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In this issue . . .

Feature Article

Executive Yuan Approves Expansion of Industrial Waste Control Center 6

The EPA announced dedication of 16 full time staff and the organization of information management, data analysis and inspection groups to begin formal operations. EPA Administrator Edgar Lin noted that the Center's work on at-source waste management, waste tracking, and industry reporting will all be easily available with one look at the computer.

EPA to Offer NT\$3,000 Subsidy for Electric Bicycles 2

By subsidizing the purchase of electric bicycles the EPA wants to help the public to shift to low-pollution transportation devices and reduce air pollution.

European Officials Visit EPA to Discuss Renewable Energy 2

Members of the Luxembourg Parliament and the Deputy Director General of the Danish Energy Agency met with Administrator Lin, generating momentum for Taiwan's renewable energy development.

Taiwan Promotes Regional Cooperation Thru Environmental Training 3

On November 6, the EPA hosted the "International Training Courses for Environmental Professionals", attended by 14 government officials from 7 Southeast Asian countries.

Taiwan Has Potential to Establish Eco-Industrial Parks 4

A number of industry parks in Taiwan have a diversified industrial base and development potential well suited to incorporating industrial ecology concepts.

Energy Star for Buildings to Promote Commercial Energy Savings 5

Starting next year, the EPA will implement a new Energy Star program for buildings as part of its bilateral cooperation program with the U.S.

EPA Assesses Feasibility of Establishing Industrial Waste Exchange Center 6

The Center would allow the transfer of information to facilitate exchange and reuse of industrial wastes.

30 Types of General Industrial Waste OK for Direct Reuse 7

The EPA expanded the number of promulgated types

of reusable general industrial wastes from 15 to 30. In the future these wastes can be directly reused.

Repeat Violators of Park Wastewater Regulations Face Shut Down 8

The EPA and the Ministry of the Interior (the agency responsible for sewer management) have developed a new consensus on how to deal with problem water polluters: shut 'em down!

Study Shows Public Fed Up With Over-Packaging 8

A recent survey found that 70% of gift items use at least two layers of packaging and that costs for packaging account for over 10% of the product price.

Green Procurement Promoted Islandwide 9

A total of 200 people attended the EPA's first lecture to explain the green clause in the new government bidding process.

EPA Clears the Way for Computers & Clothing Materials to Receive the Green Mark 10

Computers, clothing materials, rechargeable batteries, and lubricants that are energy saving, low pollution, and recyclable will soon hit stores bearing the Green Mark.

EIA System Reviewed for the First Time in 5 Years 11

The *EIA Act* has been in place for 5 years. Now, Administrator Lin has asked central and local gov't EIA committee members to give the system a good review.

News Briefs 11

New Year Means End of the Road for PCBs 12

The days of PCB use in Taiwan are coming to an end as the new year approaches. As of December 31, use of instruments confirmed to contain PCBs will be banned, with fines up to NT\$5 million for violators.

EPA to Offer NT\$3,000 Subsidy for Electric Bicycles

The EPA has announced plans to offer subsidies of NT\$3,000 per vehicle for the purchase of electric bicycles for the year 2001. Subsidies are limited to one bicycle per person. By subsidizing the purchase of electric bicycles the EPA seeks to encourage the public to shift to low-pollution transportation devices, thereby reducing air pollution.

In order to encourage the public to increase its use of low-pollution vehicles, the EPA has completed the draft *Method for Providing Subsidies for the Purchase of Electric Bicycles* (新購電動輔助自行車補助辦法). Starting next year, the EPA will set aside funds to provide subsidies for the purchase of electric bicycles that meet the *Chinese National Standard for Electric Bicycles* (CNS 14126). The subsidy will target Taiwanese citizens purchasing vehicles for domestic use. Each citizen may apply once for a subsidy of NT\$3,000 for a vehicle purchase.

The Bureau of Air Quality Protection & Noise Control stated that drafting of the *Method for Providing Subsidies for the Purchase of Electric Bicycles* has already reached its final stages. Once a legal basis has been established under the *Air Pollution Control Act* the new regulation can be issued. Implementation could potentially begin as quickly as January 1, 2001. Under new the *Administrative Procedures Law* all subsidy plans developed by the government must have a clear grounding in the relevant mother law before implementation can begin. As a result, the Bureau is currently working

with the Legislative Assembly to make the necessary revisions to the *Air Pollution Control Act* and expects to complete the changes by the end of this year.

Since electric bicycles do not require motor vehicle registration, the EPA has requested manufacturers to imprint an identification number in an easily visible location on the body of the bicycle (similar to the system currently used for registering automobile engines). The identification number will help facilitate the tracking of subsidy awards to ensure that each bicycle is only used once to apply for the subsidy. Manufacturers have expressed their willingness to accommodate the EPA's request. Electric bicycles currently sell in the range of NT\$18,000-20,000, approximately NT\$5,000 higher than traditional bicycles. This has led to limited consumer interest in the vehicles. The EPA believes that promoting the use of electric bicycles can lead to significant improvements in air quality and has therefore decided to provide subsidies to make the vehicles more price competitive.

