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Feature Column

Public and Private Sectors Team Up to Promote Green Consumption

With 13 years of experience promoting the Green Mark ecolabeling system, Taiwan leads the world in terms of developing product specification criteria and numbers of certified products. To further the trend toward green consumption, the EPA is joining forces with industry and citizens in a full-scale effort to promote green consumption. The EPA also continues to promote mutual recognition with other countries and global cooperation in developing product specification criteria.

Ever since the 1992 Earth Summit took on the theme of sustainable development, green consumption has been regarded as integral to achieving global sustainable

development. Governments and private sector organizations worldwide have since joined the ranks in promoting green consumption. Taiwan's Green Mark logo—a green leaf wrapped around a pristine unpolluted Earth—perhaps best captures the spirit of green consumption, signifying the importance for all products to be recyclable, low-polluting, and resource-efficient.

One of the first milestones for Taiwan's Green Mark ecolabeling system was the drafting of the *Working Guidelines for Promoting and Using the Green Mark* (環保標章推動使用作業要點) in August 1992. Since then, already 90 product criteria have been announced, ranking Taiwan just behind Japan and Canada. In terms of numbers of products, Taiwan ranks fifth in the world, with already 2,895 products approved to carry the Green Mark logo. These accomplishments attest to Taiwan's prominent standing alongside other nations with ecolabeling systems. The addition of

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World's First Government Procurement Law with Green Clause

Table 1: Green Mark milestones

Date	Development
1992.8	Drafted the <i>Working Guidelines for Promoting and Using the Green Mark</i> (環保標章推動使用作業要點)
1992. 10	Established the first audit committee
1998. 5	Promulgated Article 96 of the <i>Government Procurement Law</i>
1999. 5	Promulgated the <i>Regulations Governing Preferential Procurement of Green Products by Government Organizations</i> (發布機關優先採購環保產品辦法)
1999. 11	Promulgated the <i>Working Guidelines for Reviewing Second Tier Green Products</i> (發布第二類環保產品審查作業要點)
2001. 7	Executive Yuan ratified the <i>Government Green Procurement Promotion Plan</i> (機關綠色採購推動方案)
2002. 1	<i>Government Green Procurement Promotion Plan</i> officially implemented
2003. 7	<i>Resource Recycling and Reuse Act</i> (資源回收再利用法) officially implemented
2005. 8	Announced the first group of green product categories to be prioritized for procurement by government agencies, public and private schools, publicly operated businesses or groups, and military organizations.

a green procurement clause to the *Government Procurement Law* (政府採購法) puts Taiwan even further ahead of the pack as the first nation with legislation to back government green procurement.

Joining international environmental trends to promote sustainable use of resources and encourage domestic green production and green consumption, the EPA negotiated for several years to finally add a green procurement clause to the *Government Procurement Law* (Article 96) in May 1998. This entails an incentive measure that allows government agencies purchase green products that cost up to 10% more than similar non-green products. The Government Procurement Law took effect in May 1999. The bylaw, Regulations Governing Preferential Procurement of Green Products by Government Organizations, took effect later that year on 26 May 1999. The EPA and the Public Construction Committee, Executive Yuan, were the first government agencies subject to this Regulation.

Green Mark Yields 13 Years of Environmental Benefits

Generally speaking, there are currently three tiers of green products:

1st Tier: Products with the Green Mark ecolabel and products with foreign ecolabels under mutual recognition agreements.

2nd Tier: Products not bearing the Green Mark ecolabel but bearing documents showing that they qualify under the EPA's criteria of having reused or recyclable materials, or being low-polluting or energy-efficient.

3rd Tier: Products bearing documents showing that they qualify under industry competent authorities designations as having "increased social welfare or reduced

social costs."

In choosing products to receive the Green Mark logo, priority is given to those products that receive daily use, are made of reused materials, or have a potentially significant impact on the environment. The selection is further narrowed down based on existing standards in other countries, domestic market demand and manufacturers' product recommendations. More attention is given to products that have been recommended by experts or environmental NGOs, and products in compliance with environmental policy requirements. The selection committee also draws on information from other countries as well as the views of corporations, experts and scholars. Product specifications are then drafted and submitted to the Green Mark Committee for review before the criteria are approved and announced, and applications are accepted from enterprises.

As for results, preferential purchasing of recycled paper products and reused wood products over ten years has prevented the felling of 9,100,000 trees. Similar noteworthy environmental benefits have been attained in terms of saved water and electricity, and

reduced CO₂ emissions (See Table 2).

