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Feature Article

Resource Recycling Measures and Achievements

Aiming to reach the goal of waste reduction and sustainable use of resources, resource recycling has become a global trend. Since Taiwan began rolling out its four-in-one recycling measures, its recycling rate hit new highs of 55.59%, or 1.012 million tonnes, in 2014; meanwhile the daily per capita garbage collected was at an all-time low of 0.383 kg. The EPA will continue to work toward increasing resource efficiency and sustainable cyclical use of resources to attain its 2017 target of a recycling rate of 65%.

The EPA rolled out its Resource Recycling Policy Planning in 2011 after examining similar sustainable materials management plans of Japan, the Netherlands, the EU, and the Organization for Economic Co-operation and Development (OECD). The policy planning laid out five major strategies and 16 specific measures. Based on this policy planning, the EPA formulated the Promotion Plan for Sustainable Cyclical Utilization of Resources for implementation.

One of the major strategies laid out is to strengthen the functioning of the Recycling Fund, which will entail further integration of capacities and resources of the central and local governments and the private sector. A recycling rate target of 65% has also been set for 2017.

Four-in-One Recycling Plan Bolsters Recycling Industry

In 1997, Taiwan began implementing the Four-in-One Recycling Plan. This involved modifying the operation of the Recycling Fund so that – in combination with communities, recyclers, and local governments – it could be put to more effective use of recycling resources and reducing waste. Taiwan's recycling rate has been climbing rapidly from that year on.

In This Issue

With the implementation of the Four-in-One Recycling Plan and the corresponding formulation of related regulations and systems by the EPA, Taiwan's recyclable waste is now recycled as it should be. The EPA requires recycling enterprises of a certain size or above to register with their local competent authority. As stipulated in the *Management Regulations for the Review of Applications for Recyclable Waste Recycling, Clearance, and Disposal Subsidies*, enterprises hoping to receive subsidies must apply to the EPA for subsidized entity status and undergo auditing and approval procedures.

Some of the recycling measures that the EPA has rolled out – and the degree of success of such measures – are listed below:

1. Improving the Management of Recycling Channels

Since 1998 the EPA has been actively budgeting for subsidies for: operators of recycling trucks; storage facilities for recyclables; and, any other equipment needed by sanitation teams to facilitate recycling. Between 1998 and the end of January 2015, 2,645 recycling trucks have been bought to replace old vehicles. The EPA also conducts annual performance evaluation of all central and local agencies involved in order to improve overall efficiency and suggest ways for them to innovate as well as improve the image of the recycling industry.

To continue improving the image of the recycling industry, the EPA has raised environmental standards for recycling stations and individual recyclers. In 2014, the EPA provided such guidance to 812 recycling operators and 9,343 individual recyclers. The EPA also helped 222 citizens, of whom 37 were indigenous, to find work in the recycling industry under the Four-in-One Recycling Plan.

In addition, in 2014, 84 enterprises that received subsidies had Internet-connected closed circuit television (CCTV) and weighing equipment installed

