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## Feature Article

### New Environmental Measures for 2014

With the arrival of 2014, the EPA has announced nine new measures that directly enhance environmental protection. These include revisions to construction project air pollution control fee rates, the upgrading of GPS systems on industrial waste transportation vehicles, and other measures that all came into effect on 1 January 2014.

The nine measures that came into effect on 1 January 2014 are as follows:

1. From the beginning of 2014, adjustments will be made in two stages to the recycling fee rates for dry cell batteries.
2. Attachments for Article 2 and Article 7 of the *Environmental Impact Assessment Documents Review Fee-charging Standards* have been revised.
3. Reference regulations for sediment quality have been issued that will help to protect aquatic organisms and public health.
4. The Construction Project Air Pollution Control Fee Rates have been revised along with the *Construction Project Air Pollution Control Equipment Management Regulations*.
5. Natural compounds to be used in the environment as insect repellants will require approval from the EPA. Documentation of natural ingredients and their efficacy as repellants must be submitted with applications.
6. Two sets of regulations governing GPS installation

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in industrial waste transportation vehicles have been merged; the new regulations also require the upgrading of GPS in older vehicles.

7. The *Management Regulations Governing the Reporting of Greenhouse Gas Emissions* (溫室氣體排放量申報管理辦法) have been promulgated and the *Public and Private Premises Required to Report Greenhouse Gas Emission Volumes as Stationary Pollution Sources* (公私場所應申報溫室氣體排放量之固定污染源) have been announced. The regulations immediately went into effect for enterprises that emit over 25,000 tonnes of CO<sub>2</sub>e greenhouse gases per year.

8. As required by Article 105 Paragraph 1 of the *Water Pollution Control Measures and Test Reporting Management Regulations*, large-scale industries, industrial parks, and power stations were given a year from a designated date to complete the installation of automatic monitoring equipment in their sewer systems that can continuously transmit data online.

9. The *Air Pollution Control and Emission Standards for Volatile Organic Compounds* (揮發性有機物空氣污染管制及排放標準) have come into effect (as detailed below).

Details of the above regulations are shown in the following table:

 **New Measures Effective from 1 January 2014**

Measure	Content
<b>Recycling fee rates for dry batteries adjusted in two stages</b>	Some of the recycling and disposal fees for dry cell batteries will be increased. <ul style="list-style-type: none"> <li>- A 50% green discount will be given to button batteries that contain less than 5 ppm of mercury.</li> <li>- The first stage took effect from 1 January 2014; the second stage will take effect from 1 January 2015.</li> </ul>
<b>Review fees for environmental impact assessments increased</b>	Revisions that took effect on 1 January 2014 have been made to the attachment in Article 2 of the <i>Environmental Impact Assessment Documents Review Fee-charging Standards</i> (環境影響評估書件審查收費辦法). Since the fees being collected were insufficient to cover actual review costs, the EPA did the actuarial analyses a number of times and has received approval from the Ministry of Finance to raise the fee standards.
<b>Sediment quality reference regulations issued</b>	As laid out in the <i>Soil and Groundwater Remediation Act</i> , industry competent authorities for rivers, irrigation ditches, lakes, reservoirs and any other EPA-designated bodies of water, should regularly conduct sediment quality tests and assess the results using the Sediment Quality Index. The results should be published and a copy sent to the EPA for evaluation. The EPA has drawn up the <i>Industry Competent Authority Sediment Quality Testing Reference Regulations</i> to clarify the legal requirements.
<b>Working Standards for Environmental Agent Permit Application and Issuance revised to require approval for natural compounds to be used in the environment as insect repellants</b>	Revisions have been made to the <i>Working Standards for Environmental Agent Permit Application and Issuance</i> to improve the management of environmental agents. <ul style="list-style-type: none"> <li>- Environmental agent toxicity categories have been revised to align them with WHO pesticide toxicity categories.</li> <li>- Tightened restrictions on the use of the common disinfectant chlorine dioxide. From 1 January 2014, manufacturers or importers of chlorine dioxide will need to obtain a permit.</li> </ul>

