



Environmental Policy Monthly

Environmental Protection Administration, Taiwan, ROC

Feature Column

Formosat-2 Keeps an Eye on Marine Conservation

Up in orbit for nearly three years, Formosat-2 makes two passes over Taiwan each day. The satellite has helped to build international exchange channels in recent years thanks to financial assistance from a program between APEC and the EPA as well as joint efforts by member economies to promote satellite technology applications for protecting the marine environment and conserving marine resources.

Taiwan plays a leading role in the Asia-Pacific Economic Cooperation (APEC) Marine Resources Conservation Working Group's (MRCWG) Satellite Application in Knowledge-based Economies (SAKE) project. Acting as executive agency of this plan, the EPA funds domestic experts and scholars to apply Formosat-2 toward assisting Asian nations carry out APEC's marine environment conservation plans. This kind of technology cooperation helps to develop international relations while working to achieve sustainable use of marine biological resources.

World's First Daily Revisit Satellite Provides Constant Stream of Data

The 2.4-meter high and 2-meter diameter Formosat-2 is the result of four years of research and development and is the first satellite autonomously operated by Taiwan. The satellite was launched from the Vandenberg Air Force Base in Florida on 21 May 2004. Orbiting Earth at a distance of 891 kilometers and following the same path as the sun, this satellite

has propelled domestic environmental monitoring into the space age. The satellite also provides abundant firsthand images and data to both international and domestic arenas.

Compared to conventional photographs, satellite images have the following advantages: 1) images can be obtained over a large region in a short period of time; 2) images can be obtained via remote control over areas difficult to access; 3) high resolution satellite images show land formations in detail.

Some of the superior features of Formosat-2 include:

1. Daily revisit: Twelve-hour revisit function allows two passes over Taiwan per day at the same time per day and from the same angle. This allows continuous intensive images of the same area. Compared to other commercial remote control satellites, Formosat-2 is the world's first and only high-resolution satellite with this daily revisit function.
2. High-resolution black-and-white image resolution up to two meters and color image resolution up to eight meters.

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3. Provides images in the four spectral bands of red, green, blue and near-infrared, similar to the US Landsat's Multispectral Scanner (MSS).
4. Ability to observe underwater marine environments at greater depths than France's SPOT satellite.
5. The ability to detect multiple color images at multiple frequencies allows extensive surveillance of marine environments including changes in quality such as land-based pollution and changes in marine resources such as distribution and density of net-cage fish farms.

In addition to its superior capability to monitor the ocean, Formosat-2 orbits the Earth an average of 5,104 times per year (14 orbits per day) and can obtain images over approximately 2,700 square kilometers of the Earth's surface (750 times the size of Taiwan). The images taken by Formosat-2 are very useful in terms of researching disasters and carrying out rescue work during increasingly frequent typhoons, floods, shipwrecks, oil spills (such as the 25 December 2006 oil spill off the coast of Yilan) and tsunamis in Southeast Asia. For this reason, Formosat-2 has received a great deal of recognition and affirmation in the international arena.

The EPA began funding the SAKE project in 2006 to increase the value and applications of images taken by Formosat-2. The project is conducted under the joint leadership of National Taiwan University Professor Liu Cho-teng (劉倬騰) and National Cheng Kung University Professor Kao Chia Chuen (高家俊). The purpose of the SAKE project is to allow scholars in Asia-Pacific nations to use Formosat-2 images and jointly promote applications of satellite technology toward protecting marine environments

and conserving marine resources. An added benefit is the establishment of channels for future international cooperation.

Formosat-2 Images Benefit APEC Member Economies

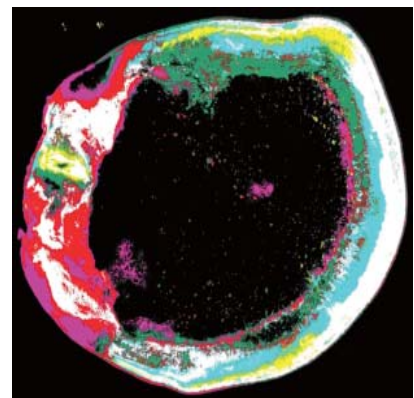
Many APEC member economies are developing countries characterized by rapid economic growth and vigorous development of marine-related economic resources such as fishing, aquatic farms, and tourism. However, overdevelopment often has a substantial influence or damaging effect on the natural environment. Monitoring and management of natural resource development and protection plans have thus become of critical importance in the quest to sustainably manage natural resources.

Dr. Liu explains the wide range of applications for Formosat-2 include coastal monitoring, oil leak monitoring, grounding of ships, land use monitoring, coastal development planning, and marine resource conservation planning (such as coral distribution and monitoring) among others.