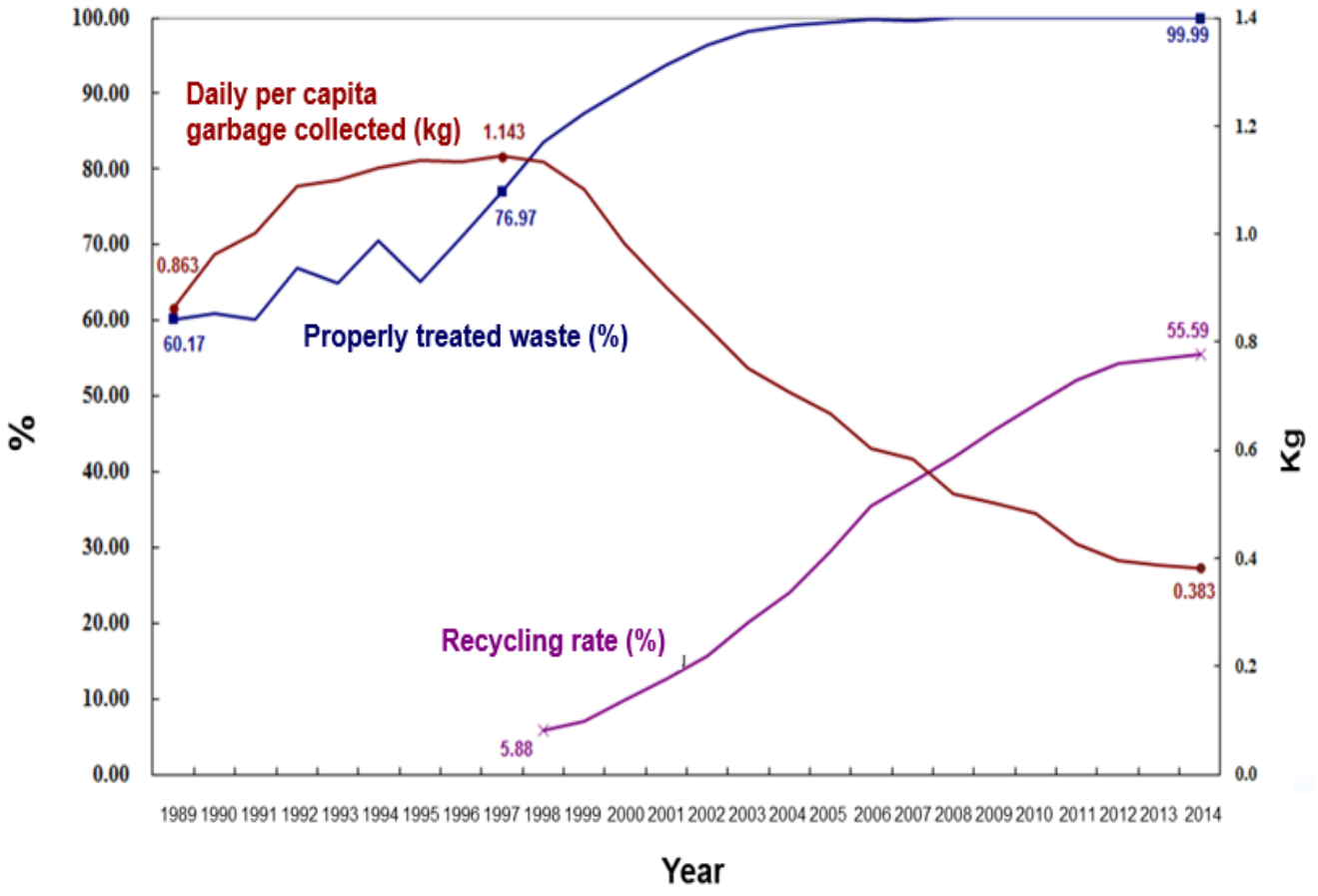

Figure: Daily per capita garbage collected, properly treated waste and recycling rate from 1989-2014

to enable authorities to monitor operations and audits conducted by third parties. Data from weighing equipment at the enterprises is transmitted directly online to authorities, reducing labor costs and increasing administrative efficiency.

2. Enhancing Management of Enterprises Responsible for Regulated Recyclables

As of the end of January 2015, the EPA had listed and regulated 16,372 responsible enterprises and had undertaken audits and documentation for a reported recycling volume of 1,311,045 entries.

To make it easier for enterprises to pay recycling fees, since 1 January 2012, the EPA has added four major convenience store chains and the credit departments of farmers' and fishermen's associations as locations at which enterprises can pay recycling fees of under NT$20,000 (applicable to 80% of such enterprises). These locations have the advantage over conventional banks of staying open longer and not collecting additional transaction fees. Since implementation began in 2007, the number of fee-free payment locations has risen from 1,400 to over 10,000, an increase of 700%. Statistics show that as of the end of January 2015, a total of 41,378 payments of under NT$20,000 had been collected at these locations. Of these, convenience stores accounted for 19,774, or 47.79% of the total number of payments.

As for inspections and audits of responsible enterprises, from 2014 to the end of January 2015, the EPA conducted on-site inspections and audits of 2,642 recycling enterprises, uncovering approximately NT$222 million in shortfalls in fee payments.

3. Promoting Recycling to Boost Achievements

The EPA has been employing TV news broadcasts, advertisements, and the Internet to enhance public awareness of recycling and to disseminate information for recycling and reuse. A hotline (0800-085717), a resource recycling website and an e-newspaper have all been set up to this end. From the beginning of 2014 to the end of January 2015, the EPA also subsidized 70 events held by citizen groups to promote recycling, which had a total attendance of 78,300.