Measure	Content
	<ul style="list-style-type: none"> <li>- Natural compounds to be used in the environment as insect repellants will also require EPA approval as of 1 January 2014, including documentation of natural ingredients and proof of their efficacy to be submitted with the application.</li> <li>- In order to safeguard the quality and chemical stability of environmental agents, from 1 July 2014 enterprises applying for permits to manufacture or import environmental agents will need to submit physical and chemical <a href="#">property test reports to the EPA for review</a>.</li> </ul>
<p><b>Two sets of regulations governing GPS installation in industrial waste transportation vehicles have been merged, while also requiring GPS upgrading in older vehicles</b></p>	<p>The merged sets of regulations have been renamed the <i>Regulations Governing the Installation of Real-Time Tracking Systems in Waste Transportation Vehicles</i>.</p> <ul style="list-style-type: none"> <li>- The said GPS systems will henceforth be required to have real-time response barcode scanning functions.</li> <li>- Considering the high reliability of the present GPS devices, the operating evaluation period for said devices has been shortened.</li> <li>- Waste transportation vehicles specified as “old” should have had their GPS systems upgraded by 1 January 2014 in order to meet legal requirements.</li> </ul>
<p><b><i>Management Regulations Governing the Reporting of Greenhouse Gas Emissions promulgated and Public and Private Premises Required to Report Greenhouse Gas Emission Volumes as Stationary Pollution Sources announced that enterprises with annual CO<sub>2</sub>e greenhouse gas emissions over 25,000 tonnes need to report emissions</i></b></p>	<p>From 1 January 2013, major high energy-consuming enterprises or enterprises with high energy intensity have been asked to be the first to abide by the relevant management regulations for reporting greenhouse gas emission volumes and conducting auditing and verification procedures.</p> <p>It is estimated that in 2013 and 2014, 280 such enterprises that are responsible for large-scale emissions were requested to report emission volumes. The first batch, for which the regulations were enforced from 1 January 2013, includes specifically designated industries and enterprises that have annual greenhouse gas emissions of over 1 million tonnes of CO<sub>2</sub>e. The second batch, enforced from 1 January 2014, includes all enterprises that have annual CO<sub>2</sub>e emissions of over 25,000 tonnes.</p>
<p><b>Large-scale industries, industrial parks, and power stations given one year to complete the installation in their sewer systems of automatic monitoring equipment that can continuously transmit data online</b></p>	<p>The regulations stipulate that large-scale industries, industrial parks, and power stations should install in their sewer systems automatic monitoring facilities that can continuously transmit data online to local competent authorities. These measures are to be implemented in two stages, starting from 15 July 2013.</p> <ul style="list-style-type: none"> <li>- The first stage of the implementation of continuous online monitoring will affect enterprises with a maximum permitted daily discharge volume of 10,000 m<sup>3</sup> and industrial park sewer systems that have passed the environmental impact assessments. As of 15 July 2013, such enterprises were required to install automatic testing and monitoring equipment that can transmit data online. Installation must be completed by 14 July 2014 at the latest.</li> <li>- The second stage of the implementation will affect: enterprises with a maximum permitted daily discharge volume of 15,000 m<sup>3</sup>; power stations where the effluent does not come into contact with cooling water or power stations that use the seawater flue gas desulfurization process in their air pollution prevention facilities; and industrial park sewer systems that have daily wastewater discharge volumes between 2,000-10,000 m<sup>3</sup>. Beginning from 1 January 2014, these enterprises will have to install automatic testing and monitoring equipment that can transmit data online, to be completed no later than 31 December 2014.</li> </ul>

Measure	Content
<b>Construction Project Air Pollution Control Fee Rates revised</b>	<ul style="list-style-type: none"> <li>- For dredging projects, the revisions have added air pollution control fee rates that are based on the volumes dredged from project sites, so as to increase the economic incentives for operators to install air pollution control equipment. Revisions were promulgated and put into effect on 1 January 2014.</li> <li>- Dredging project operators must adequately account for air pollution control fees in advance, adhere to reporting regulations and pay the fees before work begins.</li> <li>- To avoid fines, operators must also supervise contractors to ensure that they carry out the appropriate air pollution control work.</li> </ul>
<b>Construction Project Air Pollution Control Equipment Management Regulations amended to bring them into line with the revised Construction Project Air Pollution Control Fee Rates</b>	<p>The above revisions to the <i>Construction Project Air Pollution Control Fee Rates</i> were first announced on 5 July 2013 and took effect on 1 January 2014.</p> <ul style="list-style-type: none"> <li>- Along with revisions to fee rates, the category of “dredging projects” has been added and the grades of engineering projects have been clarified so that fee rate grades can be more easily determined and fees for dredging projects more easily collected.</li> <li>- The maximum values for pollutants in oil products used in construction project machinery, as stated in the above regulations, have also been amended to match announced revisions to the <i>Standards for the Composition of Automobile Gasoline and Diesel Fuels</i>. The revisions took effect on 1 January 2014.</li> </ul>

