



Electronic Environmental Policy Monthly

Environmental Protection Administration, R.O.C. (Taiwan)

ISSN: 1811-4008 GPN: 2008600068

The EPM is available at <https://www.epa.gov.tw/mp.asp?mp=epaen>



Feature Article

TCSB's 2nd Anniversary: Building a Safe Chemical Environment

The EPA's Toxic and Chemical Substances Bureau (TCSB) has facilitated the implementation of many important measures since its establishment nearly two years ago. First, in response to food safety concerns, the *Toxic Chemical Substances Control Act* (毒性化學物質管理法) was amended to promote better source management. The TCSB also expanded the capacity of ChemiCloud and inspection and audit functions, coordinated controls for buildings containing asbestos, and improved toxic chemical incident prevention and response measures. In the future, the EPA will continue to work toward realizing its vision of safety management for chemical substances via effective controls to build a healthy and sustainable environment.

Amendment of the *Toxic Chemical Substances Control Act*

The public has long been concerned about the use of chemical substances in food products. In order to further control them at the source, the EPA proposed a draft revision that the *Toxic Chemical Substances Control Act* be changed to

the *Toxic and Concerned Chemical Substances Control Act* (毒性及關注化學物質管理法).

In the revision, existing controls for Class 1~4 toxic chemical substances remain while the "concerned chemical substances" will be newly added with chapters for their own control regulations. After evaluation, harmful chemical substances will be put on

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the control list along with toxic ones, thus expanding the Act's scope and tiered management: Competent authorities will have more inspection powers; a foundation is to be set up for risk prevention and control to raise money; and consulting mechanisms will be strengthened to respond to environmental accidents. Also, the revision reviews the existing responsibilities of central and regional competent authorities, and brings in clauses for whistleblowers, witness protection, public reporting, civil litigation, and the confiscation of illegal gains. After being reviewed by a committee of the Legislative Yuan, the draft passed the third reading at the Legislative Yuan on 21 December this year.

Strengthening chemical substance source control and expanding utilization and functions of ChemiCloud

(1) Gradual chemical substance control and cooperation with local governments on assistance and inspections

At source management is implemented to expand controls in stages and groups. Announcements have been made incrementally, based on different features of chemical substances.

Fifty-seven chemical substances with potential food safety risks were split into two batches in 2017 and 2018, while 27 of them have been announced as Class 4 substances. The users are required to report flows and mention the chemicals on warning labels: "Banned for food" and "Prohibited for food and feed." They must obtain permits for usage before operation, and are not allowed to transfer the goods without authorization in order to be prevented from entering the food chains.

Working with regional environmental bureaus for preventive consultations and visits, the EPA completed 3,102 cases as of 15 December 2018. They included 2,550 consultations and visits to suppliers of chemical raw materials, 268 joint inspections on chemical raw material suppliers selling food additives and 284 consultations during Dragon Boat Festival. In addition, 12 users were counseled as model sites, and 113 consultations and visits were conducted in the feed industry.

Under the guidance of the Food Safety Office, Executive Yuan, the *Action Plan for Joint Inspection on Chemical Raw Material Suppliers Selling Food Additives*, carried out by the EPA and the Ministry of Health and Welfare (MOHW), has screened 268



1. Collecting chemical substances data
2. Reducing risks of chemical substances
3. Enhancing accident prevention and emergency response
4. Promoting clean production
5. Increasing awareness of harmful chemicals
6. Strengthening national chemical substances control policy
7. Enhancing international cooperation
8. Formulating cross-border control strategies
9. Establishing a national inspection and testing unit

▲ Taiwan's chemical substances management and performance is reviewed with nine indicators that align with the UN Strategic Approach to International Chemicals Management

enterprises since 1 July 2018. They were inspected for different aspects of toxic chemical substances control: Four self-management points for chemical substances; food product enterprise registration; labeling for products containing food additives; and three-guidelines for food additive management. All inspections were completely done as of 31 October 2018, and no violations of toxic chemical laws were found. Other violations against the *Act Governing Food Sanitation* have been found by the health authorities and were limited the time for improvement.

(2) Continual updating of the chemical substances database and additional enquiries and scheduled inspections

Between 11 December 2014 and 16 December 2018, the TCSB was in charge of 2,772 registrations of new chemical substances and 15,005 registrations of first-stage existing substances (more than 27,000 existing chemical substances registered). Since 1 October 2018, all the chemical substance registrations and reviews were changed from entrusting other organizations to self-administered by TCSB.

