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Feature Article

Pollution Remediation of Key Rivers

The work of remediating polluted rivers in Taiwan has been divided into three main areas: key rivers, urban rivers, and "one county/city, one river." Taiwan's river pollution problem can only be effectively solved by reducing the sources of pollution, which has required a continuous joint effort between central and local government departments. Over a decade of hard work is finally beginning to bear fruit as evidenced by the percentage of polluted segments of major rivers dropping from a recorded high of 16.4% to just 5.9% in 2009.

In order to safeguard river water quality around Taiwan and ensure that it meets water body water quality standards, the EPA has adopted a multi-period, multi-staged approach to promoting river pollution prevention and remediation. For example, in 1988, the First Stage Tamshui River Remediation Plan was put into effect, and in 1998 the Drinking Water Source Water Quality Protection Plan was implemented in order to guarantee a high quality of drinking water for residents. In 2001, pig farms along the five major tributaries of the Tamshui River were closed down and owners were compensated to prevent pig farm wastewater from further polluting the river.

Watershed Protection Plans to Raise Water Quality of Key Rivers

The EPA has been carrying out remediation of watersheds for a number of years now as a part of its wider effort to prevent river and marine water pollution. From 2001 to 2004, the Taiwan Watershed and Marine Operations Management Plan was implemented, and from 2005 to 2007, the River and Marine Water Quality Conservation Improvement Plan was put into effect. Both of these plans were approved by the Executive Yuan and included environmental protection schemes for watersheds. The EPA accordingly set about the task of raising the environmental quality of a number of rivers targeted for special attention by removing water-borne pollutants from mid- and down-stream segments of the rivers and removing unsightly refuse from riverbanks to prevent it from being washed into the rivers during periods of heavy rainfall. The EPA also

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conducted rigorous inspections and enforced strict controls over Drinking Water Source Protection Zones to raise the quality of drinking water. The results of water quality monitoring plans over the years have succeeded to the extent that citizens have noticed clear improvements in the quality of their drinking water.

Success in conserving and improving water quality cannot be achieved overnight and needs the continuous implementation of relevant pollution-prevention measures. The EPA has thus been very active in preventing river and marine water pollution. The EPA has also been rigorously implementing the second phase of the Executive Yuan approved River and Marine Water Quality Protection Improvement Plan that will run from 2008 to 2011.

Remediating polluted rivers is an important part of government policy. In 1988, the percentage of river segments incurring serious pollution for Taiwan's 50 major rivers was 13.0%, and in 1996, this percentage had risen to 16.4%. It took years of concerted and cooperative effort between central and local government departments to bring this percentage down to 5.9% recorded in 2009. Responding to the public's increasingly higher expectations regarding the cleanliness of river water and the quality of aquatic environments, the EPA has strengthened remediation work by dividing it into three main areas: key rivers, urban rivers, and "one county/city, one river." Recognizing the most effective way to reduce river pollution is to begin eliminating pollution sources, the EPA has demarcated four major lines of defense and drawn up eight major measures. This multi-staged remediation strategy has so far produced the following results in the three main areas of work:

1. Key Rivers

Key rivers are those in which the percentage of river segments incurring serious or moderate pollution are over 50%. Eleven such rivers are the Tamshui River Basin, Nankan River, Laojie River, Zhuoshui River, Xihuwei River, Beigang River, Jishui River, Yanshui River, Erren River, Agongdian River and Love River.

(1) Requests were sent to the Ministry of the Interior's Construction and Planning Agency; the Water Resources Offices (under the Water Resources

Agency) and the Industrial Development Bureau, both under the Ministry of Economic Affairs; the Council of Agriculture; and other relevant central and local government departments, for personnel to make up 11 river remediation taskforces. Experts, scholars, and volunteers from environmental protection groups were also invited to participate. A communication mechanism was established to facilitate oversight, guidance, and assistance for the remediation task forces. Between 2009 and August 2010, 60 meetings were convened between the remediation task forces to discuss comprehensive management of river environments.

(2) High-tech measuring instruments have been employed to collect evidence and the inspection regime has been stepped up in order to strengthen controls on pollution sources. Statistics show that from 2009 to June 2010, 631 hidden discharge pipes were discovered. Fines of NT\$50.38 million were issued as a result and 443 of the pipes were sealed up.

(3) In areas where the construction of underground sewerage systems has been delayed, the EPA has been promoting the use of on-site ecological engineering as a first step toward remediating river segments affected by mid-range pollution. As of August 2010, ecological engineering projects at 93 sites with a total area of 517 hectares have been completed. These sites are now treating 541,000 cubic meters of wastewater daily, which is the equivalent of a daily reduction of 8,352 kg of BOD (biochemical oxygen demand). Teams of experts and academics have also been invited to inspect the sites, and from 2009 to August 2010 the operation and maintenance of water purification facilities at 84 sites were inspected. The results of the inspections are being sent to local governments to review so that they can make improvements.