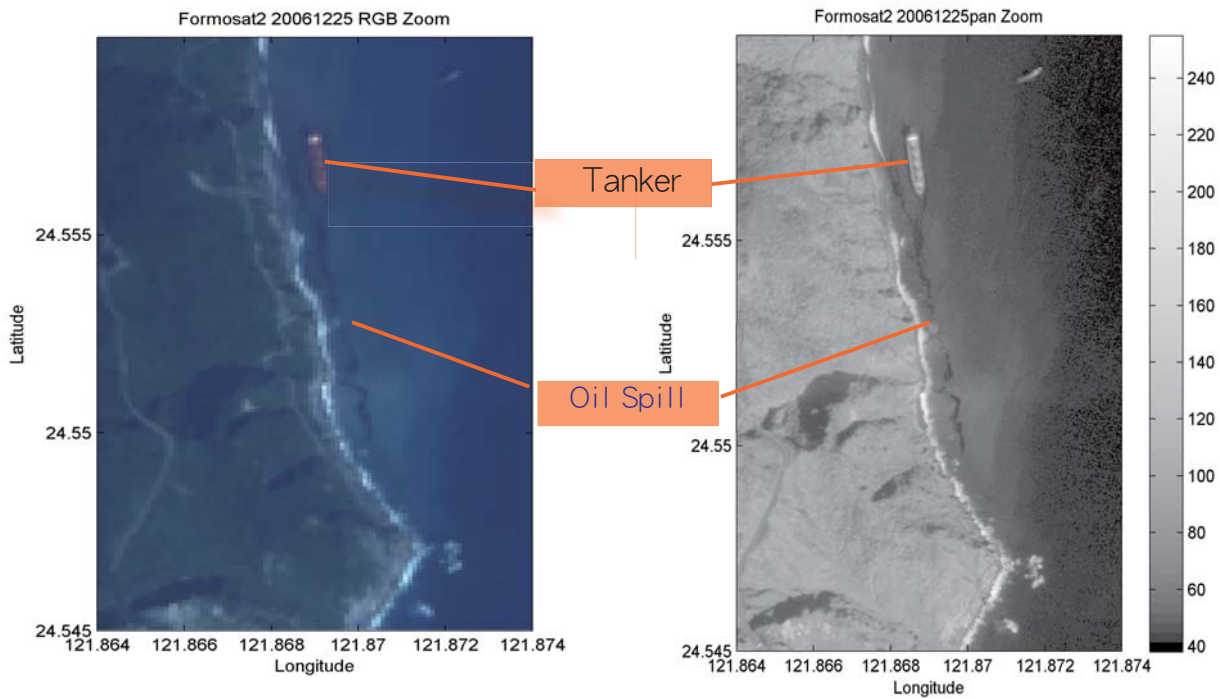
Dr. Liu points out several examples of how Formosat-2 can assist other APEC member economies safeguard marine biology and resources. For example, the Can Gio area of the Mekong River estuary in Vietnam is slated to become a mangrove tourism area. However, pollution of the Mekong River subtracts from the benefits of developing tourism here. Formosat-2 images can assist in monitoring changes in the extent of development and pollution. The number of aquatic farms in the Bolinao area of the Philippines exceeds regulation limits, which has resulted in widespread mortality of fish and shellfish. Formosat-2's high-resolution images provide the most effective reference



▶ SAKE training workshop on Formosat-2 image data analysis held in Jakarta, Indonesia



▶ Formosat-2 image showing status of coral distribution on Dongsha Atoll (Pratas Island)



▶ *Formosat-2 images help monitor oil spill and grounding of Tzini, a Maltese freighter, off the coast of Yilan County on 25 December 2006*

data in monitoring fish farm distribution. Another example refers to land-based pollution sources and net-cage farms, both of which are on the increase in Jakarta Bay, Indonesia. The net-cage farms and marine ranching near the Thousand Islands in the north require active planning. Satellite images can assist by ensuring win-win strategies in economic development and environmental protection.

Developing International Cooperation and Technology Exchange Channels

The SAKE project strives to assist all participating nations to build capacity in satellite image analysis and applications. Working through the scholars of other Asia-Pacific member economies such as Vietnam, the Philippines, China, and Indonesia, related APEC plans are jointly carried out to promote bilateral technology cooperation and establish international exchange channels in the region. Activities in the first year of the SAKE project (2006-2007) included a SAKE Steering Committee meeting held in Tainan at the Coastal Ocean Monitoring Center in National Cheng Kung University from 20-22 June 2006; a five-day Formosat-2 image data analysis training workshop held in Ho Chi Minh City from 21-25 August 2006; a six-day Formosat-2

image data analysis training workshop held in Jakarta from 11-16 September 2006; and the first SAKE symposium held in Manila, Philippines from 26-27 March 2007 jointly organized by the University of the Philippines, Marine Science Institute (UP/MSI) and National Taiwan University, Institute of Oceanography (NTUIO).

