



Feature Column

Managing the Nation's Drinking Water Quality

The EPA seeks to directly improve the daily lives of citizens by providing safe, high quality drinking water. This involves regular monitoring and testing to make sure drinking water and water quality management are up to standard. Recently, it has become necessary to develop certain reform measures to integrate related regulations and jurisdiction. In coordination with government reorganization plans, the next task of water quality management involves integrating related water quality management regulations and division of authority.

The quality of drinking water directly affects the health of the entire public, and drinking water management measures directly affect the quality of drinking water. In order to ensure high quality drinking water, the EPA

regularly holds an annual focus investigation and clampdown by taking random tests of the nation's tap water and small water treatment facilities. Most tap water in Taiwan is supplied via indirect routes, resulting in high rates of substandard water due to secondary pollution of tap water. The EPA has responded to this problem with a plan that encourages tap water users to maintain clean water storage towers and improve facilities.

the advice of experts and scholars. The EPA also takes into account the use habits of Taiwan's citizens and adopts stricter standards on water quality problems that affect human health such as trihalomethanes. To prevent tap water providers from purchasing industrial waste for use as water treatment agents, the EPA is considering tightening controls and standards for impure chemical agents. The EPA has also asked tap water providers to clearly list quality demands on purchase contracts and increase the number of random checks during delivery.

Currently 90% of tap water in Taiwan is up to standard. In terms of recent achievements, the amount of substandard tap water has de-

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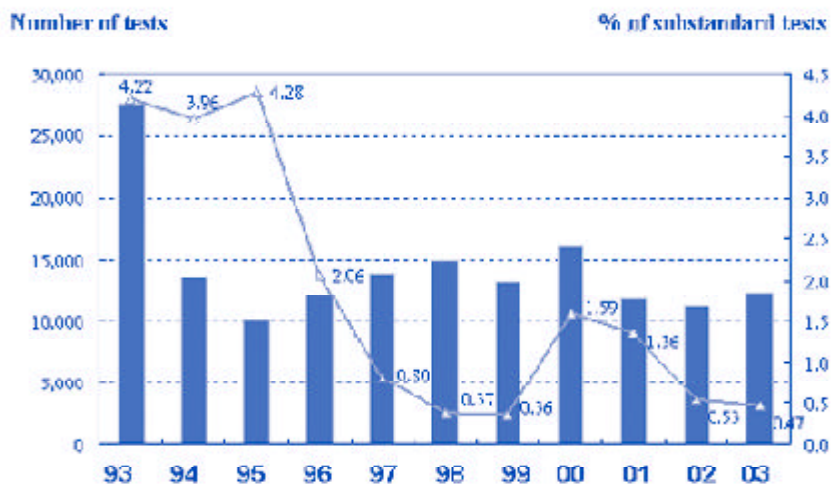
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Strengthened Testing and Supervision to Improve Tap Water Quality

The EPA gathers data on drinking water quality standards, referring to other country's standards and



Random testing of tap water quality 1993-2003

creased from 4.22% in 1993 to 0.47% in 2003. This attests to the substantial improvements brought about by increasing random testing of tap water quality and providing more public guidance.

Out of the 10,647 random tests carried out on tap water from January to October 2004, only 57 (0.54%) showed substandard quality. Enterprises that provided substandard tap water have been penalized and instructed to make improvements within a given time period. As for small water treatment facilities, 871 random tests have been administered, with 382 (43.86%) showing substandard water quality. The presence of bacteria was the primary reason for substandard water quality, mainly because the water had not undergone sterilization treatment. The EPA has stepped up guidance measures, advising the public to boil water before drinking. As for public drinking water facilities in public buildings, 1,063 random samples were taken during 4,582 maintenance inspections with two cases showing substandard water quality.

Current Challenge: Water Source Protection Zone Management

There are currently 107 water source protection zones according to the *Tap Water Act* (自來水法), covering a total area of 9,013 square kilometers, or 25% of Taiwan. Local governments and residents have voiced opposition to the excessive area drawn up in earlier years, and lack of consideration for local development or compensation. The *Drinking Water Management Statutes* (飲用水管理條例) were revised in 1997 to specify distances involved in delimiting drinking water source water quality protection zones or extracting drink-

ing water. New stipulations also specified and prohibited twelve manners of conduct that could pollute water quality. Nonetheless, citizens still disagreed with the stipulations and with the lack of compensation for their land, and as a result, local governments redefined the "tap water quality protection zones" originally included in national forest lands as "drinking water quality protection zones."

Due to a great degree of overlap between the *Tap Water Act* and *Drinking Water Management Statutes* in the areas of water source protection, the EPA advises integrating these two pieces of legislation when planning government organizational reform.

There are currently two types of source water protection zones: the Ministry of Economic Affairs (MOEA) has delimited Tap Water Source Water Quality Protection Zones (自來水水質水量保護區) according to the *Tap Water Act*; and the EPA has delimited Drinking Water Source Water Quality Protection Zones (飲用水水源水質保護區) according to the *Drinking Water Management Statutes*. Moreover, the management of source water in each protected zone involves many different regulations and authority is delegated to various government bodies including the MOEA, the Ministry of the Interior, the Council of Agriculture, the EPA and local governments.

