

Major Environmental Policies

Apr 2021

1. Feature Article: New-Generation Air Quality Monitoring and Testing in Taiwan

Aiming to enhance air quality monitoring capacity and better provide air pollution information in real-time, in 2013 the EPA launched the New-Generation Environmental Quality Monitoring and Testing Development Plan. Under the program, the air quality monitoring network has been upgraded into its fourth generation, resulting in much-improved air quality. Other than upgrades in hardware such as equipment in national-level monitoring stations, the EPA will keep strengthening the real-time broadcast and notification mechanism and working with the Central Weather Bureau (CWB) to enhance its air quality forecast operations and services.

Air quality in Taiwan has shown significant improvement based on the EPA's annual air quality monitoring report. Comparing data collected by monitoring stations in 2020 with that collected during the past decade, average annual concentrations of major air pollutants being monitored in 2020, such as particulate matters, fine particulate matters (PM_{2.5}), sulfur dioxide (SO₂), nitrogen dioxide, and ozone, are lower than concentrations in 2019.

Air quality monitoring is the key foundation for protecting air quality and controlling air pollution. The establishment of an air quality monitoring network went through three generations between 1980 and 2013. Significant steps taken during that period include the National Air Quality Monitoring Network Establishment Plan in 1993 and the Environmental Quality Monitoring Network Phasing Plan in 2005.

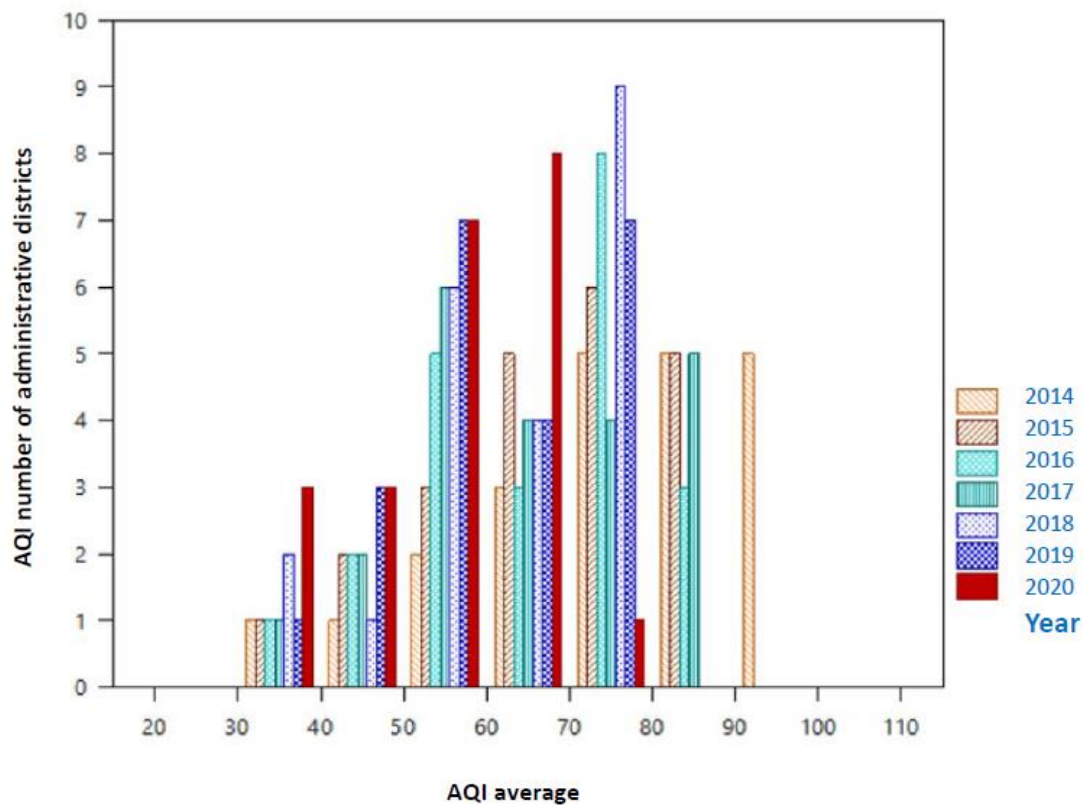
The New-Generation Environmental Quality Monitoring and Testing Development Plan was launched in 2013 in response to climate change and to meet the public demand for information on air quality. Through it, the EPA has hoped to further enhance national capacity in air quality monitoring, better provide air pollution information in real-time, and develop the fourth generation of the air quality monitoring network.