Now entering its second year, the SAKE project has been running smoothly thanks to assistance from the National Space Organization and the Center for Space and Remote Sensing Research, National Central University. Future goals for this project include: assisting APEC member economies develop knowledge-based economies through satellite applications; enhancing Taiwan's image and influence in APEC by establishing and maintaining technology exchange channels; increasing each participant's capabilities in satellite image analysis and applications by providing free satellite image data and assisting foreign scholars analyze Formosat-2 images; strengthening applications of satellite images in knowledge-based economies; and providing substantial guidance to MRCWG in monitoring marine resource data so as to maintain Taiwan's deserved international status.

Toxic Substance Management

Industry Required to Establish Nationwide Toxics Joint Command Organization

Recently promulgated revisions to the Toxic Chemical Substances Control Act require companies manufacturing, using, storing or transporting toxic chemical substances to establish a nationwide toxic chemical substance joint command organization. This organization will ensure adequate prevention, response and cleanup in the event of an accident.

The Legislative Yuan completed the preliminary review of revisions to the Toxic Chemical Substances Control Act (毒性化學物質管理法) on 18 May 2006. The revised Act then passed its third reading on 12 December 2006. On 3 January 2007, the President promulgated the revised Act and authorized the EPA to draft necessary revisions or related bylaws. This includes further mandating that firms producing, using, storing or transporting toxic chemicals shall establish a nationwide Toxics Joint Command Organisation to facilitate protection, emergency response and clean-up operations. According to regulations, if accidents occur through a lack of vigorous preventative action, handlers of toxic chemical substances may be fined between NT\$100,000 and NT\$500,000.

The key point of this amendment to the Toxic Chemical Substances Control Act is tightened standards for the transport of toxic chemical substances. The following measures are now obligatory: professional technical managers shall be installed; vehicles shall be fitted with real-time tracking systems and kept in working condition; in the event of an accident, a professional response team responsible for dealing with emergencies and subsequent clean-up operations shall be sent

to the scene within two hours; a nationwide Toxics Joint Command Organisation shall be set up to deal with protection, emergency response and clean-up operations after an accident. The EPA indicates that industry members violating related regulations in the future could face fines in the following three brackets depending on the degree of violation: NT\$60,000~NT\$300,000; NT\$100,000~NT\$500,000, or NT\$1,000,000~NT\$5,000,000.

Furthermore, the scope of this amendment has been expanded to not only control handlers of the originally restricted Class III toxic chemical substances, but also handlers of Class I and Class II substances. Reporting of accident prevention and response plans is now requisite. Moreover, to protect the people's right to know, in the future the EPA will make all industry accident prevention and response plans available for public reference on the Internet. In order to prevent toxic chemical substances from polluting the environment and endangering human health, aside from drafting revisions and related bylaws, the EPA will call on industry members to formulate plans for routine danger prevention and emergency response. They must also actually implement these measures, so that early response may reduce the risk of harm resulting from the use of toxic chemical substances.

Air Quality

Southern, Eastern Taiwan Have Higher Ratio of Noncompliant Diesel Vehicle Emissions

Results of an investigation carried out from October to December 2006 show a higher percentage of diesel vehicles failed exhaust tests in Chiayi County, Tainan County, Kaohsiung County and Hualien County. Findings indicate that less emphasis is being placed on diesel vehicle maintenance in the more remote areas of southern and eastern Taiwan, resulting in serious environmental pollution.

As the number of vehicles continues to rise each year, citizens and the government have come to pay greater heed to pollution caused by diesel car exhaust. In the interest of protecting and enhancing domestic air quality, as well as decreasing pollution emitted by diesel vehicles, the EPA has formulated the "Plan to Strengthen Inspection and Control of Pollution

from Diesel Vehicles on Highways," which went into effect from October 2006. County and municipal environmental protection bureaus (EPBs) and police forces have stationed personnel along highways and at entrance and exit ramps to reinforce inspection and control of pollution from all diesel vehicles, especially targeting small and large gravel trucks, tractors, and

diesel vehicles emitting black smoke. Inspections are conducted at tollgates and other locations suitable for checking vehicles. In other areas where vehicles cannot be pulled over due to safety considerations, vehicles emitting black smoke are photographed and the drivers are notified to bring their vehicles in to a designated testing station for inspection. Failure to pass this inspection will result in penalization.