Regulations Integrated to Complement Future Government Reorganization

The EPA will adopt the following drinking water management measures and strategies to maintain water body water quality and guarantee the quality and safety of

drinking water:

1. Integrate the *Tap Water Act* and *Drinking Water Management Statutes* to facilitate upcoming administrative reforms:

There is a great degree of overlap between the *Tap Water Act* and *Drinking Water Management Statute* in the areas of water source protection areas, water quality stan-

dards and management of treatment agents. This makes it difficult to integrate and delimit authority, and increases difficulty in management. It is thus advisable that these two pieces of legislation are integrated when planning government organizational reform.

2. Implement Total Effluent Control

Where water sources are severely polluted, the *Water Pollution Control Act* (水污染防治法) stipulates that total effluent control measures should be implemented and restricts effluent from each pollution source to within the carrying capacity of the water body so that the water quality of water bodies used for drinking meets drinking water source water quality standards.

3. Implement a compensation system for private property that is required to move out of water source protection zones.

A revision of the *Tap Water Act* was promulgated on 30 June 2004, regarding regulations for collecting water source conservation and

compensation fees. The *Tap Water Act* calls for a certain percentage of money from water fees to go into a water resource management fund, which is specifically applied to water resource conservation and ecological conservation infrastructure, as well as public welfare compensation and restricted land compensation for residents in water source water quality protection zones. This is based on principles of fairness in which those who benefit pay and those who must bear limitations receive compensation.

Aiming to make tap water available to all and enhance treatment effectiveness, the EPA will ensure safe drinking water by:

1. Increasing the universality of tap water

For places that do not receive tap water, tap water enterprises are asked to expedite the construction of tap water supply facilities.

2. Improving the water quality of tap water supply by improving water source and supply system

Surface water bodies and groundwater water bodies must conform with drinking water source water quality standards before they can be used as drinking water sources. To effectively improve water quality of tap water that is indirectly supplied, the EPA: insists that tap water enterprises increase purchases, checking and quality control of filters and water quality treatment agents; insists tap water suppliers continually replace old water lines and unsuitable pipe materials, and strengthen leak checking and maintenance work; insists tap water enterprises and water source zone management agencies are assisted in establishing routine monitoring and response mechanisms; actively promotes guidance for tap water users in cleaning and maintaining water tanks.

3. Strengthening random testing of drinking water sources and water quality

The EPA: administers focus inspections and controls on drinking water source, water quality, and agents; insists that water suppliers improve water quality; assists local environmental protection bureaus (EPBs) in administering random testing of the more difficult drinking water quality standards on pesticides, volatile organic compounds, and heavy metals; increases instruction to the public and to non-tap water users that have already installed sterilization facilities to make sure that they add sterilization agents.

4. Increasing maintenance and random testing of water quality at stationary continuous water supply facilities within public and private buildings

The EPA: confers with the Bureau of Standards, Metrology and Inspection (MOEA) to set national standards for drinking water equipment such as water purifiers and drinking water dispensing machines, and carry out product testing; ensures that drinking water equipment maintenance records are carried out according to regulations and that enterprises publicly announce the status of water quality; has revised water quality standards on the total dissolved solids and hardness of drinking water and has announced more drinking water quality treatment agents; insists that tap water suppliers carry out comprehensive water source water quality improvement plans; counsels local EPBs in carrying out inspections of drinking water agents, stipulating that bureaus that do not follow regulations will be dealt with by a judicial department.

Climate Change

Premier Leads Climate Change Response Taskforce

During a recent meeting of the National Council for Sustainable Development convened by the Executive Yuan it was decided that the Climate Change and Kyoto Protocol Response Taskforce should be elevated in status and convened by Premier Yu. Under this policy, the Executive Yuan has directed the Ministry of Economic Affairs to strengthen research, development and installation of renewable energy technology.

The Executive Yuan convened a National Council for Sustainable Development (NCSA) meeting on 8 November 2004. Three reports were given on the following issues: the integration of water, land, forests and air resources in the newly formed Ministry of the Environment and Natural Resources (環境資源部); Taiwan's response to the UNFCCC agenda; and the National Land Resources Taskforce's revisions to the Sustainable Development Action Plan. Two discussions were also on the agenda: the Taiwan Agenda 21 – National Sustainable Development Vision and Strategy Principles (draft), and the NCSA's focal work for the coming year.

During the meeting, Premier Yu Shyi-kun strongly emphasized that the government policy to phase out nuclear power plant and establish a nuclear free nation would not be abandoned just because the *Kyoto Protocol* takes effect. Moreover, the government will not ignore the people's determination to promote a nuclear-free

homeland in its efforts to reduce greenhouse gases. The Premier has decided that the Climate Change and *Kyoto Protocol* Response Taskforce should be elevated in status and convened by Premier Yu himself. Under this policy, the Executive Yuan has appointed the Ministry of Economic Affairs (MOEA) to strengthen research, development, and installation of renewable energy technologies.

Executive director of the NCS and chairman of the Research, Development and Evaluation Commission (Executive Yuan), Jiunn-rong Yeh (葉俊榮) reiterated Premier Yu's strategy for related government agencies to divide the tasks of evaluating regulations, potentials and costs of greenhouse gas reductions and use this information to formulate greenhouse gas reduction methods. Each related agency is asked to submit plans for a concrete response strategy before the end of the year. Until then, Yu believes it is too early to discuss the problems of building or closing down thermal power plant facilities.