Government, Industry and Citizens Unite to Promote Green Consumption

The EPA aims to ingrain the concept of green consumption in the general public so that peoples' everyday spending habits become the driving force behind green consumption. This requires the combined efforts of the government, industry and citizens. The main promotion strategies on these three fronts are:

1. Government organizations: Government Green Procurement Promotion Plan
2. Private enterprises: Promote the concept through organizations and systems
3. General public: Expand public education and flow of green products

Significant progress has been made in promoting government green procurement and the Green Mark system. Promotion in the private sector currently focuses on the following channels:

1. Green Procurement Alliance: Drawing from its long-term

Table 2: Environmental benefits of Green Mark products

Category	Product	Amount	Environmental benefit
Recycled paper products	Office paper	7,669,839 tonnes	Saved 9,100,000 trees over 10 years. Note: About 20 decade-old trees are required to make one tonne of new paper.
	Sanitary tissue	11,617,85 tonnes	
	Stationery	4,954,406 tonnes	
	Packaging paper	173,829,008 tonnes	
Reused wood products	Reused wood products	275,850 tonnes	
Electronic goods	Refrigerators	484,861 units	Prevented 96,602 tonnes of CO ₂ emissions per year (equivalent to CO ₂ absorption capacity of 21,680,000 large trees). Saved 190,000 tonnes of water.
	Air conditioners	351,956 units	
	Clothes washers	171,961 units	
Toilets	Water-saving toilets	2,017,598 units	Saved 44,180,000 tonnes of water per year (equivalent to three times the storage capacity of Mingde Reservoir)

participation in the Green Mark system, the Environmental Development Foundation has emulated methods used by other nations (i.e. Japan) in organizing the Green Procurement Alliance to attract domestic corporations' participation in a self-sufficient green supply chain. This added dimension has accelerated the promotion of green consumption.

2. Promotion through environmental management organizations of industrial parks, export processing zones, and science-based industrial parks: Green production and green consumption concepts are directly promoted to upstream manufacturers through education, seminars and other activities. This is made possible by promoting cooperation between 1) domestic manufacturers, processing plants and science & technology industries, and 2) the environmental management organizations of industrial parks, export processing zones and science-based industrial parks.
3. Voluntary implementation by ISO 14000 certified manufacturers: Outstanding corporations that already promote green consumption concepts internally and address environmental safety and health standards requirements are naturally more receptive than other enterprises. Such companies are likely to be given priority consideration in the future.
4. Green office initiatives: Beginning improvements directly through green office initiatives is the most fitting and effective way to integrate and promote green consumption and other environmental concepts (i.e. reduce, recycle and reuse).

In terms of international

cooperation, the Green Mark system supports:

1. The Global Ecolabeling Network (GEN), established by 28 ecolabeling organizations in over 50 nations.
2. Mutual recognition: This means acknowledging other parties' test reports, certification results and specification criteria to reduce the burden on corporations and increase the flow of certified products.
3. Development of common specification criteria: By targeting core key elements, countries can establish consistent standards and advance mutual recognition.

Taiwan currently engages in mutual recognition of ecolabeling systems in the following countries: Canada (1997.12), US (1998.7), Thailand (2001.12), S. Korea (2002.9), Australia (2004.2), New Zealand (2004.4) and Japan (2004.6). In the future the EPA hopes to complement the development of a global ecolabeling system by promoting multilateral recognition of ecolabeling systems and working toward more common specification criteria.

In developing common specification criteria, Taiwan has reached a consensus with S. Korea, Thailand and Japan in 2002 on specification criteria for water and oil based paints, original printers and reused toner cartridges. In 2004, Taiwan began interactive discussion with S. Korea, Japan, Thailand and Hong Kong regarding common specification criteria for video players and recorders, televisions, and multifunction office machines. Over the next five years, the EPA will continue to complement different product categories (globally/regionally circulating or special products in certain countries), and develop consistent or common core criteria.

The EPA's future work toward promoting green consumption will focus on:

1. Expanding government green procurement: Already implemented in ministries under the Executive Yuan for several years, green procurement will now be expanded to include the Presidential Office, the Legislative Yuan, the Control Yuan, the Judicial Yuan and the Examination Yuan. This expansion is carried out as a pilot project, which started from 1 July 2005.
2. Integrating other green labeling certification methods: Application documents and working guidelines of Green Mark and related labeling schemes are being integrated and simplified to make application more convenient.
3. Promoting civil and corporate green procurement: More active cooperation with civil organizations helps promote and establish more supply and purchasing channels. For instance, the YAM Shopping Website established a window exclusively for green products this year (2005) making it easier for people to buy green products.
4. Promoting privatization of certification work: The EPA is drafting and revising regulations to authorize private organizations to handle labeling certification. Transfer of this work to the private sector will diversify ecolabeling and allow it to develop more freely and profusely.
5. Strengthening international cooperation: This involves developing common specification criteria and entering more mutual recognition agreements.

Toxic Substance Management

Ministries Reach Consensus on Duck Egg Pollution Incidents

Just months after finding significant dioxin pollution in duck eggs this June in Siansi Township, Changhua County, a similar incident occurred in Shengang Township in September. The EPA, Council of Agriculture and Department of Health have reached a consensus on the handling of such incidents.