According to statistics on inspections conducted from 1 October 2006 to 31 December 2006, out of 5,058 vehicles pulled over for spot checks, substandard emissions were highest in Chiayi County (35%), Tainan County (34%), Kaohsiung County (24%), and Hualien County (17%). Substandard emissions were on average 9% more frequent in these counties, far exceeding the rate of substandard emissions in other localities. Southern and eastern Taiwan have evidently not adequately emphasized the importance of maintaining diesel vehicles, which has resulted in serious environmental pollution. Photographing has been used in place of spot checks out of consideration of driver safety. A total of 12,508 vehicles have reported to environmental protection bureau exhaust testing stations after being notified to

make improvements within a given time period. Out of these, substandard emissions during re-testing were highest in Hsinchu City (19%), Taitung County (13%), and Hualien County (10%). These counties and cities had a cumulative average ratio of substandard emissions five percentage points greater than other counties and municipalities. This shows that the relatively more remote areas of Hsinchu City, Taitung County and Hualien County have been unable to improve exhaust emissions to comply with standards and will need to replace more old vehicles.

The EPA calls on all vehicle owners to help protect air quality and avoid polluting the environment by paying attention to vehicle maintenance, using legal fuel products, and adopting proper driving methods. The EPA will strengthen mobilization of environmental and police forces at major highway entrances and exits to conduct unscheduled spot checks and photograph polluting diesel vehicles. Those found with substandard exhaust emissions during environmental agency examinations will be fined from NT\$3,000 to NT\$60,000 and be required to make corrections within a given period of time.

Radiation Control

Public Education of Non-ionizing Radiation Strengthened

The EPA is actively addressing concerns about electromagnetic radiation in the environment through four briefings held from January 2007. The briefings are intended to increase people's awareness of testing methods for non-ionizing radiation and electromagnetic waves.

Responding to recent citizen concerns about electromagnetic waves from electricity pylons and cell phone base stations, on 16, 17, 19 and 22 January 2007 the EPA held four "Non-ionizing Radiation Explanatory Briefings" in Taipei, Taichung, Tainan and Taitung.

So that those attending the meeting may communicate and discuss these issues face to face, the EPA specially arranged a single forum that could be jointly attended by experts, scholars, and representatives of Taipower, the telecom industry and environmental groups. One purpose of the forum was to provide a Q&A session to solve the confusion many people have over electromagnetic waves. Another purpose was to gather the public's opinions and feelings about electromagnetic waves as reference for future management.

As for recent media reports concerning wireless Internet electromagnetic waves, problems have

arisen regarding recommended environmental values and the conversion of units used in power density measurements. Having consulted the environmental values for electromagnetic waves suggested by the International Commission on Non-ionizing Radiation Protection (ICNIRP), on 12 January 2001 the EPA announced the "Non-ionizing Radiation Recommended Environmental Values" for normal exposure in non-work environments in Taiwan. The World Health Organization (WHO) and many other countries also adopt the environmental values suggested by the ICNIRP. In addition, the EPA's "Non-ionizing Radiation Recommended Environmental Values" can be consulted in instances where no other standards apply for indoor levels.


As for base stations, wireless technology electromagnetic wave sites and other issues related to public health and non-ionizing radiation, the EPA will continue to gather related academic articles and

research from all over the world, closely following all related information announced by the WHO and the opinions of people from all sectors concerned with this, in order to provide people in Taiwan with the newest information and give evidence for managerial consideration. Regarding unit conversion of wireless Internet (a.k.a. Wi-Fi, frequency 2.4GHz)

radiation, the previously set standard of 10 W/m² as stated in the Non-Ionizing Radiation Recommended Environmental Values is equivalent to 107 μW/m².

The units of measurement for the power density of electromagnetic waves are the watt (W), milliwatt (mW) and microwatt (μW). Comparative values are as follows:

Unit of Measurement	W/m ²	mW/m ²	mW/cm ²	μ W/cm ²	μ W/m ²
Unit Number	1	1,000	0.1	100	106
Recommended Environmental Value (2.4GHz)	10	10,000	1	1,000	107

 The recommended environmental values for power density as shown in this conversion table are relevant to frequencies between 2~300GHz.

Toxic Substance Management

Random Sampling of Environmental Agents Reveals Nine Substandard Products

An audit on marketed environmental agents carried out by the EPA in 2006 revealed 98.9% of products to comply with standards. Random sampling of 120 marketed environmental agents revealed 9 substandard products. The responsible businesses have been penalized and required to take those products off the shelves.

To ensure that Taiwan's citizens can select good quality environmental agents for maintaining a hygienic environment, in 2006, the EPA investigated a total of 128 environmental agent manufacturers, 216 sellers and 430 members of the disease vector control industry. Inspections were conducted on the labelling of 33,124 environmental agents on the market, revealing 98.9% to be compliant with standards. A random sampling of 120 environmental agent products on the market revealed nine substandard products (see chart), with tests showing the active ingredient contents outside the permitted range of error. Those industries producing low quality environmental agents have all been fined sums ranging from NT\$60,000 to NT\$300,000 according to regulations. They have also been required to recall the batch of substandard products from store shelves within a fixed time period. Additionally, the EPA has discovered the identities of people illegally selling environmental agents over the Internet. In response, local environment at protection bureaus (EPBs) have issued six indictments with fines ranging from NT\$60,000 to NT\$300,000.