Electric bicycles are bicycles that have installed a battery powered motor. Since the bicycles do not emit any pollution they are considered a "green product." However, like electric scooters, electric bicycles face shortcomings related to their batteries. Current batteries can only store enough energy for 20-30 kilometers of driving. The EPA, however, believes this range is sufficient for a short distance transportation vehicle. ◉

European Officials Visit EPA to Discuss Renewable Energy

On the morning of November 14 members of the Luxembourg National Parliament paid a visit to EPA Administrator Edgar Lin. The group discussed topics of energy and environment, exchanging a number of ideas on renewable energy and agreeing that developing new renewable energy sources and effective conservation measures are the key to good energy policy. On the same afternoon, Deputy Director General of the Danish Energy Agency, Ole Tarp, also met with Administrator Lin for a broad exchange on the development of alternative energy sources. In only a short time these visits have generated a great deal of momentum for Taiwan's future renewable energy development.

After the Executive Yuan announced an end to construction of the Fourth Nuclear Power Plant, proposed alternative energy plans have become of the utmost importance. On November 14, Jean

Huss, Alexandre Krieps, and Etienne Schneider of the Luxembourg National Parliament paid a visit to EPA Administrator Edgar Lin to express their support for Taiwan's decision to cancel the Fourth Nuclear Power Plant project. They expressed that Taiwan's decision has captured the attention and the support of the whole world, and further pointed out that economic development need not rely on nuclear energy.

Similarly, on that same afternoon, Deputy Director General of the Danish Energy Agency, Ole Tarp, visited the EPA to speak with Administrator Lin. Lin deeply admires the tireless efforts of the Danish government to promote use of renewable energies. He also expressed that Taiwan should wholeheartedly embrace renewable sources of elec-

tricity, especially wind energy and biomass. Lin said that, "Energy is the environment, the environment is energy." The Administrator believes that energy and the environment are two sides of the same coin and hopes to strengthen cooperation in this area with Denmark and other countries.

Deputy Administrator James J. Lee expressed that wind energy has great potential in Taiwan. Especially in light of the current debate over the Fourth Nuclear Power Plant, wind power is an excellent alternative because it both reduces CO₂ emissions and protects the environment. In this sense wind power is a clean, renewable energy source that Taiwan should be making every effort to develop.

Deputy Administrator Lee further said that Denmark, Holland, Germany and the US are all leading users of wind power. Among these countries Denmark is the largest user, with around 8% of national energy consumption coming from wind power. In a recent visit to Denmark he discovered that the country is in a location where western winds prevail while Taiwan is in an area where seasonal north-eastern winds prevail. Further, both countries are small in area and have similar industrial structures. Lee believes that with all of these similarities if Denmark can do it, so can Taiwan. And, based on Taiwan's potential for wind power there is plenty of room for growth.

From 1988 onwards Denmark has enjoyed an economic growth rate of around 25%. At the

same time energy consumption has not increased and CO₂ emissions have dropped by 10%. The EPA believes that this is related to Denmark's efforts to conserve energy and promote use of renewable energy sources. Danish energy policies heavily favor development of wind energy to generate electricity and support the development of related energy industries. This has allowed Denmark to go from an overall energy importer to an overall energy exporter. In 1999 11% of energy used came from renewables and 70% of this (8% of the national total) from wind power. Future targets for wind power use are 11% by 2005 and 45% by 2030.

Based on analysis by the Industrial Technology Research Institute's Energy and Resources Laboratories, Taiwan has 2,000 square kilometers of strong wind zones suitable for wind farms. In these areas average wind speed is around 5 to 6 meters per second. Based on conservative estimates Taiwan's land based wind energy potential is at least 1,000 megawatts. Ocean based wind energy potential on Taiwan's western coast is around 2,000 megawatts, giving Taiwan a total possible installed capacity of 3,000 megawatts of wind generated electricity. This exceeds the 2,700 megawatt capacity of the Fourth Nuclear Power Plant. Deputy Administrator Lee believes that by learning from Denmark, Taiwan can have considerable success in reducing reliance on nuclear energy and promoting development of new energy industries. ♻️

Taiwan Promotes Regional Cooperation Thru Environmental Training

On November 6, the EPA hosted the "International Training Courses for Environmental Professionals". The event was attended by 14 government officials from 7 Southeast Asian countries. While chairing the opening ceremonies, EPA Administrator Edgar Lin noted that hosting the event marked an important step in Taiwan's eco-diplomacy efforts, and underlined Taiwan's willingness to play an increasing role in resolving regional environmental issues.

On November 6, the EPA hosted the "International Training Courses for Environmental Professionals". Participants included 14 officials from environmental agencies around the region, including representatives from Brunei, Indonesia, Malaysia, the Philippines, Thailand, Vietnam, and Palau. EPA Administrator Edgar Lin stated that under the principles of maintaining national interests and mutual equality, Taiwan has actively worked to

establish cooperative partnerships with developed countries to study their experiences in developing environmental policies and technologies. In addition to these partnerships, increasing exchanges with developing countries has also become an important dimension of Taiwan's eco-diplomacy efforts. By organizing the training session, the EPA hopes to take a first step towards increasing environmental technical exchanges with countries in the Southeast Asia region, as well as strengthen Taiwan's ties with the participating countries.

