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Feature Article

Current Status on Soil and Groundwater Pollution Control

Regarding the status of soil and groundwater pollution remediation in Taiwan, a total of 8,794 polluted sites have been announced and listed on the EPA's control list, and among them 80% have been improved. Among the 1,771 sites that are still on the list, 83% are farmlands and the rest are industrial sites. The majority of the industrial sites are factories and gas stations. The farmlands that are still listed are mostly located in Taoyuan City and Changhua County, and the EPA estimates that all listed farmlands will be fully improved by the end of 2021.

Environmental protection has been pursued for over two decades in Taiwan. Economic development has led to worsening pollution and more strain on the environment. With insufficient waste treatment and disposal facilities, random waste dumping has caused soil and groundwater pollution that society needs to tackle urgently.

Groundwater pollution control strategies include promoting the legislation of groundwater pollution regulations, continuing to monitor sites currently undergoing remediation, and encouraging new gas station operators to install groundwater pollution prevention facilities and conduct self-monitoring. The EPA is also subsidizing city and county governments based on the approved plans to set up groundwater monitoring stations, in order to get a basic

I. Groundwater pollution control strategies

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understanding of regional groundwater background water quality.

Based on the *National Environment Protection Plan* (國家環境保護計畫), groundwater protection tasks aim to complete the groundwater protection system and strengthen water quality monitoring and remediation. Groundwater pollution prevention and management tasks, such as groundwater background data monitoring and taking measures that prevent enterprises from polluting groundwater, are implemented in accordance with the *Water Pollution Control Act* (水污染防治法).

The *Soil and Groundwater Pollution Remediation Act* (土壤與地下水污染整治法) mainly regulates the remediation and control of groundwater pollution areas. It includes groundwater quality monitoring, investigation, pollution control scope setting, and remediation work. With both the *Soil and Groundwater Pollution Remediation Act* and the *Water Pollution Control Act*, the groundwater protection system can be further refined, and groundwater quality monitoring and pollution remediation tasks can be enhanced.

1. Current status of listed pollution sites

Based on the *Soil and Groundwater Pollution Remediation Act*, a total of 8,794 sites had been listed for control by 30 September 2020. To date, 7,023 sites (80%) have been improved and delisted, leaving only 1,771 sites (20%) on the list. Among the sites that are still listed, 1,365 sites (77%) are farmlands and 406 sites (23%) are industrial sites. The majority of the industrial sites that are still listed are factories and gas stations.

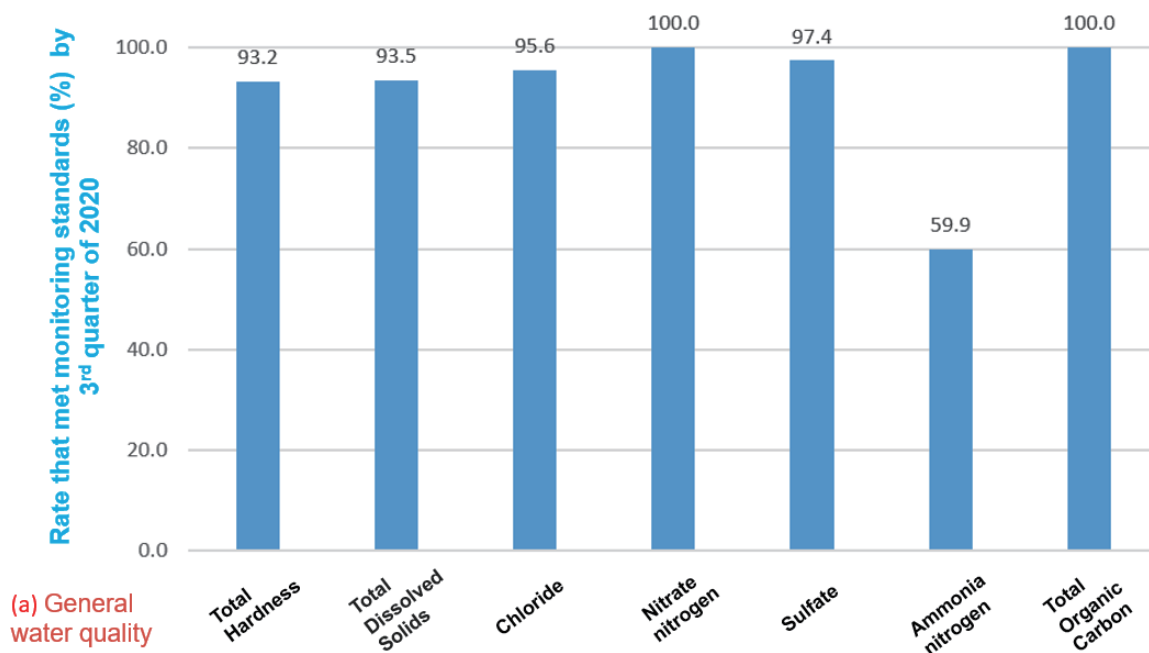
2. Pollution site remediation and management

(1) Farmlands

The assessment conducted on all 800,000 hectares of farmland in Taiwan in 2010 showed 21,000 hectares with high heavy metal pollution potential. A total of 1,185 hectares of farmland had been listed for control by 30 September 2020, of which 977 hectares have been improved and delisted. The rest 208 hectares that are still listed are mainly located in Taoyuan City and Changhua County, and are expected to be fully improved by the end of 2021.