The EPA indicates that each year environmental agencies carry out an exemplary investigation of the

environmental agents available for sale. Without prior warning, county and municipal EPBs conduct label checks and random sampling of environmental agent ingredients used in cleaning products sold at shops, supermarkets, pharmacies, wholesalers and ten-dollar-shops. In 2006, of the 33,124 environmental agent labels inspected, 372 were found to be substandard, a rate of 1.1%. The majority of substandard cases involved expired products, followed by incomplete labelling methods. The EPA points out that when an expired environmental agent is discovered, the local environmental agency first admonishes the shop to take the item off the shelves and inform the producer or importer to recall the product. If expired environmental agents are found on the shelves for a second time, however, the shop is fined between NT\$30,000 and NT\$150,000. The EPA warns general retailers against trusting their luck in engaging in such infringements.

In 2007, the EPA will continue to strengthen inspection and random sampling of labels and ingredients of environmental agents in cleaning products on the market. It will also target the recent discovery of unregistered, low quality environmental agents from mainland China that have been secretly

making their way onto the shelves of ten-dollar-stores. The EPA aims to hunt down the source of mainland-produced counterfeit and low quality environmental agents, and intensify investigations into western pharmacies, traditional markets and ten-dollar-stores. The EPA reminds people to pay attention to whether or not products have permit numbers when choosing what environmental agent cleaning product to buy. For example only products with "環署衛製字第○○○○號" ("EPA cleaning product serial number no. xxxx") or 環署衛輸字第○○○○號 (EPA cleaning import serial number no. xxxx") are legally registered environmental agent cleaning products. People should not be misled by serial numbers on products labelled 環署毒字第××××××××××號 ("EPA poison number xxxxxxxx#"), or mistakenly believe

exaggerated and unrealistic advertisements. Please report any ads of this kind (for example, "Not harmful to humans or animals," "Kills all types of insects" or "One bottle is as effective as ten of another product") to your local environmental protection agency. Violations may be charged fines of NT\$60,000 to NT\$300,000 according to the Environmental Agents Management Act (環境用藥管理法).

Inquiries about different types of environmental agents or identification of products can be found by consulting the "Environmental Agents Permit and Labelling Information System" on the Environmental Protection Administration's website: <http://ww2.epa.gov.tw/posn/>. Information about the labelling of each type of environmental agent can also be accessed on this website.

List of substandard products sampled in the 2006 investigation of environmental agent active ingredients:

Company Region	Company Name	Permit Number	Product Name	Date of Production/ Batch Number	Active Ingredient
Taipei City	Fengying Biotechnology LTD	EPA cleaning import number 0612	Sizhang (cockroach killer)	2005.09 /5J108	Boric acid
Hsinchu City	Guanghua Chemical Company LTD	EPA cleaning product number 1255	SOLID1.0 % powder preparation	2005.12.22 /1	Chlorpyrifos
Miaoli County	Jiajia Products LTD	EPA cleaning product number 1219	Jiajia Ant Killer Bait	2005.12.02 /01	Borax
Miaoli County	Jiajia Products LTD	EPA cleaning product number 1219	Jiajia Ant Killer Bait	2006.02.15 /01	Borax
Miaoli County	Jiajia Products LTD	EPA cleaning product number 1490	Jiajia Ant Killer Granules	2006.04.14 /01	Borax
Hsinchu City	Chung Hsi Chemical Plant LTD	EPA cleaning import number 0570	Jinpu Ant Killer	2005.03.23 /940323	Boric acid
Taichung City	Chenglang Xingye LTD	EPA cleaning product number 1419	Aikuai Insecticide Powder	2005.11.09 /01	Chlorpyrifos
Taichung City	Teli Xingye LTD	EPA cleaning product number 1246	Bishi	2005.09.06 /01	Chlorpyrifos
Taichung City	Teli Xingye LTD	EPA cleaning product number 1228	Mianjingzhang	2005.06.07 /W509	Boric acid

Recycling

Second Stage of Mandatory Garbage Sorting Policy Successful

After just one year of promotion, the second stage of the mandatory garbage sorting policy has seen impressive results. The volume of garbage has been cut 14.15%, and the volume of resources recycled has increased 51.36%.