Yeh conveyed the Premier's conviction that during the next stage of talks regarding the Protocol, Taiwan should seek opportunities to participate in flexible transnational reduction mechanisms as a non-member nation. The Premier has asked the Ministry of Foreign Affairs to take up the greenhouse effect issue one of its foremost tasks, and the MOEA to help the Climate Change and *Kyoto Protocol* Response Taskforce engage in international cooperation and interaction, drawing on its experience of getting Taiwan into the WTO.

As for Taiwan's response to the UNFCCC's strategies, Premier Yu indicated that the *Kyoto Protocol* is slated to take effect in February 2005. While Taiwan is not required to bear the responsibility of

emission reductions at the outset, Taiwan is the world's twenty-second greatest emitter of greenhouse gases (GHG) and is accountable for 1% of world emissions. Such amounts will not be overlooked in the international arena, making emission reductions in Taiwan an important goal for the planet at large. After the Protocol takes effect, the next stage could require those countries with significant GHG emissions to make reductions. Although Taiwan is not yet a signatory nation to the Protocol, she should be prepared to adhere to

Soil & Groundwater

Groundwater Pollution Early Warning System to Be Installed

The EPA will carry out the National Groundwater Quality Early Warning Monitoring Network Planning Program over four years starting this year (2004). The plan calls for installing monitoring wells in industrial zones where there is a higher potential of groundwater pollution. The wells will be monitored on a regular basis to ensure pollution is detected early on, followed by immediate remediation.

Taking precautions against potential pollution incidents, the EPA has launched a four-year National Groundwater Quality Early Warning Monitoring Network Planning Program this year. The program calls for the installation of 180 monitoring wells to conduct regular monitoring where there is a high potential of groundwater pollution, such as industrial zones. The goal is to protect groundwater quality and the health of citizens by establishing a groundwater quality early warning monitoring network that can detect pollution as early as possible and ensure immediate treatment.

In recent years, Taiwan has experienced groundwater pollution incidents in which pollutants have peculiar characteristics and different dispersion traits, as in the

its stipulations.

Premier Yu indicated that NCS will lead a delegation to participate in the UNFCCC assembly in Argentina this December (2004). After gaining a full comprehension of the latest international trends, the Premier will promptly invite experts and representatives from the nation's industry, government, and academia for in-depth analysis and negotiation to draw up plans for structural adjustment of Taiwan's industry, and development of high value-added, low-consumption industrial technology.

RCA groundwater pollution incident. The underground movement of certain pollutants is often so slow so that by the time they are discovered, they have already dispersed over a large area. This complicates remediation work and poses a potential threat to public health.

As a part of regional groundwater quality monitoring work, environmental agencies have already installed 431 standard monitoring wells in ten major groundwater regions. These wells carry out regular sampling and maintenance work, with the purpose of gathering data on the ambient water quality of regional groundwater on the whole. However, the current network of wells is widely dispersed and most wells are situated upstream of pollution sources, making this system inadequate in terms of providing an early warning function. To gain command

over groundwater quality in areas with potentially high levels of groundwater pollution, the EPA is planning to install 180 more wells in northern, central, southern and eastern Taiwan over the next four years. These wells will ensure close monitoring of areas with suspected large-scale pollution sources.

After comprehensive planning and installation of this early warning groundwater quality monitoring network, environmental agencies can put into full play the groundwater quality pollution early warning results. Through regular continuous monitoring of groundwater in areas with a high potential for severe pollution, once discovered, polluters will not be able to conceal the incident. In this way further groundwater pollution can be prevented and the public can be guaranteed that their water is safe.

Second PM Supersite to Be Established in Kaohsiung-Pingtung Area

Following the establishment of Taiwan's first Particulate Matter Supersite in Hsinchuang, the EPA has further plans to install a core testing station for the nation's second PM Supersite in Daliu Township (大寮鄉), Kaohsiung County. Three satellite testing stations will also be installed in nearby Chaozhou (潮州), Pingtung County; Chianjen District (前鎮區), Kaohsiung City; and Ciaotou Township (橋頭鄉), Kaohsiung County. The primary purpose of these facilities is to monitor the more serious pollutants of ozone and particulate matter (PM) in southern Taiwan. These stations will complement the monitoring work of EPA's existing air quality monitoring stations in the southern region. The EPA hopes to develop a strong monitoring network for air quality in the Kaohsiung-Pingtung region, and greatly increase the capacity to analyze time and space distribution of the region's air pollution. This information will be a useful reference when formulating air pollution control plans to improve the region's environmental quality.

Soil & Groundwater

Industries to Test for Soil Pollution from 2005

The EPA will soon require 18 industries to submit soil pollution test data before transferring land ownership, setting up operations, suspending operations, or going out of business, starting from 1 January 2005. This measure will confirm soil conditions at the time of sale, will let both buyer and seller know whether the soil is polluted, and will clarify liability for polluted soil.