(4) The removal of refuse from riverbanks has been stepped up. Between January 2009 and August 2010, 26,357 tonnes of refuse were removed.

(5) The "Manual for Patrolling Water Environments" has been completed and is being used to educate local environmental protection bureaus regarding the integration of the "six forces" that can be employed to combat river pollution in coordination with EPA policy to patrol water environments. These "six forces" are local community concern, civil action, the

government's public rights, expert knowledge, media reporting, and social pressure. As of September 2010, 359 river patrols have been set up around Taiwan, comprising of 7,984 members. In addition, in keeping with the ongoing promotion of electronic management systems, on 30 October 2010 a river conservation network was added to the EcoLife Web site. The network allows the water environment patrol teams to quickly submit reports of pollution cases online and gives them a platform through which to share knowledge and experience.

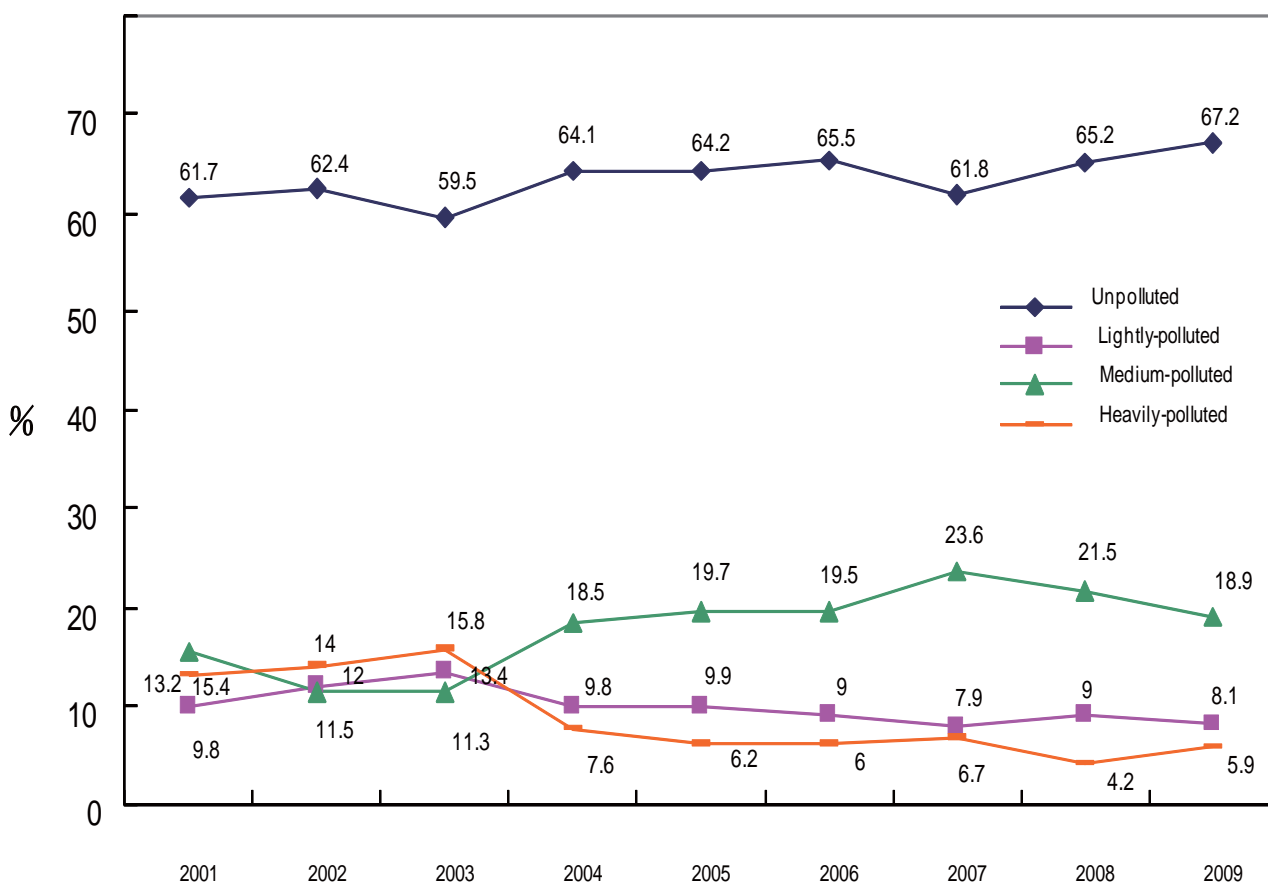
(6) A special river pollution reporting system has been established and the Water Pollution Incident Emergency Joint Response System Guidelines have been formulated and announced. Joint response mechanisms are now in place for the four major regions in northern, central, southern, and eastern Taiwan. The response resources of private-sector specialist organizations have also been enlisted to reinforce the response capabilities of frontline local environmental protection units to deal with major pollution incidents at the local level. Between 2009 and August 2010, 34 river pollution emergency response rehearsals or pollution emergency

response equipment operations drills were held. During the same period, 147 cases of water pollution were reported, of which 81 concerned fish die-offs and 59 concerned cases of oil pollution.