Regarding the recent discovery of dioxin pollution in duck eggs in Shengang Township, the Council of Agriculture (COA), Department of Health (DOH) and EPA held a discussion on 28 September 2005 and reached consensus on the following resolutions:

1. All duck farms in Shengang Township (伸港鄉) and Siansi Township (線西鄉) will be included in a comprehensive investigation and all domestic feed, duck meat, and duck eggs will undergo random testing for dioxin.
2. To safeguard public health, the three ministries will coordinate the handling of agricultural products potentially containing dioxin, health and safety issues, and environmental controls.
3. The COA, DOH and EPA will jointly draft and implement the abovementioned investigation plan.
4. As for follow-up measures in handling these pollution incidents, the three ministries will strengthen communication and cooperation, in addition to coordinating with the Changhua County government's response.
5. To get a full understanding of the pollution source, the three ministries have already organized a taskforce to work with the Changhua County government.
6. The COA will conduct an experiment on duck eggs by

mixing dust from the Taiwan Steel Union Co., Ltd. (台灣鋼聯) into duck feed.

All duck eggs potentially involved in June's Siansi Township dioxin pollution incident have already been destroyed. Related agencies have already convened numerous meetings to clarify the issue and adopt response measures. Upon notification of the incident, the EPA conducted an investigation on the background environments and ecological and biological status of duck farms and surrounding areas to check for potential pollution sources. Analysis reports on environmental media, duck feed, duck eggs and duck meat have already been published. However, so far there is no clear indication of the

Soil & Groundwater

Water Pollution Fees Levied from Industry Starting July 2006

From 1 July 2006, the EPA will begin collecting water pollution control fees. The primary targets of fee collection will be industries and sewerage systems of industrial parks. The fees will be exclusively used to fund water pollution control efforts.

The EPA has drawn up a system for collecting water pollution control fees based on the *Water Pollution Control Act* (水污染防治法). Water pollution control fees will be levied next year, primarily targeting industries (including factories and livestock enterprises) and sewerage systems of industrial parks. Households will initially be exempt from

source of pollution. More scientific testing methods and data are required to clarify the situation and provide concrete evidence.

One suspected pollution source, the Taiwan Steel Union Co., Ltd., voluntarily suspended operations on 17 June 2005 to improve their facilities. The EPA has already drawn up stricter dioxin controls and emission standards for dust and ash from high-temperature smelting facilities in Changhua County. The EPA has also targeted major dioxin pollution sources including incinerators and smelting industry factories with electric arc furnaces, in drafting dioxin controls and emission standards, which will be promulgated in the near future.

The EPA will follow up on the Siansi Township case and draw up a comprehensive control plan. All duck farms in the nearby Shengang Township will also be included in a full-scale plan for testing and analysis. The EPA will then proceed with monitoring and control. An investigative taskforce has already been established to look into the cause of pollution.

fee collection. To reduce the burden on industry, a preferential fee rate and fee reduction mechanisms will be introduced. Collected fees will be put into a special fund exclusively for water pollution control work to expedite improvements to the quality of Taiwan's water bodies.

The EPA points out that according to plans, collection of water pollu-

tion control fees will commence on 1 January 2006. The fees will be collected once per six months, with payments for the January–June period due by the end of the following July, and payments for the July–December period due by the end of the following January. Assuming the fee collection plan begins on schedule in January 2006, the first payments will be collected in July 2006.

The EPA indicates that fees will be based on the amounts and concentration of pollutants (including organic substances and suspended solids) in discharged wastewater. Therefore lower pollution amounts and concentrations mean lower fees. Enterprises with low pollution concentrations will enjoy a special fee rate. According to calculations, 80% of industries will only have to pay under NT\$20,000 per year. Hog farms will pay about NT\$25 per hog. This calculation is based on the assumption that it takes half a year to raise hogs from birth to sale.

In addition, an annually diminishing fee reduction measure will be introduced in the first few years to lighten the burden for industries. It is estimated that 80% of industries will pay under NT\$10,000 for the first year after reductions are calculated in. The EPA will invite related industries and unions to upcoming briefings to impart related fee collection affairs and details of regulations.

The EPA explains that water pollution control fees will be earmarked to expedite improvements to water body water quality through remediation of surface water bodies, riverbank ecoengineering improvements, guidance to industries in improving wastewater treatment, and research and development of water pollution control technology.

General Policy

Premier Affirms Recycling and Sorting Policy

The EPA reported the progress of resource recycling during a recent Executive Yuan assembly. Premier Frank Hsieh expressed his support of the EPA's hard work in promoting mandatory sorting of garbage. Hsieh called on citizens to help out by increasing the recycling rates of batteries, polystyrene and paper.

