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## Feature Article

### Acid Rain Monitoring and Prevention

Acid rain is a serious environmental problem that has long been of concern to many nations around the world. The EPA has adopted a three-pronged approach to reduce the damage that acid rain causes to the environment and human health: increasing the number of acid rain monitoring stations, continuing the promotion of pollution controls, and strengthening international cooperation.

Scientists are now in agreement that acid rain should be defined as rainwater that has a pH of below 5.0. Acid rain has a multifarious impact on the environment, with the potential to damage aquatic ecosystems, forests, lakes, rivers, buildings, as well as human health..

Taiwan's first research into acid rain was carried out by the Central Weather Bureau working with rainwater collected at Taipei Weather Station. The lowest rainwater pH ever recorded at the station was 3.8. In April 1990, the EPA began a nationwide, long-term study into acidic deposition. The results showed that acid rain was occurring all over Taiwan, with sulfur oxides (SO<sub>x</sub>) and nitrogen oxides (NO<sub>x</sub>) as the main culprits. Airborne quantities of these two types of pollutants were thus listed as important indices for air quality monitoring.

#### Monitoring and Controls Jointly Implemented to Prevent Acid Rain

In order to effectively prevent acid rain, Taiwan has drawn up three major monitoring and control strategies:

##### Adding Acid Rain Monitoring Stations

Two new acid rain monitoring stations will be built in 2012: One in either Hsinchu or Miaoli; and one in either Yunlin or Changhua. The new stations will make the nationwide monitoring of acid rain more comprehensive.

##### Continuing the Promotion of Pollution Controls

The following reduction measures are being promoted to strengthen controls on SO<sub>x</sub> and NO<sub>x</sub>:

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### Stationary Source SO<sub>x</sub> Emission Controls:

1. Strict standards for designated enterprises have been brought into effect since the 1990's. These include:

- The Stationary Source Air Pollutant Emissions Standards, promulgated on 10 April 1992.
- The Refuse Incineration Plant Air Pollutant Emissions Standards promulgated on 30 November 1992.
- The Electricity Generation Facilities Air Pollutant Emissions Standards, promulgated on 4 May 1994.
- The Steel Industry Smelting Plant Air Pollutant Emissions Standards, promulgated on 2 April 1993.
- The Secondary Lead Smelting Plant Air Pollutant Emissions Standards, promulgated on 28 August 1992.

The above regulations have all been made progressively stricter since their first promulgation.

2. On 17 November 2004, regulations were announced that reclassified all liquid fuels with a sulfur content of over 0.5% used by stationary sources as "substances prone to cause air pollution." On 5 January 2006, it was announced that liquid engine fuels - in use at stationary sources in public or private premises - that exceed stated maximum values for designated pollutants or are of certain categories will also be classified as "substances prone to cause air pollution."

3. On 23 March 1995 and 5 July 1995, regulations governing air pollution control fees to be collected from operators of SO<sub>x</sub> stationary sources were also promulgated.

### Mobile Source SO<sub>x</sub> Emission Controls:

1. In 1989, restrictions on the maximum amount of sulfur permitted in high-grade diesel first took effect. On 1 July 1989, this was set at 5,000 ppmw (0.5%). On 1 July 1993, the maximum was lowered to 3,000 ppmw. It was then gradually lowered until it reached the 50 ppmw set in 2005. Maximum sulfur content

for gasoline was set at 275 ppmw in 2000, and was gradually lowered to 50 ppmw by 2007.

2. On 29 July 2009, standards were announced to regulate the chemical content of gasoline and diesel used by vehicles: Starting on 1 July 2011, and again on 1 January 2012, the maximum permitted sulfur content of these fuels will be lowered to 10 ppmw.

### Stationary Source NO<sub>x</sub> Emission Reduction Strategies:

1. In addition to the Stationary Source Air Pollutant Emission Standards, a number of other standards have been promulgated for designated categories of industry, including the Refuse Incineration Plant Air Pollutant Emissions Standards, the Electricity Generation Facilities Air Pollutant Emissions Standards, the Steel Industry Smelting Plant Air Pollutant Emissions Standards, and the Glass Industry Nitrous Oxides Emission Standards.