According to the *Soil and Groundwater Pollution Remediation Act* (土壤及地下水污染整治法), as of 1 January 2005 the EPA will require 18 industries to provide soil pollution test data before transferring ownership, establishing operations, suspending operations or terminating business. The designated industries must provide soil pollution test data before transferring ownership to confirm the soil conditions at time of sale and make both buyer and seller aware of whether there is pollution. This measure will clarify liability for pollution and prevent disputes when pollution is found after change of ownership. Soil test results should also be submitted to the local environmental protection bureau (EPB) for reference before the establishment, suspension or shut down of operations. This information will help confirm whether pollution occurred before or after establishment of operations and thus clarify liability for any pollution found.

The 18 designated industries are divided into two groups. The first group comprises 15 industries that have factories or additional facilities on over 100 square meters of land: leather tanneries, fur producers, raw chemical manufacturers, petrochemical raw material manufacturers, artificial fiber manufacturers, synthetic resins and plastic manufacturers,

synthetic rubber manufacturers, pesticide and environmental sanitation agent manufacturers, oil refineries, manufacturers of plastic skins, plastic boards, and plastic tubing, manufacturers of products made of plastic skins, steel smelting enterprises, metal plating enterprises, semiconductor manufacturers, printing circuit board manufacturers, and battery manufacturers. The second group comprises three industries regardless of land area: electric power plants, gas stations and waste treatment facilities.

The EPA separately announced those industries required to submit soil pollution tests before establishing, suspending or closing down operations, and those industries required to submit soil pollution tests before transferring ownership, on 29 and 30 August 2001, respectively. Industry representatives had many concerns upon the initial announcement, stating that the implementation date was too pressing, the scope of industries was too broad, the soil testing methods were unclear and there were not enough testing organizations at the time. After careful reconsideration, the EPA revised the original implementation date and discussed other details of the regulation on 21 March 2003. After a year and a half of careful consideration and several more public hearings and meetings, the regulation is now ready to be announced.

In order to prepare the 18 designated industries and related fields for this soil testing regulation, the EPA is working to enhance people's understanding of soil

pollution by holding four seminars on soil pollution testing data throughout Taiwan. For more information, please call 02-23832389 ext. 842.

as "green vehicles" with the "three lows."

In rating the finalists, the EPA referred to the selection methods outlined in the Green Vehicle Guide compiled by the US-EPA. Emission concentrations of the two smog-producing pollutants that cause the greatest harm to human health – NOx and HC – were used as the basis for the final screening process. The Passat 1.8 took first place. Making it to the list for the first time, the Accord V6 3.0 took second place overall and rated as the best domestic produced car.

Among this year's green vehicles were two models not yet on the domestic market, the first and second generation of the gasoline-electric hybrid Toyota Prius. This car's power system derives its energy from both a gas engine and battery, allowing the car to run at 35.5 km per liter, saving energy and cutting pollution. The Prius has been on the market for five years and over 100,000 units have been sold so far. The EPA is currently working on related regulations and expects that subsidies will soon be available for those purchasing gas-electric hybrid cars.

Air Quality

2004 Green Vehicles List Is Out

The 2004 rating of environmental sedans has come out with first place taken by Volkswagen Passat 1.8 imported from Germany by Hong Kong Beldare Motors Limited. Three domestic cars also made it to the list: Honda's Accord 3.0, Accord 2.0 and Kuozui's Camry 2.0.

From 2003, the EPA's Green Vehicle award selection review process has included statistics on car emissions and noise, as well as fuel economy data provided by the Bureau of Energy (Ministry of Economic Affairs). Car models certified for sale on the market were evaluated and compared based on these data and other existing categories.

Among the 247 sedans that were issued the EPA's "Gas car model emission test certification" for the 2004 model year included eight models with the "three lows" indicating low pollution, low noise and low fuel consumption. These were Accord V6 3.0, Peugeot 607 3.0, Peugeot 206 SW 1.6, Accord EX-S 2.0, NVIEPE (Camry 2.0), Mazda 6 2.3, and MINI Mini Cooper 1.6. Among these, the longstanding brand Camry 2.0 (NVIEPE) model by Kuozui made it to the list for the second consecutive year. In production

for only two years, Honda Taiwan came forth with two Accord models that made it to the list as well.

The EPA indicated that the audit process for selecting Green Vehicles was carried out in four stages. The screening criterion for the first stage required air pollutants to conform with California's low-polluting car standards, the world's strictest standards. Only 47 cars passed this first stage. The second stage required noise test levels to meet the fourth phase control standards in advance of their implementation in 2007. Only 13 imports and 5 domestic cars passed this test. The third stage looked at fuel consumption, requiring cars to surpass the US Fuel Economy Guide's highest fuel consumption standard values (9km/L in the city and 13.5 km/L on the highway) jointly laid down by the US-EPA and Department of Energy. Only eight cars passed this third screening procedure and these remaining models qualified



The world's first hybrid car under mass production uses this Toyota Hybrid System engine.



EPA Minister Chang hands the 2004 Green Vehicle first place award to Hong Kong Beldare Motors Limited.

Air Quality

Entire Nation to Use Low Sulfur Fuel by July 2005

Initiating source controls to reduce air pollution, the EPA has announced that from 1 July 2005, stationary pollution sources throughout Taiwan will be restricted to using liquid fuel with sulfur content under 0.5%. The full implementation of this restriction is expected to effectively improve the nation's air quality.