The EPA submitted the "Resource Recycling Progress Report" during the Executive Yuan assembly on 7 September 2005. The report showed that under the "Complete Recycling, Zero Waste" waste management policy, the daily per capita waste clearance volume has seen a noticeable decrease in recent years. The percentage of garbage that undergoes proper treatment has increased to 98.93% in 2004.

The Executive Yuan also showed support and approval of the food waste recycling policy upon seeing the significant increase in volume of recycled food waste, skyrocketing from 80 tonnes per day in 2001 to 919 tonnes per day by 2004. The number of townships to begin recycling food waste has also jumped from 23 to 254. It is estimated that by the end of 2006, all 319 townships will have food waste recycling programs, at which time the nation will be recycling 1,500 tonnes of food waste per day.

Premier Frank Hsieh (謝長廷) expressed during the assembly that the EPA has made good progress in promoting garbage sorting, attesting to wide public approval of the policy. Garbage sorting is expected to gradually help reach waste reduction targets.

According to an EPA survey, 90% of the public support the mandatory garbage sorting policy

and 98% of the public are willing to comply with it. Happily surprised about the survey results, Hsieh noted that the job of sorting garbage was once seen as a nuisance for the public, yet now receives overwhelming public support.

Premier Hsieh expressed gratitude at the progress made by many counties and cities in implementing the policy to keep garbage off the ground. Hsieh said that he is moved to see homemakers outside in the wind and rain carrying sorted bags of garbage and recyclables to the garbage trucks. As for the long-disputed issue of how to recycle food waste designated for composting or for pig feed, Hsieh indicated that the EPA, Council of Agriculture and Ministry of Economic Affairs are working together to find the best solution.

As for areas that require more effort, the EPA indicated that only 17% of batteries, 46% of paper and containers, and 42% of polystyrene materials are being recycled at present. Taiwan has yet to reach targeted recycling rates for these items. The Premier thus calls on all citizens to do their part to protect the environment by recycling more batteries, paper, containers and polystyrene.

General Policy

Taiwan-US Environmental Meeting Successful

The 2005 TECRO and AIT Annual Meeting on Environmental Issues of Common Concern was a success. Air pollution control was the focus of discussion and participants drew up cooperation plans for the next two years, including air pollution modeling and other areas of research. The meeting further developed bilateral cooperation in environmental protection and good relations between Taiwan and the US.

The annual meeting on environmental issues of common concern between the Taiwan Economic and Cultural Representative Office (TECRO) and the American Institute in Taiwan (AIT) was held on 26–27 September 2005 in Taipei. The US delegation was led by Mr. Jerry Clifford, Deputy Assistant Administrator of the USEPA Office of International Affairs. Taiwan's team was led by EPA Minister Chang Kow-lung, and included EPA officials and academic representatives. Speeches were delivered by EPA Minister Chang, Coordination Counsel for North American Affairs Secretary General Liang Ying-bin (梁英斌), AIT Deputy Director Dr. David Keegan, and Mr. Jerry Clifford.

The focus of discussion during this year's annual meeting was air pollution control. The growing demand for automobile emission regulations in Taiwan is complemented by an increasing demand for stricter control of fuel quality. In addition to sharing experience, both sides discussed how to jointly assist other developing countries in improving automobile pollution.

Mercury has a serious impact on ecology and human health, and can be transported long distances in the atmosphere to other countries. Mercury pollution is therefore an issue of concern for both Taiwan and the US. It is one of the factors behind Taiwan's drive to complete construction of an ambient air qual-

ity monitoring station with mercury testing capabilities on Mt. Lulin in Yushan National Park before the end of spring 2006. This will facilitate understanding of how mercury emissions from other countries affect Taiwan. The station will also provide relevant information to the international community to facilitate research and tracking of long-distance transboundary movement

Climate Change

2005 Taiwan International Conference on Atmosphere Protection

The EPA has convened the 2005 Taiwan International Conference on Atmosphere Protection with around 200 attendees including representatives from the US, Australia, India, Japan, S. Korea, Singapore and Mongolia. Main themes included strategies to protect the ozone layer and respond to climate change; the development of alternative products and technologies to replace ozone depleting substances; global voluntary programs to reduce fluorinated greenhouse gases; and ways to increase energy efficiency.

The EPA held the 2005 Taiwan International Conference on Atmosphere Protection on 20–21 September 2005. EPA Vice Minister Tsay Ting-Kuay (蔡丁貴) delivered the welcoming speech and personally awarded the 2005 Atmosphere Protection Awards to groups and individuals in Taiwan that have made outstanding contributions to protecting the atmosphere. Corporate recipients of the award included TECO

of pollutants.

The meeting also discussed the draft "bilateral implementing arrangement #7," which lays down cooperation plans for 2006 and 2007. Areas of cooperation include studies on air pollution modeling, greenhouse gas reduction cooperation strategies, long-distance pollutant monitoring, soil and groundwater remediation technologies, cooperation in reducing mercury pollution, ecological engineering to improve water quality, and marine pollution control.