(2) Industrial pollution sites

1,009 industrial pollution sites, covering 2,088



▲ Regional monitoring wells from the first quarter to the third quarter of 2020, and the testing results that met the *Groundwater Pollution Monitoring Standards* (a)

hectares in total, have been improved and taken off the control list. For the 406 sites (1,381 hectares) that are still listed, individual plans for improvement, control, or remediation based on pollution types have been submitted. Their improvement and delisting will be implemented according to the approved plans.

3. Control measures

(1) Color signal control system for industrial parks

To enhance regional control of soil and groundwater quality, competent authorities are responsible to regularly monitor pollution trends within their jurisdictions under set regulations. As of August 2020, the monitoring rate reached 99.5% in all of the 160 designated industrial parks in Taiwan. A color signal control system is in place in industrial parks based on current testing status and control results. The latest results showed a red light at five sites, orange at 13 sites, yellow at 25 sites, and green at 117 sites. The percentage of industrial parks with green lights has increased from 69% in 2017 to 74% in 2020, and that of parks with red, orange, and yellow lights combined has decreased from 31% to 26% after years of promoting improvements. The EPA will continue to supervise industrial parks to strengthen pollution prevention and control.

(2) Storage facility control

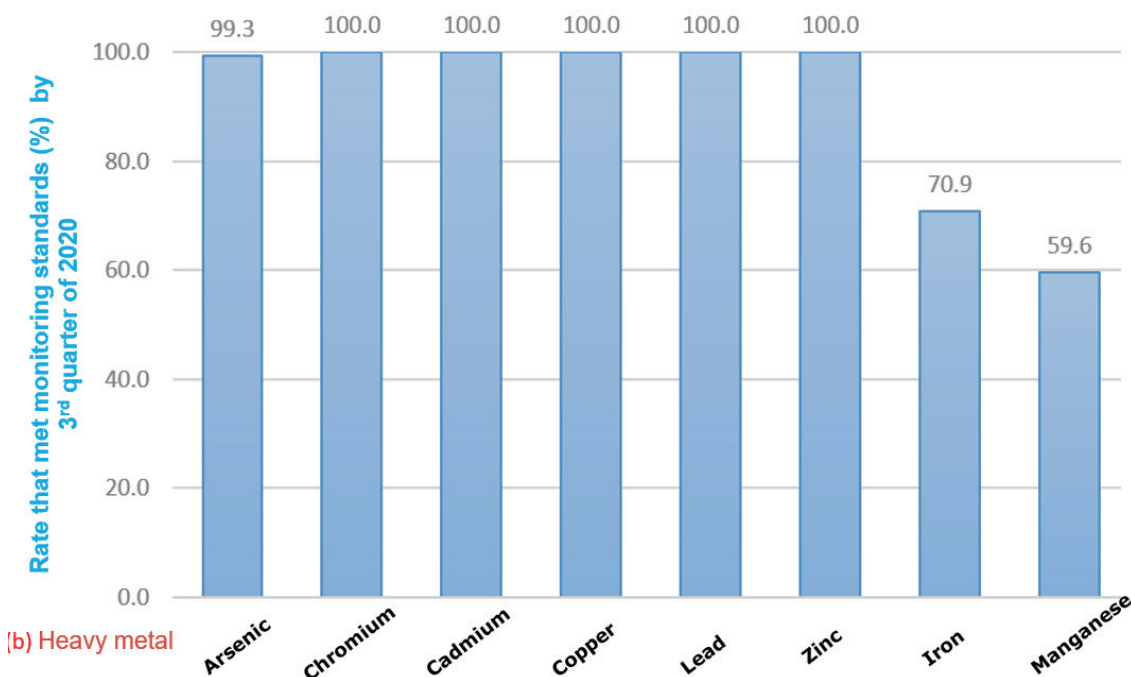
To prevent above-ground storage tanks from causing soil and groundwater pollution, the EPA added and amended relevant regulations to integrate controls on above-ground and underground storage tanks. This was to enhance the effectiveness of pollution prevention facilities and leakage monitoring to firmly implement pollution prevention tasks.