4. Subsidizing recycling related R&D

In 2014, the EPA set aside NT$20 million of its budget and announced that it was to be made available as research grants to public and private universities, research organizations and enterprises that are conducting research on recycling systems, technology, recycled material utilization or other innovative R&D. Last year, 14 projects from such entities were granted with a total of NT$18.676 million. In addition to research capacity building, such effort is helping to raise recycling and reuse rates and to increase the quality and value of recycled materials, thus bringing about the sustainable use of resources.

Waste Reduction and Resource Recycling Bring Taiwan Closer to a Sustainable Recycling Society

Taiwan's resource recycling achievements have been excellent under the Four-in-One recycling system. Listed recyclables have reached 34 items across 13 categories. From 1997 to 2014 the recycling rate climbed from 5.88% to 55.59% and the average daily per capita refuse collected fell from 1.143 kg to 0.383 kg (see figure on page 2). This continuing trend indicates that the implementation of each stage of the Four-in-One Recycling Plan has been effective in reducing waste and raising recycling rates.

As for the recyclable waste that has been recycled each year through inspected and audited channels, this has risen from 288,000 tonnes in the initial period of Four-in-One recycling in 1997 to 1.01 million tonnes in 2014. This is due to increased public awareness, an increase in the number of items announced as being recyclable, and continued advance of recycling technologies. The climbing recycling rate is proof that resource recycling in Taiwan is on the right track.

In future, the EPA will continue to diligently promote the efficient and sustainable use of resources, while simultaneously reducing the volume of waste that requires final disposal. The EPA will also continue to work with manufacturers to reduce their greenhouse gas emissions and environmental impact, thereby boosting the competitiveness of Taiwan's green industries with a view towards building a society based upon the sustainable use of resources.

Water

Water Pollution Control Fees to Be Collected from 1 May 2015

On 31 March 2015, the EPA announced revisions to the *Regulations Governing the Collection of Water Pollution Control Fees*. Of the original 23 articles, 18 were amended, 2 were deleted and 2 new ones were added. The main purpose of the changes was to incorporate Legislative Yuan resolutions stating that livestock enterprises should start paying the said fees in the third year of implementation, and that enterprises that produce harmful substances should start paying fees in the first year of implementation instead of the fourth. The amendments also stipulate the starting date for collection of water pollution control fees to be 1 May 2015.

To gather the opinions of all interested parties, the EPA held four public hearings in December 2014. Lively discussions on the content of the regulations among experts from government, industry, academia and representatives of environmental organizations took place. Suggestions collected were taken into consideration by the EPA when drawing up the amendments.

The method for collecting the fees will be as follows:

1) Targeted entities: From the first year of implementation, the targeted entities will include all enterprises except the livestock industry and operators of dedicated wastewater systems in industrial parks. From the third year livestock enterprises will be included, and from the fourth year households and operators of public sewage systems will also be required to pay the fees (see table below).

2) Targeted substances and fee rates: The items for which fees will be collected include chemical oxygen demand (COD), suspended solids, lead, nickel, copper, total mercury, cadmium, total chromium, arsenic, cyanide compounds, and any other item designated and announced by the central competent authority. The fee rates for the first year have been set at NT$12.5/kg for COD and between NT$625-31,250/kg for lead and other harmful substances.

3) Fee amount calculations: The amounts that enterprises and operators of dedicated wastewater systems in industrial parks will have to pay is calculated by multiplying the effluent quality by the above fee rates for each substance and then multiplying the volume of the effluent: fee = Σ (effluent quality x fee rate) i x effluent volume (i represents the quantity of each item for which fees are collected).

4) Payment deadlines: The fees will be collected every six months. Affected enterprises will be required to report their calculations for the previous six months and pay water pollution control fees by the end of January and July every year. For the first year, the July deadline for reporting and payment has been put back three months to the end of October.

5) Reporting methods: Reporting should be done online wherever possible, with written material being submitted when necessary.