The new-generation air quality monitoring system strives to achieve four goals: integration of central and regional monitoring capacity; strengthening of pollutant concentration testing capacity; enhancing understanding and handling of regional pollution incidents, and; improving real-time environmental monitoring data broadcasting mechanisms. Significant measures include integrating all types of national monitoring resources under the EPA's global information website (<http://airtw.epa.gov.tw/>), providing assistance, phasing out of obsolete or old instruments in national-level monitoring stations, establishing a multi-layered air quality monitoring Internet of Things (IoT), and adding standard manual methods for PM_{2.5} as well as a monitoring network for chemical compounds.

For the data collection systems of monitoring stations and the air quality monitoring center database, the EPA has also enhanced real-time broadcasting and notification mechanisms and works with the CWB to fine-tune operations and services related to air quality forecasts.

Monitoring instruments, such as the automated ones for PM_{2.5}, that have been upgraded under the New-Generation Environmental Quality Monitoring and Testing Development Plan will no longer undergo calibration based on linear regression. This is because the instruments have already passed the USEPA's similarity standard methods, as well as meeting the similarity requirements listed in Taiwan's Regulations Concerning Comparisons Between Manual and Automated In-Air PM_{2.5} Testing Methods (空氣中細懸浮微粒手動及自動檢測方法比對規範).

In response to making yearly air quality improvement, in the future, instruments in national-level monitoring stations will undergo upgrades on precision and limits will become more stringent so as to meet environmental monitoring needs concerning low-concentration pollutants. It is hoped this will provide the better information and high-quality monitoring data services needed to formulate control strategies.



Distribution map of the average AQI of the administrative district over the years

Focuses of recent air quality monitoring

Recent air quality monitoring has been focusing on the following two aspects:

1. Strengthening monitoring capacity for low-concentration pollutants

To meet future needs to monitor air pollutants at lower concentrations, the EPA is paying special attention to the low-concentration monitoring capacity of instruments as they are upgraded. Specification improvements have included the removal of vapor disruption, which effectively led to the setting of record-low detection limits. For instance, instruments can now detect sulfur dioxide as low as 0.3 ppb as opposed to 0.5 ppb previously (a drop in the lower detection limit by 40%), 0.4 ppb of nitrogen oxides as opposed to 0.5 ppb previously (a 20% drop), and 0.5 ppb of ozone as opposed to 1 ppb previously (a 50% drop). These all demonstrate a significant leap in the monitoring capacity of instruments.

2. Integrating capacity of central and regional monitoring networks

The EPA has developed an integrated national air quality system, which collects and combines data from 218 monitoring stations in Taiwan. They include the EPA's own 78 stations, 34 stations belonging to regional environmental bureaus, 36 stations belonging to specialized industrial parks, and 70 to large-scale enterprises. In addition, there have been continual efforts in assisting and expanding the collection of data from monitoring stations of other large-scale enterprises. The purpose is to improve comprehensive services to the public including real-time air quality information by facilitating integration of all monitoring stations across Taiwan.

3. Handling of regional pollution incidents

In order to get the complete picture of the impacts on air quality from regional environmental atmospheric changes, the EPA has built a LIDAR (light detection and ranging) network. The network can monitor altitudes of diffusion layers in the atmosphere in areas prone to poor air dispersion. Another monitoring network has been set up with sensors for long distance visibility and particle size analyzers, so as to simultaneously monitor both visibility and particle sizes and analyze the correlation between visibility and air quality. Core monitoring stations comprising LIDAR, visibility sensors, particle size analyzers, and facilities that monitor PM_{2.5} components have been set up in three regions to analyze pollution characteristics for future reference. These locations are: Banqiao, New Taipei City, in the northern region; Xitun, Taichung City, in the central region, and; Xiaogang, Kaohsiung, in the southern region.