The session lasted a total of five days from November 6 to November 10. In addition to participating in training workshops, the 14 Southeast Asian participants also had opportunities to observe the computer recycling facility in Kuanyin Industrial

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Park, the air pollution control system installed in Taiwan Power's Linkou plant, the Peitou Recycling Facility, and the Pali Sewer Treatment plant. Through the visits, the participants were able to develop a thorough understanding of "the Taiwan environmental experience."

The training workshops included units on: the current status and future outlook of Taiwan's efforts to promote sustainable development, water pollution prevention strategies, solid waste management practices, resource recycling, air pollution control strategies, and environmental impact assessment.

The session was attended by senior officials from each country's environmental protection agency. The EPA hopes that the opportunity to exchange experiences afforded by the training session will help stimulate increased cooperation among

Southeast Asian countries. Such cooperation could lead to greater improvements in environmental quality in the region.

Participants showed a particularly strong interest in the computer recycling facility operated by Chialung (佳龍) Engineering Company in Taoyuan County. During a site visit, participants noted that the facility not only produces raw materials for glass and tile manufacturing, but, to their surprise, also recovers high-purity gold and silver. The participants were impressed with the results and all agreed that computer recycling is both a feasible and important recycling task. Chialung is currently the only company in Taiwan that has accepted assistance from the EPA and Industrial Technology Research Institute's Energy and Resource Laboratories to develop their recycling process. Virtually all computer components, including CD-Roms, integrated circuits, wafers, capacitors, casings, and monitors can be disassembled and reused. ♣

Taiwan Has Potential to Establish Eco-Industrial Parks

In discussing Taiwan's challenges in industrial solid waste recovery and reuse, EPA Deputy Administrator James J. Lee recently stated that Taiwan has excellent potential for establishing an "Industrial Eco-System," and noted that several industrial parks have potential to become eco-industrial parks. Lee specifically noted Formosa Plastic's Mailiao Industrial Park, the Tainan Science Park, and the Changbin Industrial Park as facilities with a diversified industrial base and development potential particularly well positioned to incorporating industrial ecology concepts. Converting them into eco-industrial parks would lead to significant gains in terms of industrial waste minimization and waste reuse.

At a recently press conference on industrial waste management, EPA Deputy Administrator James J. Lee cited Denmark's experience in managing industrial waste as a useful model for Taiwan. Denmark relies on a combination of providing a range of treatment technologies/options and good coordination among industrial organizations to encourage efficient use of resources and energy. As a result, Denmark has become the first country to develop a successful eco-industrial park. The Deputy Administrator noted that Taiwan can benefit substantially from studying Denmark's experience as the two countries share many similarities in terms of size, industrial character and waste streams.

In order to maximize the efficiency with which

resources are used, Denmark's eco-industrial park is designed so that its members co-exist in a symbiotic fashion. For example, oil refineries give their desulfurization products to other factories to use as a raw material for manufacturing sulfuric acid; effluent from the wastewater treatment plant is used by a thermal power plant; in turn wet calcium sulfate and residue generated by desulfurization of the power plant's air emissions is sold to a cement facility for use as raw materials; warm water generated by cooling processes used for aquaculture and heating homes; and sludge from a pharmaceutical plant reprocessed into fertilizer for agricultural uses.

The EPA Bureau of Solid Waste Management explained that industrial eco-systems are networks of manufacturing and business relationships in which wastes and byproducts from one company serve as raw materials for another. The result is a system that is highly efficient in its use of resources and raw materials, similar to the "zero waste" food chains of the natural world. The EPA has commissioned the Industrial Technology Research Institute (ITRI) to prepare a "Demonstration Industrial Eco-System Plan" in the hopes of establishing such a system in Taiwan.

The results of ITRI's research suggest that initial efforts should focus on developing an industrial eco-system for sludge, incinerator ash, and

wastes with calorific value. Currently, only 18.9% of sludge is reused in Taiwan. However, through use of appropriate technology, sludge can be reprocessed for use as compost, construction materials, raw materials for cement manufacturing, or incinerated for heat recovery. ITRI has already begun to

cooperate with three companies to develop methods for reuse of sludge from paper processing. Similarly, energy recovery techniques can be applied to incinerator residuals and other wastes with high calorific value to help accomplish waste minimization and reuse goals. ♻️

Energy Star for Buildings to Promote Commercial Energy Savings

For many years, Taiwan's energy strategy has not been sufficiently diversified and has not incorporated enough energy conservation measures. EPA Administrator Edgar Lin stated that in recent years the United States has managed to save over 11.9 billion degrees of electricity through a combination of promoting energy conservation practices, use of energy efficient products, and systematically incorporating energy conservation principles into building design and operation. The reductions in energy demand have saved US\$2.2 billion in costs, which amounts to a return on investment of over 20%. Starting next year, the EPA will implement a new Energy Star program for buildings as part of its bilateral cooperation program with the U.S., making it possible that energy-efficient buildings will soon appear throughout Taiwan.

The EPA has announced plans to initiate a new Energy Star program for buildings in 2001 as part of its bilateral cooperation agreement with the US EPA. The EPA hopes to use voluntary energy conservation programs such as Energy Star to invite the business community to join in a national effort to improve energy efficiency. Deputy Administrator James J. Lee announced that Taiwan has already signed a formal Energy Star agreement with the U.S. and has obtained the rights and authorization to use the Energy Star label and system in Taiwan.