2. The Air Pollution Control Act states that new or modified stationary sources that emit volumes of pollutants over the stated maximums should adopt Best Available Control Technology (BACT). Therefore, the EPA referred to current environmental impact assessment (EIA) commitments and domestic and foreign emission BACTs, to upgrade Stationary Pollution Source Best Available Control Technologies, adding types of suitable pollution control technology for each category of manufacturing process. The issue of NO<sub>x</sub> emissions produced by manufacturing processes that involve burning materials at high temperatures was discussed at public briefings held on 15 June 2010, attended by representatives of relevant industries and city and county environmental protection bureaus.

3. Article 16 of the Air Pollution Control Act allows stationary source operators to be charged air pollution control fees in order to encourage factory operators to invest in pollution control equipment that reduces emissions. The fee rates were initially announced on 23 March 1995, and 5 July 1995. On 5 August 2008, a revision to the Air Pollution Control Fee Rates for Stationary Sources was announced. This revision allows for a 60% reduction in fees for operators who have installed selective catalyst reduction (SCR) equipment and whose NO<sub>x</sub> emissions are below 40 ppm. Operators whose emissions are below

the permitted maximums, and have given an EIA commitment value of 80, also qualify for the discount. Since coming into effect, at least 38 public or private premises have installed or upgraded their SCR equipment, raising their average pollution prevention rates from 70% to 90%.

4. As a result of government policy that is gradually making emission standards stricter and is adding new standards for different categories of industry, it is estimated that NO<sub>x</sub> emissions will be reduced by 200,000 tonnes between 2011 and 2016. This is equivalent to an annual reduction of 3~9%.

#### Mobile Source NO<sub>x</sub> Emission Reduction Strategies:

1. The existing emission standards for diesel vehicles include pollutants such as particulate matter (PM) and NO<sub>x</sub>. Vehicles must pass an exhaust emission test before owners can obtain license plates from a motor vehicle supervision office.

2. The relevant regulations for diesel vehicles came into effect on 1 July 1987 and were initially aimed at controlling soot emissions. The second stage emission standards for diesel vehicles, which were based on the 1990 US federal standards, were implemented on 1 July 1993, setting the maximum permitted levels of PM at 0.7g/bhp-hr and NO<sub>x</sub> at 6.0g/bhp-hr. The third stage emission standards for diesel vehicles introduced on 1 July 1999 were based on the 1998 US federal standards: the PM maximum was reduced from 0.7g/bhp-hr to 0.1g/bhp-hr and the NO<sub>x</sub> maximum 6.0g/bhp-hr to 5.0g/bhp-hr.

3. After joining the WTO, Taiwan began allowing the importation of diesel cars, and with the increase in diesel vehicles on roads came a need for stricter emission standards. As a result, the fourth stage emission standards – based upon the 2004 US federal standards and EURO 4 standards - came into effect on 1 October 2006. The PM maximum remained unchanged, whereas the NO<sub>x</sub> maximum was lowered 52% from 5.0 g/bhp-hr to 2.4 g/bhp-hr. The implementation of the fourth stage emission standards has led to more new diesel vehicles being fitted with particulate filters and other pollution prevention devices.

4. The fifth stage emission standards for diesel vehicles will be implemented from 1 January 2012. They are based on the 2010 US federal standards and EURO 5 standards. The maximum permitted PM will be lowered from 0.1g/ bhp-hr to 0.01g/ bhp-hr; the NO<sub>x</sub> maximum will be lowered from 2.4g/bhp-hr to 0.2 g/bhp-hr. It is expected that implementation of the fifth stage emission standards will result in all diesel vehicles being fitted with pollution prevention equipment, which will lead to a sizeable reduction in PM and NO<sub>x</sub> emissions.

In addition to the controls mentioned above, starting in 2010 the EPA began to actively encourage enterprises to participate in establishing a battery swapping system for electric vehicles. This will help deal with the problem of the short range of electric vehicles. EPA subsidies will make the cost of swapping batteries for electric vehicle owners lower than the cost of running conventional petrol or diesel vehicles. The regulations governing the issuing of these subsidies were announced on 14 June 2011. The long-term objective is to supersede conventional vehicles and improve air quality, which will go a long way to alleviating the problem of acid rain.

#### Strengthening International Cooperation

1. Taiwan is working with Japan and the Republic of Korea – fellow members of the UN Environmental Programme's Acid Deposition Monitoring Network in East Asia (EANET) – to analyze regional acid rain data.