## Toxic Substance

# Toxic Chemical Substances Control Act Revised to Launch Chemical Substance Registration

In December 2013, President Ma Ying-jeou announced revisions to the *Toxic Chemical Substances Control Act* (毒性化學物質管理法) that will initiate a national registration system for chemical substances in 2014. The 17 revisions include the addition of 4 new articles and revisions to 13 existing articles, which will provide for the formulation of chemical substance management regulations, thereby facilitating control over the manufacture or import of such substances and enhancing the overall management of Category 4 toxic substances.

The revised act authorizes the EPA to formulate and promulgate the necessary subsidiary laws within one year (i.e., before 11 December 2014). These bylaws include regulations governing chemical substance registration, approval of Category 4 toxic substances for use, and enforcement rules for toxic chemical substance control. They also include regulations governing outsourcing review of chemical substance registration applications, labeling and safe-handling information for toxic chemicals, standards for permit application fees to handle toxic chemicals, and emergency response vehicles that respond to incidents involving toxic chemicals (to be formulated

in conjunction with the Ministry of Transportation and Communications). The EPA is currently endeavoring to carry out the research and planning for a draft of the above regulations, and expects to begin a series of public hearings and consultations from September 2014 to take on board the public's opinions.

Under the provisions of the act, there will be a system for controlling chemical substances at the source, and manufacturers and importers of chemical substances will be required to register information on said substances with the EPA. This information must include the status of manufacture and importation, physical

and chemical properties, toxicity, and exposure and risk assessments. EPA approval must be gained before the said substances can be manufactured or imported. Details of implementation rules will be specified in the draft of the *Management Regulations Governing Chemical Substance Registration* (化學物質登錄管理辦法). Currently, the draft covers the following:

1) Registration of new chemical substances – based on the category of the substance, three types of registration will be used: standard registration, simple registration, and small-volume registration.

2) Registration of existing chemical substances will be carried out in batches and in stages.

The EPA would like to stress that enterprises that manufacture or import new chemical substances without approval are liable to a fine of NT\$200,000~2,000,000; manufacturing or importing

existing chemicals without approval could result in a fine of NT\$30,000~300,000. Violators who do not make improvements before the given deadline will incur repeat fines. Violators who do not make improvements after receiving two written warnings will face suspension of operations, suspension of business or will be forced to ship back the offending batch of chemicals.

Both local circumstances and international trends will be taken into account for the draft of the *Management Regulations Governing Chemical Substance Registration*. The EPA will continue to consult with experts from the government, industry and academia on issues related to chemical substance registration, such as tonnage range, types, information to be registered, regular reporting of manufacturing/importation methods and volumes, and disclosure of information. The ultimate goal is the establishment of a complete at-source chemical substance registration system.

## Air Quality

# Emission Standards for Volatile Organic Compounds Take Effect

On 1 February 2011, the EPA announced revisions to the *Air Pollution Control and Emission Standards for Volatile Organic Compounds* (揮發性有機物空氣污染管制及排放標準). Considering that operators of existing pollution sources would need time to make the improvements to bring them into line with the law, different timescales were laid out with the latest being three and a half years from the date of promulgation. New manufacturing operations, however, have had to abide by the regulations since 1 February 2011.

The relevant emission standards that took effect from 1 January 2014 are explained below:

### 1. Flare Stacks

(1) Regulations that govern the installation of monitoring equipment in flare stacks and subsequent reporting procedures include:

- Equipment for monitoring waste gas composition and concentrations must also indicate gross/net heat values. Oil refineries should add equipment to monitor total sulfur concentrations in the waste gas.