Deputy Administrator Lee hopes that businesses in Taiwan will voluntarily join in the new Energy Star for Buildings program. During the period of cooperation with the US EPA, the Taiwan EPA will provide free consultation on energy conservation improvement plans in buildings (including evaluations of technical feasibility and cost analysis), as well as provide assistance in the implementation of improvement plans. In discussing the program, the EPA cited a number of techniques that can be used to improve energy efficiency, based on the condition of the building. Examples included: installation of green lighting; adjustment or recalibration of energy-consuming equipment to accommodate peak energy use; installation of energy conservation equipment to reduce energy consumption by office equipment or improve a building's insulation; improvement of air circulation; and rede-

sign of air conditioning systems to maximize the use of small, highly energy efficient units. Buildings which demonstrate significant improvements will be awarded the Energy Star logo.

The Bureau of Air Quality Protection and Noise Control noted that even though businesses that participate in this voluntary program must take responsibility for the cost of improvements, investments in energy conservation typically make good business sense. Experience has shown that energy conservation projects typically have a return on investment that exceeds 20% and a payback period of less than five years. The EPA noted that commercial operations currently account for approximately 11% of the energy consumed in Taiwan, and that many commercial buildings have substantial opportunity to improve their efficiency.

The EPA has chosen to make department store lighting a focus of the Energy Star for Buildings program. Department stores are particularly large consumers of energy. The 44 department stores in Taiwan with a capacity of over 1 thousand kilowatts account for around 2.67% of the nation's commercial energy consumption, with a combined capacity of 102,000 kilowatts and consuming over 450 million degrees (kilowatt hours) annually. In most office buildings, air conditioning systems and lighting typically account for the bulk of energy demand, consuming 50% and 30% respectively. In department stores, air conditioning systems account for 42% of energy consumption, lighting 34%, and other uses for 24%. A review of lighting practices in department stores showed that lighting levels exceeded standards by 60% in parts of the store. Walkways within stores are often over-lit creating the need to similarly increase the level of lighting in the display areas, which results in a significant waste.

The EPA plans on selecting 1-2 commercial buildings as model facilities to demonstrate US energy conservation technologies and methods. Next year, the EPA will provide free consultation in cooperation with American experts to organizations interested in improving their energy efficiency. ♻️

Feature Article

Executive Yuan Approves Expansion of EPA Industrial Waste Control Center

On October 21 the Executive Yuan gave its seal of approval to the Industrial Waste Control Center. The EPA announced dedication of 16 full time staff and the organization of information management, data analysis and inspection groups to begin formal operations. EPA Administrator Edgar Lin noted that the Center's work on at-source waste management, waste tracking, and industry reporting will all be easily available with one look at the computer. Once discovered, any problems will be immediately referred to the North, Central, and South Environmental Police brigades for handling.

The EPA's Industrial Waste Control Center was established in 1998 but was initially hampered by a lack of manpower. Now, after the Executive Yuan's formal approval on October 21, the Center will be expanded to include 16 full time staff. Three working groups will be formed, an information management group, a data analysis group, and an inspection group. By using an information management system to compare the information enterprises report on waste disposal, the groups will be able to effectively monitor, audit, inspect and take action against any waste law violators. By monitoring national waste flows the Center will help promote its mission of managing waste at-source and tracking the flow of waste once it leaves the factory. EPA Administrator Edgar Lin pointed out that data analyses will reveal whether industries are reporting faithfully. Under the watchful eye of this, "digital-nerve monitoring system," says Lin, "cheating will be impossible!"

The Industrial Waste Control Center is established under the EPA's Bureau of Solid Waste Management. The necessary hardware and software systems that will form the framework and command system of the Center still require some time to complete, and it will probably be six months

to one year before the Center begins fully running. Initial inspection work performed by the Center will focus heavily on state owned enterprises, large industrial organizations, enterprises located in industry parks, and contract waste management companies. Hazardous waste will be the priority of inspections and audits.

In terms of tracking waste flows, in the future it is hoped that every waste transport truck will be installed with GPS. With real time monitoring and a manifest management system, the routes and whereabouts of industrial waste shipments will be crystal clear.

Currently the EPA has listed those industries which are required to report waste disposal information online. This list includes state owned enterprises, hospitals with 50 beds or more, the largest 1,000 enterprises, contract waste management companies, factories required to apply for effluent discharge permits, and the six big industries (chemical materials, basic metals, electricity and electronics, chemical products, metal products, and leather and hide manufacturing industries).

Addressing the failure to prevent the Kaoping dumping incident, Administrator Lin attributed the major cause to the incompleteness of the Center's industrial waste reporting system. The companies involved, Eternal Chemical Co. and Sheng Li Chemical Co., were not included in the reporting system controls. Only because the Center's software system was not fully installed and manpower, budget, and equipment were all clearly insufficient was it possible for this type of an incident to occurred. Lin expressed confidence that the new staff and computer system will be able to effectively track the flow of industrial waste and encourage enterprises to properly dispose of industrial waste. 