2. The UN Acid Deposition and Oxidant Research Center has verified the quality of Taiwan's data and has been contacting the EPA for more data. In October 2010, data from Taiwan's Pengjia Islet station and Chenggong station was displayed on the global network for the first time. The data was part of the background data for the West Pacific section of East Asia.

3. At the invitation of the US EPA, Taiwan has joined the US National Atmospheric Deposition Program as an East Asian cooperative partner to monitor mercury wet deposition.

## Feature Article

## Minister Shen Meets US Counterpart to Discuss Regional Cooperation

On 11 August 2011, EPA Minister Stephen Shu-hung Shen met with his American counterpart Administrator Lisa Jackson at the US EPA headquarters in Washington, D. C. The two sides emphasized cooperative measures regarding the new directions in regional cooperation on environmental issues. Both sides agreed to jointly promote regional partnership plans, and to seek exchanges of knowledge and technology that support environmental protection and sustainable development and governance. They also discussed how to harness the power of cooperative action undertaken with other regional partners. They agreed that advances in regional environmental protection should be shared with the rest of the world so that our Earth may become a cleaner planet with a sustainable future.

The meeting between the two EPA heads was the first since they have taken office. Also in attendance at the meeting was the Taiwan Deputy Representative to the US, Jacob Chang, representatives from the United States Department of State and the American Institute in Taiwan, and Taiwan EPA staff who deal directly with cooperative efforts between the two nations.

During the meeting Minister Shen and Administrator Jackson discussed how Taiwan in the 1970s and 1980s was similar to other developing countries in enjoying rapid economic development while suffering from serious environmental pollution brought about by the shift from agriculture to industry. The Taiwan EPA was established in 1987, and it immediately began working on pollution control and environmental management. A critical factor in the success of promoting environmental protection in Taiwan was the 1993 signing of an environmental technology cooperative bilateral agreement with the US EPA, which allowed Taiwan access to the latest American ideas and innovations in environmental policy and lawmaking, environmental impact assessment, decision making techniques, and monitoring technology, contributing greatly to Taiwan's environmental progress.

Administrator Jackson responded by first thanking Minister Shen for reiterating the main points of the 9th Implementation Agreement for Environmental Protection Technology Cooperation that the two parties had signed. She also expressed gratitude for, and approval of, Taiwan's accomplishments and sharing of knowledge in a number of partnership plans and activities. These include the e-waste forum held in Taiwan in June 2011; the remediation of contaminated

sites; the creation of sustainable communities; and the creation of sustainable elementary sister school relationships. Administrator Jackson also thought it highly significant that the partnership had evolved from nation-to-nation and region-to-region to the grassroots levels of communities and elementary schools, adding to the number of model sister school relationships. She also praised the founding of some eco-schools and the exchange of knowledge of best operating practices for sustainable communities - practices that have won international accreditation - as examples of the power of group effort that are deepening the relationship between the two EPAs and their regional partners.

Administrator Jackson also pointed out the importance to developing nations of this year's International Conference on Environmental Informatics, to be held in Taiwan in October, when environmental data that has been collected, filed and managed according to standardized methods will be shared. Such data is the foundation upon which environmental policy planning and implementation is built. A delegation of managers from the US EPA's Office of Environmental Information will be attending the conference in order to participate in and further their understanding of environmental data collection and sharing among regional partners.

Minister Shen pointed to the growing trend of international trade and scientific evidence of the impacts of cross-boundary transmission of pollutants, explaining that globalization means the food we eat, the beverages we drink, and the myriad products that we use come to us from many different countries around the world. The soil and water used abroad are closely connected to the food, beverage and

products that end consumers use. The many products that reach our hands are created in diverse working environments. Minister Shen also thanked the United States for the assistance that had been given to Taiwan over the past 18 years. He also described how pollutants travel around the world on the back of international commerce and impact regional environments and human health. He went on to explain the considerable significance of regional partnership plans in helping authorities in nations around the world achieve their environmental protection goals.

