary according to the densities and total amounts of emitted pollutants as well as different industries. The adjustment has become effective since January 1, 2015.

Environmental Monitoring

The environmental monitoring system of Shanghai successfully passed the overall acceptance test of standardized construction organized by the Ministry of Environmental Protection, as all the monitoring stations in 16 districts and a county had undergone the acceptance inspection adopting state standards.
- Ambient air quality assessing apparatus has been installed and put into operation all over the city to facilitate real-time release of local air quality index in all districts and county.
- The Regional Air Quality Forecast Center in the Yangtze River Delta was partly put into trial operation. Before the end of 2014, it has become possible to forecast regional air quality to the public synchronously with those in the Beijing-Tianjin-Hebei Region and the Pearl River Delta.
- Over 70% of the construction of a network monitoring characterized air pollution in key industrial parks was completed.
- The construction of online system of in-use motor vehicle supervision for environmental protection was initiated, and the extended construction of simply-equipped measuring line of working conditions was almost completed in stations of annual vehicle checkup.
- Further analysis of fine particulate matter in air was made to provide scientific evidence for curbs on air pollution.

Administration of Environmental Impact Assessment

As the regulations for “approving a project after examining and calculating the total amount of pollutant emission” continued to be strictly followed in 2014, the total amount of the emission of main pollutants was regarded as a prerequisite for environmental evaluation. Measures such as using new facilities to redeem the inadequacies of old ones, innovating technologies, utilizing recycled water, etc. were actively taken for reduction of the total amount of emission. Environmental evaluation was carried out in an all-round way in the 104 Industrial Regions/Blocks and has been completed in 17 ones such as Yangshan Port Bonded Area and Jinshan No. 2 Work Zone.

Chart 23: Comprehensive analysis of PM2.5 sources in Shanghai
Environmental Science, Technology and Standards

“Researches on Synergetic Reduction of Air Pollution Emission, Technologies for Improving Air Quality, and Plans of Controlling Air Pollution in Shanghai” continued to be made in 2014, focusing on what major pollution sources contributed to complex air pollution and exploring the path to reduce multi-pollutant emission coordinately for continuous amelioration of air quality.

Two projects conducted by the Shanghai Research Institute of Environmental Science, “Research on the List of Precursor-emission Causing Complex Air Pollution in the Yangtze River Delta Region and the Essential Technology of Ensuring Air Quality” and “Research and Application of the Technology and Managerial System of Pollution emission Reduction in Livestock and Poultry Farming in River Plain”, respectively won the second prize and the third prize of 2014 National Awards for Scientific and Technological Progress in Environmental Protection.

It was approved by the Ministry of Environmental Protection to establish the Key Laboratory of National Environmental Protection on Causes and Control of Complex Urban Air Pollution in Shanghai Academy of Environmental Science to make researches on
-Complex air pollution occurred in the coastal cities in east China, especially in the Yangtze River Delta Region;
-Physical and chemical characters of aerosol;
-Mechanism of the formation of ozone pollution; and
-Origin of and prevention-control solution to air pollution.

Two sets of local standards issued by Shanghai Municipal Bureau of Environmental Protection, “Standards for Air-Polluting Emission of Boilers” (DB31/387-2014) and “Standards for Oil Fume Emission in Catering Industry” (DB31/844-2014), have played a positive role in promotion of control and management of air-polluting emission and in improvement of air quality.

International Cooperation

“Demonstration Project of Policies for Green Supply Chain in Shanghai”, a project assigned by the China Council for International Cooperation on Environment and Development (CCICED), “China-Italy Collaborative Project of Training and Exchange in Environmental Protection” and “Project of Exchange of Environmental Technology between Shanghai and Kawasaki and Kitakyushu in Japan” continued to be implemented in 2014.

An agreement over cooperation was signed by Shanghai Monitoring Station of Radiation Environment and Hong Kong Observatory. A Framework Agreement over Collaborative Intention was signed by Shanghai Society of Environmental Science and Taiwan Association of Soil and Groundwater Protection.

In 2014, 191 people of 28 foreign delegations were received, 11 talent-introduction projects were organized and 18 experts from foreign countries or from Hong Kong, Macao and Taiwan visited Shanghai.

Team Building and Performance Improvement

Following the demand that “fostering fine style of work endlessly” and the essentials of General Secretary Xi Jinping’s serial important speeches, theme activities of “Excel in the Performances” were unfolded and the gains from the Education and Practice of the Party’s Mass Line were further consolidated. 125 job-specific training programs were conducted to make the environmental protection team more professionally-trained. Personnel, positions and responsibilities were more clearly fixed and defined. Institutional management was standardized. Along with anti-corruption campaign, the Party’s style of work was improved.

The municipal-level honorable title of “Model Unit” was conferred upon the Shanghai Academy of Environmental Science, the Shanghai Environmental Monitoring Center, the Shanghai Environmental Supervision Institute and the Shanghai Radiation Supervision Station.
Accepting Opinions and Handling Proposals

141 written proposals and motions from the deputys of the Municipal People’s Congress (MPC) and the Municipal Committee members of CPPCC were received by Shanghai Municipal Bureau of Environmental Protection in 2014, 43.8% more than in 2013. All the written opinions and motions were satisfactorily handled in time; both the rate of process and the rate of satisfaction were 100%. The environmental issues over which the MPC deputys and CPPCC municipal committee members expressed great concern were:

- Making further research on the causes of air pollution and strengthening control of pollution to realize joint prevention and control in the Yangtze River Delta Region;
- Energizing soil research and monitoring, soil pollution control and soil restoration;
- Exalting drinking water safety and Jiangsu-Zhejiang-Shanghai joint effort at rectification of pollution in the upper reaches of the Huangpu River;
- Establishing a platform for information management of the comprehensive utilization of bulky solid waste to facilitate the upgrade of the industry;
- Quickening the pace in eliminating yellow-labeled motor vehicles;
- Punishing the practice of infringing environmental law more severely.