EPA Assesses Feasibility of Establishing Industrial Waste Exchange Center

Even as expansion of the Industrial Waste Control Center will bring at-source management and waste tracking on the right track, the EPA still isn't satisfied. The EPA wants to go a step further and is considering the feasibility of doing this by establishing an Industrial Waste Exchange Center. The Center would allow the transfer of information to facilitate industries to exchange and

reuse industrial wastes. The Exchange Center would be founded on the premise that government controls AND assistance are equally important.

The EPA's Bureau of Solid Waste Management pointed out that after the Industrial Waste Control Center's three years of operation it already

has a basic grasp on the flow of industrial wastes across the island. Now the Bureau hopes to integrate an Industrial Waste Exchange Center with the Control Center's online reporting database. This approach emphasizes the EPA's policy that controls AND assistance are equally important in resolving industrial waste issues. Recently the Ministry of Economic Affairs (MoEA), the Industrial Technology Research Institute (ITRI) and companies such as TSMC (Taiwan Semiconductor Manufacturing Company) from the Hsinchu Science Park, were invited to share ideas on the establishment of the Exchange Center.

In November 1987 the Industrial Waste Exchange and Reuse Center was established by ITRI's Union Chemical Laboratories with the assistance of the Industrial Development Bureau. Over the last 13 years, ITRI has used telephone, print materials, the internet, etc. to provide an agency service for industrial waste users and generators. Legally, the exchange of industrial wastes is only possible if permitted by the EPA. The Center's services, however, were restricted to information exchange and did not cover permitting assistance. To help improve the management of industrial waste exchanges, this fiscal year the EPA has contracted Union Chemical Laboratories to plan an Industrial Waste Exchange Center from the perspective of the government (i.e.

the EPA) and to develop related internal procedural standards.

ITRI expressed that the Industrial Waste Exchange Management System under planning will make use of the EPA Industrial Waste Control Center's online reporting system and ITRI's long running Industrial Waste Exchange Center's information service system to strengthen services for enterprises that report waste online. Currently such activities are still in the planning stage. If in the future the EPA's Industrial Waste Exchange Center is actually established, enterprises can submit an industrial waste exchange petition through an online reporting system. The Exchange Center will then search the waste management database and provide an agency service. The EPA will actively assist in coordinating with factories that are reusing industrial wastes. One of the important benefits of using waste exchange to replace waste treatment and storage will be to reduce the burden on Taiwan's landfills and incinerators.

However, there is a danger that enterprises participation will be lukewarm over fears that using the EPA exchange system will turn them into inspection or auditing targets. In consideration of this problem, assessment is underway as to whether the Exchange Center will be established and operated by the government or the private sector. ●

30 Types of General Industrial Waste OK for Direct Reuse

After obtaining a consensus with industries and related government departments the EPA has expanded the number of promulgated types of reusable general industrial wastes from 15 to 30. In the future industrial wastes such as bagasse, slag from electric arc furnace smelting, sludge from food processing or paper pulp, and waste food oils can be directly reused. This should greatly increase the proportion of industrial wastes reused.

On November 10 the EPA called a public hearing to discuss management methods for general industrial wastes that are classified as reusable. Through consultation with representatives from industry associations and government agencies at the public hearing, the EPA gave final confirmation to planned additions for new categories of reusable general industrial waste. After a thorough discussion, the number of reusable industrial waste categories was increased by a total of 15. The new categories will be promulgated before the end of the year. The new categories include, waste masonry materials; slag from induced current furnaces,

cupola furnaces, and electric arc furnaces used for smelting; waste earth from mining; waste food oils; livestock excrement; tobacco leaf processing wastes; bagasse; bagasse furnace ash; and sludge from sugar refining, masonry, food processing, breweries, paper pulp, livestock, and textiles.

If an enterprise has related product items listed on their factory registration they may directly accept the waste items for reuse. For example, slag from electric arc furnaces used for smelting could be used directly by companies for construction filler, raw material for cement, mixer for road construction, or aggregate for concrete. However, any uses must be in accordance with all relevant regulations, such as the *Soil and Groundwater Pollution Remediation Act*.

The Bureau of Solid Waste Management expressed that there are a number of channels that exist for industrial waste reuse. Besides waiting for a gov-

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ernment listing, industries can also apply for reuse on a case-by-case basis. If the industrial waste can be used as a raw material by other industries, it can be registered as a company product instead of a waste. For example, in June of 1999 the blast fur-

nace slag, converter slag, and desulfurization residuals produced at one of China Steel's smelting factories were registered as one of their company products. As a result, in the eyes of the law such items are no longer considered industrial wastes as defined by the *Waste Disposal Act*, and become instead saleable products. ♻️

Repeat Violators of Park Wastewater Regulations Face Shut Down

To punish companies that violate wastewater statutes industrial park management will often cut off their access to central wastewater treatment facilities. However, when such companies continue to discharge wastewater authorities are often at a loss. Now, the EPA and the Ministry of the Interior (the agency responsible for sewer management) have developed a new consensus on how to deal with this problem. Companies that have access cut yet continue to secretly discharge effluent will be punished by having their entire operations shut down. The EPA Bureau of Water Quality Protection stated that the Administration's next step will be to conduct a thorough survey of all factories located within industrial parks to end the wastewater honeymoon for irresponsible enterprises.