Following the adjustments in cooperation strategy between the EPAs of Taiwan and the USA in March 2009, Minister Shen announced the main points of the regional cooperation plan in October 2010. These include:

- Establishing remediation capabilities to clean up contaminated sites
- Working to bring about cleaner air in port areas

- Strengthening greenhouse gas reduction plans
- Reinforcing the implementation and observance of environmental regulations
- Building environmental monitoring and data management capacity
- Monitoring mercury in the environment
- Establishing Low Carbon communities
- Strengthening global partnerships in order to alleviate the worldwide e-waste problem

The above issues have already been included in the most recent three-year (2011~2013) cooperation plan signed with the US EPA. Based upon 18 years of knowledge and technology exchanges with the US EPA and the plans for new directions in cooperative efforts between the two nations, the Taiwan EPA is looking to share its knowledge and technology with other nations in the region, to improve regional environmental quality and public health.

## Climate Change

### City Carbon Inventories Compiled to Seek International Cooperation on Low-Carbon Communities

The international low-carbon city trend has caught on as counties and cities in Taiwan set their sights on carbon reduction targets and actively participate in international carbon reduction actions. Taking "think globally, act locally" to heart, the EPA has integrated the implementation outcomes of each county and city, and is now assisting them to develop international low-carbon community partnerships worldwide.

Cities worldwide have become increasingly concentrated centers of population and economic activity, responsible for over 80% of world energy consumption, as well as an enormous amount of greenhouse gas (GHG) emissions. Because of this, the International Council for Local Environmental Initiatives-Local Governments for Sustainability (ICLEI) advocates cooperation between cities around the world to serve as the driving mechanism to fight global warming and climate change. As cities worldwide are launching their own carbon reduction initiatives, Taiwan's cities and counties have committed to emission reduction agreements and participated in international organizations for cities since as early as 2005, paving

the way for international cooperation on low-carbon communities. ICLEI is a representative organization with participation from over 1,200 local governments, including 9 from Taiwan. This shows the determination of Taiwan's counties and cities to fight global warming. Each county and city has helped promote carbon reduction through various means including: signing environmental agreements and climate protection declarations, such as the San Francisco Urban Environmental Accords and the Mexico City Pact; participating in international meetings and activities such as the ICLEI annual forum, UNFCCC side events and the World Mayors Summit on Climate; and inviting important international NGO representatives to Taiwan to share ideas.

ICLEI also proposes countermeasures for cities in setting global warming mitigation strategies, firstly by clearly calculating emissions and learning what room there is for feasible reductions, and then by deciding upon actions towards reductions. ICLEI announced the International Local Government GHG Emissions Analysis Protocol (IEAP) in 2009 to serve as a reference for cities to calculate carbon emissions. In 2010, the EPA began actively collecting inventory methods used by cities internationally, and also drew on past inventory experience by cities and counties in Taiwan. After a series of consultations and discussions, the EPA completed the "County and City Level Greenhouse Gas Inventory

Plan Guidelines," which is expected to set a firm foundation for promoting energy conservation and carbon reduction at the city and county levels. To further assist cities and counties in staying abreast of information on developments of the latest low-carbon activities, the EPA has launched activities for cities to share experience in taking low-carbon actions. For example, a Web page for low-carbon actions in cities is currently being planned on the national GHG registration platform. This Web page will also serve as a liaison site for international cooperation on low-carbon cities.

## Climate Change

### Winners of Low-Carbon Cities Funding Announced

Following a year of intense competition, on 4 August 2011 the EPA finally announced four municipalities selected to be transformed into model low-carbon municipalities. They are New Taipei City, Taichung City, Tainan City, and Yilan County, representing the northern, central, southern, and eastern administrative areas of Taiwan, respectively.

Local governments from across Taiwan participated in the Low-Carbon Model Cities Funding Contest. The selection process was divided into two stages. During the first stage, local governments submitted the primary conceptual outlines of their plans. Those selected to go on to the second stage then had to review and analyze the content of the projects in depth and select the most specific and feasible flagship model projects to be presented by the local government leaders and their team members. Among the 11 participating municipalities that reached the second stage, eight of them sent delegations led by their mayor or county magistrate, who personally gave a presentation on their municipality's administrative outlook and the task of planning for their low-carbon models.