Following the meeting, the EPA arranged for the US delegation to visit the Feitsui Reservoir Management Bureau, the Taichung thermal power plant, and the ambient air quality monitoring station under construction on Mt. Lulin in Yushan National Park.

Electronics and Machinery Co. Ltd., and an individual award went out to Mr. Jiang Hong-ming (江鴻銘) of the TTLA's (Taiwan TFT-LCD Association) Occupational and Environmental Safety Committee.

Around 200 people attended the two-day forum, including senior environmental officials, experts, scholars from the US, Australia, India, Japan, S. Korea, Singapore, and Mongolia, as well as represen-

tatives from domestic industry, government, and academia. Participants passionately discussed the latest international efforts to protect the ozone layer, and management strategies and technological developments in reducing greenhouse gases. Many of the incisive and valuable suggestions proposed are bound to benefit the public's understanding and appreciation of atmosphere protection in Taiwan. Taiwan representatives also took the opportunity to advance international experience sharing and technological exchange, as well as report Taiwan's hard work and accomplishments in protecting the atmosphere.

Now in its seventh year, the Taiwan International Conference on Atmosphere Protection first began in 1989, formerly known as the International Forum on the Protection of the Ozone Layer. This annual international forum has led to cooperation between the government and corporate entities in protecting the atmosphere, as well as concrete achievements toward implementing the *Montreal Protocol*. Taiwan's success in this area is now well known around the world. Topics for this year's dis-

ussion covered strategies to protect the ozone layer and respond to climate change, the development of alternative products and technologies to replace ozone depleting substances (ODS), global fluorinated greenhouse gas voluntary reduction programs and increasing energy efficiency.

The EPA reports that since 1989, Taiwan has stayed abreast of international efforts to implement the Montreal Protocol by controlling chemical substances and promoting new technologies. Taiwan has also maintained the same schedule as other developed nations in making sharp reductions in the production and consumption of ODS including CFCs, HCFCs, halons, carbon tetrachloride, and methyl bromide. The government has assisted domestic manufacturers of electronic information products, air conditioners, and plastic foaming products to minimize environmental impacts and upgrade manufacture processes. The results of these initiatives have been affirmed by key trade nations who have openly voiced support for exempting Taiwan from certain trade restrictions. These efforts have therefore not only helped to maintain trade but also to fulfill Taiwan's international

obligations to protect the ozone layer. Taiwan has continually promoted international exchange in the interest of mitigating climate change, especially since the *Kyoto Protocol* took effect on 16 February 2005. International industry associations and greenhouse gas reduction certification agencies were invited to this year's forum to exchange information and technology and show Taiwan's efforts and concrete achievements in protecting the atmosphere.

General Policy

National Sustainable Development Conference Welcomes Input from All

The National Sustainable Development Conference is scheduled to take place in the first half of 2006 to decide the future direction of Taiwan's environmental policy. The EPA has set up a conference website and welcomes all citizens concerned about sustainable development to submit their opinions online.

During a forum with environmental NGOs on 5 July 2005, President Chen Shui-bian promised to convene a national sustainable development forum in hopes of materializing the concept of sustainable development in Taiwan. According to a resolution made by the National Council for Sustainable Development, Executive Yuan (NCSD) during its 20th assembly on 8 July 2005, all proposals for conferences regarding national sustainable development should be planned by the EPA and carried out by the NCSD.



EPA Deputy Minister Tsay Ting-Kuay awarded the 2005 Atmosphere Protection Awards to winners.

The conference is being convened in response to civil organizations' concerns about national sustainable development. The conference will be primarily attended by NGOs, with the government playing an assisting role. The initial planning will be made by a special taskforce comprising environmental NGOs, experts and scholars, and EPA staff. The proposed range of topics for discussion will then be confirmed by a NCSO advisory committee and submitted to the NCSO for approval. The nation's 25 city and county governments will invite local civil organizations to convene and propose issues for discussion. These issues will also be confirmed by the NCSO advisory committee and submitted to the NCSO for approval. Regional meetings are being organized in northern, central, southern and eastern Taiwan in early 2006 to gather suggestions from each region. A preparatory meeting will then be held in early 2006 in Taipei.

Expected discussion themes for the National Sustainable Development Conference will focus on sustainability in terms of environment, resources and society. Participants will address the challenges of how to materialize Executive Yuan ministries' sustainable development plans; give impetus to local, civil and industrial promotion of sustainable development; and create strategies that reciprocally benefit the interests of environmental protection, economic development and social justice.

The EPA is keen to hear opinions from all circles in advance of the 2006 National Sustainable Development Conference. All are welcome to state their views online at the EPA's website or by email to chenhw@sun.epa.gov.