Replacing and upgrading instruments used in the monitoring network

Significant achievements in the work of replacing and upgrading monitoring network equipment include:

(1) A better understanding of regional pollution characteristics

To enhance the quality of the national-level air quality monitoring network, the EPA has set up a background monitoring station in Fugui Cape, added six mobile monitoring stations, three mobile photochemical assessment stations, and one

stationary station to assess photochemical reactions. Another significant advance was the establishment of the LIDAR monitoring network and set up of optical monitoring bases in the northern, central, and southern regions. Moreover, the EPA has been working on enhancing data collection and transmission management systems. By-the-hour data checking and equipment status analysis are now automated, effectively optimizing data collection and reading.

(2) New equipment for better environmental analysis

As air quality has improved year after year, there has been a growing need for low-concentration pollution monitoring. Thus, the EPA has replaced old equipment with new, including 90 new analyzers for sulfur dioxide, 90 for nitrogen oxides, 90 for ozone, 80 zero air generators, and 80 gas dilution calibrators. In total, the replacement and upgrades consisted of 1,286 instruments under 35 categories, 26 operation rooms under four types, and two vehicles for quality maintenance and audits. They can all be operated with higher stability and lower malfunction rates, with enhanced performance and 20-50% improvement in their capacity for detecting low concentrations of pollutants.

Future work and expected results

The following are focuses and expected results of future air quality monitoring:

1. Establishing the new-generation air quality monitoring network

With low-concentration pollution more and more common, the EPA will continue to upgrade equipment, enhance detection capacity and removal of interfering data, and lower detection limits. Another focus is to lay the foundation for telecommunications for monitoring in the age of Industry 4.0.

2. Improving understanding of regional pollution characteristics

The EPA will be able to better understand regional pollution incidents and, in turn, improve in issuing forecasts and warnings by enhancing its capacity to monitor atmospheric characteristics.

3. Enhancing analysis capacity with new equipment

Multiple types of environmental quality monitoring and testing equipment have been introduced to better analyze pollution characteristics in the future.

4. Improving environmental monitoring information services

The EPA is able to provide better information services to over 20 million viewers every year after upgrading its information system's hardware and software.



The air quality monitoring network webpage

2. Major Accomplishments of Environmental impact assessment (EIA) and environmental education promotion

(1) During April, the EPA held two EIA review committee meetings, one special task group meeting to collect opinions, and 13 preliminary review meetings. A total of 12 development projects were jointly explained and determined whether to undergo EIA. Six projects were approved to modify their EIA documents, while one was rejected. All were based on the Environmental Impact Assessment Enforcement Rules (環境影響評估法施行細則) Article 36, paragraph 2.

(2) The 2020-2021 Caring for the Environment Design Competition was held on 13 April. EPA Deputy Minister Hung-Teh Tsai was the award presenter with Bo Mønsted, Director of the Trade Council of Denmark, in attendance. The first prize went to the TWIST Folding Cup, the second to the Pyupack Environmental System for Urban Beekeeping and Greenhouse Pollination, and the third to the Marine Waste Styrofoam Recycling and Reused. Five awards were also given for excellent designs.

Winning works from the competition will be on display in northern and southern Taiwan: at Songshan Cultural and Creative Park Warehouse No. 4 in Taipei from 13 to 15 April, and the National Science and Technology Museum in Kaohsiung from 22 to 27 April.



The first prize-winning work: TWIST Folding Cup

(3) On 22 April, President Tsai met with representatives of environmental organizations at the 2021 National NGOs Environmental Conference. A total of 14 representatives, including President Yue-Mei Liu of the Society of Wilderness, offered suggestions to the president in person. Moreover, representatives of the Ministry of Economic Affairs (MOEA), Ministry of the Interior (MOI), the Council of Agriculture (COA), the National Development Council, and the EPA were in attendance as well.