The EPA is keen to stress that the form of the low-carbon model cities funding contest differed from traditional single-theme plan competitions due to the complexity of the "energy conservation and carbon reduction" issues involved. These encompassed such diverse fields as environmental protection, energy, transportation, architecture, land use planning, and regulations. The winning municipalities therefore needed to demonstrate strong administrative abilities

and the determination to integrate and clearly delineate interdepartmental responsibilities, in addition to the ability to incorporate industrial, academic, and R&D resources to formulate a comprehensive mechanism to execute their low-carbon plans. The object of the dual-stage selection process was not to automatically choose the municipalities that promised the greatest carbon reductions, but instead favor those that already had some experience implementing carbon reduction schemes. The winners also submitted plans that combined creativity, high levels of feasibility and carbon reduction potential, while taking into account the unique features of the local environment.

In order to achieve complete objectivity and fairness, and ensure that selection criteria were met, the EPA put together the Low-Carbon Cities Selection Panel to take charge of the selection process, and also designed different evaluating criteria for each of the stages.

The second-stage requirements differed from the first-stage carbon reduction conceptual outlines in a number of ways. Specific carbon-reduction measures

and targets were required, financial plans and cost-benefit analyses of any commercial operations had to be included, and candidate municipalities' written and oral presentations were evaluated. The selection team also conducted on-site inspections, which afforded the team a better understanding of the environmental suitability or limitations of the respective plans, orders of priorities, the reasons for choosing particular areas or proposing particular measures, and any unresolved problems. By visiting all of the sites – each with its own unique environment – the selection team was able to better evaluate how each plan had creatively taken account of local conditions such as unique geographical and other features. The winning plans took local circumstances into account by prioritizing projects to solve the most pressing local problems first.

The EPA has drawn up a summation of the selection team's conclusions, which show the main reasons behind the selection of the four winning municipalities were the keen interest shown by the leaders and the overall administrative capabilities of their governments. Also taken into consideration was the extent to which local environmental conditions and unique features were harmonized with medium- and long-term development prospects. The core plans that

were accepted were flagship plans that functioned as clear quality indicators.

The four winning low-carbon model city plans also include forward-looking and unique designs for new infrastructure. New Taipei City plans to build the Coastal Zone Green Energy and Resource Recycling Living Spheres, the New Metropolitan Green Energy Low Carbon City Center, and the Mountain Area Carbon Sink Ecological Fun Park. Taichung City has drawn up the Smart Traffic and Transport System Flagship Plan and the Low-Carbon Gateway Park Flagship Plan. Tainan City has its primary Creating Sustainable Low-Carbon Communities Plan, and has also drawn up two benchmark plans for promoting low-carbon cultural tourism and employing diverse sources of green energy. In Yilan County, two green infrastructure plans have been formulated: the Low-Carbon Transport and Mobile Roaming Networks Plan and the New Green Lanyang Plan.

It is estimated that by 2014 the combined carbon reduction targets set out in the low-carbon model city plans of the four municipalities will result in the reduction of approximately 12 million tonnes of carbon emissions.

## Water Quality

### Companies Must Suspend Operations if Found Illegally Discharging Effluent

Enterprises are expressly warned not to illegally discharge effluent, an action that is deemed a serious violation by the EPA in Article 73 of the Water Pollution Control Act. If such conduct has been discovered by the competent authorities, in order to deliver a harsher penalty, the responsible enterprise will be ordered to suspend operations.

The EPA reports that in recent years unscrupulous enterprises have seriously damaged river water quality by illegally discharging effluent via buried pipes or during evenings, early mornings, or times of rainfall to avoid detection and cut wastewater treatment costs. In the past, environmental agencies have wielded Article 46 of the Water Pollution Control Act (水污染防治法) to stipulate fines and require removal of the buried pipes. However, this Article does not specify this as a serious violation and does not require the polluter to halt operations, and thus

has only limited effect in intimidating polluters from continuing such behavior.

The Water Pollution Control Act does contain a stipulation mandating the suspension of business operations in the event of serious misconduct, and Article 73 of the Act specifies conditions for each kind of serious misconduct. However, it does not clearly describe illegal discharge as one of these conditions, making competent authorities hesitant to order enterprises to suspend operations. Thus to

improve the water quality of water bodies and allow competent authorities to administer justice, the EPA has determined, according to Article 73, Paragraph 8, that any discharge of effluent through pipes that have not been registered, or any alteration of effluent flows that bypass permitted treatment facilities, are deemed as misconduct that could seriously affect water quality in nearby water bodies.