- Flow meters should be installed in the independent

fuel systems that feed the pilot light.

- Equipment that has water sealed tanks installed should also have water level or pressure gauges installed on the tanks to indicate how well the water seals are functioning.

- Steam flow meters should be installed in steam-assisted combustion.

(2) Public and private premises that have monitoring equipment but are exempt from the requirement for continuous automatic monitoring should still inspect their flare stack every six days, or hire a specialized analysis organization to do so.

(3) Every year at the end of January, April, July and October, public and private premises should submit quarterly reports to their local competent authority. Said reports should include total flare stack operation time, volume of waste gas, rate of discharge, volume of pilot light fuel, water levels or pressures of water sealed tanks, gross/net heat values, waste gas composition and concentrations, steam volume, and calculated air pollutant emission volumes.

(4) Attachment 1 in the standards stipulates the calibration and function specification for flare stack monitoring facilities. These include frequency of calibration and function inspections for flow meters installed on the flare stack feeder pipes.

2. The cleaning of storage tanks that hold liquid VOCs should be done when the tank is empty and all residual gas has been collected. The tank should only be opened after VOC concentration has been 50% below the explosive threshold or below 34,000 ppm for at least one hour. However, if a cleaning machine is installed, these restrictions do not apply. In such a case, when the tank is opened, the operator should ensure that any residual VOC gas is collected and treated properly before being discharged in order to minimize its impact on the surrounding environment and the chance of public complaints arising.

### 3. Effluent Treatment Facilities

(1) The regulations stipulate that liquid effluent in petrochemical industry wastewater collection systems must not come into contact with the atmosphere, and thus must be covered or enclosed.

(2) The regulations state that the preliminary treatment units and biological aerated filters in petrochemical industry wastewater treatment plants must be hermetically sealed and regularly maintained. In cases where the volume of wastewater from petrochemical operations does not exceed 40% of the total volume of wastewater received at the industrial park wastewater treatment plants, or when safety considerations or special circumstances arise and there is no cause for public complaint, then the effluent may be left uncovered with the prior approval of the local competent authority. In such cases, the operator must submit reports giving details on foul odors noticed in the vicinity of wastewater facilities, wastewater sources and flow volumes, as well as water volumes and VOC concentrations in the biological aerated filtering systems. The report must be submitted to the local competent authority before the end of January, April, July and October.

The above regulations are designed to prevent wastewater dispersing VOCs into the environment. Sludge treatment facilities should adopt sealed or enclosed gas collection systems that should be regularly maintained and kept sealed. Treatment should be continued until there has been a reduction in pollutants of over 85% or until a discharge concentration of below 150 ppm has been reached. The measure aims to ensure that VOCs will not escape from the sludge into the surrounding environment where the foul odors they create could lead to complaints from local residents.

## Air Quality

### Vehicular Air Pollutant Emission Standards Revised

It was announced in 2012 that six major greenhouse gases would be classified as air pollutants and hence subject to controls. In light of this, the EPA announced the amendments to the Vehicular Air Pollutant Emission Standards, including the addition of CO<sub>2</sub> emission standards for vehicles. The amendments will extend the reach of Taiwan's greenhouse gas reduction efforts even further.

**G**reenhouse gases are a cause of global warming and climate change, and thus indirectly impact, change and damage our living environment. Hence, on 9 May 2012, the EPA officially announced that CO<sub>2</sub>, methane, nitrous oxide, HFCs, SF<sub>6</sub>, and CF<sub>4</sub>

to be air pollutants, and so it became necessary to add CO<sub>2</sub> to the *Vehicular Air Pollutant Emission Standards*.

The first stage of implementation will target passenger

cars and will use 2009 as the base year. A target of a 15% reduction in CO<sub>2</sub> emissions from new cars will be phased in starting from 2015. Taiwan's emission standards were set after consulting the EU's emission standards for passenger cars.

The EU's linear target curve method has been adopted and CO<sub>2</sub> emission reporting values will be calculated using factory sales weighted averages. The EU has set its control standard value at 130 g/km but has also stated that factories that sell less than 300,000 vehicles per year can go up to 25% over the limit. As the total number of annual newly-registered passenger cars in Taiwan has never exceeded 300,000, the EPA has decided to set the control standard value at 163 g/km (130g/km × 1.25) so that it is in line with current standards in the EU.