Considering inter-ministerial management needs and trends in international chemical substances registration systems, the EPA preannounced the revision of the *New Chemical Substances and Existing Substances Data Registration Regulations* (新化學物質及既有物質資料登錄辦法) in March 2018. The revision focuses on coordinating Taiwan's chemical substances registration system. Also, 106 widely used existing substances with high potential of harm for which data were lacking would be listed in the first stage to complete the standard registrations and announcement of the registered chemical substances for annual reports.

Since its establishment in June 2015, ChemiCloud has been coordinating and transferring data from 9 ministries and 44 systemic databases. Four main functions, including basic information inquiry, diverse screening for suspected enterprises, cross-area comparison and analysis, and warning, have been set up for the data. It strengthens interdepartmental management and exchange on chemical substances information as each department is able to access relevant information for its operations.

Promotion of asbestos measures and interdepartmental discussions on management of structures containing asbestos

(1) Promotion of asbestos use

Manufacturing, import, sale, and use of crocidolite and amosite have been banned since 26 February 1997. Besides research, testing, and education, all uses of asbestos have been banned as of 1 January 2018.

In 2016, the EPA established the Asbestos Risk Information Platform jointly with the Ministry of Labor, MOHW, Ministry of Economic Affairs, and Ministry of the Interior. A booklet on asbestos risk and prevention promotion was published in 2017 as a result of interdepartmental efforts. Then in 2018, the EPA, the Construction and Planning Agency (CPA) of MOI, and Occupational Safety and Health Administration (OSHA) of MOL, produced a short video, "About Asbestos". They also held three seminars promoting asbestos risk and management of asbestos-containing construction materials in northern, central, and southern Taiwan. The aim was to strengthen education and training of asbestos prevention and protection as well as risk communication with the public.

(2) Interdepartmental coordination on asbestos removal and disposal management

The MOI's Construction and Planning Agency (CPA) assured that all new building materials sold in Taiwan are now free of asbestos. For demolishing, clearing, and disposal of asbestos-containing building materials, the EPA has discussed with the CPA and the Occupational Safety and Health Administration (OSHA), Ministry of Labor (MOL), on systems, regulations, data sharing, and division of responsibilities. The aim is to lower the risk of exposure to asbestos.

Enhancing toxic substances and chemical substances disaster prevention and rescue capacity

(1) Lowering harm and risk of toxic chemical substance disasters

From January 2018 to the end of November, a total of

408 on-site consultations and 205 trials without prior warnings were carried out with help from regional governments to tighten toxic chemical substance risk management and disaster prevention. It was done to supervise and help enterprises improve their substance management. The EPA also assisted enterprises to form joint national chemical substance incident prevention organizations. So far 102 joint organizations have been formed, with over 4,500 enterprises participating.

Handling cross-regional joint preventions, two briefings, 76 joint prevention organization consultations and inspections, and 41 at-site operation trials and trainings for joint prevention organizations; eight trainings for "Northern, Central, and Southern District Joint Prevention and Rescue Teams for Toxic Chemical Disasters". And a total of six sessions were held in the "Northern, Central and Southern District Toxic Chemical Disaster Prevention and Mobilization Seminar."

(2) Incorporating disaster response capacity

Between January and the end of November 2018, the EPA investigated 451 accidents in Taiwan, deployed personnel for disaster response support 44 times, and offered professional emergency consultation and suggestions 195 times. The purpose is to help relevant authorities become familiar with the joint response mechanism and incorporate the response capacity of enterprises in different regions.

Remediation technology enhancement and promotion of international exchanges

In the future, the EPA will continue to promote various measures in stages. These measures include keeping up with farmland pollution, strengthening pollution prevention and control, pursuing liable parties, establishing a soil quality database, holding an inter-ministerial discussion on homeland planning management strategies, and formulating a sustainable protection mechanism for quality soil.

The EPA stays updated on international developments in pollution investigation and remediation technology and introduces new technology suited to the characteristics of Taiwan's pollution sites and remediation needs. Other efforts are directed toward local technology development, improving existing technology, and technological assistance. The EPA has also expanded international exchanges and cooperation, established the Asia-Pacific Regional Soil and Groundwater Pollution Remediation Task Team, and enhanced remediation technology capacity.

