



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/ENG/BE5D11C9F277E893>



Feature Article

Analysis Capacity Enhanced to Increase Data Credibility

Environmental analysis provides strong scientific support and serves as the foundation for implementing environmental policies. The EPA is carrying out its environmental analysis work with two focuses: strengthening analysis capacity and enhancing the credibility of analysis data. Specific goals include formulating different types of standard analysis methods, strengthening the management of environmental analysis and testing organizations, implementing environmental quality and pollution source sampling and analysis, promoting environmental analysis quality assurance and quality control, and enhancing environmental analysis technologies.

Environmental analysis has always been a critical part of environmental protection. Precise and high-quality data serves as the basis for environmental regulation and standard formulation, environmental impact assessment (EIA) surveying, environmental quality monitoring, and environmental nuisance and pollution inspection and control. To enhance environmental analysis capacity and the credibility of analysis data, the EPA founded the Environmental Analysis

Laboratory (EAL) on 10 January 1990.

The EAL was established to carry out the overall planning for environmental analysis affairs, standardize analysis methods, enhance analysis technology capacity, ensure the quality of the analysis data, manage environmental analysis and testing organizations, and guide or assist environmental agencies at all levels with their needs.

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In light of the EPA's "Be friendly to the environment" policy, there are two important EAL-related measures:

I. Enhancing analysis capacity with technology

1. Actively conducting assessments to better communicate with the public

Residents in the Dalinpu area requested to relocate their village as their health was at significant risk due to their proximity to several industrial areas. Concerned about their health, the EPA conducted for the first time a health risk assessment for the area's residents based on actual pollutant exposures for a period of four quarters between 2017 to 2018. The EPA subsequently held a press conference on 26 April 2019 and issued a press release to present an assessment report. The entire report and data can be found on the EPA website with a downloadable link.

2. Swiftly identifying pollution sources to dispel public doubts and anxiety

To quickly identify the pollution sources and transmission paths when major dioxin pollution incidents happen in the future, the EPA has compiled the original data on dioxin collected by the EAL between 2001 and 2018 and set up a new inquiry and statistics system.

3. Properly using scientific methods to add values to analysis data

The EAL has since 2016 been working on developing and verifying identification technologies and analysis models concerning rivers and has collected and accumulated water quality and pollution source discharge data on ten rivers in the nation. In 2019, the EPA set up river water environment information and map webpages and established pollution source identifying models to find potentially polluted rivers. This way, the distribution and profiles of materials causing abnormalities can be determined when abnormal discharges or unusual monitoring data appear, and the corresponding discharging industries can be targeted to assist pollution source tracking and containment.



▲ On-site inspection in the processing and manufacturing of a dyeing plant

II. Strengthening source control and supervision with environmental analysis and improved data credibility

1. Enhancing inspection and verification by the authorities

Since 2019, the EAL has been working with the Bureau of Environmental Inspection to carry out extensive audits by implementing the *Quality Control and Audit Project Concerning Regular Industry Inspection, Reporting and Testing*. The operation and testing data of stationary sources are examined to determine whether there are forgeries or false data in past analysis reports. If needed, further examination and comparison of previous records of analysis organizations that carried out the said analyses would be conducted.

2. Harsher penalties for deliberate violations or repeat offenses

The EAL is revising the *Environmental Analysis Organization Management Regulations* (環境檢驗測定機構管理辦法) by adding penalties concerning

spurious analysis, breaching of analysis methods or management guidelines by analysis organizations, or other major offenses. Stipulations concerning the liability of analysis reports' signatories were also added. The revised regulations have now entered the legislative procedure.

3. Evaluating the system and amending regulations or formulating special laws

To improve analysis data's credibility and establish a comprehensive environmental analysis and testing system, the EAL has drafted the *Environmental Analysis Act* (環境檢測法) to regulate analysis operation and practitioners. The completed draft has already entered the legislative procedure and will be submitted to the Legislative Yuan for review once the Executive Yuan approves it.