In order to encourage enterprises to manufacture or import low-carbon emission vehicles, the amendments also allow for the recognition of extra credits for the lower CO<sub>2</sub> emission volumes from electric or hybrid (i.e., low emission) vehicles. Furthermore, if average emissions for some of the manufacturers' vehicles are below the set control standard then the difference can be counted – within a stated time period – as a credit against other vehicles that have higher emissions. Credits will also be given for the adoption of new environmental technologies that have been recognized by developed nations. All of the new measures aim to encourage Taiwan's auto industry to manufacture or import low-emission vehicles for consumers.

## Air Quality

# Subsidies Announced for Converting Two-wheeled Vehicles to Use Universal Battery

The EPA has announced the *Regulations Regarding Subsidies for Converting Two-wheeled Vehicles to Use Universal Batteries* (電動二輪車改裝使用共通電池補助辦法). The subsidies will be available to manufacturers of two-wheeled electric vehicles and battery exchange operators who wish to switch to the swappable universal batteries that meet the EPA's specifications. New regulations have also been announced governing the testing procedures for the universal battery. The aim of the new regime is to encourage enterprises to quickly adopt the universal batteries which will promote the uptake of two-wheeled electric vehicles and the battery swapping system.

The EPA is currently actively promoting the use of two-wheeled electric vehicles and the battery swapping system, and has already provided subsidies to two enterprises that have each set up over 30 battery swapping stations. Vehicle owners who join the battery swapping system do not need to worry about the cost of maintaining or replacing batteries but instead can have their batteries exchanged as conveniently as filling a conventional vehicle up with gas. Having a network of swapping stations thus gives two-wheeled electric vehicles a far greater range, which is what the vehicle owners want. Starting in 2010, the EPA has held almost 30 meetings with operators in order to reach a consensus on the specifications of the universal batteries. On 9 December 2013, the EPA announced the *Regulations Regarding Testing Universal Batteries in the Two-wheeled Electric Vehicle Battery Swapping System* (電動二輪車電池交換系統共通電池審驗規範) and

promulgated the *Regulations Regarding Subsidies for Converting Two-wheeled Vehicles to Use Universal Batteries* (電動二輪車改裝使用共通電池補助辦法). Enterprises that join the scheme will be able to claim subsidies for converting their facilities in order to handle the universal batteries and also for carrying out battery testing.

In order to encourage members of the public to buy two-wheeled electric vehicles with swappable batteries, the EPA is offering a subsidy of NT\$10,000 on battery swapping fees for each of the first 10,000 people who buy a two-wheeled electric vehicle and become members of the EPA battery swapping system. This will facilitate technology and operating feasibility assessments for the system and should also accelerate the spread of two-wheeled electric vehicles.

Two-wheeled electric vehicles operate entirely by electricity and thus generate less air pollution than conventional combustion engine motor bikes. The EPA encourages the public to purchase two-wheeled electric vehicles that use swappable universal

batteries and likewise encourages industry to adopt such batteries for their products. Air quality is thus bound to improve with people pitching in to do their part.

▶ *Subsidies for Two-wheeled Electric Vehicle Conversion, Battery Swapping Station Modification and Battery Testing*

Type of Vehicle	Type of Subsidy	Amount of Subsidy
Electric bicycle	Conversion fee	NT\$650,000
Electric motorbike	Conversion fee	NT\$1,000,000
Electric bicycle	Test fee	80% of test fee
Electric motorbike	Test fee	
Battery swapping station	Modification fee	49% of the total modification fee determined by the case-based evaluation done by the EPA, with a maximum subsidy of NT\$10 million



▶ Battery swapping station (photo: Citypower Taiwan Co. Ltd)



## Climate Change

# Draft of Guidelines for Greenhouse Gas Analysis and Auditing Organization Management Regulations Preannounced

In order to streamline and improve the management of greenhouse gas testing and auditing organizations, the EPA has formulated a draft of the *Greenhouse Gas Analysis and Auditing Organization Management Regulations* (溫室氣體檢驗測定及查驗機構管理辦法). The regulations will provide a framework for the management of such organizations and their staff.