3. Major Accomplishments of Air Quality Improvement

(1) A press conference was held on 13 April to announce the launch of Indoor Air Quality Voluntary Control Label in June to safeguard the health of sensitive groups. The EPA will promote the Label to encourage venues to establish a healthier indoor environment by voluntarily improving indoor air quality. The EPA will review the system on a rolling basis to better understand the effects of the voluntary control

label and make further improvements.

(2) The Regulations Concerning Food and Beverage Industry Air Pollution Control Equipment Management (餐飲業空氣污染防制設施管理辦法) were announced on 5 February. Apart from collecting relevant questions, the EPA organized seminars in the north on 16 April and in the south on 19 April to help answer questions from enterprises in person. Local environmental bureaus have been asked to provide needed assistance and supervise enterprises' improvement measures. To properly control fugitive air pollution, the EPA will assess the formulation of administrative regulations for special facilities to lower difficulties in actual practice.

(3) A forum was held on 23 April to allow the exchange of ideas on airborne dust control in riverbeds. Approximately 85 people from the MOEA's Water Resources Agency, River Management Offices, COA's Forestry Bureau, and local environmental bureaus were in attendance, sharing successful experiences in controlling and improving airborne dust in riverbeds. Participants talked about discovering problems by listening to the locals and overcoming various difficulties via management platforms, joint inspections, response measures, communications, and coordination. Moreover, the forum emphasized the importance of customized measures based on location and time period. For instance, using residual materials from agricultural production as mulch serves multiple purposes, such as effective sand stabilization, a channel for waste disposal, and increasing plant survival rates. In the Zhuoshui River region, the occurrence of airborne dust incidents in 2020 is 85% less than that in 2017, and the average particulate matter concentration in 2020 is a 44% drop from that in 2017. All of that has contributed to a better living environment for local residents.

4. Major Accomplishments of Water quality protection

(1) The Taichung City Lyu-Chuan Canal Improvement Plan was officially completed on 14 April. EPA Deputy Minister Hung-Teh Tsai and Mayor Shioh-Yen Lu were on hand to witness the opening of the area. Taichung City Government implemented the Plan with a NT\$34.6-million budget approved by the EPA, aiming to restore the canal to its former glory by improving the deteriorating environment caused by economic development. All household wastewater generated from both shores between Shin-Yi South Street and Da-Ming Road (a 2.4-kilometer-long section of the canal) is now intercepted, with some of the wastewater going to Fu-Tien Water Resources Recycling Center. The rest goes downstream to the gravel contact aeration disposal

facilities in Han-Xi Water Park, whose daily capacity of household wastewater treatment reaches 12,000 metric tons. Treated water is then sent back to the canal. Not only so, but pedestrian areas and public facilities on both sides of the canal also went through a makeover to provide the public with easy access to a high quality water environment.

(2) Sheng-Chung Wu, Director General of the EPA's Department of Water Quality Protection, and Pingtung County Commissioner Men-An Pan were on site for the opening of Fu-Shing Park, the result of the Wannian Stream Riverbank Environment Improvement Plan. The 2.7-hectare park went through a renovation based on urban flood detention, water purification, riverbank ecosystems, and environmental education. The park, whose green space is interspersed along the waterway, can now be accessed by visitors who can enjoy closer interaction with nature. It also helps facilitate development in the surrounding areas and enhance residents' living quality.

(3) The EPA went to Erlin, Chunghua on 30 April and jointly promoted centralized disposal of livestock excrement with the town's mayor, as well as visited Brother Livestock Farm. The trip led to cooperation between the EPA and Erlin Town Hall after the EPA explained the government's available subsidies and resources and assisted the progress of the promotion. In addition, Brother Livestock Farm has applied to use biogas slurry to irrigate 1.1 hectares of farmland. As there is still room to expand its irrigation size, the EPA discussed with the farm on opportunities to increase resource utilization.

