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## Feature Article

### Conferences on Important Policy Documents and Events Held for EPA's 25th Anniversary

22 August 2012 marked the 25th founding anniversary of the EPA. From August 14 to 21, the EPA held a series of conferences on the important policy documents and events of its history and invited the public to review the environmental protection business over the years, witness its achievements, and look forward to a brighter future.



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Twenty-second of August 2012 was the 25th founding anniversary of the EPA. This year's anniversary celebration bears special significance inasmuch as after the restructuring of the Executive Yuan, the EPA and five other related governmental agencies will be integrated into the Ministry of Environment and Natural Resources. As a token of solidarity, past ministers of the EPA, including Eugene Chien, Jaw Shau-Kong, Larry L.G. Chen, Lung-Sheng Chang, Hsun-Hsiung Tsai, Lung-Bin Hau, Juu-En Chang, Ting-Kuei Tsay, and Winston Dang were invited to participate in the anniversary celebration (as shown in the photo on page one).

Twenty-five years ago, under the eager anticipation of our citizens, the Environmental Protection Administration was formally established. Business units under the Administration include: the Department of Comprehensive Planning, Department of Air Quality and Noise Control, Department of Water Quality Protection, Department of Waste Management, Department of Environmental Sanitation and Toxic Substances Management, Department of Supervision Evaluation and Dispute Resolution, Department of Environmental Monitoring and information Management, and the Bureau of Environmental Inspection. Affiliated units include the Environmental Analysis Laboratory, the Environmental Professionals Training Institute, etc., which are responsible for the protection of the environment of our nation. Due to the economic development of Taiwan, the workload for environmental protection has become increasingly heavy by the day, so it is vitally important for the EPA to do its job properly.

With the step by step development of the restructuring work of the Executive Yuan, the EPA

will be integrated into the Ministry of Environment and Natural Resources. At this important juncture, the EPA conducted a special review and analysis of its important policies over the years, including their rationale, developments and processing in an effort to analyze the evolvement of Taiwan's environmental policies, how the establishment of new agencies and the alteration of regulations impacted Taiwan's environment, etc. Through the oral history of the major facilitators of the important policies, the EPA tried to gain insight into the implementation process of the policies on environmental impact assessment, air pollution control, soil and groundwater remediation, prevention and control of marine pollution, waste disposal and resource recycling, industrial waste management, environmental and toxic management, and compiled its findings into "An Anthology of the Important Policies and Documents of the Environmental Protection Administration" as a reference tool for future promoters of environmental policies.

In addition, to line up with its 25th founding anniversary celebration, the EPA also put out a chronicle of important events which relates to all the major topics of the businesses under its jurisdiction. The EPA expresses thanks to everyone who has participated in the environmental protection work, and invites the public to witness the course and outcome of their endeavors. The EPA also awarded retired staff who had devoted their entire lives to environmental work. To sum up, the EPA hopes to continue achieving innovations and breakthroughs, so that all people in Taiwan can march towards a low-carbon, healthy, sustainable homeland composed of blue sky, green earth, verdant mountains and pristine water.

## Energy and Resource

### District Heating and Cooling Systems to Help Reach Zero-carbon Goals

Taiwan is working hard to gradually move from a low-carbon policy to a zero-carbon policy, so promoting renewable energy sources is an important item on its agenda. To this end, the EPA is currently evaluating a refuse incinerator district heating and cooling (DHC) system. The EPA estimates that installing this system on all of Taiwan's incinerators could increase total heat efficiency of the nation's incinerators by over 30% just by utilizing waste heat from power generation.

Energy conservation and carbon reduction are administrative goals aimed directly at solving the greenhouse gas problem. According to the estimates of the 2009 National Energy Conference, adjusting Taiwan's industrial structure to raise energy efficiency could lead to an annual reduction of at least 2% of overall energy consumption by the year 2020. In order to achieve this target, the four main sectors — industry, transport, residential/commercial, and government — must all come up with large sums of money to replace outdated facilities or upgrade basic infrastructure (such as building rail transport systems, and facilitating the uptake of bicycles and electric scooters as modes of transport). The degree of difficulty and necessary costs for relevant improvement plans will also increase accordingly.

### The Worldwide Trend toward Zero Carbon

In addition to saving energy, nations around the globe are leaving no stone unturned to develop new energy sources that are cleaner and renewable in order to gradually replace depleting fossil fuels. Renewable energy has the advantages of reducing environmental pollution, mitigating climate change, and protecting consumers from high oil prices and energy crises.