Future perspective

In line with the Executive Yuan's mid-term goals and approved budget, the EPA has formulated a policy implementation plan based on the current social condition and the EAL's future development needs. The targets include:



▲ An EPA-held press conference to present the health risk assessment report for Dalinpu's citizens.

1. Formulating standard environmental analysis

methods: adding, revising and announcing standard environmental analysis methods for all types of pollutants.

2. Strengthening the management of environmental analysis organizations

(1) Managing and assisting environmental analysis organizations to enhance data integrity.

(2) Promoting the informatization of environmental analysis operations and management of analysis organizations.

(3) Establishing a task delegation mechanism for laboratories of environmental agencies at all levels to carry out efficient pollution analysis and testing.

3. Implementing environmental quality and pollution source sampling and analysis

(1) Establishing high-efficiency environmental analysis capacity to carry out analyses based on the EPA's policies and needs.

(2) Activating the environmental analysis and response system to provide timely analysis support in times of emergency.

4. Promoting environmental analysis quality assurance and quality control and enhancing environmental analysis technologies

(1) Promoting a system of environmental analysis quality assurance and quality control and continuing to participate in global certifications to increase public trust in environmental analyses.

(2) Building the environmental analysis research and development capacity and promoting the collaboration of research institutions at home and abroad.

Environmental Management

First Livestock Farm in the Country to Complete Carbon Offset Program Registration

In addition to be made into fertilizers, pig excrement can be used to generate power that can be exchanged for carbon credits. Hanbao Livestock Farm in Fangyuan Township, Chunghwa County has about 40,000 heads of pig. It treats its pig excrement via anaerobic fermentation and uses the biogas produced from the treatment process to generate electricity. It also installed solar panels on the roofs of pig sheds to generate energy. The farm applied to register for the EPA's greenhouse gas (GHG) offset program. It completed registration on 20 March 2020 and became the first livestock farm in Taiwan that successfully registered for the voluntary GHG offset program. Its annual GHG reduction is expected to reach 27,541 metric tons of CO₂e, and its total carbon credits over the seven-year-long program is estimated to amount to 192,787 metric tons of CO₂e.

The EPA said that currently most of the pig excrement goes through three stages of treatment: solid-liquid separation, anaerobic fermentation, and aerobic aeration. Among these stages, aerobic aeration requires tremendous amount of electricity, and the anaerobic fermentation generates biogas which is rich in methane, a substance with a global warming potential 21 times higher than carbon dioxide and hence contributing more to global warming. Therefore, livestock wastewater treatment processes generate massive amounts of GHG and cause severe impact on the global climate.

Hanbao Farm generates roughly 1,810 metric tons of livestock excrement every day. It collects the biogas generated from the anaerobic fermentation and removes the sulfides before using the biogas to generate electricity, reaping double carbon reduction benefits. Reduction of fugitive methane results in lower GHG emission equivalent to 23,900 metric tons of CO₂, and using the collected methane instead of fossil fuels for power generation further reduces GHG emission equivalent to 1,930 metric tons of CO₂. The farm also installed solar panels on the expansive roofs of pig sheds to generate green energy, further cutting down emission by 1,800 metric tons of CO₂e.

The *Greenhouse Gas Offset Program Management Regulations* (溫室氣體抵換專案管理辦法) was formulated by the EPA to encourage enterprises to adopt reduction measures. Enterprises can apply to register for a GHG offset program with their emission reduction proposals. After the registration is approved, they can further apply for GHG reduction credits based on actual reductions. With measures like collecting biogas for energy generation and solar power in place, Hanbao Farm was able to apply to implement a GHG offset program, which was reviewed and approved. After the registration was completed, the farm has become the first livestock farm in Taiwan that has completed a GHG offset program registration, and is now qualified to apply for reduction credits.