5. Major Accomplishments of Waste management

(1) A seminar was held on 7 April on legislative revision concerning waste disposal, where participants discussed plans to thoroughly review and amend the Waste Disposal Act (廢棄物清理法). Local environmental bureaus were invited to collect opinions from the competent authorities working at the frontline as references for future legislative revisions.

(2) The EPA organized activities on Earth Day (20 April) at the Red House in Ximen, Taipei, including a road run and a street fair. Government agencies, corporations, and NGOs were urged to jointly promote waste reduction, carbon reduction, an environment-friendly lifestyle, resource and plastic recycling, and at-source waste reduction. The purpose was to raise public awareness of environmental protection and green behaviors in everyday life.

6. Major Accomplishments of Environmental sanitation and greenhouse gas reduction

To keep out lumpy skin disease (LSD), the EPA joined hands with the Ministry of Transportation and Communications (MOTC) on 16 April, disinfecting the entrances, exits, and surrounding areas of 11 ports and 13 airports. The competent authorities of these ports and airports were in charge of disinfecting their jurisdictions, whereas the environmental authorities handled surrounding roads and public areas. It was an interdepartmental collaboration that effectively lowered disease-carrying mosquitoes' density and protected the livestock industry through proper disease control measures.

7. Major Accomplishments of Evaluation and dispute

A press conference was held on 7 April to promote environment-friendly households and offices and energy conservation. The EPA also worked with Test Rite Group by having an exhibition in the TLW Shilin Branch from 7 to 20 April, displaying various simple actions to achieve a green lifestyle in households and offices and save energy.

8. Major Accomplishments of Environmental monitoring and promotion of e-government

(1) The 100 air sensors donated by the EPA to Vietnam have arrived at the Ministry of Natural Resources and Environment, Vietnam, and completed calibration. The EPA also organized a teleconference with the Taipei Economic and Cultural Office in Vietnam, Vietnam Economic and Cultural Office in Taipei, and the Ministry of Natural Resources and Environment on 20 April. Participants discussed the related training.

(2) On expanding the EPA's Environmental Project Reports Information System, a column requiring budget items was added to the basic information page in April. It is to help the public understand the status of all operations commissioned by the EPA and in turn, achieve disclosure and transparency of government data.

9. Major Accomplishments of Waste Treatment and Environmental Law Enforcement

(1) To respond to African swine fever and strengthen relevant epidemic prevention measures, on 13 April the EPA held a meeting with environmental bureaus of all counties and cities across Taiwan to remind them to require pig farmers to comply

with relevant food waste cooking regulations so as to ensure the safe use of food waste as pig feed. In addition to requiring all environmental bureaus to strengthen the inspection of pig farms that utilize food waste recycling within their jurisdictions and to supervise pig farms to ensure implementation of high-temperature cooking of food waste, the EPA and all environmental bureaus also sent personnel to carry out inspections at the 694 pig farms that had been approved for food waste recycling. A total of 183 pig farms were inspected, and all of them were compliant with the regulations. The EPA and the bureaus' personnel also joined with representatives from pig farmers' associations of all counties and cities to carry out patrols and promotion activities in the major food waste recycling pig farms of each county or city.

(2) In light of the trend that environmental crimes are getting more specialized and organized in recent years and having different characteristics in different geographic areas, the EPA invited prosecutors with extensive experience in handling environmental crime cases from local prosecution offices of the Ministry of Justice to serve as advisory members in the "2021 Environmental Crime Investigation Consultation Meeting (Southern Session)" held on 27 April.