In order to promote the government's low-carbon policy, in 2010 the EPA set up the Office of Energy and Resource Program, which is charged with coordinating among departments and offices all issues related to generating renewable energy from waste and recycling resources for sustainable use. Sources of renewable energy currently being developed in Taiwan include solar power, hydro power, wind power, geothermal energy, and biomass energy. The great hope is that the day will come when fossil fuels have been completely replaced by renewable energy and the goal of zero carbon emissions has been achieved. That there is an international trend toward actively developing sustainable renewable energy sources can be seen in the zero-carbon targets set by a number of developed nations, for example, 2020 for Australia, 2030 for the UK, and 2050 for Denmark and Germany. These nations are planning simulations of attaining zero-carbon targets, and Denmark has already completed legislation to this effect.

Steps commonly taken to attain low-carbon or zero-carbon targets include increasing building energy efficiency, reducing energy demand, upgrading the

efficiency of electric equipment, promoting district heating and cooling and power supply systems, strengthening waste heat recovery and using renewable energy. It is clear that waste heat recovery and district heating and cooling are important steps to achieve low-carbon and zero-carbon goals. In the past, many nations adopted district heating methods, such as using the heat produced by refuse incinerators to heat and supply hot water in nearby homes. However, since Taiwan is situated in a warm climate, its excess incinerator heat could be put to better use by powering air conditioners via absorption refrigerators. The EPA is currently assessing cooling plans for the Nei-hu Refuse Incineration Plant in Taipei City. Assuming trials are successful, district heating and cooling (DHC) systems will be installed on other incinerators around Taiwan and the nation will soon be benefiting from the sustainable use of renewable waste heat from power generation as an energy source.

### The District Heating and Cooling Systems Demonstration Plan

Taiwan currently has a total of 24 large-scale refuse incineration plants that annually burn a total of 6.35 million tonnes of household and general waste. As well as going a long way to solving Taiwan's waste disposal problem, these incinerators also produce high-temperature steam that drives steam turbines to generate electricity. Statistics show that in 2011 Taiwan's 24 incineration plants produced 3,070 gigawatt-hours of electricity, of which 2,360 gigawatt-hours, or 76.87%, was sold. Revenues of NT\$4.51 billion were generated from the sale of the electricity, making it the incinerators' most important side benefit.

However, in terms of heat efficiency, power plants that use thermal coal or fuel oil have an overall heat efficiency of less than 40%, and the heat efficiency of incinerators employing the natural gas combined cycle struggles to reach 50%. This means that 50-60% of the heat being generated escapes into the atmosphere. If all of this wasted heat were captured it would be equivalent to at least five times all of the energy saved by the current projects to save energy. Unfortunately, power stations are public enterprises that are charged with the task of providing a stable supply of electricity; therefore, any proposed project to channel excess heat to them would inevitably involve

reducing their generating capacity and/or modifying their steam turbines, and would thus be turned down on the basis of the impact on the supply and stability of electricity.

### Reuse of Waste Heat from Incinerators Increases Heat Efficiency by over 30%

In comparison to power plants, incinerators — the primary purpose of which is to incinerate refuse — have a heat efficiency of just 20% on average. This means that 65-80% of excess heat escapes into the atmosphere via air-cooled condensers. Incinerators are thus a suitable target for heat reuse projects and the installation of demonstration systems as the margin for improving recovery is so large. The EPA estimates that taking advantage of the latent heat capacity of steam could lead to at least a 30~45% increase in the heat efficiency of Taiwan's refuse incinerators.

When the DHC systems find application in the combined cooling, heating, and power (CCHP – a way of distributing energy supply) systems of large urban buildings, natural gas is used as fuel instead of traditional thermal power generation. Gas turbines or internal combustion engines are used to generate electricity. The waste steam is passed through waste heat recycling boilers to produce steam – or, in the case of incinerators, waste steam is produced directly from generating electricity – part of which is used to drive absorption refrigerators, and part to provide hot water. The CCHP combines power generation and air conditioning into one system in order to meet the total cooling, heating, and power requirements of a large building.

Reusing the waste heat from incineration plants by installing the DHC systems will lead to a reduction in installed power generation capacity for the peak summer months and also raise generator heat efficiency. The costs incurred will also be lower than replacing old equipment with energy-saving facilities as long as the DHC systems are confined to the incineration plant itself and the immediate surrounding neighborhood. The DHC systems are currently the most feasible methods for saving energy and reducing carbon emissions.