2. Urban Rivers

Urban rivers are heavily-polluted rivers that flow through areas of high population density. The EPA has been subsidizing the remediation and regeneration of a number of such rivers, including Tianliao River in Keelung City, the Zhonggang Drainage Canal in Taipei County, Fengshan River in Kaohsiung County, Wannian River in Pingtung County, and Liu Canal in Taichung City. It is estimated that 397,000 cubic meters per day of polluted river water is now being diverted and treated as a result to the benefit of 1.37 million residents. As of August 2010, the remediation engineering projects on Fengshan River and Wannian River have been completed and engineering work on the other rivers has been sped up.

3. One County/City, One River



▶ Percentages of polluted river segments for Taiwan's rivers from 2001 to 2009

Key river segments affected by mid-range pollution have been chosen for each county and city to undertake remediation efforts, such as analyzing pollution sources and pollutant amounts, constructing underground sewerage systems, diverting polluted water, and treating water on-site. Remediation strategies for each municipality are based on their own particular circumstances and remediation work is carried out on a yearly basis.

A number of bottlenecks have been encountered during river remediation projects. Successful remediation relies heavily on cooperation between different departments in terms of allocating tasks and keeping each side informed of developments. Other challenges include selecting remediation methods that accord with the unique topography and environment of each river, and uncovering and appropriately dealing with cases of illegal discharges of wastewater that violate the Water Pollution Control Act. These challenges test the extent to which environmental protection officials are able to implement regulations.

Regular Joint Meetings to Facilitate Interdepartmental Remediation Work

The response strategies that the EPA has adopted to overcome the above problems are as follows:

1. Continuing to build an effective platform for remediation personnel from the MOEA's Water Resources Agency, the MOI's Construction and Planning Agency, and the Council of Agriculture to communicate with each other. Regular joint meetings regarding key river remediation efforts will also be held to further facilitate interdepartmental cooperation. The EPA will also continue to work closely with the Construction and Planning Agency to speed up the laying of underground sewage pipes and individual household feeder pipes. The EPA will also continue to assist reservoir management authorities and water catchment area relevant competent authorities with soil and water preservation efforts and the conservation of catchment areas.

2. For areas where primary and secondary sewers have yet to reach, the EPA will be promoting the use of natural methods of on-site wastewater treatment. Increased use of the residual capacity of wastewater treatment plants in order to treat diverted polluted wastewater should also lead

to faster improvements in river water quality.

3. Inspections and control over pollution sources will also be strengthened in order to facilitate the gathering of evidence and punishment of polluters. A new set of restrictive measures such as continuous monitoring of water quality and average pollutant concentrations in effluent will also give the EPA a better understanding of actual pollutant discharges. Other strategies include enlisting the assistance of local residents and river patrols to spot illegal discharges and using high-tech equipment to improve wastewater sampling and discover hidden pipes.

Some of the achievements of recent years include:

1. River water is tested according to water quality standards for DO, BOD, SS, and ammonia nitrogen. The pass rate for tested samples has risen from 14.6% in 2002 to 33.2% in 2009, proving that water quality is improving over the long term.

2. The percentage of river segments incurring serious pollution has fallen from 13.2% in 2001 to 5.9% in 2009.

3. A number of rivers that were originally seriously polluted are beginning to show signs of ecological regeneration, with the Tamshui River basin and Erren River being good examples. Between 1983 and 1986 there were 56 species of fish in the Tamshui River drainage area; by 2008~2010 the number of species had increased to 89. Anadromous fish, such as the clinging goby, spotfin river goby, and topmouth culter, which had disappeared from the river for many years, are now thriving in the mid- and lower- reaches of the river, proving that water quality has improved dramatically. The Erren River was only able to support two species of fish in 2002; in 2009, 28 species were found in the river.

The EPA's specific goals for future improvements to rivers are "adequate oxygen, no foul odors, and riverbanks full of life," and our great hope is to see rivers regenerated to the degree whereby "the water is clear, the fish are swimming, and the people are happy."

Establishing Internationally-Acceptable Greenhouse Gas Inventory and Registration Practices

In order to ensure that greenhouse gas inventorying and registration are uniform for all enterprises, and to guarantee the accuracy of records and approvals of future reduction credits, on 10 September 2010 the EPA announced the Greenhouse Gas Inventory and Registration Management Principles. This means that there are now regulations to cover applications accompanied by inventory and registration data to the EPA from enterprises for greenhouse gas preliminary or offsetting projects. They also apply to developers that have promised to undertake inventorying and registration as a part of environmental impact assessments, and to private-sector inventory and registration organizations that are under the guidance of the government.