(3) Groundwater quality control

A total of 232 samples were taken from regional monitoring wells from the first quarter to the third quarter of 2020, and the testing results that met the *Groundwater Pollution Monitoring Standards* (地下水污染監測標準) (Category 2) was 93.1% on average as of the third quarter 2020.

(4) Sediment quality control

The first round of sediment quality testing, conducted on 473 sites that include 83 sites at rivers, 91 sites at lakes and reservoirs, and 299 sites at irrigation ditches, was completed between January 2014 and December 2019. The testing result submissions rate reached 100%. The EPA will keep supervising the second round of testing and report submission.



(b) Heavy metal Regional monitoring wells from the first quarter to the third quarter of 2020, and the testing results that met the *Groundwater Pollution Monitoring Standards* (b)

In 2013, the EPA formulated regulations stipulating that the industry competent authority of each water body should regularly inspect the sediment quality of the water body at least once every five years. As of the end of August 2020, 565 water body sediment quality declarations had been completed, which met the target of implementing 500 national sediment quality inspections in 2020 as prescribed in the Taiwan Sustainable Development Goal Corresponding Indicators. The EPA will continue to supervise the sediment inspections and declarations.

Future prospects

Based on the EPA's announced policies for 2021, the EPA will continue to implement the following measures to promote soil sustainability: expediting restoration of soil and groundwater pollution sites, ensure sustainable use of the Soil Pollution Fund, actively carry out remediation and protection work on polluted soil and groundwater, and keep track of pollutants and sediment quality.

Water Quality

The EPA Wins Presidential Hackathon Award for Its Water Refill Map App

When one is thirsty outside, he or she can open the app "Water Refill Map" on a mobile phone and find the nearest spot where clean drinking water is free to use. Developed by Fong Cha Action, a team formed by the EPA and the social enterprise CircuPlus, the app has won the 2020 Presidential Hackathon Award out of over 300 competitors. The EPA was the only government agency that won the honor this year, and received the award from President Tsai Ing-Wen on 20 September 2020 along with four other winning teams.

Heading the panel of judges, Minister Without Portfolio Audrey Tang pointed out that the EPA's advocacy for open data, along with its help coordinating local

environmental bureaus to collect data on all drinking water refill spots, have provided a strong footing for Fong Cha Action. Besides collecting the data



▲ "Water Refill Map", developed by the EPA and the social enterprise CircuPlus, received an award from President Tsai Ing-Wen on 20 September 2020.

on existing water stations, the team also initiated multilateral cooperation through crowd sourcing, inviting enterprises, Friendly Stores, and the general public to share information on any drinking water refill spots.

The team's name "Fong Cha", which means "serve tea" in Chinese, reminds people of well-known Taiwanese hospitality. The entire project is the embodiment of such warmth and willingness to help others, and with the help of open-data technology

the app makes finding drinking water much easier for people, while also reducing plastic use and greenhouse gas emissions, which are among the goals of the Green Lifestyle Movement.

Taiwan consumes a billion bottles of drinking water per year, not counting bottles for other beverages. Cutting the use of bottled water by a mere 1% per year can lower carbon dioxide emissions by approximately 895 metric tons.

Air Quality

Revised Air Quality Standards Announced

The EPA announced the amendments to the *Air Quality Standards* (空氣品質標準) which were made based on the current air quality levels in Taiwan and the improvement plans of the government. Risks to human health and the standard-setting trends of advanced countries were also taken into consideration. The amendments eliminated the standard for total suspended particulates (TSP) and revised the standards for PM₁₀, sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and lead. Stipulations on determining whether the eight-hour average concentration standard for ozone (O₃) is met were also added.

The EPA explained that, according to the suggestions of the World Health Organization (WHO), national air quality standards should be set based on factors such as the human health risks of local air quality, status of pollution sources, technological feasibility, and social and economic developments. Therefore, the EPA has revised the Standards in line with the suggestions of the WHO as well as in line with the global trends in air quality control and similar regulations in Japan and Korea.

Taking air quality standards of other countries as references, the amendments lowered the daily average PM₁₀ limit from 125 µg/m³ to 100 µg/m³ and reduced the annual average limit from 65 µg/m³ to 50 µg/m³. For SO₂, the maximum one-hour average concentration was lowered from 250 ppb to 75 ppb and the maximum annual average concentration from 30 ppb to 20 ppb. For NO₂, the maximum one-hour average concentration was lowered from 250 ppb to 100 ppb and the maximum annual average from 50 ppb to 30 ppb. And for lead, the air quality standard was set at 0.15 µg/m³ as a rolling three-month average. Moreover, the EU's eight-hour concentration standard for ozone is 120 µg/m³ (equivalent to 61 ppb), which is roughly the same

as Taiwan's 60 ppb. Therefore, the amendments adopted the EU's determination method on ozone standard compliance, and stipulated that "within a specific region, the highest daily eight-hour average ozone concentrations recorded by each regular air quality monitoring station are arranged in order from the lowest to the highest; the value corresponding to the 93rd cumulative percentage is to be used to calculate the average over three consecutive years". This will be the way used to determine whether the 8-hour concentrations of ozone meet the standard in Taiwan.