To ensure successful establishment of the DHC systems in the future, the following feasibility

assessment for the Nei-hu Refuse Incineration Plant's demonstration plan is provided as an example:

1) Analyze Nei-hu Refuse Incineration Plant operation and efficiency details: Gather data on heat engine cycle equipment, operating statistics and data. Establish a heat balance diagram, heat consumption rate, thermodynamic properties of discharged waste heat, and total quantity of heat discharged. This will serve as the baseline data for evaluating waste heat recovery, and calculating thermal efficiency of the equipment and power generation efficiency.

2) Check current use of space and feasibility of expanding the plant: Check the arrangement of equipment in power generator rooms, and assess feasibility of adding areas for cooling centers, ice water distribution pumps and storage tanks near power generator rooms. Assess feasibility for retrofitting or adding steam conduit, ice water conduit, control valves, and pressure release valves.

3) Survey the potential energy demand of users in neighboring districts: Survey key areas including the Nangang Business Park and the potential quantities of ice water needed there. Evaluate the most suitable waste heat recovery plan based on user peak demand potential.

4) Research case studies in waste heat recovery: Evaluate thermodynamic properties of steam heat sources in waste heat recovery. Assess heating and cooling equipment models, and the potential for retrofitting existing equipment or adding new equipment. Evaluate waste heat pre- and post-recovery power generation efficiency and changes in the amounts of electricity sold; and in total heat efficiency of units; quantities of waste heat recovered; total quantities and areas for providing heat or air conditioning; carbon dioxide emissions and carbon tax benefits

5) Assess the possible establishment and investment methods of district cooling centers: Scope of equipment remodeling, functional needs of district cooling centers, spare equipment capacity and distribution.

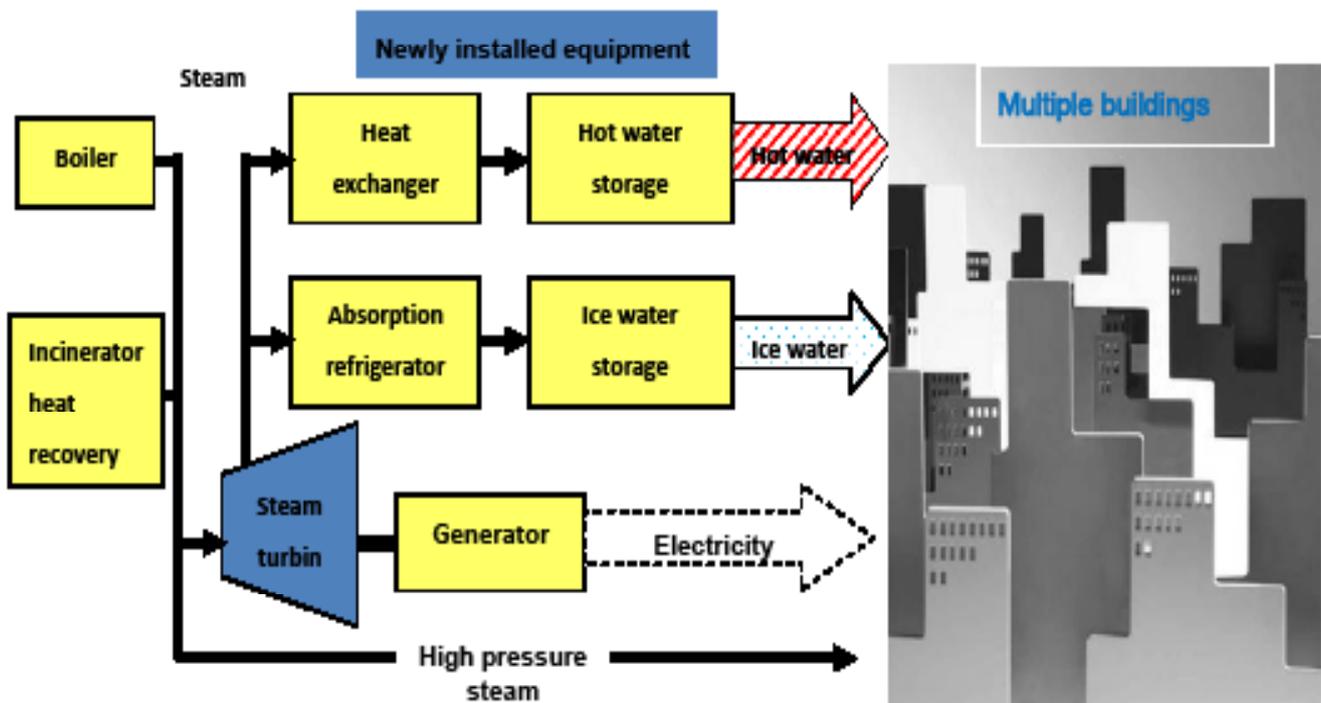
6) Inspect and select conduit networks and pathways.