6) Preferential fee rates:

a) To reduce the impact on industry, the full fee rate will be implemented incrementally over a six-year period: The fee collected for the first year will be 50% of the calculated sum, and the full payment will be collected from the sixth year.

b) To encourage polluters to reduce the amounts of pollution they produce, enterprises and operators of dedicated wastewater systems that are able to maintain the effluent quality at a certain level below the stated effluent standards will be given a fee discount of 20%~85% depending on the amount of pollution they reduce.

The EPA is keen to point out that it has intentionally simplified procedures and reduced water pollution control fee rates for the initial period to minimize the impact upon Taiwan's enterprises. However, keeping in mind that reductions in effluent translates into reduced water pollution fees, enterprises are encouraged to respond to the new regime at the earliest by improving their wastewater treatment

efficiency and reducing the amounts of pollutants discharged, and/or by instigating water-reduction measures such as recycling and reuse. The fees that are paid will be used to prevent water pollution and protect and improve the water quality of Taiwan's water bodies, thus creating a better and healthier living environment for all of Taiwan's citizens.

Table: Targeted entities and items subject to water pollution control fees

Category	First stage (First year of fee collection)	Second stage (Third year of fee collection)	Third stage (Fourth year of fee collection)
Targeted entities	- enterprises - wastewater sewage in industrial parks	- livestock enterprises	- households - other sewage systems (public sewage and community sewage)
Targeted items	- chemical oxygen demand (COD) - suspended solids (SS) - hazardous substances (lead, nickel, copper, total mercury, cadmium, total chromium, arsenic, cyanide compounds) - other items announced by the central competent authority		

Air

Air Quality Flags Piloted at Schools

Since the implementation of the Fine Particulate Matter ($PM_{2.5}$) Index from 1 October 2014, the EPA has been working with the Ministry of Education (MOE) to implement the School Air Quality Flag Pilot Plan. The plan is based on four warnings – indicated by colored flags – that are determined using a combination of the Pollutant Standards Index (PSI) and the Fine Particulate Matter ($PM_{2.5}$) Index.

Taiwan's School Air Quality Flag Pilot Plan is based upon the US School Flag Program and is being used by the EPA and MOE to educate teachers and students about the meaning of the air quality flags and how people can protect themselves against air pollution. Taiwan's flags are of four colors – green, yellow, red and purple. Green indicates that regular activities can be conducted; yellow indicates that preliminary precautions should be taken; red indicates that medium level protective measures should be employed; purple indicates that emergency protective measures should be adopted. The color of flag to be flown each day is determined by PSI and $PM_{2.5}$ Index readings. If readings of the two indices differ to the extent of indicating different colored flags, the higher reading will be used.

A green flag indicates that regular activities can be conducted although staff and students with sensitive constitutions or medical conditions should be aware of how the air quality is affecting them physically.

A yellow flag indicates that staff and students with cardiac or respiratory conditions should consider

reducing physical activity, particularly outdoor activity, if they notice symptoms appearing.

A red flag indicates the following:

1) Students and kindergarten pupils should wear masks and goggles when exercising outdoors, depending on individual health conditions.

2) Classroom windows should be kept shut to minimize exposure to poor quality air.

3) Staff and students suffering from physical discomfort – particularly sore eyes, coughing, or sore throats – should consider reducing outdoor activities.

4) Staff and students with sensitive constitutions should be proactive in personal health management and should consider reducing physical activity, particularly outdoor activity.

5) Staff and students who are asthmatic may have to increase the frequency of inhaler use.

A purple flag indicates the following:

1) Students and kindergarten pupils should wear masks if they are outdoors.

2) Classroom windows should be kept shut to minimize exposure to poor quality air.

3) Staff and students suffering from physical discomfort – particularly sore eyes, coughing, or sore throats – should consider reducing physical exertion and outdoor activities.

4) Staff and students with sensitive constitutions should be proactive in personal health management and should consider reducing physical activity, particularly outdoor activity. Staff and students who are asthmatic will probably have to increase the frequency of inhaler use.

5) School authorities should take into account air quality conditions at any location selected for outdoor activities. Outdoor activities should be moved indoors or postponed if necessary.

6) If air quality readings reach or exceed a PSI level of 300 or a $PM_{2.5}$ level of 250.4 μg/m^3, all outdoor activities should be immediately halted and staff and students with sensitive constitutions should go to the school clinic or an air-conditioned area in order to safeguard their health.