(3) On 27 April, the EPA held the "2021 Environmental Crime Investigation Consultation Meeting (Southern Session)". In light of the trend in recent years of environmental crimes becoming more specialized and organized, with different characteristics in different geographic areas, the EPA invited prosecutors from local prosecution offices of the Ministry of Justice, who have extensive experience in handling environmental crime cases, to serve as advisory members. The meeting aimed to strengthen the communication between environmental and prosecutorial authorities by sharing and discussing environmental law enforcement achievements and conduct in-depth review and analysis of individual cases. It also aimed to reinforce environmental law enforcement capacities so as to deter environmental crimes and illegal behaviors and protect local air quality.

10. Major Accomplishments of Resource Recycling and Management

(1) On 9 April, the EPA Operating Guidelines for the Promotion of the Label for Products Made of Recycled Marine Waste was announced. It specifies matters related to the application, review, and management of recycled marine waste products. The main items on application documents are verification statements

and verification reports issued by verification agencies, to verify that the waste used to make the products is sourced from coastal or marine environments. The right to use the label is granted once applications meet the regulations specified in the Operating Guidelines and pass reviews. It is hoped that enterprises identify themselves with the concept of marine waste reduction and recycling and apply for the label for their products out of corporate social responsibility. Public support is also needed to demonstrate Taiwan's determination to protect the oceans.

(2) To monitor the implementation of “cleaning, sorting and stacking” of waste tableware in desert stations and fast food areas set up in the temples along the Mazu pilgrimage route, personnel were sent to Taichung City, Changhua County, Yunlin County, and Chiayi County to gain an understanding of the collection and clearance mechanism of lunch box waste generated from the pilgrimage, and to timely remind local environmental agencies to carry out lunch box clearance tasks.

Along the Mazu pilgrimage route, EPA personnel were sent to Taichung City, Changhua County, Yunlin County, and Chiayi County. The personnel monitored implementation of “cleaning, sorting and stacking” of waste tableware in snack stations and fast food areas set up in the temples to gain a better picture of the collection and clearance mechanisms for lunch box waste generated during the pilgrimage. They also gave timely reminders to local environmental agencies to carry out lunch box clearance tasks. It was verified that all relevant counties and cities had set up recycling stations and related sorting facilities at appropriate locations along the pilgrimage route, and that disposable tableware, paper containers, food waste, recyclables, and general waste were sorted and recycled properly.

(3) On 27 April, a press conference was held on the win-win situation achieved by LCD glass and electroplating industries through the use of water resource recycling and the application of nanoporous glass materials. The conference shared information on technology that converts the glass in LCD monitors, which was previously disposed, into high-quality nanoporous adsorption material, a process that can treat massive amounts of electroplating wastewater produced by the electroplating industry. Resource recycling and reuse were emphasized, and electroplating enterprises were encouraged to adopt this technology so as to create multiple types of value jointly with a circular economy.

(4) On 29 April, local environmental agencies and waste processors were issued and notified of the Evaluation Plan for Recycling Enterprises Handling Regulated Recyclable Waste. The onsite evaluation was scheduled to be conducted at the plants of recycling enterprises between June and September 2021. Model enterprises will be selected onsite by evaluation committee members to encourage enterprises in other counties and cities to emulate and for peers to learn from, promoting the further improvement of the recycling industry.

11. Major Accomplishments of Toxic and Chemical Substances Bureau

(1) On April 7, amendments to “Toxic Chemical Substances Handling Application and Chemical Substances Registration Fee Standards” were promulgated and a press release was distributed for a detailed explanation.

(2) The “Nitrous Oxide Inspection and 2021 Conference on Toxic and Concerned Chemical Substances Operation and Flow Control and Auditing Project” was summoned on April 13, allowing the Bureau to review and share the nitrous oxide inspection results and to exchange experience with local environmental protection bureaus. Besides, the “2021 Chemical Engineering (Raw) Material Industry Counseling and Field Investigation” and the methods and highlights of the “Joint Investigation of Chemical Engineering (Raw) Material Industry Operators Concurrently Selling Food Additives” were presented.

(3) Jointly organized “National Toxic and Chemical Substances Disaster Prevention and Rescue Drill” to simulate the scenario of a toxic substances disaster, based on which a drill was conducted to enhance the Bureau’s overall disaster-relief capacity and to better respond to similar disasters in the future.