According to existing procedure, companies in industrial parks that consistently fail to meet wastewater pretreatment standards, despite repeated warnings and penalties, are barred by the responsible agency (for example, the industrial park service center) from using the park wastewater system. However, it has come to the attention of government agencies that some companies placed on such probation continue large-scale discharge of wastewater outside the factory, for instance into storm drains. The so called "honeymoon period", where companies are not hooked to the park system but still lack the capacity to treat their own wastewater, had become a significant blind spot in the management of water pollution.

According to a preliminary survey by the Bureau of Water Quality Protection, over 30 factories are not properly included in park wastewater systems. The EPA is now discussing methods to

improve the management system and is considering making revisions to the principles for identifying cases of gross violations under the *Water Pollution Control Act*. In the future factories that do not heed warnings issued or guilty of gross negligence will be ordered to cease operations.

Taiwan currently has 39 industrial parks with common wastewater treatment systems. Of the 8,500 factories located in the parks (not counting facilities under construction, currently inactive, or that have applied for permits to discharge wastewater individually), 7,000 factories that generate a combined 390,000 tons of wastewater per day are connected to the central treatment systems. Given the diverse nature of industries operating in the parks, the characteristics of the wastewater tend to be complex and present a difficult management challenge.

The EPA stated that environmental protection is increasingly becoming an international trend and that government leaders have already achieved a consensus that the environment and the economy are of equal importance. The EPA called for industry, particularly those that are hooked up to industrial park wastewater treatment systems, to recognize this consensus and develop a resolve to improve environmental protection efforts. Companies sharing joint treatment facilities need a strong sense of common interest; any abuse of the system or lack of this sense will lead to wastewater treatment systems failing to operate properly. Ultimately, those companies that fail to recognize the social trend towards environmental protection and adjust their behavior will become extinct. ♻️

Study Shows Public Fed Up With Over-Packaging

A recent questionnaire survey of packaging practices found that over 70% of gift items use at least two layers of packaging, and that costs for packaging materials account for over 10% of the price of surveyed products. To deal with the problem of excessive use of product packaging, the EPA has begun drafting a series of initiatives that will be incorporated into the *National Implementa-*

tion Strategy for Reduction, Recycling, and Reuse of General Waste. The initiatives will include measures to regulate the number of packaging layers and ratio of packaging space on gift items.

Every holiday season we receive gifts, beautifully wrapped in layer upon layer of packaging

material. According to the results of a recent survey commissioned by the EPA, 60.9% of the public feels that product over-packaging is a serious or extremely serious problem. Only 5.1% of those surveyed felt that packaging was either not a serious problem or was an insignificant problem. The survey results clearly demonstrate that the general public feels that packaging of domestic gift items has reached excessive levels.

To deal with the problem of over-packaging of gift items, the EPA commissioned National Taipei University to perform a market survey of product packaging and develop recommendations for a strategy for reduction and regulation. The University distributed a questionnaire to businesses and the general public to assess public attitudes towards current packaging practices. The report showed that despite the fact that 78% of those surveyed described themselves as unwilling to pay extra fees for product packaging, they are already unknowingly paying a significant premium. The survey showed that the cost of packaging now accounts for over 10% of a product's cost. Over-packaging is most severe for pastry items, with product packaging accounting for 25.54% of the space occupied by the product and for 10.39% of total costs associated with the product.

According to the survey, the top three categories of products that were identified by survey respondents as being the most over-packaged were: pastries (32.8%), processed foods (15.5%), and cosmetics (11.4%). The two leading reasons cited

by respondents for selecting these product categories as the main culprits were: 1) packaging included too many layers (34.4%); and 2) packaging costs accounted for too much of the overall product cost (25.8%). In terms of the product categories, pastry items were noted as having too many layers of fancy packaging, with 33.3% of the products using three layers. The survey also showed that 53.3% of cosmetics products used two layers of packaging.

The EPA Bureau of Solid Waste Management stated that products on the market ranged from one to five layers of packaging. Products with only one layer of packaging only accounted for 33.9% of these, while the remaining 66.1% products had two or more layers of packaging! This ratio clearly shows that current packaging practices are designed for aesthetic rather than functional purposes, resulting in a significant over-use of packaging material. However, survey results showed that only 35% of the public prefer simply packaged products, a number that closely corresponds to the 33.9% of the market occupied by products with only one layer of packaging.

The EPA intends to include measures to deal with over-packaging problems in the upcoming *National Implementation Strategy for Reduction, Recycling, and Reuse of General Waste*, the content of which the EPA is currently in the process of preparing. The EPA plans to use the results of the survey to develop appropriate regulations to govern the number of layers of packaging allowed and the ratio of space occupied by the packaging. ♻️

Green Procurement Promoted Islandwide

In May of 1999 the amended *Government Procurement Act* was put into force to help promote "green production" and "green consumerism" in Taiwan. A total of 200 people attended the EPA's first lecture on the subject, from Executive agencies such as the Ministry of Economic Affairs, the Department of Health, the Council of Agriculture as well as procurement staff from state-owned industries. The lectures explain that during the bidding process government agencies should follow green procurement procedures, which is to say they can give priority consideration to eco-products. This endeavor shows that the government is willing to lead the way for "green consumerism" to help realize the dream of a green Taiwan.