Actively working to improve air

quality and pollution problems caused by sulfur oxides and sulfur-derived particulate matter, the government is preparing to enact a full-scale policy of low sulfur fuel. The EPA will incrementally control stationary pollution sources and restrict their use of liquid fuel with over 0.5% sulfur content. From 1 July 2005, all stationary pollution sources throughout Taiwan shall be subject to this regulation.

Article 28~1 of the *Air Pollution Control Act* (空氣污染防制法) stipulates that all vendors or users of coal, petroleum coke or other substances likely to cause air pollution must first submit related information to their local environmental protection bureau (EPB). The enterprise may only sell or use such products after review and issuance of a permit. Records must be kept on the sale or use of such substances and reported to the local EPB. Article 28~2 stipulates that procedures pertaining to the vendor or user's application, review procedures, permit issuance, revocations, recording and other procedures shall be established by the EPA following discussion with related organizations.

According to Article 28~2, the EPA announced on 17 November 2005 that stationary pollution sources throughout Taiwan will not be allowed to use liquid fuel with sulfur content over 0.5%, which is likely to cause air pollution. Regional implementation dates are as follows:

1. The following regions already adhere to this regulation: Taipei City, Kaohsiung City, Keelung City, Taipei County, Taoyuan County, Taichung County, Taichung City, Nantou County, Changhua County, Yunlin County, Chiayi County, Chiayi City, Tainan County, Tainan City, Kaohsiung County, and Pingtung County.
 2. Hsinchu County, Hsinchu City, Miaoli County, Yilan County, Penghu County and Lienchiang County will begin implementation from 1 February 2005.
 3. Hualien County, Taitung County and Kinmen County will begin implementation from 1 July 2005.
- Before the implementation date of each designated region, the

former regulation shall remain applicable (maximum liquid fuel sulfur content of 1% for stationary pollution sources). Stationary pollution sources using liquid fuel with sulfur content exceeding the stipulated amount (1% before implementation date, and 0.5% after implementation date), or those vendors selling liquid fuel that does not conform to regulations must first obtain a permit.

Recycling

Recycling of Bulk Waste Promoted Nationwide in 2007

Owing to successful promotion efforts in eight cities and counties, the recycling of large-sized waste items has not only proved efficient use of resources but has also benefited local economies. The EPA is planning to promote recycling of bulk waste items nationwide in 2007 to fulfill zero waste goals

With heightened environmental awareness and active promotion by local environmental protection bureaus (EPBs), already eight counties and cities have started programs to recycle, repair and reuse bulk waste items. More and more people are becoming familiar with the concept of "turning garbage into gold." Approximately 45 tonnes of bulk waste is recycled or reused per day in Taiwan. As this practice becomes universal, the EPA plans to go nationwide with its Bulk Waste Recycling and Reuse Plan in 2007.

Resounding the global call by citizen environmental groups to reduce consumption and conserve resources on Buy Nothing Day in late November just as the Christmas shopping frenzy begins, for years the EPA has been implementing a bulk waste recycling and reuse plan, emphasizing that "garbage is just resources put in the wrong place." In fact, most household-generated waste from furniture and bicycles to tree

branches all can be reused or recycled. With the creative skills of EPB employees, many of these items can be turned into usable furniture after repairs or refurbishment. The resulting cheap and good quality products are highly sought after on the market. Items not worth repairing are sorted, crushed and screened and the remaining scraps of plastic, metal, wood, and stone can be made into various green building materials

This plan has already been executed in eight counties and cities: Taipei City, Kaohsiung City, Hsinchu City, Taichung City, Tainan City, Nantou County, Chiayi County and Tainan County. When citizens want to get rid of old furniture, they need only contact the local sanitation crew for free collection service. The waste is given new life under the skilled hands of master craftsmen at recycling factories and put through sterilization processes to ensure the health and safety of the next owners. Based on current

auction prices, a secondhand bicycle can be bought for just NT\$200, a bed for NT\$500, and a set of sofas for just NT\$3,000 – quite a bargain! The EPA plans to set up a recycled furniture website to make it easier for people to shop for environmentally friendly recycled furniture.

The EPA is assisting each county and city to set up factories that

recycle bulk waste items, and expects the daily recycling rate of this waste category to increase to 120 tonnes by 2007, creating an economic value of NT\$350 million per year. The recycling of wood materials will save an estimated 100,000 trees per year, greatly relieving stress on the environment and natural resources.

Air Quality

Fifth Phase Emission Standards for Motorbikes Planned

To reduce pollution from motorbike emissions, the EPA is currently planning the fifth phase of emission standards for motorbikes. The new standards, slated to take effect in 2007, will be more than twice as strict for each category of air pollutant and adopt the same sampling procedure used by the European Union.

Taiwan's fourth phase motorbike emission standards were implemented in 2004 to effectively reduce pollution from motorbike exhaust. Manufacturers have already ceased production of traditional carburetor two-stroke motorbikes, which were unable to meet this standard. The EPA is now formulating the fifth phase of emission standards for motorbikes. This will make standards for each category of air pollutant over twice as strict and will also tally with citizens' vehicle use habits and reflect the pollution status in terms of actual car usage. Just as in the EU, the new regulations will do away with the current practice of first warming up the engine before taking a sample. New testing procedures will require samples to be taken from the moment a cold engine is started. The standards are to go into effect in 2007.