The management principles were drawn up with reference to the draft bill of the Greenhouse Gases Emissions Reduction Act (溫室氣體減量法) and similar international regulations. In the future, for registration data that requires verification by the EPA, operators must first complete a greenhouse gas inventory report and emission inventory that accord with R.O.C. CNS 14064-1 (Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals) and the relevant greenhouse gas inventory and registration guidelines. The data must also then be verified by an outside inspection agency. The emission inventory must then be recorded on the National Greenhouse Gas Inventory Platform, and the inspection and verification reports must also be submitted to the EPA. Inspection data that was recorded before the announcement of the management principles must undergo supplementary verification.

A working system of inventorying and registration is internationally considered to be a cornerstone for building greenhouse gas management capabilities. Since 2004, the EPA has been working hard at creating standardized procedures for greenhouse gas inventorying, registration and testing. In July 2007, the National Greenhouse Gas Inventory Platform was officially made available online. The platform not only allows manufacturers to upload inventory data but also has finished versions of the Greenhouse Gas Inventory and Registration Guidelines and

the Greenhouse Gas Verification Guidelines for all interested parties to refer to.

As of July 2010, a total of 256 manufacturing companies have voluntarily submitted greenhouse gas emissions data. Scope 1 data from these companies (emissions directly from manufacturing processes and facilities) account for 74.6% of total emissions from their industry and energy departments, proving that Taiwan's major manufacturers have already developed basic inventory and registration capabilities. It is expected that the management principles will ensure that manufacturers' inventorying and registration records fully accord with international principles of "measurable, verifiable, and reportable" data, and bring Taiwan's greenhouse gas management methods into line with international practices.

In order to assist enterprises in becoming familiar with greenhouse gas inventory and registration methods, the EPA has provided consultations on 25 occasions at the premises of energy intensive enterprises. A consultation hotline has also been set up ((02) 2775-3919 ext. 245). It is hoped that offering manufacturers a variety of options for getting guidance and information on greenhouse gas inventory and registration will help raise their competitiveness in low-carbon manufacturing. Manufacturers and other interested parties can view details of the management regulations on the EPA Web page <http://w3.epa.gov.tw/epalaw/index.aspx>.

Clampdown on Noisy Motorcycles from 1 October

In order to prevent motorcycle street racing and to tackle the problem of noise pollution caused by modified motorcycles, from 1 October 2010, the EPA will be requesting local environmental protection bureaus to work in conjunction with the police to set up noise pollution check posts at places and times where racing of modified or large motorcycles is known to occur. Riders found violating regulations will be fined NT\$1,800~3,600.

A revised draft of the Noise Control Act (噪音管制法) was passed into law on 1 December 2008 and on 2 September 2009 the EPA announced the Automobile Noise Pollution Reporting Regulations. The EPA also created a Web page - <http://noise.ea.gov.tw/> - that the public can utilize when reporting noisy vehicles. The public can either enter details of the vehicle registration number, vehicle type, and the place where the noise pollution incident occurred online, or they can make their report by phone or fax to their local environmental protection bureau. The owner of the offending vehicle will then be notified to take it to a designated testing station.

As of 31 August 2010, 3,325 noisy vehicles have been reported by the public, of which 2,619 (over 70%) have been motorcycles. Members of the public have also been reporting which sections of roads are frequently used for vehicle racing that seriously disturbs the peace. This has shone light on the need to clampdown on street racing on these particular sections of public roads at certain times.

There have recently been a number of media reports about disturbances caused by motorcycle racing on Provincial Highway 3 in the Miaoli area and the EPA has already requested that the Miaoli County Environmental Protection Bureau step up its

roadside vehicle noise inspections. For six weekends starting from 11 September 2010, the Miaoli County Environmental Protection Bureau, began working with local police to set up posts on Provincial Highway 3 to check for suspected noisy motorcycles. This special joint effort to alleviate noise pollution started with a clampdown on the first day, mobilizing 70 EPA, police, and vehicle inspection station personnel in an attempt to scare away the street racers. Seventy motorcycles were stopped, and twelve were tested at the check posts for excessive noise. Ten of these motorcycles (around 83%) were found to be producing excessive noise. The owners were fined according to regulations and ordered to have a follow-up test. The fact that no noisy vehicles were stopped during the following few weekends attests to the effectiveness of this tactic.

The EPA is keen to point out that violators not only must pay a fine but also must make improvements to their vehicle within a stated period of time and take it to a designated testing station for testing. If the vehicle still exceeds noise standards it must be modified so that it meets noise control standards within another set period of time. The EPA reminds vehicle owners to not unnecessarily modify their vehicle or otherwise create excessive noise in order to uphold everyone's right to a peaceful living environment.