The meaning of the air quality flags and how people can protect themselves against air pollution. Green indicates that regular activities can be conducted; yellow indicates that preliminary precautions should be taken; red indicates that medium level protective measures should be employed; purple indicates that emergency protective measures should be adopted.

Air

Cross-ministerial Action to Fight Air Pollution

Government ministries are joining forces to fight air pollution. On 20 March 2015, the EPA brought together the Ministry of Economic Affairs (MOEA), the Ministry of Transportation and Communications (MOTC), the Ministry of the Interior (MOI), the Ministry of Health and Welfare (MOHW), the Ministry of Education (MOE), and the Council of Agriculture for the first Air Pollutant Reduction Actions Supervisory Board, at which consultations were held on a draft of the National Air Pollution Reduction Action Program. The integration of ministerial air pollution reduction capabilities and the distribution of workload and responsibilities were also discussed. The new board shows that Taiwan's government departments are committed to working together to improve the nation's air quality.

The creation of air pollutants is intimately linked to energy consumption, industrial manufacturing, transportation, agricultural activity, construction, and general daily activities. Effective government air pollution reduction policy planning thus needs to account for the environment, energy generation, manufacturing, transportation, agriculture, education, construction, public health, and land use, hence the need for an interministerial body that can push for air pollution reduction actions.

In addition to the central government's Air Pollutant Reduction Actions Board, an air pollution reduction taskforce has also been established in each of the Air Quality Zones of Central Taiwan, Yunlin-Chiayi-Tainan（雲嘉南）, and Kaohsiung-Pingtung（高屏）. The taskforces comprise personnel from central and local government agencies, academics, experts, local residents, and representatives of citizen groups. The board thus not only strengthens cooperation between central and local government but also affords citizen groups the chance to participate in the work of reducing air pollution.

After two preparatory meetings, the first Air Pollutant Reduction Actions Board was formally convened on 20 March 2015. The increased communication and cooperation between ministries and between the central and local governments has created a new avenue for controlling and reducing air pollution, so as to improve air quality and protect public health.

Air

River Bank Dust Control Achievements for 2014

An interdepartmental effort throughout 2014 to control river bank dust produced commendable results. Monitoring stations near the Kaoping River（高屏溪）indicated that particulate matters (PM_{10}) have been reduced by 48%, while the daily values for river bank PM_{10}>150 μg/m^3 also showed a large decline by other rivers.

River bank dust control in 2014 was a joint effort between the EPA, the Ministry of Economic Affairs' Water Resources Agency, the Council of Agriculture's Forestry Bureau and local governments. The PM_{10} yearly average readings from monitoring stations near the Kaoping River（高屏溪）fell from 76.75 μg/m^3 in 2013 to 39.95 μg/m^3 in 2014, a decrease of 48%. The decreases for Beinan River（卑南溪）, Wu River（烏溪） and Zhuoshui River（濁水溪） were 3%~12%. There were also fewer days with PM_{10} exceeding 150 μg/m^3, going from 11 days in 2013 for the Zhoushui River area to 8 days in 2014.

When northeast monsoons blow across Taiwan, dust from river banks is blown around, affecting the quality of life of riverside residents. Serious dust conditions along the banks of Dongluo River（東螺溪）, which is now called Old Zhuoshui River（舊濁水溪）, and XiluoRiver（西螺）, which is now called Zhuoshui River（濁水溪） were recorded in travel journals dating back to the Qing Dynasty. To improve the quality of the surrounding environment for local residents, the EPA has joined forces with the MOEA's Water Resources Agency, the Council of Agriculture's Forestry Bureau and local governments to implement a four-year river bank dust control program.

Since 2012, the EPA has completed grading of fugitive dust conditions for six rivers and put in place control measures. In addition, the planning for model green corridors on four rivers has been completed; the Water Resources Agency has completed dust control engineering works on 2,660 hectares of land; the Forestry Bureau has planted and nurtured 1,131 hectares of windbreak forestry; and local governments have implemented river bank dust warnings, related education and environmental cleanup. Cooperation between the central and local governments has resulted in a significant decrease in the yearly average PM_{10} reading for 2014, with a correspondingly large decrease in dust-related complaints from the public.