The EPA indicates that the fifth phase motorbike emission standards system adopts the same criteria used by the EU's third phase emission pollution regulations

(EU3). This initiative shows Taiwan's response to the WTO, complies with international trends to adjust automobile emissions regulations, and spurs domestic motorbike production to keep pace with world technology. Compared to the fourth phase motorbike emission standards currently in effect, the limit for carbon monoxide (CO) will be cut from 7g/km to 2g/km. HC and NOx will be subject to separate controls, and the standard limit for exhaust under 150cc will decrease from the current 2g/km to 0.95g/km.

The EPA has already made a preliminary consensus with industry and will soon invite experts, scholars and motorbike industry representatives to a discussion on the implementation date for the fifth phase motorbike emission standards. The EPA indicates that it will actively communicate with industry and strive to implement the new emission standards on schedule in keeping with the ultimate objective of protecting air quality.

General Policy

Seven Green Companies Enter Kaohsiung ESTP

The Kaohsiung Environmental Science and Technology Park (ESTP) is now home to seven companies. US-based World Resources Company (WRC) has also signed a memorandum of understanding to enter the park. The ESTP promotion plan offers companies entering the park many preferential benefits and only a limited number of companies are allowed to enter. The EPA advises enterprises to enter the park as soon as possible to avoid being left out.

The EPA's Environmental Science and Technology Park Promotion Plan offers many preferential benefits to companies setting up in the park, including subsidization of 50% of land lease fees, a NT\$25 million subsidy for production, and NT\$10 million toward a trial mass production research and development plan. Meanwhile, the plan also works to revitalize local industry and reconstruction. The government has already approved of the establishment of four ESTPs nationwide to be located in Kaohsiung County's Benjhou Industrial Park, Hualien County's Fenglin Industrial Integrated Development Zone, Taoyuan County's Taoyuan Science-based Industrial Park, and Tainan County's Greater Sinying Industrial Zone.

Of the four parks, the Kaohsiung ESTP project is progressing the fastest as the location is part of a previously developed industrial park with complete infrastructure. Since the park opened on 22 Feb-

ruary 2004, already seven companies have moved in. These seven companies alone will have a production capability of around NT\$1.3 billion and will create employment opportunities for around 200 people.

Seven firms have established in the Kaohsiung ESTP so far, each with their own distinguishing features. Although the seven firms have yet to form an interconnected system between each other to cycle resources, they may team up with other industrial parks in Kaohsiung and the Chianan region to help supply each other's needs. They can also make use of their own resource recycling technology to assist other firms in nearby industrial parks recycle and treat wastewater, and airborne and solid wastes. Such practices will expand the ecological cycling of resources.

The seven companies include Shankou Metals (山口金礦物科技), which collects heavy metal sludge and valuable metals from discarded catalysts; Gwolian Machinery (國聯機械實業), which manufactures environmental mechanical equipment; Leige Technology (磊格科技), which recycles scrap lead acid batteries; Jhengjia Hsingye (正加興業), which develops and manufactures environmental equipment and provides systems integration technical service; Topco E&M Systems, Inc. (敏盛生物科技), which produces agents used in environmental pollution remediation and microbial products to decompose agricultural waste; Fuchan Mechanics (富產機械), which develops, manufactures, installs, provides construction and systems integration of environmental facilities; and Ruihsin Environmental Engineering Co. (瑞鑫環保工程公司), which recycles waste lubricants. Most of them are still in the process of establishing facilities and initial trial runs.

The Kaohsiung ESTP covers an area of about 30 hectares, and there is still room for about 20 more companies. The EPA indicates that in consideration of the mutually compatible development in parks near the Kaohsiung ESTP, other companies entering the park will hopefully possess high-tech recycling and reuse technology, environmental biotechnology or renewable energy. Southern Taiwan is endowed with ample sunlight, and as soon as the Bureau of Energy's new act to promote solar energy is passed, the solar energy industry will be the next emerging environmental technology industry in Taiwan.

The US-based World Resources Company (WRC) collects sludge that contains metals generated by countries all over the world (including Taiwan) and recycles this into usable resources. WRC initially treated around ten thousand tonnes of waste sludge from Taiwan each year, accounting for one fourth of all of Taiwan's waste sludge. WRC has recently decided to establish a branch in Taiwan, and plans to enter the Kaohsiung ESTP and set up pretreatment facilities for recycling metal sludge. WRC will make use of the excess heat generated by the neighboring Gangshan municipal waste incineration plant to provide some of the heat required for pretreatment procedures. Once established, these facilities will reduce the need to export metal sludge and WRC will be able to fully treat about 15,000 tonnes of this waste here in Taiwan, greatly increasing the ratio of waste that is treated domestically.

The EPA indicates that the ESTPs provide numerous preferential benefits and are a source of information on environmental and renewable energy technology both here and abroad. As the

parks are limited in terms of area and number of firms, all environmental related companies are called on to apply as soon as possible and join the ranks of Taiwan's cutting edge environmental industry. For more information, please call (02) 2311 7722 ext. 2643.

General Policy

EPA Urges Service Industry to Go Green

An "Enterprise Environmental Protection Seminar" was held on 9 November 2004, targeting the three largest service industries: department stores, finance businesses and amusement parks. The seminar covered three main issues: the Green Mark ecolabel system and green procurements, complete waste sorting and green offices. Eighty business representatives participated in this seminar and actively shared ideas with each other.