From 1 January 2006, the second stage of the mandatory garbage sorting policy took effect nationwide. After a year of implementation, preliminary statistics comparing the monthly averages during 2006 and before

implementation in 2004 show that garbage clearance volume decreased by 69,136 tonnes, from 488,574 tonnes to 419,438 tonnes, for a waste reduction rate of 14.15%. The volume of resources recycled rose from 116,060 tonnes to 175,688 tonnes for an increase of 51.36% or 59,608 tonnes. Food waste recycling increased from 24,939 tonnes to 47,471 tonnes for an increase of 90.35% or 22,532 tonnes. These figures show that volumes of recycled material resources and food waste have greatly increased nationwide after a year of mandatory garbage sorting. As for implementing agencies, resource recycling rates have increased from 18.43% to 27.34% from 2004 to 2006. Food waste recycling has increased from 3.96% to 7.39%, greatly surpassing the 2006 target for implementing mandatory garbage sorting. The following nine localities recycled over 30% of municipal garbage: Tainan City (42.37%), Taichung City (36.59%), Taipei City (35.89%), Keelung City (33.75%), Kaohsiung City (32.78%), Hsinchu City

(32.24%), Taoyuan County (31.70%), Hualien County (31.24%) and Nantou County (31.09%).

Daily garbage clearance volumes have decreased by 2,300 tonnes from 2004 to 2006, a volume equivalent to the waste required to operate three incinerators the size of the Hsinchu Incinerator (900 tonnes/day, with a construction cost of NT\$3.6 billion). At an incineration treatment rate of NT\$2,500 per tonne of waste, these reduction measures have saved a total of NT\$2.1 billion in waste disposal fees per year. Added to these savings is NT\$600 million worth of recycled resources, for a total economic benefit of NT\$13.5 billion. Also important is that reduced waste incineration means fewer emissions of carbon dioxide greenhouse gases. The EPA indicates that since the implementation of mandatory garbage sorting, most people have adopted good sorting habits, cutting waste at the source and achieving a high quality Zero Waste lifestyle. Citizens with questions about recycling can call the EPA's toll-free recycling hotline at 0800-085717

▶ Achievement rates of mandatory sorting policy

(After implementation of mandatory sorting policy)	2006 monthly average	2004 monthly average	Achievement rate
Garbage clearance volume	488,574 tonnes	419,438 tonnes	14.15% reduction
Resource recycling volume	116,060 tonnes	175,688 tonnes	51.36% increase
Food waste recycling volume	24,939 tonnes	47,471 tonnes	90.35% increase

Air Quality

Early Production of Vehicles Compliant with Fourth Stage Emission Standards Encouraged

The Fourth Stage Emission Standards for automobiles are slated to take effect from 1 January 2008. The EPA has revised related regulations to ensure an early response from domestic automobile manufacturers and traders of foreign cars, and encourage them to begin producing and importing vehicles compliant with the fourth stage emission standards in advance.

Working to effectively promote control of pollution emissions from gasoline-fueled vehicles, the EPA has set 1 January 2008 as the implementation date for the fourth phase emission standards for gasoline-fueled vehicles according to the Vehicle Air Pollutant Emission Standards (交通工具空氣污染物排放標準). In order to encourage domestic automobile manufacturers and traders of foreign cars to begin producing and importing vehicles compliant with the fourth stage emission standards in advance, the EPA has decided to revise and promulgate the Regulations on Issuing, Revoking and Abrogating Qualifications

for Examinations of Automobile and Alternative Clean Fuel Engine Car Models (汽油及替代清潔燃料引擎汽車車型排氣審驗合格證明核發撤銷及廢止辦法) one year earlier than originally planned. The Regulations will be promulgated on 1 December 2007. Honda Taiwan, Kuozui Motors, Ltd. and Daimler-Chrysler Taiwan have already made an immediate response by applying for certification of many car models. Domestic car manufacturers Yulon Motor Co., China Motor Corp. and Ford Liuhe are preparing to do the same in the near future.

The fourth stage emission standards to take effect from 1 January 2008 primarily reference the US current Tier 2 Bin 7 standards, as well as adopt EU Directive 98/69/EC testing emission standards. The main emphasis is on stricter standards for hydrocarbons (HC) and nitrogen oxides (NO_x). The third stage standard for HC has been tightened to 0.045 g/km, 71% stricter than the third stage standard of 0.155 g/km. The standard for NO_x has been tightened to 0.07 g/km, 72% stricter than the third stage standard of 0.25 g/km.

The revision of the Regulations on Issuing, Revoking and Abrogating Qualifications for Examinations of Automobile and Alternative Clean Fuel Engine Car Models primarily targets domestic manufacturers and importers of automobiles. These enterprises must produce or import cars compliant with fourth stage emission standards before they can obtain certification from the EPA, which qualifies them to apply for a license from the Motor Vehicle Office.

While actual enforcement of these regulations will not take effect in advance, the purpose of promulgating these revisions at this time is to encourage car manufacturers and importers to make an early response.