In the future, competent authorities that discover illegally discharged effluent will be able to immediately order the enterprise to suspend operations and issue a maximum fine. When profits are gained through illegally discharging effluent, authorities are now able to issue

a stronger penalty by adding the amount of the profits to the fine, in accordance with the Administrative Act, thus adding a substantial weapon to the competent authorities' law enforcement arsenal.

The EPA explains that this stipulation calls on enterprises to take the initiative to thoroughly check for inappropriately designed piping and ensure that such conduits are closed off or removed. The enterprise must also treat wastewater according to the permitted and registered sequence of treatment facilities to avoid violating regulations and being ordered to suspend operations.

## Waste Management

### Clearance and Treatment Organization Permit Management Regulation Revised

As a measure to streamline administrative affairs and provide more convenience to the public, the EPA has revised the Public and Private Waste Clearance and Treatment Organization Permit Management Regulations (公民營廢棄物清除處理機構許可管理辦法). The revisions took effect on 23 August 2011.

The EPA summarized the following revisions made to the Public and Private Waste Clearance and Treatment Organization Permit Management Regulations, which first took effect over nine years ago, on 23 November 2001:

In response to revisions to the Standards for Identifying Items and Scope of Development Activities Requiring Environmental Impact Assessment (開發行為應實施環境影響評估細目及範圍認定標準), a regulation has been added so that a local government can directly issue construction approval documents to treatment organizations that have passed their EIA review.

Existing factory or waste treatment facilities are no longer required to submit the Factory Construction Period Regular Monitoring Reports when they apply for a treatment permit after completing a trial run.

To streamline the review process, operators are not required to report changes if it concerns strengthening

effectiveness, updating equipment or adding auxiliary equipment, but does not alter the original permit conditions.

Operations generating waste are required to conduct a self-assessment of the legality of the clearance and treatment organization and to enter a formal contract. The revisions also add reporting regulations concerning clearance and treatment organizations' business records and operating records.

The EPA intends for these revisions to uphold its determination to protect the environment, improve environmental sanitation, and protect public health through better management of waste clearance and treatment work and the flow of waste.

## EIA

## EIA and BACT Obligations Disqualify Air Pollution Fee Reductions

In accordance with social justice principles, the EPA has revised regulations that will withhold eligibility for reduced air pollution control fees for parties obligated to keep promises in their environmental impact assessment (EIA) and required to adopt best available control technology (BACT).

In order to uphold their EIA promises, or due to requirements to adopt BACT, some enterprises or organizations are required to comply with emission restrictions that are stricter than current standards. For these enterprises, lower concentrations of air pollutants are enforced through EIA or Air Pollution Control Act regulations, and are not the result of voluntary initiatives to actively reduce emissions. The purpose of offering reduced fee rates for operations that achieve lower emissions is to encourage voluntary reductions. Operations subject to restrictions on air pollutant emissions should thus not be eligible for the benefits offered to enterprises that voluntarily reduce their emissions. Therefore stationary source air pollution control fee rates have been revised to exclude those bound by EIA promises or required to adopt BACT from enjoying special fee rates. This

measure is intended to maintain and improve air quality by encouraging industries to adopt cleaner production and fuels.

The EPA indicated that regarding regulations on three-tiered fuel rates for high-grade diesel fuel shown in the annexed table, it was announced on 4 January 2008 that stationary sources and enterprises engaged in the sale or import of high-grade diesel fuel must pay air pollution control fees according to their diesel fuel sales volume. Since mobile source air pollution control fee rates are also announced, original regulations regarding three-tiered fee rates for high-grade diesel fuel have been deleted.

### Soil & Groundwater

## Guidelines Drafted for Providing Alternative Sources of Drinking Water in Event of Groundwater Pollution

Groundwater pollution incidents understandably raise citizens' concerns about the safety of public drinking water. In order to safeguard public drinking water and ensure public health, the EPA has promulgated the Working Guidelines for Providing Necessary Alternative Drinking Water or Hookup with Water Mains in Groundwater Pollution Incidents (地下水污染事件提供民眾必要替代飲水或接裝自來水作業要點). This measure integrates the resources of different agencies to quickly resolve safety issues regarding public drinking water.