7) Evaluate economic benefits of investments: Preliminary installation, maintenance, energy consumption, and operation costs of cooling and heating equipment; installation, operation and maintenance costs of pumping ice water, steam, and hot water; and installation and maintenance costs of setting up conduit networks.

8) Other specific key tasks to look into: Feasibility of transforming facilities into district energy centers; evaluate measures and energy conversion efficiency; maintenance of conduit networks when not in use; evaluate the economic sensitivity of electricity prices and carbon taxes on investments.

Some problems exist regarding the promotion of renewable energy sources such as wind, water, solar, geothermal, and biomass (e.g., torrefied wood). One

is that they can only supply energy intermittently; another is the difficulty of storing energy from these sources. Then there is the problem of cross-ministerial coordination between such diverse units as the Industrial Development Bureau, the Bureau of Energy, and the Water Resources Agency under the Ministry of Economic Affairs, as well as the Council of Agriculture. In comparison, the DHC system for incinerators is totally self-contained, is a much more stable source of renewable energy, and would be solely under the auspices of the EPA, making it easier to implement. The EPA thus hopes that once current trials are proven successful, the DHC system will be applied to all of Taiwan's incineration plants, giving Taiwan a push along the road toward low-carbon output and eventually becoming a zero-carbon nation.



▶ Diagram showing the concept of CCHP for incineration plants and the additional facilities required

## International Cooperation

### Cross-strait Environmental Services Exchange Launched on the Web

In order to assist Taiwan's environmental services companies to enter China's market, the EPA has established the Cross-strait Environmental Services Exchange Platform. The Web site went into operation on 21 August 2012.

The Cross-strait Environmental Services Exchange Platform integrates all of the relevant information on one platform and consists of seven subsidiary windows: environmental analysis and monitoring; environmental engineering; resource reuse and recycling; energy conservation and carbon reduction; soil and groundwater; pest control; and environmental education. The platform provides information about environmental regulations of Taiwan and China, relevant experiences, and research articles will be valuable to environmental service personnel in particular and the industry as a whole. The Web site is at <http://csesep.tesd.org.tw>.

From an international perspective, over the last few years environmental protection has expanded in scale from local to global. The main driving forces behind this trend have been the growth of international trade and increased numbers of environmental disputes. The growth of technical barriers to trade in relation to environmental issues shows that the era of the commercialization of corporate environmental protection is upon us. At present, promoting sustainable industrial development has become an international trend, and so many nations are asking how they can adjust their industrial structure to harmonize it with the trend toward sustainable development in order to enhance their industrial competitiveness. Learning how to respond to the global trend toward green manufacturing has thus become the most important topic on the agenda.

The EPA points out that the environmental industry in China is growing hand-in-hand with rapid economic development, and their current (12th) five-year plan emphasizes saving energy, reducing emissions, and

protecting the environment in general. The rules of the World Trade Organization's service trade agreement state that China had to open up its domestic environmental services market to foreign enterprises by 2002. Taiwan has also allowed mainland Chinese corporations to enter the Taiwan market. However, both nations have their own regulations regarding the environmental service industry as well as limitations due to commercial competition, making it difficult for Taiwan's environmental service providers to enter China's market. Although the *Economic Cooperation Framework Agreement (ECFA)* service trade arrangement has been designed to assist Taiwan's enterprises in removing obstacles to entering China's market by allowing for negotiated settlement of problems in stages, there is still a lot of collecting and analyzing of information, cross-strait exchanges, and further research and discussion that has to be done before a full understanding will be gained of how well Taiwan's businesses are penetrating China's market, how willing they are to invest, and how big are the obstacles that stand in their way.

The EPA emphasizes that the rolling out of the Cross-strait Environmental Services Exchange Platform signifies the start of a formal exchange mechanism for cross-strait environmental services. This integrated information and exchange platform will be used to ascertain the problems, difficulties, and follow-up needs of Taiwan's environmental service providers so that they can be solved by being included in ECFA service trade negotiations or through signing other relevant cross-strait cooperative agreements. This will be of considerable help to Taiwan's environmental service providers as they attempt to break into China's market.