To ensure that Taiwan's greenhouse gas emission volumes and reduction data is accurate, in 2009 the EPA promulgated the *Greenhouse Gas Auditing Organization Working Guidelines* (溫室氣體查驗機構作業原則). The guidelines improved the management of greenhouse gas auditing organizations by specifying application and evaluation procedures. On 9 May 2012, the EPA further announced that CO<sub>2</sub> and five other greenhouse gases were to be classified as air pollutants. The draft of the *Greenhouse Gas Analysis and Auditing Organization Management Regulations* aims to streamline and improve the administration of greenhouse gas analysis and procedures for evaluating greenhouse gas auditing organizations. The regulations comprise a comprehensive set of legislation that facilitates the management of greenhouse gas analysis and auditing organizations and their staff.

The management procedures laid out in the draft are similar to those laid out in the *Environmental Analysis Organization Management Regulations* and the *Environmental Analysis Organization Working Guidelines* in that they stipulate the conditions that greenhouse gas analysis and auditing organizations must meet, permit application and revocation procedures, minimum qualifications for personnel, auditing procedures, and other legal requirements. After the regulations are implemented, the EPA will grant sufficient time for obtaining the new permit to the organizations that currently have a valid permit to conduct greenhouse gas analysis, as well as to the 11 approved auditing organizations.

## Waste

# Scope of Enterprises Required to Designate Waste Disposal Professionals Expanded

The EPA announced its amendments to the *Enterprises Required to Designate Waste Disposal Professionals*, in which the scope of enterprises under regulation was greatly expanded to cover an additional 1,632 enterprises.

The amendment was based on the following considerations: 1) the growing importance of the functions of waste disposal specialists; 2) strengthening the self-regulation of the waste production source; 3) strict management of waste disposal; and 4) source reduction of wastes. The EPA is thus tightening controls on enterprises which report in excess of the maximum monthly production of 60

tonnes of hazardous wastes or which exceed the monthly maximum of 100 tonnes for non-hazardous sludge. By so doing, 90% of hazardous industrial wastes and 82% of non-hazardous sludge will be controlled.

In an effort to encourage large scale enterprises to fulfill their environmental responsibilities, the EPA also

amended its regulations regarding manufacturing industries that should submit waste disposal plans. Enterprises with a registered capital of over NT\$2 billion are required to designate waste disposal professionals.

The EPA reminds local environmental protection bureaus to communicate the amended regulations to the enterprises under their jurisdiction. Enterprises that are newly ordained to have waste disposal

professionals are urged to select appropriate personnel to undergo waste disposal training sessions and obtain suitable qualifications. Alternatively, these enterprises may opt to hire personnel who have already acquired such qualifications. Information on the related training courses can be found at <http://www.eps.gov.tw/traini8ng/index.html>. Regarding the contents of the amendments, please refer to <http://ivv5.epa.gov.tw/epalaw/index.aspx>.

## Soil & Groundwater

### Soil Pollution Monitoring Standards Revised

In response to the need to update Taiwan's soil pollution controls, the EPA has announced revisions to Article 4 of the *Soil Pollution Monitoring Standards* (土壤污染監測標準). The revisions will bring soil pollution management more into line with on-the-ground requirements, and should result in land being put to more effective use.

Since the promulgation of the *Soil Pollution Monitoring Standards* on 31 January 2011, Taiwan's economy and manufacturing industries have undergone certain changes. Meanwhile risk assessments and other useful reference information from Taiwan and overseas have become more comprehensive. All of these have allowed for a more pragmatic approach to environmental risk control and adopting more effective land use. Following a period of research, discussions, and collection of the public's opinions, the EPA conducted a review of the *Soil Pollution Monitoring Standards* and made revisions to Article 4.

The EPA summarized the main points of the revisions as follows:

1. Control standard values for five heavy metals – arsenic, cadmium, copper, lead, and zinc – have been

revised, changing the wording of “food crop farmland” to “agricultural land and drinking water source and quality protected area.” Heavy metal control standards for industrial parks have also been added.