The EPA points out that it will use community public announcement systems or news tickers on TV broadcasts to inform the public when the northeast monsoon is strong enough to cause serious problems related to river bank dust. The EPA is also urging riverside residents in particular to pay attention to all relevant alerts so that they can close their windows, reduce outdoor activities, and take other self-protective measures when the need arises. The EPA will continue to work with all of the agencies concerned to push forward with river bank dust control works to improve the quality of life of riverside residents.

Air

EPA Supports Local Governments in Sustainable Operation of Public Bicycle Sharing System

The Taipei City Government recently announced that from 1 April 2015, the first 30 minutes of use of its YouBikes, the public bike sharing system, will be charged NT$5 instead of being free of charge. The EPA is fully supportive of the Taipei City Government's decision to focus on making the YouBike scheme sustainable and agrees with the principle of user pays. Taipei City's change in policy will not affect the EPA's policy of subsidizing local government public bicycle sharing systems.

The EPA's policy of subsidizing local government public bicycle sharing systems aims to encourage local governments to set up such schemes. The subsidies are offered according to the following principles:

1) All local governments that wish to implement public bicycle sharing systems should conduct preliminary assessments. A grant of a maximum amount of NT$5 million will, after due consideration, be made available to local governments to assist in making assessments to ensure that, once operating, the schemes are self-financing and sustainable to the highest possible degree.

2) Once a public bicycle sharing system is up and running, if an EPA assessment shows that people are using it instead of their own vehicles, and an analysis of financial feasibility plans based upon a sustainable operating model have been done, the EPA will consider subsidizing short-term (three months maximum) promotion measures. The EPA hopes to encourage motorcycle owners to opt for bicycles for short-distance transportation, thus reducing overall vehicle emissions.

Environmental Sanitation

2014 Environmental Agents Inspection Results Released

On 2 March 2015, the EPA released the results of its 2014 inspections of environmental agents on the market. A total of 31,280 products were inspected, of which 379 had incorrect information on their labels, resulting in a pass rate of 98.79%. In addition, 131 products were also tested for active ingredients, all of which passed.

To ensure that environmental agents being sold are all legal, and to prevent environmental agents from unknown sources from harming public health and the environment, every year the EPA draws up an Environmental Agent Inspection Plan for local government environmental protection bureaus to administer. Inspections and testing are conducted at irregular intervals and focus upon dollar stores, flower markets, traditional wet markets, pesticide and herbicide stores, grocery stores and night markets. The inspectors look for incorrect labeling, counterfeit products, and banned environmental agents. Random ingredient testing is also conducted. In addition, to ensure that the public is not buying greenwashed products, the EPA has requested manufacturers of self-claimed "natural" insect-repelling environmental agents to send in samples of their products and submit ingredient certificates and proofs of efficacy to confirm the effectiveness of ingredients.

In 2014, the EPA also uncovered 27 unregistered environmental agents being sold in shops around Taiwan. Upon being tested, three of these products were found to contain Mirex, a chemical compound banned by the EPA and listed as a persistent organic pollutant under the Stockholm Convention. Vendors of 20 other products – which were claimed to be natural pesticides or insect repellants, but which had not been approved by the EPA – were also fined and given deadlines to remove the products from shelves.

To strengthen control over illicit environmental agents entering Taiwan from overseas, the EPA has been keeping in close contact with the Customs Administration of the Ministry of Finance to ensure that all the shipments of environmental agents carry a permit or other certification issued by the EPA when going through customs clearance. Unapproved shipments will be immediately confiscated, and the Customs Administration will pass on importers' details to the EPA, which will then instruct local government environmental protection bureaus to issue penalties. The EPA also releases news on illicit environmental agents every year, and urges the public to avoid buying online environmental agents from unknown sources.

The EPA is also consulting with owners of e-commerce platforms to strengthen controls by requiring that member vendors abide by the regulations forbidding the sale of illicit environmental agents. The platform owners have also modified their keyword search functions so that they are alerted to the sale of illicit environmental agents, and are better able to block such products from being displayed on their websites. The aforementioned measures

The EPA's website provides guidance on recognizing common household pests along with principles for selecting and using environmental agents. (http://mdc.epa.gov.tw/EVagents/EVSecurity/EVIndex.aspx)

constitute strong mechanisms that allow the EPA, local government environmental protection bureaus and customs officials to prevent illicit environmental agents from being sold in Taiwan.