Toxic Substance Management

BFRs to Be Listed Toxic Chemical Substance

The incineration of brominated flame retardants (BFRs) can disperse brominated dioxins or furans throughout the environment and endanger human health. The EPA has therefore decided to regulate BFR materials octa-BDE and penta-BDE. After the regulation is approved, the EPA will announce these two items as controlled toxic chemical substances and restrict their use.

Brominated flame retardants (BFRs) are widely used in the manufacture of electric and electronic products, household products, plastic products, fabrics, construction materials and car interiors. BFRs are confirmed to contain polybrominated diphenyl ether (PBDE), which can cause the dispersal of brominated dioxins and furans in the environment upon incineration, and subsequent bioaccumulation and environmental accumulation. The EPA listed decabromodiphenyl ether (deca-BDE) as a toxic chemical substance in 1999. Now that control of BFRs has already become an international trend, the EPA has considered further adding octa-BDE and penta-BDE to the list of controlled chemical substances.

The EPA pointed out that BFRs account for 36% of all flame retardants worldwide. Domestic manufacturers use deca-BDE and octa-BDE as raw materials in plastic flame retardants, with ABS plastic, high impact polystyrene (HIPS), and polypropylene (PP) plastic being the main products containing these substances. ABS plastic is mostly produced for export, and Taiwan is the number one producer of this material. HIPS and PP are sold in Taiwan and abroad. About 540 tonnes of deca-BDE is imported into Taiwan each year and Taiwan uses about 680 tonnes per year.

The EPA explains that PBDE has high lipid solubility, low volatility and does not readily degrade in the environment; all these factors increase the likelihood of bioaccumulation in the human body. Results of animal experimentation abroad show that PBDE may affect thyrotropin secretions, early stages of mental and behavioural development, teratogenicity, carcinogenicity, and even estrogen secretions. Studies by domestic scholars have confirmed the presence of PBDE in urban incinerator stacks, electric arc furnace smelting plant stacks, fly ash, bottom ash, reaction ash, river benthic substrate and fish.

According to an investigation carried out by the EPA in 2004 on samples of benthic substrate and fish from 12 rivers including the Bajhang River, the most prevalent PBDEs in benthic substrate samples were deca-BDE, followed by octa-BDE. Compared with other countries, apart from Bajhang River and Yanshui River, concentrations of these two PBDEs were lower than in rivers in other countries. Deca-BDE was also the main PBDE found in fish samples, followed by penta-BDE. Concentrations of these two PBDEs were lower than those found in fish in other countries. However, studies also showed that BFRs and their derivative substances have already been widely dispersed throughout Taiwan's environment.

The EPA explained that many na-

tions have already set controls on BFRs. For example, the EU's WEEE and RoHS directives stipulate that as of July 2006, BFRs will be banned in the manufacture of electric and electronic equipment. In 2003, the European Parliament banned the sale and use of octa-BDE and penta-BDE. California State stipulated in 2003 that the use of octa-BDE and deca-BDE will be prohibited as of 2008. Statistics show global PBDE usage up to 800,000 tonnes in 1999. This has dropped to 180,000 tonnes by 2003, attesting that Europe and international reductions or bans on BFRs have already become a world trend.

The EPA is currently drafting relevant regulations. After public hearings and discussions are held, the EPA will officially list octa-BDE and penta-BDE as controlled toxic chemical substances and restrict their use. This year many countries are working on the development of halogen-free flame retardants or using high ignition point polyamides as base materials in plastics. This will end the need to use flame retardant materials. The EPA calls on domestic manufacturers to promptly switch to alternative products in order to forestall further damage to the environment and human health.

Toxic Substance Management

New Remote Control Sampling Vehicles to Aid Toxic Disaster Response

The EPA has introduced remote control sampling vehicles to enable toxic disaster response personnel to safely and reliably engage in inspection and sampling of gaseous pollution from over 1.5 km away from the disaster site.

Repeated explosions or uncertain conditions at the outset of toxic disasters make it hard for response personnel to safely approach the disaster site and analyze the situation in a timely manner. The EPA has therefore introduced a remote control detection and sampling vehicle researched and developed by the Center for Environmental Safety and Health, Industrial Technology Research Institute. The new technology will allow safe and reliable detection and sampling of onsite air pollution during dangerous disasters or emergencies.

The EPA reports that this high-tech remote control detection and sampling vehicle adds a new level to the nation's toxic chemical disaster response system. Recent years have seen a wide diversity of manmade disasters involving tankers, factories, storage facilities and laboratories. Some

manmade disasters or terrorism threats may even occur in areas that are difficult to access, showing the need for this kind of remote control detection and sampling vehicle.