Livestock excrement can go through an anaerobic fermentation to produce digestate sediment and fluid, which can be used to fertilize farmland instead of

being discharged directly into surface water bodies. This way not only can river pollution be reduced, the digestate sediment and fluid, which are rich in nitrogen and phosphate and more soil-friendly than chemical fertilizers, can also replace chemical fertilizers and hence help to reduce soil acidification and increase production yields and quality. Every year Hanbao Farm sends its roughly 10,000 metric tons of digestate sediment and fluid via irrigation pipes to fertilize 4.17 hectares of foxtail grass farms. Foxtail grass is a main crop for herbivore livestock like cattle and sheep and is also one of the best fiber supplements for pigs. Moreover, Hanbao Farm treats its solid excrement left behind after solid and liquid separation via aerobic aeration indoors instead of by anaerobic fermentation outdoors. This also lowers the chance of methane escaping into the air and is expected to achieve an annual carbon reduction of 3,158 metric tons of CO₂e. The farm has applied for GHG offset program registration for this practice.



▲ Director Show-siung Chen (center) of the Hanbao Livestock Farm, the first livestock farm in Taiwan to successfully register for the voluntary GHG offset program

Waste Management

EPA Holds Eco-Party in Keelung Night Market

To promote the environmental concepts of “plastic reduction, low carbon emissions, and clean environment” in night markets, the EPA held an “Eco-chic Party” at Keelung Miaokou Night Market on 9 August 2020. The EPA Minister Tzi-chin Chang, Deputy Mayor of Keelung City Yong-fa Lin, plastic reduction ambassador Sabrina Pai, and environmental social media personality Goldfish Brain all participated and had an eco-friendly night with the citizens of Keelung.



▲ Youtuber Goldfish Brain, EPA Minister Tzi-chin Chang, Deputy Mayor of Keelung City Yong-fa Lin, and plastic reduction ambassador Sabrina Pai (from left to right) had an eco-friendly night with the citizens of Keelung.

The “Eco-chic Party – Party on, Night Markets of Taiwan!” was an environmental event jointly held by the EPA and Keelung City Government at Ocean Square in Keelung City. The event featured stalls and sensational performances to promote environmental night markets, and it attracted thousands of participants, who were invited to bring their own tableware and shopping bags to shop around the night market together.

Minister Chang indicated that environmental protection is not just about cutting emissions from factories and power plants; it should also be implemented in our daily lives, such as conserving energy by turning off lights when you leave a room. He also pointed out that night markets are not only one of the best tourist attractions in Taiwan, but also hangout spots frequented by citizens. Since the coronavirus pandemic has subsided, people have started going back to their favorite night markets again.

To create a better and more environment-friendly image for night markets when they completely reopen, the EPA has worked with local environmental

protection bureaus, night market associations and vendors to establish 22 eco-friendly demonstration night markets. These night markets are located all over Taiwan and were developed based on the theme of “plastic reduction, low carbon emissions, and clean environment.”

To reduce plastic waste, these night markets have switched to using reusable dishware, offering discounts for people who bring their own containers, and sorting garbage into recyclables, food waste, and general waste. To lower carbon emissions, they provide public shuttle services and use energy-efficient LED light bulbs. And in regard to clean environment, concrete measures have been taken, such as installing cooking oil fume-control equipment and oil and water separation equipment, improving wastewater discharge, and maintaining the cleanliness of the general environment in night markets and public restrooms.

Air Quality

Draft Amendments to the Regulations Concerning Indoor Air Quality Analysis Announced

The *Regulations Concerning Indoor Air Quality Analysis* (室內空氣品質檢驗測定管理辦法) has remained unrevised since its promulgation on 23 November 2012. The EPA has noted problems when implementing the Regulations in recent years, namely the promotion of Indoor Air Quality Voluntary Control Labels and the announced revisions to the sampling requirements in the test methods of bacterial and fungal concentration in the air (NIEA E301.15C and NIEAE401.15C respectively) as it reviewed and drafted the amendments to the Regulations.