The EPA is keen to emphasize that there are 731 types of general environmental agents that have been registered with the EPA. Gaining approval for these substances involves multiple checks and controls, and the EPA is urging the public not to turn their backs on these bona fide products by instead buying falsely-labeled products from untraceable sources. Consumers should always check the label of the environmental agent product that they are buying to ensure that it carries an EPA approval number.

The EPA has established an online environmental agent permit checking system at http://mdc.epa.gov.tw/MDC/search/search_License.aspx, that allows consumers to type in the permit number on the label and immediately check whether or not a product is legally registered with the EPA. The system can also be used to identify which insect repellent products use natural ingredients as well as legally registered environmental agent vendors and disease vector control enterprises. The EPA has also established a website, http://mdc.epa.gov.tw/EVagents/EVSecurity/EVIndex.aspx, to provide guidance on recognizing common household pests, along with principles for selecting and safely using environmental agents.

Recycling

Regulations Amended for Reviews of Recycling Organization Subsidy Applications

On 6 May 2015, the EPA once again amended the *Management Regulations for the Review of Applications for Recyclable Waste Recycling, Clearance, and Disposal Subsidies*. The amendments aimed to simplify the review procedure in response to the two-stage review that entered force on 18 December 2014, in accordance with the amended *Management Regulations for Recycling Enterprises Handling Regulated Recyclable Waste*. With the latest amendments, the EPA will have a better grip on the efficiency of air pollution control facilities of enterprises. The amendments also make it easier for enterprises to apply for a subsidy to improve administrative performance.

To enhance the management of recycling enterprises that receive EPA subsidies, on 24 June 2013 the EPA announced amendments to the *Management Regulations for the Review of Applications for Recyclable Waste Recycling, Clearance, and Disposal Subsidies*. The amendments stipulate that registered recycling operators wishing to apply for EPA subsidies will have to submit operation plans and ongoing operation reports to the EPA so that the EPA can evaluate whether or not actual operations are in line with standards for recyclable waste recycling, storage, clearance and disposal methods and facilities, and whether or not the subsidies are enhancing operational capacity.

To simplify procedures in accordance with the 18 December 2014 revisions to the *Management Regulations for Recycling Enterprises Handling Regulated Recyclable Waste*, which state that disposal enterprises would undergo two-stage inspections, the EPA announced the following amendments to the *Management Regulations for the Review of Applications for Regulated Recyclable Waste Recycling, Clearance, and Disposal Subsidies*, on 6 March 2015:

1) Keep definitions consistent: In the *Management Regulations for Recycling Enterprises Handling Regulated Recyclable Waste,* the definition of "hazardous substances" has been revised as "substances listed by the *Standards for Defining Hazardous Industrial Waste* as components generated by waste disposal processes.

2) Specify the content of the operation plan: Enterprises that apply for government subsidies within six months of registering as a recycling operator may, with the permission of the central competent authority, be exempted from having to submit operation plans and follow-up reports.

3) Enterprises that apply for government subsidies

may first submit hard copy documents with the approval of the central competent authority. The related documents must be submitted online before a stated deadline. The amended regulations are published on the EPA website: http://ivy5.epa.gov.tw/epalaw/index.aspx.

Waste

EPA Subsidizes Liouciou Township NT$10 Million for Waste Disposal

Because of contract issues and budget constraints, the off-shore Liouciou Township （琉球鄉） of Pingtung County （屏東縣） could not dispose of its garbage in a timely fashion, resulting in the piling up of mountains of refuse. To address the problem, the EPA allocated an annual subsidy of NT$10 million to help Liouciou Township ship the garbage to the main island for appropriate disposal.

Local newspapers reported that because Liouciou Township lacked funds to transport its garbage to be dealt with at the Kanding Incineration Plant （崁頂垃圾焚化廠）in Pingtung County, 850 tons of garbage had piled up on the island. Although waste disposal falls within the jurisdiction of local governments, as the central competent authority the EPA decided to provide funding, administrative and technical support to help Liouciou Township resolve its waste disposal problems.