Promotion of international exchanges

The EPA promotes chemical substance control with a vision of building a healthy and sustainable environment via effective controls, and hopes to strengthen chemical substance safety management using government policies and resources. Hopefully, chemical substances can be properly used to give a competitive edge in safe international trade while achieving sustainable development.

Waste

International Conference on Sustainable Materials Management and Workshop Held to Display Circular Economy Results

The EPA held the 5th International Conference on Sustainable Materials Management (SMM) and SMM Workshop. The conference focused on the plastic issue. Officials, experts, and guests from various countries discussed the latest trends in circular economy and declared the goal of total control of plastic disposables by 2030. At the same time, the workshop investigated cooperation between private and public sectors, and between nations under international partnership mechanism so as to achieve a circular economy via SMM.

Experts from different countries discussed a Circular Economy of Plastic

Under the International Environmental Partnership (IEP) Program's framework, the EPA held the 5th International Conference of SMM in the GIS Convention Center of the Ministry of Transportation and Communications on 19 November 2018. The topic this year was "From Waste to Valuables: Redefining Plastics for A Circular Economy". Government representatives and scholars in various industries from Taiwan, the EU, the Netherlands, New Zealand, Japan, Germany, and the US all attended and discussed the issues of plastics and a circular economy.

Taiwan has always been a strong advocate of a circular economy. To respond to the strong emphasis placed on a plastic circular economy by the UN, EU, OECD, and various global organizations, the EPA began from improving the production concept, creating an eco-consumption model, and strengthening recycling systems. It also announced that a total ban on plastic disposables will be implemented in 2030 and that measures to reduce the use of plastic products will be expanded in 2018. A total ban on plastic-microbead-containing products came into effect in July 2018 to build a well-rounded plastic circular economy and recycling industry to maintain the environment and ecosystems.

Professor Shin-Cheng Yeh, a former EPA Deputy Minister as well as Director of the Graduate Institute of Environmental Education of National Taiwan

Normal University, was invited as the keynote speaker to share the core methods to promote a circular economy. In addition, strategies of plastic management and innovative technology were discussed among the attending local and foreign experts. Anestic Filopoulos, Policy Official of Grow at the European Commission, talked about Europe's plastic control strategies. Herman Huisman, senior advisor for international projects of the Ministry of Infrastructure and Environment in the Netherlands, shared his country's plan on a plastic circular economy. Akira Sakano, Director of Zero Waste Academy in Manikatsu, Takushima, told attendees about the zero waste movement in Japan. Jay Hadfield, Investment Manager of the New Zealand Ministry for the Environment, discussed New Zealand's journey on developing a circular economy for plastic resources. Moreover, plastic industry representatives from Remondis, Dupont, Carrefour, and Horng En Group were present to discuss the issue of expanding manufacturers' responsibilities and building a plastic value chain to generate business opportunities for plastic materials.

Cooperation between private and public sectors and among nations to create a partnership mechanism

On 20 November 2018, the SMM Workshop was held by the EPA with representatives and guests from various countries. The event focused on promoting



▲ Opening of International Conference of SMM

cooperation between private and public sectors, as well as among nations under the IEP mechanism.

On cooperation between the private and public sectors, the discussion was on how governments and enterprises can work together to cut down plastic waste and relevant costs. Attendees also looked into how to promote SMM and a circular economy with smart technology via international cooperation among nations, as well as intensify bilateral and multilateral cooperation.

After the workshop, attendees headed to 2018 Taichung World Flora Exposition to visit venues featuring ideas related to a circular economy. The Humanitarian Eco-Tech Pavilion exhibited manufacturing, recycling and remanufacturing of

plastic bottles by the recycling industry, and how they went from scraps of recycled bottles at the beginning, granules, yarn, and fabric, to eco-products at the end.

The Netherlands Pavilion displayed various energy-conserving and green energy technologies like a pneumatic vacuum elevator, aquaponic farms, edible landscapes, sun-blocking vine walls. In addition, all equipment in the venue is mostly rented, instead of bought, to demonstrate the new business model and circular economy that emphasize service. Nearly all building materials could be used repeatedly and would be used in the Taiwan Circular Design Zone in Taisugar's factory in Yuemei, Taichung, after the pavilion is demolished once the exposition ends.