Groundwater is an important water resource and a primary source of drinking water in some remote areas. Recent pollution events at the Taichung Export Processing Zone in Taichung City and in the Siaoli River in Taoyuan County show how groundwater pollution can affect the safety of the drinking water of nearby residents. Government agencies at all levels are to follow the Soil and Groundwater Pollution Remediation Act (土壤及地下水污染整治法, SGPRA) and immediately launch necessary response

measures, such as providing alternative drinking water or connecting affected areas with tap water mains after such incidents. However, until now there has been a lack of unified operating standards, thus the Working Guidelines have been drafted to ensure a timely and effective response to similar incidents and continued provision of safe drinking water in affected areas.

The Working Guidelines are in accordance with related articles in the SGPR and specify the parties that should provide alternative drinking water, or that should inform competent authorities to prioritize hooking up affected areas to public water mains. The Guidelines lay down principles on methods for providing drinking water and allocating expenses to effectively integrate the resources and authority of government agencies.

In order to minimize the harmful effects of pollution and prevent pollution from spreading, municipal and county competent authorities follow the SGPR in holding polluters, those potentially liable for polluting, users of the sites, managers, owners, polluted land stakeholders or entrusted third parties (all of whom are regarded as responsible persons) legally responsible for bearing the cost of providing necessary alternative drinking water or hooking up affected areas to public water mains.

In order to ensure the safety of public drinking water, the municipal or county competent authority is required to act in advance to ensure alternative sources of drinking water, or to hook up affected areas to public water mains, in the event that the parties responsible fail to fulfill their legal obligations to do so, or if investigations do not uncover the responsible parties.

The EPA states that the Working Guidelines contain a compensation mechanism that requires responsible parties to bear the cost of the competent authority having to act to provide alternative drinking water or to hook affected areas up to public water mains, and that they should pay within a limited time as stipulated in the SGPR, thus ensuring fair and normal funding operations.

## Climate Change

### Greenhouse Gas Reduction Symposium Held to Draw on International Experience

The EPA held the International Greenhouse Gas Reduction Technologies Symposium on 24~25 August 2011 in order to promote the development of greenhouse gas reduction technologies in Taiwan. A number of foreign experts from the US, Germany, France, and Japan were invited, including keynote speaker Mr. Scott Bartos from the US EPA. The delegates exchanged ideas and shared their experience on topics such as the current state and development trends of techniques related to greenhouse gas reduction, carbon capture and storage (CCS), and CO<sub>2</sub> reuse. The symposium was of great benefit to Taiwan's greenhouse gas reduction work.

According to the International Energy Agency's 2010 Energy Technology Perspectives report, the goal of halving total global greenhouse gas emissions by the year 2050 will only be achievable by using more renewable energy sources, raising energy efficiency, and developing greenhouse gas reduction techniques such as CCS. It is thus imperative to keep abreast of the latest international developments in greenhouse gas reduction. To this end, Mr. Bartos, head of the US EPA's Climate Change Division, and also the main author of the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, was invited as a special guest speaker. Mr. Bartos spoke about the latest trends in international greenhouse gas emission reduction management.

Of the greenhouse gas emission reduction techniques mentioned above, CCS is expected to have the most impact, leading to an estimated 19% reduction in greenhouse gases by the year 2050. The EPA has therefore drawn upon the experiences of developed nations in actively promoting CCS techniques and management systems. Taiwan's CCS Strategic Alliance was established on 28 March 2011, and has set CCS targets for official commercial operations to achieve by the year 2020. The symposium delegates thus stressed the importance of promoting CCS techniques.

The discussions were wide-ranging and fruitful: Gerhard Heinz (Germany), Luca Tescari (France) and Shang-hill Wong (Taiwan) discussed carbon

capture; Michael Atkinson (USA) and Dr. Chi-wen Liao (Taiwan) talked about marine sequestration;

and Dr. Ziqiu Xue (Japan) and Professor Tien-shun Lin (Taiwan) discussed terrestrial sequestration.

## Ecolabelling

# EPA Cooperatively-Run Store Transformed into Green Shop to Promote Green Consumption

To encourage green consumption among staff, the EPA is providing guidance to transform their current cooperatively-run employee store into a Green Shop. Minister Stephen Shu-hung Shen inaugurated the new establishment by placing the Green Shop plaque in the store.