## Dispute and Resolution

### Legal Aid for Public Nuisance Disputes Now Available

In order to fully protect the rights of members of the public involved in public nuisance disputes arising from environmental pollution, the EPA has for the first time been conducting trials of its Public Nuisance Dispute Legal Aid Plan of factories and complexity of operations. The EPA has also been integrating inter-agency resources, and has devised a system of colored "lights" – red, orange, yellow, and green – to signal different levels of intensity in terms of management work in the 151 zones.

The types of assistance provided by the Public Nuisance Dispute Legal Aid Plan include

composition of legal documents, representation in the various procedures related to public nuisance

disputes (on-site inspection and preliminary negotiation, mediation, arbitration, conciliation, and settlement), and providing legal representation for civil court cases. From now on, members of the public who require legal aid can apply to their local environmental protection bureau, who will offer their services after determining that the case is a bona fide public nuisance dispute that qualifies for legal aid according to the relevant regulations.

Usually when members of the public are involved in cases of environmental pollution or public nuisance they will submit public nuisance petitions that are received and investigated by EPA officers and dealt with satisfactorily. However, when environmental pollution has already caused demonstrable damage, even if the behavior in question accords with environmental regulations, then the question of compensation must be settled either through the public nuisance mediation procedure or through civil

action in court. The legal aid provided by the EPA is designed to help the complainant protect their legal entitlements.

Of the available services mentioned above, legal document composition and representation in mediation procedures will be provided free of charge for all. For civil court cases, legal assistance will be offered according to the applicant's financial capability (for example, there is an exclusionary clause whereby wealthy litigants will not be eligible) and will only be available for cases directly related to environmental pollution. The EPA hopes that these services will act as another way for complainants to solve their public nuisance problem, and that the public will avail themselves of the services without hesitation. More information on legal assistance is available by calling (02)23131183, ext. 15, or the EPA at (02)23117722, ext. 2931.

## Air Quality

### Air Pollution Control Fee Collection Regulations Revised

On 6 September 2012, the EPA announced revisions to the *Air Pollution Control Fee Collection Regulations*. The revisions will affect the submission of air pollution control fee applications, their evaluation and approval, and installment payments for the fee. As a result of the threshold figure for payment installments being lowered, operators of stationary pollution sources (not including construction projects) who have overpaid the air pollution control fee by over NT\$2,000 as calculated by the competent authority can choose either to have further payments reduced by the equivalent amount or have the amount refunded.

The revisions to the relevant articles were drawn up to address problems encountered by competent authorities during their annual audits and by the operators of the public or private premises being audited. The revised regulations are more logical, and also more in keeping with the actual situation.

One revision concerns air pollution control fees for stationary pollution sources (not including construction projects): All public and private premises will from now on have to submit fee payment applications online. This is in keeping with the government's overall drive to digitalize and simplify application procedures and will reduce enterprises' use of paper. Public or private premises that produce relatively small volumes of emissions will also be able to file their application

once yearly instead of once every quarter, which will reduce their administrative workloads. A new revision stipulates that operators of stationary pollution source facilities that create large volumes of emissions due to poor maintenance or broken equipment will have to pay additional air pollution control fees. This should lead to higher quality self-management from operators and thus greater overall control of emissions.

There are occasions, however, when public and private premises are unable to pay their air pollution control fees on time due to natural disasters or other factors beyond their control. Another new revision stipulates that once the reason for the delay has been removed, information explaining the delay must be submitted to the competent authority within a given time period in order for the operator to be allowed

to make up the missing payment without further sanctions being imposed. The EPA believes that finding the right balance between leniency and the law will encourage operators to fulfill their legal obligations. The information storage period for enterprises has also been extended from five years to six years so that competent authorities can have access to a full five years of relevant information on applications. The EPA will also be passing the task of collecting air pollution control fees onto designated competent authorities in Taiwan's special municipalities, counties, and cities so that they will gain greater control over the actual amounts of pollutants being emitted by enterprises under their jurisdiction.

The EPA has amended the criteria for determining the day of project commencement for construction projects that are underway, or were completed, without an air pollution control fee application being received by the relevant competent authority. The

EPA has also added a revision stating that competent authorities in special municipalities, counties, and cities must take into account the common good and suspend receiving — for an announced period — air pollution control fees for construction projects that are for the purpose of resettling victims or rebuilding infrastructure following natural disasters. Another revision designed to encourage construction operators to pay their air pollution control fees in full and on time allows for competent authorities to determine — based on inspection results — the air pollution fee of any enterprise that does not abide by the application regulations (such as attempting to pay a lower rate or submitting incomplete information).