The EPA stressed that it will continue to take opinions from all circles, observe the WHO suggestions, and refer to local and international research results and control trends in reviewing the *Air Quality Standards*, which must be reviewed at least once every four years in accordance with the *Air Pollution Control Act* (空氣污染防治法).

Chemicals

Revisions Concerning *Toxic Chemical Substances Handling Application and Registration Fee Standards* Preannounced

On 22 September, the EPA preannounced the revisions of the *Toxic Chemical Substances Handling Application and Chemical Substances Registration Fee Standards* (毒性化學物質運作申請及化學物質資料登錄收費標準). The revisions will clearly specify the fees for the accreditation of professional response and consulting agencies (organizations) for environmental incidents, and add multiple measures to simplify the application procedures and provide more incentives for the public.

The EPA explained that the amended *Toxic and Concerned Chemical Substances Control Act* announced on 16 January 2019 added the accreditation system for professional response and consulting agencies (organizations) for environmental incidents. In addition, the *Regulations Governing Accreditation and Management of Professional Response and Consulting Agencies (Organizations) for Toxic and Concerned Chemical Substances in Environmental Incidents* (毒性及關注化學物質環境事故專業應變諮詢機關 (構) 的認證及管理辦法) was announced on 3 March 2020. The revisions will clearly set the accreditation fees.

The revised *Permit Registration and Approval Regulations for Toxic and Concerned Chemical Substances* (毒性及關注化學物質許可登記核可管理辦法), announced on 15 January 2020, amended the way permits, registration documents, and

approval documents are approved and issued to “one document with multiple substances”, allowing multiple substances to be registered together with the issuance of a single document. The purpose was to simplify the administrative procedures and reduce the application costs since enterprises that handle multiple chemical substances are required to apply and pay just once for a single document.

The EPA also mentioned that the draft revisions added incentives concerning the review fees for registering the handling of chemical substances to encourage enterprises to reduce the use of animals in tests. And after considering the inputs of all stakeholders and evaluating the issues, the revisions also reduced the application fees for extending the confidentiality period of registration information and for renewing the simplified registration.

Ecolabeling

Private Sector Green Procurement Spending in 2019 Reached Record High

The EPA held a ceremony on 30 September 2020 to recognize enterprises and organizations that successfully promoted green procurement and green consumption in 2019. As many as 106 private sector entities were recognized. They included 20 entities that have supported the Green Mark system for 20 years, organizations that registered over NT\$50 million in green procurement in 2019 and green stores with excellent performances in 2019.

To encourage all citizens to practice green consumption, the EPA has since 1992 promoted the Green Mark to make it easier for consumers to identify green products. Currently, there are over 4,700 products with valid Green Mark certification in the market. In addition, since green procurement was one of the focuses of the EPA’s green

consumption promotion, the EPA has also been pushing private enterprises and organizations since 2007 to practice and register green procurement. After years of promotion, the 2019 expenditure of private enterprises and organizations on green procurement reached NT\$34 billion, with a total of 2,326 private entities having registered the spending. Both the spending

and the number of the registered private entities reached record highs. Moreover, in an effort to make it more convenient for consumers to practice green consumption, the EPA has also been promoting the Green Store system since 2008 to encourage the public to buy green products. In 2019, the sales of green products in Taiwan amounted to NT\$55.8 billion.

Implementations of the above policies rely on the support and efforts from the private sector. For instance, Taiwan Green Device Co. and Chen Chi Electro-Chemical Co. have continuously applied for

and supported the Green Mark for 20 years and have been manufacturing high-quality green products. Other companies, such as Chung Hwa Pulp Corporation, Far Eastern New Century, and Uni-President, have also been practicing green procurement for years.

In addition, green stores like Fuji Xerox (Taiwan), Tatung Consumer Products (Taiwan) Hwashia branch in Kaohsiung, and ELife Mall Digital City Mintsu branch have been actively promoting green products, raising the public's awareness of environment-friendly products and creating a market for green consumption.

Waste Management

Ban on the Import of Mercury-Containing Products Announced

To align with the international trend in mercury control, which is to gradually limit and eventually ban it, and to comply with the *Minamata Convention on Mercury*, the EPA announced the *Restrictions on the Import of Mercury-Containing Products* (限制含汞產品輸入) on 25 August 2020. The new rules tighten mercury control in Taiwan by banning the import of mercury-containing switches and relays, high-pressure mercury lamps, and non-electronic measuring instruments such as barometers, hygrometers, pressure gauges, thermometers, and sphygmomanometers from 1 January 2021. Violators will be fined NT\$60,000 to NT\$300,000.