The EPA Environmental Professionals Training Institute held the first "Enterprise Environmental Protection Seminar" on 9 November 2004, inviting representative environmental authorities of the nation's large-scale department stores, shopping malls, finance and insurance businesses, amusement parks, and entertainment companies. The response was excellent with about 80 participants, mostly top-level representatives, all of whom showed enthusiasm and commitment to environmental protection.

EPA Minister Juu-En Chang noted during his opening remarks that environmental seminars in the past have focused mostly on manufacture and environmental engineering industries. It is commonly thought that only a few industries have any-

thing to do with environmental protection. Chang said that this is not the case, as the service industry generates pollution from consumptive waste, just as manufacturers generate pollution from production waste. The purpose of this seminar was to encourage all industries to incorporate environmental principles into each operation strategy and create successful environmental life cycles for enterprises and their clients, suppliers, and even the entire supply chain. By having an influence on the daily life of citizens, the service industry can help reach the ultimate goal of getting the entire citizenry to take environmental initiatives.

Minister Chang further pointed out that the service industry is central to the future of industrial development. Department stores, malls, finance institutions, and amusement parks are places where citizens frequently gather to consume and recreate. As consumption behaviour is inextricably tied to natural resources, these places have a strong influence on people's lifestyles and habits. Just as in the past when people were used to using plastic shopping bags, and throwing out excessively packaged

gift boxes, cardboard boxes and plastic containers, failing to reuse office paper, and other environmentally unfriendly habits, it took cooperation from the private sector to spur environmental changes.

Participants in the seminar

General Policy

Awaiting Verdict on Amorgos Oil Spill Environmental Claims

Already four years since the Amorgos oil spill incident, the ship owner has already agreed to pay a portion of compensation, however still disputes claims for ecological and economic damages. There is still quite a large gap in understanding between the ship owner and Taiwan. The case has been called to court this November (2004) and the verdict will be out before the end of the year.

The grounding of Greek-registered bulk cargo ship Amorgos off the shore of Longkeng near Kending on 14 January 2001 caused an oil spill that has had devastating repercussions on Taiwan's marine environment. After negotiations between related government agencies and the ship owner's insurer, an agreement was reached for the latter to pay a portion of com-

penetration claims. The ship owner and its insurer paid over NT\$61 million for oil pollution cleanup fees, and NT\$1.8 million for forest restoration fees. The ship owner also complied with Taiwan's maritime law regulations by paying US\$ 2,455,993 (NT\$84,731,759) for removal of the vessel.

However, there is still a wide gap of disagreement between the two

Motorbike Testing Stations' Performance Awarded

The EPA held a national awarding ceremony on November 11 to commend the outstanding service performance of motorbike exhaust testing stations in 2003. Ninety-eight testing stations were chosen from a total of 1,883 stations nationwide. Each local government submitted the top 5% motorbike testing stations of their county or city, from which the EPA made further selection based on testing quality assurance and quality management. Special commendation was given to Mr. Liu Mu-chuan of Kaohsiung County, who showed devotion to protecting the environment through five years of enthusiastic service attitude toward customers despite a physical handicap. Liu expressed appreciation to EPA Minister

Activity

Chang for implementing policies to reduce air pollution. Liu also offered advice to associates in the testing in-

dustry based on his own successful experience: "Our job is not just to make money, but to protect the environment."



EPA Minister Juu-En Chang poses with award winners.

sides regarding claims for ecological and economic damages caused by the oil spill. After negotiations fell apart, the EPA represented Taiwan's government sued the ship owner's protection and indemnity insurance group, Gard, for refusing to compensate for ecological and economic damage incurred. The Norwegian court opened a court session on 1 November 2004 in a local court in Gard's hometown of Arendal.

The government of Taiwan claims over NT\$35 billion in compensation for damage to the coral reef incurred by the vessel, damage to fishery resources, coast monitoring fees, specialist fees, and losses of revenue from admission tickets to publicly-owned facilities. As most claims are for environmental damages involving the two specialized fields of coral reefs and fisheries, in addition to a trial judge, two Norwegian scientists – Bjorn Braaten, a coral researcher of the Norwegian Institute for Water Research and Lars Feyn, a fishery researcher of the Institute of Marine Research – are serving as judges in the trial.

The court session in Norway took place from November 1 to 18. This misfortunate pollution incident resulted in the establishment of an emergency response team in the Kenting National Park management office. The extent of damage to the ecology and scenery, as well as future repercussions of this incident are perhaps best understood by the director of the Kenting National Park Management Office. The EPA has therefore entrusted Kenting National Park Management Office Director Li Yang-sheng (李養盛) to represent the government of Taiwan throughout the entire court proceedings. Li has made a loud appeal for the coral reefs of the Kenting National Park, petitioning the court to cherish and protect this natural treasure that belongs not just to Taiwan, but to

the whole world.

The EPA indicated that the verdict for this case has not yet been decided. During the trial, only the ship owner and their insurance representative proposed various stances of denial, referring to the typhoon at the time as their main

excuse for refusing to compensate for all damage claims. After the court proceedings, the chief judge conveyed that the panel of four other expert judges would require at least four weeks to write up the verdict for this case, which will be out before Christmas at the soonest.