Air Quality

Gasoline and Diesel Standards Tightened, Air Pollution Fees Adjusted

The EPA recently tightened controls on the chemical content of retailed gasoline and diesel. Sulfur content can now not exceed 10 ppmw, compared to the previous limit of 50 ppmw. This accords with standards enforced in the EU, the US, and Japan. In tandem with the latest revision the EPA has also adjusted air pollution fees for vehicular gasoline and diesel. Fees will no longer be graded according to the sulfur content of the fuel and single rates will be charged instead.

In order to encourage oil companies to produce low-sulfur gasoline and diesel for vehicles, starting in 2000 air pollution fees were placed on these fuels according to sulfur content. This has had the effect of progressively reducing sulfur content from 500 ppmw to 10 ppmw. Fuel with sulfur content of 10ppmw or

below cannot be practically graded for sulfur content and grading an oil product by its content of other chemicals such as olefins or aromatic hydrocarbons might have an adverse effect on the proper functioning of the product. The EPA thus decided to adopt a single rate fee of NT\$0.2 per liter. China Petroleum

Co. and Formosa Petrochemical Co. will from now on pay this rate on every liter of vehicular gasoline and diesel that they retail.

According to the current floating pricing mechanisms, air pollution fees are calculated based on average fees paid in the previous year. The public review of oil prices in 2011 will be based on the actual fees paid for 2010. Since the fee adjustments came into effect on 1 October 2010, this should not lead to extra costs for the consumer.

Following the 1995 decision to impose an air pollution tariff on mobile pollution sources it was decided that a flat fee of NT\$0.2 per liter of gasoline or diesel would

be the best option. At the time, gasoline cost NT\$16.7 per liter and so the air pollution tariff was 1.2%. Using the cost of gasoline for the second season in 2010 and the recently-adjusted rate to calculate the percentage taken up by the air pollution tariff gives 0.67%, which is lower than in 1995.

The EPA has also been actively encouraging the residents of Taiwan to purchase electric vehicles instead of those powered by traditional engines in order to reduce the use of vehicular gasoline and diesel. Although income from air pollution fees would be reduced as a result, air quality would certainly improve, which is the reason for imposing an air pollution tariff in the first place.

Air Quality

Exhaust Testing Exemption Period for New Motorbikes Extended to 5 Years

The EPA recently issued a preannouncement of revisions to regulations governing exhaust emission testing for motorbikes in order to make the regulations more effective. From 1 January 2011, new motorbikes will not need to undergo exhaust testing for the first five years after leaving the factory.

The fifth phase of motorbike exhaust emission standards went into effect on 1 July 2007, but due to new models of fuel-injection motorbikes having lower exhaust emissions than older models the EPA decided to review the periodic emissions testing regulations. As a result, new motorbikes will not need to undergo exhaust emissions testing for the first five years after leaving the factory instead of the previous first three years. After five years, motorbikes must then be tested annually. The EPA is also promoting motorbike maintenance before periodic exhaust emissions testing, which is hoped to eventually lead to a single maintenance/testing system.

The large number of motorbikes on Taiwan's roads make them a significant source of air pollution. The periodic exhaust emissions testing regime that the EPA started in 1998 was thus aimed at combating this problem. At present, there are over 2,500 testing stations around the nation that test the exhaust emissions of over eight million vehicles annually. Good vehicle maintenance is also a way of reducing emissions, and to promote awareness of the importance of this the EPA will be revising the Motorbike Emissions Air Pollutants Testing Station Establishment and Management Regulations.

The revision will also help the EPA to ensure that motorbikes which fail the periodic exhaust emissions test are repaired and tested again, which will make the whole testing regime more effective.

Motorbike owners who do not take their vehicle for regular exhaust emission testing as stipulated by the regulations will be fined NT\$2,000. If a motorbike fails the emissions test the first time, the owner will be given one month in which to make the necessary repairs and have it re-tested, otherwise a fine of NT\$1,500 will be levied. The EPA is therefore calling upon all motorbike owners to remember to take their vehicle for regular exhaust emission testing and to also make sure that their vehicle is well-maintained to ensure that it passes the test the first time. If a motorbike fails the emissions test the first time owners are kindly requested to have their vehicle inspected and repaired before having it re-tested. The EPA reminds all motorbike owners that their small efforts to improve air quality for the common good are much appreciated.

Air Quality

Dust Nets and Wastewater Interception Equipment to Control Air Pollution

On 6 September 2010 the EPA issued a preannouncement of revisions to the Management Regulations for Equipment to Prevent Fugitive Particulate Air Pollution from Stationary Pollution Sources. In the future, some load-carrying vehicles must cover their loads with dust nets to prevent fugitive dust particles from escaping. The revisions also lay down regulations to cover wastewater interception or collection equipment on board vehicles that carry wet loads.