To improve indoor air quality and safeguard public health, the EPA announced the *Indoor Air Quality Act* (室內空氣品質管理法) on 23 November 2011 and the *Regulations Concerning Indoor Air Quality Analysis* (室內空氣品質檢驗測定管理辦法) on 23 November 2012 to serve as the basis for analysis, testing, and management of indoor air quality.

Considering the problems encountered during the implementation of the Regulations in recent years, the EPA has revised the sampling requirements in the *Test Methods for Bacterial Concentrations in the Air* (NIEA E301.15C) and *Test Methods for Fungal Concentrations in the Air* (NIEA E401.15C) requiring at least two sampling spots at each premise to ensure the representativeness of the sampling data.

The revisions include new additions that take the characteristics of different premises, air conditioning, and pollution sources into account and promote incentives aligned with the Indoor Air Quality Voluntary Control Label system. Specifically, when premises are regulated by the EPA and rated “excellent” in the label system, they can be tested once every three years and the required number of the sampling spots can also be halved. The revisions also simplified the application procedure for installing automatic indoor air quality monitoring equipment, and specified the methods and frequencies for equipment accuracy inspection, the approval of the inspecting agencies, and the equipment maintenance matters. All these will serve as the basis for the announced premises installing automatic monitoring equipment in the future. Revisions of the Regulations were evidently necessary for better management of the announced premises.

The main points of the amendments are as follows:

1. Definition of automatic monitoring equipment was added. Relevant terms have been changed to be

consistent with the first and second announcements of the premises regulated by the *Indoor Air Quality Act*.

2. Inspection and test frequency were set to be once every six months. How to archive the inspection records was also specified.

3. For regular inspections on the announced premises, follow-up tests on pollutants not meeting the standards shall be conducted. These pollutants shall also be included in the maintenance and control plans of the premises for future improvement.

4. Premises announced by the EPA and rated “excellent” in the Indoor Air Quality Voluntary Control Label system can undergo testing once every three years, and the required number of the sampling spots can also be halved.

5. Application procedure for installing automatic monitoring equipment was simplified.

6. Stipulations concerning automatic monitoring equipment are amended, focusing on the general requirements of the equipment.

7. Amendments were made on stipulations concerning mandatory accuracy verification or recalibration of automatic monitoring equipment.

8. In regard to the time limit for the analysis and testing organizations to conduct regular inspections and produce inspection reports, the time for enterprises to submit their inspection results is extended to 45 days. In addition, the stipulation requiring enterprises to report online the results of the continuous monitoring in the previous year was removed. Instead, the stipulation now requires the data of the continuous monitoring be kept for the competent authorities to review.

Air Quality

Subsidy Regulations Revised to Encourage Replacing Old Motorcycles

After having implemented the subsidization policy to phase out old motorcycles for more than half a year, the EPA is actively reviewing the policy on a rolling basis in response to some practical issues brought up by various sectors since the implementation, such as problems concerning the competent authorities in charge and the required application documents. To simplify the implementation and make it easier for the public to apply, the EPA has revised and announced the *Regulations Concerning Old Motorcycle Replacement Subsidization* (機車汰舊換新補助辦法).

The EPA noted that the original version required a subsidy application to be filed with the environmental authorities located in the district the old motorcycle is registered. However, buyers of new vehicles often let the manufacturers or dealers from whom they purchase the vehicles handle the scrapping of old vehicles and the subsidy application. Therefore, the regulations have been revised to stipulate that, from 1 September 2020, when buying new motorcycles while replacing their old ones, buyers are to apply for the subsidies at the environmental authorities of the place where the new motorcycles are registered, while buyers of electric (or power-assisted) bicycles shall apply at the environmental authorities of the place where their households are registered.

The original version also required applicants to submit photocopies of vehicle registration change (or scrapping) forms, but the revisions lifted the requirement since the registration information of the old vehicle can be found in relevant information systems. The requirement to submit photos of the new motorcycle was also lifted for buyers because the motorcycle registration documents they are required to submit already contain the relevant information.