Mercury and its compounds are mostly used in measuring instruments, electric appliances, and electronic products, but the use of mercury-containing products has been on a decline with the development of electronic instruments and consumer electronics. Since mercury is persistent and bioaccumulative, once it enters the human body through inhalation or ingestion, it is difficult to be excreted, and may cause nausea, vomiting, and abdominal pain. Accumulation over a long period can damage the brain, nervous system, and organs like liver, kidneys, and lungs. Without proper collection and treatment, mercury can circulate in the environment, causing pollution and harming humans. For these reasons, the EPA has taken control measures in accordance with the *Minamata Convention*.

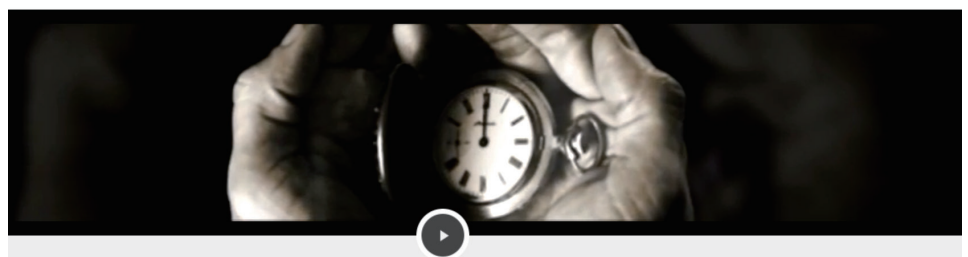
The EPA noted that the importation and sales of mercury thermometers have

been restricted since 2008. Due to the harm mercury can cause the environment and human health, the Toxic and Chemical Substances Bureau further announced the revised *Toxic Chemical Substances Listed for Control and Relevant Operations and Management* (列管毒性化學物質及其運作管理事項) on July 2019, banning the manufacturing of mercury-containing products after 1 January 2021. The announcement this time further imposed the ban on the importation of mercury-containing products after



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1 January 2021 to step up mercury control in Taiwan and safeguard the environment and human health.

For more information, please visit:

1. <http://www.mercuryconvention.org/>
2. <https://topic.epa.gov.tw/hg/mp-3.html> (Chinese)

Air Quality

Central and Local Governments Share Collaborative Experiences on River Airborne Dust Mitigation

Central and local governments have been collaborating on river airborne dust mitigation to reduce fugitive dust from riverbeds. The EPA recently held the “River Dust Prevention and Mitigation Workshop” to share its successful experiences with local river fugitive dust mitigation. Approximately 150 people were invited to the workshop, including people from the Water Resources Agency (WRA) of the Ministry of Economic Affairs, the Forest Bureau of the Council of Agriculture, local governments and environmental volunteers.

The central and local governments have produced remarkable results from their collaborative efforts in river airborne dust mitigation. No river dust events have occurred along Da'an River, Dajia River and Wu River since 2014. In the past two years, only two river dust events occurred along Beinan River. In 2019, a total of 29 river dust events occurred along Zhuoshui River, which is a 50% decrease compared to 2017 (59 events).

Special speakers from the 3rd River Management Office of the WRA and the Environmental Protection Bureau of Taichung City Government were invited to the workshop to share their experiences on river dust mitigation, from spotting problems to expanding the scope of collaboration. Through establishing a cooperation mechanism, performing joint inspections and carrying out response measures, they have achieved a record of having zero river dust events along Da'an River, Dajia River and Wu River for six consecutive years. Residents in river areas also reported significant improvements over the years.

The 4th River Management Office was also invited to explain how to analyze causes of river dust events and identify potential areas where river dust problems might occur using an integrated river basin management approach. They also covered mitigation strategies in three areas: “water conservation,” “forestation,” and “disaster prevention and response,” and proposed to use measures such as long-term water inundation or vegetation to ameliorate the dust problems that have been pestering the Zhuoshui River area for more than a century.

The Environmental Protection Bureau of Taitung County Government also shared its experiences on river dust mitigation along the Beinan River since 2001. Through satellite images, exposed riverbed inspections, a river dust alert system, public information campaigns and other response measures, the Taitung County Government successfully mitigated river dust and was awarded best mitigation performance nationwide in 2017. Its public approval rate also went up as a consequence.