After the management regulations went into effect in 2009 a number of enterprises told the EPA that dust nets could be used to cover truck loads and that wastewater interception equipment could prevent wastewater from dripping from the vehicles. Tests conducted by the EPA showed that dust nets could indeed prevent pollutant particles from escaping. The EPA thus decided to revise the management regulations to include these two types of pollution-prevention equipment as viable options for enterprises to adopt. The revision also requires vehicles carrying wet loads to have wastewater interception or collection equipment installed on the vehicle body.

The management regulations were drawn up according to provisions laid out in Article 23~2 of

the Air Pollution Control Act (空氣污染防制法) and were originally promulgated on 1 August 2009. The regulations mainly concern any person coming into contact with fugitive particulate pollutants as a result of work involving operating machinery or the stockpiling, delivering, loading or unloading, or transportation of goods at any public or private premises, or at any other open-air or roadside source of pollution. These people must install suitable equipment or adopt other effective methods to prevent fugitive particulate pollutants caused by their activities from escaping into the atmosphere and adversely affecting air quality. Details of the pre-announcement have already been published on the EPA Web site <http://ivy5.epa.gov.tw/epalaw/index.aspx>

Climate Change

Taiwan Airlines to Help Monitor Pacific Greenhouse Gas Next Year

The EPA is always keen to promote international environmental cooperation and to this end recently hosted the 2010 Third International Workshop on Pacific Greenhouse Gas Measurement. The workshop was an opportunity for experts from various nations to exchange knowledge and experience on greenhouse gas monitoring. The EPA has also entered into an agreement with China Airlines to use their commercial airplanes that fly set routes for gathering valuable greenhouse gas data that can be shared with the rest of the world.

Actively seeking ways to promote international cooperation, the EPA held the 2010 Third International Workshop on Pacific Greenhouse Gas Measurement on 9 September 2010, bringing together under one roof the expertise that manufacturers, government, academia and researchers have built up over many years. Officials in charge of greenhouse gas monitoring plans and other experts from the EU, Germany, the UK, and Japan, attended the workshop. Experts from Taiwan included those from the National Space Organization, the Industrial Technology Research Institute, and National Central University's

Environmental Research Center. The experts engaged in fruitful exchanges on topics such as technological developments in greenhouse gas monitoring, the current state of international cooperation, and the results of recent greenhouse gas measurements. Discussions were also held on the work necessary to develop international greenhouse gas monitoring using aircraft from Taiwan and overseas, which would raise Taiwan's quality of atmospheric monitoring, research capabilities, and international visibility.

The EPA commissioned National Central University

to coordinate efforts with the EU, leading to the 18 February 2008 signing of the Pacific Greenhouse Gas Monitoring Plan Memorandum of Cooperation. This will allow Taiwan to participate in the EU Greenhouse Gas Monitoring Plan, which was previously limited to aircraft flying over the North Atlantic Ocean. Taiwan's participation extends this plan to cover the whole globe, and shows Taiwan's commitment and contribution in responding to global warming.

Hard work and cooperation between industry, government, academia and researchers led to the first voyage to conduct Pacific Ocean greenhouse gas monitoring on 4 July 2009 by an Evergreen

container ship. This voyage has since been followed by others to the north and northwest Pacific, the Strait of Malacca, the Indian Ocean, the Red Sea, the Suez Canal, and other regular shipping routes to monitor the atmosphere and test for concentrations of CO₂. From 2011, China Airlines' commercial airplanes that fly set routes will be used for gathering greenhouse gas data, and in the future data gathered by Taiwan's Formosat-3 satellite will be used to confirm the veracity of this data that will then be combined with data from around the world to establish a set of 3-D spatial maps of greenhouse gas distribution in the Pacific Ocean area. Such maps will lead to a greater understanding of the effects of global warming.

Soil and Groundwater

Competent Authorities of Designated Parks Now Required to Test Soil and Groundwater Quality

In accordance with recent revisions to the Soil and Groundwater Pollution Remediation Act, on 29 September 2010 the EPA issued a preannouncement of a draft of relevant regulations. From now on, industry competent authorities in industrial parks, export processing parks, science-based industrial parks, Environmental Science and Technology Parks, agricultural science and technology parks, and any other parks designated by the EPA will have to conduct periodic soil and groundwater quality tests at intervals dictated by the potential of the pollution problem in the area under their jurisdiction. Results of the tests must then be sent to local competent authorities.

The revision to the Soil and Groundwater Pollution Remediation Act (土壤及地下水污染整治法) was announced on 3 February 2010. The revision states that industry competent authorities are now responsible for periodic testing of soil and groundwater quality in parks with a high potential for pollution. These include industrial parks, export processing parks science-based industrial parks, Environmental Science and Technology Parks, agricultural science and technology parks, and any other parks designated by the EPA, depending on the potential pollution problem. The test results must also be sent to local competent authorities. In accordance with Article 6~4 of the Act, the EPA thus formulated a draft of the Regulations for Periodic Testing and Reporting of

Soil and Groundwater Quality by Industry Competent Authorities.