The *Government Procurement Act* was promulgated in 1998 and officially went into force in May of 1999. Article 96 of the Act includes a green procurement clause allowing governments to prior-

ity purchase products with a Green Mark by giving them 10% or lower price advantage during the bidding process. The green procurement article will help the government lead the way for green consumerism in Taiwan. From November 13 – 30 the EPA held nine lectures at key locations around the Island to explain to government procurement staff concepts of green consumerism, eco-labeling, the green procurement clause, and regulations determining priority purchasing of eco-products. In total 2,000 government officials participated in these lectures.

Eco-products that can receive priority during the government procurement process are divided into three categories. The first category, Tier 1 products, have obtained the Green Mark or another

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recognized eco-label. Tier 2 products have not obtained an eco-label but are low pollution, recyclable, or conserve energy. The EPA issues product specifications for Tier 2 products and awards certificates to approved products. Tier 3 products are those that have characteristics beneficial to the environment but for which no product specifications yet exist, and so must be approved on an individual basis. Tier 1 products (Green Mark products) have been in existence for seven years. At present 67 types of Green Mark product specifications have been set and the label affixed to products with a total value in excess of NT\$27.5 billion. In addition, Taiwan has signed a mutual recognition agreement with Canada for eco-labels covering computer mice, keyboards, and wooden toys. This agreement is an excellent model for mutual recognition of international eco-label products.

The EPA has kept statistics on the environmental benefits accrued by Green Mark products over the years. Based on EPA calculations, a total

of 150 thousand tons of Green Mark recycled paper has been used for office paper. If each ton of paper pulp requires cutting 20 trees this accomplishment has saved over 3 million trees. In addition a total of 70 thousand tons of Green Mark recycled paper has been used for stationary and writing paper saving a total of 1.4 million trees from logging. Other examples of environmentally beneficial products include use of recycled paper for packaging, 100% recycled toilet paper, and recycled lumber products.

In terms of conserving energy, the use of Green Mark approved energy saving refrigerators, air conditioners, washers, or water saving toilets not only conserves energy and water but also reduces front-end pollution generated. For example, over the years use of Green Mark products have eliminated around 5,000 tons of CO₂ emissions from electricity generation. Simply using a one-stage water saving toilet can save 60 liters of water per household per day. In one year this equals 0.11 times the storage capacity of the Mingteh Reservoir, or 16.59 million tons of water. 

EPA Clears the Way for Computers & Clothing Materials to Receive the Green Mark

The EPA's Green Mark Review Committee recently cleared the way for four product types to apply for the Green Mark. Based on the Green Mark criteria of energy saving, low pollution, and recyclability the markets will soon bear witness to a new breed of environmental computers, clothing materials, rechargeable batteries, and lubricants.

At a recent meeting of the EPA's Green Mark Review Committee, EPA Deputy Administrator and Committee Convener, Lin Ta-hsiung, pointed out that Taiwan produces on average 20% of the world's desktop computers. Having a Green Mark (Taiwan's eco-label) for computer hardware including the CPU, monitor, keyboard, mouse, etc., would encourage the design of energy saving, low pollution, recyclable, desktop computers. Statistics show that in 1999 the domestic market for personal computers in Taiwan reached 1.37 million, consisting of 1.16 million desktop computers and 210 thousand notebook computers, an annual growth rate of 32%. Estimates show that in the year 2000 global market for desktop computers will also continue to grow at a double digit pace, breaking the 100 million mark.

The major considerations in developing a Green Mark for desktop computers was coming up

with clear guidelines for reducing energy consumption, regulating use of hazardous materials, ozone depleting substances, and heavy metals, and increasing use of recycled plastics and paper. For example use of mercury in batteries, use of mercury or cadmium in monitors, and use of ozone depleting substances regulated by the Montreal Protocol during the production process would disqualify a computer from obtaining the Green Mark.

Traditional industries, such as textiles, also play an important role in Taiwan's economy. According to statistics Taiwan is the world's largest producer of raw polyester fibers and the third leading producer of rayon (behind the US and China). A new Green Mark for textile products will encourage the use of recycled PET and plastic bottles. PET can be used as a raw material for fibers which are used to produce blended cloths that are later manufactured into finished clothing products. A product must incorporate over 50% recycled PET plastics to be considered a recycled PET textile.

The EPA's Bureau of Performance Evaluation and Dispute Settlement noted that production of recycled PET textiles does not require complicated chemical reactions and can reduce energy

consumption and pollution, and contribute to recycling. Further, products made from blended recycled fibers have a number of special characteristics, such as moisture absorption, wear resistance, and the ability to breathe. For these reasons, in the future the Green Mark for PET textile products will most likely begin appearing on clothing as a mark of quality assurance similar to the "100% Cotton" label.