Yet for electric or power-assisted bicycles, buyers are still required to submit photos as there are no vehicle registrations for these bicycles. The revisions also added that they can submit documents with an embossed image of the serial number on the bicycle frame instead of the photos since it is sometimes difficult to photograph these numbers on certain models. And the requirement of submitting the invoice receipts has been changed to submitting the photocopies of the invoices to cut down administrative costs.

The EPA emphasized that the revisions are expected to simplify implementation, make subsidy application easier for the public, and eventually motivate more people to replace their old motorcycles. The public is also reminded that the subsidies will be lowered year by year. The early-bird subsidies of up to NT\$5,000 are only available until the end of this year and will drop to NT\$3,000 next year. Therefore, the public is encouraged to replace their old motorcycles as soon as possible, as doing so not only helps to reduce air pollution, but also allows them to get a higher subsidy.

Water Quality

EPA Subsidizes Local Governments for River Restoration

To properly treat household wastewater and improve river water quality before more homes are connected to the public sewage system, the EPA has been implementing a variety of water treatment projects, including subsidizing local governments to install facilities for gravel contact oxidation treatment, wastewater interception, artificial wetland and overland flow. To improve local water quality and protect river ecosystems and landscapes, the EPA has worked with local governments on a total of 75 water remediation projects, including the Si-Fang-Lin Water Restoration Project. The projects have enabled the treatment of 444,000 metric tons of polluted water per day and helped transform approximately 64.9 hectares of polluted riverbanks into friendly public spaces.

The EPA explained that the Si-Fang-Lin Water Restoration Project in Taoyuan City installed a gravel contact oxidation facility to treat wastewater. The

method relies on the self-purification function of the river and no chemical additives are used. The facility is capable of treating 2,500 metric tons of household

wastewater per day and has a pollutant removal rate of at least 70%.

The project has improved the river water quality around the downstream area of Laojie Creek, where the Meiduli Bridge Water Quality Monitoring Station is located, from the moderately-polluted to lightly-polluted level. After the construction of the treatment facility was completed, the land mass above was restored as a park and a croquet court, thus providing nearby residents a better living environment with clean water.

The Li-Ming Canal Water Environment Improvement Plan was a joint project implemented by the EPA and the Taichung City Government. The project included installing water quality monitoring equipment and automated control gates to monitor upstream water

quality changes and immediately block polluted water from flowing into the Li-Ming Canal system when necessary. The project also established an environmental education explanatory platform, created more biodiverse habitats and allowed local residents to get closer to the rivers.

The EPA has been dedicated to the improvement of water environments to provide residents cleaner water and make rivers more accessible. With river restoration as the top priority, the EPA worked to gradually improve river water quality from upstream to downstream, restoring at the same time the species richness and biodiversity in rivers. Riverbanks were also landscaped to provide residents inviting recreational spaces with clean water and thriving ecosystems.



▲ The Li-Ming Canal Water Environment Improvement Plan was a joint project implemented by the EPA and the Taichung City Government.

Waste Management

Food Waste Repurposed to Achieve a Circular Economy

Recycled food waste can be converted into pig feed, compost and electricity. To diversify food waste treatment options, the EPA has assisted local governments to build treatment facilities. For example, Nantou County has built facilities to turn food scraps into compost for flowers and has transformed a town into a beautiful garden city. Another example is a bioenergy plant built by Taichung City to convert food waste into green energy. All of these are fruitful achievements of the EPA's food waste recycling efforts.

Have you ever wondered where the leftover food we hand over to the cleaning crews end up? The EPA explains that the recycled food waste can be used as pig feed or compost, or even used to generate power.