The EPA describes the vehicle as having tracked wheels, allowing it to overcome difficult terrain and maintain systems stability. The wireless surveillance system can transmit information including audio and video images of the site to distances over one kilometer away. Data backup abilities allow it to gather and store basic information for further research and analysis. Remote control air sampling functions can be controlled from over 1.5 kilometers away so that response personnel can complete sampling work without getting close to the site. The vehicle can remain in operation for over four hours. Equipped with the ability to instantly detect the concentration of air pollutants, this vehicle can provide response personnel the information needed to decide quickly on an emergency relief and response strategy.

The new technology has already been put to use during past exercises including the Datan Power Plant toxic gas terrorist attack exercise in Taoyuan County and a toxic disaster exercise at Chian General Plastics Corp. in Toufen Industrial Park, Miaoli County. The results were good and the exercises received good reviews from observers. The EPA indicates that



Remote control detection and sampling vehicle

use of this technology during toxic disasters can make the most out of the first response when personnel are unable to approach

the site. Remote sampling and the ability to transmit close-up images of the situation will greatly strengthen toxic disaster onsite

analysis capabilities, ensure the safety of response personnel, and minimize damage.

News Briefs

Battery Recycling and Treatment Standards to Be Revised

The EPA has set more specific standards regarding the treatment of dry cell batteries collected for recycling. On 30 September 2005 the EPA announced its intention to revise the *Methods and Facility Standards for the Recycling, Storage, Clearance, and Disposal of Dry Cell Batteries* (廢乾電池回收貯存清除處理方法及設施標準). The revisions include recycling and storage methods of spent batteries, storage facilities for renewable materials and derivative waste, as well as the expected recycling rates for materials in batteries. For example, metal content recycling rates for the first year of implementation should be 35% for non-rechargeable batteries, and 55% for rechargeable batteries. Existing recycling enterprises must meet the new requirements within six months after the revisions are announced. Those failing to make the necessary improvements will be penalized according to the *Waste Disposal Act*.

Restaurant Range Hood Exhaust to Be Regulated

Oily smoke and odors emitted by the exhaust fans of restaurant range hoods are becoming recognized as a major pollution source in urban areas. They have increasingly been the topic of public nuisance complaints in urban areas in recent years. Based on the EPA's statistics, restaurant odors and oily smoke made up 54% of all public nuisance complaints in 2003. Smoke and odors from restaurants have therefore become the focus of new control measures. The EPA will require business owners to install equipment that helps get rid of oily smoke and

odors, and will also evaluate the feasibility of setting up a certification system for effective equipment.

Gas Station Vapor Recovery Equipment to Be Installed Nationwide in 2006

Revisions to the *Regulations Governing Gas Station Vapor Recovery Equipment* (加油站油氣回收設施管理辦法) were promulgated on 13 September 2005. The regulations stipulate that from 1 January 2006, all gas filling stations in Taiwan must install vapor recovery equipment and maintain their effective operation. Already 90% of gas stations have installed vapor recovery equipment. The primary reason for this high installation rate is that most gas station companies recognize the benefits of installing vapor recovery equipment. Not only does it improve the surrounding air quality, but it also safeguards the health of gas station attendants. Citizens have also shown strong support of the policy. Research results show that nationwide implementation of the vapor recovery equipment will reduce the concentration of benzene in the immediate environment near gas pumps by 67-86%. It will also reduce gas station attendants' exposure to volatile organic compounds (VOCs) by 66-87%. Moreover, VOC concentrations in the air near gas stations will decrease by over 32-76%. These estimates attest to the positive effects of installing vapor recovery equipment.

Biodiesel Road Tests Bring Good Results

The EPA has set aside an annual budget of NT\$100 million to promote the Biodiesel Road Test Plan. So far this plan has subsidized 13 counties and cities including Taipei City and Kaohsiung City to conduct trial plans this year (2005). Over 780 vehicles of all types have been used in the road tests so far. The general response from most circles is that biodiesel is an improvement over the exclusive

use of petroleum diesel fuel, which typically emits black smoke and noxious odors. Subsidies to county and city governments for the trial plan are mostly going toward providing biodiesel fuel to garbage collection trucks with routes in densely populated areas. The road tests are helpful in identifying the best model for domestic promotion of biodiesel. Results will be an important reference for the planning and establishment of a biodiesel fuel system in Taiwan.

EPA Considers ClO₂ as Drinking Water Treatment Agent

According to the *Drinking Water Management Act* (飲用水管理條例), there are six disinfectant agents that can be used in treating drinking water quality: ozone, liquid chlorine, sodium hypochlorite, calcium hypochlorite, chlorinated lime, and potassium permanganate. As other developed nations such as the EU and the US use chlorine dioxide (ClO₂) as a drinking water quality disinfectant agent, the EPA has already assessed the feasibility of Taiwan also using ClO₂ as a disinfectant agent. The EPA indicated that it has completed collection and assessment of ClO₂ related documents and background data, and expects to complete an assessment report before the end of December 2005. If feasible, the EPA will announce the drafting of new regulations at that time, and will announce the new regulations according to procedures.