The EPA emphasizes that to improve domestic air quality and improve control over automobile pollution emissions, the EPA has already drafted pollution controls for new cars and in-use cars still within their kilometer warranty. By gradually tightening automobile air pollutant emission standards and control methods, the EPA can insist that automobile manufacturers and importers make and sell cars compliant with emission standards. This strategy effectively improves air quality, protects the health of citizens and safeguards the rights and interests of consumers. The EPA calls on all citizens currently planning to purchase an automobile to choose a model that complies with fourth stage emission standards.

Recycling

Recycled Glass Applications Diversified

The EPA began promoting glass recycling from 1997. Cooperation between the government and the private sector has led to threefold growth of glass recycling rates over the past decade. One reason for this success is the diversification of applications for recycled glass.

One characteristic of glass is that there is no chemical reaction when it comes in contact with other materials under normal environmental conditions; therefore its application is both broad and ubiquitous. Glass does not easily decompose due to its high density. It also takes up a large amount of space in landfill sites, limiting the site's useful lifetime. On the one hand if glass is incinerated, much of it is incombustible, resulting in particles that cause machine failures. On the other hand, if glass is not recycled, this can have a significant negative effect on environmental protection measures and the environment itself. Therefore, at the beginning of 1997, the EPA started to promote glass recycling, with less than 50,000 tonnes recycled per year during this initial period. Later on, however, following the combined efforts and cooperation of the public, environmental protection groups, the recycling industry, treatment facilities and local governments, the annual volume of glass recycled has been maintained at around 150,000 tonnes. This increase in the glass recycling rate is also attributed to research and development using high technology and encouraging glass vessel manufacturers to obtain

Green Mark certification to verify, "This product is made from recycled glass."

After joint efforts between the EPA and industry members to promote research, development and applications of waste glass in recent years, waste glass has already found extensive applications in environmentally friendly materials. It can be added to ceramics, bricks, paving blocks that allow vegetation to grow through them, water permeable bricks, lightweight aggregate concrete, materials for inlaying walls or mosaics, glass beads, sidewalk paving, and asphalt road surfacing. Three years ago, the first tests of glass asphalt road coverings took place on several roads in Taipei City, including Fuxing South Road, Bade Road and Changchun Road. Also, the dazzling glass frontage of the Public Television building, aside from being aesthetically pleasing, also has increased the building's durability. This year, the EPA will once again liaise with local governments to integrate recycling into public work projects, even combining traditional glass craft trades, in order to demonstrate the different channels available for the use of waste glass, both now and in the past.

Most importantly, the EPA wants everyone to know

that it is actually very simple to recycle glass. All you need to do is wash out glass containers, gather them together, and give them to your local sanitation crew's recycling truck or community center recycling station. While away from home, people can cooperate by disposing of their garbage into recycling bins located in public places, giving their litter to local shops (convenience stores, supermarkets, superstores) or road-side service stations for recycling. All means should be taken to avoid littering the environment with glass, which not only wastes resources but could cause serious injury. Collected waste glass containers

are first sorted according to color by professional recycling enterprises and then transported to a processing plant where they can be treated and reused in an appropriate fashion.

However, people should also be aware that ceramic household items are not considered glass. In order to avoid adversely affecting the quality of recycled products, it is asked that people do not mix ceramics and recycle them together with glass. Further information on the recycling of waste glass containers can be found on the EPA's resource recycling website: <http://recycle.epa.gov.tw/>



▶ The EPA and local governments cooperate in promoting diversified reuse of waste glass

News Briefs

Accident Mitigation at Environmental Facilities Leads to Fewer Injuries for Sanitation Workers

The EPA has been aggressively promoting accident mitigation at environmental protection facilities to minimize the occurrence of job related accidents causing injury or death for sanitation workers. In 2006, the EPA printed 2,000 related promotional posters advocating accident mitigation

at environmental facilities, as well as analyzing and reviewing accidents causing injury or death to sanitation workers. The posters were distributed among all related agencies to drive home the importance of occupational safety. Emphasis has also recently been given to safety education. From October 2004 to December 2006, the EPA has held nine educational training workshops. In the first year, these initiatives to promote safety education cut

the number of work related deaths for sanitation workers by half, from 22 deaths in 2004 to 11 deaths in 2005. The work related death rate was further decreased by 37% last year with seven deaths recorded in 2006. These statistics attest to the success of safety education. The EPA will continue promoting educational training to prevent and reduce the occurrence of accidents.