The original garbage transport contract of Liouciou Township expired at the end of 2014. Due to the lack of a new contract, garbage kept piling up on the island and could not be dealt with efficiently. To help the local government solve its garbage disposal problem, on 16 March 2015 the EPA agreed to allocate annual funds of NT$10 million, and on 17-18 March conducted on-site inspections. The EPA instructed the Liouciou Township Office to immediately start garbage transport and incineration operations, while at the same time admonishing the local government to adopt a multi-year garbage transport contract, or to reserve the right to ship more waste than the disposal contract stated in case of the need to do so, in order to prevent a situation of being unable to transport garbage from occurring again. In addition, the EPA instructed the Liouciou Township Office to strengthen its disinfection and environmental maintenance work.

The Liouciou Township Office indicated that it was reviewing the paperwork and will put the contract for open bidding at the end of April. The EPA has also been in contact with the mayor of Liouciou Township to discuss the feasibility of integrating the procedures for budget review and open bidding. In the meantime, the Liouciou Township Office started to bundle its accumulated garbage and an emergency transport process was to be launched within three days. The EPA has requested the Environmental Protection Bureau of Pingtung County to dispatch personnel to supervise the disinfection and coverage of the transported garbage.

Recycling

EPA Exhibits its Recycling R&D Achievements

On 27 March 2015, the EPA held an exhibition to showcase the innovations produced from processed recycled waste. With a theme of resource regeneration and environmental design, the EPA showcased the research and development results from innovative designs it subsidized in 2014. The innovations created opportunities and harnessed the potential of discarded resources. The subsidy attracted experts from industry and academia in various fields to participate in the cause

The EPA expressed that Taiwan is continuously working on sustainable materials management. The government therefore formulated related regulations and management schemes to guide the

consumption of materials towards being cyclical and sustainable. After reduction, recycling and appropriate disposal of waste, the upgrading of recycling technology and improvement of the quality of products made from recycled materials are becoming the best driving forces to reaching the goal of sustainable material consumption.

The innovations from the exhibition all showed promising results, despite being created from spent batteries, used household appliances, discarded liquid crystal displays (LCD) or empty plastic containers. Newly developed technologies have proven able to extract high purity, ever-valuable, rare earth metals and environmentally friendly catalysts, as well as fuels derived from solid waste. Through modifying manufacturing processes, high quality reground materials that provide the advantage of lower carbon emissions have been generated, which can then be used in thermal insulators, eco-friendly umbrella covers, shopping bags and garbage bags. Promising results have also been obtained from the evaluation of the potential of: making polymer films from used tires; gasification of Tetra Pak cartons for combustible gases; the development of aluminum recycling technology; and improvements in pollution control.

The EPA noted that the subsidized projects conducted in 2014 showed a progression from basic research and development to commercial products. These projects led to a total of six patent applications, six industry cooperation cases and six published articles. Through the exhibition, the EPA expected to encourage new R&D research and new innovations, by bringing together industry and academia to collaborate and develop new market opportunities. The EPA hopes that the subsidized projects will transform resource recycling into a more upgraded, high-quality and high-tech industry.

News Brief

Drinking Water Quality Testing Strengthened During Droughts

With drought conditions persisting, to prevent the safety of drinking water from being affected by the low amounts of available water, since March 2015 the EPA has been strengthening the testing of public drinking water quality and inspecting pollution sources in major water supplying areas. The EPA also reminds the general public to boil drinking water during periods of water shortage and to not drink water from unknown sources. If saving water, stored water should be covered with a lid and water should not be stored for excessive periods of time. People should also be aware of water pumps during periods of water restrictions, in that negative pressure could build up in pipes and lead to contamination of water. Related information can be accessed on the EPA's website (http://www.epa.gov.tw/mp.asp?mp=dt).

Also since March 2015, in response to water quality problems stemming from water shortages, the EPA has enhanced water quality inspections for public drinking water, packaged water and water fountains. The EPA is also reinforcing the inspection of pollution sources in catchment areas of water supply reservoirs and water purification stations. In addition, to better assess any changes in water quality, the EPA has expanded the examination of water quality to include the rivers and reservoirs serving as primary water supply. For areas under water restrictions, the quality of tap water coming from purification stations, rivers and reservoirs are being monitored and the results are announced on the EPA's website. Results from January and February showed no differences in water quality compared to the average of last year.

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