Environmental Monitoring

Central and Regional Governments Monitor Pollution with Internet of Things and Smart Inspection

In 2018, 3,200 sensors were installed as part of the Internet of Things (IoT) for environmental monitoring. The public can check for real-time air quality by visiting the EPA's iEnv website. The EPA stated that it finished building the air pollution sensing IoT by working with 13 regional environmental bureaus and can now monitor over 30,000 factories that are under control. The effort is to aid environmental law enforcement with big data analysis and AI technology. It has also led the Environmental Police Unit (EPU) to discover 12 violations.

The EPA has been constructing its sensing IoT to provide the public with information on local air quality. By October 2018, sensors were installed in 2,500 locations in four municipalities (New Taipei, Taoyuan, Tainan, and Kaohsiung) and nine counties (Yilan, Keelung, Hsinchu, Miaoli, Yunlin, Chiayi, and Pingtung). In addition to the 700 sensors set up in 2017, the total monitored area covers over 30,000 factories under control across 120 towns, 44 major industrial zones and science parks.

To effectively investigate pollution sources, the EPU utilizes data from environmental management systems and various technologies based on pollution types, and conducts inspections and investigations by monitoring data from sensing IoT. Violations of 12 enterprises were discovered in 2018, leading to issuing of penalties. Also, the EPA will form the *In-Depth Inspection Plan for Stationary Pollution Sources* to target enterprises that have installed automatic continuous emission monitoring systems

(CEMS) according to the regulations. Enterprises with large emissions are screened out and have their regularly reported air pollutant emission data compared. The plan will also analyze big data such as regional air quality changes and petitions in order to conduct inspections on possible pollution sources, punish violating enterprises, and improve air quality.

The EPA noted that it has cracked down on multiple violation incidents by combining environmental sensing IoT and smart detection functions. It proves that the sensing IoT can aid environmental law enforcement and produce tangible results. People can now go to the EPA's iEnv website (<https://ienv.epa.gov.tw/>) to find the latest PM2.5 data, which is updated at the sensor's spots every three minutes. The public can find air pollution sources with changing data and trends to take part in air quality improvement efforts.



 The EPA's iEnv website (<https://ienv.epa.gov.tw/>)

Environmental Monitoring

The Environment IoT Summit Held for Industry Innovation

On 16 and 17 November, the EPA organized the Environmental IoT (EIoT) Summit, which featured discussions on international cross-industry trends and future application scenarios. The results of the EPA's utilization of IoT on environmental inspections were also on display to show the effects of smart law enforcement.

The EIoT and Industry Innovation Summit took place in the Chang Yung-Fa Foundation International Convention Center; it featured five topics covering different stages of constructing a sensor IoT. They included international trends of environmental application, cross-field smart installation, optimization via innovative technology, component research and connection among industries, and technological connection for industry development. Inside the venue, there were also interactive exhibitions under four themes: component research, installation and promotion, model development, and scenario experience. A section was specifically set up for industries and research and development teams to talk about technological assessments and patents to promote cooperation between different fields.

The Summit invited experts and scholars from the Netherlands Trade and Investment Office (NTIC), MOTC's Institute of Transportation (IoT), and the Industrial Technology Research Institute (ITRI), who discussed international trends of smart environmental technology, as well as business opportunities to develop the EIoT industry. Besides displaying EIoT sensing component development results of the Ministry of Science and Technology (MOST), the

Ministry of Economic Affairs (MOEA), and the EPA, the venue also had a section for industries to exchange and explore EIoT business opportunities.

The EPA demonstrated its results of using EIoT technology on environmental inspection, including the 2,500 sensors installed in 2018 to provide PM_{2.5} data every three minutes and the newly-developed platform showing air quality monitoring data. The platform incorporates air quality sensing data, pollutant release and transfer registers (PRTR), continuous emission monitoring systems (CEMS) for stationary sources, petitions of public nuisance, and wind fields and directions. Real-time data captured by sensors, time and space changes, pollution potential, and real-time warning information are all shown in visual motion maps, which are able to gradually enhance environmental inspections as an example of smart law enforcement. As 12 enterprises that violated regulations were discovered and received penalties in 2018, the summit also had the Environmental Police Unit and the environmental bureaus of Taoyuan and Kaohsiung share their experiences.