There were 50 pieces of written opinion and motion concerning control of PM$_{2.5}$ and smog.

Hearing Complaints and Coping with Emergency

28,613 cases of complaint over environmental pollution, 6.4% more than those in 2013, were dealt with within the environmental protection system in Shanghai in 2014. 94.5% of the total could be categorized as follows:

- 14,010 cases of air pollution;
- 7,198 cases of noise pollution;
- 3,072 cases of water pollution;
- 2,747 cases of pollution caused by oil fume.

366 cases of environmental emergency were reported in 2014. 309 cases were investigated and handled on the spot, among which, 106 ones causing environmental influence were all Grade-IV accidents. Both the reports on environmental emergency and the occurrence of environmental accidents decreased in 2014. Neither critical environmental accident nor that bringing about social impact happened.
Model Units of Environmental Protection

Maogang in Sonjiang District was officially entitled “National Eco-town” by the Ministry of Environmental Protection and was enlisted as one of the ten demonstration cases for China Beautiful Village by the Ministry of Agriculture in 2014. It was examined and approved by Shanghai Municipal Bureau of Environmental Protection, also reported to the Ministry of Environmental Protection, that the following towns were upgraded to National Eco-town:
- Zhangjiang, Gachang, Caolu and Hangtou in Pudong New Area;
- Xinzhuang, Qibao and Pujing in Minhang District;
- Gucun and Miaochang in Baoshan District;
- Malu and Anting in Jiading District;
- Siqing in Songjiang District;
- Xujing and Zhaoxiang in Qingpu District;
- Nanqiao in Fengxian District.

Nanxiang in Jiading has passed municipal-level acceptance inspection for being a national eco-town and was waiting for the official approval of the Ministry of Environmental Protection.

Shibei Hi-tech Service Industry Park has been turned to be a National Eco-Industrial Demonstration Park. Shanghai Gulf National Forest Park and the Oriental Land have passed technical evaluation and acceptance appraisal for being National Eco-tourist Resort at city level and were reported for the official approval of the National Tourism Administration and the Ministry of Environmental Protection.

Jinze in Qingpu District, Haining in Fengxian District and Nicheng in Pudong New Area were named “Shanghai Eco-town”.

Shanghai Children’s Museum and other 9 institutions were appraised to be among the second batch of “Shanghai Base of Environmental Education”.

15 Quiet Residential Quarters were newly-built in Shanghai and 46 old ones passed recheck-up. So far in Shanghai there have been 179 Quiet Residential Quarters where 475,000 people benefit from quiet environment.

An area of 2 km² in Zhaoxiang in Qingpu District has become a Flying-dust-controlled Area and the total area of such areas in Shanghai has amounted to 971.5 km².

Publicity about Environmental Protection

On June 5, 2014, the World Environment Day with “Declare war on pollution” as its Chinese theme, a grand meeting entitled “Green and Environmentally-friendly: We are Acting” as well as Jingqiao Eco-cultural Festival took place in Tesla Square in Jingqiao Development Zone. On this occasion,
- Name-plate was awarded to the National Bases of Environmental Education and Social Practice for Primary and Secondary Schools;
- Special banner was granted to international eco-schools;
- National “Mother River Award” was presented;
- The title of “Shanghai Youth Model Team of Environmental Protection” was conferred;
- Low-carbon Market and “Low-carbon Bicycling” were inaugurated;
- “Jingqiao Environmentally-friendly Mother” showed up in public;
- A three-month public-interest exhibition of calligraphic works with “Green Living in Beautiful Shanghai” as its theme opened, which then produced a favorable response and attracted enthusiastic participation from the public.

Main events in environmental publicity in 2014 were:
- “Clean and Water-Saving China Tour: 10,000-liter Water Saved by Each Family per Year” Shanghai 2014;
- Action of 1,000 Environmentally-friendly Women Messengers;
- “1 DO: Public-interest and Happy Forest for Environmental Protection”, a planting-tree activity;
- Shanghai Cartoon Image Design Contest for Environmental Protection;
- “Green Shanghai in My Eyes”, a Teenager Digital-Video Production Contest.

In the official website of Shanghai Environment, the platform on air quality index (AQI) information release was optimized, the column relating to the pollution source information disclosure and the monitoring date on them was enriched, the new columns including total pollution emission reduction...
and monitoring system, clean air action plan and the environmental protection on the Yangtze River delta were added. The system update and renovation of the website was completed. More efforts were put on the linkage with the portal website of the Municipal Government in administrative examination and approval. Three environment-related items in the procedure of administrative examination and approval could be processed online with the same login username on the municipal government portal website. The update could also be found on the column of the approval system on Shanghai construction project environmental impact assessment and the newly built public service system on EIA. The year of 2014 witnessed 6 online interviews and 8 public opinion collections. The official website of Shanghai Environment ranked as No.1 in the comprehensive performance evaluation among the official environmental websites at province level and was awarded as the excellent unit among the governmental websites in Shanghai in 2014. In the website of Shanghai Environment Hotline, the columns such as the World Environmental Day, the realtime AQI and the air pollution pre-warning were developed and released. The online public investigation on EIA, the public participation and notice on EIA, the EIA report publicity before approving and the analysis report on the glass curtain wall technology were released by 2726 pieces. 4,763,650 person-times of netizens logged onto the websites of www.sepb.gov.cn and www.envir.gov.cn in 2014.