News Briefs

Taiwan Adheres to Stockholm Convention in Controlling Chemical Substances

The EPA Department of Environmental Sanitation and Toxic Management briefed on 12 November 2004 that Taiwan is keeping in step with Stockholm Convention regulations on the management of the 'dirty dozen' chemical substances, and has enhanced management of additional substances as advised by the United Nations Environment Programme (UNEP). The Stockholm POPs Convention took effect in May 2004, specifying standards for twelve chemical substances, including nine kinds of organochlorides (such as DDT) and polychlorinated biphenyls. Taiwan has already prohibited the production, import, sale, and use of these substances. The other three substances are dioxin furans, and Mirex (an ant poison). Regulations are already in place to control and reduce pollution from dioxin and furans, while Mirex is subject to *Agro-Pesticide Act* (農藥管理法) regulations and has not been certified for use in Taiwan. Meanwhile, the UNEP also recommends adding sixteen other persistent toxic substances. The EPA has already begun evaluating standards for three of these: dimethyl phthalate (鄰苯二甲酯類), polybrominated diphenyl ethers (PBDEs) and nonylphenol. The other thirteen substances are under close watch.

Two EIA Standards Revised

The EPA recently announced related criteria for two environmental impact standards. Based on the 8 January 2004 revision of the *Environmental Impact Assessment Act* (環境影響評估法), the EPA announced criteria for executing continuous daily fines for violations of the Act on 3 November 2004. The criteria specify how to define the starting date, suspended

dates, and the end date of continuous daily fines imposed for violations of the Act, as well as how to establish that improvements have indeed been made and other rules to abide by. Also, a revision was made to Appendix 1 of the *Standards for Establishing Environmental Impact Assessment of Petroleum Product Storage Facilities* (石油、石油產品貯存槽應實施環評認定標準) announced on 10 February 1998. Criteria for identifying petroleum and petroleum products were revised to correspond with related modifications made by the MOEA.

Consensus Supports Environmental Tax Conditionally

The EPA held a series of environmental consensus meetings in October convening government, academia, and business sector representatives for a month of joint discussion. A resolution was reached on 7 November 2004 in which it was decided that under the preconditions that related financial income is fair, transparent, and effectively administered, environmental pollution control fees should be expanded to include environmental external costs. It was agreed that negative environmental consequences should be internalized into production costs, market price and consumer behavior. This will help actualize the principle that polluters and users should pay for environmental damage. Environmental pollution control fees will go toward designated organizations as special funds for specified use. Consensus was reached that environmental pollution control fees should not be limited to the scope of pollution control and remediation, but should be expanded to include the conservation of environmental and natural resources, and the safeguarding of public health.

Activities

First "Little Green Sprout" Children's Books Selected

The EPA recently held the first awarding ceremony for "Little Green Sprout" books that help spread environmental education concepts and encourage teachers and parents to make use of first-rate environmental education storybooks when reading with their children. Through easy reading, these books are hoped to inspire preschoolers to become "little green sprouts" that cherish nature and protect the environment. EPA Minister Chang described how the winners were chosen from 141 illustrated storybooks put out by 22 publishing companies. After two months of review, 22 of the most outstanding books were selected including 11 on the living environment and 11 on nature conservation. Hsin-Yi Foundation (信誼與上誼出版社) was the leading publisher with seven books awarded. Eleven of the winning books were authored by local writers and artists.

Celebrating Environmental Volunteers Day

In celebration of the annual "Environmental Volunteers Day" on November 12, the EPA held an "environmental cheerleading" contest, with representative volunteers from all over Taiwan participating. During the event, EPA Minister Juu-En Chang entered the stage dressed up as an environmental warrior wearing a vest and overcoat made of recycled plastic bottles, straws and CDs. Chang joined the troop of en-

vironmental volunteers in cheerleading and encouraging the public to help actualize the new policy slogan: "Complete Sorting of Garbage for Zero Waste." Chang explained that people have become accustomed to convenient modes of consumption, throwing things out after one use. This new cultural behaviour compounded by recent proliferation of industry and commerce has generated far more waste than the environment can assimilate. Affirming grassroots community action as the starting point for change in the world, Chang called on citizens to take up environmental lifestyles that help reduce pollution, and rebuild a sense of stewardship for their hometown and living environment.

Ecological Engineering Expo

The EPA and the Taipei County Gov-

ernment jointly held an "Environmental Engineering Expo" at the Erchong Floodway (二重疏洪道) on November 13 to display the effectiveness of water purification engineering at the Hsinhai Wetland (新海溼地) and the Erchong Wetland Ecology Area (二重沼澤生態區). The Hsinhai Wetland covers eight hectares containing densely vegetated areas, open water for recreation, and an ecology pond. Making use of photovoltaic panels to supply electricity and special microbes to facilitate treatment processes, the Hsinhai Wetland currently treats about 2,000 tonnes of city and township sewage water per day at a pollution reduction efficiency of over 60%, equal to the amount of wastewater generated by 10,000 people as well, attesting to the eager involvement and concern for water resources by more and more citizens.



Minister Chang dressed as environmental warrior in celebration with environmental volunteers.

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