The EPA mentioned that future application of EIoT would start from existing air pollution hotspot analysis

technology and further expand to water quality pollution monitoring. The ultimate goal is smart environmental management combining air and water IoT. Smart urban developments in foreign countries

will also serve as references to gradually apply environmental sensing data on health maintenance and smart transportation.

Climate Change

Draft Preannounced Concerning Best Available Technology for Emission Sources

The EPA aims to allow newly established factories or expansion of existing factories to respond to the greenhouse gas cap scheme as early as possible by referencing international reduction technology. Based on Article 20 of the *Greenhouse Gas Reduction and Management Act* (溫室氣體減量及管理法), the draft of *Best Available Technology (BAT) for Greenhouse Gas Emission Sources* (溫室氣體排放源最佳可行技術) was preannounced on 27 November 2018. It designates that regulations concerning BAT enterprises are required to be adopted.

According to the Act, the central competent authority may reserve partial allowances and may allocate specific scales of new entrants or modified emission sources for designated entities, which are also required to adopt the designated BAT. The EPA has taken reference from international categories of reduction technologies, the *National Climate Change Action Guidelines* (國家因應氣候變遷行動綱領), energy development guidelines, and actual practices of Taiwan's industries. The draft plans to list several technological options. They include natural gas, low-carbon energy, installation or use of renewable energy, technologies recycling, reusing, or destroying or removing greenhouse gas, or more

energy-efficient manufacturing processes. Based on categories of existing targets under control or inventory, technological options for different industries' manufactories are listed to enable enterprisers to follow.

The content of the draft can be divided into BAT categories that emission sources should adopt as well as regulations on required documents to be submitted to the central competent authorities for those not listed as BAT. The EPA particularly reminds enterprises planning for future factory expansions to adopt BAT as early as possible so as to cut down carbon emission and prepare for the coming cap control.

Water

Water Pollution Control Measures and Test Reporting Management Regulations Amendment Drafted

On 9 November 2018, the EPA formulated the draft revision of the *Water Pollution Control Measures and Test Reporting Management Regulations* (水污染防治措施及檢測申報管理辦法) to simplify the registration process. The goal is also to expedite the use of gas fluid and compost as fertilizers on agricultural land and to respond to the need to manage testing, measuring, and monitoring frequency by level, considering the rationalization of industrial characteristics and testing fees.

The Regulations have been through six revisions since their promulgation in 2006. For using livestock waste sediment and fluid as farmland fertilizers, the soil and groundwater monitoring fee is higher than the water pollution fee, and its application process is more complex than paying water pollution fees. It affected small-scale pig farms' willingness to make

livestock sediment and fluid fertilizers. The application is split into two phases. First, a wastewater or sewage management plan must be submitted to apply to treat wastewater or sewage to be reviewed by environmental authorities. Then a utilization plan is to be submitted to apply for fermentation sediment and fluid to be reviewed by agricultural authorities.

There is a need to simplify the application and management procedures for small hog farms in fertilizer use, in order to lighten farms' administrative load and expedite the use of livestock sediment and fluid as farmland fertilizers. Management by level based on farm size and simplification of testing and monitoring operations strive to push for a circular economy in the livestock industry.

The EPA announced the revised *Effluent Standards* (放流水標準) on 25 December 2017, as a response to revision of the *Water Pollution Control Act* (水污染防治法) on 13 June 2018. A need also exists to manage testing, measuring, and monitoring frequency level based with consideration of industry characteristics and testing fees. The revision formulated by the EPA includes the following focuses:

1. Definition of "agricultural land" is amended as lands used for farming, forestry, culture, livestock farming, and conservation.
2. Plans to cut down runoff wastewater on construction sites should be sent online starting on the date specified by the EPA.
3. The EPA hopes to encourage small-scale livestock enterprises to accept excrement resource treatments as well as simplify application for those with fewer than 200 pigs. A wastewater and sewage management plan for fermentation sediment and fluid must be submitted without further submission of a plan using fermentation sediment and fluid as fertilizers. The draft also waives providing fermentation sediment and fluid, and testing its quality, quality of water for irrigating farmlands, and soil quality for background and monitoring data. Competent agricultural authorities in municipality, county, and city governments will participate in the reviews. Also, regulations will be specified for applying for, modifying, and stopping use, as well as competent authorities' reviews, monitoring, and other responsibilities.
4. Periods banning wastewater discharge are specified for enterprises with major violations that do not finish installing automatic monitoring or testing facilities within the required time.
5. Equipment for calculating and testing water quantity should be calibrated at least once a year to maintain data credibility.
6. It specifies that targets for use of fermentation sediment and fluid exclude livestock enterprises with fewer than 200 pigs.
7. For enterprises raising cows or over 200 pigs, testing for quality of fermentation sediment and fluid, as well as soil and groundwater monitoring frequency, will be managed by level. The management is based on the risks and quality of affected soil and groundwater, as well as monitoring fees.
8. For regulations relevant to groundwater testing, the part on targets applied is removed, while testing and reporting items, as well as operational qualifications to conduct water quality and quantity testing and resting, are added. Testing, measuring, and monitoring frequency are managed by level in consideration of industry characteristics and testing fees.
9. Enterprises with fewer than 200 pigs, which transport fermentation sediment and fluid based on items on wastewater and sewage management plans, do not have to comply with the regulations on industrial waste reuse in the *Waste Disposal Act* (廢棄物清理法).

Table: Soil and Groundwater quality monitoring frequency for those using fermentation sediment and fluid

Use of farmland fertilizers	Fertilizing amount allowed (tons/year)	Groundwater monitoring frequency	Soil monitoring frequency
Fermentation sediment and fluid	$\leq 2,000$	Once/2 years	Once/2 years
	2,000~6,000	Once/year	Once/year
	$\geq 6,000$	Once/6 months	Once/year
Only fluid as fertilizers	$\leq 6,000$	Once/2 years	Once/2 years
	6,000~18,000	Once/year	Once/year
	$\geq 18,000$	Once/6 months	Once/year

Storage Tanks and Vehicles Help Turn Liquid Gas and Compost into Resources

Vehicles and farmland storage tanks have been delivered and used to fertilize fermentation sediment and fluid made from livestock manure. They were purchased by Kaohsiung City Government with subsidies from the EPA to turn excrement into valuable resources.

To increase the use of livestock manure as a resource, Kaohsiung City Government bought two vehicles, each of which has four-ton loading, five fertilizing machines, and ten farmland storage tanks. This diversified service not only increases the convenience and incentives to use livestock waste sediment and fluid as fertilizers, but also replaces chemical fertilizers and organic ones. It also helps raise crop production and decrease soil acidification.

Problems mentioned in the livestock industry and by farmers include lack of transporting and fertilizing vehicles, as well as difficulty fertilizing crops at the desired time. In response, the EPA began subsidizing regional governments in 2018 to purchase collecting vehicles, fertilizing vehicles or machines, and farmland storage tanks to provide fermentation sediment and fluid transporting services to livestock industry and farmers. Moreover, the livestock industry, farmers, or civil groups can apply to buy these vehicles and storage tanks to transport and store these fertilizers and operate according to crop fertilization schedules. So far, a total of 20 collecting and fertilizing vehicles and 64 farmland storage tanks have been purchased across Taiwan in places like Kaohsiung, Taichung, Yunlin, and Pingtung.

The EPA has been promoting the use of fermentation sediment and fluid from livestock manure as farmland fertilizers. Until 7 December 2018, a total of 461 livestock farms obtained permits to use livestock waste sediment and fluid as fertilizers. For the use of livestock manure as resources, there are cases of agricultural waste reuse in 73 farms as well as 49 farms that comply with the effluent standards on recycling these wastes to fertilize crops.

Also, 583 livestock farms in Taiwan have adopted practices to turn livestock excrement into resources, applying 3.01 million tons of fermentation sediment and fluid on 1,751 hectares of farmland.

Meanwhile, the EPA has been working on cutting down organic pollutants discharged into rivers by reducing 18,548 tons every year. This is equivalent to the amount of reduced pollution resulting from 339 gravel contact oxidation treatment facilities, each with a 10,000-ton daily capacity. The livestock industry can save NT\$139 million on electricity used in aeration during the third wastewater treatment facility and NT\$15.87 million of water pollution prevention fees every year. Farmers can cut down NT\$25.8 million on fertilizers every year. It will produce a multi-win benefit with cleaned-up rivers and odor-free air.