Waste Management

EPA and Taoyuan City Government Jointly Promote Livestock Biogas for Energy Generation

The EPA and the Taoyuan City Government worked together to install anaerobic fermentation tanks and biogas collection equipment for power generation. The equipment collects manure from a total of 5,346 pigs located at Hongzhi livestock farm and Hexin livestock farm, and treats it to produce biogas for power generation. The facility where the equipment was installed is the first green energy facility that generates electricity using biogas in northern Taiwan and has been operating since 14 September 2020. It is expected to prevent 160 metric tons of animal waste per day from being discharged into local rivers, helping to improve the water environment and the living quality of the area.

Currently 5,510,000 pigs and 152,000 heads of cattle are kept as livestock in Taiwan. Domestic livestock products play an important role in Taiwan's food industry. However, releasing livestock waste into the environment can negatively impact river water quality. Therefore, to achieve both industrial development and environmental sustainability, the livestock industry needs to implement pollution management at source, and it can convert waste into valuable resources while doing so.

The EPA has been cooperating with the Council of Agriculture to promote power generation using biogas generated from livestock manure. In 2016, the EPA started pushing the recycling of livestock manure through converting the animal waste into farmland fertilizer. The waste-to-resource strategy has increased resource efficiency in rural areas, ameliorated river quality and odor problems near livestock farms, and reduced GHG emissions. By the end of August 2020, permits had been granted to 1,388

livestock farms to use animal manure as farmland fertilizer. These efforts have led to a total of 6,530,000 metric tons of manure being used as fertilizer annually, which amounts to 22.5% of the total volume of manure produced.

The livestock manure treatment facility in Hongzhi livestock farm turns the collected manure into biogas through an anaerobic fermentation process. The produced biogas can be used to generate electricity and sold to Taiwan Power Company. In addition, to further carry out circular economy measures, the farm also recycles the nitrogen nutrients contained in the manure by using the digestate sediment and fluid produced from fermenting the manure as organic fertilizers for farmland. Recycling livestock manure has also improved the water quality of Daku River, which is downstream of the farm. Due to these accomplishments, the farm has become an industry role model for livestock manure recycling and green energy generation.

Environmental Management

EPA Supervises Clean-ups of Dengue Breeding Grounds

On 26 September 2020, the Taiwan Centers for Disease Control (TCDC) announced nine new confirmed local cases of dengue fever in New Taipei City due to cluster infection. All nine patients had visited the same bamboo shoot farm in Sanxia District. The EPA dispatched personnel on the day of the announcement to supervise the Environmental Protection Department of the New Taipei City Government while they sprayed insecticide and cleaned up the breeding grounds. Due to the difficulty in drawing water for irrigation, hillside farms often have water stored in different water containers or tanks, which can easily become high-risk places for breeding vector mosquitos. The EPA requested the Environmental Protection Department to strengthen inspections and mobilize community residents to eliminate potential breeding sites.

There have been a total of 30 indigenous dengue fever cases – 16 in Taoyuan City and 14 in New Taipei City (13 in Sanxia District and 1 in Zhonghe District). The cases in Sanxia District were all associated with bamboo shoot farms located on Wuliao Mountain and Wuliao Village.

On 26 September 2020, the EPA sent personnel to accompany Err-Lieh Hsu, Professor Emeritus from the Department of Entomology of National Taiwan University, to inspect the breeding sites. Besides giving guidance to the Environmental Protection Department on insecticide spraying, they also reminded local community residents to regularly clean

water storage containers that are commonly found in community gardens, including water buckets and water tanks. Water storage containers should also have lids or be covered with a fine mesh to reduce vector mosquito breeding. Since the first case in Sanxia District was reported, the Environmental Protection Department of the New Taipei City Government has employed chemical control strategies in the outdoor environments of the infected villages and the neighboring villages. Three hundred thirty sanitation workers from Yingge District, Sanxia District, and Shulin District were also dispatched. They emptied 1149 containers of standing water and disposed a total of 49 metric tons of trash.