The draft of the regulations is intended for industry competent authorities to refer to when making their soil and groundwater quality inspection reports. It details the required content, test dates and dates for reporting, documents to be reviewed, and other administrative items.

Details of the pre-announcement have been published on the "Draft Regulation Preannouncement" Web page, which is a part of the EPA Web site <http://ivy5.epa.gov.tw/epalaw/index.aspx>

International Cooperation

Japanese Experts Visit Taiwan to Exchange Experience on Waste Disposal Management

In 1997, the EPA drew up a pilot plan for the establishment of an industrial waste control center for the purpose of improving the management of Taiwan's industrial waste. The center was officially opened on 21

October 2000, and the electronic management systems have proven effective at tracking the movement of waste nationwide. The success of the center over the last decade has attracted international attention, as demonstrated by the visit to the center on 14 September 2010 of the Japan Industrial Waste Center Cooperative Team who came to observe the center's operations.

In conjunction with the center's operations, from 1998 the EPA has progressively implemented controls on the production, storage, clearance and disposal of waste substances. There are currently 24,000 enterprises that are required under law to submit waste disposal reports online, and the actual reporting rate is 97%, which represents a big leap in the effectiveness of industrial waste management. Other regulations now require all industrial waste clearance vehicles to be fitted with real-time GPS tracking devices so that the movement of waste can be tracked.

The Japanese government is currently promoting a fee-based system of electronic reporting. Taiwan has a similar electronic management system but fees are not collected. The main purpose of the visit on 14 September of the four-man Japan Industrial Waste Center Cooperative Team led by Dr. Haruo Matsumura was thus to gain a better understanding of

Taiwan's waste management system and to observe the industrial waste reporting system in operation. The team also exchanged knowledge and experience with their Taiwanese counterparts.

The EPA would like to point out that Taiwan's waste disposal management system has developed from written report manifests to today's fully-electronic management that allows for complete control of the waste disposal process. Electronic management is effectively preventing illegal dumping and promoting the proper disposal of waste, and Taiwan's system has received recognition and plaudits from the international community. The fruitful exchanges of experience with the Japanese team gave the EPA the chance to learn about the concepts and technology being employed in other advanced nations and will help Taiwan's efforts to become one of the world's environmentally-progressive nations.

Waste Management

Construction Waste Gets a New Lease on Life

In order to reduce consumption of natural resources and turn construction waste into reusable resources, the EPA has been actively promoting better recycling of waste construction materials and products made from such waste. Statistics drawn from online reporting by construction firms show that in 2009, of 2.21 million tonnes of construction waste, 1.83 million tonnes were reused, marking a reuse rate of 82.86%.

According to research papers, the reusable resources available in construction waste include metals, wood, soil, bricks, clay and ceramic tiles, slabs of concrete, plastic and glass. The metal can be sent directly to foundries for smelting, while the wood is used mainly as fuel, with only 5% being used to make renewable products.

Bulky waste materials, such as soil, slabs of concrete, bricks, and tiles, account for 60~70% of the total. About 72% of this is used as construction site or road fill or as reusable aggregate. About 3% is used to make renewable products, including compressed concrete paving units, cinder blocks, fiber cement board, fiber reinforced cement board, ceramic wall tiles, and plasterboard. These renewable products can be used as substitutes for the original product in 50~60% of cases, and all accord to Chinese National Standards (CNS).

The technology for creating products from reusable materials has already reached maturity, and such products that have been certified in Taiwan are of a very high standard in terms of both quality and functionality. Some examples of outstanding products currently on the market include: transparent cement made from waste concrete; high-performance permeable pavers made from waste ceramic tiles; lightweight exterior wall tile made from waste brick, glass, and tiles; and plasterboard made from waste plasterboard.

Transparent cement in particular has made a splash overseas, being used on the exterior walls of the Italian Pavilion at the World Expo currently being held in Shanghai. Transparent cement consists of 20% waste concrete that has been pulverized with transparent materials and then reformed. The resulting transparency makes it suitable for buildings

where special optical effects are desired as an integral part of the architectural design.

Seventy-five percent of the content of high-performance permeable pavers is waste ceramic tiles. These pavers are permeable to both air and water, and can be used for paving swimming pool walkways, flat-surface plaza fountains, and surface drains around any kind of building. The lightweight exterior wall tiles are made from 40% waste brick, glass and tiles, and their low thermal conductivity makes them a very eco-friendly choice for tiling building exteriors.