All information related to the latest revisions can be found on the EPA's Web site (<http://ivy5.epa.gov.tw/epalaw/index.aspx>) under the section labeled "Latest Environmental Regulations."

## Air Quality

### Fines Lifted for Idling Vehicles When Outdoor Temperature Exceeds 30°C

The EPA has pre-announced revisions to the *Motor Vehicle Idling Management Regulations*. In future, owners of idling vehicles will not be fined when outdoor temperatures exceed 30°C or during rain showers. Taxis waiting in line to pick up passengers will also be exempt. The revisions are intended to facilitate more effective enforcement of the regulations without impacting public health.

Since the *Motor Vehicle Parking and Idling Management Regulations* first came into effect on 1 June 2012, many opinions on what circumstances should qualify for exemption from the regulations have been put forward from all sectors of society. After taking into account all of these suggestions, related regulations in neighboring countries, the nature of Taiwan's climate, and also the general mood of the populace, the EPA decided to revise Article 4 of the regulations.

The exemptions for idling included in the recent revisions include:

- All vehicles on days when the maximum temperature has been forecasted to exceed 30°C;
- When it is raining hard enough to influence the reading of inspection instruments;
- Taxis waiting in line to pick up passengers;
- School buses and minivans, coaches, and other large passenger vehicles that have passengers on board;
- Any vehicle that a person other than the driver is in the process of embarking or disembarking from;
- Any vehicle being used by the emergency services to deal with a traffic incident;
- Any vehicle for which manual regeneration of the diesel particulate filter requires that the engine idles, or any malfunctioning vehicle in which idling cannot be stopped;
- Any vehicle that is being used by government

inspectors carrying out inspections or tests in accordance with the law.

The revisions are intended to facilitate more effective enforcement of the regulations without impacting public health.

## Toxic Substance Management

# Screening Principles for Controlled Substances in Drinking Water Drafted

Local government environmental protection bureaus are responsible for conducting drinking water inspections and testing. Some contaminants, however, are difficult to detect, so this year the EPA began assisting local bureaus in testing for these items in order to enhance controls over drinking water quality. In addition to more stringent testing for controlled substances, the EPA also developed working principles for screening harmful substances in drinking water.

There are a total of 357 water purification plants in Taiwan. This year the EPA is planning to help local government environmental protection bureaus to conduct 364 visits to test water quality at these plants. To date, 318 first-stage visits have been completed, and a total of 7,267 water quality tests have been carried out. Nearly all of the samples tested (99.97%) were found to be up to standard. When the EPA has the full results of the first stage of testing, plans for a second stage of testing and follow-up inspections will be drawn up. Besides taking samples from the direct supply system for tap water — the main component of the public water supply — the EPA also tested 456 samples from the supply systems of 38 small water treatment facilities, which were found to be 100% up to standard. The difficult-to-detect contaminants that the EPA assisted in testing for this year included 38 items in 6 main categories: heavy metals, substances that affect human health, disinfection by-products, volatile organic compounds (VOCs), pesticides, and persistent organic pollutants (POPs).

Regarding the water purification plants that were found to have substandard water, the EPA has already sent written notices to the local government environmental protection bureaus concerned, asking them to fine the plants and supervise the improvement work as regulations dictate. The EPA will be conducting follow-up inspections to ensure these plants have been sufficiently improved.

Total trihalomethanes (TTHMs) and bromate are both by-products of disinfection processes. TTHMs are known to affect the normal functioning of the human nervous system, as well as liver and kidney

functions. TTHMs are usually found in drinking water as a result of chlorine being added to disinfect it: The chlorine reacts with organic compounds in the water to form TTHMs. TTHM contamination can be reduced by removing organic substances from drinking water, and by restricting the use of chlorine or using a substitute disinfectant. Bromate also affects normal kidney functioning, and can also cause cancer. Bromate forms in drinking water when there is a high concentration of bromide ions or when chloride or ozone is used as disinfectant during water purification. Removing bromate from water can be done by removing organic compounds from the water, reducing the proportion of seawater, and maintaining rigorous control over the disinfection process.