EPA Holds Exhibition to Promote Circular Economy

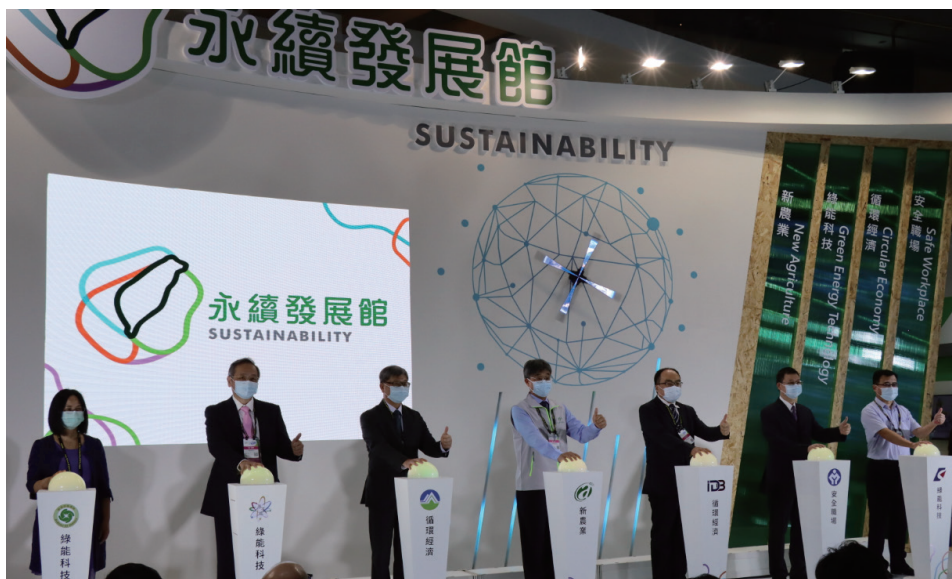
To promote green industry, the EPA jointly held the 2020 Taiwan Innotech Expo with other government agencies and Academia Sinica at the Taipei World Trade Center on 24 September 2020. The EPA worked with the Industrial Development Bureau of the Ministry of Economic Affairs to organize the “Sustainability Pavilion - Circular Economy” that features both domestic and international circular business models. Revolving around the theme of “Circular Island”, the pavilion aims to stimulate interdepartmental cooperation between businesses, government agencies and academic institutions.

The “Sustainability Pavilion” exhibited various innovative technologies and environmental certification systems, and was divided into three sections: highlights, domestic displays, and international displays. One of the highlights, PackAge+ showcased their reusable packaging service for e-commerce, which complies with the “Online Shopping Package Reduction Guidelines” promulgated by the EPA in 2019. By partnering with online shopping platforms and delivery companies to provide the service of reusable shipping packaging for online purchases, PackAge+ created an innovative business model that accomplishes the goal of waste reduction.

The domestic and international display areas also exhibited some remarkable inventions. For example, the EPA presented the “resource recycling analysis system”, which utilizes material flow analysis (MFA) to track the flow of substances. Other participating companies that implement circular economy concepts included Covestro, Xibao Green Tech, Eastern Plastic Enterprise, and Wen Ming Fountain Pen MFG.

As one of the largest manufacturers for polymer materials in the world, Covestro took the spotlight among the international exhibitors with their innovative products such as shoes and bike tires made of material derived from carbon dioxide. Xibao Green Tech presented their “automatic detergent refilling machine”, an original invention that allows users to refill laundry detergent with their own empty bottles and encourage citizens to carry out reduction at source. Eastern Plastic Enterprise featured their “PE recycled pellets” that are produced using recycled plastic films through intermediate treatment technologies. Wen Ming Fountain Pen MFG brought their “black-faced spoonbill fountain pen” which is made from recycled marine waste, showing the benefits of waste reuse.

Businesses are facing immense challenges due to COVID-19. Therefore, the EPA has been striving to promote circular economy measures and stimulate cooperation between different industries and companies. During the three days of this expo, companies showed how they have delivered exceptional results with their innovative products and ideas.



▲ The opening ceremony of “Sustainability Pavilion - Circular Economy” in the 2020 Taiwan Innotech Expo

Environmental Inspection

Incineration Plants Awarded for Excellent Performance in Energy Production and Bottom Ash Recycling

On 7 September 2020, the EPA held the 2019 Incineration Plant and Bottom Ash Recycling Evaluation and Award Ceremony to recognize the efforts and achievements of local governments towards maintaining incineration plants and promoting the recycling of bottom ash. To reward their accomplishments, the awards were handed to representatives of the plants with outstanding performance by EPA Minister Tzi-chin Chang and the evaluation committee. During the ceremony, the EPA also expressed its respect for first-line workers of the plants who are directly engaged in the operations and who have been devoting their time to protecting the environment.

There are currently 24 operating mid- or large-scale waste incineration plants in Taiwan. In 2019, these plants generated a total of 3.459 billion kWh of electricity, which is equivalent to an average of 530 kWh of electricity per metric ton of waste incinerated. Both the total energy generation and operational efficiencies of incinerators in 2019 hit record highs. Approximately 756,000 metric tons of bottom ash was recycled in 2019, which amounts to a recycling rate of 82.7%. The EPA plans to make a few adjustments to the policies regarding waste treatment in incineration plants, including changing quality controls for input materials at the front-end and the management of bottom ash at the back-end. To meet public expectations of incineration plant reforms, the EPA's goal is to promote mechanical treatment to convert waste to energy, achieve waste homogeneity,

transform waste into fuel, and improve the quality of bottom ash while also reducing the total amount of it that is produced.