Case Review Guidelines for Packaging Reductions Announced

The EPA announced the "Restrictions on Product Overpackaging" on 1 July 2005 to reduce unnecessary generation of waste. Considering manufacturers frequently make changes to product packaging, and in order to avoid regulating all packaging under one single standard, which could be excessively strict in certain cases or could contradict goals to reduce the volume of packaging, the EPA announced the "Case Review Guidelines for the Restrictions on Product Overpackaging" on 3 January 2007. Product packaging applications for individual cases should show that 1) even less packaging would be used than if the current standards were applied, 2) the packaging method would better facilitate resource recycling or reuse, or 3) although the existing standards cannot be met, the manufacturer has nonetheless successfully prevented overpackaging. Applicants must provide related documentation and test reports, and must submit a review fee of NT\$20,000 per product. Packaging that passes the review process will not be subject to the existing restrictions as long as it accords with the conditions stated in the approved documents.

Rewards for Recycling of Fans and Keyboards Announced

To effectively promote recycling of newly designated mandatory recyclables, on 26 January 2007 the EPA has made a preannouncement of a draft subsidy measure that will provide monetary rewards for recycling, clearance and treatment of electric fans and keyboards. Fans and keyboards were designated as mandatory

recyclables on 20 September 2006. Recycling of these items will commence from 1 July 2007. The new subsidy measure was drafted to ensure open channels for the recycling and treatment of these items. Subsidy rates were decided based on targeted recycling and treatment volumes for these items; recycling, storage, clearance and treatment costs; degree of processing into reusable materials; market prices of reused materials and costs of inspection and certification work; the financial status of the Recycling Fund, and other relevant factors. After discussion by a fund rate review committee composed of experts, scholars, environmental groups and related industry representatives, recycling, clearance and treatment subsidy rates proposed for this draft measure were decided at NT\$20 for each electric fan, and NT\$12 for each keyboard. Further information can be viewed on the latest announcement webpage at <http://atftp.epa.gov.tw/announce/index.htm>. Suggestions are

welcome from all.

Recycling Subsidy Rates Categorized for Waste Fluorescent Lights

Working to increase the recycling and reuse rates of mercury in fluorescent lights, on 27 February 2007 the EPA made a preannouncement of "Mandatory Recyclable Recycling, Clearance, and Treatment Subsidy Rate (Fluorescent Lights)," slated to take effect from 1 March 2007. This draft measure primarily stipulates that recycling and treatment enterprises should aim to recycle at least 80% of the glass and metal contained in fluorescent lighting fixtures. The EPA has set different subsidy rates based on the ratio of mercury recycled by enterprises; greater mercury recycling rates will enjoy higher subsidy rates, up to NT\$40/kg. Related information can be found on the EPA's website at <http://atftp.epa.gov.tw/announce/index.htm>.



▶ You can help prevent the release of mercury into the environment by turning in intact and undamaged fluorescent lights

Activities

PCB Creative Art Activity on the Erren River

Tying in with efforts to strengthen pollution remediation on the Erren River, the EPA has subsidized the Kaohsiung County Government to hold the "Love the Earth, Let the Rivers Flow Clean – Printed Circuit Board Creative Art Activity and Exhibit." Among those invited to the event included celebrated metal sculptor Liu Ding-zan (劉丁讚) and design department students from various colleges. The activity featured artistic uses of discarded PCBs gathered during a riverbank cleanup event along the Erren River. The purpose was not only to remind citizens about the hazardous wastes that affect our living environment, but also to teach people that without appropriate treatment, industrial waste can pollute irrigation water sources and affect drinking water and quality of life. This event also featured educational exhibits open to the public at the Southern Environmental Science and Technology Park in Kaohsiung County. The exhibits were open to the public with free admission from 9:00am to 5:00pm, 13~15 January 2007. The event was deemed an overall success. More information on this event is available online at <http://iserv.kscep.gov.tw/web/index.html>.

Outstanding Senior Sanitation Workers Commended

On 1 February 2007, the EPA held the "2006 Award Ceremony for Outstanding Senior Sanitation Workers" in Taichung City to commend 25 excellent and 175 outstanding senior sanitation workers selected from over 20,000 sanitation workers nationwide. EPA Minister Chang Kow-lung handed out awards and gift certificates for NT\$3,000 as well as took photos with recipients to commemorate the event. Following the award ceremony, the EPA arranged a field trip with recipients to the Taichung City "Treasure Secondhand Furniture Recycling and Refurbishing Center," which is noted for its outstanding performance in reuse and recycling. The senior workers were given a chance to observe

the center and exchange ideas with others present.

2007 Selection of Top Performers in Industrial Waste Recycling

To affirm appropriate treatment of industrial waste and encourage reduction, recycling and reuse of resources, the EPA is holding the "Industrial Waste and Renewable Resource Cleanup and Resource Reduction, Recycling, Reuse Outstanding Performance Awards." The deadline for registration to participate in this selection activity is 31 March 2007. Registration method and selection criteria can be found on the EPA's website at <http://www.epa.gov.tw>.



▶ EPA Minister Chang Kow-lung hands out a plaque to top performing senior sanitation crew workers for their noteworthy contribution and sacrifice

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