12. Major Accomplishments of Soil and Groundwater Pollution Remediation

(1) Explanation meetings were held on 9, 20 and 21 April on the operation of the Soil and Groundwater Information Management System – Site Procedure Control System. A total of 60 people attended the meetings to familiarize local environmental bureaus with the operation of soil and groundwater-related systems. Items on the agenda included: site procedure control systems, particular application functions, alert functions, common site cases, 2021 performance

evaluation systems, hands-on exercises, and exchange and discussions. The meetings were designed to enhance the administrative efficiency of soil and groundwater-related tasks.

(2) An explanation meeting was held on 26 April on oil product identification technology exchange and promotion of gasoline source-tracking analysis methods. Local environmental bureaus, analysis organizations, and technology consultants were invited to attend. One hundred sixteen people participated in the meeting, which promoted the achievements and emphasized the importance of developing oil product identification technologies. These technologies have been applied at domestic sites polluted by oil products to help with source-tracking and policy-making, enhancing pollution investigation and efficiency of remediation.

13. Major Accomplishments of Management of environmental analysis organizations and support for examining important projects

Applications submitted from environmental analysis organizations were processed: six organizations added environmental test items, three renewed permits, two were newly established, and 23 analysis report signatories were added. In addition, 28 permit and 22 report signatory evaluations were conducted. One hundred thirteen environmental analysis organizations (121 laboratories) and 18 motor vehicle testing organizations (21 laboratories) have obtained permits and are in operation.

14. Major Accomplishments of Staff training

(1) Environmental personnel training: to upgrade skills of personnel in all levels of environmental authorities and enterprises, 16 environmental personnel training sessions were held, with 637 people trained on environmental technology, policies and regulations, data applications, administration, and management.

(2) Environmental license training: the EPA conducted air pollution control, and wastewater disposal personnel training for 1,302 people, and 1,024 environmental protection certificates in seven categories were issued. Orientation was conducted for environmental protection personnel and technicians to enable those with certificates that have not used them for over three years to catch up with the latest regulations. A total of 100 people participated in the orientation.

(3) Review for all types of environmental education certification continues: A total of 11,336 people (including 5,041 people certified by the Ministry of Education), 26 institutes, and 209 venues have been certified.

15. Major Accomplishments of Appeals and arbitration

(1) On 13 April, lawyer Hsiu-chun Chen of Root Law Office was invited to give a speech at the EPA. The speech was titled "administrative sanctions and the difference between public and private contracts - and discussion on the legality of a company (branch) being the target of sanctions."

(2) On 19 April, a deliberation meeting was convened concerning damages and compensation over a public nuisance dispute between a fishery and a power generation company.

(3) The Petitions and Appeals Committee conducted its 709th plenary meeting on 23 April, completing deliberation of 28 appeal cases, including six rejected, 21 dismissed, and one withdrawn. The withdrawal rate was 3.57%.

16. Major Accomplishments of Regulation revisions

(1) On 7 April, an official document (EPA Chemical 1108200208) was issued, ordering to commence the revision of the Toxic Chemical Substances Handling Application and Chemical Substances Registration Fee Standards.

(2) On 16 April, an official document (EPA Water 1101035476) was issued, announcing revisions to the Water Pollution Control Act Enterprise Classification and Definitions.

(3) On 23 April, an official document (EPA Inspection 1108000092) was issued, ordering to commence the revision of the Regulations Governing Motor Vehicle Air Pollutant and Noise Emission Testing Organizations.

17. Major Accomplishments of Sustainable development, technological development, and international

development

The National Council for Sustainable Development (NCSO) convened three working meetings at the Executive Yuan on 16, 20, and 30 April. NCSO members and representatives from relevant ministries gathered to discuss the implementation of NCSO tasks in the first half of the year, the progress towards sustainable development goals of the current stage, and other related issues. Each task force and project group of the NCSO was asked to submit reports on work progress in the first half of the year.

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