The EPA has been assisting local governments in developing diverse treatment options to increase the food waste processing capacity in Taiwan. The EPA has subsidized the installation of 50 traditional food waste composting plants since 2003. In the last two years, the EPA also subsidized local governments to install 50 sets of shredding and drying equipment to upgrade food waste treatment facilities. The weight of food waste can be reduced by half after the drying process, which greatly reduces the burden for back-end processing. Subsidies were also given to local governments for the installation of 20 sets of fast composting equipment, which is capable of cutting the composting time from three months to just a few days.

Food waste bioenergy plants are being built in Taichung City, Taoyuan City, Taipei City, New Taipei City and Kaohsiung City, among which the one in Taichung City has been completed and is in operation. Taoyuan City plans to finish construction of its plant by the end of July 2021, and all plants are estimated to be completed by 2024. Upon completion, the plants can process 230,000 metric tons of food waste per year and generate 41,970,000 kWh/year of electricity, which can provide a year's worth of electricity for more than 11,000 homes. The plants will generate an annual revenue of NT\$214.79 million from selling electricity and reduce carbon emissions by 22,200 metric tons

per year. The plants will greatly increase the food waste treatment capacity in Taiwan and help achieve a circular economy.

The EPA indicates that roughly half of the recycled food waste in Taiwan is turned into compost, which is then sold or provided to the public. Zhushan Town Hall grew flowers with the compost they made from food waste. The flowers were used for public area landscaping, and were also provided to the residents to decorate their homes, transforming the whole town into a spectacular garden city.

Taichung City Government has built a food waste bioenergy plant in Waipu Green Energy Ecopark, which has been effectively using food waste to generate electricity. The power plant has been connected to Taiwan Power Company's power grids since June 2020. The second stage of the construction for the plant is estimated to be completed by 2023. Upon completion, the plant will be able to process 54,000 metric tons of food waste per year and generate 8,870,000 kWh/year of electricity, which can provide a year's worth of electricity for 2,540 homes. The plants will generate an annual revenue of NT\$45,390,000 from selling electricity and reduce carbon emissions by 4,687 metric tons per year.

The EPA stresses that recycling food waste can bring many benefits. It can effectively reduce the amount of waste that is incinerated and convert waste into useful resources. The EPA also reminds the public to cherish food, keep a green diet, and avoid food waste. In other words, do not overcook, and order only what you can finish and take home the leftovers when eating out.



♻️ Recycled food waste can be converted into compost by local governments

Environmental Monitoring

Central and Local Governments Jointly Launch 2020 Taiwan AI Water Alarm Network

The “2020 Taiwan AI Water Alarm Network” launch event was held in Hsinchu City on 17 August 2020, featuring the official announcement of five types of water quality sensor components and three kinds of (fixed, mobile and handheld) water quality sensors. During the event, the EPA gave 400 sensors to 13 different city/county governments to jointly establish the water quality sensing IoT (Internet of Things) network in Taiwan.

To overcome limitations of the traditional manual sampling method, the AI water alarm network deploys water quality sensors that monitor the pH value, conductivity, temperature and dissolved oxygen level in rivers or other water bodies every minute. The sensors are combined with a GPS system and artificial intelligence (AI) to monitor changes in water quality at different times and places. Through the network, the EPA aims to reach to goal of smart environmental enforcement, promote environmental education, and stimulate IoT applications across different industries.

During the trial period of the past four months, the water warning network detected 17 cases of abnormal activities in three different cities/counties. Two of the cases are under investigation by district prosecutor offices and their illegal gains are being confiscated. This shows how water quality sensors can be very useful for cracking down on unscrupulous enterprises and detecting pollution. The EPA has been working

with 13 cities/counties to install water quality sensors in areas that are frequently reported or crowded with regulated factories, so as to expand the applications of IoT in law enforcement and implement 24-hour continuous monitoring. The network can detect targeted pollution and intelligently dispatch personnel to investigate and deal with it.