The construction industry in Taiwan is gradually

moving toward more use of plasterboard. Waste plasterboard and recycled paper can both be used to make new plasterboard, replacing up to 80% of the raw materials that would have originally been used in the manufacturing process. Plasterboard can also have additives added to it as required to make it stronger, fire resistant, or damp resistant.

The reusable products described above are all common building materials that are readily marketable. They all accord to CNS and have passed green construction materials accreditation. The high-performance permeable pavers have also obtained the Green Mark ecolabel.

General Policy

37 Environmental Programs Available for Viewing on EPA Channel

The EPA is always looking for means to promote concern for the environment and to encourage people to take action. To this end, in 2010 the administration has continued to produce environmental programs and broadcast them on the EPA Internet channel (<http://hichannel.hinet.net/event/2010EPACHannel/index.html>). There are a total of 37 programs in three categories – "Protecting our Earth," "Caring about life," and "Cherishing resources" – that are available online for all to view.

EPA Channel has the express function of disseminating information regarding the importance of environmental protection and building environmental awareness among the general public so that they can take actions to protect our planet. The EPA will continue working with HiNet's Internet TV station hiChannel to produce and broadcast EPA Channel programs online from 26 August 2010 to 31 August 2011. The programs are simple, direct, and yet moving, and are designed to leave every

viewer with a clear understanding of the concepts involved. Environmental protection has to become more than just a slogan, and the EPA hopes that broadcasting these programs will sow the seeds of meaningful environmental action in the hearts of their audience.

EPA Channel went online in November 2008, and since then it has become a firm favorite with teachers, students, and the public at large. In 2009, the channel



▶ Many programs are available on the EPA Internet Channel

received around 106 million hits, a daily average of about 450,000. Fourteen million visitors watched the environmental protection programs, a daily average of 38,000. The channel is now being widely used

in schools and colleges nationwide as a source of teaching material for environmental protection classes and activities.

News Briefs

Seven Chemical Substances Banned as Ingredients in Environmental Agents

On 15 September 2010 the EPA promulgated "Prohibitions on Chemical Ingredients in Environmental Agents and Methods for Their Detection" (環境用藥禁止含有之成分及檢驗方法), bringing into effect new prohibitions on the use of seven chemical ingredients: endrin, hexachlorobenzene, mirex, toxaphene, chlordecone, pentachlorobenzene, perfluorooctane sulfonates and its salts. Also stipulated were detection methods and detected content limits for screening of these compounds. The EPA indicated that among the persistent organic pollutants (POPs) currently listed for control under the Stockholm Convention, 15 are used in insecticides. Having already placed prohibitions on eight POPs, the EPA is strengthening prevention of hazards from these types of chemical substances by adding new prohibitions on the remaining aforementioned seven POPs as chemical ingredients in environmental agents, to protect human health and the environment.

Ten Exceptional Green Packaging Designs Unveiled

Packaging that can be turned into flower pots, fruit boxes that can be partitioned depending on contents, extremely simple yet attractive ink-free packaging... such ingenuity was recognized on 14 September 2010 at the EPA's "2010 Green Packaging Design Contest," where ten exceptional entries were awarded from among many packaging designs. The EPA also balloted reporters present at the event to choose three winners of a "Media's Favorite" award.

The EPA reported a total of 101 contest entrants split into commercial and industrial packaging categories. All award winners had to fulfill three criteria: resource conservation, easy recycling, and low pollution. Such green creativity goes beyond traditional packaging concepts, combining environmental protection, attractiveness, and practicality. In addition to awarding prizes, the EPA also conferred winning products with the "Green Packaging Label." Thus businesses that adopt these winning packaging designs in the future will also be able to display the Green Packaging

Label, to help consumers distinguish and make purchasing decisions based not only attractiveness of packaging, but on environmental principles as well.



▶ One of the winners of the "Media's Favorite" award: A non-cardboard modular packaging box by Chunghwa Picture Tubes that has transformed the concept of the conventional cardboard box into paper slabs that can be adjusted according to the contents

Public Keen to Participate in 2010 World Water Monitoring Day Activities

To raise environmental awareness among citizens and encourage common protection of water resources, the EPA invited the public to participate in activities for 2010 World Water Monitoring Day, which began on 18 September at Sunny Park in Taipei County. Jointly organized by the Monitoring Division of the EPA and the Taipei County Environmental Protection Bureau, the activities brought together teachers and students from four Taipei County elementary schools, students' parents, river patrol teams, volunteers, county government personnel and their families, and other citizens from the area concerned about water quality, to personally get their hands wet testing river water quality, so as to gain a better understanding of water quality issues and advance the protection of water environments.

This year's World Water Monitoring Day activities kicked off in Taipei County, followed by events in Nantou County and Tainan City. These activities not only give Taiwan an opportunity to coordinate with international events, but more importantly give local citizens a chance to get involved in the inspection of rivers and the measuring of water body temperatures, dissolved oxygen, pH values, and turbidity.

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