Petrochemical Industry VOC Emission Regulations Tightened

The EPA promulgated revisions to the *Volatile Organic Compound Air Pollution Controls and Emission Standards* (揮發性有機物空氣污染管制及排放標準) on 12 September 2005. The revised standards tighten controls on equipment susceptible of leaking VOCs during the manufacture

of petrochemicals. To reduce VOC emissions by the petrochemical industry, the revisions expand controls over volatile organic liquid storage and other equipment, tighten regulations on the manufacture of equipment and components, and add regulations on the manufacture of wastewater treatment facilities. With the promulgation of this revised standard, the EPA expects to reduce VOC emissions by 4,410 tonnes per

year, or 6.4% of all VOC emissions by the nation's petrochemical industry (68,437 tonnes per year).

14 Business Sectors Added to Stationary Pollution Source Permit Control System

To strengthen VOC emission controls, the EPA announced the Eighth Group of Public/Private Facilities Required to Apply for the Installation, Modification and Oper-

ating Permit of Stationary Pollution Sources (第八批公私場所應申請設置、變更及操作許可之固定污染源) on 31 August 2005. This measure lists 14 categories of manufacturers likely to produce VOCs (nearly 1,700 public and private facilities) under stationary pollution source permit controls.

Table: Eighth Group of Public/Private Facilities Required to Apply for the Installation, Modification and Operating Permit of Stationary Pollution Sources

Targeted industries	Manufacture process or procedure
Businesses installing, modifying or establishing a stationary pollution source	Plastic bags (膠帶製造程序)
	Plastic injection or blow molding (塑膠押出或吹膜成型程序)
	Compact discs (光碟片製造程序)
	Photovoltaic materials, cells or electronic components (光電材料、元件或電子零組件製造程序)
	Paint or surface coat of motorbikes and bicycles (機車、自行車表面塗裝程序)
	Passive components (被動元件製造程序)
	Composite board products (合板製品製造程序)
	Wood products (木造品製造程序)
	Printing, dyeing, finishing (印染整理程序)
	Aromatic hydrocarbons (芳香烴製造程序)
	Industrial waste reuse or treatment (事業廢棄物再利用或處理程序)
	Organic solvents (有機溶劑作業程序)
	Waste incineration (including general and industrial waste) 廢棄物焚化程序 (含一般廢棄物及事業廢棄物)
	Storage of volatile organic liquids (揮發性有機液體儲存程序)

Activities

First Top Ten Products with Green Packaging Chosen

The EPA held the first "Marketed & Designated Product Green Packaging Design Selection" in which the top ten environmental packaging designs were chosen. Among the winners included one alcohol gift box, one processed food gift box, and eight bakery product gift boxes. The products were publicly announced for people to refer to when shopping. The winning designs will also serve as models for other businesses to learn from. The EPA pointed out the main reasons why these ten green packaging designs were selected: simple packaging (saving packaging material, space and resources), smart design (structurally sound, visually aesthetic, practical and creative), and more environmentally friendly design compared to former packaging. A total of 26 enterprises

participated in this activity, registering a total of 59 products, most of which (40) were bakery product gift boxes.



Review committee member and Consumer's Foundation Vice President Cheng Ren-hong (left, 程仁宏), displays old and new packaging design.

Activities

US Water Ambassador Visits Taiwan on World Water Monitoring Day

Taiwan has gained worldwide recognition for its participation in World Water Monitoring Day activities for the past two years. This year the EPA has invited America's Clean Water Foundation Chairwoman Ms. Roberta Savage to Taiwan. America's Clean Water Foundation is the founding organizer of World Water Monitoring Day. Ms. Savage participated in World Water Monitoring Day activities held at Bitan Lake in Hsindian City on 28 September 2005 and Liyu Lake in Hualien County on 10 October 2005. To encourage citizen concern for

environmental water quality, the EPA invited all citizens to participate in the Third World Water Monitoring Day activities. This year's activities were held from 18 September to 18 October. It is hoped that more citizen participation in water monitoring will help protect Taiwan's environmental water quality.

"Protect Our Air" Children's Art Contest

To encourage more participation in atmosphere protection work, the EPA held the "Protect Our Air" children's art contest award ceremony on 15 September 2005. EPA Minister Chang handed out awards

and book gift certificates to winning students from all over Taiwan, to let the kids personally experience the honor of participating in environmental protection work, and encourage the next generation to cherish the environment. Over 500 works were entered in the contest, with participants from elementary schools in urban and rural Taiwan as well as outlying islands. The youngest student to win an award was seven years old, freely expressing concern for nature with a pure heart and simple drawings. All winning contest entries are posted on the EPA's website at <http://www.saveoursky.org.tw/kid/index2.html>



Winning artwork from an older elementary school student, Chen Nai-ying (陳乃熒, age 12, Hualien City)

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