Minister Shen said during his opening remarks that the EPA provides guidance for the public to adopt green lifestyles, actively promotes the Green Mark and the Carbon Label system, and encourages green consumption in all aspects of life including food, clothing, housing, transportation, education and entertainment. The Green Mark and Carbon Label help people identify and prioritize products that have less impact on the environment and human health. Minister Shen explained that the EPA has provided guidance in transforming the EPA employees' store into a Green Shop to ensure EPA employees have more opportunities to experience green procurement. It is also hoped that this serves as a model for other government agencies and private organizations in

turning employee cooperatives into Green Shops.

EPA employee cooperative president, Director Shaw-Ying Yuan, said that the store has established rules for operating as a Green Shop, and has introduced daily essentials such as shampoo, soap, tissue, PE bags, and whiteboard markers that carry the Green Mark, as well as drinks, fruit juice, and adhesive tapes that have Carbon Labels. Green products are conveniently placed on the left side of shopping aisles connection with a catchy slogan that is part of the policy promoting green products and Green Shops. The store also makes use of the EPA Web site to promote group buying of green products, not only expanding the scope of purchasing, but also making



▶ Minister Shen (second from left) present awards the Green Shop certificate to the EPA Cooperatively-Run Store

it more convenient for employees to purchase green items in a way that saves precious time.

The EPA calls on other government agencies and private enterprises to transform their employee stores into Green Shops as a way of promoting green consumption concepts and

letting employees understand the significance of green products and Green Shops. The EPA also continues to encourage prioritized purchasing to ensure green consumption becomes a citizen movement that everyone can get involved in as a way of working together to change the world.

## News Briefs

### Article 12 of Environmental Impact Assessment Act Enforcement Rules Explained

On 19 August 2011, the EPA issued an explanation regarding the Ministry of the Interior's "working guidelines for county and municipal governments to cooperate in holding environmental impact assessments for cases of general residential development on slopelands" and Article 12 of the Environmental Impact Assessment Act Enforcement Rules (環境影響評估法施行細則). An explanation was issued specifically regarding non-urban land general residential area development cases (apart from redesign of farming village land) in compliance with the second stipulation in the Ministry of the Interior's "Working Guidelines for Reviewing Applications for Non-Urban Land Use Allocation and Land Use Change Entrusted to County and Municipality Governments" regarding county/municipality governments entrusted to review and issue permits. The EPA stated that EIA affairs (including review, monitoring and issuing penalties) in such cases will be handled by county or municipality governments.

In addition, if applications for alterations to non-urban land for general residential development plans comply with the first stipulation in Article 22 of the "Non-Urban Land Use Control Regulations," then follow-up EIA affairs (including alterations review, monitoring and issuing penalties) in such cases will be handled by county or municipality governments.

### Subsidy for Recycling Light Bulbs Lowered

On 1 August 2011, the EPA raised mandatory recovery rates for waste fluorescent light tubes (bulbs) and their mercury contents, and lowered the recycling subsidy available to recycling plant operators for these items,

due to falling operating costs. According to the EPA, the annual volume of recycled fluorescent light tubes (and bulbs) has increased yearly, from 523 tonnes in 2002 to 5,052 tonnes in 2010. Since Taiwan's recycling operators are now able to achieve recovery rates of over 90% for fluorescent light tubes and 50% for mercury contents, the EPA has decided to raise the mandatory recovery rates for these items to 90% and 50%, respectively, up from 80% and 35%, respectively. As for the subsidy for recycling operators, this has been lowered from NT\$40 per kg to NT\$29 per kg. Calculations are based on EPA data for recycling operating costs in 2010.

### No Toxins Found in Random Test of Household Detergents, Toys and Paints

Detergents, paints and toys were the three categories of commonly used products targeted by the EPA in 2011 for random testing of toxic substances including trichloroethylene, nonylphenol (NP), nonylphenol ethoxylates (NPEO), tributyltin (TBT), and 8 kinds of phthalic acid esters (PAEs). Test results showed that none of the products contained any of these toxic substances.

The EPA explained that the products in this round of random testing included 25 kinds of household detergents, 3 kinds of paints, and 17 kinds of toys, for a total of 45 products. Testing was conducted by the EPA's Environmental Analysis Laboratory. According to the test report, trichloroethylene, NP and NPEO were not found in the 25 household detergents, TBT was not present in the 3 paint products, and the 8 kinds of PAEs were not found in the 17 tested toys. Test results confirmed that all tested products were in compliance with regulations on toxic substances.

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