The EPA pointed out that in addition to smart environmental inspections, with the era of 5G upon us, the sensors can also be used by academia to promote environmental education, research on water body ecology or assist with other courses. The handheld water quality sensors developed by the EPA are inexpensive to manufacture, easy to use, and can be connected to mobile devices. They can also become useful tools to encourage river patrol squad members to participate in patrols, inspections, pollution reporting and debris cleaning, thus further enabling joint cooperation between government and the public for protection of water bodies.

Water Quality

EPA Promotes Green Travelling with Water Refill Map

To encourage citizens to reduce plastic use while traveling and support sustainable tourism, the EPA held the “Bring Your Own Water Bottle to Penghu Fireworks Festival – Travel Green on Gaillardia Island” press conference on 24 August 2020 at Penghu County Government Hall. During the press conference, the EPA recommended travelers to take advantage of the drinking fountains and smart recycling bins on the island as a way to go green while travelling. Travelers were also advised to bring their own toiletries and reusable tableware, and travel in the most environmentally friendly way to protect the natural resources on the outlying island.

The EPA has been implementing the Plastic-Free and Low-Carbon Island Demonstration Project on Xiaoliuqiu, Pingtung County since 2018, and it has produced significant results. With tourists bringing their own water bottles, and assuming each bottle has a 600 ml capacity, roughly 400,000 plastic bottles have been prevented from being wasted over the past

two years. Duplicating the experience of implementing the drinking fountain project in Xiaoliuqiu, the EPA cooperated with Penghu County Government this year to install 15 drinking fountains at 13 sightseeing spots. It also worked with private companies to include the locations of these drinking fountains in the Water Refill Map app to provide tourists with a

convenient way to stay hydrated during travel.

Marine debris near Penghu County has always been an issue of public concern. Thanks to all the beach cleanups Penghu County Government has held, the beauty of Penghu coastlines has been well kept. In addition to the subsidies provided to Penghu County Government for the installation of 15 drinking fountains this year, the EPA also subsidized the installation of five smart recycling bins to offer more recycling channels for tourists to discard their plastic bottles and cups. These policies are to encourage tourists to live out the “eat local, play local and protect local” green lifestyle principles while travelling. Penghu attracts

a large number of tourists with its naturally blessed basalt landscape and everchanging international festivals. Hence, the EPA stresses that Penghu’s rare environmental makeup and natural resources should be properly protected by everyone.

To encourage the public to take advantage of the drinking fountains, the EPA has launched the “Island jumping with your water bottles” promotion program this year. Travelers can use their cellphones to scan a QR code while visiting Xiaoliuqiu and Penghu and operate the drinking fountains onsite. They will receive 1,000 green points with the use of each fountain and can receive up to 25,000 points.

News Brief

2030 Future All Together Exhibition a Success

The “2030 Future Beyond the Circle, Future All Together”, a four-day exhibition on circular economy, took place on 3-6 September 2020. It featured roughly 50 participating parties in the field of circular economy. To show people how to incorporate the concept of circular economy in their daily lives, the exhibition area was divided into six categories which represented the bare necessities of life. Many participating parties presented products or services that were both innovative and culturally enriching, for example, rental systems. Homeapp123 provides a rental platform for users to rent out their home appliances that are not frequently used. ChingPiao and Good to Go are services that help reduce single-use plastics by offering reusable tableware. Mangodan rented out shelves that are made from recycled plastic.

There were also companies that focus on the theme of zero waste and circular economy. For example, Double_Dribble turns recycled basketballs into delicate products. Taiwan Banner Bag manufactures products that display Taiwanese culture with recycled flags. Chabuwu promotes creative designs using blue-dye plants and recycled clothing and waste fabric. Village Wu Workshop is a company near a small fishing town that promotes regional revitalization. They make trendy shoulder bags with recycled fishing nets. Other exhibited products that had innovative designs included: Health Life’s 3R green pillow which incorporates the concept of circular economy in the manufacturing process, and the “kitty tea” that is cultivated with compost made from recycled cat litter, forming an endless circle of life.



▲ The Village Wu Workshop makes trendy shoulder bags with recycled fishing nets.

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

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