2. In order to maintain the effectiveness of pollution risk management, and after taking into account current restrictions on land use and the way land is re-designated for industrial use, the EPA has decided that the newly-added heavy metal control standards for industrial parks and high factory-density areas will be applied only to areas which are designated for industrial use only. These are the same industrial parks, export processing zones, science-based parks, and environmental science and technology parks stated in Article 6 Paragraph 3 Item 1 of the *Soil and Groundwater Pollution Remediation Act*.

## Environmental Analysis

### Using Fish, Shrimp and Algae as Environmental Indicators

The EPA has been announcing the results of research that employ river organisms such as fish, shrimp and algae in order to set benchmarks for effluent toxicity in aquatic life forms. The tests could be used by enterprises to conduct self-assessments of their effluent with the aim of improving the protection of river water quality.

**B**iological toxicity testing refers to the practice of using certain living organisms to evaluate the toxic effect of pollutants in water samples on organisms in general. Biological toxicity is commonly divided into two types: acute and chronic. Acute toxicity testing assesses the impact upon the organism's survival, with death thus being the final possible outcome. Chronic toxicity testing involves long-term observation of the effect of toxicity on the organism's biology, and so the assessment criteria include determining whether growth, reproduction, etc. have been impacted.

In 1993, the EPA began developing biological toxicity testing standards that would be suitable for use in Taiwan. After many years of hard work, the EPA has developed different sets of testing standards for the following indigenous species: carps, *Pseudorasbora parva*, *Zacco platypus*, *Neocardina denticulate*

*sinensis*, water fleas (*Daphnia pulex*), and algae. A number of different species is necessary because organisms in their natural ecosystems are intimately connected – no single species can survive without the others – and there is no single species that is equally sensitive to all forms of toxicity, hence the need for different tests for different species. Toxicity testing should also cover organisms in at least two different nutrient levels, such as fish and shrimps, or fish and water fleas.

Costs for biological testing are not low, so the EPA is calling on Taiwan's businesses to remember their corporate social responsibility as they pursue economic growth and develop their own biological toxicity tests in the effluent they discharge. Not only would this improve their corporate image but it would also help Taiwan along the road to having healthy and sustainable ecosystems.



▶ *Pseudorasbora parva*, a native Taiwan species that feeds on algae, plankton, and water-borne insects

## News Briefs

### Subsidies Extended for Purchasing New Electric and Electric-assisted Bicycles

In order to encourage the general public to purchase electric bicycles and electric-assisted bicycles, the EPA has extended the application deadline for subsidies to 30 November 2015. In addition, the subsidy amount is higher for early birds who opt to use the swappable universal batteries with standard specifications. From 1 January 2015, however, only owners who use universal batteries will be eligible for the subsidies, and the amount of subsidies will also be curtailed. For detailed information about the subsidies, please refer to the chart below.

The first 2,500 members who participate in the battery swapping system will be entitled to receive up to NT\$5,000 for battery swapping expenses. The EPA hopes that the promotion of electric bicycles and the battery swapping system will be accelerated through these multiple measures.

▶ Amount of subsidy and application period for electric and electric-assisted bicycles

Type of bicycles	Type of battery	Subsidy Levels for 2014	Subsidy Levels for 2015
Electric bicycles	Universal battery	NT\$6,000	NT\$3,500
	Non-universal batteries	NT\$3,000	No subsidy
Electric-assisted bicycles	Universal battery	NT\$3,500	NT\$1,500
	Non-universal battery	NT\$3,000	No subsidy



### 2013 International Conference on Resource Recycling Held

From 18-19 December 2013, the EPA held the 2013 International Conference on Resource Recycling, to which government representatives from Canada, Germany, India, Japan, Korea, Singapore, Thailand, and the UK were invited to share their experiences in resource recycling. Through keynote speeches and panel discussions, the delegates exchanged information on their respective governments' recycling management systems and provided many feasible ideas on planning the construction of sustainable cities. On 20 December, the delegates visited several waste sorting plants of the local environmental protection bureaus as well as some privately owned waste recycling enterprises.

The guests expressed that they were deeply impressed with Taiwan's accomplishments in resource recycling, and in particular with Taiwan's ability to implement the sorting of household garbage. They also trusted that Taiwan's advanced technology in waste recycling would provide a paragon for other nations to follow, and that based on the solid foundation laid by Taiwan, the international community will be able to march toward the construction of sustainable cities.

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