The EPA will continue to reinforce testing of controlled substances listed in drinking water quality standards. The EPA is also looking at drinking water management methods and principles in other nations with a view to formulating working principles for screening drinking water for listed substances (currently being drafted). The idea is to develop a systematic and standardized system for screening controlled substances in drinking water. Once the draft bill is adopted, the next step will be further assessment and long-term observation of substances in drinking water which will require the cooperation of utility companies so that testing at water purification plants can be carried out. The EPA will then review all of the related information and test results to determine whether or not new drinking water controls are needed to guarantee the safety of public drinking water.

**Waste Management**

## Promoting Land Reclamation with a View toward Zero Waste in Resource Recycling

The capacity of domestic landfills in Taiwan is becoming saturated, and new landfills cannot be built successfully due to the NIMBY(not in my back yard) effect. In order to solve the problem of insufficient landfill space and reduce the frequent incidents of illegal dumping, the EPA decides to draw on the experience of foreign countries and actively promotes the concept of using solid wastes to reclaim land and to build landfill islands as a final strategy to dispose of waste materials that are unsuitable for incineration. At the same time, the EPA vehemently communicates with the Maritime and Port Bureau of the Ministry of Transportation and Communications and the Taiwan International Ports Corporation to gain opportunities for cooperation and policy support, in an effort to solve the ultimate disposal problem of Taiwan's annual 3.8 to 7 million cubic meter of wastes and construction and demolition waste that are unsuitable for incineration.

**A**t the same time, the EPA vehemently communicates with the Maritime and Port Bureau of the Ministry of Transportation and Communications and the Taiwan International Ports Corporation to gain opportunities for cooperation, in an effort to solve the ultimate disposal problem of Taiwan's annual 3.8 to 7 million cubic meters of wastes and construction and demolition waste that are unsuitable for incineration.

The purposes of using non-recyclable, non-incinerable wastes and construction residues for land reclamation and coastline development projects are: to establish a resource recycling system for the earth; to accomplish the task of sustainable materials management; to fill the gap of resource recycling, and to achieve the ultimate goal of zero waste in resource recycling. In doing so, the projects that are connected to land are called "land reclamations," whereas the offshore projects are called "creation of landfill islands." When the land reclamation projects are implemented in coordination with the port authority of the artificial coastline and with the port authority's future development plan, damage to the natural coastline can be avoided. As regards creating offshore landfill islands, the projects will not destroy the existing coastlines. On the contrary, they will only create new coastlines. Hence, the impact on the land is minimal.

The Japanese government established the "Osaka Bay Regional Offshore Environmental Improvement Center" in 1982 to carry out the "Osaka Bay Phoenix Project." The Izumioozu oki and the Amagasaki oki were slated to be the sites for land reclamation,

whereas the Kobe oki and the Osaka oki were slated for landfill islands. In addition, the government also installed nine bases where general and industrial waste materials could be received and piled. The Singapore government, on the other hand, started to build the offshore Palau Semakau landfill in 1995. It was inaugurated on 1 April 1999 to solve the problem of ash from garbage incineration and the final disposal of waste materials that were unsuitable for incineration. At the same time, Singapore was able to develop a new island, and use the newborn land for recreational purposes.

The EPA has started to proceed with the strategic environmental impact assessment (EIA) of industrial waste disposal policy in 2012. On 29 March 2012, it invited related ministries and scholars to participate in an Strategic Environmental Assessment definition conference, in which the scope and targets of assessment were confirmed. In order to garner consensus and incorporate pluralistic opinions, the EPA specifically invited 20 independent citizens to participate in four preparatory and citizens' consensus-building meetings which were held in August 2012 on "Using solid waste to reclaim land and create landfill islands." The conclusions arrived at the meetings were included in the contents of the EIA report as references for the EPA's decision on whether to reclaim land and create landfill islands.

**International Cooperation**

## Taiwan and South Korea Cooperate on Soil and Groundwater Protection

On 27 August 2012, representatives of Taiwan and South Korea signed a Taiwan-South Korea soil and groundwater protection cooperative memorandum. The memorandum outlines the way the two nations intend to cooperate on soil and groundwater protection, such as exchanging knowledge and experience on soil and groundwater pollution characterization and remediation matters.

To attend the signing ceremony, the director of Water Supply and Sewerage Policy Office of the South Korea Ministry of Environment Jin Seok Kim led a delegation of 11 members arrived in Taiwan on 27 August 2012 for a 4-day visit. In addition to discussing the scope and practicalities of future cooperative efforts with the EPA, the accompanying delegation of Korean industry representatives held talks with their Taiwan counterparts on the markets for pollution remediation in their respective nations and the development of remediation methods and technologies.