Since the EPA began promotion of the Green Mark over 67 categories of product specifications

have been developed. Over the years 1,211 information requests from enterprises have been recorded, 225 Green Mark applications have been approved, and 906 products have been permitted to use the Green Mark. The Green Mark has been used over 1.3 billion times on items with a total production value of NT\$27.5 billion. The EPA has continued to amend product specifications and collect information from advanced countries about their governments' green procurement programs. ♻

EIA System Reviewed for the First Time in 5 Years

In the five years since the *Environmental Impact Assessment Act* went into effect a number of academics and enterprises have questioned the operating methods of the EIA review system. Now, for the first time in five years, EPA Administrator Edgar Lin has asked central and local government EIA committee members to undertake a thorough reassessment of the EIA review system. Administrator Lin asked attendees to be forthcoming in their criticisms to create a truly meaningful reform.

For the first time in five years, EPA Administrator Edgar Lin has invited environmental impact assessment (EIA) committee members from central and local governments to gather at the EPA to re-evaluate the EIA review system. The Administrator pointed out that the EIA review system was created as a reference for development projects through a 1985 administrative order. Only at the end of 1994 was the *Environmental Impact Assessment Act* actually put into law. Over these 15 years the EIA

system has been one of the most important environmental regulations in putting to practice the principle that an ounce of prevention beats a pound of cure. While this is extremely important, the current system is still imperfect and Administrator Lin hopes that a broad exchange of ideas by EIA committee members will help to thoroughly review the system.

The EPA's Bureau of Comprehensive Planning noted that since implementation of the *Environmental Impact Assessment Act* at the end of 1994 a total of 412 EIA cases have been reviewed. Of these, 299 cases have been conditionally passed, 83 entered second stage EIA and 27 rejected. In general the EIA process is quite efficient. It is only when enterprises choose to initiate development activities in environmentally controversial areas or without long term supporting data is the EIA

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News Briefs

EPA Encourages Private Enterprise to Establish Industrial Waste Final Disposal Sites

To resolve the difficult lack of industrial waste final disposal sites the EPA invited a number of county and city environmental protection bureaus (EPBs), environmental industries, solid waste management associations and relevant agencies to attend the EPA's integrated meeting on application for establishing final disposal sites. The meeting aimed to help the EPA better understand the difficulties faced by companies that would like to establish final disposal sites. To help resolve this issue by the end of this year, the EPA will most likely draft a guideline for application to establish final disposal sites as well as a compilation of relevant regulations. To accommodate interested parties the EPA held consecutive meetings in Taipei, Taichung and Kaohsiung to explain regulations regarding establishment of final disposal sites.

Edgar Lin Travels the Island Hitting Back at Polluters

Of late EPA Administrator Edgar Lin has been

traveling continuously across the Island looking at environmental problems. On November 16 he took flight in a helicopter searching major southern rivers for signs of pollution. In the Kaoping area he discovered that not only is river pollution grave, but that the banks are also littered with dumped wastes. This finding prompted Lin to order the Environmental Police to pit their full efforts against pollution on the Erhjen River.

Subsidy for Landfill Methane to Energy in Jeopardy

The EPA recently discussed the future status of landfill methane gas to energy projects in Taiwan. As of the present Taiwan's methane to energy project is the largest in Asia. Methane to energy generators are operating with good results at Taipei City's Shanchuku and Futehkang landfills, and in Taichung City and Kaohsiung City's Hsichingpu landfill. However, after the *Administrative Procedures Law* goes into effect next year the government subsidies may be cut. The EPA is currently looking into ways to prevent this from occurring.

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process dragged out. Currently an average of 10 cases are reviewed each month with an average review deadline of 40 days for each case. Committee task forces perform simultaneous initial literature and onsite review to compress the EIA process. This method has successfully improved the efficiency of EIA reviews.

Some EIA committee members suggested a minimum number of seats be given to environmental groups, and instituting service terms for committee

members. For example, adopting a two year term of service with a maximum limit of two terms. A number of committee members believe there are serious discrepancies between the EIA system at the central and local levels. Other problems commonly cited include long EIA review times and low efficiency; lack of public credibility; and failure to enforce EIA policies. The EPA will consider the opinions of committee members as the basis for future improvements to the EIA review system. ♻️

New Year Means End of the Road for PCBs

The days of PCB use in Taiwan are coming to an end as the count towards the new year winds down. As of December 31, use of instruments confirmed to contain PCBs will be banned, with fines as high as NT\$5 million for violators.

Polychlorinated biphenyls (PCBs) are extremely difficult to breakdown biologically and have a high chronic toxicity. On June 22, 1988 the EPA listed PCBs as a controlled substance under the *Toxic Chemical Substances Control Act*. From this time production, import, and sale of such items was banned, and their use prohibited in the food industry.

Currently most PCBs are found in capacitors and transformers produced before May of 1980. Because such products have been in use for over twenty years they present a constant threat of leaks

and environmental contamination. To improve control of PCBs, on May 26, 1995, the EPA decreed that with the exception of experiments, research and education, all use of PCBs would be banned as of December 31, 2000. The EPA further stipulated that all PCB containing capacitors and transformers not in use should be immediately removed, reported as a hazardous waste, and properly disposed of according to the *Waste Disposal Act*.

Capacitors or transformers confirmed to contain PCBs that are not removed from use and declared as a waste before December 31 will result in a fine between NT\$1-5 million. However, the EPA emphasized that capacitors produced from June 1980 to December 1982 that cannot be tested because they are in use may be used until the end of their life expectancy. ♻️

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