The EPA conducts annual audits to evaluate and reward the performance of local governments. The purposes of the audits are also to ensure that plants operate and carry out maintenance properly, increase the operation efficiency of incineration plants, and promote bottom ash recycling. The evaluation focuses on air pollution prevention upgrades and bottom ash reduction. This year, Keelung City Incineration Plant and Yilan County's Lize Plant won outstanding performance awards for their high energy production and energy utilization efficiency, their continuous efforts in cutting down air pollution emissions, and their active participation in regional cooperation.

Climate Change

EPA Collaborates with ITRI in Green Living and Energy Saving Technologies

EPA Minister Tzi-chin Chang visited the Industrial Technology Research Institute (ITRI) on 8 September 2020 to inspect the progress of multiple green living technologies that the EPA and the ITRI are jointly developing. The projects are mostly low-carbon equipment or practical products that provide more options for citizens. Minister Chang indicated that the EPA will continue to promote the New-Generation Environmental Internet of Things (IoT) Technologies and build the Taiwan AI Water Alarm Network to safeguard water resources in Taiwan.

"Green Living for Everyone" is an important policy the EPA has been promoting. Its main purposes are to encourage public participation in green living, raise public awareness of environmental protection and eco-friendly lifestyles, stimulate development of green industries, and improve energy and resource efficiency.

To develop new environmental technologies using smart technologies and provide a better living environment for our citizens, the EPA has been collaborating with ITRI for a number of projects and technologies. They include the New-Generation Pollution Traceability and Predictive Environmental IoT Technologies, the Taiwan AI Water Alarm Network,

and Waste Liquid Crystal Display (LCD) Recycling Technologies. To date, high-quality glass derived from waste LCD recycling technology has been used as adsorbents in wastewater treatment by electroplating industries in the Changhua Coastal Industrial Park.

Carbon reduction and energy saving have become two key issues in tackling global warming. Currently, one-third of the world's energy is consumed by buildings. Hence, ITRI is making it a priority to enhance buildings so as to save energy. Most buildings of the ITRI headquarters are at least 20 years old, among which the oldest dates to 1984. Moreover, to stimulate industrial development while protecting the environment, ITRI launched the Green Campus Program in 2011 and has been inspecting buildings for renovation.

Building 64, where the leading team of the Green Campus Program, the Green Energy and Environment Research Laboratories, is located, was one of the earliest renovated buildings. It was transformed into a building with ultra-low energy consumption with an annual energy use intensity (EUI) of 74 kWh/m², which is roughly half of the average energy density of all business buildings in Taiwan. The successful transformation was largely due the application of self-developed energy saving technologies, including high efficiency magnet-bearing centrifugal compressors, the Intelligent Building Energy Management System (IBEMS), human factor lighting technology, and lighting control technology. By employing advanced equipment and innovative technologies, ITRI has achieved an eco-friendly, low carbon campus.

News Briefs

Follow Me! EPA Promotes Safe Recycling Options for Tablets

Are you hesitant to recycle your tablets because you worry about data being stolen? Well, rest assured! The EPA has developed data destruction equipment for secure tablet disposal. The EPA also participated in the "2020 Electrical Appliance, Air Conditioner and 3C Show" at the Taipei World Trade Center from 4 to 7 September 2020 to promote the use of the equipment and to encourage tablet recycling.

According to the EPA's announcement, recyclable information technology equipment includes desktop computers, portable computers (including laptops and tablets), monitors, printers and keyboards. Recyclable household appliances include TVs, refrigerators, washing machines, heaters, air conditioners and fans. Due to the increased participation in recycling from the general population, assistance from recyclers and local sanitation teams, and the implementation of recycling funds, the overall recycling rate reached 64.7% in 2019. The EPA aims to further increase the recycling rate by raising the willingness of people to recycle their old tablets, through raising their awareness of this new method for secure tablet data destruction.

EPA Holds Regional Public Hearings on Amendments to Greenhouse Gas Regulations

The EPA is in the process of amending the *Greenhouse Gas Reduction and Management Act* and is currently gathering public opinion from different sources. The EPA has held two regional public hearings on proposed amendments to the Act in Taichung City and Kaohsiung City on the 6th and the 8th of October 2020, respectively. The public hearings were open to the participation of all citizens and groups concerned about climate change issues.

The EPA has put great emphasis on public participation in the process of amending the law. This year, the EPA established the "Climate Talk Platform" website (<https://www.climatetalks.tw/>) that provides interactive infographics on the sources of domestic GHG emissions and the implementation progress of GHG reduction action plans from relevant government units for public reference. The website has collected 3,000 online comments directed towards different government units, which will be publicly disclosed on the website along with responses. Furthermore, the EPA has been holding climate dialogues with young adults, businesses, local governments, private organizations, experts and scholars to obtain diverse opinions from a wide variety of sources and to design climate policies that meet public expectations.

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