As small-scale livestock farms lack technology and manpower to treat wastewater, the EPA subsidizes large-scale farms to handle treatment on behalf of smaller farms or on centralized treatment. For centralized treatment, there was one case in Hualien County and, for large farms handling treatment for



▲ The EPA began subsidizing regional governments to purchase collecting vehicles, fertilizing vehicles or machines.

smaller ones, there was one case in Taoyuan City and two in Pingtung County. Altogether, they treated manure from 35,212 heads of livestock. Regional governments where the four cases were located have

signed contracts with installing enterprises and began building treatment plants, which are expected to be completed by the end of 2019.

Waste

Revisions to Review Regulations for Industrial Waste Disposal Plan Announced

The EPA promulgated the *Management Regulations for the Review of Industrial Waste Disposal Plan* (事業廢棄物清理計畫書審查管理辦法) on 16 Nov 2017 to strengthen source regulation for reuse organizations. The regulations combined examinations of reuse with the industrial waste disposal plan. On 27 Nov 2018, the EPA announced revisions to two items for the benefit of practical operations. For more details, see the full announcement at the following link (<https://bit.ly/2RBxdkS>).

The key points of the revision include complying with the objectives of the regulations on enterprises from competent authorities, revising the designated enterprises announced and responding to the addition

of reuse examinations to the industrial waste disposal plan. In addition, the application process for control numbers has been unified.

Recycling

Revisions to the Scope of Responsibility for Enterprises' Products and Packaging Preannounced

In response to the market's tendency to continually develop new products and confirm the scope of enterprises' responsibility, the EPA preannounced revisions to *Scopes for the Articles and the Packaging and Containers Thereof and the Enterprises Responsible for Recycling, Clearance and Disposal* (物品或其包裝容器及其應負回收清除處理責任之業者範圍). Products including air conditioners, heaters, electric fans, personal computers, laptops, and tablets will be added. Additionally, the definition of responsible enterprises for dry cell batteries was revised. Responsible enterprises are to follow regulations set forth by the *Waste Disposal Act*, declaring and paying recycling and disposal fees. These revisions were undertaken to create a resource recycling system, expand the producer's responsibilities and facilitate the development of a circular economy.

The main points of the revisions are listed below and will take effect on 1 July 2019:

1. Revised definition of air conditioner and heater; added portable air conditioners and heaters to items for regulation in compliance with regulations
2. Revised electric fan to be an item that has an electric motor with output standards between 10 and 125 watts; added direct current electric fans.
3. Revised definition of portable computer to include laptops and tablets with a screen that exceeds 6.5

inches diagonally, but is less than 17.4 inches.

4. Expanded the scope of personal computer to include desktop computers, all-in-one desktop computers, thin clients, and portable all-in-one computers with a screen that exceeds 17.4 inches.
5. Recycling and disposal fee for dry cell battery packs. The manufacturer or importer of battery packs is responsible for declaring and making payments.

Environmental Inspector

Inspecting Areas with Worsening Air Quality in Northern, Central and Southern Taiwan

With the recent worsening of air quality, the Bureau of Environmental Inspection has established a response team that will continue to collaborate with local government response centers. These groups will improve control and audits of air pollution. In addition, the EPA has planned audits of large pollution sources. To gain a fuller understanding of the situation and punish enterprises for illegal emissions, the EPA will conduct in-depth and comprehensive audits of air pollution sources nationwide.

In response to the recent worsening of air quality in certain areas (as seen below), the Bureau of Environmental Inspection will improve air pollution audits and restrictions.

- North: Shulin District, New Taipei City; the plastic industry in Guishan District, Taoyuan City; and

the glass production industry in Xiangshan District, Hsinchu City

- Central: The densely populated Houli District, Taichung City; Taichung's industrial area; and large stationary pollution sources in Taichung Harbor Related Industrial Park



▲ Inspecting the manufacturing components in a large stationary pollution source

- South: The southern audit focuses on the petrochemical industry for its particular characteristics in Kaohsiung City's Linyuan, Dafa, and Renwu Districts. It also investigates the plastic industry in Chiayi County's Hsingang area

Electronic Environmental Policy Monthly R. O. C. (Taiwan)

Publisher

Ying-Yuan Lee, Minister

Editor-in-Chief

Huichen Chien

Executive Editors

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