In 2010, the EPA invited Japan, South Korea, the Philippines, Vietnam, Malaysia, Thailand, India, and Indonesia to establish the Working Group on Remediation for Soil and Groundwater Pollution of Asian Countries (ReSAG) in order to actively

promote international exchanges on this issue. The Taiwan-South Korea memorandum is the first official cooperative memorandum that Taiwan has signed with a nation it has no formal diplomatic ties with since the establishment of ReSAG. It will have considerable precedential significance as Taiwan continues to develop official environmental exchanges with other ReSAG member nations. The EPA expects that deeper cooperation between Taiwan and the Republic of Korea will highlight Taiwan's leading regional role in both the development of environmental regulations and technological capabilities, which should lead to ReSAG members seeking to advance cooperative exchanges with Taiwan. The EPA aims to turn Taiwan into a regional hub for soil and groundwater pollution remediation technology, and the recent signing might well prove to be a significant step in the right direction.



▶ EPA Minister Stephen Shu-hung Shen (third from left) and the Republic of Korea delegation

**Ecolabelling**

## Celebrating 20 Years of Green Mark

The EPA has been commemorating its founding 25 years ago by holding a series of talks by its various administrative units on their environmental work over the past quarter century and hopes for the future. To promote the Green Mark, an animated film – A Documentary of 20 Years of Promoting the Green Mark Plan and Hopes for Its Future – was shown on 17 August 2012. College students and representatives from environmental groups were invited to attend.

As the EPA's Department of Supervision Evaluation and Dispute Resolution points out, the EPA has always been keen to keep abreast of global environmental trends and so first took a close look at eco-labeling in developed nations before formulating the Protocols for the Promotion and Use of Green Mark in 1992 which demonstrated Taiwan's willingness to actively participate in the green consumerism movement that was mushrooming around the world.

The preliminary stage of Taiwan's green labeling involved setting standards for six product categories. At present, standards have been announced for 115 items in 14 different categories, and 7,913 individual products have been certified to carry the Green Mark, with around 4,000 still effective. The results of implementing the plan compare favorably with similar efforts in North America, Europe, and Japan. In order to further promote sales of products carrying the Green Mark, the EPA has also established two online platforms – the Environmental Products Online Procurement Network, and the Green Living Information Network – that provide transparent information on green products and how buying them can benefit the environment. Over the last few years the EPA has also been working hard at setting up Green Stores around Taiwan, and at present there are nearly 11,000 of these outlets that are making it easier for the public to buy Green Mark products.

In order to realize the vision of total public participation in green consumption, starting in 2002, government agencies in Taiwan began green procurement. Since that year, the total amount spent on government green procurement has grown from NT\$2.6 billion annually to approximately NT\$9 billion this year. The enormity of government agency procurement power has successfully driven green procurement and green manufacturing in the private sector. In 2007, the EPA

began actively guiding private enterprises and citizen groups to increase green procurement. This resulted in money spent on green purchases as reported to the EPA rising from NT\$600 million in 2007 to over NT\$3.9 billion in 2011, a great success by any standards.

In recent years, the Green Mark plan has been extended to formulating Green Mark regulations for the service industry and rolling out a more comprehensive plan for total public participation in green consumption. New measures include: Having green hotels encourage their guests to bring their own toiletries, having green restaurants encourage their customers to bring their own eating utensils, encouraging couples about to be wedded to plan out low-carbon wedding ceremonies, and providing information on eco-friendly behavior for every aspect of life – food, clothing, accommodation, travel, education, entertainment, etc. The EPA hopes that the public will fully participate in creating a culture of sustainable green lifestyles. All relevant information has been posted on the EPA's GreenLiving Information Platform (<http://greenliving.epa.gov.tw/GreenLife/>)

## News Brief

### Revisions to Criteria for Penalizing Vehicular Violations of the Air Pollution Control Act Pre-announced

The EPA has revised the Criteria for Penalizing Vehicular Violations of the Air Pollution Control Act. The revisions come after the revisions to the Standards for the Composition of Automobile Gasoline and Diesel Fuels promulgated on 29 July 2009 tightened the controls on sulfur content in gasoline and diesel to 10 mg/kg, and the stricter controls were applied to all vehicle oil products on 1 July 2012. In conjunction with revisions to the penalty criteria as set out in Article 2 of the Criteria for Penalizing Vehicular Violations of the Air Pollution Control Act, the EPA has also added penalty criteria for manufacturers and importers who sell standard oil products and has adjusted calculation methods in order to increase the fines for illicit gain from violating the regulations.

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